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ABSTRACTS

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Abstracts

Oral communication I

Community Pharmacy: pharmaceutical care

CP-PC001

Validation of a novel self-report questionnaire to assess swallowing difficulties with medication intake in patients with systemic sclerosis

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Background and objective: Around 9–27 % of patients report acute swallowing difficulties (SD) with medication[1,2] that may affect quality of life, leads to hazardous coping strategies (splitting or crushing pills) and reduce adherence to medication regimen.

Patients with systemic sclerosis (SSc) suffer from a multisystem autoimmune disease with high mortality where vascular remodelling and increased fibroblast activity result in abnormal growth of connective tissue including the GI-tract. The disease leads in many cases to SD that may influence drug ingestion.

Our project aimed at developing and validating an assessment tool in patients with SSc.

Setting and method: Published questionnaires on SD with medication intake were retrieved from a systematic literature search following PRISMA guidelines. The self-report questionnaire draft, ending with the 8-item Morisky Medication Adherence Scale, was evaluated by an expert panel made of health professionals and patients. SSc patients pilot tested it on comprehensibility.

The final questionnaire was validated according to Fitzpatrick[3] with SSc patients of the European Centre for the Rehabilitation of Scleroderma, Reha Rheinfelden (Switzerland). Paper-based questionnaires and pre-paid return shipping envelopes were send by mail. Approval from the local ethics commission [EKNZ 2014-013] was obtained (ClinicalTrials-ID: NCT02105818).

Results: The study was performed in January-May 2014. Literature search yielded 4 articles. The expert panel (8 health professionals, 3 patients) agreed upon 35 questions within 5 sections (complaints type; intensity; localisation; coping strategies; current care situation). Pilot testing with 9 patients lead to no modification of the draft. From the 64 SSc patients enrolled, 43 (67 %) returned the questionnaire. The tool was appropriate, acceptable, feasible, valid and reliable (test–retest with 6 patients after 2 weeks; $\varkappa = 0.81$). SD with medication intake were existing at present (n = 11; 26 % prevalence) and in the past (n = 9; 21 %). Intensity was strong or unbearable for 5 patients (25 %). Most patients localised the difficulty in the larynx (43 %) or the oesophagus (34 %). Eight patients (40 %) modified the dosage form of their medication. SD and adherence did not correlate ($p = 0.087$).

Conclusions: We present the first self-report questionnaire assessing SD with medication intake in SSc patients. Its validation in this highly specific population prone to develop SD resulted in a practicable assessment tool with concrete fallouts for physicians and pharmacists e.g., the discovery of inadequate coping strategies with medication intake. Since SD may hamper any patient with polypharmacy, further studies will test the tool in a general population setting and evaluate its usefulness as screening tool for drug related problems.

References

1. Marquis J et al. IJCP 2013
2. Schiele JT et al. Eur J Clin Pharmacol 2013
3. Fitzpatrick R et al. Health Technol Assess 1998

Disclosure of interest: None Declared.

Public Health

PH001

A systematic review of health professionals' beliefs, attitudes and experiences of medication error reporting

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Background and objective: Medication errors are prevalent in the all healthcare settings and are key modifiable factors impacting patient care and safety. Effective and efficient medication error reporting systems are necessary to allow for review, learning and change following errors. The objective of this systematic review was to critically appraise, synthesize and present the evidence on health professionals' beliefs, attitudes and experiences of medication error reporting.

Setting and method: A systematic review protocol was developed and registered with the Joanna Briggs Institute (JBI). The search string included: health professional, doctor, nurse, pharmacist; medication error reporting; beliefs; attitudes; experiences; under reporting. Boolean operators, truncation, wildcards, alternative spellings were applied to search databases (Cumulative Index of Nursing and Allied Health professionals Literature, Medline, International Pharmaceutical Abstracts, PsycInfo, Cochrane Database of Systematic Reviews). Each paper was assessed by two reviewers for methodological quality prior to inclusion in the review. Studies were critically appraised and data extracted using standardized JBI tools. Findings were synthesized using a narrative approach.

Main outcome measures: Health professionals' beliefs, attitudes and experiences of medication error reporting.
Results: Database searching identified 724 studies, 25 of which were included in the review. Studies designs were quantitative (cross-sectional surveys), qualitative (interviews and focus groups) and mixed. Most studies were conducted within Europe, the United States and Australia. Many factors appeared to influence sub-optimal reporting rates including: lack of awareness and understanding of reporting policies; lack of visibility of the reporting processes; disagreement on what constitutes an error worthy of reporting; the effort required to report; lack of any senior role models; fear of the potential consequences of reporting; and lack of any feedback or effective feedback to the reporter.
Conclusions: A number of relevant studies have identified the key perceived limitations of medication error reporting processes and systems. These issues are contributing to sub-optimal reporting and hence are compromising the effectiveness and efficiency of the reporting processes. There is an urgent need to explore these issues in greater depth, from both the organization and individual practitioner perspectives, to develop and implement interventions to facilitate a positive reporting and patient safety culture.
Disclosure of interest: None Declared.

Community Pharmacy: Pharmaceutical care

CP-PC002

Different perceptions of pharmacy/pharmacist role: a case from Danish pharmacy internship

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Background and objective: This study aimed at documenting pharmacy students' perceptions of the role of the pharmacist and pharmacy prior to and at the end of the pharmacy internship, since internship seems to influence the development of pharmacy studenťs perceptions. Further, in order to understand how the perceptions were linked to a professionalization process, comparisons with supervisor and pharmacy customer perceptions was also carried out.
Setting and method: In 2012, 127 pharmacy students were asked – prior to and at the end of their pharmacy internship—to fill out a questionnaire with predeveloped categories including (1) their perception of the most important tasks of community pharmacies, (2) the main tasks of community pharmacists' and (3) customers' expectations of pharmacies.. Previously collected data from 2010 and 2011 were used in the analyses to strengthen and validate the findings by calculating the variance between answers for the three years both prior to and at the end of the internship. The students also interviewed customers and pharmacists (supervisors) about the issues and mentioned in (1)−(3). All in all, the results are based on data from 395 students, 285 customers and 96 pharmacists .
Results: The study shows how pharmacy internship makes students more aligned with each other with regard to perceptions. Studenťs perceptions appear to be aligned with those of the pharmacists/supervisors in that the pharmacisťs most important task is "Being a clinical leader". However, studenťs perception of customeŕs expectations of pharmacy were more aligned with customers than with pharmacists, especially in relation to the importance of "Service".
Conclusions: The results of the study imply that the influence of pharmacy internship on students' perceptions is the result of a complex learning process based on both individual and social processes. More research is needed, though, in order to better understand this phenomenon and what implications it might have when designing internship programs.
Disclosure of interest: None Declared.

Public Health

PH002

Influences on antibiotic prescribing by dentists: insights from a pilot study

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Background and objective: Antibiotic resistance is a key public health problem, primarily related to the inappropriate use of these drugs. Antibiotics are among the most frequently prescribed drugs by dentists, however literature indicates that they are not always prescribed appropriately. There is a paucity of qualitative research on dentists' beliefs and perceptions of this prescribing process. The aim of this study is to explore issues related to antibiotic prescribing by dentists. This paper focuses on issues related to influences on prescribing.
Setting and method: Semi-structured qualitative interviews with 14 purposively selected dentists. Interviews were audiotaped (subjected to written consent), transcribed *verbatim* and analysed using the five-stage "Framework Approach", with the aid of the software WebQDA. Ethical approval was granted.
Results: A "defensive" practice was identified as one of the factors influencing antibiotic prescribing. Underlying this practice was a concern of avoiding clinical complications and a fear of losing patients. Data analysis suggests that the influence of clinical guidelines is subtle, even amidst those who claimed to use them for decision-making. Nonetheless, only one interviewee was directly opposing to guidelines. Experience, mainly in the form of know-how gained over the course of years of work, appeared to be an overarching influence upon antibiotic prescribing.

Dentists acknowledged the existence of patient pressure; pressure for *not* being prescribed antibiotics was mentioned as well as a demand for these drugs. Providing information to patients was the preferred strategy to deal with pressure; dentists saw invoking their authority as the last resort. Capitulation to patient pressure was admitted in few cases.

Pressure from drug companies' representatives was not unanimously acknowledged; even those mentioning it showed reluctance in changing prescribing habits.
Conclusions: Antibiotic prescribing by dentists seems to result from multiple influences. It appears that a "defensive" practice and experience are central influences; pressure from patients or drug companies' representatives appear to have a more discreet impact. A larger study is warranted, to inform the design of a multimodal intervention, which could ultimately lead to improving the quality and safety of antibiotic prescribing by dentists.
Disclosure of interest: None Declared.

Community Pharmacy: Pharmaceutical care

CP-PC003

Evaluation of Predictive Factors in Patients' Self Reporting Types to Adverse Symptomatic Events

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Background and objective: Morbidity and mortality are significantly associated with adverse drug reactions ADRs (1) Reporting of adverse events is done either by physicians or patients themselves (2) Physicians either uncared or unfamiliar to all adverse reactions of medications (3) Nowadays many pharmacovigilance centres in European countries and US were established to receive patients' reports about ADRs of medications (4) The present study was aimed to finding out the predictive factors that affect the incidence and severity of symptomatic adverse events.
Setting and method: It is cross sectional study conducted for 400 outpatients for self-reporting of symptomatic adverse drug events. These adverse events were reported in patients complained different diseases like cardiovascular system conditions, gastrointestinal system conditions, endocrine system conditions, and infectious diseases. Validated questionnaire form (Cronbach's alpha $= 0.92$) was used either as a form (for patients who were attended in the clinic) or in validated website (http://www.ilacpedia.com/adverse-effects). Approval of this study was granted from Ethical Committee of the University of Marmara-Institute of Health..SPSS version 20 was used to analyse the collected information. Descriptive analysis, Chi square, Multiple logistic regression and reporting odd ratio (OR) tests was used to find the predictors of symptomatic adverse events.
Results: The majority of patients were females and those aged 21–30 years old (mean age 39.78 ± 15.41 years). Low incidence of patients found on the

smoking and alcohol consuming habits. The patients were suffered from cardiovascular, infections, hormone disturbances or gastrointestinal problems. Gender and group of disease were the only significant factors of symptomatic adverse events. For groups of disease the highest mean rank found in cardiovascular diseases followed by infections, hormone disturbances and gastrointestinal problems. For gender, females got higher mean rank than males. Females suffered of cardiovascular disease found to be the group with the highest complains of symptomatic adverse events, followed by females with infections, males with cardiovascular diseases and so on.
Conclusions: From the results of this study, we can conclude that patient′s self-reporting may play a supplementary cycle in pharmacovigilance, and may subscribe to earlier disclosure of known and unknown adverse drug reactions. A combined utilization of electronic health data and questionnaire reporting can mend competence and reliability for detecting ADRs.
Disclosure of interest: None Declared.

Community Pharmacy: Pharmaceutical care

CP-PC004

Depression training for pharmacists improves patients' satisfaction with the pharmacist

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Background and objective: For moderate to severe depression, antidepressants have become the cornerstone of treatment. Between 2002 and 2010 the number of daily doses (DDD) of antidepressants dispensed in community pharmacy in Belgium continued to grow, from 171 to 272 million, indicating that pharmacists frequently deliver antidepressants and have the opportunity to provide proper medication counselling.

The objective of the current study was to analyse the impact of structured medication counselling by community pharmacists on patients' satisfaction with the pharmacist. The results of the current study were part of the SIMCA study, which aimed to Study the Impact of structured Medication Counselling on patients starting a new treatment with Antidepressants.
Setting and method: A clustered RCT was set up in the Surplus Pharmacy chain, with 53 pharmacists in the control group (delivered standard care) and 46 in the intervention group (trained to counsel patients with a new prescription for antidepressants with use of pharmacy software). Telephone survey interviews based on validated scales were used to collect data at the start of treatment, after 1 month, 3 months and 6 months of treatment.

Patients visiting different pharmacies for filling their repeat prescriptions were excluded for data-analysis. We further limited our analysis to data from patients who were prescribed antidepressants for a mood disorder ($n = 125$). Mann–Whitney U tests were used to compare the median scores of the different scales (Satisfaction With Pharmacists scale, Satisfaction with information regarding treatment and Satisfaction with information regarding side effects) between intervention and control group at the different time points.
Main outcome measures: Patients' satisfaction with pharmacists; satisfaction with information regarding treatment and side effects.
Results: At the start of treatment, significantly more patients, who filled their prescription for antidepressants in an intervention pharmacy were satisfied with their pharmacist ($p = 0.015$) and with the information regarding treatment ($p = 0.003$) and side effects ($p = 0.014$), compared to patients who visited control pharmacies. There were no significant differences in satisfaction ($p > 0.050$) at the other time points.
Conclusions: Structured medication counselling for patients starting a new treatment with antidepressants had a positive impact on patients' satisfaction with the pharmacists and with the provided information regarding treatment and side effects.
Disclosure of interest: None Declared.

Public Health

PH003

Identification of factors associated with hospital potentially preventable readmission in Switzerland

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Background and objective: Potentially preventable readmissions (PPR) occur in nearly 10 % of Swiss inpatients. Patients at high risk of readmission should be identified early during their hospital stay, in order to benefit from specific interventions to prevent these readmissions. The aim of the present study was to characterize the profile of patients readmitted in Swiss hospitals.
Setting and method: This retrospective study included all patients identified by SQLape (Swiss algorithm used for hospital quality management) readmitted within 30 days in 2011 in general medicine wards of two different Swiss hospitals (university and regional). Control patients were matched on age and sex. To identify factors associated with PPR, multivariate logistic regressions were performed on 4 pre-set groups of variables: administrative information, admission diagnosis, laboratory values and drugs. Charlson score was analysed out of the diagnosis group.
Main outcome measures: Factors associated with PPR.
Results: 982 patients (275 readmitted and 707 controls, mean age (SD) 68.9 (16.2) years, 60 % male) were included. The following variables were found to be significantly associated with PPR. Administrative information: previous admission within 6 month (Odds ratio, 95CI: 2.52 (1.88,3.39)), length of stay >14 days (2.45 (1.69,3.55)). Admission diagnosis: cancer (1.77 (1.21,2.58)), heart failure (1.96 (1.40,2.73)), dementia (1.83 (1.08,3.06)), ischemic cardiopathy (2.04 (1.28,3.23)). Charlson comorbidity score >3 (1.45 (1.02,2.06)). Laboratory values: hyperkalaemia (2.67 (1.36,5.31)), hypo-haemoglobinemia (1.48 (1.01,2.14)), spontaneous INR > 1.5 (1.52 (1.03,2.22)), last measured creatininemia >120 mmol/L (1.57 (1.04;2.36)). Drugs: diuretics (1.53 (1.10,2.11)), number of severe drug–drug interactions >2 (1.79 (1.24,2.58)). PPR was significantly reduced in presence of renin-angiotensin-aldosterone drugs (0.55 (0.39,0.76)). Electrolyte and acido-basic disorders, anaemia, COPD and asthma, hypernatremia, opioids, blood glucose lowering drugs including insulin, benzodiazepine and NSAID were not associated with PPR.
Conclusions: This Swiss retrospective study identified several factors significantly associated with PPR and routinely available during hospital stay that might help to identify patients at risk of PPR. These preliminary results will be the basis for the development of a predictive tool that could further be used by clinical pharmacists to target their interventions on specific patients presenting a panel of readmission risk factors.
Disclosure of interest: None Declared.

Community Pharmacy: Pharmaceutical care

CP-PC005

Effectiveness of medication review as isolated intervention: a systematic review and meta-analysis of randomized controlled trials

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Background and objective: According to guidelines, medication review is a structured examination of a patient's medicines with the aim of optimizing the outcomes of medicine therapy. In practice, this is mostly operationalized by one or two examinations with short term (<3 months) follow-up. Most systematic reviews did not only assess the effectiveness of medication review as isolated intervention but also included medication reviews with co-interventions (e.g. education, transitional care, adherence intervention) or included specific patient groups (elderly/polypharmacy). Therefore the objective of this systematic review is to assess the effectiveness of medication review as isolated intervention with short term follow up (<3 months), irrespective of the patient population.
Setting and method: A systematic review was performed in MEDLINE, EMBASE and Web of Science using PRISMA guidelines. Randomized controlled

trials with medication review as only intervention were selected by two reviewers independently. Relevant data on patient and intervention characteristics and outcomes were extracted. The quality of studies was also evaluated independently by two reviewers using the GRADE approach in order to obtain a best evidence synthesis.
Main outcome measures: The synthesis evaluated all available outcomes of the included trials
Results: From an initial set of 11,239 selected titles and abstracts, a total of 26 trials met the inclusion criteria. Medication review was not significantly associated with decreased mortality (9 trials (T), 2049 intervention patients (IP) (RR 0.92 (0.76–1.10)). Furthermore no effect was found on respectively the total number of hospital admissions (T:9; IP:1849), the number of emergency admissions/visits (T:6; IP:1180), the number of GP visits (T:6; IP:1607), the number of patients having falls (T:4; IP:949), medication costs (T:8; IP:2457) and quality of life scores SF-36 (T:3 IP:749), EQ-5D (T:6; IP:1541) and EQ-5D VAS (T:2; IP:379). This systematic review identified a higher number of solved drug related problems (DRPs) (T:2; IP:223; RR: 1.16 (1.10–1.22)), more changes in medication (T:3; IP:913), a lower number of drugs used (T:9; IP:1319), more drugs with dosage decrease (T:2; IP:486)) and a lower VAS for health (T:3;IP:380) due to medication review.
Conclusions: An isolated medication review reduces the number of DRPs, the number of drugs used and VAS for health and increases medication changes and the number of drugs with dosage decrease. However, no effect was seen on mortality, the total number of hospital admissions, the number of emergency admissions/visits, the number of GP visits, the number of patients having falls, medication costs and quality of life scores.
Disclosure of interest: None Declared.

Oral Communication II

Therapeutic Drug Monitoring and pharmacokinetics

TDMP001

Possible Pharmacokinetic Interaction between Pantoprazole and Mycophenolic Acid in Renal Transplant Patents: A Randomized Crossover Study

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Background and objective: Mycophenolic acid (MPA) is used as an immunosuppressive agent in renal transplant (tx) patients (pts). It limits lymphocyte proliferation by IMPDH inhibition. Two formulations are on the market: Mycophenolate-Mofetil (MMF) and Enteric Coated Mycophenolate Sodium (EC-MPS). Pantoprazole (PAN) is prescribed against gastrointestinal side effects. It leads to an increased gastric pH which may alter MPA exposure especially after MMF intake (Rupprecht et al., 2009).
Setting and method: In this single-centre, open, randomized, 4 sequence, 4 treatment, crossover study an influence of PAN 40 mg o.m. on MPA exposure after MMF and EC-MPS intake were analysed in renal tx pts (>6 months post-tx). Additionally the major metabolite MPAG and IMPDH activity were examined as well. Three dosing steps for MPA were allowed including standard dosing.

MPA was administered with Ciclosporin ± Glucocorticoids. PK/PD parameters were measured with a HPLC UV/Vis based method. PK parameters were dose normalized to equimolar doses of MPA including dose-normalized AUC (dAUC; ng*h/ml/mg), dCmax (ng/ml/mg), for IMPDH AEC (area under enzyme activity curve; mol/s per mol AMP*h) were calculated with Pharsight®WinNonLin®. Statistical analysis was performed by linear mixed effect model with MMF set up as reference treatment.
Results: 20pts participated in the study; 12/20pts (60 %) received standard dosing. For statistical analysis full PK/PD profiles were eligible for 17/20pts (85 %).

MMF + PAN intake led to lowest MPA exposure (37.32 ± 18.24; $p = 0.274$) and exceeded lowest limit of 90 % CI (88.87; 74.25–106.38) for geometric mean ratio (GMR). For EC-MPS + PAN MPA exposure was highest (46.30 ± 17.88; $p = 0.231$; GMR: 112.29 (90 % CI: 93.82–134.39)). Differences in dAUC in reference to MMF were for all treatment options not significant (EC-MPS: 43.42 ± 19.37; $p = 0.953$; GMR: 100.55 (87.48–115.58)). For pts receiving standard dosing higher differences in dAUC were observed for MMF ± PAN (43.7 ± 16.2 vs. 35.6 ± 15.0; $p = 0.093$).

Similar results were obtained for dCmax except 90 % CI for GMR exceeded lower acceptance interval for GMR (14.69 ± 6.78) vs. EC-MPS (16.06 ± 10.24, $p = 0.587$; GMR: 89.95 %; 90 %CI: 65.03–124.43).

PAN intake did not show any impact on MPAG AUC for MMF ($p = 0.989$) or IMPDH activity (AEC MMF ± PAN: 859.36 ± 241.29 vs. 816.60 ± 217.41; $p = 0.552$).
Conclusions: Bioavailability was decreased for MMF + PAN intake probably caused by insufficient dissolution of MMF at higher PH values. For EC-MPS + PAN higher MPA exposure was examined. Gastric pH values >5 are observed in pts taking PAN 40 mg for at least two weeks which might lead to earlier dissolution of the tablet (Savarino et al., 1998). However, MPA dAUC remained within the therapeutic window (30–60 ng*h/ml) for all treatment options and had no significant impact on IMPDH activity (Shaw, L.M., et al., 2001). PAN + MPA administration in stable renal tx pts seems to be safe regardless of the administered formulation.
Disclosure of interest: None Declared.

Pharmacotherapy

PT001

Patient adherence to TNFα inhibitors in rheumatoid arthritis and psoriatic arthritis

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Background and objective: Patient adherence to treatment plays a fundamental role in clinical outcome, healthcare costs, treatment safety and quality of patients' life. The objective of this study was to calculate patient adherence to treatment with tumor necrosis factor alpha (TNFα) inhibitors (adalimumab, etanercept and infliximab) in rheumatoid arthritis (RA) and psoriatic arthritis (PsA).
Setting and method: Observational cohort study based on two registries: Firstly, the ICEBIO registry, which is a national registry on biologic use for rheumatic conditions in Iceland and secondly the medication prescription registry system at our hospital. The present study included 499 patients registered in ICEBIO, 321 with RA and 178 with PsA. All patients were receiving their first biologic treatment during the study period (2009–2013).
Main outcome measures: Medication adherence was calculated using medication possession ratio (MPR) and proportion of days covered (PDC) to create an adherence score, which was used to classify patients as adherent (80 % or higher for either score) or non-adherent otherwise.
Results: Of the 499 patients 53.1 % received infliximab, 34.1 % etanercept, and 12.8 % adalimumab. Patients treated with infliximab were more likely to adhere to treatment than those treated with etanercept or adalimumab ($p < 0.0001$). With infliximab, patients showed 99.1 % (CI 98.7–99.6) and 94.9 % (94.0–95.7) adherence, calculated with MPR and PDC, respectively. In contrast, etanercept showed 89.6 % (87.5–91.8) and 81.7 % (79.6–83.8), and adalimumab 94.3 % (92.0–96.7) and 86.0 % (83.2–88.9), respectively. If MPR and PDC were combined, more than 80 % of patients were adherent to treatment.
Conclusions: Medication adherence is high in Icelandic RA and PsA patients treated with TNFα inhibitors. In the comparison, patients treated with etanercept had the lowest rate of adherence and those treated with infliximab had the highest rate of adherence. Mode of administration probably play a fundamental role in adherence to treatment among rheumatic patients.
Disclosure of interest: None Declared.

Pharmacotherapy

PT002

Discontinuation of TNFα inhibitors in rheumatoid arthritis and psoriatic arthritis

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Background and objective: Safety and efficacy of tumor necrosis factor alpha (TNFα) treatment is of utmost importance. Information about reasons for discontinuing these drugs is therefore valuable. The object of this study was to explore the reasons why patients with rheumatoid arthritis (RA) and psoriatic arthritis (PsA) discontinue TNFα inhibitor treatment (adalimumab, etanercept and infliximab).
Setting and method: This study is based on data from the nation-wide registry on biologic use for rheumatic conditions in Iceland (ICEBIO), medication prescription registries at our hospital and interviews with patients. In the present study, reasons for discontinuation of treatment were explored during the study period (2009–2013).
Main outcome measures: Discontinuation was categorized into two sets. The first one included cases where treatment was completely discontinued or switched to a different TNFα inhibitor. The second set included cases where treatment was temporarily discontinued (≥ 112 days) and subsequently resumed with the same TNFα inhibitor.
Results: Of the 513 patients that were included in the study, 283 patients discontinued treatment, 229 completely or switched to other drug (304 occasions) and 54 discontinued temporarily their TNFα treatment (74 occasions). The most common reasons for complete discontinuation/switch of treatment were an inadequate response to treatment (36.2 %) and adverse events (32.6 %). The latter was also the most common reason for temporal treatment discontinuation (28.4 %), infection being the far most common (76.2 %). In cases of complete discontinuation/switch of treatment, infliximab was most commonly discontinued (45.7 %) while treatment with etanercept was most commonly temporarily discontinued (64.9 %).
Conclusions: Inadequate response and adverse events are the most common reasons why RA and PsA patients discontinue TNFα inhibitor treatment and infliximab is the drug that is most commonly discontinued. However when patients temporarily stop treatment, adverse event is the main reason and the drug most commonly involved is etanercept.
Disclosure of interest: None Declared.

Pharmacotherapy

PT003

Risk management of QT-prolongation in a Belgian university hospital: epidemiological data

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Background and objective: Many drugs, including haloperidol, are linked with a risk of QT-prolongation, which can lead to Torsade de Pointes and sudden cardiac death. The objective of this study was to investigate the safety measures that were taken to follow-up the risk of QT-prolongation in patients treated with haloperidol.
Setting and method: A retrospective, epidemiological study was set up in a university hospital in Belgium. On 15 consecutive Mondays, all patients with a prescription for haloperidol were included. Data, including risk factors for QT-prolongation, were collected from the electronic patient files. For each patient a risk score for QT-prolongation was calculated based on gender, presence of comorbidities, lab results and use of QT-prolonging drugs (identified by QT-drug lists of AZCERT), each counting for one point. Available electrocardiograms before and during the treatment of haloperidol were registered. A Chi Square test was used to compare the safety measures between patients with a risk score <4 and ≥4.
Main outcome measures: Management of the risk of QT-prolongation while prescribing QT-prolonging drugs.
Results: Two hundred twenty-two patients were included (59.0 % men, median age 77 years), of which 68.5 % had a risk score between 1 and 3; 26.6 % had a risk score of ≥ 4. Overall, 40 patients (18.0 %) had other QT-prolonging drugs (known risk of Torsade de Pointes) in their medication profile.

Half of the patients had an electrocardiogram in the week before the start of haloperidol; in one-third of the patients a follow-up electrocardiogram during haloperidol treatment was performed. Of the patients who had a moderately (QTc ≥ 450 ms (men)/QTc ≥ 470 ms (women), n = 41) or severely (QTc ≥ 500 ms, n = 14) prolonged QTc-interval before haloperidol, only 48.8 % and 42.9 % respectively had an electrocardiogram taken during haloperidol treatment. In patients with a risk score ≥ 4, significantly more electrocardiograms were taken before starting haloperidol (p = 0.020); it tended to be significant for the electrocardiograms during haloperidol treatment (p = 0.124).
Conclusions: Despite the fact that many patients have risk factors for QT-prolongation, are taking other QT-prolonging drugs or have a prolonged QTc on a baseline electrocardiogram, a follow-up electrocardiogram was only performed in one-third of the patients. Persistent efforts should be taken to develop decision support systems that can help to manage the risk of QT-prolongation.
Disclosure of interest: None Declared.

Therapeutic Drug Monitoring and pharmacokinetics

TDMP002

FcGR genetic polymorphisms are related with the response to adalimumab in rheumatoid arthritis patients

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Background and objective: The engagement of FcGRs by TNF antagonists could affect to macrophage-mediated clearance of immune-complexes. The aim of our study was to explore the potential role of *FcGR* genetic polymorphisms as a predictor of adalimumab efficacy in rheumatoid arthritis (RA) patients for the first time.
Setting and method: The *FcGR2A* (R > H) (rs1801274) and *FcGR3A* (F > V) (rs396991) genetic variants were genotyped using pre-designed TaqMan® genotyping assays technology and analysed on a ViiA7® Real-time PCR system. *FcGR3A* was also genotyped using a validated pyrosequencing method. Clinical response was evaluated at 14 weeks with the use of the 28-joint disease activity score criteria (DAS28) and good response and remission were classified according to EULAR criteria. EULAR good response was defined as a change of DAS28 > 1.2 and DAS28 ≤ 3.2. EULAR remission was defined as achieving DAS28 at 14 weeks ≤ 2.6. The statistical analysis was performed using SPSS v.20
Results: Clinical data of 307 adalimumab treated patients were obtained from a database of ApotheekZorg. The patients were aged (mean ± SD) 58.5 ± 11.5 years, 71.3 % were female. The mean DAS28 at baseline was 5.8 ± 0.98. The 81.8 % of patients received concomitant MTX with an average dose of 22.38 ± 5.59 mg. In this cohort, 55 patients (17.9 %) used adalimumab as monotherapy during evaluation period.

The *FcGR2A*-RR was significantly associated with a good EULAR response (p = 0.037, OR = 1.79, CI 95 % 1.036–3.11), but no significant association was found for remission. No significant association was found for *FcGR3A*, with good response or remission. The combined effect of both *FcGR2A* and *FcGR3A* SNPs showed an association with EULAR good response (*p* value = 0.048, OR = 1.36, CI 95 % 1.0–1.86) and remission (p-value = 0.037, OR = 1.43, CI 95 % 1.02–2.01).
Conclusions: Our results confirm that *FcGR* polymorphisms could be useful as a genetic marker of adalimumab efficacy in RA patients. More studies are necessary to confirm these results.
Disclosure of interest: None Declared.

Pharmacotherapy

PT004

Dosing accuracy and potential drug–drug interactions in haemodialysis patients

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Background and objective: Medication regimens of haemodialysis (HD) patients are extensive, complex, and potentially put patients at risk for drug–drug interactions (DDI). Due to changes in pharmacodynamics and pharmacokinetics of several drugs prescribed in HD patients, correct dosing is essential to ensure effective and safe pharmacotherapy. The audit was conducted to assess dosing accuracy and quantitatively and qualitatively analyse potential DDIs in HD patients.
Setting and method: Retrospective audit of HD patients being treated at the Vienna General Hospital chronic HD unit. Prescriptions were audited against the official SPC (A), and two commonly used dosing compendia (B, C) [1,2]. Medication regimens were screened for potential DDI using the databases (DB) MEDIS (DB1), MICROMEDEX (DB2) and MEDIQ (DB3).
Main outcome measures: Number/type of prescriptions deviating from official or commonly used dosing recommendations·Number/type of potential DDI as indicted in commonly used interaction DB
Results: A total of 1209 prescriptions (199 drugs) of 144 HD patients (mean ± SD number of drugs/patient: 9.5 ± 3.5) were analysed. Dosing information was absent for 14–63 % (33–107 drugs). 52.6, 25.3, and 58.7 % were correctly dosed according to the references A, B and C. Additional 3–20 % were assessed as correct based on the absence of exactly defined dosing borders. Over- or underdosage was present in 3–7 and 3–4 %, respectively. 7.4 % dosing errors (i.e. incorrect in all references) were detected, but most of them were deemed to be intended. 668 different potential DDIs were detected. The median number (IQR) of DDIs/patient was 3 (1–5) (DB1), 2.5 (1–6) (DB2) and 7 (3–12) (DB3).The combinations of aspirin/calcium (i.e. reduced anticoagulant efficacy of aspirin) and levothyroxin/sevelamer (i.e. reduced absorption of levothyroxin) were the two most common DDI, rated as moderately relevant by the DB, and assessed as unwanted. 43 % of patients showed at least one severe potential DDI with substantial deviation of severity classification between DB. DB concordance was poor with only 12 % of DDIs found in all three, but 68 % only in one DB.
Conclusions: Dosing accuracy was high with extensive deviations between dosing compendia complicating the choice of correct dose. Interaction databases facilitate screening for DDI, but cannot replace sound and individual clinical assessment of HD medication regimens.

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Disclosure of interest: None Declared.

Public Health

PH004

Medicine use behaviours among young Iranians: why country of residence matters

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Background and objective: In Denmark, previous drug utilization studies have shown that ethnic minority adolescents have higher probability of using medicines beyond formal therapeutic indication than the majority population of adolescents, but little is known about the reasons behind this higher consumption. Although the Iranian ethnic minority is one of the main ones living in Denmark, there is a scarcity of studies on young Iranians' medicine use behaviour.

To explore knowledge, perceptions and attitudes among adolescent immigrants and descendants with Iranian background living in Denmark and to compare it with Iranian adolescents living in their home country. This comparison will allow us to understand the contextual effect of living in a foreign country on adolescents' medicine use behaviour.
Setting and method: Semi structured interview guides were developed and 14 adolescents were interviewed for ½-1 h in Farsi, Danish or a mix of the languages to make interviewees comfortable. All interviewees were re-interviewed to increase conformability. To ensure the validity of the results, triangulation was used. Data thematization was used to compare the Iranian adolescents from Iran and Denmark.
Main outcome measures: Family played a more important role in medicine use behaviour among adolescents living in Iran and first generation immigrants living in Denmark than among descendants. Descendant boys' knowledge about medicines was very scarce and they expressed the most difficulty with being part of a minority.
Results: Interviewees were all 15–20 years old urban adolescents with both parents being Iranian. In Iran, family is a major factor of influence on the adolescents' medicine use. This can also be seen among first generation Iranian immigrants living in Denmark. A general theme among all adolescents was the use of analgesics and herbal remedies for head and stomachache. A specific topic boys brought up individually was the use of steroids. The immigrant and descendant boys expressed greater difficulties with being part of a minority compared with immigrant and descendant girls.
Conclusions: Medicine use behaviour differs between young Iranians living in the home country and adolescents with Iranian background living in Denmark. The contextual effect of country of residence is therefore an important factor when understanding medicine use behaviour.
Disclosure of interest: None Declared.

Hospital Pharmacy: Pharmaceutical Care

HP-PC001

Development of a multidimensional scale "CLEO" for evaluation of clinical, economic, and organizational impacts of a pharmacist intervention

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Background and objective: A scale with optimal properties for evaluation of potential significance of a pharmacist intervention (PI) is not available. This study aims to develop and validate a new multidimensional scale.
Setting and method: Development of a scale was based from a systematic review of existing scales in PubMed, PsycINFO, PASCAL, and CINAHL from 1986 to 2013 and a review of evaluation models of health care interventions. After content validation of the scale by a group of 7 experts of French Society of Clinical Pharmacy, the experts coded 50 scenarios extracted from the French national database of PIs "Act-IP©" in order to test the inter-rate reliability. The satisfaction on the content and structure of the scale by 4-level Likert (not satisfied = 0, somewhat satisfied = 2, satisfied = 4, very satisfied = 6) and suggestion for modification of the scale were questioned.
Results: A first version of a multidimensional scale, named "CLEO", was developed according to models of evaluation of health care intervention (''structure-process-outcome" by Donabedian and "economic-clinical-humanistic outcomes" by Kozma et al., and pharmacoeconomic models) and references from 81 distinct scales identified from 133 studies results of 873 citations screened. CLEO includes 3 independently dimensions: clinical (7 categories), economic (4 categories), and process-related dimension (4 categories) with assessment supports (definitions of keywords, an assessment algorithm). The inter-rater reliability showed fair agreement for clinical dimension (agreement 82 %; kw = 0.34); moderate agreement for economic dimension (agreement 80 %; kw = 0.53); and fair agreement for

organizational dimension (agreement 76 %; kw = 0.27). The average score of satisfaction on the whole scale, structure of scale, definitions of keywords, algorithms was 3.7; 4.9; 3.1; and 3.4, respectively. Many suggestions for improvement of the first version of the scale were provided.
Conclusions: A multidimensional scale CLEO for assessing the potential significance of PIs was developed and tested. However, the modification of the first version of the scale is necessary to improve the reliability, particularly for organizational and clinical dimension. A second version of the scale is currently under examination and will be definitely validated in September 2014.
Disclosure of interest: None Declared.

Oral Communication III

Hospital Pharmacy: Pharmaceutical Care

HP-PC002

Direct oral anticoagulant: the impact of pharmaceutical interviews on patients' knowledge

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Background and objective: Direct oral anticoagulants (DOA) are more and more prescribed as an alternative to vitamin K antagonists (VKA). Previous studies carried out in our hospital showed that recommendations on the correct use of DOA are little known by patients. In collaboration with cardiologists and haemobiologists, we produced information sheets about Apixaban, Rivaroxaban and Dabigatran. The aim of this study was to assess the impact of a pharmaceutical interview, using these sheets, on patients' knowledge and also to assess patients' satisfaction about the information available on the sheets.
Setting and method: The study was conducted in cardiology in 4 steps: 1/Selection of the patients with a DOA prescription and collection of their consent. 2/Pharmaceutical interview with these patients: assessment of their knowledge about their DOA before presentation of the information sheets (D0). The main points assessed are patients' knowledge in terms of learn to know (5 points) (drug name, indication, risk in the case of over or under dosage), learn to do (4 points) (treatment's management, adverse effects' management…) and learn to be (2 points). Global score: 11 points. 3/Assessment of patient's satisfaction. 4/Reassessment of patient's knowledge one month after with the same survey during a phone interview (M1).
Results: 20 patients were included (SR:4, mean age 66.5 [39; 88]), half of them were previously treated with VKA. 18 patients (90 %) replied to the satisfaction survey. 98 % were completely or quite satisfied with the explanations provided by the pharmacy resident, the information given on the sheets and its presentation, and 94 % will keep it at home as a reminder. 14 patients (70 %) agreed to be called back one month after the interview. The mean score for the 14 patients was 6.1 at D0 and 8.2 at M1. The difference between these scores is significant ($p = 0.0002$).
Conclusions: This study showed that pharmaceutical interviews are involved in the optimization of patients' knowledge about their treatment. They should systematically be integrated into DOA treated patient's care, at least for the first prescription. Indeed, because of the iatrogenic risk of these molecules, patient's safety, through the acquisition of coping skills and specific knowledge, is essential. City pharmacists are also an essential information relay, so we developed a city/hospital link.

This study should be continued to achieve long term results on a large cohort of patients. The information sheets will be used in other care units by nurses and doctors as an educational tool for patients.
Disclosure of interest: None Declared.

Hospital Pharmacy: Pharmaceutical Care

HP-PC003

Effect of teaching and check list implementation for physicians and nurses on quality of medication history recording

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Background and objective: At admission to hospitals, discrepancies in the medication lists have been reported for 60–80 % of patients. This reflects the need of actions to improve the quality of medication history recording at hospital admission. The objective of this study was to study the effect of teaching and check list implementation for physicians and nurses on quality of medication history recording.
Setting and method: Patients admitted to an internal medicine ward were prospectively included in the study in two consecutive periods, i.e. autumn 2011 (period 1 = P1) and autumn 2012 (period 2 = P2). Between the periods, lectures by pharmacists and implementation of a check list for physicians and nurses were performed. Discrepancies between the recorded medication list at admission and the patient's actual drug use, as revealed by pharmacist-conducted medication reconciliation, were compared between the two periods.
Main outcome measures: The difference between P1 and P2 in the proportion of patients with minimum one discrepancy was measured as the primary end point, while the median number of discrepancies in P2 versus P1 was included as a secondary end point.
Results: Median patient age was 83 years (range 21–97) in P1 and 77 years (range 20–98) in P2 ($p = 0.11$), and most of the patients were home-living before admittance both in P1 (60.7 %) and P2 (69.7 %). It was identified 133 discrepancies among the 56 included patients in P1 and 221 discrepancies among the 119 included patients in P2. There was no significant reduction in the proportion of patients with minimum one discrepancy revealed by medication reconciliation in P2 versus P1 (76.8 % versus 68.9 %, $p = 0.36$), but the observed median number of discrepancies was lower in P2 than in P1, i.e. 1 and 2, respectively ($p = 0.0865$).
Conclusions: Teaching lessons and check list implementation for physicians and nurses, did not significantly reduce the proportion of patients with medication discrepancies at hospital admittance. Although a tendency of reduced number of discrepancies was observed after teaching and check list implementation, the present study might indicate that direct pharmacist involvement is required for sufficient improvement in quality of drug history recording when patients are hospitalized.
Disclosure of interest: None Declared.

Hospital Pharmacy: Pharmaceutical Care

HP-PC004

Age-Appropriateness of Formulations of cardiovascular medicines for Neonates

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Background and objective: Appropriate drug formulations are essential for efficacy and safety of medicine. Our aim was to assess the extent of use extemporaneously prepared/modified products and to assess the age-appropriateness of licensed formulations in European neonatal units in cardiovascular medicines group.
Setting and method: The study is based on ESNEE (European Study of Neonatal Excipient Exposure) database, containing information on 21 European countries neonatal units drug use. The suitability of formulations was assessed among industrial preparations, based on: inclusion of certain 'risk' excipients (EOI)—parabens, polysorbate 80, propylene glycol, benzoates, saccharin sodium, sorbitol, ethanol and benzalkonium chloride, immeasurable dose, manipulations before administration to neonates.

Sources: British National formulary for Children (2012), summaries of Product Characteristics and Patient Information Leaflets.
Results: Out of 130 cardiovascular medicines prescribed (n = 59 enteral, n = 66 parenteral, n = 5 topical), 20 % (n = 26) were prepared by local

pharmacies and 15 % (n = 19) were commercial solid oral formulations, that needed extemporaneous modification. Immeasurable volume was found in 18 % (n = 19) of industrial formulations (tablets n = 18, capsules n = 1). EOI were found in 22 % (n = 23) of drugs. The extent was highest in oral liquid formulations (n = 13/17, 76 %), containing commonly parabens (n = 8), propylene glycol (n = 7), ethanol (n = 6). Of parenteral formulations 11 % (n = 7) contained EOI, frequently ethanol (n = 5) that was found in alprostadil, digoxin and dopamine solutions. Solid oral commercial formulations (n = 19) were free of EOI. When dosing and excipients were both considered, most industrial parenteral medicines 86 % (n = 55/64) and only 6 % (n = 2) of enteral formulations were age-appropriate for neonates. Altogether 45 % (n = 58/130) of drugs were produced industrially, EOI free and suitable for dosing. Most of these (n = 55) were for parenteral use.

Medications, that were frequently used in departments (furosemide, dopamine, epinephrine), were all parenteral and all of them, except one dopamine preparation, were EOI free.

Conclusions: Although the use of enteral route of administration is common in European neonatal units, majority of oral formulations are inappropriate for neonates. Further research in dosage forms suitability and substitution possibilities between European countries is required.

Disclosure of interest: None Declared.

Hospital Pharmacy: Pharmaceutical Care

HP-PC005

Multicentre medical record review on Adverse Drugs Events requiring a higher level of care

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Background and objective: Adverse drug events (ADEs) are a world-wide concern for healthcare professionals and policy-makers. The incidence of hospital ADEs ranges from 6.5 to 29 per 100 admissions (1–4). A patient with an ADE may require a higher level of care, defined in this study as an unplanned (re)admission to an Intensive Care Unit (ICU) or an intervention by a Mobile Emergency Team. These transfers prolongs hospital stay and increases its cost (5); they can have an important impact on the patient. Therefore, preventable ADEs (pADEs) that lead to a higher level of care are of particular concern. Earlier research (6) found that 17 % of the adverse events which lead to an ICU admission are drug related. The objectives of this study are to determine the incidence and preventability of ADEs requiring a higher level of care, to assess the type of drug concerned, the levels of harm induced and the risk factors that can be identified.

Setting and method: The study was performed in six hospitals in Belgium. It used a three-stage retrospective review process of screening, medical record review and consensus judgement. For the patients included records were assessed by a trained clinical team consisting of a research nurse, a physician and a clinical pharmacist. Once the team detected an ADE, the assessment on preventability, the type and level of harm was delivered by consensus judgment. A panel of experts was available for advice.

Main outcome measures: The incidence and preventability of ADEs requiring a higher level of care, the type of drug concerned, the levels of harm induced and the risk factors are the main outcome measures.

Results: 830 patients were included in the medical record review process. The mean age was 70.1 years (SD ± 14.5); 44.9 % of patients had a severe life-threatening systematic disease (ASA 4). In 19.3 % of these patients ADEs were found. 83.8 % of the ADE were preventable. The overall incidence of patients transferred to a higher level of care because of an pADE was 33.9 per 100 000 patient days at risk. Antibiotics and antithrombotic agents accounted both for one-fifth of all pADE. Age, ASA score and the number of medications taken before admission are risk factors for pADE. The level of harm varied: 53.8 % of patients with an ADE endure temporary harm, 18.1 % suffer permanent impairment and 28.1 % of patients died during hospitalization after the occurrence of an ADE. Because of many confounders and the design of the study, it was impossible to assess the causality between ADEs and mortality.

Conclusions: One in five patients with a unplanned transfer to a higher level of care had an ADE. Of these 83.8 % was preventable and most often related to the (mis)use of antibiotics or antithrombotic agents. Age, ASA score and the number of medications taken before admission were risk factor for pADE. Detection and root cause analysis of these pADE is needed as a basis for the implementation of system improvements.

Disclosure of interest: None Declared.

Hospital Pharmacy: Pharmaceutical Care

HP-PC006

Sofosbuvir prescriptions review in a French university hospital

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Background and objective: Sofosbuvir is a new direct-acting antiviral medication, the first NS5B polymerase inhibitor marketed for the treatment of chronic C hepatitis in adults. Sofosbuvir's efficacy was established in subjects with genotype 1, 2, 3 or 4 HCV infections including those with hepatocellular carcinoma awaiting liver transplantation (LT), post-LT with liver reinfection and those with HCV/HIV-1 co-infection. Furthermore, and compared to the ribavirin/interferon bi-therapy, sofosbuvir is well-tolerated by patients. Sofosbuvir must be used as part of a combined antiviral treatment regimen. The objective of this study was to review the sofosbuvir prescriptions in our university hospital.

Setting and method: Six-month retrospective observational study. Prescriptions were extracted with software Pharma® (Computer Engineering, Paris). Clinical and biological data were collected with the computerised patient file Millennium® (Cerner Corporation, Kansas City) and prescriptions' analysis was performed with the guidelines of the French Association for Liver Study (AFEF).

Main outcome measures: Age, sex-ratio of the sample population; HCV genotype, treatment indications, antiviral combination, treatment duration and treatment cost

Results: 73 patients were included between December 2013 and June 2014: 51 men (69.9 %) and 22 women (30.1 %); medium age was 57.2 ± 2.1 years. Most common HCV genotypes were 1, 3 and 4 (56.2, 19.2 and 12.3 % respectively), genotypes 2, 5 and 6 were 5.5, 2.7 and 0 % respectively. 39 patients were in therapeutic escape (53.4 %); 12 in pre-LT (16.4 %), 9 in post-LT (12.3 %) and 13 patients were naïve with contraindications to other treatments (17.8 %); sofosbuvir was combined with daclatasvir (46.6 %), ribavirin/interferon bi-therapy (32.9 %), ribavirin alone (16.4 %) and simeprevir (4.1 %); treatment duration was mainly 12 weeks (47.9 %) or 24 weeks (46.6 %). Between December 2013 and June 2014, expenditures associated with sofosbuvir were close to 5 million euros.

Conclusions: As a result of its efficacy and tolerance, sofosbuvir is more and more prescribed but treatment cost is very important. In our university hospital, the initial budget proposed to the financial management was 3.5 million euros, until its availability in community pharmacies (October 2014). In order to save costs, it seems essential to remain vigilant on the prescriptions' compliance with latest guidelines.

Disclosure of interest: None Declared.

Hospital Pharmacy: Pharmaceutical Care

HP-PC007

CIRCUS, a tool for paediatrics drug-use process quality. Validation with a Delphi technique

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Background and objective: Patient safety is a key priority in healthcare. To our knowledge, there is no standardized tool to evaluate and compare drug-use process in paediatric hospitals. The aim of this study was to develop a tool for paediatrics drug-use process quality (CIRCUS) with a Delphi technique.

Setting and method: A literature review has been conducted in order to identify the key indicators of patient safety in paediatrics. A modified Delphi technique consisting of two rounds of electronic-survey was used to establish an expert consensus on relevant indicators. One statement per relevant indicators of patient safety in paediatrics was formulated. The expert panel included eight trios (two per country) with a physician, a pharmacist and a nurse working in a paediatric unit in four French-speaking countries (e.g. France, Canada, Swiss and Belgium). The experts used a Likert scale from 1 to 9 to rank their level of agreement per statement.
Main outcome measures: The main outcome measure was the average level of agreement per statement on patient safety in paediatrics. A statement was kept for the second of evaluation if it had a median score of 7 and above or if more than 60 % of the participants had an individual score of 7 and above. A statement was integrated in the patient safety tool if it had a median score of 7 and above or if more than 75 % of the participants had an individual score of 7 and above.
Results: 48 statements were proposed to the experts. 92 % of the experts (22/24) completed both Delphi rounds. After both rounds, 79 % (38/48) of the statements were integrated in the patient safety tool targeting 26 domains (e.g. age, weight, allergies, decimals, recommended doses, fluid concentration, infusions, non-formulary drugs, adapted galenic formulations, excipients, references, protocols' validation, oral syringes compounding, double check, decentralized pharmacists, education, etc.). Ten indicators were eliminated by the panel for the following reasons: not applicable, not feasible, not enough evidence, not understandable.
Conclusions: CIRCUS is the first tool for paediatrics drug-use process quality with 38 statements. CIRCUS may be used for self-evaluation and benchmarking of the drug-use process in hospitals with paediatric patients.
Disclosure of interest: None Declared.

Hospital Pharmacy: Pharmaceutical Care

HP-PC008

Risk cartography in management of medication-use system in care units

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Background and objective: In application of the order of April 6th, 2011, pharmacists decided to realize a self-assessment of risks in order to obtain a cartography in the medication-use system (MUS) of patients in care units.

The purpose is to measure the risks incurred and to target corrective actions to decrease them.
Setting and method: A mapping was conducted in 11 care units during 6 months. Archimed® was the tool used to measure risks. It is declined in 8 axes sweeping the stages of the MUS (prescription, dispensation, administration of medicines). It allows to identify dangerous situations and to estimate risks in percentage. It was processed during a multidisciplinary meeting, by declarative audit approach.

An action plan was developed according of levels of criticality of risks and efforts necessary to master them.
Main outcome measures: The global risk in the 11 care units was 23 % [14–34 %]. 139 situations at risks were identified on processes of patient's safety. The action plan was limited to risks with unacceptable criticality. Among those, there were 15 risks with weak effort of mastery and 5 with long term and continuous effort.
Results: The main axes impacted by immediately controllable risks, were: protocols and general procedures (risk at 48 %), stocking and management of stock (26 %), prescription and dispensation (24 %).

In the plan for improvement of practices, among immediate corrective actions, a "pharmacy file", for medical teams, was proposed. This file contained documents such as protocols, information on appropriate use of medicines and help tools of medical teams for prescription and administration (identification of high-alert medications, list of tablets " not to crush "…).

The main axes concerned by risks with continuous effort of mastery, were: experience feedback (risk at 41 %), entrance and exit of patients (11 %).

A proposal of implementation of medicinal conciliation, therapeutic education and experience feedback committee appears as long-term corrective actions.
Conclusions: The risk cartography is a useful tool for pharmacists to evaluate quality and risk management of MUS of patients, and to release precautionary measures to improve practices.

We could employ a second audit to measure the impact of the corrective actions deployed in care units.
Disclosure of interest: None Declared.

Hospital Pharmacy: Pharmaceutical Care

HP-PC009

A multifaceted pharmacist intervention to support medication adherence after stroke and transient ischemic attack

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Background and objective: Adherence to medication is often suboptimal after stroke and transient ischemic attack (TIA), which increase the risk of recurrent stroke and death. Complex interventions and motivational interviewing (MI) have been proven effective in other areas of medicine. The objective of this study was to investigate the effectiveness of a multifaceted intervention including MI performed by clinical pharmacists in improving medication adherence in stroke and transient ischemic attack (TIA) patients.
Setting and method: In this randomized controlled trial, TIA and stroke patients receiving a clinical pharmacist intervention in a hospital setting were compared with patients receiving usual (non-pharmacist) care. Two-hundred-and-eleven patients were randomized to usual care (n = 107) and intervention (N = 104). The interventions lasted for six months and consist of a focused medication review, a MI approached consultation and 3 follow-up telephone calls, all performed by clinical pharmacists.
Main outcome measures: The primary outcome was adherence towards antiplatelets, anticoagulants and statins in the year after hospitalization, calculated from pharmacy records and reported as both a continuous rate and a binary outcome. Non-adherence was defined as a medication possession ratio <80 %. Secondary outcomes measures included adherence and persistence to specific medications (acetylsalicylic acid, dipyridamole, clopidogrel, statins and antihypertensive agents) during the one-year follow-up period. Patients were classified as non-persistent upon failing to redeem a prescription within 90 days after the last date covered by the last prescription. Clinical outcomes included number of admissions and a combined endpoint of cardiovascular death, stroke or acute myocardial infarction.
Results: The analyses included 203 patients (102 in the intervention group and 101 in the control group). At the end of the one year study period, the median overall adherence rate (25th–75th centile) were 94 % (77–99 %) in the intervention group and 91 % (83–99 %) in the control group (p = 0.998). The proportion of patients who were non-adherent in the intervention and control group were 28 % and 21 %, respectively (risk difference 7; 95 % confidence interval −5 to 19). No significant differences were found for the secondary adherence and persistence outcomes or the clinical outcomes.
Conclusions: A multifaceted pharmacist intervention including MI for stroke and TIA patients did not improve adherence or persistence to secondary prevention therapy and had no impact on clinical outcomes.
Disclosure of interest: None Declared.

Poster Discussion Forum I

Hospital Pharmacy: Pharmaceutical Care

HP-PC011

Liposomal daunorubicin in children with relapsed or refractory leukaemia: a retrospective study

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Background and objective: Liposomal daunorubicin (DNX) is an encapsulated form of daunorubicin in liposomal vesicles. It is expected to cause a lower incidence of cardiotoxicity and to promote drug selective accumulation on the tumor site. This drug is not licenced for use in children, but studies have shown an influence on the survival of children with refractory acute myeloid leukemia (AML). In our haematology unit, DNX was prescribed as a salvage treatment in refractory or relapsed leukemia. In order to evaluate its efficacy and safety, a retrospective study was conducted.
Setting and method: The study focused on all children who received DNX from April 2005 to August 2013. Clinical, biological and pharmaceutical data were collected. The response to treatment was defined as follows: complete remission (CR with blast cells in bone marrow <5 %), partial remission (blast cells in bone marrow <5 %, but non-complete haematological recovery) and no response.
Results: 27 children (median age = 10.4, sex ratio = 1.3), were treated with various DNX-containing protocols. All children were in relapsed or refractory phase: 12 AML, 11 acute lymphoblastic leukemia, 2 biphenotypic leukemia and 2 others had haematological malignancies. DNX dosing ranged from 30 to 100 mg/m^2/infusion and the number of courses varied from 1 to 4. 63 % of patients were responders and among them 59 % were in CR. 13 patients underwent haematopoietic stem cell transplantation (HSCT), and 3 died later from disease progression. At cut-off date 14 children were alive with a median follow-up period of 27.6 months. DNX treatment was well tolerated: nausea and vomiting were usually observed, 4 patients developed intense myelosuppression with fungal infections. We also noticed 1 case of heart insufficiency.

Salvage treatment with DNX, is feasible with regard of toxicity and good response rate allowing HSCT in almost 50 % of cases. Different protocols were used in our study but the association of DNX, fludarabine, cytarabine and granulocyte colony-stimulating factor ended to the best results with 55 % of CR.
Conclusions: Children with relapse or refractory acute leukemia still have a poor prognosis. DNX seems to be efficient in particular when associated with others chemotherapies. Nevertheless it must be borne in mind that DNX is an anthracycline and that the heart function of children must be followed in the long term.
Disclosure of interest: None Declared.

Hospital Pharmacy: Pharmaceutical Care

HP-PC012

Telephone Follow-Up for Patients after Initiation of Antiretroviral Therapy (ART)

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Background and objective: To assess the Telephone follow up model as a means of providing after care services and documenting adverse drug reactions (ADRs) in ART-naïve patients.
Setting and method: 6 months prospective study of outpatients attending the HIV Clinic in Lagos State University Teaching Hospital, Lagos, Nigeria; Researcher-patient interaction by means of the telephone.
Main outcome measures: Responses from telephone conversations were grouped into four categories: providing education/reassurance; clarifying drug administration for adherence; recommending actions to be taken at home and referring patient back to clinic. ADRs were categorized as mild, moderate, severe or life-threatening and those that caused harm or not.
Results: There were 53 patients (71.7 % female; mean age 32 ± 7.76) among which education/reassurance (69.8 %) and correct drug administration for adherence (15.1 %) were given. Of the 53 patients,
68 % had adverse drug reactions, which were mild (59.5 %), moderate (2.7 %) severe (8.1 %) and life threatening (5.4 %). Among those with ADRs, actions were recommended to be taken at home for 41.5 % and 18.7 % of the patients were referred back to clinic due to the severity of symptoms.

Mild ADRs (40.5 %) caused no harm to the patient and was self-managed; for the moderate ADRs 5.4 % was self-managed and 21.6 % required intervention, while those with severe ADRs requiring intervention was 5.4 %. Severe and life threatening ADRs that eventually caused harm was 8.2 %.
Conclusions: The telephone follow up model was able to identify, resolve or reassure patients about medication related problems especially those with mild to moderate symptoms. The patients with severe to life threatening ADRs, though infrequent, were identified and referred to the clinic. The study highlighted the need for close monitoring and management of patients especially during the first few weeks of initiation of therapy to prevent avoidable adverse effects.
Disclosure of interest: None Declared.

Hospital Pharmacy: Pharmaceutical Care

HP-PC013

Development of quality indicators (QI's) for patients taking oral anti-cancer drugs (OADs)

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Background and objective: With the increasing importance of oral anti-cancer drugs, the need to evaluate and assure the quality of oral anti-cancer treatment is also growing. The development of a set of quality indicators can direct cancer centres in evaluating and adjusting the care for patients treated with OADs.
Setting and method: Based on a literature search and previous semi-structured interviews with patients, oncologists, oncology nurses and hospital pharmacists, a list of 95 candidate QI's for the pharmacotherapeutic care of cancer patients treated with OADs was composed. The initial set of QI's was validated by a panel of experts using a two-round Delphi method. Comments and indicators newly identified in the first round were co-evaluated in the second round.
Main outcome measures: Expected value of single QI's for the assessment of the quality of care for patients treated with OAD's.
Results: Twenty experts (4 oncologists, 6 oncology nurses, 6 hospital pharmacists, 3 onco-coaches and 1 researcher) completed the two-round Delphi approach. In the first round, 95 indicators across seven different themes (coordination of care; communication with patients; patient education; medication counselling; follow-up of treatment; psychosocial support; involvement of family and friends) were evaluated and rated. Based on the suggestions of the participants, 39 additional indicators were formulated, resulting in a set of 134 indicators to be evaluated in the second round, of which 92 (68.7 %) were withheld. The final list contained 69 of the initially proposed indicators (70.6 %) and 23 indicators defined by participants. In each of the seven themes indicators were retained and added, with the exception of the theme 'involvement of family and friends', where none of the new indicators was retained.
Conclusions: Using a two-round Delphi approach, consensus was reached about a set of QI's for the care of cancer patients treated with OADs. This is an important step in the development of pharmacotherapeutic care concepts that meet the needs of these patients. However, in the next phase it will be crucial to determine and provide all preconditions necessary to implement these QI's in practice.
Disclosure of interest: None Declared.

Hospital Pharmacy: Pharmaceutical Care

HP-PC014

Rheumatologists' medication beliefs barely differ from patients' medication beliefs

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Background and objective: In patients with rheumatoid arthritis (RA), medication adherence is suboptimal. Different studies demonstrate that patients' beliefs about medication are associated with non-adherence. Moreover, some studies hypothesize that physicians' beliefs about medication might also be associated with non-adherence. This is the first study to describe medication beliefs of rheumatologists and to compare them with beliefs of RA patients.
Setting and method: Data for this descriptive study were collected in a rheumatology clinic in Nijmegen. Beliefs about medication were assessed in consecutive RA patients in 2010, and in rheumatologists in 2013 by questionnaires. Results were reported by means of descriptive statistics.
Main outcome measures: The Beliefs about Medicines Questionnaire (BMQ) was used to measure, amongst others, the perceived need to take medication and concerns about taking medication. Rheumatologists' medication beliefs were assessed with an adapted version of the BMQ.
Results: 96 % (n = 27) of rheumatologists (mean age 42, 63 % female) and 71 % (n = 580) of eligible RA patients (mean age 63, 68 % female) provided data. Both rheumatologists (81 %) and patients (79 %) had a strong perceived need for (the patients) taking medications as prescribed. However, 63 % of the rheumatologists had concerns about the long-term effects of medication and 44 % about side-effects of medication. Most of the beliefs about medication seemed to correspond between the rheumatologists and the patients.
Conclusions: Although both rheumatologists and patients had a high perceived need for taking medication as prescribed, they also had considerable concerns. These concerns of rheumatologists might influence adherence in patients. Demonstrating the presence of associations between rheumatologists' medication beliefs and patients' adherence is needed to further explore physicians' beliefs as possible targets for improving adherence.
Disclosure of interest: None Declared.

Hospital Pharmacy: Pharmaceutical Care

HP-PC015

Pharmaceutical interventions : impacts and reasons in regard of chemotherapy's validation

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Background and objective: In our hospital, chemotherapy protocols are prescribed via the CHIMIO^{TM} software. Before preparing treatment, protocols are pharmaceutically validated by a team of pharmacists. Few studies related to pharmaceutical validation (PV) of chemotherapy's protocols are found in literature. As a result, their impact remains unknown. So we decided to assess the nature and impact of pharmaceutical interventions (PI) performed daily by pharmacists to clinicians during validation of chemotherapy's protocols.
Setting and method: Prospective data collection over a period of six months (December 2013 to May 2014) of all PI done during chemotherapy's protocols validation. 5 specialties were initially targeted: Gastroenterology, Internal Medicine, Dermatology, Onco-Haematology and Pneumology. Data collection was done using a table Excel. The main elements were collected: nature of the problem identified by pharmacist, action performed with the prescribing physician and impact of PI on the initial prescription (modified or not).
Results: Over the study period, 251 PI were performed over 5820 chemotherapy's prescriptions (4.4 %). Qualitative analysis of data shows 2 main types of PI. 1/**Request for additional information to the physician**: this is about a confirmation and if needed a clinical and/or bibliographic justification of a different dose not in accordance with recommendations, a treatment discontinuation or a change in treatment from previous one. The aim is to ensure the proper use of molecules; it can also lead to a prescription's change. 48 % of PI is concerned and 22 % of them leaded to a change of prescription. 2/**Proposed amendments to chemotherapy's protocol**: 52 % of PI are concerned and 98 % leaded to a change of prescription. 34 % are about the protocol (double inclusion with a risk of toxicity, inclusion error related to the staff decision, a too short period between two cycles) and 60 % are related to dose matters (dose reduction and increase's omission from a cure to another, dosing error related to a wrong massive reduction of the patient weight).
Conclusions: The PV of chemotherapy's prescriptions is a key step. It leads to a proper use of those products and a safe care of patients. This study allowed a characterization of PI in regard of chemotherapy's prescription. The PV grid made by French Society of Clinical Pharmacy for drugs is not relevant for chemotherapy's prescription; some problems and interventions realized are not identical. We will continue this study in order to adapt a PV grid of chemotherapy's prescription that we can suggest to other hospitals.
Disclosure of interest: None Declared.

Hospital Pharmacy: Pharmaceutical Care

HP-PC016

Feasibility study to implement dose banding in a teaching hospital

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Background and objective: Dose banding (DB) is a system whereby, through agreement between prescribers and pharmacists, chemotherapy doses calculated on body surface area (BSA) are rounded up or down to predetermined standard doses (SD) with a variance limit of ± 5 %.

In our hospital, over 30,000 preparations of chemotherapy per year are made.

Implementation of DB could reduce patient waiting time and improve capacity planning of our cytotoxic preparation unit (CPU). Thus, the aim of this project was to conduct a feasibility study on the implement of DB in our CPU.
Setting and method: The study consisted in 2 phases:

Phase I—literature review of DB: to identify selection criteria and method of assigning dose bands.

Phase II—retrospective analysis of 2013′s production in CPU: to identify cytotoxic drugs candidates and select SD
Main outcome measures: In accordance with literature review, drugs were selected using following criteria: frequency of preparation upper than 250 preparations per year, sufficient long-term physicochemical stability after reconstitution (more than 7 days) and opportunity for savings.

"Target dose" banding was chosen for selecting SD.

In order to guarantee a good turnover, 5 SD should cover at least 60 % of preparations.
Results: On the 70 pharmaceutical specialties prepared in our CPU, six candidate drugs were eligible: paclitaxel, 5-fluorouracil (5-FU), cyclophosphamide, gemcitabine, cytarabine, calcium folinate. The simulation was made with paclitaxel, 5-FU bolus injection (400 mg/m^2), and 5-FU 48-hour continuous infusion (2400 mg/m^2) with a percentage standardisation of 65 % (SD: 105, 120, 135, 150 and 165 mg), 69.5 % (DS: 500, 600, 700 and 800 mg) and 79,5 % (SD: 3500, 3900, 4300 and 4700 mg) respectively.
Conclusions: Before implementation, this DB project should be approved by the medical staff and some practical constraints such as software, system management, storage, control should be developed.

On the other hand, status of these preparations is not well established by health authorities in France. They can be considered as hospital preparations (authorization request, statement, and respect of Good Manufacturing Practice) or as compounded medications requiring an early prescription.
Disclosure of interest: None Declared.

Hospital Pharmacy: Pharmaceutical Care

HP-PC017

Tolerance and safety of infliximab in the treatment of moderate to severe Hidradenitis Suppurativa

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Background and objective: Hidradenitis Suppurativa (HS), also known as Verneuil's disease is a chronic inflammatory disease that affects skin areas rich in apocrine glands. The main symptoms are painful nodules evolving into abscesses and hypertrophic scars that impair patient's quality of life. Current medical treatment modalities (combine or single antibiotherapy, high dose of zinc) failed to provide an effective treatment to severe form and often lead to long term side effects such as digestive disorders. Surgery still remains the standard treatment despite of extensive scars. Anti-tumor necrosis factor (TNF-a) therapies have demonstrated their efficacy in moderate to severe HS. The aim of our study was to evaluate the tolerance and follow-up of infliximab (IFX) treatment in our university hospital.
Setting and method: Six years retrospective and observational survey of patients with moderate to severe HS and treated with IFX. Prescriptions were extracted with software Pharma® (Computer Engineering, Paris) and clinical data were collected with the computerised patient file Millennium (Cerner Corporation, Kansas City).
Main outcome measures: Age, sex-ratio, date of the first treatment and risk factors (smoking, overweight), dosage and number of treatment with IFX, surgery required, emergence of adverse effects, discontinuation of treatment were compared for each patient.
Results: The survey included 15 patients: 5 men and 10 women with a median age of 43 years [28–70] at the beginning of treatment with IFX. All of patients were overweight (median IMC = 31.2) and 13 were current smokers, that are the 2 main factors associated with HS. All patients received infusions of IFX (5 mg/kg) in weeks 0–2–6 then every 8 weeks and 4 patients had dosage adjustment (6 or 7 mg/kg every 5, 6 or 7 weeks) according to the frequency of recurrences. The average number of infusions was 11 [4–30]. Good tolerance and reduced frequency of relapses were observed particularly in the early cures. Adverse events occurred in 7 patients (46.7 %): 5 infections, 2 abnormal liver biologic (hepatolysis) and 1 polyarthralgia which led to stop the treatment. Six patients (40 %) required plastic surgery during the treatment. Only 1 patient stopped the treatment for therapeutic escape after 8 infusions. Due to immunization reported by low IFX serum trough levels, 2 patients stopped treatment but there were breaks in IFX treatment.
Conclusions: This evaluation of IFX use in HS showed satisfactory tolerance and reduction of relapses in the early cures, which greatly improve patient's quality of life but prospective studies on long-term therapy with IFX are required to better assess the benefit-risk ratio for this high cost treatment.
Disclosure of interest: None Declared.

Hospital Pharmacy: Pharmaceutical Care

HP-PC020

Implementing an infusion practices study mutualized between two hospitals

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Background and objective: The French "ARMEN" project's aim is to identify economic gains from good practices, born from the interdepartmental program "PHARE". In this way, we decided to evaluate the use of IV manual flow regulators (FR) by healthcare teams in two hospitals (1067 and 324 beds), in order to secure the patient medical care with a mutualized reflection on issues and solutions.
Setting and method: Sharing of literature review and questionnaire design; presentation to each hospital nursing leadership; distribution to the nurses in care units; analysis of results; common propositions to optimize good infusion practices; communication in both hospitals.
Main outcome measures: Selection criteria's of a FR; catheter used; the check of counting drops; medication used.
Results: 243 questionnaires have been collected during 3 months. Similar proportions in the results were observed in both hospitals. The main selection criteria's of a FR were the infusion time (70 %), the inpatient security (64 %), and medication used (63 %). The most used catheters were 20G (70 %) and 18G (48 %), while the manufacturer recommends 22G or more. The optimum infusion height is unknown by 60 %. The counting drops is respected by 68 % at infusion beginning, by 7 % fifteen minutes after the beginning and by 37 % during infusion while it should be monitored during therapy as for the simple gravity infusion. According to manufacturer recommendations and good infusion practices, inappropriate drugs were given as, for instance, parenteral nutrition (34 %), potassium chloride (22 %), concentrated solutes (18 %) or chemotherapy (14 %).
Conclusions: As the use of FR does not fulfil good infusion practices, we both decided institutionally to remove FR from the pharmaceutical booklet. The removing is supported by the nursing leadership and will be guided in each using care unit. New documents are to be written to help healthcare teams to choose the best infusion rate device if needed. The study has been valued as « Assessment of Occupational Practices » and can be provided and used into the regional buying group.
Disclosure of interest: None Declared.

Hospital Pharmacy: Pharmaceutical Care

HP-PC027

Discrepancies revealed by medication reconciliation on hospital admission and discharge: differences in process, number and type

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Background and objective: Transition in care like hospital-admission or discharge, induces a large number of discrepancies in patients' medications. These can be detected and prevented with medication reconciliation (MR).

Little is known about the differences of detected discrepancies between several hospitals and patients characteristics.
This research had three objectives: to describe differences in the process of MR between hospitals, to determine the number and type of discrepancies per hospital and characteristics of patients who experience discrepancies.
Setting and method: A retrospective study was performed in three hospitals with $\geq$5 year experience in MR on admission and discharge. In each hospital 150 patients were included (Aug.-Nov. 2012) on four different ward types.

This study was a part of a research project including six hospitals.
Main outcome measures: Number and type of discrepancies per hospital, as determined by the pharmaceutical team based on a medication history and interview with the patient. The four types of discrepancies were omission, dose, substitution and addition.
Results: Overall 450 patients were included, 223 of surgical and 227 of medical wards (not equally divided between the hospitals). A significant difference was found in age, gender and length of stay (all $p < 0.001$) between the hospitals.

86.7 % of the patients had an admission interview and 83.8 % at discharge. On admission the mean number of discrepancies per patient was 4.5 (hospital A), 3.2 (hospital B) and 4.2 (hospital C). Hospital A and B had the highest score of omissions (54–65 %) whereas in hospital C dose discrepancies (66 %) reached the maximum number. The number of patients with $\geq$1 discrepancies on admission (84.7–88.7 %) is higher as compared to discharge (8.0–29.3 %). Finally, at discharge differences between hospitals was more profound (number of discrepancies 100 (A), 40 (B) and 12 (C) resp).

Differences between hospitals in MR processes were found, e.g. in education of the MR team, sources used to obtain the medication list, place of consultations of the patient and moment of performing the MR.

Patients with the mean number of discrepancies (4) or more, had a significant higher age, less patients in surgical wards, more discharge medication and more patients had a discharge consultation. The medication group with the highest number of discrepancies with regard to the number of prescriptions were vitamins, medications acting on the renin-angiotensin system and oral anti-diabetic drugs.
Conclusions: Number and type of discrepancies revealed by MR differs per hospital, ward and moment. Possible reasons for this are differences in method of MR, in populations and in wards. Patients with more discrepancies appear to have differences in characteristics and some medications appear to have a greater chance for a discrepancy.
Disclosure of interest: None Declared.

Poster Discussion Forum II

Community Pharmacy: Pharmaceutical care

CP-PC006

Nature and management of duplicate medication alerts

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Background and objective: Clinical decision support systems generate many alerts, with risk for potentially hazardous overriding of alerts by the care provider. Duplicate medication (DM) alerts are generated when two prescriptions for the same or comparable active substances are dispensed with an overlap in the assumed period of use. As DM alerts contribute substantially to the total number of alerts, their specificity should be considered. This study investigates the nature and management of DM alerts in community pharmacy.
Setting and method: Observational study in 56 community pharmacies. Each pharmacist registered on a structured form the nature and management of 24 DM alerts generated in daily practice.
Main outcome measures: Pharmacist-perceived relevance of the DM alerts, sources used to decide on the action needed, and performed actions based on the alerts; factors influencing these outcomes.
Results: On average, the CDSS generated 19.9 DM alerts per 100 dispensed drugs. In 50 % of the 1344 registered alerts, there was no intention and no risk of concurrent use of both prescriptions. In 33 %, the combination was intentional. In 17 %, the combination was unintentional with a theoretical risk of concurrent use, but most of the patients involved (93 %) had already been informed by the prescriber.

The electronic patient record was the most frequently used source to decide on the action needed (64 %); in 30 % of the alerts the pharmacist contacted the patient (25 %) or prescriber (5 %).

In 67 % of all alerts, the pharmacist decided not to take any action. In 15 %, the patient record was updated, in 15 % patient instructions were given, and in 2 % (n = 26) the prescription was modified or cancelled for administrative (n = 18) or therapeutic reasons (n = 8). Alerts were more likely to be followed by action at first dispense compared to refill (68 % vs 23 %); handwritten prescriptions were more likely to be followed by action than electronic prescriptions (49 % vs 32 %).
Conclusions: In community pharmacy, therapy changes based on DM alerts are rare. However, one-third of the DM alerts is a trigger to inform patients or to keep patient records up-to-date. As the current DM alerts are nonspecific, other ways of alerting (taking into account risk factors e.g. as in clinical decision rules) should be considered.
Disclosure of interest: None Declared.

Hospital Pharmacy: Pharmaceutical Care

HP-PC022

Hospital pharmacists narrow the gap between health care levels by optimizing discharge letters

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Background and objective: Clinical pharmacists (CP) work in a health care team at an orthopaedic ward. They are responsible for medication reconciliation and review of the hip fracture patient's medication list. At discharge, the CP sums up changes in the patient's medical treatment and formulates the current medication list in a discharge letter to the patient's general practitioner (GP). Therapeutic recommendations regarding drug related problems (DRP) are included in the discharge letter. The main objective was to see to what degree this information provided by the CP had been taken in consideration by the GP and if these changes and recommendations had been implemented at a patient level. We also wanted to investigate the GPs's experience and potential benefit of this discharge letter.
Setting and method: Patients and their GP were interviewed minimum 6 weeks post discharge, and their current medication list was collected both from the GP and the patient. All therapeutic recommendations in the discharge letter were reviewed and the outcome at the time of interview, noted both in the GP's records and at the patient level, was noted. In addition, two focus groups consisting of four and six GPs were interviewed and data were recorded and systematically analysed.
Main outcome measures: Number of changes and recommendations in the discharge letter brought to completion by the GP and the patient.
Results: Thirty-two GPs who had received the discharge letter, and nineteen of their hip fracture patients, were interviewed. On average each discharge letter contained 8 DRPs. Seventeen (53 %) of the GP's had read the discharge letter and 14 had documented changes to the patients' medical treatment accordingly. 70 % of the changes and recommendations were brought to completion as described in the discharge letter at a patient level. The GPs were positive to the discharge letters and thought it increased patient safety. Therapeutic recommendations were regarded as a substantial support for assessing drug therapy and contributed to further learning.
Conclusions: Detailed information from CPs regarding medical treatment in the discharge letter helps transferring medical information between different levels of health care and emphasizes important DRPs, thus enabling increased patient safety.
Disclosure of interest: None Declared.

Community Pharmacy: Pharmaceutical care

CP-PC007

Differences in patients' self reporting types to adverse symptomatic events

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Background and objective: Adverse symptomatic events considered one of main problems during patients' therapy, and as early signs for the more expected serious adverse drug reactions (ADRs) of medications.Reporting of adverse events is done either by physicians or patients themselves. Patients' self-reporting found to be more reliable than of physicians and improve early detection of ADRs, particularly symptomatic reactions, as patients considered the main source of information. The present study was aimed to finding out the differences in patients' self-reporting in two different methods (questionnaires and website).
Setting and method: Cross-sectional design was used for self-reporting of symptomatic adverse drug events, reported in 400 patients complained different diseases like cardiovascular system conditions, gastrointestinal system conditions, endocrine system conditions and infectious diseases. Validated questionnaire form (Cronbach's alpha = 0.92) was used either as a form (for patients who were attended in the clinic) or in validated website (http://www.ilacpedia.com/adverse-effects). Approval of this study was granted from Ethical Committee of the University of Marmara-Institute of Health. SPSS version 20 was used to analyse the collected information. Mann–Whitney (or independent t test) was used to find the difference in symptomatic adverse drug reactions between form and website reporting.
Results: The majority of patients were females and those aged 21–30 years old (mean age 39.78 ± 15.41 years). Low incidence of patients found on the smoking and alcohol consuming habits. The patients were suffered from cardiovascular, infections, hormone disturbances or gastrointestinal problems, however, the highest incidence of these diseases were noticed in cardiovascular conditions mainly hypertension. Reporting by questionnaire showed higher incidence than website, except for somnolence (14 %) and joint pain(12.5 %). Concerning the different medical conditions, flu was among the highest

infectious conditions (12.3 %), gastroesophagal reflux disease has a higher incidence (11 %) of the gastrointestinal diseases. Among the hormonal disorders, menstrual irregularities was the most obvious one by (12.3 %), and hypertension took the higher incidence with (17.5 %).

Conclusions: From the results of this study, we can conclude that patient′s self-questionnaire may demonstrate to be a useful method of heartening patients to monitor their therapy and to report their symptoms to health verbal and can be used as a monotone way for ADRs detection in an outpatient setting in a reliable and valid way.

Disclosure of interest: None Declared.

Community Pharmacy: Pharmaceutical care

CP-PC008

Safety and efficacy of flurbiprofen spray for the treatment of sore throat

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Background and objective: Sore throats are often treated with antibiotics even though most cases are caused by viruses. Antibiotics can cause serious side effects so should only be used when necessary, and antibiotic overuse is a major factor in the development of antibiotic resistance. To help reduce these adverse effects, non-antibiotic treatments should be considered whenever possible. Flurbiprofen, a non-steroidal anti-inflammatory drug, is an alternative treatment for sore throat symptoms. This study determined the safety and efficacy of flurbiprofen 8.75 mg spray in adults with sore throat.

Setting and method: This randomised, double-blind, placebo-controlled multicentre study enrolled patients aged 18–75 years, with recent onset ($\leq$4 days) sore throat due to an upper respiratory tract infection, $\geq$5 points on the 21-point Tonsillo-Pharyngitis Assessment, $\geq$6 points on the 11-point Throat Soreness Scale, $\geq$50 mm on the 100-mm Difficulty Swallowing Scale and $\geq$33 mm on the 100-mm Swollen Throat Scale. Patients took one dose of flurbiprofen 8.75 mg cherry mint flavoured spray or flavourless and odourless placebo spray and were instructed not to re-dose for 6 h. They rated throat soreness, difficulty swallowing, pain intensity and swollen throat at baseline and at regular intervals in the first 6 h. Patients could re-dose after 6 h (every 3–6 h as needed, up to five doses a day for up to 3 days). All adverse events (AEs) were recorded.

Main outcome measures: The primary outcome measure was the area under the change from baseline curve (AUC) for throat soreness, from 0 to 2 h post first dose. The AUC up to 6 h for throat soreness and other symptoms was also measured, and treatment groups compared using analysis of covariance.

Results: 505 patients (mean age 25.6 years, 56 % male) received study medication (flurbiprofen 8.75 mg spray n = 249, placebo n = 256). The mean AUC over 2 h for throat soreness was significantly greater with flurbiprofen 8.75 mg compared with placebo (−1.82 vs. −1.13; $p < 0.0001$). Results were similar for AUC over 6 h for throat soreness (−2.14 vs. −1.50), difficulty swallowing (−22.50 vs. −16.01), pain intensity (−22.50 vs. −15.64) and swollen throat (−20.97 vs. −13.80) (all $p < 0.0001$). There was no significant difference in AEs between the flurbiprofen and placebo groups during the 3-day study. In the 6 h post first dose, 6.8 % of flurbiprofen-treated patients and 3.1 % of placebo-treated patients, reported any (p = 0.061). Most AEs were mild and none were assessed as definitely related to study medication.

Conclusions: Flurbiprofen 8.75 mg spray is well-tolerated and provides effective and long-lasting relief for sore throat symptoms. Flurbiprofen 8.75 mg spray can be recommended for the symptomatic treatment of sore throat, while antibiotics should be reserved for patients who are severely ill or at increased risk of complications.

Disclosure of interestinterest: M. Russo: None Declared, F. de Looze: None Declared, M. Bloch: None Declared, B. Montgomery: None Declared, G. Smith Employee of Reckitt Benckiser Healthcare Ltd, A. Shephard Employee of Reckitt Benckiser Healthcare Ltd, S. Aspley Employee of Reckitt Benckiser Healthcare Ltd.

Community Pharmacy: Pharmaceutical care

CP-PC009

Factors influencing haemoglobin levels in chronic medicine users

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Background and objective: Blood dyscrasias are pathological conditions in which any of the constituents of blood are abnormal in structure, function or quality[1]. Haemoglobin is one component which may be influenced resulting in polycythaemic or anaemic blood counts [2].

To investigate the effect of chronic medication use, illness, haematological, and dietary and lifestyle factors on haemoglobin levels.

Setting and method: A community pharmacy

Patients were recruited according to a specified list of nine chronic medications that influence the haemoglobin blood count. Blood levels were tested in the community pharmacy using the STAT Site® M^{Hgb} Haemoglobin Meter at two instances to determine any possible fluctuations in blood level over time (retest time average 1 year). Questionnaires were distributed to the recruited patients for further insight into lifestyle habits.

University of Malta Research Fund Grant on Point-of-Care Testing

Main outcome measures: Degree to which chronic medications use affects haemoglobin levels

Results: Out of the 76 patients tested, 55 were female and 21 were male. Lower than normal haemoglobin levels were obtained by 45.45 % of females and 47.62 % of males, with these abnormalities observed primarily in those on proton pump inhibitors (n = 12) and the oral contraceptive pill (n = 15). A linear relationship exists within the male population; an increase in age reflected a decline in the haemoglobin level (p = 0.013). No such correlation was found within the female population.

Conclusions: Although sample sizes were small, the results obtained indicate a possible trend. Detailed patient history and understanding of lifestyle and dietary habits is fundamental for proper analysis of factors affecting haemoglobin levels.

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Disclosure of interest: None Declared.

Public Health

PH005

A qualitative study of the general public and healthcare professionals to understand medication wastage related behaviours and potential reduction strategies

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Background and objective: Medication wastage continues to compromise public health in terms of safety, the environment and the economy. There is a need to develop and implement wastage reduction strategies. Paying attention to behaviour change theories significantly impacts the positive implementation of evidence into healthcare practice. The Theoretical Domains Framework (TDF) provides a constructive conceptual basis for gauging implementation issues, designing interventions to enhance healthcare practice, and understanding behaviour-change processes. To understand medication wastage behaviours and explore potential wastage reduction strategies from the perspectives of the Maltese general public and healthcare professionals (HCPs).

Setting and method: A qualitative, phenomenological study of five (two public and three HCPs) focus groups of 11 pharmacists, 6 doctors and 6 members of the general public. Participants were purposively selected from those indicating willingness in a previous questionnaire research phase. The focus group topic guide was based upon the 14 TDF domains and key findings of the questionnaire phase of data collection. Focus groups of around 90 min were audio recorded and transcribed verbatim. The Framework Approach to data analysis was performed by two independent researchers, reaching consensus over the coding frame. Ethics approval was obtained.
Main outcome measures: Behaviours; potential strategies to reduce wastage.
Results: Key behaviours identified as contributing to wastage aligned to several TDF domains. In terms of knowledge, there were key issues of lack of awareness of wasted resources, overstocking (both public and HCPs) and unsafe medication disposal. There were environmental constraints related to lack of resources and poor organisation. Social influences existed, particularly for HCPs around power dynamics and attitudes (e.g. influence of some consultant physicians), political pressure and pressure from patients. Behavioural regulation around medication wastage was another key TDF domain, described as the abuse of the free healthcare system, sub-optimal use of medication by patients and lack of review of prescribing patterns of doctors. Proposed strategies to reduce wastage included: education of HCPs and the general public, employing social media as a means of targeting; the introduction of a patient specific pharmaceutical identity card containing medication history to prevent re-dispensing; and setting up a healthcare intermediary independent body for Government subsidised medications to prevent abuse.
Conclusions: This study has employed a theoretical framework to identify key underlying medication wastage related behaviours (such as system, practitioner and patient effects) which require attention (e.g. lack of education and information, and political interference) as part of strategic development.
Disclosure of interest: None Declared.

Drug Information

DI001

Knowledge of Polypharmacy in HIV- infected patients in a Spanish University Hospital

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Background and objective: HIV patients in Spain are followed in Hospitals by physicians and pharmacists. Antiretroviral Therapy (ART) is delivered in hospital pharmacies. Aging of HIV patients has been associated with higher incidence of co-morbidities, which may finally lead to polypharmacy. Sometimes, hospital practitioners cannot know patients' co-medications because neither patients remember it nor the ambulatory treatment is registered in hospital records. The aim of this study was to describe the prevalence and types of co-medication in HIV-infected outpatients.
Setting and method: Observational cross-sectional study including all patients that started or switched ART during a three month period. A specific database gathering antiretroviral and ambulatory treatments was designed collecting data from the public health system information about ambulatory care treatment. Drugs were coded according to Anatomical, Therapeutic and Chemical (ATC) classification.
Main outcome measures: Percentage of patients with co-medication and main drug prescribed according to ATC classification.
Results: A total of 245 patients were included (78 % male, median age 44.1), generating 257 Pharmacy Department visits. Out of them, 39 patients were naïve to ART, 14 came for a post-exposure prophylaxis and 204 switched their previous ART (29 % due to either toxicity or drug interactions). Overall, 162 patients (66.12 %) were receiving at least one co-medication beside their ART, with a median of 3.5 (range 1–12) drugs per patient. In our data series, 39 patients (7 % of all data prescriptions) had no information about co-medication in clinical records and 44 patients (8 %) did not have any co-medications. Among ATC families, nervous system was the most prescribed group (30 %). Other main groups were alimentary tract and metabolism (13 %), cardiovascular system (13 %), anti-infective for systemic use (6 %), blood and blood forming organs (5 %), respiratory system (4 %), musculo-skeletal system (3 %), genito-urinary system and sex hormones (2 %), systemic hormonal preparations, excluding sex hormones and insulin (2 %). The 7 % left was coded as others and include illicit drugs and ethanol abuse.
Conclusions: Up to 66 % of HIV-infected patients on ART may receive other co-medications, mainly related to nervous system, alimentary tract and metabolism and cardiovascular system. This knowledge is crucial before prescribing ART in order to minimize drug–drug interactions and assure a safe therapy.
Disclosure of interest: None Declared.

Community Pharmacy: Pharmaceutical care

CP-PC010

Effects of a single dose of flurbiprofen spray for the treatment of sore throat

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Background and objective: Most sore throats are due to viruses but are often treated with antibiotics. Inappropriate antibiotic use drives antibiotic resistance, which is now a major threat to public health, and antibiotics are associated with potentially serious side effects. To help safeguard against these adverse effects, non-antibiotic treatments should be considered whenever possible. Flurbiprofen, a non-steroidal anti-inflammatory drug, is an alternative treatment for sore throat symptoms. This study determined the efficacy and safety of flurbiprofen 8.75 mg spray in adults with sore throat.
Setting and method: This randomised, double-blind, placebo-controlled, multicentre study enrolled patients aged 18–75 years, with recent onset ($\leq$4 days) sore throat due to an upper respiratory tract infection, $\geq$5 points on the 21-point Tonsillo-Pharyngitis Assessment, $\geq$6 points on the 11-point Throat Soreness Scale, $\geq$50 mm on the 100-mm Difficulty Swallowing Scale and $\geq$33 mm on the 100-mm Swollen Throat Scale. Patients took one dose of flurbiprofen 8.75 mg cherry mint flavoured spray or flavourless and odourless placebo spray and were instructed not to re-dose for 6 h. They rated throat soreness, difficulty swallowing, pain intensity and swollen throat at baseline and at regular intervals in the 6 h post dose. Patients could re-dose after 6 h (every 3–6 h as needed, up to five doses a day for up to 3 days). All adverse events (AEs) were recorded.
Main outcome measures: The main outcome measure was the analgesic efficacy of flurbiprofen 8.75 mg spray. Time to onset and duration of action were determined based on mean change from baseline in symptom scores, and treatment groups compared using analysis of covariance.
Results: 505 patients (mean age 25.6 years, 56 % male) were randomised (flurbiprofen 8.75 mg spray n = 249, placebo n = 256). One dose of flurbiprofen 8.75 mg spray reduced throat soreness from 5 min (the first post-dose assessment) to 6 h ($p < 0.01$ vs. placebo). Reductions were also observed for the other symptoms from the first assessment timepoint (5 min for difficulty swallowing, 20 min for sore throat pain intensity, 30 min for swollen throat) to 6 h ($p < 0.05$ vs. placebo). There was no significant difference in AEs between the treatment groups in the 6 h after the first dose (flurbiprofen 8.75 mg 6.8 %, placebo 3.1 %; p = 0.061) and during the overall 3-day study period (flurbiprofen 8.75 mg 12.4 %, placebo 8.2 %; p = 0.119). There were no serious AEs.
Conclusions: Flurbiprofen 8.75 mg spray is well-tolerated, provides fast and long-lasting relief for sore throat and is suitable for using p.r.n. (as needed) during a sore throat episode. Flurbiprofen 8.75 mg spray can be recommended for the symptomatic treatment of sore throat, while antibiotics should be reserved for patients who are severely ill or at increased risk of complications.
Disclosure of interest: M. Russo: None Declared, F. de Looze: None Declared, M. Bloch: None Declared, B. Montgomery: None Declared, G. Smith Employee of Reckitt Benckiser Healthcare Ltd, A. Shephard Employee of Reckitt Benckiser Healthcare Ltd, S. Aspley Employee of Reckitt Benckiser Healthcare Ltd.

Pharmacoepidemiology

PE001

Pharmaceutical home visits for chronic complex patients as an outreach tool regarding compliance, home medication management, and the patients' expertise degree. Could these factors improve treatment safety and effectiveness?

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Background and objective: Polymedication, chronicity and patients' expertise degree are strategic pillars defined in our recent health policies, in which primary care pharmacists have a great opportunity to be involved. The aim of the present study was to evaluate which domiciliary characteristics and factors for patients may be associated with drug compliance and other drug related problems (DRP) appearing in chronic complex patients (CCP).
Setting and method: An observational, transversal study was performed during the last quarter of 2013 in an urban primary health centre in Barcelona, Catalonia. A home visiting program was carried on a CCP sample (all of them adults, $\geq$5 daily medications, $\geq$1 chronic disease and $\geq$2 non-programmed hospital admissions during the past year). Afterwards, each patient's pharmacotherapeutic plan (PTP) was individually reviewed according to MAI, Beers and STOPP/START criteria. Data were analysed by PASW Statistics software version 18.0.1.
Main outcome measures: Pharmacological compliance through Morisky-Green test and DRP using Pharmaceutical Care Network Europe V6.2 classification.
Results: 51 patients were selected: 49.0 % being women, an average age of 83.2 years old, with a mean of 10.7 daily medications and yearly PTP cost of 3,100.1€ per patient. An average of 5.7 DRPs per patient or 1 DRP for every 2.2 prescriptions was detected. The most common DRP was underdosing (24.6 %) due to "patient's drug use process" being the most frequent cause of DRP (27.2 %). DRP multi-causality was shown by a DRP-cause ratio of 1:1.4. 88.0 % of prescriptions were for long-term treatment, 24.0 % of patients were non-compliant and 57.0 % were taking an additional healthcare product regularly. Patients' medicine cabinet analysis showed an average of 27.9 packages per patient valued at 416.9€. Despite the establishment of co-payment policies and electronic prescribing and dispensing, an average of 2.2 packages was stored per prescription and 2.9 expired medications were found per medicine cabinet. It should be noted that there was better compliance among patients with a high expertise degree ($p < 0.05$) which also correlates with a decrease in DRP ($p < 0.05$).
Conclusions: The development of pharmaceutical home care programs could prevent medication over-accumulation, improve medicine cabinet's management and promote patient's involvement in their own health. These and other domiciliary characteristics found to be related with PCC treatments' effectiveness and security.
Disclosure of interest: None Declared.

Community Pharmacy: Pharmaceutical care

CP-PC011

Factors contributing to medicine-related problems (MRPs) that may be specific to South Asian (SA) and Middle Eastern (ME) cultures in the UK

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Background and objective: There has been little research which specifically examines medicines use among SA and ME groups, although evidence suggests that medicines related needs may be poorly met for these groups. Thus, the aim of this study was to describe the reasons which may contribute to MRPs and were reported to be specific to SA and ME cultures.
Setting and method: The study was a cross-sectional study. Patients were from SA and ME origins, aged over 18 and prescribed three or more regular medicines. Patients were identified through previous medicine use reports (MUR), patient medication records (PMR) or when presenting with a prescription. The data were collected in 80 face-to-face semi-structured interviews in seven pharmacies in London using MRPs tool. Interviews were audiotaped, transcribed verbatim and analysed thematically using Gordon's coding frame and Nvivo 10 software.
Main outcome measures: Identification of factors contributing to MRPs that may be specific to SA and ME groups.
Results: Participants (61 % male) had mean (SD) age 58 (13.4) years and on a mean (SD) of 8 (4) medicines. Interviews revealed that several factors contribute to the development of MRPs; some appeared to be specific to SA and ME cultures and others were similar to the general population. The factors that were reported to be specific to SA and ME groups comprised religious practices and beliefs, use of non-prescription medicines, extent of family support, and travelling abroad back—to patient's home land or to take religious journeys. Perceptions of healthcare providers, difficulty consulting a doctor of the same gender, lack of referrals to specialised care, language and communication barriers, lack of translated resources, illiteracy, lack of involvement in the treatment decisions, problems with source, delivery, type and timing of information may also contribute to the problems. Many of these factors could be expected to influence patient's safety, adherence, and informed decision-making.
Conclusions: This study demonstrated that SA and ME patients have their own problems and needs with both medicine use and service access. By uncovering particular problems experienced by these groups the study can inform healthcare professionals to support SA and ME patients in the use of their medicines.
Disclosure of interest: None Declared.

Community Pharmacy: Pharmaceutical care

CP-PC012

Assisting consumers in self-medication: reflections on the role of support staff in community pharmacy

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Background and objective: Community pharmacies are often the first port of call for consumers with minor illness. In Portugal assisting self-medication in this setting—by supplying non-prescription medicines (NPM) or assessing symptoms—involves pharmacists and support staff (technicians and assistants). There is a paucity of research on support staff roles. This paper, which is part of a larger study, reports the perceived roles of pharmacy staff in assisting consumers in self-medication.
Setting and method: In-depth interviews with one pharmacist, one pharmacy technician and three pharmacy assistants were conducted as part of a case study in a purposively selected high street urban pharmacy. The topic guide included questions on staff's role in self-medication. Interviews were audiotaped, transcribed verbatim and analysed using the Framework Approach with the aid of NVIVO. The tripartite model of attitudes guided the thematic framework development. Ethical approval was granted.
Main outcome measures: Pharmacy staff perceived roles in self-medication.
Results: Both cognitive and affective dimensions were found. Accounts on role definition were associated mainly with the cognitive dimension. There was general concurrence about the ability of support staff to adequately assist consumers in self-medication. When discussing the role of pharmacists versus support staff, all non-pharmacists except one argued that there was no distinction. One pharmacy assistant overtly displayed a view that "*I don't see why (a pharmacist) is needed*", whilst recognising that a pharmacist could be consulted when

in doubt about the posology, interactions and contraindications. This consulting role was echoed by others and by the pharmacist, who pointed out the ability to detect possible adverse drug reactions as an additional reason for his involvement. Another role assigned to the pharmacist by support staff was that of a figure of authority.

Positive affective dimensions were found in interviewees' narrative on their role in self-medication, related to perceptions of increased customer loyalty and professional satisfaction.

Conclusions: It seems that support staff perceives assisting of consumers in self-medication as integral to their role. Although the workflow in Portuguese community pharmacy allows supervision by pharmacists, who work in the frontline with support staff, the apparent inexistence of structured mechanisms for in-pharmacy referrals to the pharmacist has potential implications for practice and policy. Ensuring the quality and safety in assisting self-medication by support staff may require standardisation of training and agreement on situations that require in-pharmacy referral.

Disclosure of interest: None Declared.

Community Pharmacy: Pharmaceutical care

CP-PC013

Problems encountered by community pharmacists in processing hospital discharge prescriptions

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Background and objective: Medication transfer during care transitions is associated with risks for patients resulting in errors, adverse drug events (ADEs) or readmissions with accompanying costs. Numerous projects to reduce those risks by improving information transfer have been opposed, but hospitals struggle with implementation. In the Netherlands for example, discharge reconciliation is performed for only 19 % of the patients discharged home.

Placed at the interface between hospital and primary care, community pharmacists are in a position where they can intervene and prevent drug-related problems (DRPs) as, in most cases, the community pharmacist is the final point in transitional care.

Therefore, the objective of this study was to investigate the current state of issues, divided in potentially drug-related problems (pDRPs) and administrative problems (APs), encountered by community pharmacy employees in processing discharge prescriptions.

Setting and method: An observational study in Dutch community pharmacies was performed. Standardized checklists were used in observing community pharmacy employees during the processing of hospital discharge prescriptions from adult patients who used at least 3 different drugs for chronic use and were discharged home. Data were collected between September 2013 and September 2014.

Main outcome measures: The primary study outcome was the number and type of pDRPs and APs encountered by community pharmacy employees.

Results: In total, 149 checklists were collected from 30 community pharmacies. On average, it took community pharmacy employees 22.5 (SD $\pm$ 19.5) minutes to process a discharge prescription. Additionally, 8.1 (SD $\pm$ 5.4) minutes was needed for physician consultation and 7.4 (SD $\pm$ 8.0) minutes for patient contact. Physician consultation to resolve any pDRP or AP was necessary in 37.6 % of the prescriptions, mainly to resolve uncertainties regarding missing, newly started or changed medication. For 63.1 % of the prescriptions the patient was contacted (e.g. for clearing up uncertainties, but also for giving advice or instructions) and in 26.2 % of the cases both patient and physician were contacted.

Conclusions: A high percentage of discharge prescriptions could not be processed smoothly by community pharmacies due to the encountered problems. In those cases interventions towards physicians or patients were necessary to prevent pDRPs and APs from potentially causing harm or inconvenience respectively. So, despite all the attention for information transfer during care transitions, our results show that there is still a need for further improvement. More thorough analysis of this data will indicate the details regarding the problems encountered and future recommendations.

Disclosure of interest: None Declared.

Poster Discussion Forum III

Hospital Pharmacy: Pharmaceutical Care

HP-PC023

Reassessment of antipsychotic prescribing for patients suffering from Alzheimer's Disease

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Background and objective: Behavioural disorders frequently occur in Alzheimer's disease (AD). Care is first unmedicated, then, if not efficient, antipsychotics are used. The objectives are to identify patients suffering from AD who are prescribed antipsychotic medications (defined as Alert Indicator Measurement) and to assess the implementation of actions to improve these prescriptions (defined as Risk Management by the prescriber Indicator Measurement).

Setting and method: We conducted a retrospective survey of practices on patients who were prescribed antipsychotic medications, on 18 Clinical Units (including Establishments of Accommodation for Dependent Old Persons and Long-Term Care Units). Patients suffering from AD were included, whereas patients with psychotic states or schizophrenia were excluded.

Results: Of 100 patients with AD (20 male and 80 female, aged from 70 to 101 years), 34 were treated with antipsychotics, 32 had already stopped these treatments, and 34 never received any.

Clinical disorders such as agitation or aggression were found for 83 % patients. Triggering factors were researched, clinical treatment of these disorders in non-drug treatment was performed for 83 patients, which was successful for 14 (17 %). The other 69 patients required at least one antipsychotic medication.

Different reassessments of antipsychotic medications were performed, such as:

– replacement by another antipsychotic medication (24 patients/69: 35 %),
– replacement of antipsychotic medication by memantine (29 patients/69 : 38 %), successful for 14 patients (48 %).
– change in dosage (32 patients/69 : 46 %),
– interruption of antipsychotic medication (36 patients/69 : 52 %), successful for 27 patients (75 %),

These reassessments have reduced the number of patients treated from 69 to 42.

Conclusions: The Alert Indicator pointed out in this survey could be improved (69 %). Of 69 patients, 59 (85 %) had their antipsychotic medications reassessed without time limit (good Risk Management Indicator); within a period of 3 months, they were only 40 patients (58 %).

The Risk Management Indicator is a proactive measure that will change and will have to be reassessed after return of results to the clinical units.

This study was developed to reduce the inappropriate use of antipsychotic medications, and to improve the management of behavioural problems in patients suffering from AD.

Disclosure of interest: None Declared.

Research development

RD001

e-Health in pharmacy practice in Scotland: conceptualising policy and strategy for role and service development

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Background and objective: Policy driven e-health and IT underpin the delivery of healthcare. Policy intention is to facilitate and develop the patient-facing clinical role of the pharmacist and the integrated role of pharmacy in Scotland by enabling web-based communication between health and social care. Policy documents envisage role development for the pharmacy team through IT-supported, multi-disciplinary education and training

'to meet future professional and service needs.' This research aimed to build conceptual models of the policy driven intended use of e-health in pharmacy in Scotland.
Setting and method: Policy and strategy documents relevant to e-health and pharmacy practice in Scotland were identified. Experts were consulted to ensure currency, relevance and reduce possible omission. Content analysis using a framework approach (transcribing, familiarising, coding, developing the analytical framework, mapping, interpreting patterns across and within constructs) was conducted. Independent searching for keywords (pharmacy, e-health, technology, digital, ICT, IT, education, training) by two researchers in identifying categories/sub-themes, minimised bias. Text was extracted to the initial conceptual model, with iteration and refinement producing a summarised, diagrammatic conceptual model. Intended applications of technology were captured. Ethical review was not required.
Results: Four documents were identified as the most relevant/current; two 2011, two 2013. Three were Scottish Government publications, one from RPS. Analysis identified four key categories each with sub-themes: patient care (safety, partnership, integration, resources); education and learning (fit for future needs, multi-disciplinary, delivery mode); information governance (systems, staff); implementation (accessibility, interoperability, support for role development). Most heavily exampled category was 'implementation' which emphasised the need to facilitate sharing of information across the health and social care team to improve the patient journey and safety, making the best use of workforce skills mix. Consistent throughout was the drive to continue to develop compatible, secure technologies which support and extend the role of pharmacy to deliver safe, effective person-centred care as an integral part of the health and social care team (patient care). 'Education and learning' encouraged design of training for effective use of IT to meet future professional and service needs with 'information governance' fundamental to the development of secure, shared patient information systems. Twenty intended IT applications were identified.
Conclusions: The conceptual models illustrated key themes, demonstrating congruence of the intended use of IT in pharmacy in Scotland at policy and strategy level. The research captured the aspirational intended use of IT in pharmacy to benchmark for future research into e-health implementation. Further research is indicated around key stakeholder perspectives on planned strategies and actions for e-health implementation.
Disclosure of interest: None Declared.

Pharmacotherapy

PT005

Is early switching from parenteral to oral analgesics after arthroplasty safe and effective?

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Background and objective: The aim of our study was to design and test a multimodal pain management strategy for faster IV to PO switch after arthroplasty.
Setting and method: Randomized prospective study in an orthopaedic surgery unit of a teaching hospital. We enrolled 100 patients planed for total knee or hip arthroplasty who signed the informed consent. 2 groups of patients: switch from intravenous (IV) to oral (PO) analgesic therapy on day 2 (group1) or on day 4 or 5 (group2), which is a usual practice (day 0 = surgery). For statistical analysis SPSS was used. Clinical pharmacist designed the protocol, educated the therapeutic team and patients, and recorded data.
Main outcome measures: VAS $\leq$4, opioids use, opioids adverse effects, analgesics costs
Results: 67 patients included (excluded: switch on day 3, IV + PO combination therapy, postponed operation, transfer): 29 in group1 (58.6 % women; age 68.2 $\pm$ 8.8) and 38 in group2 (60.5 %; 67.4 $\pm$ 8.0). In protocol as basic analgesia acetaminophen 1 g/tid was anticipated (IV/PO) and therapy on demand: IV piritramide/metamizole/diclofenac; PO diclofenac/metamizole/oxycodone + naloxone. As acceptable pain intensity a cut point of VAS $\leq$4 was set. Patients (group1/group2) who achieved cut point: day 2–44.8 %/38.5 %; day 3–75.9 %/61.5 %; day 4–72.4 %/64.1 %; day 5–88.9 %/70.3 %; there was no statistically significant difference (nonparametric-Chi square test). Percentage of opioid use (group1/group2): day 2–79.3 %/38.5 %; day 3–62.1 %/10.3 %; day 4–34.5 %/41.0 %; day 5–14.8 %/40.5 %; no statistically significant difference. From the monitored specific adverse effects the largest difference, but still not significant, was in constipation. Patients who were constipated: day 3–3.4 %/12.8 %; day 4–0 %/7.7 %; day 5–0 %/2.7 %. Analgesics therapy costs show statistically significant difference: group1 (18.69 $\pm$ 4.42 €), group2 (28.14 $\pm$ 7.34 €), p = 0.000.
Conclusions: There was a statistically significant difference regarding costs but not efficacy and safety. We are aware of study limitations (patients' number, protocol noncompliance—fear of insufficient pain management with PO therapy, non-24 h pharmacist presence), however, the early switch in this study was still recognized as an appropriate choice for patients after arthroplasty. So in the future we will work on implementing of this pain management protocol into practice.
Disclosure of interest: None Declared.

Pharmacoepidemiology

PE002

Consumption of antithrombotic drugs in North Estonia Medical Centre and Estonia from 2009 to 2013

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Background and objective: The reasonable consumption of antithrombotic drugs (ATC code B01) is important and costly part of hospital care. North Estonia Medical Centre (NEMC) as one of the biggest hospitals in Estonia has an important impact to the utilisation of antithrombotic drugs on national level and vice versa. Purpose of this study is to evaluate the use and expenditures of antithrombotic drugs in NEMC and in Estonia and to highlight important findings for planning of hospitaĺs medicines budget in next years.
Setting and method: The study was carried out in NEMC, tertiary care hospital, and in Estonia during 2009–2013. Drug consumption and expenditure data for antithrombotic drugs in NEMC was obtained from pharmacy database and amount of hospital days (hd) from hospital database. Collected data has been analysed by the use of DDD (defined daily doses) methodology per 100 hospital days (DDD/100 hd). Utilisation and expenditures data of antithrombotic drugs in Estonia was obtained from State Agency of Medicines. Drug utilisation on national level was expressed as DDD per 1000 inhabitants per day (DDD/1000 inh/day).
Main outcome measures: The use of antithrombotic drugs presented as the DDD/100 hd and DDD/1000 inh/day and cost in euros (EUR).
Results: The structure of antithrombotic drug consumption in NEMC and in national level is similar and consists mainly from three groups: platelet aggregation inhibitors, vitamin K antagonists and heparins. The overall utilisation of antithrombotic drugs in NEMC has increased moderately from 91.16 to 107.85 DDD/100 hd (18.3 %) being highest (110.12 DDD/100 hd) in 2012. In NEMC, heparins are mostly consumed group of antithrombotic drugs (73.6 DDD/100 hd in 2013). Use of novel oral anticoagulants (NOAC)- dabigatran, rivaroxaban and apixaban, started in 2009 and increased to year 2013 from 0.44 to 4.07 DDD/100 hd (825 %), respectively. Expenditures for antithrombotic drugs increased in total from 0.32 to 0.37 million EUR (15.6 %) only, being highest (0.38 million EUR) in 2012. In Estonia most commonly used antithrombotic drugs are platelet aggregation inhibitors. National use of antithrombotic drugs increased continuously from 53.03 to 85.09 DDD/1000 inh/day (60.5 %) and the expenditures from 3.04 to 5.5 million EUR (80.9 %). As in NEMC, there is substantial increase in utilisation of NOAC- from 0.0043 to 1.6 DDD/1000 inh/day (37109,3 %).
Conclusions: Biggest challenge for NEMC budget in the near future will be expected further increase of utilisation of NOAC. Thus, local recommendations for use of NOAC should be updated aiming to specify right target patient population and describing tools of price control on hospital pharmacy level. Moreover, further collaboration between hospital pharmacists, nurses and physicians should be encouraged to ensure that newly developed local recommendations are properly introduced into routine clinical practice in NEMC.
Disclosure of interest: None Declared.

Drug Information

DI002

The emergency drugs diluted and stored in the syringe for 12 h are not contaminated by fungi and microorganisms: the experience in our Helicopter Emergency Medical Service (HEMS)

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Background and objective: Contaminated drugs used in HEMS may influence nosocomial infections in the intensive care units (ICU) by their effect on patients who in most cases are hospitalized in the ICU. Nosocomial infections in the intensive care units increase morbidity, mortality rates and financial cost. The patient rescued by HEMS requires, in some cases, the immediate availability of emergency drugs. For this reason, some drugs are pre-diluted every morning by HEMS nurse on duty. Used syringes may be contaminated in a busy environment. Most pathogenic bacteria prefer a narrow pH range of 6.0–8.0 Furthermore, it is known that the temperature has an impact on bacterial growth rates. The aim of this study was to evaluate the contamination risks of Sodium thiopental 2.5 % solution, prepared as a sterile powder and after reconstitution with an appropriate diluent in syringes at pH = 5–7. Epinephrine 0.01 % isotonic solution at pH 3–5. Atropine Sulfate 0.01 % isotonic solution at pH 4–6. Diazepam 0.05 % isotonic solution at pH = 6–7.
Setting and method: All drugs were prepared for usage in HEMS conditions according to the protocols used in Emergency department. The storage temperature was in a range of 20–28 °C.

In accordance with the pharmacopoeial procedures, the media used were: Trypticase soy agar with 5 % sheep blood, Sabouraud dextrose agar and thioglycollate broth. All media have been incubated at different temperatures for the recovery of different microorganisms on the basis of the sterility procedures for at least 7 days
Main outcome measures: to evaluate the contamination of emergency drugs when they are pre-diluted in syringes
Results: No drug presented the development of fungi or microorganisms
Conclusions: Our data are comparable with those from other investigations. Some Authors suggest that prepared drugs might be used safely up to 24 h when drawn into sterile syringes. Others have suggested 8 h, still others 72 h. Drugs may become contaminated by microorganisms during preparation. Bacterial contamination of drugs may occur during the opening of the glass ampoules. Bacterial counts increased in time even at room temperature. These findings support the possibility of having drugs diluted in the syringe for 12 h and the importance of aseptic techniques.
Disclosure of interest: None Declared.

Hospital Pharmacy: Clinical education

HP-CE001

ACCP standards of practice for clinical pharmacists

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Background and objective: The American College of Clinical Pharmacy (ACCP), a 15,000-member international scientific and professional society of clinical pharmacists, began in 2011 a process to define the standards of practice for clinical pharmacists, including their qualifications, process for providing direct patient care, documentation of practice activities, and other qualities that define what can and should be expected of clinical pharmacists.
Setting and method: In fall 2011 ACCP's Public and Professional Relations Committee was charged to address the question, "Should organized clinical pharmacy promote a consistent, standardized process of patient care provided by clinical pharmacists that could apply to any clinical practice setting?" The committee developed a multi-part series that reviewed and analysed published clinical pharmacy processes of care and their potential application to sample patient cases. The series and several ACCP President's columns on the topic were published in ACCP's monthly newsletter throughout 2012 to inform and solicit feedback from ACCP members. An all-member survey was then conducted in summer 2012.
Main outcome measures: A consistent, standardized process of patient care that could apply to any clinical practice setting; Standards of practice for clinical pharmacists
Results: A total of 894 members representing over 13 areas of primary practice or professional setting/function completed the survey. Of those who responded to each of the items, 89.75 % indicated that they were practicing clinical pharmacy at the time of the survey and 80.52 % were involved in the education of pharmacy students in a clinical pharmacy practice setting. Over 77 % felt that organized clinical pharmacy should promote a consistent process of care. When asked which published process of care should be adopted, the most common response was "a combination of 2 or more existing processes of care" (34.69 %). The most selected processes of care were those associated with Pharmaceutical Care or Comprehensive Medication Management (21.51 % and 20.57 %, respectively). Subsequently, a keynote session and town hall meeting, both held at the 2012 ACCP Annual Meeting, were dedicated to further the discussion of the question and the survey findings. The standards were then developed based on member feedback, a white paper developed by the committee, and a commentary published by the ACCP Board of Regents on qualifications of pharmacists who provide direct patient care.
Conclusions: The ACCP Standards of Practice for Clinical Pharmacists are the only standards for clinical pharmacists that address qualifications; process of care; documentation; collaborative, team-based practice and privileging; professional development and maintenance of competence; professionalism and ethics; and research and scholarships. The standards define for the public, health professionals, and policy-makers what they can and should expect of clinical pharmacists. They are intended to serve as a reference for those designing and assessing clinical pharmacy education and training programs.
Disclosure of interest: None Declared.

Pharmacoepidemiology

PE003

Antibiotic prescribing patterns and factors related to the rational antibiotic prescribing at primary health care in Depok City, Indonesia

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Background and objective: Approximately 50 % of antibiotic prescribing is categorized as irrational according to the data from the WHO.

The aim of this study was to evaluate antibiotic prescribing patterns and factors related to the rational of antibiotic prescribing in primary health care in Depok City.
Setting and method: Primary health care.

Study design used a cross sectional method. The sample consisted of 28 physicians, 788 oral antibiotic prescriptions as prescribing pattern, 392 of it was evaluated in rationality according to local guideline issued by Ministry of Health Republic of Indonesia, and drug use report from October to December 2012.
Main outcome measures: Patient and physician profile, antibiotic profile, antibiotic rational pattern.
Results: Based on the results of analysis, the most widely prescribed antibiotic pattern based on type of antibiotic were amoxicillin (73.5 %) and cotrimoxazole (17.4 %), based on the type of disease were acute pharyngitis (40.2 %) and non-specific respiratory infection (25.4 %), based on the patient's gender was female (54.4 %), and based on the age was between 19 and 60 years (45.4 %). About 56.1 % of 392 prescriptions were found not to meet the criteria for rational antibiotic prescribing in the case of antibiotic selection (22.7 %), duration of administration (72.3 %), frequency of administration (3.2 %), duration and frequency of administration (1.8 %). Physicians who had attended training for rational drug use was 2,014 times more rational than physicians who had never attended training. Physicians with short working period (<7 years) was 3,952 times more rational in prescribing of antibiotics compared to physicians with a longer working period (>7 years).
Conclusions: Most of antibiotic were not prescribed rational. Training for rational drug use and working period of physicians were factors related to the rationality of antibiotic prescribing.
Disclosure of interest: None Declared.

Pharmacoepidemiology

PE004

Who does receive the virus post-exposure prophylaxis?

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Background and objective: Ease of access to the virus post-exposure prophylaxis (PEP) for the population who is at high risk for HIV infection is one of the French Experts Guidelines (*Ph.Morlat* et al., sept 2013) on the support of Blood and Body Fluids Exposures (BBFE).
Setting and method: It's a 3 months descriptive study. Patients answered to a questionnaire voluntarily and anonymously during pharmaceutical consultation.
Main outcome measures: Epidemiological data, BBFE circumstances, knowledge about PEP.
Results: On 103 dispensing, 70.9 % (73/103) of the patients replied to the questionnaire included 5 occupational and 68 non-occupational exposures.

Principal prescriber was Emergency Department (72.1 %; 53/73).
The major non-occupational BBFE population is: men (86.8 %; 59/68) aged 35.4 years old on average; borne in France (61.5 %;40/65); French nationality (76.1 %; 51/67). The ratio between homosexuals and heterosexuals was 1.1 (31/28).

Circumstances for non-occupational BBFE were split of condom (61.9 %; 39/63) and unprotected intercourse (38.1 %; 24/63). The majority of the patients had already done a HIV screening test (81.0 %; 47/58). They consulted less than 4 h after intercourse (20.6 %; 14/68), between 4 h and 48 h (77.9 %; 53/68) and after 2 days (1.5 %; 1/68).

Among the 19 persons who had already received the PEP, six came within 4 h.

Half of the patients were aware of the existence of PEP by surroundings (59.1 %; 36/61).
Conclusions: This study highlights that the population receiving PEP is already aware of the HIV risk and prevention practices.

Although almost half of the non-occupational BBFE occurred during heterosexuals intercourses, few women received the PEP, while there are regarded at high risk for HIV infection by the French Agency for Research on AIDS and viral hepatitis (ANRS).

The Emergency Department is more sought than Free and Anonymous Testing Concealing Centre (CDAG) because the first one remains open all night long and maybe ignorance of the CDAG existence. CDAG physicians may have more time to evaluate the risk of contamination and avoid useless PEP prescriptions.

This study allowed us to target and to strengthen some messages during our pharmacist consultation (prevention, contamination risk, early PEP treatment). Several studies are underway: definition of information chain on the PEP existence in the absence of French public national campaign, PEP prescription evaluation in accordance with the French Experts Guidelines.
Disclosure of interest: None Declared.

Research development

RD002

Stability of frozen Amphotericin B eye drop

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Background and objective: Amphotericin B ophthalmic solutions are regular administered as treatment for fungal keratitis. Until now, the stability of Amphotericin B ophthalmic solution has only been shown under refrigerated conditions and for a short period. In order to facilitate the preparation and distribution of Amphotericin B eye drop, a study was performed in order to assess its stability in the freezer (−20 °C) over 2 months and for a further use during 4 days at 4–8 °C.
Setting and method: The quantitative analysis was performed with a HPLC–UV method previously validated according to ICH guidelines. The 0,5 % (w/v) Amphotericin B eye drops were prepared from the branded product and diluted with glucose 5 % and sodium carbonate, and performed according to recommendations for aseptic preparation. The vials were then placed at −20 °C (monitored) and stored for up to 60 days, protected from light (coloured type I glass vial). Vials were analysed at 0, 7, 15, 30 days. After 30 days, the vials were also stored for the 4 following days under refrigerated conditions to mimic the use by the outpatients and then subsequently analysed each of these days. Stability of the concentration was assessed when less than 10 % difference from initial concentration was observed. Physical stability was assessed using visual inspection, osmolarity, turbidimetry and pH assay.
Results: There were no significant differences before the storage and after 7, 15 and 30 days of freezing in the concentration (0,49 w/v ± 0,048), osmolarity (331,5 ± 2,1), turbidimetry and pH (7,62 ± 0,18) of the solutions.
Conclusions: Amphotericin B eye drop can be stored for 30 days at −20 °C. After this time, these eye-drops should be stored at 4 °C and should be discarded after 3 days. The stability will also be tested after 60 days of freezing.
Disclosure of interest: None Declared.

Research development

RD003

Mind the gap: multidisciplinary team perceptions of e-health in relation to integrated care

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Is this work original?: No
Abstract submitted before to: Health Services Research and Pharmacy Practice 2014
Background and objective: Managing patients with combinations of conditions and treatments, multiple or co-morbidity and polypharmacy, is complex and logistically challenging with implications for patient safety. Health strategists believe e-health has a role to play in supporting practitioners to provide integrated care. As reliance on e-health grows, we need to understand the views and experiences of the multidisciplinary team taking equal account of social and technical factors of computer supported cooperative working (CSCW). This systematic review aimed to explore multidisciplinary team perceptions of e-health in relation to integrated care.
Setting and method: A systematic review was conducted of full articles published in English from January 2005-February 2013 matching the search terms (e-health, integrated care, perceptions) from electronic databases (AMED, Business Source Premier, CINAHL, IPA, LISTA, MEDLINE, Cochrane, EThoS, SciVerse, WoK, Zetoc). Independent reviewers conducted the reproducible search, followed by screening of titles/abstracts then full papers before critical appraisal prior to data extraction. Main inclusion criteria were perceptions of e-health reported by healthcare practitioners practicing in multidisciplinary teams. Narrative and diagrammatic synthesis exploring context and interdependencies through socio-technical systems theory was further developed by application of the CSCW framework. Ethical approval was not required for this review of the existing literature.
Results: Database searching identified 850 titles with five for review. All were predominantly interview-based qualitative studies which two supplemented with observational fieldwork, mapping, focus groups. Two studies were in multi-hospital settings while three crossed the primary-secondary care interface. Each was based in a different country focusing on a different e-health application. Context and interconnectedness of social and technical healthcare subsystems was explored while the review provides evidence (feedback) of improved communication, collaboration and coordination countered by issues around accuracy, inflexibility, security, increased workload and task complexity. Although limited by the unreliability of self-reporting and potential recruitment, response and social desirability bias, these findings provide insight into digital literacy in pharmacy practice
Conclusions: The few yet varied studies found practitioners reluctant to acclaim any e-health technology an unqualified success in supporting integrated care, with direct implications for practice and patient safety. Health research continues to focus on doctors and nurses despite the multidisciplinary of care. While political and legislative processes move toward integrated health and social care, wider access to shared electronic healthcare records and a

paperless NHS, there is a lack of research inviting the multidisciplinary team to 'mind the (social-technical) gap.'
Disclosure of interest: None Declared.

Hospital Pharmacy: Clinical education

HP-CE002

Cancer patients' medication knowledge: what about oral immunomodulatory drugs to treat multiple myeloma?

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Background and objective: Thalidomide, lenalidomide and pomalidomide are oral immunomodulatory drugs (IMiDs) prescribed in the treatment of both newly diagnosed and relapsed multiple myeloma. Hematologic toxicity (neutropenia, thrombocytopenia) and thrombotic effects are reported. The adverse effects' identification and management by the patients and their ability to report them to the physician are essential to secure oral therapy. The aim of this study is to evaluate patient's knowledge about the IMiDs' adverse effects and their management.
Setting and method: Patients with multiple myeloma treated with IMiDs were prospectively enrolled. Data regarding knowledge about IMiDs were recorded using a face-to-face standardized interview (8-item questionnaire). For each response, the degree of certainty of patients was evaluated with a 6 point-scale from 0 to 100 %. Simulation of 3 clinical situations (fever, difficulty breathing, swollen and painful limb) were proposed to the patients to assess their ability to identify potential adverse effects of IMiDs (i.e. neutropenia, pulmonary embolism, phlebitis) and their behaviour in these ambulatory situations.
Main outcome measures: Correct responses with degree of certainty.

Adequate behaviour for the 3 clinical situations.
Results: 33 patients were enrolled with a median age of 68 years [range: 54–81]. The median time from diagnosis was 76 months [range: 1–183]. 5 patients were treated with thalidomide, 23 with lenalidomide and 5 with pomalidomide. For the knowledge questionnaire, 51 % of correct answers were collected. 31 % were associated to a high degree of certainty (100 %). 8 % of incorrect answers were observed of which 4 % with a degree of certainty up to 40 %. The patients didn't know the answer for 41 % of the questions. 9 patients (27 %) knew hematologic adverse effects of IMiDs. 21 patients (64 %) recognized the clinical manifestations of developing a blood clot such as a swollen and painful limb for phlebitis or a shortness of breath for pulmonary embolism. The simulation of clinical situations showed that 48 % (n = 16), 27 % (n = 9) and 33 % (n = 11) of patients identified fever, difficulty breathing, swollen and painful limb as respectively potential neutropenia, pulmonary embolism and phlebitis. The patients had an adequate behaviour in case of occurrence of fever, difficulty breathing, swollen and painful limb for respectively 27 % (n = 9), 64 % (n = 21) and 42 % (n = 14).
Conclusions: This study demonstrates that patient's knowledge about toxicity and management of their IMID treatment has to be strengthened. It's important to improve the patient's abilities to identify the most important adverse effects for an optimal reactivity at home and a rapid resolution.
Disclosure of interest: None Declared.

POSTERS

Community Pharmacy: Pharmaceutical care

CP-PC014

Patients', physicians' and pharmacists' viewpoints on the implementation of medication reviews in the French primary care

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Background and objective: Medication review (MR) improves patient safety. Since 2009, the implementation of MR in primary care is possible in France. Nevertheless, it is not part of the current cognitive pharmacy services. The objectives of this study are to explore the views of patients, community pharmacists (CP) and general practitioners (GP) concerning MR and GP-CP collaboration.
Setting and method: 6 focus groups were conducted with 28 persons [9 patients (PT), 8 GPs and 11 CPs]. A specific topic guide was developed from a literature review on GP-CP collaboration models. Each focus group was recorded, transcribed and thematically analysed using the thematic inductive method and Nvivo software.
Results: The main PTs' expectations include the acquisition of information on medicines, of associated side effects and reasons for treatment changes. GPs expect additional information on PTs, including adherence. For CPs, it provides an opportunity to concentrate on their core business as well as to get personal satisfaction.

Participants perceived the lack of national funding, the time-consuming aspect of the process and the reorganization of the workflow in the pharmacy as barriers. Unlike PTs, GPs expressed concern about privacy and confidentiality of medical data in pharmacies, and they feared that their privileged relationship with PTs might be deteriorated. PTs perceived GPs as reluctant to accept medical recommendations from a CP. CPs criticized the lack of information sharing with GPs.

For PTs and GPs, confidence is a long-term process based on CP's interpersonal skills. Some GPs were more likely to work with former resident CPs.

Two different GP-CP relationships emerged. The first one is the equivalent of the GP—specialist relationship. The second one is the creation of patient-centred practice groups. The latter is only supported by GPs and CPs who are the most invested in local medical care networks. CPs discussed a new way to practice: a specialized and external CP who would not practice in a pharmacy and who would not dispense drugs.
Conclusions: The findings will be used to develop a Best Worst Scaling to determine PTs', GPs' and CPs' preferences on collaborative pharmacy services. Future research may help to define the CP's role in a community-based primary care team
Disclosure of interest: None Declared.

Community Pharmacy: Pharmaceutical care

CP-PC015

Main outcomes of a collaborative pharmacy practice model in nursing homes

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Background and objective: In nursing homes (NH) of the canton of Fribourg (FR, Switzerland), drug costs were observed to increase yearly by 10 % between 1998 and 2001. In order to maintain the costs and the quality of care, the health authorities of the canton have modified their law in 2002 with the obligation for each NH to benefit from a collaborative pharmacy practice model (Locca et al., 2008). The aim of the model is to contribute to the safety and efficiency of drugs (i.e. quality circles physicians-pharmacists-nurses, ongoing interprofessional education, negotiations with firms).

The objective was to analyse the evolution of key monitoring outcomes after eleven years of interprofessional collaboration (2002–2012).
Setting and method: All the NHs of the canton were included: 22 NHs (13 pharmacists, 1201 residents) in 2002, and 42 NHs (24 pharmacists, 2454 residents) in 2012.

Retrospective analysis of the evolution of the mean annual drug cost per patient (random intercepts mixed-models, 2002–2012), the mortality rate and the number of days of hospitalization per patient (2002–2012), together with the evolution of the number of falls with injuries per patient (2009–2012). Data was yearly provided by the pharmacists.
Main outcome measures: The mean annual drug cost per patient, mortality and hospitalization rates, number of falls with injuries per patient.
Results: In 2002, the mean annual drug cost was 2241 CHF per resident. It decreased significantly each year until 2012, on average by 44.70 CHF. The mortality rate decreased by 12.3 % between 2002 and 2008 (from 33.3 %, $N_{2002} = 22$ to 29.2 %, $N_{2008} = 39$), and increased slightly by 5.5 % from 2008 to 2012 (30.8 %, $N_{2012} = 42$). The hospitalization rate followed the same tendency with a decrease by 17.6 % between 2002 and 2008 (from 3.4 %, $N_{2002} = 22$ to 2.8 %, $N_{2008} = 39$) and an increase by 14.3 % until 2012 (3.2 %, $N_{2012} = 42$). The mean rate of falls with injuries decreased from 20.1 % in 2009 to 10.9 % in 2010, and then stabilized to reach 12.8 % in 2012.
Conclusions: The collaborative pharmacy practice model showed sustainable drug costs containment without affecting mortality and hospitalization. Further investigations are needed to better understand the possible relations of different variables on the evolution of these outcomes. The link between drug use and falls will form another research interest.
Disclosure of interest: None Declared.

Community Pharmacy: Pharmaceutical care

CP-PC016

Therapy management program for immunoglobulin self-infusion: patient related outcomes

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Background and objective: Self-administered subcutaneous immunoglobulin (SCIg) is a recognised alternative to intravenously infused immunoglobulin (IVIg). To educate and support patients treated by SCIg, the Community Pharmacy of the *Policlinique Médicale Universitaire* (Lausanne, Switzerland) have implemented a 3-steps interprofessional (community pharmacists, nurses, physicians) standardized program in 2012: (*i*) inclusion (patient's skills evaluation), (*ii*) education (self-infusion techniques, side effects management, etc.) and (*iii*) long-term support (follow-up interviews, "hotline" and supervised administrations). The aim is to describe the first patient related outcomes.
Setting and method: Data collection from patients' pharmaceutical records, patients' interviews (education sessions and follow-up) and patients' therapy journal.
Main outcome measures: Patients' characteristics, pharmacist's interventions (number of education sessions, number of follow-up calls, type of barriers and patients' needs), patients' feedback, medication adherence.
Results: So far (June 2014), five patients were included in the program. One left before switching to SCIg (anguished by treatment's self-management at home). Mean numbers of education sessions = 2.3 [1–4] and more than 300 self-administrations have been performed all together. Mean age = 49(± 4) years old; female 100 %. A minimum of four follow-up calls (semi-structured interviews) per year and per patient were performed by a pharmacist: mean time = 11(± 5) minutes. Follow-up by pharmacist allowed to solve technical (e.g. change pump battery (n = 2), problem with a defective syringe (n = 3)) and reimbursement issues (n = 2). Each patient claimed to be satisfied by treatment's switch; one, who could not work under IVIg, found a new job after switching to SCIg, two reported a better tolerance (mainly improvement for headaches and fatigue side effects). No administration has been missed, but occasionally they have been shifted for convenience. Two patients switched to IVIg for a short period (4–8 weeks), for practical reasons (holiday, hospitalisation). All data will be updated at the time of the poster.
Conclusions: These first results shown that the program seemed to meet patients' needs. Patients' feedbacks are positive and adherence seems excellent. Further analysis will be needed to confirm these first observations.
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Community Pharmacy: Pharmaceutical care

CP-PC017

A study comparing the effectiveness of three warning labels on the package of driving-impairing medicines

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Background and objective: Several medicines are known to potentially impair patients' driving fitness. Appropriate communication towards patients about this risk can be supported by the use of package warning labels. The objective was to compare the effectiveness of a standing practice yellow/black label -with written warning- with a newly developed rating model in communicating risk on driving-impairing medicines (DIMs). Furthermore, the added value of a side-text in the rating model was determined.
Setting and method: In a cross-sectional study in the Netherlands, patients with a first dispensing of a DIM were asked by their community pharmacists (n = 38) to fill out a written questionnaire to compare each of the three warning labels. A 2 (yellow/black label vs. rating model (pair 1) and rating model with side-text vs. rating model without side-text (pair 2)) × 3 (category of driving-impairment: I = minor risk, II = moderate risk, III = severe risk) design was used. The category of driving-impairment varied per respondent, depending on the DIM the patient collected.
Main outcome measures: (1) estimated level of driving risk valued by patients (2) intention to change driving behaviour after seeing the warning label.
Results: An estimated number of 992 patients were approached. As 298 questionnaires were analysed, the net response rate was 30 %. With the yellow/black label, respondents considered DIMs of all three categories of driving-impairment to equally impair driving fitness, while with the rating model the estimated risk was higher when the category referred to a higher level of driving-impairment. Addition of a side-text to the rating model resulted in a significantly higher estimated level of driving risk and a significant increase in intention to change driving behaviour. Only 8.0 % of the patients using a category III DIM estimated the level of driving risk correctly when seeing the yellow/black label, while this was 26.7 % for the rating model and 43.0 % for the rating model with side-text.
Conclusions: The yellow/black label, which is standing practice in the Netherlands, is less effective in terms of estimated risk and intention to change driving behaviour, compared to a newly developed rating model. This model is even more effective when a side-text is added. Implementation of the rating model in clinical practice should be considered.
Disclosure of interest: None Declared.

Community Pharmacy: Pharmaceutical care

CP-PC019

Medication regimen complexity evaluation in a hypertensive portuguese population

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Background and objective: Hypertension is the most frequent chronic disease in the elderly and affects more than a half of Portuguese old people. Despite its

benefits to control hypertension disease, polypharmacy can increase medication regimen complexity which predisposes the patients to higher risks of developing drug–drug interactions and adverse effects and it may also lead to patient's lack of compliance. Such complexity can be evaluated using the Medication Regimen Complexity Index which was recently adapted in Portugal as the Índice de Complexidade da Farmacoterapia (ICFT). This tool ponders dosage form (section A), dosage frequency (section B) and administration instructions (section C).

The principal objectives of the present work included the quantification of ICFT in a hypertensive population, identify the main contributing factors and relate the complexity of the treatment with its efficacy and safety.

Setting and method: A descriptive study was carried out in a pharmacy in Coimbra, Portugal, from January until May of 2014 and included 26 patients administered with at least one antihypertensive drug. Information considering the number and dosage forms of medications, posology and instructions regarding therapeutics were gathered. ICFT was calculated globally and for each section; using Excel®, ISFT was related to patient's age, number of drugs co-administered and arterial tension values

Main outcome measures: ICFT

Results: The hypertensive patients enrolled in the study presented a mean age of 66.3 (varying from 44–89) and a mean of 4.23 medications (varying from 2 to 8) was administered per person.

The ICTF average founded for this sample was 20.6 points (varying from 8.0 to 39.0). Section C was the major contributor (maximum of 21.0 points *versus* 9 and 10 for section A and B, respectively). ICFT increased with patient age and with the number of drugs administered. The highest values were founded in patients with normal-high blood pressure or hypertension grade 1 and 2.

Conclusions: Regarding this hypertensive population, higher ICFT values were associated to uncontrolled hypertension disease, clearly demonstrating that the complexity of the pharmacological therapy hampers the therapeutic success. The ICFT revealed to be a useful tool to identify risk patients and simplify the therapy to make it safer and more efficient.

Disclosure of interest: None Declared.

Community Pharmacy: Pharmaceutical care

CP-PC020

The use of rescue packs among patients with chronic obstructive pulmonary disease exacerbation

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Background and objective: Chronic obstructive pulmonary disease (COPD) exacerbations are episodes of symptom worsening that have both short and long-term consequences and are potential causes of hospital admission and death.[1] Promoting earlier treatment for COPD exacerbations, using a rescue pack (7 days course of antibiotics and steroids) may minimise the disease severity, National Health Services (NHS) costs and the need for hospital admission.[2] Additionally, this treatment course is recommended to be used by the National Institute for Health and Care Excellence (NICE) guidelines.[3] The aim of this study was to evaluate the acceptability and use of a rescue pack provided for COPD patients when discharged from hospital

Setting and method: A cross-sectional study design using semi-structured face-to-face interviews was conducted.

Main outcome measures: Evaluating the acceptability and use of a rescue pack provided for COPD patients based upon interviews in patients' homes.

Results: 46 COPD patients (male (N = 24), female (N = 22), mean age 77 years: range 63–100 years), using multiple inhalation devices were interviewed. Of these, 14 patients who have had an exacerbation were considered for a rescue pack including a course of antibiotics (e.g. amoxicillin 500 mg, three times a day for 5–7 days. For penicillin allergic patients, doxycycline 200 mg immediately followed by 100 mg once daily for 6 days was given) and oral steroids (i.e. Prednisolone 30 mg once daily for 7 days). The use of a rescue pack was discussed among users. The majority of users (N = 12) reported benefiting from this course of antibiotics and steroids; and 9 patients had obtained a replacement pack. This treatment was perceived to be effective and successful in relieving COPD symptoms, helping patients to breathe while sleeping and making daily activities possible. Another benefit was seen in noticing a difference in the colour of the sputum, by those who received a rescue pack.

Conclusions: This study findings support the use of a rescue pack for patients with COPD who have experienced exacerbations, as the majority of participants perceived it to be effective. Therefore, this course should be given to all patients with exacerbations and should be supported by education.

Disclosure of interest: None Declared.

Community Pharmacy: Pharmaceutical care

CP-PC021

Drug-related problems in community pharmacies: a new tool to classify pharmaceutical interventions

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Background and objective: A classification system of pharmaceutical interventions (GSASA system) was implemented in several Swiss hospitals, while in community pharmacies no standardised classification is used. To promote mutual information (seamless care), the structure of the classification system should be similar for both settings but provide different levels of details, and support medication management along the patient pathway. Our objectives were to adapt the existing GSASA system to suit the community pharmacy setting and to perform a first validation of the new tool.

Setting and method: Based on an exploratory trial using the GSASA system and protocols of medication reviews performed in community pharmacies, we developed a modified classification system. During a 6-week trial, 5th-year pharmacy students (n = 77) collected 10 discharge and ambulatory prescriptions requiring an intervention. They received training to thoroughly document each case with short description, prescription copy, and classification forms for each intervention. This allowed assessing appropriateness, interpretability, and validity. Acceptability and feasibility were tested by a 10-item questionnaire and 5-point Likert scales (1 = strongly disagree, 5 = strongly agree). To determine inter-rater reliability, the same students (n = 58) classified 3 standard cases and Fleiss-Kappa coefficients k were calculated.

Main outcome measures: Proportion of fully classified interventions, comprehensiveness of the classification, user's satisfaction, inter-rater reliability (Fleiss-Kappa coefficients)

Results: The classification system includes 5 main categories and 52 subcategories. Out of all interventions (n = 725), 39 (5.4 %) could not be fully classified. Out of 76 students, 30 (39.5 %) agreed that time expenditure to classify a drug-related problem (DRP) was appropriate (mean user agreement 3.05 ± 1.12). They reported more difficulties to find the proper classification for DRPs in the categories 'problem' (3.12 ± 1.15) and 'cause' (3.25 ± 1.18), than in the others. This is reflected by the moderate users agreement for the categories 'problem' (k = 0.53) and 'cause' (k = 0.45), while substantial agreement for the categories 'type of problem' (k = 0.70) and 'intervention' (k = 0.76) was obtained.

Conclusions: The new classification system for pharmaceutical interventions, adapted for community pharmacies, reached good inter-rater reliability (all categories with k > 0.4), high rating of acceptability and feasibility, and almost all interventions could be classified. Further refinements are needed to improve the precision of the tool and to enable final validation with practicing community pharmacists.

Disclosure of interest: None Declared.

Community Pharmacy: Pharmaceutical care

CP-PC022

Detection of medication-related problems through the analysis of pharmaceutical interventions

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Background and objective: Adverse drug events are common and often preventable; most of medication-related problems occur during prescription process.

The objective of this study was to identify improvement opportunities in medical prescriptions through the analysis of pharmaceutical interventions.

Setting and method: A 3-month prospective study at a Spanish 110-bed General Hospital: daily monitoring of prescription of patients admitted at units with system for personalised medication dispensing.

Medication-related problems (MRP) and pharmaceutical interventions (PI), as well as their degree of acceptance by prescribers, were recorded.

Results from laboratory tests were obtained from the OMEGA database. Types of medication errors were parameterized according to Group Ruiz Jarabo 2000 classification. Interactions were identified by using the Lexicom® database. Fact sheets were used to determine appropriate dosages and to identify counter-indications.

Main outcome measures: Classification of the MRP and PI; Main involved drugs and ATC groups; Rate of acceptance of the PI by the prescribers.

Results: 268 PI were carried out after reviewing 8849 prescriptions (1324 patients). The prevalence of patients with MRP was 20.2 %. Reported incidents were classified as follows: improper dose (38.1 %), drug–drug interaction (31.7 %), wrong administration frequency (10.4 %), contraindication (4.1 %), therapeutic duplication (3.4 %), inappropriate drug for the patient (2.2 %), wrong administration technique (1.9 %), wrong treatment duration (1.9 %), lack of compliance with protocols (1.5 %), lack of monitoring (1.5 %), allergy (1.1 %), omitted dose/medication (1.1 %), unnecessary drug (0.7 %),wrong preparation (0.4 %). The main involved ATC groups were: J- anti-infective (in 109 PI), N-drugs for nervous system (in 84) and M-drugs for musculo-skeletal system (in 49); common drugs implicated were: levofloxacin (in 51), dexketoprofen (in 31), citalopram/escitalopram (in 25) and enoxaparin (in 21). The most frequent pharmaceutical recommendations were dose changes because of improper doses and treatment changes because of drug–drug interactions. It was not possible to evaluate the effect of PI in 15.3 % of the MRP; the rate of acceptance was 50.7 %.

Conclusions: The best knowledge of MRP let focus safety activities on strategic points. At our hospital improper doses and drug–drug interactions were identified as the main MRP.

Disclosure of interest: None Declared.

Community Pharmacy: Pharmaceutical care

CP-PC023

The Non-dispensing Pharmacists' needs in a clinical pharmacy training program

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Background and objective: The Pharmacotherapy Optimization through Integration of a Non-dispensing pharmacist in primary care Team (POINT) study is a research project in the Netherlands for the implementation of a non-dispensing pharmacist in general practice. To support the pharmacists in their new role, a clinical pharmacy training program (CPTP) has been developed. The aim of this study is to explore the pharmacists' needs in their CPTP to enable them to practice as a clinical pharmacist in a general practice as a member of the healthcare team.

Setting and method: Within this qualitative study all ten participating non-dispensing clinical pharmacists and four involved teachers were interviewed, three months after the start of the CPTP. An additional group interview with eight potential patients was conducted to include patients' perspective. The semi-structured interviews were audio taped, transcribed verbatim and coded. The transcriptions were entered into qualitative data analysis software, NVivo V9.0 (QRS International). From the theoretical framework [Kolb, Vermunt, Merrienboer] of the course design a code list was developed from which an overall theme and subthemes were identified in the transcriptions.

Results: The translation of knowledge is identified as an essential need of the CPTP. This overall theme is achieved in the CPTP by 1) patient centered teaching instead of focusing on the medication 2) training of communication skills to obtain clinical information from the patient and to discuss and execute a pharmaceutical care plan 3) Learning to establish pragmatic pharmaceutical care, instead of following protocols and guidelines, and learning to be reflective on and responsible for this care. A safe learning environment, a community of practice and a flexible working environment is required to achieve translation of knowledge.

Conclusions: The non-dispensing pharmacists' needs have changed due to the transition from community pharmacy to general practice. The CPTP provides support and structure and stimulates translation of knowledge. Essential elements are case presentations, communication skills, clinical reasoning, improving reflective practice and peer to peer learning.

Disclosure of interest: None Declared.

Community Pharmacy: Pharmaceutical care

CP-PC024

Pharmacotherapy Optimization through Integration of Nondispensing pharmacist in a primary care Team (POINT): design of the POINT intervention study

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Background and objective: Pharmacotherapy is an essential and commonly used intervention in primary care. However medication errors occur and can result in hospital admissions.[1] One way of improving pharmacotherapy is to review patients' medication but this seems difficult to implement in primary care. Identified difficulties are lack of access to patient information for the community pharmacist and poor collaboration between the community pharmacist and general practitioner (GP).[2] The POINT-study is designed to overcome these difficulties and to study the effect of integrating a non-dispensing clinical pharmacist as a member of the primary health care team on medication safety.

Setting and method: The POINT-study is a prospective, non-randomized controlled intervention study with pre/post comparison in an integrated primary care setting. In this project we compare the main outcome measures in three different settings: 1) a non-dispensing pharmacist as an integral member of a GP practice, 2) a pharmacist in a community pharmacy with a predefined training in performing structured medication reviews, and 3) a pharmacist in a community pharmacy.

Within group 1, a non-dispensing pharmacist will be posted to each of ten GP practices (6–10.000 patients) for a period of 15 months. The non-dispensing pharmacist will perform medication review including follow-up and is responsible for the medicines management and pharmaceutical care provided in the practice. [3]

Main outcome measures: Medication-related hospital admissions and medication errors in patients with multimorbidity and polypharmacy

Results: The results of this intervention study are expected in 2016.

Conclusions: The POINT-study is a large, intervention research project to study the effect of integration of a non-dispensing pharmacist in primary care on patient safety. The study should provide evidence as to whether this integration will improve effective and safe pharmacotherapy and should be implemented in primary care.

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Disclosure of interest: None Declared.

Community Pharmacy: Pharmaceutical care

CP-PC025

Added value of the nondispensing clinical pharmacist in primary care

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Background and objective: Medication errors can result in preventable drug related hospital admissions.[1,2] Much effort has been put in medication reviews by community pharmacists to prevent medication errors by addressing drug therapy problems (DTP).[3,4] However DTP persist because these are inadequately recognised, addressed or acted upon.[5]

Our objective was to assess whether clinical medication reviews executed by a nondispensing clinical pharmacist results in a reduction of DTP in patients previously reviewed by the community pharmacist.

Setting and method: 30 Eligible patients with polypharmacy from 10 GP practices, of which the medication was reviewed by the community pharmacist in the previous year, were selected. These patients were referred to a nondispensing clinical pharmacist integrated in the primary care team, in a selected week, who carried out a clinical medication review in order to assess the patient's needs, identify DTP, design and execute a pharmaceutical care plan.

Main outcome measures: The number and nature of DTP noticed and interventions executed by the nondispensing clinical pharmacists were compared to those documented and executed by the community pharmacist.

Results: Compared to the medication review by the community pharmacist, the nondispensing clinical pharmacists identified new DTP. These problems were often categorised as "adverse drug reaction", "unnecessary drug therapy" or "needs additional drug therapy". In addition new interventions were executed by the nondispensing clinical pharmacist during the follow-up evaluation of the patient.

Conclusions: The nondispensing clinical pharmacist identified, addressed and solved DTP in patients previously reviewed by a community pharmacist. This suggests an additional value of the nondispensing clinical pharmacist to improve patient safety in primary care. The difference in number and nature of DTP identified by the nondispensing clinical pharmacists can be caused by a change of the patient, training of the nondispensing clinical pharmacist or better collaboration between the nondispensing clinical pharmacist and the general practitioner in comparison with the community pharmacist.

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Disclosure of interest: None Declared.

Community Pharmacy: Pharmaceutical care

CP-PC026

Status quo of electronically generated medication plans in German community pharmacies

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Background and objective: To evaluate the status quo of the technical capabilities and the utilisation of electronically generated printable medication plans (MPs) for patients in German community pharmacies.

Setting and method: An online survey was developed and sent to 4,253 community pharmacists. The questionnaire contained items on the digital storage of patient data, the technical capabilities to generate and print a MP for patients and its utilisation in pharmacy practice. Pharmacists were also asked to mail an example of a MP. These sent documents were analysed according to specific criteria: First criterion was whether it was actually to be considered as a plan for patients and not for health care professionals. In the next step it was analysed to which extent the document followed the specification for a standardised medication plan from the "Action Plan to promote medication safety in Germany" by the German Ministry of Health (BMG).

Results: The response rate was 22 % (n = 924). 82 % (n = 753) of the respondents saved patient-based medical data digitally. For 35 % (n = 269) of these pharmacists this also included dosages for selected patients. Whereas 48 % (n = 439) of all respondents indicated that their pharmacy software offered the technical capabilities to print a MP, 35 % (n = 319) were uncertain about this. 11 % (n = 101) of the questioned pharmacists stated to print MPs for selected ambulant patients. Pharmacists sent 142 documents as example MPs. 20 % (n = 28) of these documents were judged to be a MP for patients. Others were e.g. medication profiles, dosing instructions or blister plans. Only 4 % (n = 5) of the sent MPs were based on the BMG-specification.

Conclusions: Currently not all community pharmacies in Germany have the technical capabilities to generate and print a medication plan for patients. Furthermore, many pharmacists mistake other medication lists for MPs. Hence, it is essential to improve (i) the technical capabilities of pharmacy software systems, and (ii) the knowledge of community pharmacists in order to implement a MP for patients in daily practice and therefore promote patient safety.

Disclosure of interest: None Declared.

Community Pharmacy: Pharmaceutical care

CP-PC027

Evaluation of drug burden index in elderly patients utilized disposable insulin pen

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Background and objective: The aim of the present study was to evaluate patients' attitude and knowledge about disposable insulin pen utilization and calculate drug burden index among elderly patients at community pharmacy.

Setting and method: This cross sectional descriptive study was conducted between February and May 2014. Patients were eligible for the present study if they were 65 years old or older, prescribed at least a disposable insulin pen for at least 4 weeks, did not take any support for medication utilization and accepted to participate to the present study.

Main outcome measures: Cognitive function has been evaluated by using revised Turkish version of Mini Mental State Examination (rMMSE-T) was scored between 0 and 30; the score under 22 or less and 18 or less were labelled as cognitive impairment in educated and uneducated elderly; respectively (1). The steps for proper administration and storage were evaluated in utilization of disposable insulin pens. Drug burden index have been also calculated.

Results: A total of forty-five elderly patients (mean of age: 72.18 ± 5.77 years old; male/female: 27/18) utilized disposable insulin pen were included in this study. Of them, 40 % had cognitive impairment according to rMMSE-T scores. The DBI scores were between 0 and 1 in twenty-eight patients and were more than one in three patients. Most of them were failure to hold needle adequate period before withdrawal of pen needle from skin (80.0 %), failure to prime needle (60.0 %), failure to store in-use pen at room temperature (53.3 %), and failure discard the insulin pen before expire date reported by manufacturer (44.4 %). When evaluated discard pen needle after each injection, 84.4 % of them stored their disposable insulin pen with needle.

Conclusions: Although the small sample size is a limitation of the present study, it was concluded that patients' cognitive function and drug burden index should be considered when selected disposable insulin pen for elderly and pharmacist would take a role in education and monitoring of disposable insulin pen among elderly patients.

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Disclosure of interest: None Declared.

Community Pharmacy: Pharmaceutical care

CP-PC028

Does a new guideline influence the prescribing of antibiotics by physicians in Denmark?

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Background and objective: In a new guideline, November 2012, The Danish National Board of Health tightened up the rules of antibiotic prescription. The study objective was to elucidate whether the prescriptions of antibiotics in Region Zealand follow the new guideline and are evidence-based.
Setting and method: Collection of 600 prescriptions of antibiotics at Køge Torvets Pharmacy during March 2014. Evaluation of the prescription adherence to the Danish "*Guidelines on the Prescribing Antibiotics"* based on the information present on the prescriptions and the use of narrow- or broad-spectrum antibiotics. Information extracted from the prescriptions was: Drug, diagnosis, dose, treatment duration, age of patient and gender in order to evaluate whether the correct antibiotic treatment was prescribed. For each prescription, it was investigated in the pharmacy database whether the patient within the past month had redeemed other prescriptions of antibiotics in order to know whether the most narrow-spectrum antibiotics were ordered as the initial treatment according to the guideline. Regional and national treatment guidelines were used to evaluate the evidence of the treatment.
Main outcome measures: Distribution of prescribed narrow- and broad-spectrum antibiotics, respectively, with specific focuses on carbapenemes, fluoroquinolones, cephalosporins (critical antibiotics) and macrolides. Indication of adherence with the new guideline for antibiotic prescription.
Results: Narrow- and broad-spectrum antibiotics accounted for 48 % and 41 % and macrolides for 11 % of the prescriptions, respectively. Consumption of the critical antibiotics was negligible. These data were comparable with the total consumption of antibiotics in the primary health care in Denmark 2012. However, the proportion of the critical antibiotics in the present study seemed lower compared to the total consumption in Denmark 2012.

Specific diagnoses were stated in 60 % and treatment durations in 23 % of the prescriptions. Narrow-spectrum antibiotics were prescribed before broad-spectrum antibiotics for 5 % of the patients. 56 % of the prescriptions containing specific diagnoses were evidence based. However, for Macrolides this was only 28 %.
Conclusions: Overall, the results indicated that prescription of antibiotics on the studied items did not adhere with the "*Guidelines on the prescribing antibiotics"* a year after publication. However, in this study the prescription of critical antibiotics seemed lower compared to Denmark 2012.
Disclosure of interest: None Declared.

Community Pharmacy: Pharmaceutical care

CP-PC029

Risk factors of negative clinical outcomes identified through medication review in elderly patients

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Background and objective: In a classical 'findings and recommendations' medication review scheme, 'findings' could be identified as the risk factors of medication negative clinical outcomes. The aim of this study is to identify risk factors associated to medication negative clinical outcomes, detected by means of medications reviews carried out to aged patients in a community pharmacy.
Setting and method: Patients visiting a community pharmacy in Central Portugal and eligible for medication review following the United Kingdom National Health Service criteria were invited to participate. Medication review was performed between Jan-Dec 2012. Data collection was conducted first through a structured questionnaire given to the patient, which allowed to depict the socio-demographic characteristics, self-related medical history, and established therapeutic regime. Then, an interview with the pharmacist allowed patients to ask questions about their medication and their conditions, as well as the complaints related to their therapy.
Main outcome measures: Risk factors that can lead to medication negative clinical outcomes
Results: The study population included 43 aged patients with an average age of 78.4 (SD = 6.1) years old and an average of 10.2 (SD = 3.7) medicines used per person. All the patients presented at least one 'finding' with a total of 603 findings identified. The most prevalent finding was 'drug interactions' (58.2 %), followed by 'inappropriate dosing' (9.1 %), 'adverse reactions' (7.0 %) and 'potentially inappropriate medications' identified according to the Beers Criteria (6.6 %). A total of 638 'recommendations' were suggested by the pharmacist, as a consequence of the medication reviews developed. Among them, 186 occurred during the interview, being the most prevalent recommendation the 'promotion to medication adherence'. Considering the 452 recommendations addressed to the physicians, the most prevalent were: 'drug monitoring required', 'patient education', and 'need for therapy revision'.
Conclusions: The medication review allowed the identification of situations that constitute risk factors for negative clinical outcomes in the use of medicines, in an elderly population, and may be used as an important tool for optimizing drug therapy.
Disclosure of interest: None Declared.

Community Pharmacy: Pharmaceutical care

CP-PC030

Point-of-care testing for *Streptococcus pyogenes* in community pharmacies

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Background and objective: *Streptococcus pyogenes* is a Gram-positive extracellular bacterial pathogen that causes pharyngitis. Point-of-care *Streptococcus pyogenes* testing allows a fast test result to be produced and used to make an instant, evidence-based clinical decision.[1] The objectives of this study were to determine Strep A Rapid Test Kit sensitivity and specificity characteristics, to determine patient acceptability of a pharmacist run service and to evaluate pharmacists' perception of such a service.
Setting and method: The rapid tests were carried out in a health centre, a community pharmacy, and a paediatric clinic. Forty subjects who showed symptoms of sore throat and fever were tested. The first throat swab was tested with the GIMA 24523 Strep A rapid test kit whilst the second throat swab was sent to the hospital laboratory. Questionnaires were disseminated to the forty patients who had undergone the tests and to fifty community pharmacists in order to get their perspective.
Main outcome measures: Point-of-care test specificity and sensitivity, patient and pharmacist perception.
Results: Out of 40 patients only 3 tested positive with both tests. 5 tested negative with the rapid test and positive with the culture, hence the sensitivity of the test is of 0.4 whilst the specificity is 1. All of the patients said they would undergo the test again if necessary. 21 said so since they did not want to take unnecessary antibiotics whilst 9 others said that they wanted to know the cause of infection. Out of the 50 pharmacists that answered the questionnaire, 40 pharmacists said that they would be willing to perform the test but only 24 said they would stock it. 4 thought that it is too expensive, 11 said that the shelf-life is too short (shelf-life is of 1 year and a half) whilst 8 thought it is both too expensive and has a short shelf-life. When asked if they would be ready to

carry out the test, 10 out of the 50 pharmacists said they would not have time to perform the test. When asked if this test should be available in a pharmacy, 7 said no since it should be performed in the doctor's clinic.
Conclusions: GIMA 24523 is not sensitive enough since it gave 5 false negatives and thus could lead to under treatment. A second culture test is required to confirm the result since the rapid test is not reliable. Pharmacists would be willing to perform the test but found it too expensive and too time consuming. They complained of the short shelf-life and the lack of a protocol that allowed pharmacists' prescribing of antibiotics if the test gave a positive result.
Disclosure of interest: None Declared.

Community Pharmacy: Pharmaceutical care

CP-PC031

Evaluation of drug burden index in elderly patients utilized inhaler

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Background and objective: The aim of the present study was to evaluate patients' inhalation skills and calculate drug burden index (DBI) among elderly patients utilized metered-dose inhalers, discuses, turbuhalers and aerolizers at community pharmacy.
Setting and method: This cross sectional descriptive study was conducted between February and May 2014. Patients were eligible for the present study if they were 65 years old or older, used at least one inhaler device, did not take any support for medication utilization and provided their consent. Patient demographic, clinical and medication data were recorded with face-to-face interview.
Main outcome measures: Cognitive function has been evaluated by using revised Turkish version of Mini Mental State Examination (rMMSE-T) was scored between 0 and 30 (1). Patients' inhaler use attitudes were evaluated essential steps during inhaler use for each inhaler device. Drug burden index has been also calculated.
Results: A total of thirty-seven elderly patients (mean of age: 71.65 ± 5.47 years old; male/female: 20/17) utilized aerolizer (70.27 %), metered dose inhaler (54.05 %), discus (21.62 %), and turbuhaler (10.81 %) were included in this study. The number of inhaler utilized by elderly patients was one (48.60 %), two (45.90 %) and three (5.40 %). The mean of rMMSE-T score was calculated as 23.62 ± 4.08. Twenty seven elderly patients utilized five or more medications. Among twenty five elderly patients who utilized anticholinergic and sedative medications; DBI index was calculated equal and less than one in twenty two and more than one in three patients. When evaluating patients' steps while using their inhaler; only five patients could correctly follow all steps during inhaler utilization. Most of patients were failure to hold their breath for ten second after inspiration and wait a few seconds before next dose.
Conclusions: Although present study had a little sample size; our results presented the importance of evaluation drug burden index and cognitive function in elderly patients, who used inhalers which required special skills and had polypharmacy.

1. Keskinoglu P, Ucku R, Yener G, Yaka E, Kurt P, Tunca Z. Reliability and validity of revised Turkish version of Mini Mental State Examination (rMMSE-T) in community-dwelling educated and uneducated elderly. Int J Geriatr Psychiatry. 2009;24(11):1242–50.

Disclosure of interest: None Declared.

Community Pharmacy: Pharmaceutical care

CP-PC032

Patients' reasons for acceptance of a free inhaler service

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Background and objective: Provision of cognitive services in community pharmacies has been considered a cornerstone in the development of pharmacy practice and pharmaceutical care for decades. Challenges in recruiting patients for cognitive services have however been observed thereby hampering a development in this area. In Denmark, a pharmacy based inhaler service has existed since 2005. The service is publicly reimbursed and free of charge. Recruitment challenges of especially experienced inhaler users have however been recognised. In order to improve the uptake of the service we conducted a study to explore patients' reasons for accepting the inhaler service.
Setting and method: Seven community pharmacies from different parts of Copenhagen (depending on general socio-economic level) recruited patients who had recently received the inhaler service for the study. In total 15 patients were recruited of which the majority were experienced users. Semi-structured qualitative interviews were conducted and meaning condensation used as the analytic approach. The interviewguide was formed on basis of earlier studies regarding communication around the inhaler service and other literature in the field.
Main outcome measures: Reasons for accepting the service including perceived need.
Results: Despite none of the participants expressed a need for an inhaler service, the absolute majority had accepted it. Many patients did not perceive to have a need as they had never reflected about the inhalation technique at all i.e. if there were different ways of inhaling including inhaling more or less appropriately. Inhaling thereby became something you did without thinking about it.

The reasons for acceptance were: you can never get too much information about health issues, acceptance because the participants thought they contributed to a survey or aspects related to the staff. Most interviewees found considerably differences between staff members both in their clinical knowledge and with regard to their perceived interest in helping the patient. Hence, many patients accepted the service because they had experienced that the individual employee had showed a special enthusiasm and interest in the patient receiving the inhaler service.
Conclusions: Patients felt little need for an inhaler service however was persuaded to accept it. Staffs' true interest in helping patients was felt strongly by many patients and in some cases directly influenced whether participants accepted the service or not.
Disclosure of interest: None Declared.

Community Pharmacy: Pharmaceutical care

CP-PC033

Patients' preferences as to the solid forms of oral medications—results of the discrete choice experiment in Polish outpatients

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Background and objective: Non-adherence with drug treatment is widespread. Personal beliefs and related preferences play an important role in the patients' decision process whether to adhere to the treatment, or not. The purpose of this study was to assess the Polish outpatients preferences as to the solid forms of oral medications to be used in different treatment scenarios.
Setting and method: This was a discrete choice experiment (DCE) based study in primary care patients. Patients enrolled in the study were provided with a selection of both tablets and capsules, in different shapes, sizes, and colours, and co-payment levels.,
Main outcome measures: Participants were asked to assess drugs' properties according to their preferences, for either chronic (e.g. for hypertension treatment), or short-term use (e.g. short-term antibiotic treatment).
Results: The convenience sample of 200 outpatients took part in this study. Preliminary analysis of data revealed that patients are happy to pay some out-of-pocket money to obtain their drugs for both short-term, and chronic use in a form that corresponds with their preferences. Detailed results of the DCE analysis will be provided at the ESPACOMP meeting.
Conclusions: Results suggest that colour, shape and size of solid form of oral medications are important predictors of patients' acceptance. Not only they can be expressed in monetary value, but also may serve as an important hint for those designing new drugs, in order to assure best possible adherence. In

Poland, patients are free to take their own choices when being dispensed drugs from community pharmacies, due to the law that enables generic substitution. Thus, their preferences may serve for the basis of pharmacy-based interventions, aiming to improve adherence at the individual level. However, our findings are probably country/culture specific, and further research is necessary to better understand the relationship between solid drug properties, and patient preferences across the countries.
Disclosure of interest: None Declared.

Community Pharmacy: Pharmaceutical care

CP-PC034

Psychometric properties of the hypertension health status inventory 18 clinical scale for measuring quality of life in portuguese hypertensive patients

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Background and objective: The systolic blood pressure (SBP) values to be achieved by antihypertensive therapy in order to maximize reduction of cardiovascular outcomes are unknown. Because of the uncertainty whether´the lower or the better' Health Related Quality of Life (HRQoL) is an important health outcome measure in hypertension. The aim of this study was to assess the psychometric properties of the Portuguese version of HYPHSI_18 Clinical Scale, a disease-specific questionnaire for hypertensive patients performed in a community pharmacy.
Setting and method: HYPHSI and SF-36 were administered to 1876 adult hypertensive patients. We performed an observational, cross-sectional study, in hypertensive patients followed in community pharmacies. Patients were selected at the pharmacy when they bought an antihypertensive drug or measure blood pressure. Portuguese version was administered together with a socio-demographic questionnaire, and another for the duration of symptoms related to antihypertensive therapy.
Main outcome measures: Hypothesized scale structure, internal consistency (Cronbach's α), and test–retest reliability, as well as various types of construct validity were evaluated
Results: Scale structure of HYPHSI was confirmed, with good item convergence and discrimination rates. Cronbach'sα was 0.877 for all and test–retest reliability was significantly high. The strength of Spearman's correlations between HYPHSI and SF-36 scales ranged from 0.25 to 0.75 ($P < 0.01$). Multiple stepwise linear regression analysis revealed that HYPHSI dimensions were important predictors of SF-36 scales. Known-groups comparisons yielded consistent support of the instruments' construct validity and significant relationships were identified. A number of maximally congruent items were chosen to represent the HYPHSI_18.
Conclusions: A patient is not, or at least should not be, a passive subject, but the active participant of the process of hypertension treatment. This naturally imposes covering patients with hypertension with a holistic model of care. Assessment of health-related quality of life (HRQoL) is one component of this model. Overall, the psychometric properties of the Portuguese version of HYPHSI_18 Clinical Scale, resulting from this first time administration of the instrument to Portuguese adult hypertenses, confirmed it as a reliable and valid questionnaire for assessing hypertension-specific HRQoL in Portugal. This smaller scale for clinical use can be administered to patients from personal interviews, to computer-based and paper-and-pencil delivery. This instrument can be very useful to improve the pharmacist competence in Portugal.
Disclosure of interest: None Declared.

Community Pharmacy: Pharmaceutical care

CP-PC035

Skill mix between non-dispensing clinical pharmacists and physicians working in general practice

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Background and objective: The aim of the study is to develop the role of the non-dispensing clinical pharmacist in primary care.
Setting and method: We selected ten community pharmacists who undergo a clinical pharmacy training program in providing pharmaceutical care to patients. In addition to training in communication skills, clinical pharmacy and quality management we teach the pharmacists to reflect upon their collaboration with general practitioners (GPs), in particular upon skill mix (?). The pharmacists counted the number of patient consultations and the number of meetings with GPs. In addition they made notes of observation of their daily work. The research team analysed the data and presented the results to the pharmacists for member check and to attune the further data collection.
Main outcome measures: Reflection about the role of the nondispensing clinical pharmacist, in particular reflection about 1) (in)dependence of the GP and 2) the importance of the competencies as a scholar, communicator, manager, collaborator and professional [1]. We distinguish three different roles for pharmacists: specialized role, extended role and advanced role.
Results: The pharmacists perceive direct patient care as their main task which means that their first responsibility is to the patient and they are committed to meet the patient's medication related needs Other roles like quality management, communication with other care providers, screening and education to providers and patients are seen as less important to the new role as nondispensing clinical pharmacist. Second, they aim to work as an independent practitioner. The pharmacists' reflection about skill mix contributes to the development of an advanced and independent role.
Conclusions: Reflection contributes to the development of a new advanced and independent role rather than extended or specialized role for nondispensing clinical pharmacists.

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Disclosure of interest: None Declared.

Community Pharmacy: Pharmaceutical care

CP-PC036

Evaluation of drug burden index and medication utilization in geriatric patients at community pharmacy

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Background and objective: The aim of the present study was to evaluate medication utilization including determination of polypharmacy and patients' knowledge about medication, assessment of physical risk in medication utilization and evaluation of drug burden index among geriatric patients.
Setting and method: This study was conducted in community pharmacy located in Canakkale, Turkey between July and August 2012. Patients were eligible for the present study if they were 65 years old or older, used at least one medication at least four weeks, they did not take any support for medication utilization, and accepted to participate the present after get required information regarding the aim and method of the study.
Main outcome measures: Patients' demographic data and clinical data were collected. Medication utilization physical risk assessment has been evaluated by using sub-scale developed by Lubinga et al. (1). Patients' medication knowledge and drug burden index have been also evaluated.
Results: Of the 100 geriatric patients, 52.5 % were 65–74 years old and 52 % of them were females. Of them, 84 % were exposed to polypharmacy and 4 % of patients were exposed to hyperpolypharmacy. DBI score has been calculated in a total of seventy-five patients. The DBI scores were between 0 and 1 in sixty-six patients and were more than one in 9 patients. Of them, 52 % had low medication knowledge. When evaluated patients' dexterity on usage of dosage form, most of the patients experienced no difficulties during medication utilization. However; only 43 % of patients showed fine manipulation skills.

Conclusions: It is important to detect and prevent medication related problems in geriatric patients at community pharmacy setting. This will be beneficial to enhance the medication adherence in elderly patients.

1. Lubinga SJ, Millar I, Babigumira JB. Pilot evaluation of the psychometric properties of a self-medication Risk Assessment Tool among elderly patients in a community setting. BMC Res Notes. 2011; 4:398.

Disclosure of interest: None Declared.

Community Pharmacy: Pharmaceutical care

CP-PC037

The role of pharmacist in detecting angiotensin converting enzyme inhibitors induced dry cough at community pharmacy setting

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Background and objective: The aim of this study is to determine role of pharmacist in detecting angiotensin converting enzyme (ACE) inhibitors induced dry cough at community pharmacy setting.
Setting and method: The study was conducted between January 01 and June 30, 2013 at a community pharmacy located in Istanbul. The patients were eligible for the present study if they were 18 years and older, came to community pharmacy for any reason, used ACE inhibitors at least four weeks, accepted to participate after information regarding aim and method of the study. The demographic and clinical data of the patients were collected. The knowledge and attitude about ACE inhibitors were assessed at baseline
Main outcome measures: If the patients had a dry cough complaint, the pharmacists referred these patients to physicians for further diagnosis and treatment. The changes after all patients who had a dry cough, referring to the physicians by the pharmacist, were questioned after a month by telephone call. 'Leicester Cough Questionnaire (LCQ)' was applied to patients who had dry cough to assess the effect of ACE inhibitors induced dry cough on patients' quality of life (1). The LCQ was scored from 3 to 21.
Results: Among 70 patients used ACE inhibitors, 56 % of patients were female and the mean age of the patients was 58.5 ± 10.72. Among 70 patients, 84 % of them did not know the possible adverse drug reaction related to use of ACE inhibitors. In 26 patients out of a total of 70 patients had dry cough complaint while using ACE inhibitors. It is found that 81 % of patients who had dry cough did not know that dry cough could be related to ACE inhibitors utilization. The mean total score of LCQ was calculated as 14.40 (12.00–15.85) in these patients. When evaluating attitude of patients towards dry cough, %85 of them had previously used different medications to eliminate their dry cough complaint. In 42 % of them who had dry cough complaint during the therapy with ACE inhibitors and visited the physician after pharmacist consultation, their physician substituted the ACE inhibitors with other agents. However, only 54 % of them reported that their dry cough complaint has been relieved after medication modification by their physician.
Conclusions: Pharmacists may take more professional responsibility in patients under treatment of ACE inhibitors to eliminate medication related problems, which could be resulted in improvement in patients' quality of life.

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Disclosure of interest: None Declared.

Community Pharmacy: Pharmaceutical care

CP-PC038

Risks involved in diminished patient access to medication

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Background and objective: Availability, accessibility and affordability have an impact on the ability of the patient to obtain essential medication[1]. Locally, access to medications depends on two independent markets—public and private.

The objectives were to analyse Maltese patients' access to medicines including the insights of health care professionals, particularly with reference to free medicines entitlement schemes, to propose innovative ideas to improve the local scenario.
Setting and method: A total of 200 questionnaires were distributed to the general public attending the outpatients' clinic at Mater Dei Hospital via a randomized sampling technique. This was done in order to gain insight on their perception on the current systems in place, which were then statistically analysed using a Chi square test.

Two focus group meetings were held with individuals whose expertise involves the procurement, supply and financial management of pharmaceuticals.[UOM1] This exercise was carried out with the aim of gathering a broad spectrum of information from expertise of a different background targeting several issues with respect to the topic in question.
Main outcome measures: Knowledge from experts and the general public regarding access to medicines.
Results: Out of a total of 133 respondents, 83 were female and 50 were male with the 41–50 year old age group being the most populated. Patients benefiting from free medications amount to 53.4 % of the study population and the most commonly used drugs belong to the cardiovascular classification. 48.9 % of the patients were not familiar with generic medications.
Conclusions: Evidently, a low availability of generics, geographical location, price, a small volume throughput and deficiencies in the medicine supply chain were identified as the main barriers to access of medications in Malta. Addressing the situation requires an approach that would encompass both the state and the private sectors working in concert, along with an efficient and a more transparent manner of incorporating novel and innovative therapies into state pharmaceutical formulary would lead to an improved local scenario. Educating and encouraging the use of generic medicines amongst the community is vital so as to support increasing access whilst decreasing the burden on the state system.
Disclosure of interest: None Declared.

Community Pharmacy: Pharmaceutical care

CP-PC039

Improving pharmaceutical care by implementation of a clinical pharmacist in Dutch primary healthcare: a Q-study on the debate

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Background and objective: Besides health benefits medicines can also lead to (severe) side effects, which can even lead to hospitalization. Pharmaceutical care may prevent some of these hospitalizations. In the Netherlands community pharmacists typically combine their role of pharmaceutical care with dispensing, leaving little time for medicines management. A new function in Dutch primary care, a non-dispensing clinical pharmacist, is now being evaluated in ten general practices. A major debate has erupted on this new role for a pharmacist. The aim of this study is to map the debate about improving pharmaceutical care by implementing a clinical pharmacist in Dutch primary care by using a q-study design.
Setting and method: A q-study is a qualitative and quantitative method to assess opinions and believes of participants. In the qualitative part of a q-study participants are asked to rank a subset of predefined statements. In the quantitative part different and shared mindsets can be identified using person factor analysis.

An important part of the q-study is to develop a set of predefined statements. These were developed from extensive searches in scientific and professional literature and in the media. In addition, six semi-structured interviews with healthcare professionals were done. Based on these findings, 36 statements were developed. These statements were divided in six categories: job responsibilities, consequences for drug dispensing, cooperation with other

healthcare professionals, knowledge, financial incentives and pharmaceutical care. These statements will be used in the q-study.
Main outcome measures: A subset of statements that map the debate about improving first line pharmaceutical care by implementation of a clinical pharmacist.
Results: Results will be presented on the qualitative and quantitative parts of the q-study.
Conclusions: The results of the q study can clarify different and shared mindsets on the value and positioning of the Dutch clinical pharmacist. These findings can help to improve the evaluation and implementation of this new healthcare role in GP practices in the Netherlands.
Disclosure of interest: None Declared.

Community Pharmacy: Pharmaceutical care

CP-PC040

Interactions identifying—retrospective analysis on hypolipidemics

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Background and objective: Lots of patients using hypolipidemics suffer from other, usually chronic disease. Polymorbidity is usually associated with polypharmacy and with the higher risk of interaction and adverse reactions. The aim of this study was retrospective evaluation of potential drug interactions in patients using hypolipidemics concurrently with other drugs by the community pharmacist.
Setting and method: Community pharmacy, retrospective analysis of prescriptions in 2012 and 2013 in one community pharmacy in Slovakia, located in policlinic.

Methods were based on retrospective analysis of patientś prescriptions in a community pharmacy. Only potential interactions were evaluated. Inclusion criteria were: 1. at least one medicine dispensed in 2012 or 2013; 2. every patient should have prescribed one hypolipidemic agent; 3. at least 2 different medicines should have dispensed; 4. there was no age limit defined. Based on above, we analysed 200 patients. Every patientś pharmacotherapy was analysed on potential interactions, out of OTC. Interactions were evaluated and categorised according to Slovak professional literature: Magulova L, et al.: Interactions in clinical practice, 2004 and Czech monograph: Suchopar J: Compendium of drug interactions, 2012.
Main outcome measures: Relevance of documentation, number, severity and type of potential interactions detected in retrospective analysis.
Results: Two hundred patients (98 females, 102 males, mean age 61.5 ± 8.3) used in average 4.6 ± 2.07 medicines; 186 patients used 1 hypolipidemics, 14 patients used combination of 2 hypolipidemic agents; Identified were 117 interactions (average 0.585 ± 0.98 per patient). Interactions of hypolipidemics were 22 (9.9 % of all identified potential interactions): 11 (50 %) interactions were classified as clinical not important, 4 (18.2 %) interactions were minor important, 3 (13.6 %) interactions were clinical medium important, 3 (13.6 %) interactions were clinical important and 1(4.6 %) interaction was clinical very important. Clinical and clinical very important interactions identified were simvastatin-fluconazole, simvastatin-verapamil and atorvastatin-clarithromycin, clinical medium important potential interaction identified was simvastatin-warfarin.

The most potential drug–drug interactions were identified with statins (22); no potential interactions were identified with fibrates.
Conclusions: Potential interactions of hypolipidemic agents were analysed, most of them were not clinical severe. The important role of the community pharmacists is to detect and solve as potential as manifested interaction prospective, not only retrospective, to avoid clinical severe and important interaction potential ending in health damage.
Disclosure of interest: None Declared.

Community Pharmacy: Pharmaceutical care

CP-PC041

Assessing the impact of banner as educational media on self-medication with antibiotic in Indonesian community pharmacies

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Background and objective: Antibiotic purchase without prescription from community pharmacies are common in Indonesia. Pharmacy staff attitude and behaviour can be a substantially factor impacting self-medication with antibiotic practice in community pharmacies. The objection of this study was to assess the impact of antibiotic educational banner on sell-medication with antibiotic practice in community pharmacies.
Setting and method: Community pharmacies in Depok City, Indonesia. This study was experimental multicentre, one group pre-test post-test design. Pseudo-patient method was used to establish the kind of professional service provided in case of patient's explicit demand to buy an antibiotic for treatment of self-diagnosed upper respiratory tract infection without complication. A young women posed as simulated patient and visited 79 community pharmacies, randomly selected from 212 pharmacies. She visited twice, before and after one month intervention, Intervention was educational on antibiotic media banner which was set in each pharmacy under the government permitted.
Main outcome measures: Antibiotic sell-medication rate, antibiotic profile, quality of information
Results: Antibiotics requested without prescription were sold in 68 of 79 (86 %) pharmacies before intervention and decreased to 81 % after intervention. Amoxicillin was the most self-medication with antibiotic before and after intervention. Cefadroxil, cefixim, ciprofloxacin, thiamphenicol and levofloxacin were other antibiotics which were sold without prescription before intervention. After intervention, thiamphenicol and levofloxacin were not anymore sold. The quality of information on antibiotic which were given by pharmacies staff were improved after intervention.
Conclusions: Information provided in banner could not improve self-medication with antibiotic practice in community pharmacies in Depok City. Although quality of information which were given by pharmacy staff increased there is still not influence the risk practice.
Disclosure of interest: None Declared.

Community Pharmacy: Pharmaceutical care

CP-PC042

Determination of drug related problem and drug burden index in elderly patients

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Background and objective: The aim of the present study was to determine medication related problems and drug burden index in elderly patients at community pharmacy.
Setting and method: This cross-sectional descriptive study was conducted between February and May 2014. Patients were eligible for the present study if they were 65 years old or older; they did not take any support for medication utilization, and accepted to participate study.
Main outcome measures: Potentially inappropriate medications were defined as updated 2012 Beer's Criteria. Cognitive function has been evaluated by using revised Turkish version of Mini Mental State Examination (rMMSE-T) was scored between 0 and 30 (1). Drug burden index have been also calculated.
Results: Among 123 elderly patients, 43.1 % of them were female and the mean age of the patients was 71.50 ± 6.71. The most of the patients were married (74.0 %) and had a low education level. The mean of total medication utilized in patients was 5.20 ± 1.53 and eighty patients used five and more medication. The mean of rMMSE-T score was 23.56 ± 4.44. 56.91 % (n = 123) of the patients were prescribed with potentially inappropriate medications. The frequency of DBI exposure was high (76.5 %) in elderly patients. The DBI scores were between 0 and 1 in eighty-one patient and more than one in 13 patients.
Conclusions: As a conclusion, it was found higher rate of drug burden index and polypharmacy in elderly patients in the present study. Pharmaceutical care conducted in community pharmacy would be beneficial in preventing and determining of medication related problems.

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Disclosure of interest: None Declared.

Community Pharmacy: Pharmaceutical care

CP-PC043

Point-of-care testing for urine analysis and microalbuminuria for diabetic patient management

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Background and objective: Microalbuminuria is defined as the urinary albumin excretion (UAE) rate of 30–300 μg mg^{-1} if the concentration of albumin is measured in an albumin to creatinine ratio (ACR) [1]. The objective was to implement point-of-care testing (POCT) in the community pharmacy setting for the urine analysis of microalbuminuria and study the practicality of the service.
Setting and method: Three community pharmacies were used to randomly recruit 25 type 1 or 2 diabetic adult patients who provided a urine sample which was analysed using the Clinitek Status® Analyzer to yield results for the presence of microalbuminuria and glucose levels. Patients underwent a finger prick test to determine blood glucose levels using the Bionime® GM550. Patients who tested positive for microalbuminuria in the urine test underwent HbA1c testing using the DCA 2000 + ® Analyzer. A patient characteristics form containing questions relating to patient demographic information and current drug therapy was completed. The patients were also asked questions relating to the quality and usefulness of the service offered.
Main outcome measures: Practicality of microalbuminuria testing in community pharmacies and patient perception of this service.
Results: Out of the 25 patients tested (13 male, 12 female, mean age 62.2 years), it was found that 6 had microalbuminuria. Of these, four patients had HbA1c levels in the abnormal range. Mean duration that the patients suffered from diabetes was 7 years, 11 patients suffered from hypertension and 24 were type 2 diabetics. The most common drug class taken were oral hypoglycaemics followed by ACE inhibitors. Testing in pharmacies was deemed useful by 23 patients, with easy accessibility the most common reason. Twenty two patients would use the service with the average fee cited being between €4.00 and €6.00 for the strip test only, which takes around 5 min to complete after a urine sample has been provided.
Conclusions: The cost per strip needed to conduct the test is €1.60 which is within the range patients expect to pay. The initial acquisition of the microalbuminuria device is hard to recover but the cost for the service to cover the consumables and time taken can be covered from the charge to the patient.

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Community Pharmacy: Pharmaceutical care

CP-PC044

Application for a nondispensing clinical pharmacist in general practice

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Background and objective: The Pharmacotherapy Optimization through Integration of a Nondispensing pharmacist in primary care Team (POINT) study requires ten qualified pharmacists to work as a nondispensing clinical pharmacist in a general practice to improve the management of drug-related needs of the individual patient. To give shape to this extremely challenging new role we need the most suitable candidates. Our objective is to describe the suitability of our application procedure and to develop a selection procedure that could be useful for others to select the appropriate pharmacists for a clinical pharmacy education or clinical pharmacy position.
Setting and method: A three-phase structured application procedure was developed, consisting of 1. Application letter rating, 2. First-round panel interview, combined with a short medication review based on a patient case and two role plays, 3. Second-round interview. Key considerations formulated in advance by the research team are a reliable, public accountable, feasible procedure and key competencies are vision, affinity with patient care and communication/collaboration skills.
Main outcome measures: Total score and score on competencies of application letter review and first-round interview.
Results: 75 applications letter ratings, 30 first-round interviews and 13 s-round interviews were conducted. Ten pharmacists were contracted. Total mean scores of application letter review and first-round interview were significantly higher among applicants who moved on to the subsequent phase of the procedure compared to the rejected applicants. The past work experiences of the contracted pharmacists ranged between <1 and 10 years. Contracted pharmacists mean scores on vision, empathy, communication, critical reflection and feedback skills were higher compared to the rejected applicants.
Conclusions: The contracted nondispensing clinical pharmacists had a variety in experience but all demonstrated the vision and key competencies appropriate to the project. The showed balance between the structured use of different methods and the feasibility of the procedure may be helpful as a tool for others who want to set up an application procedure for a new professional role.
Disclosure of interest: None Declared.

Community Pharmacy: Pharmaceutical care

CP-PC045

Perception of pharmacists and patients of the Pharmacist-of-Your-Choice Scheme in Community Pharmacies

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Background and objective: The Pharmacy of Your Choice (POYC) scheme was implemented as a pilot project in December 2007. Through this system patients are able to collect free medicines from their preferred pharmacy rather than the earlier system where distribution of medicines took place from designated public regional pharmacies The objectives of this study were to evaluate pharmacists' and patients' perception about the POYC scheme, to investigate the problems encountered, to assess the systems adopted by pharmacies registered and to propose improvements with regards to the POYC system.
Setting and method: The study was carried out in 25 community pharmacies around Malta and Gozo. It was done as follows. First, two structured interviews, one for the pharmacists and the other for the patients, were designed, developed and validated. The pharmacists' interviews were conducted to 25 pharmacists all from different pharmacies. The patients' interviews were carried out to 5 registered patients from each pharmacy chosen in the study (total 125 patients). Data was analysed using Microsoft® Office Excel 2007 and SPSS® version 19.
Main outcome measures: The perception of pharmacists and patients about the POYC scheme.
Results: The average time to dispense a POYC prescription is 5 min. Pharmacists (n = 25) listed the following problems with POYC: 23 found the IT system inefficient, 16 found the automated system for orders inefficient, 10 stated that the POYC Unit is unresponsive, 21 believed that financial compensation given per patient is inadequate and 18 stated that the attitude of POYC clients differ from that of private clients.

When the patients' interviews were carried out, the most common complaint about the POYC system was the out-of-stock (OOS) medication where 118 patients (n = 125) have been affected some time or another. This was followed

by the inconvenience to go to the pharmacy twice in a short span of time in order to get the medication. This is because 77 patients (n = 125) in this study had to leave their voucher at the pharmacy and collect their entitlement a couple of days later. Patients were more satisfied with regards to the pharmacist's communication and the pharmacist's approach when compared to the old system, where they used to collect medication from the health centres. 113 patients (n = 125) stated that the pharmacist informed them how to take the medication properly and 112 patients (n = 125) said that the pharmacist approach was better than the one in the old system.

Conclusions: From the results obtained in this study, it is clear that the POYC system is perceived by patients as better than the earlier system but needs to be improved. The OOS problem is the one which mostly affects the patients. Another problem needed to be addressed is the IT system which almost all the pharmacists in this study found to be inefficient.

Disclosure of interest: None Declared.

Community Pharmacy: Pharmaceutical care

CP-PC046

The causes of the lack of patient compliance during antihypertensive therapy from pharmacist's perspective

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Background and objective: Noncompliance of medication in patients with arterial hypertension may cause severe consequences and even disability. If we will know the most frequent causes of inappropriate taking of medicine, possible improvements within the pharmaceutical care could be performed, promoting the safety and efficacy of antihypertensive therapy from time of starting treatment and also in the long term.

The aim of the study was to find the factors affecting patient compliance when taking antihypertensive therapy.

Setting and method: In the period from 2014 June to 2014 September were made the quantitative study including patients with diagnosed arterial hypertension who visited pharmacies in Riga for getting the antihypertensive therapy.

Results: The study collected data of 52 patients (median age 61.4 ± 10.7 years) with the mean antihypertensive treatment duration of 9.7 ± 2.4 years. The most of patients knew the reason for the use of the medication (n = 42, 80.8 %), but it was also unclear for some patients (n = 10, 19.2 %), more frequently with the use of 2 or 3 drugs at the same time, compared with patients who received more medications (n = 9, 17.3 %; p = 0.063). The instructions of medications always read only 9 (17.3 %) of the patients, more rarely they read them regularly (n = 33, 63.5 %) or not at all (n = 10, 19.2 %), due to the complex content of them (n = 14; 32.6 %). About one-third of patients (n = 15, 28.8 %) said that they were not informed about the adverse reactions of medications.

Conclusions: An unclear reason for taking medicine is one of the most common causes of the lack of patient compliance. This tendency is increasing during time of taking antihypertensive therapy. Awareness of antihypertensive therapy for individual patient, reminders of prescribed medicines and dosage instructions in the time of pharmaceutical care may contribute to patient compliance.

Disclosure of interest: None Declared.

Community Pharmacy: Pharmaceutical care

CP-PC047

Implementation of a protocol of use of albumin

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Background and objective: Clinical situations in which the use of albumin is justified and beneficial are not well established. Moreover, there are counter-indications in certain clinical conditions.

Due to the progressive increase in its use observed at our hospital and its high price, the Pharmacy & Therapeutics Committee decided to implement a protocol of use.

Setting and method: Literature review of albumin uses; Development of a protocol including accepted indications and recommended dosage regimens; Design of a standardized document for albumin prescription; One year prospective observational study at a Spanish 110-bed General Hospital: analysis of the compliance with the protocol; Consumption and cost analysis.

Main outcome measures: Rate of compliance with the protocol; Albumin consumption and costs.

Results: Accepted albumin indications in the protocol were: acute hypovolemia, paracentesis (volume of ascites > 5 L), spontaneous bacterial peritonitis, refractory oedema to diuretics, nephritic syndrome and hepatorenal syndrome; some of them were restricted to serum albumin values <2 g/dL.

45 standardized documents were received for the treatment of 28 patients (some of them had more than one admission at hospital or received albumin for more than one clinical condition).

According to approved indications, 8/49 (16.3 %) of the prescriptions did not follow the protocol (enteropathy, intestinal fistula, bacterial peritonitis prophylaxis and bacterial peritonitis); in the rest of the situations, indications were as follows: 10/49 (20.5 %) refractory oedema to diuretics, 10/49 (20.5 %) acute hypovolemia, 19/49 (38.8 %) paracentesis, 1/49 (0.5 %) hepatorenal syndrome.

In some occasions, even though the indications were the correct ones, the dosages differed from those recommended in the protocol: 3/10 (30 %) for refractory oedema to diuretics, 9/10 (90 %) for acute hypovolemia, 6/19 (31.6 %) for paracentesis, 0/1 (0 %) for hepatorenal syndrome.

The annual albumin consumption decreased a 48 % (2718 €) after the implementation of the protocol.

Conclusions: The protocol had a positive impact on the correct use of albumin. However, the high percentage of non-compliance highlights the need for continuous and prospective monitoring of the protocol in order to get a cost-effective and secure use of albumin.

Disclosure of interest: None Declared.

Community Pharmacy: Clinical education

CP-CE001

Improving medication adherence in stroke patients

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Background and objective: Non-adherence to medication therapy is associated with poor outcomes. Identifying factors that are predictive of poor adherence may be useful to screen patients at need for educative interventions. The primary objective of this study was to evaluate the adherence to hospital discharge medication in patients with ischemic stroke. The influence of sociodemographic parameters, risk factors and automedication are assessed as secondary objectives.

Setting and method: Data were collected in a neurovascular unit either during the hospitalisation, or three month after the event during a medical consultation. Adherence was assessed with a self-reported medication adherence scale (derived from Morisky-Green questionnaire), [1, 2] pretested on two patients.

Results: During the first six months, forty two patients were included (38 % during the hospitalisation, 62 % three months after the stroke). This episode was the first one for 77 % of the patients.

Concerning the risk factors: 80 % of the patients suffered from hypertension, 40 % from dyslipidaemia, 15 % from diabetes. Many patients (80 %) forgot to take medications as prescribed, for example Acetylsalicylic Acid (ASA) was frequently notified. The long-term advantages of taking medication is unknown by 70 % of the patients. Half of the patient declared taking medicine other than those prescribed by their doctor, among which 70 % of plants.

Conclusions: This first phase of study will be extended during another 6 months to improve the number of included patients. Low compliance, with drugs therapy having a dominating place in strategy to prevent recurrent stroke, has been shown in this first phase. The lack of information is as well pointed up by many patients. Auto medication, with plants is often described in

combination with therapeutic drugs, raising the potential of plants-drug interactions. Improving adherence to appropriate prescriptions of existing efficacious treatments may well represent the best investment for improving self-management of long-term medical conditions [3]. These data will be used to design medical interventions to improve the quality of care post-acute hospitalization and reduce the risks of future stroke.

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Disclosure of interest: None Declared.

Community Pharmacy: Clinical education

CP-CE002

Diabetes medications' knowledge and its association with glycaemic control in adults with type 2 Diabetes in Qatar

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Background and objective: Diabetes education is considered an integral part in the management of diabetes. The aim of this study is to assess the level of knowledge about diabetes medications, and its correlation with glycaemic control in adults with type 2 diabetes attending ambulatory and hospital based diabetes clinics in Qatar.
Setting and method: Patients diabetes medications were identified by electronic chart review, and their knowledge about these medications (oral agents and/or insulin) was assessed by an interview- based questionnaire derived from the National Council on Patient Information and Educations (NCPIE) consumer guide and validated in previous literature. Areas assessed pertained to: medications name (generic or brand name), mode of action, administration, important side effects and how to react if they occur, and finally what to do if a dose is missed. Patients were divided into three groups based on their type of therapy: oral medications, insulin and combination therapy. A maximum knowledge score of 8, 7 and 15 was assigned for each group, respectively.
Main outcome measures: knowledge scores were calculated and correlated to the most recent HbA1c (drawn within the previous 90 days).Potential confounders of knowledge scores and glycaemic control, such as number of diabetes medications and level of education were further evaluated by multivariate logistic regression analysis.
Results: Of the 250 evaluated patients, 59.6 % were on oral hypoglycaemic agents,7.6 % were on insulin and 32.8 % received a combination of both. Only 56 % of patients reported receiving education about their diabetes medications; provided by the treating physician in 50.7 % of cases. The majority of patients did not achieve the ADA target HbA1c of <7 (71.2 %). Mean knowledge score (± SD) was (5.2 ± 0.9) for oral hypoglycaemic agents, (5.3 ± 1.3) for insulin and (10.4 ± 2.1) for combination therapy. Patients scored highest in their knowledge of how and when to take their medications and lowest in their knowledge of oral medications' side effects and insulins' mode of action (onset and duration). Pearson correlation and multivariable logistic regression analysis showed insignificant association between knowledge scores and glycaemic control in the three evaluated subgroups of patients, after adjusting for all possible confounders. Educational level and medication counselling were the only significant variables associated with high knowledge scores (>5) in patients receiving oral agents. Moreover, type of therapy (insulin alone; combination therapy) and number of prescribed medications (≥3 medications) were the only significant predictors of poor glycaemic control.
Conclusions: Among adults with type 2 diabetes in Qatar, an overall good knowledge about diabetes medications was observed. However, this knowledge did not correlate with glycaemic control. Further studies are needed to explore factors other than knowledge that may play a role in the effect of diabetes education on glycaemic control.
Disclosure of interest: None Declared.

Community Pharmacy: Clinical education

CP-CE003

Safety and efficacy profile of Ceritinib (LDK378) in ALK-Rearranged Non-Small-Cell Lung Cancer (NSCLC)

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Background and objective: Pharmacy Department and Pharmacovigilance Unit assessed toxicity and efficacy data of LDK378 for patients treated at Gustave Roussy after failure of crizotinib therapy.
Setting and method: Data were collected from medical records for patients treated by LDK378 from March 2013 to April 2014. LDK378, a new oral ALK inhibitor used in crizotinib resistant NSCLC, is under a Temporary Authorization for Use (TAU), a procedure of the French competent authority that provides an early access to new promising drugs that have not yet been granted a Marketing Authorization. The initial dose was 750 mg once daily.
Results: 10 patients have been treated. The median age was 50 years old [46–70], the sex ratio M/F was 1,5. The median duration of treatment was 80 days [28–286]. 90 % of patients received at least 3 previous lines of chemotherapy before LDK378 (including crizotinib). 70 % had at least 3 metastasis sites. 30 % had carcinomatous meningitis and 80 % a baseline PS ≤1. All patients experienced at least 1 adverse reaction (AR). The main toxicity was grade 1–3 increased ALT/AST observed in 80 % of patients which led to treatment interruption (median time 11 days) and dose reduction (600 mg) for 3 out of 4 patients who reached grade 3. Other common ARs were graded 1 or 2 : gastrointestinal disorders 38 % (nausea/vomiting 30 %, diarrhoea 60 %, constipation 20 %), general disorders 16 % (asthenia 40 %, anorexia 20 %) and did not require dose modification.

About the efficacy, overall response and overall survival rates were both 60 %. The estimated median time to progression was 100 days [46–310].
On April 2014, 3 patients were still under treatment. LDK378 was stopped for 6 patients: 4 had tumor progression, 2 had serious toxicities (grade 4 thrombocytopenia and grade 3 increased AST/ALT). One died during therapy (stroke unrelated to LDK378).
Conclusions: LDK378 used as rescue therapy is active in patients with advanced ALK + NSCLC, previously treated with crizotinib and quite well tolerated. The safety data indicate LDK378 has a predictable toxicity profile with mainly elevated transaminases levels, diarrhoeas and asthenia, the most common ARs observed in this study which are reversible with remedial therapy or dose reduction.
Disclosure of interest: None Declared.

Community Pharmacy: Clinical education

CP-CE006

Perception of pharmacists and patients on point of care testing for PSA

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Background and objective: The Prostate Specific Antigen (PSA) is a protein secreted by the prostate gland. It is specific to the gland but is not limited to definite conditions[1]. Point-of-care (POC) testing provides investigator with rapid results leading to an immediate therapeutic action.

Study **e**valuates pharmacists' and patients' perspectives on pharmacists-lead testing and measuring the feasibility of carrying out POC testing in community pharmacies
Setting and method: Study set in Community Pharmacies (CP) and Health Centres (HC).

Male patients, fifty years or older, participated in the study. Patients from CP were first identified by the pharmacist and were tested following an informed patient consent. Participants from the HC were booked for an intravenous PSA whole blood sample on the same day. These patients were also tested using the POC device. This enabled result comparison between the two testing methods. POC PSA testing was carried out using 'On-Call PSA' POC test kit.

Patients were given the International Prostate Symptom Score (IPSS) and a questionnaire measuring their views on pharmacist testing. In case of illiteracy, a semi-structured interview was carried out. Questionnaires were both in English and Maltese. Correlation between IPSS and PSA was carried out using SPSS.

Pharmacists' perspectives were measured by a questionnaire distributed electronically to all registered pharmacists. A random sample of CP were visited and questionnaires were filled in during the visit or were collected a week later. Project was funded by the University of Malta Research Fund Grant on Point-of-Care Testing.

Main outcome measures: Assessing variation of lab-based and POC results, correlation between IPSS and PSA levels, pharmacists and patient perspective of PSA POC testing in community pharmacies

Results: 33 patients participated in the study, 16 patients from CP and 17 patients from HC. 30 patients were in favour of PSA POC testing. Pearson Correlation showed a value of 0.761 indicating a positive relationship between IPSS and PSA levels. Comparison of lab and POC tests resulted in the POC kit not detecting 4 elevated PSA readings detected by the lab-based test.

Of the 120 participating pharmacists 93 % think POC devices for PSA levels ought to be available in CP and would carry out testing in between consultant follow ups. 17 % were aware of the IPSS implying its use as an addition to patient monitoring.

Conclusions: Results indicate positive patient and pharmacist acceptance of carrying out POC testing for PSA levels in community pharmacy. However, recent guidelines by the American Urology Association (AUA) suggest testing to be limited to high risk patients that is patients between 55 and 69 years and with a family history of prostate abnormalities[2].

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Disclosure of interest: None Declared.

Community Pharmacy: Clinical education

CP-CE007

The MEDISIS programme—Hospitalization as an opportunity to improve medication and patient safety

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Background and objective: Emergency department visits and rehospitalisations are common after hospital discharge and the leading contributor is medication. The objective is to present an intervention named MEDISIS Programme. It is designed to partner with the patients as well as with the community pharmacists to reduce medication errors and thereby minimize hospital utilization.

Setting and method: Luneville hospital is a French public health institution with 420 beds for a territory of 77 000 inhabitants.

Results: The MEDISIS team includes representatives from primary care and hospital. They defines a six-step process to improve efficiency of medication regimens. First step recommends organizing the medication reconciliation process at admission of patients aged 65 years and over hospitalized through the emergency department. Second step involves identifying patients who benefit from the programme. A criteria set of 7 risk factors guides the selection of patients eligible because at high risk of serious adverse drug events. Third step involves reviewing and clarifying the medication regimens during a multidisciplinary staff with the general practitioners. The forth step promotes giving to patients an individualized instruction booklet that contains contact information about the health care professionals, the confirmed new medication plan, the calendar and scheduled appointments. The fifth step recommends organizing a reconciliation process at discharge managing continuity of care and enhancing communication to primary care providers. The last step involves setting a patient-centred information programme. It targets the reason of hospitalization, the diagnosis, the changes in medication plan, what to do if a problem arises and how recognizing drug side effects. It is declined in 6 sessions, three performed by the hospital pharmacists and others by the community pharmacists.

The team creates a well-established set of standardized methods, a kit of 12 tools and 3 work flows to make sure staff can easily perform each of the 6 steps.

Conclusions: The six bundled elements of the MEDISIS Programme design a seamless care complex but not complicated. Actually 4 steps are on the way. The decrease of hospital utilization will be assessed 30 days after discharge.

Disclosure of interest: None Declared.

Community Pharmacy: Clinical education

CP-CE008

The correlation of Accutrend® Plus and Multicare-In® for the total cholesterol parameter with standard lab results

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Background and objective: Hypercholesterolemia is one of the most imperative risk factors in the development and advancement of atherosclerosis, the foremost cause of vascular disease and is associated with myocardial infarction. [1] The objectives of the study were; to determine the correlation of the Accutrend® Plus and Multicare-In® with the Cobas® 6000 Analyser Series c501 module, and to determine the intra-device correlation for the two devices with regards to the total cholesterol parameter.

Setting and method: Patients were recruited by convenience sampling at the Pathology Clinic at Mater Dei Hospital. The 21 patients participating fitted into pre-established criteria [2] and a lipid profile test was conducted at the time of intervention following venous blood sampling. In addition the patients were tested twice with both devices using the finger-prick technique. Following unsatisfactory results obtained for the Multicare-In® device, another 25 patients were tested with the same study design. The results for Multicare-In® from both instances were combined.

Main outcome measures: Intra-device correlation for Accutrend® Plus and Multicare-In® was determined by regression analysis. The mean results of both devices were calculated and a scatter plot with the line of best fit was generated with respect to the lab results obtained.

Results: An r^2 of 0.821 for the Accutrend® Plus device was obtained, while the Multicare-In® had an r^2 of 0.679. R^2 values of 0.831 and 0.179 were achieved for the Accutrend® Plus and the Multicare-In® respectively ($n = 21$) when tested for their correlation with the lab results. An r^2 of 0.164 ($n = 25$) was obtained when re-testing with the Multicare-In®. Combining the 21 subjects tested previously and eliminating results exceeding 6 mmol/L, $r^2 = 0.336$ for the Multicare-In® device was obtained ($n = 36$).

Conclusions: The results obtained can be associated with a study by Finderle et al. [3] where similarly, the Accutrend® achieved a better correlation with the lab results when compared with the Multicare-In®. Locally, these findings are paramount, as community pharmacists need to ascertain themselves of the accuracy of the devices with the local standard laboratory.

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Disclosure of interest: None Declared.

Community Pharmacy: Clinical education

CP-CE009

Assessment of knowledge and attitude towards osteoporosis among women attending community pharmacy settings

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Background and objective: The aim of the study was to assess the knowledge and attitude about osteoporosis, in women 40 years and older who attend community pharmacy for any reason.
Setting and method: This study was carried out within community pharmacies from March to May 2014 among subjects who came to community pharmacy for any reason and accepted to participate after being informed about the present study. Participants included were women of 40 years and older that had never been diagnosed with osteoporosis before, and that had not been using any antiresorptive agent.
Main outcome measures: Subjects' demographic and clinical data has been collected. The knowledge about osteoporosis was assessed by the OKAT—'Osteoporosis Knowledge Assessment Tool' (1). OKAT was scored from 0 to 20.
Results: The study was performed on a total of 192 subjects of a mean average age of 54.61 ± 9.05 years. Of the subjects, 66.1 % possessed drinking milk and consuming dairy products habits. Meanwhile about 85.0 % used to drink more than 2 cups of tea/coffee daily. In addition 83.8 % of the participants had smoking habit, while 89.6 % were aware that smoking can contribute to osteoporosis. About 95.8 % used to drink alcohol once in a while when about 65.0 % accepted they knew that alcohol effects bone integrity. It was noticed that BMI (Body Mass Index) of the subjects showed that approximately 72.0 % of them were overweight, with 65 participants being obese. Of them, 77.5 % tended to think that physical activity is beneficial against osteoporosis, while only 53.1 % of the subjects accepted to be active in exercising. It was revealed that 74.5 % knew some symptoms caused by osteoporosis and 87.0 % were conscious that osteoporosis increases the risk for fractures. The total mean score of OKAT was calculated as 11.92 ± 3.27.
Conclusions: At the end of the study it was concluded that the biggest part of women included were aware of osteoporosis as a problem and its high incidence in women. Still more information and advice concerning lifestyle changes, prevention measures and treatment of osteoporosis must be provided, as well as encouragement to modify attitude towards osteoporosis with these changes as soon as possible in order to get less affected by this disorder.
Disclosure of interest: None Declared.

Hospital Pharmacy: Pharmaceutical Care

HP-PC021

Experiences of adverse drug effects reported by patients in ambulatory clinic

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Background and objective: To explore Adverse Drug Effects (ADEs) in outpatients by self-reported questionnaires and perception relating to their experiences.
Setting and method: A cross-sectional study was conducted at a university hospital. Outpatients, who had previously experienced potential ADEs in the past 3 months, completed the self-assessment questionnaires about ADEs.
Main outcome measures: General symptom checklists were used for patients to identify experiences of unusual symptoms and indicate whether they were confident that the symptom was a side effect of their medicine (s). Confidence of overall drug-related symptoms was rated on 10-cm Visual Analog Scale (VAS). The VAS was also used to assess perception of the most confident ADEs on severity, worry, and daily life activities.
Results: A total of 120 patients were recruited into the study. Most patients were female (65.8 %) with average age of 46.72 ± 13.61 years. Most patients (68.3 %) had 1–2 concomitant diseases and 46.7 % of them had taken more than 4 concomitant drugs. Of a total 1,277 reported symptoms, 65.1 % were confidently believed to be ADEs. Mean overall confidence of ADEs significantly affected by concomitant disease (0–1 disease 7.38 ± 2.87 vs. more than 1 disease 6.35 ± 2.81; P = 0.037). The total number of symptoms for which patients felt they were most confident symptoms was 162 (median 1, IQR 1–2). Unusual tiredness was the most commonly reported symptom as ADEs (12.5 %), followed by oedema of face (6.7 %), hair loss (6.7 %), and weight gain (6.7 %). Patients generally rated their symptoms at moderate level for symptom severity (Mean ± SD.: 5.60 ± 3.19), worry about symptoms (5.52 ± 3.54), and effects of symptom on daily life activities (5.74 ± 3.60). Symptoms mostly started more than 3 months ago (34.1 %) and always occurred every day (56.4 %). Majority of reported symptoms were recovered (38.1 %) and did not lead to any serious conditions (71.8 %). About 87.0 % of all patients could identify name of the suspected drugs in which prednisolone (n = 20), simvastatin (n = 4), and acitretin (n = 3) were commonly involved.
Conclusions: Patients were generally confident that many of their experiences might be suspected as ADEs. The suspected drugs could be identified by most patients, hence, this self-reported questionnaire might encourage their involvement in medication safety monitoring.
Disclosure of interest: None Declared.

Hospital Pharmacy: Pharmaceutical Care

HP-PC025

One-stop dispensing: patients' views and experience from a Danish ward

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Background and objective: The Danish healthcare sector is constantly challenged to achieve the most health value for money. Dispensing and administration of medication is a time consuming process for the nursing staff, but unused resources among patients and their relatives may assist the nursing staff in reducing the time spent on these processes. The patient role is changing to include further patient involvement, patient control and patient empowerment. This new patient profile will be explored in the current study. This study represent the first evaluation of patients' experience with the medication system; One-Stop Dispensing (OSD), at a Danish hospital ward.
Setting and method: The OSD pilot project was performed in collaboration between The Capital Region Pharmacy and the Orthopaedic Surgery department, Amager-Hvidovre Hospitals from April 2013 to December 2013. Before inclusion, a nurse or senior doctor assessed whether the individual patients were suitable for self-administration according to medicine guidelines of the Capital Region. Patients were asked to bring in their medicine in the original container when admitted and to use this during hospitalization. Medicine was placed in a bedside locker, after a pharmacist had recorded a medication history and performed quality assurance. Patients were discharged with all prescribed medications in the original packages to cover 10 days.

Six semi-structured telephone interviews with patient, who had been included in the OSD pilot project, were conducted. The interviews were recorded, transcribed and analysed by condensations of meanings.
Results: Patients were satisfied with administering their own medication during the admission. The patients felt that self-administration resulted in better insight and control over their own situation and needs. Patients felt they achieved a higher confidentiality regarding their medication; easier to be compliant; and felt empowered regarding their medication treatment. Medicine to cover treatment for 10 days from discharge made the patients feel more secure and comfortable.
Conclusions: This study found that the patients, who are suitable for self-administration, identified benefits from the OSD medication system during hospitalization and at discharge. The OSD system seems to have several opportunities regarding patient involvement. In the future, a larger study of

OSD in a Danish setup will be conducted to further explore the potential benefits of the system.
Disclosure of interest: None Declared.

Hospital Pharmacy: Pharmaceutical Care

HP-PC026

Use of romiplostim in paediatric patients

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Background and objective: Romiplostim is approved in Europe for adult chronic immune thrombocytopenic purpura (ITP) splenectomised patients who are refractory to other treatments and as second line treatment for adult non-splenectomised patients where surgery is contra-indicated.

However, romiplostim is used off-label in paediatric patients. It has shown strong evidence in ITP and, more recently, some case reports of platelet recovery after allogenic stem cell transplantation (allo-HSCT) have been published.

The recommended initial dose is 1 μg/kg once weekly and dose is adjusted depending on platelet count (PC).

The aim of this study is to describe our experience with romiplostim in paediatric patients.
Setting and method: A descriptive retrospective observational study was performed in a tertiary paediatric unit in Barcelona. All children who received treatment with romiplostim between April 2010 and June 2014 were included. Data were obtained from the electronic medical records. Data analysed included: sex, age, indication, start dose, maintenance dose, treatment duration and response.

Dose adjustments followed this algorithm: for PC $<50\times10^9$/L, dose is increased weekly by 1 μg/kg to a maximum of 10 μg/kg/week; for PC $> 150 \times10^9$/L for two consecutive weeks, dose is decreased by 1 μg/kg and for PC $> 250 \times10^9$/L, dose is not administered.
Main outcome measures: The main endpoint was the number and percentage of children who responded to romiplostim treatment. Response was defined as a platelet count over 50×10^9/L.
Results: Ten children (5 boys, age range 3–17) were included. Four of them had ITP and five, delayed platelet recovery after allo-HSCT. The other one was a Jehovah's Witness with osteosarcoma and chemotherapy induced thrombocytopenia. The initial dose was 1 μg/kg/week in eight patients and the other two started with 2 μg/kg. It was necessary to increase the dose in all cases except in one who started with 2 μg/kg. Median maintenance dose was 4 μg/kg/week (range 2–8). Median treatment duration was 27.5 weeks (range 3–208). Five children (50 %) responded to romiplostim: three with ITP, one with thrombocytopenia post allo-HSCT and the one with chemotherapy induced thrombocytopenia.
Conclusions: Half of children treated with romiplostim showed therapeutic response. All of them required doses higher than 1 μg/kg/week. Response rate was higher in patients with ITP than in those with delayed platelet recovery post allo-HSCT.
Disclosure of interest: None Declared.

Hospital Pharmacy: Pharmaceutical Care

HP-PC028

Clinical pharmacist interventions to improve patient safety through medication reconciliation process outpatient clinic

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Background and objective: Medication Reconciliation (MR) is the formal process of obtaining, verifying and documenting an accurate list of patient's current medicines on admission and comparing this list to the admission, transfer, discharge, and surgery orders, to identify and resolve discrepancies.

The purpose of the study was to verify the correctness of immunosuppressive drug prescriptions for transplant outpatients by means MR performed by clinical pharmacist (CP) to prevent medication error (ME).

Setting and method: A 28 months retrospective observational study (January 2012–April 2014) was conducted by ISMETT's CP. Prescriptions and treatment plans are necessary for prescribing immunosuppressive drugs to transplant outpatients. The CP through a dedicated software checked appropriateness of prescribed treatment plans and related prescriptions and assessed: therapeutic indication, dosage, frequency, route, duration of therapy and validity of prescription. The incorrect prescriptions have been deleted during verification and reasons recorded and the discrepancies found were divided into categories by type of error.
Main outcome measures: Identification of ME through MR in outpatient clinic on transplant patients in immunosuppressive therapy by checking appropriateness of prescribed treatment plans and related prescriptions.
Results: We reviewed 4325 treatment plans and related prescriptions of which 213 (4.92 %) were deleted because ME. ME concerned: 56.8 % (121:213) immunosuppressant drugs for transplant outpatients and 43,2 % (92:213) drugs for other diseases.

Immunosuppressant drugs ME were cancelled for: 24,8 % (30:121) duplicated therapeutic plans or prescriptions; 23,1 % (28:121) outside of prescription validity; 21,5 % (26:121) drug therapy regimen changes; 21,5 % (26:121) wrong drug therapy; and 9,1 % (11:121) incorrect dispensing regimen.

Drug therapy regimen changes included changes in: dosage 42,3 % (11:26), frequency of administration 23,1 % (6:26), suspension or cancellation of therapy 19,2 % (5:26) and drug for allergy 14,4 % (4:26).

The most serious ME was wrong drug therapy it covered prescriptions with incorrect: duration of treatment 50 % (13:26); dosages 34,6 % (9:26) and therapeutic indication 15,4 % (4:26).
Conclusions: The process of discharge MR is of the utmost importance in transplant patient population due to the risk for rejection and other complications in the post-transplant period.

Strategies such as MR attempt to avoid ME and as our results have shown the CP contribution has demonstrates in significant improvements of patient safety in this process
Disclosure of interest: None Declared.

Hospital Pharmacy: Pharmaceutical Care

HP-PC029

Clinical significance of liver toxicity caused by bosentan and sildenafil interaction in pulmonary hypertension treatment

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Background and objective: To evaluate the liver toxicity caused by the simultaneous administration of sildenafil and bosentan in patients suffering from pulmonary hypertension.

To investigate how this interaction is described by different drug interaction sources.
Setting and method: Retrospective observational study of all the patients treated at the same time with sildenafil and bosentan from 20013 to the present. By reviewing the electronic clinical history the values for GOT, GPT and GGT were obtained, before and after the co-administration till the 37th week. The drug interaction sources consulted were: My optimum health.com, Drugdigest, Medscape (Drug Interaction Checker), BOT plus and Micromedex.
Main outcome measures: To determine if there is hepatotoxicity we have checked the transaminases values. GOT 0-37, GPT 0-40 and GGT 7-50 were considered normal ranges for men and for women GOT 0-32, GPT 0-35 and GGT 7-32.
Results: During the study, 8 patients took both drugs at the same time. In 4 out of the 8 patients no change in transaminase levels was found. In 2 of them, the GOT level was raised but not over the normal range. In 3 patients the GPT level was raised but only one over the normal range. In 2 patients the GGT level raised, just one over the normal range. Only in one patient were both GPT and GTT levels outside the normal range, but they returned to normal values in a few weeks. In any case it was not necessary to stop the treatment because of hepatotoxicity.

The drug interaction sources consulted classify this interaction as moderate risk except Medscape which does not classify it and BOTplus which defines it as potentially important.
Conclusions: Although this interaction is classified as moderate risk by different sources and potentially important by one of them, we did not see any significant events in the patients we studied.
Disclosure of interest: None Declared.

Hospital Pharmacy: Pharmaceutical Care

HP-PC030

Preliminary risk analysis applied to pharmaceutical management in clinical trials: experimental drugs reception

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Background and objective: Created in 1994, the clinical trials department of Agence Generale des Equipements et Produits de Sante (AGEPS) is responsible for the pharmaceutical management of experimental products used in institutional biomedical research. Therefore, its original status of pharmaceutical company of a public hospital led to frequent reviews and approvals by competent authorities.

Though a return on operating experience (2000–2010) that showed less than 5 % of quality gaps, most of them of minor severity, it was judged essential to keep pursuing the quality management improvement in a field where the statutory requirements become increasingly demanding and the potential impact on the patient or the research could be major. Furthermore, the activity has increased by a factor 20 since the beginning.

The objective was to establish a grid with all the potential events, theirs consequences, their likelihood, their severity and the overall risk of each scenario in order to validate or not the current treatment of anomalies.
Setting and method: Of all the methods of risk management the preliminary risk analysis (PRA) was chosen to explore systematically and thoroughly all the stages of the routine activity.

A multidisciplinary work group had been selected to identify all the different sub processes of the department in order to develop a map of risks and identify the high risk stages.
Results: The critical step is the reception of experimental drugs or medical devices. The analysis has been focused on this particular step. The reception has been divided in 5 substeps (identification, product control, sampling/analysis, release, batch recalls).

The PRA has highlighted 60 high risk situations needing direct corrective actions, 57 with low risk that would be treated secondly and 15 of intermediate risk, managed in another workgroup. The analysis of every possible scenario had shown high risk situations that hadn't been planned but very unlikely.
Conclusions: This task management was not familiar to the team members and very time-consuming. It showed however that some high risk instances, overlooked by the department quality procedures, exist. Such instances were judged highly unlikely, but those carrying potential adverse outcome for the patients were addressed using new procedures. All the staff has been re-educated on these specific risks.

The future step will be to involve all the remaining processes, an Failure Modes, Effects and Criticality Analysis (FMECA) analysis.
Disclosure of interest: None Declared.

Hospital Pharmacy: Pharmaceutical Care

HP-PC031

An exploration of the attitudes and beliefs of doctors on the various barriers and facilitators to implementing antimicrobial stewardship programmes in acute appendicitis

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Background and objective: To address antimicrobial resistant pathogens, antimicrobial stewardship programmes (ASPs) are being developed through a variety of structures and interventions. The success of these programmes depends upon their rate of adoption by doctors. Despite wide promulgation, however, ASPs have had limited effects on changing doctors' behaviour and clinical practices. The aim of this research was to explore the attitudes and beliefs of doctors on the various barriers and facilitators to implementing ASPs in acute appendicitis.
Setting and method: Twenty-five semi-structured interviews were conducted with 10 consultant doctors, 8 registrars and 7 senior house officers involved in the management of acute appendicitis from the departments of surgery, paediatrics, emergency medicine, anaesthesia and microbiology in an acute 210-bedded general hospital in Ireland. As part of the piloting and validation exercise, a topic guide was tested for face and content validity by a consultant surgeon and a microbiologist and piloted with 2 doctors. Interviews were tape-recorded, transcribed verbatim and analysed using the framework method. To enhance the validity and reduce any bias of the findings, 10 % of the transcripts were independently reviewed for emerging themes by the microbiologist. All data were anonymous, coded and securely stored. Informed consent was sought from all participants and ethical approval received.
Results: Three key themes emerged as barriers to the successful implementation of ASPs in acute appendicitis. Theme 1 identified doctors' lack of knowledge, experience and confidence in the use of ASPs. Theme 2 identified doctors' disagreement with ASPs due to a perceived lack of high-level evidence supporting local recommendations and ineffective communication between developers and users. Theme 3 identified external factors such as the presence of contradictory literature and a lack of doctors' time and resources in implementing ASPs. The use of a high level of evidence and the involvement of doctors in the development of ASPs emerged as key facilitators for their effective implementation. Persuasive interventions, such as education and guidelines, were perceived to have more of an impact than restrictive interventions in their effectiveness and acceptance into practice.
Conclusions: Antimicrobial stewardship programmes are significant in clinical practice to reduce emerging antimicrobial resistance. There is a pressing need for qualitative studies that aim at understanding aspects that influence prescribing practices for optimal healthcare delivery and effective translation of evidence-based research into practice. As every participant in this study was a doctor, inclusion of allied health professionals such as clinical pharmacists and nurses may be of additional value in identifying further barriers and facilitators and in exploring how best to implement ASPs.
Disclosure of interest: None Declared.

Hospital Pharmacy: Pharmaceutical Care

HP-PC033

Evaluation of the antibiotic use for surgical prophylaxis in paediatric acute non-perforated appendicitis

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Background and objective: To evaluate antibiotic use for surgical prophylaxis in paediatric acute non-perforated appendicitis before and after introduction of the hospital guidelines.
Setting and method: Paediatric Surgery clinic at the University Children Hospital. Retrospective review of patients' medication records before guidelines introduction in July/August and two months after in November/December 2013.
Main outcome measures: Comparative analysis of the appropriateness of prophylaxis: number and percentage of patients who got prophylaxis on time, correct antibiotic choice and duration of prophylaxis.
Results: Total number of patients: 30 in July/August and 38 in November/December.

Non-perforated appendicitis had 26 (87 %) patients in July/August and 27 (71 %) in November/December.

Age range: 5–12 years: 15 (58 %) patients in July/August, 17 (63 %)–November/December; >12 years: 11 (42 %) patients in July/August, 10 (37 %)–November/December with males making up a greater proportion of patients: 20 (77 %) in July/August and 15 (56 %) in November/December.

Surgery had 24 (92 %) patients in July/August, 22 (81 %) in November/December.

2 patients in July/August and 5 in November/December were treated conservatively with ampicillin and gentamicin; 1 of them had periappendicular infiltrate.

5 (21 %) patients did not receive antibiotics in July/August and 2 (9 %) in November/December.

2 (8 %) patients received a single dose in July/August and 3 (14 %) in November/December; multiple doses within 24 h: 1 (4 %) patient in July/August and 0 in November/December; prophylaxis >1 day: 16 (71 %) patients in July/August and 17 (78 %) in November/December.

Prophylaxis was too early in 6 (32 %) patients in July/August, 5 (25 %) in November/December; on time: 2 (11 %) in July/August and 7 (35 %) in November/December, too late (started after appendectomy): 9 (47 %) in July/August, 8 (40 %) in November/December. No information about time: 2 (11 %) in July/August, 0–November/December.

The most often used antibiotic combination was ampicillin with gentamicin: 8 (33 %) patients in July/August and 12 (55 %) November/December. Only 1 (5 %) patient received antibiotics (cefotaxime) according to guidelines in November/December.

Conclusions: Although the guidelines were discussed and accepted by surgeons and there was two month introduction period as well, only few positive trends were observed with antibiotic treatment guidelines not having major impact on antibiotic use. There is a need for new ways of promoting adherence to guidelines and appropriate antibiotic use.

Disclosure of interest: None Declared.

Hospital Pharmacy: Pharmaceutical Care

HP-PC034

Medication defined daily doses (DDD) and orthostatic decline of blood pressure among geriatric inpatients

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Background and objective: Evidence is scarce regarding an association between cardiovascular or psychotropic drugs and orthostatic hypotension. The observation of a weak correlation between the dosages of such medications and the decline of blood pressure in orthostatism would be a dose–response argument against their causal association.

Setting and method: Cross-sectional study in 100 patients admitted to the geriatric ward of an academic hospital. For all older patients (≥75 years) able to stand up, an orthostatic test was performed at the beginning of the hospital stay. The maximum decline in systolic (SBP) and diastolic (DBP) blood pressure (mm.Hg) between the lying (0) and the standing position (1 or 3 min) was measured by a physiotherapist. The Defined Daily Dose (DDD) on the day of the orthostatic test was used to calculate the dosage of medications affecting the vascular (V) system [diuretics, ACE inhibitors/angiotensin inhibitors, calcium channel blockers, β-blockers, central α-agonists, peripheral α-blockers, nitrates] or the central nervous (N) system [benzodiazepines, neuroleptics, antidepressants, opiates].

Main outcome measures: Determinants of SBP and DBP blood pressure declines, identified by multivariate linear regression

Results: In 100 patients (85 ± 5 years, 58 % women), lying SBP and SDP were respectively 136 ± 21 and 72 ± 14 mm.Hg, while receiving 7.7 ± 4 medications (DDD : 1.0 for V and 0.74 for N systems). In orthostatic position, SBP declined (median 11; mean ± SD 12 ± 17 mm.Hg, n = 100), and decreased in 77 patients. In multivariate analysis (adjusted r^2: 93 %), this SBP postural decline was significantly ($p < 0.05$) and positively correlated with age, diabetes, history of falls, and number of medications, but not with the DDD of any nine drug classes. However, DBP declined in orthostatism (median 4; mean ± SD 11 ± 5 mm.Hg, n = 100), decreasing in 74 patients. In the multivariate model (adjusted r^2: 87 %), the DBP decline was significantly ($p < 0.05$) and positively correlated with age, diabetes, stroke and anaemia, but not with the DDD of any drug class.

Conclusions: The main determinants of SBP and DBP decline in orthostatism were age and diabetes. Neither vascular nor central nervous drug DDD were associated with a decline of blood pressure. The lack of correlation between these drug dosages and the orthostatic decline in blood pressure is an argument against their causal association in geriatric inpatients.

Disclosure of interest: None Declared.

Hospital Pharmacy: Pharmaceutical Care

HP-PC035

What pharmacist interventions to what medication to patient with kidney failure?

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Background and objective: The goal of the decree dated April 6, 2011 in relation to management of the quality of drug treatments in medical facilities was to improve prevention of medication errors, in particular by analysing risk.

Because of the pharmacokinetic changes associated with the elimination of drugs, kidney failure (KF) is considered to be an iatrogenic risk factor. The goal of our study was to define the drugs that were most frequently associated with the need for a pharmacist's intervention (PI) and the types of PI described to map the medication risk.

Setting and method: This study was performed for 18 months in adult patients hospitalized in a General Hospital, excluding intensive care and haemodialysis units. These patients had a glomerular filtration rate (GFR) of less than 30 ml/min that was estimated by the MDRD formula. The drugs were classified according to the ATC classification and the types of PI according to the classification of the French Society of Clinical Pharmacy.

Results: We analysed 4436 prescriptions in patients, whose mean age was 79.5 years old with a GFR of 18.9 ml/min. PI were found in 1041 (24 %) of these prescriptions including 620 (14 %) in relation to KF criteria. The mean age of patients in these 620 prescriptions was 78.6 years old and the GFR was 19.0 ml/min.

The most frequent therapeutic classes of drugs were cardiovascular (22 %), for the nervous system (20 %) and blood and hematopoietic organs (19 %). Ten medications were the source of 2/3 of the PI: enoxaparin, tramadol, alfuzosin, allopurinol, ofloxacin, rosuvastatin, acetaminophen, perindopril, colchicine and ramipril. Most patients were in a nephrology (14 %), emergency (12 %) and surgical (11 %) units. Most PI's were for contraindications (42 %), overdose (37 %) or side effects (7 %). Finally the optimizations proposed by the prescribers were usually adapting the posology (40 %), substitution (37 %) or treatment follow-up (14 %).

Conclusions: The PI rate in our establishment is higher than that published in a French study in 2011 (9.9 %) including PI for all prescriptions. Thus the analysis of prescriptions in selected patients according to KF criteria seems to result in a higher rate of PI. Although the proportion of patient presenting with KF is higher in a nephrology unit, the distribution of PI by unit shows that other units are also involved. We did not shown any difference in mean age and GFR in patients in whom a PI was identified in relation to the KF compared to the rest of analysed prescriptions.

This study provided a list of at risk medications for which kidney function should be systematically evaluated when they are prescribed.

Disclosure of interest: None Declared.

Hospital Pharmacy: Pharmaceutical Care

HP-PC037

Analyse causes and consequences of a ground for refusal pharmaceutical intervention: a case report of Carbapenem induced seizure

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Background and objective: The infections induced by Extended-Spectrum ß-Lactamases producing bacteria (BLSE) are carried by Carbapenem (bactericidal effect time depending). The objective is to describe a case report showing importance of dosage reduction in renal insufficiency (IR) situation.
Setting and method: We report an analyse of the refusal of a pharmaceutical intervention concerning a case of patient presenting seizures during Ertapenem therapy without previous neurological disorders but with IR.
Results: Patient is 68 years old. Her medical history was: renal transplantation in 2009 for a diabetic nephropathy (baseline serum creatinine = 160 µmol/L), obesity, arterial hypertension, previous events of pyelonephritis with BLSE.

She had been hospitalized in intensive care unit (ICU) for an acute obstructive pyelonephritis caused by Klebsiella Pneumoniae. Imipenem-Cilastatine and Vancomycin were prescribed but no dose adjustment was performed (serum creatinine = 650 µmol/l).

Two days later, she was transferred in nephrology, a therapeutic adjustment was performed by Ertapenem (1 g daily). A pharmaceutical intervention for dose adjustment according to guidelines was formulated (Cl = 6 mL/min with MDRD). This intervention was refused according to the following criteria: patient outgoing reanimation department (pharmacokinetics parameters were probably modified), recurrence of BLSE infections, risk of selecting bacteria producing carbapenemases, low risk of seizure and improvement of creatinine. Two days later, patient presented seizure treated by Clonazepam, Levetiracetam and Ertapenem was switched to Sulfamethoxazol-Trimethoprim.

The next day, the patient was transferred in ICU and clinical improvement was observed. A declaration of pharmacovigilance was realized. According to the chronology of adverse events, improvement of IR (Cl = 6 mL/min to 10 mL/min in 2 days), the exclusion of other non-medical causes: hypoxia, hypotension and worsening of sepsis and the characteristic ECG (no focalization signs and a characteristic pattern indicating a drug impregnation),, an overdose of Carbapenem (Ertapenem and Imipenem) is strongly suggested.
Conclusions: Use the renal function to adapt the treatment dose is very important. Carbapenems are known to be implicated in the apparition of central nervous system toxicity, including hallucinations and seizures. The prevalence of Ertapenem induced seizures is low (0.2 à 0.5 % in adults) contrary to Imipenem (1.5 à 2 %). An early and appropriate antibiotherapy is crucial for the morbi-mortality induced by serious infections. This case illustrates difficulty for doctors in this specific situation, between dose adjustment in IR to limit adverse events and conservation of usual dose to be effective and limit resistance selection.
Disclosure of interest: None Declared.

Hospital Pharmacy: Pharmaceutical Care

HP-PC038

Identification of adverse events caused by drug tenders and shortages

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Background and objective: Objective data on the impact of drug tenders and shortages resulting in changes of specific drug brands and hence their influence on patient safety in Danish public hospitals remain scarce. Healthcare professionals are obliged to report to the National Agency for Patients' Rights and Complaints if medication-related adverse events (AEs) occur.
The aim of this study was to identify and analyse the types of AEs caused by drug tenders and shortages reported to the national reporting system Danish Patient Safety Database (DPSD).
Setting and method: A search in DPSD conducted in 2014 included 107 drug changes systematically chosen from the tendering years 2011, 2012 and 2013 and 51 recorded drug shortages lasting a month or longer. Furthermore Danish abbreviations for tenders and shortages and challenging drug changes identified by two Risk Managers were included.
Results: A total of 2621 reported AEs were identified and assessed by a trained person. Of these 71 AEs were found to be directly related to drug tenders and shortages. Additionally 18 AEs were potentially related AEs, but the relation to tenders and shortages could not be verified. The majority of AEs caused by drug tenders could be arranged into 5 categories: dispensing and/or administration of the wrong drug (look alike/sound alike), administration of the wrong concentration, delayed drug treatment and duplicate prescriptions with risk of overdosing. AEs related to shortages were omission/delay of drug administration, administration of reduced/wrong concentrations and randomized errors.
Conclusions: In this study 71 AEs which were directly related to drug tenders and shortages were identified. Drug tenders and shortages which result in administration of a wrong drug or concentration and omission of treatment can jeopardise patient safety. Although this study may only reveal a minor part of the problem it emphasizes the importance of focusing on patient safety in relation to drug changes.
Disclosure of interest: None Declared.

Hospital Pharmacy: Pharmaceutical Care

HP-PC039

Medication reconciliation by pharmacist in a fast-track patient care at an orthopaedic ward

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Background and objective: Transitions through different levels of care contribute to medication discrepancies due to lack of information between the different levels. Medication reconciliation is a strategy for reducing medication discrepancies and improving patient safety. In October 2011, St. Olavs Hospital initiated a fast-track model for patients with hip-fractures, where clinical pharmacists are a part of a multidisciplinary team of health professionals.

The purpose of this study was to examine discrepancies discovered in medication lists by clinical pharmacists at the orthopaedic ward and consider the clinical relevance of the discrepancies.
Setting and method: Medication reconciliation by clinical pharmacist was done for all patients with a hip-fracture admitted to an orthopaedic ward in the period October 2011-August 2012 using Integrated Medicines Management.

An independent expert group consisting of a geriatrician, an orthopaedist and a clinical pharmacist, considered level of clinical relevance of the discrepancies found in the collected data.
Main outcome measures: Number of discrepancies discovered in medication lists by clinical pharmacist and distribution of unlikely, moderate and severe discrepancies.
Results: A total of 410 discrepancies were registered for all 317 patients, with an average of 2.6 for patients with discrepancies.

68 % and 19 % of the discrepancies were evaluated by the expert group as potentially moderate and severe, respectively, if they were unattended during hospitalization and after discharge.
Conclusions: Using a clinical pharmacist in medication reconciliation at an orthopaedic ward can avoid discrepancies that can lead to serious discomfort or clinical deterioration of the patient.
Disclosure of interest: None Declared.

Hospital Pharmacy: Pharmaceutical Care

HP-PC041

Assessing electronic prescribing errors in cancer patients

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Background and objective: Our oncologic clinical pharmacy department ensures preparation of anticancer chemotherapy in accordance with the requirements of staff's protection, quality of finished preparation and patient safety. Given that cytotoxic drugs have a narrow therapeutic index we start to assess chemotherapy prescribing errors and their potential clinical consequences as part of a wide quality insurance plan.

Setting and method: This study was conducted over a 12 months period (April 2013–March 2014) in a university hospital specialized in cancerology including haematology and paediatric oncology.

Prospective detection of medication errors during prescription monitoring and collection of data with a fast and exhaustive tool on following criteria: chemotherapy regimen, dose, anthropometric values, route and mode of administration.

Main outcome measures: Assessment of clinically relevant avoided dose deviations and potential clinical impact according to Hatoum's classification.

Results: 190 discrepancies were detected representing 1.4 % of 13550 prescriptions reviewed. Clinical trials are involved in 15 % of cases. About 98 % of the prescribing errors were accepted and corrected by the physicians. Discrepancies of dose (55 %) and of chemotherapy regimens (20 %) are the most frequently detected errors. 46 % of errors would have potentially significant impact and allow avoiding 63 relevant overdosages due to exceeding maximum dose, inadequate or missing dose adjustments and errors of anthropometric values. Drugs most concerned were bortezomib, bendamustine, cyclophosphamide, carboplatin and intrathecal chemotherapy. Other errors are related to the use of electronic prescription: regimen's selection, double prescribing, date or patient errors. Detection of a too short intercure resulted in the postponement of a chemotherapy cycle.

Conclusions: In order to improve safety, this study highlights risk factors of chemotherapy prescribing errors. Currently, in the context of setting up a new computerized software system including physician orders, the constitution of a multidisciplinary working group seems essential.

Disclosure of interest: None Declared.

Hospital Pharmacy: Pharmaceutical Care

HP-PC042

Medication conciliation at patient admission: comparison of performance indicators and types of admission

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Background and objective: The High5 s project was launched by WHO to improve patient treatment safety in 5 problem areas including medication accuracy during transitions in care. The Medication Conciliation procedure (MR) is one of these. MR compares all chronic treatments with the associated prescriptions received by a patient throughout the various steps of the treatment. The goal of our study was to compare performance indicators (PI) from the High5 s in relation to sectors of hospitalization, and modes of admission.

Setting and method: Our study was performed during two 3-week periods. Unlike the High5 s project which only proposes MR in patients over the age of 65 admitted through the emergency department, we evaluated all patients admitted in the departments being studied. Patients were classified according to emergency(U) or scheduled(P) admission, and according to the department of hospitalization, Medicine(M) or Surgery(C).

Main outcome measures: MR was performed in 50 patients in Medicine: 14(28 %) scheduled admissions(MP) and 36(72 %) emergency admissions(MU). MR was performed in 50 patients in Surgery: 30(60 %) scheduled admissions(CP) and 20(40 %) emergency admissions(CU). The mean number of lines of prescription was CP = 6.87 CU = 6.49 MP = 6.61 MU = 6.67. The results of each of the High5 s performance criteria were:

- MR1 (percentage of eligible patients who received MR in the past 24 h) CP = 63.3 % CU = 65,0 % MP = 57.1 % MU = 63.9 %
- MR2 (Undocumented Intentional Discrepancies (UDID) in relation to the number of patients) CP = 1.70 CU = 1.65 MP = 5.29 MU = 3.81
- MR3 (number of Unintentional Discrepancies (UID) in relation to the number of patients) CP = 1.10 CU = 1.90 MP = 1.79 MU = 1.89
- MR4 (percentage of patients with less than 1 UID in relation to patients) CP = 56.7 % CU = 55,0 % MP = 64.3 % MU = 63.9 %

Results: The percentage of MR in 24 h corresponds to results in the literature (MR1 = 18–94 %). UDID (MR2) are less frequent in surgery because of preoperative and anaesthesia files. The most ID (MR3) were found in Medicine despite the same number of lines of prescription in the 2 sectors. The MR performed during emergency admissions showed the most UID, in particular because the patient did not bring a prescription or brought personal medications during scheduled admissions. The group with the highest percentage of patients presenting with at least one UID (MR4) was MP, which shows the source of prescriptions is not investigated before writing prescriptions.

Conclusions: The calculation of these performance indicators identified high-risk patients, and these results must be completed by a study of other criteria (age, difficulty speaking, medical history, for example). This preliminary study also shows that our overall MR3 (1.64) including Surgery and Medicine is high compared to other pilot centres in the High5 s project (Canada 2006 1.2, USA 2008 1.4, France 2011 0.89) except Belgium in 2010 (1.90). Once this activity becomes routine, progression of this indicator should be evaluated to make sure that the MR limits established by the High5 s project are adapted to our facility.

Disclosure of interest: None Declared.

Hospital Pharmacy: Pharmaceutical Care

HP-PC043

Pharmaceutical follow-up program for patients under oral chemotherapy

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Background and objective: Oral chemotherapy (OC) includes drugs with possible serious side effects and high drug–drug interaction potential. Adherence is essential to guarantee treatment effectiveness. As a result, a multidisciplinary follow-up team is required to manage patient complications and assure safety.

A pharmaceutical follow-up aimed at patients treated with OC was implemented. Patient evaluation was focused on identifying potential interactions between OC and chronic medication and the early detection of side effects. The aim of the study is to assess the contribution of this program to patient safety.

Setting and method: A prospective study was performed in a tertiary university hospital from July to November 2013. All patients ≥18 year-old starting OC the first two months were included.

A baseline appointment was done when a patient started on a new drug. Drug interactions were checked and the patient received information about the medication to avoid or reduce the intensity of side effects. Individual changes were suggested to the physician based on the type of interaction. A month later, a second visit was planned to evaluate adherence and appearance of side effects. Drug discontinuation was assessed at 3-month by checking the electronic medical records.

Main outcome measures: Number of drug interactions detected, number of patients who presented side effects at 1-month follow-up and number and cause of withdrawals at 3-month.

Results: Forty-three patients were included (24 men, mean age: 62). Patients were treated with: capecitabine (57 %), temozolomide (6.8 %), gefitinib, axitinib, lomustine, procarbazine, sunitinib, dasatinib, erlotinib (4.5 % each) and imatinib, abiraterone, lapatinib and thalidomide (2.3 % each). Seven interactions were detected, 4 with drugs and 3 with integrative medicine. Thirty-four out of 43 patients (79 %) presented side effects at 1-month follow-up. Fourteen out of 43 patients (32.5 %) withdrew the treatment at 3-month follow-up: 5 due to side effects, 6 due to disease progression, 2 due to both and 1 died during the treatment.

Conclusions: A pharmaceutical follow-up program aimed at patients under OC allows the early identification of interactions and side effects. The rate of detected side effects is high resulting in a significant number of withdrawals. Pharmaceutical follow-up turns to be important in order to manage complications and increase patient safety.

Disclosure of interest: None Declared.

Hospital Pharmacy: Pharmaceutical Care

HP-PC044

Insulin injection techniques and recommendations: state of nursing practices

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Background and objective: Techniques of insulin injection are important to ensure quantity of product injected and the quality of the injection. As survey of nurses was conducted to determine their knowledge of insulin injection and to assess their practices.
Setting and method: This one day prospective observational survey, conducted in a public health institution for adults, interviewed 91 nurses from 48 clinical units.
Main outcome measures: It consisted in asking them where insulin is stored once opened, how it is administered, and with which injection devices. Data were collected and analysed.
Results: The experiences of the nurses are variable: 46 % (n = 42) of them have less than 5 years of experience, and 32 % (n = 29) have more than 10 years' experience. Once the insulin is opened, 77 % (n = 70) of the nurses keep it at room temperature, and among them 34 % (n = 24) also protect it from light. The preferential injection sites are the upper arm only (66 %, n = 60), alternately the arm/thigh (11 %, n = 11), or abdomen/arm/thigh (20 %, n = 18). Most of them (93 %, n = 85) declared to alternate the injection sites within the same area but 89 % (n = 81) don't keep the same area for the same moment of the day. Keeping the needle in the skin for at least 10 s before withdrawing it is respected by 42 % (n = 38) of the nurses. Only 14 % (n = 13) use the specific insulin needles on pens, 62 % (n = 56) use the secured insulin syringes, and 24 % (n = 22) use both. 47 % (n = 43) declared attributing one pen for one patient and 70 % (n = 64) declared writing the opening date. However, there are discrepancies between those statements and insulins found in the nursing stations: only 9 % of the insulin complied with our recommendations (individualized for a patient, dated less than 1 month before the audit).
Conclusions: This study shows that our gold standard is well known but its compliance is unsatisfactory. Indeed, misuses and bad habits were detected: e.g. insulin syringes are widely used to draw insulin from pens or cartridges. A procedure has been written and published, summing up the good practices and recommendations of insulin injection to be reminded. Their knowledge and training sessions should be strengthened. A further evaluation of professional practices is planned to determine its impact.
Disclosure of interest: None Declared.

Hospital Pharmacy: Pharmaceutical Care

HP-PC045

Inventory of all insulins and glucagon like peptide 1 analogues in clinical units : compliance with the recommendations

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Background and objective: Several pharmaceutical forms of insulin exist and coexist in our hospital: vial, pen, or cartridge. The recommendation is that one pen should be used by one person only. The essential criteria for being compliant with this recommendation are the nominative attribution of the pen and the notification of first opening date on it.
Setting and method: The aim of this audit is to assess how and where the insulins and glucagon-like-peptide 1-analogues are stored in the clinical units.
Main outcome measures: This one day prospective audit was conducted in 48 clinical units, inspecting the nursing stations, the medicine trolley, the nominative medication drawer, the fridges, and patients' rooms. All insulins, opened or not, were registered. Criteria like pharmaceutical form, the individualization of the product (patient's name on it, presence in the patient's room or drawer), and the notification of opening date were checked.
Results: A total of 930 insulins were listed, including 612 (65,8 %) pens, 172 (18,5 %) vials, and 146 (15,6 %) cartridges. Among them, 399 (43 %) were opened. One third (n = 133) were individualized, and the opening date was mentioned on 90 (22.5 %) of the specialities. Considering all the gold standard criteria of our hospital (one pen for one patient, with an opening date <4 weeks), only 35 (9 %) of the opened insulins complied with the hospital recommendations.
Conclusions: These alarming results are essentially due to a misuse of injection devices. Indeed, insulin syringes are commonly used for retrieving from vials, pens, and even cartridges, because secured insulin needles (adapted for pens) were not available. One of the corrective actions was to provide these secured insulin needles and to assist the nurses with their use (by programming training sessions). Also all cartridges have been withdrawn from clinical units, as their use should remain an exception. A reminder of good practices was circulated and an evaluation of professional practices is planned.
Disclosure of interest: None Declared.

Hospital Pharmacy: Pharmaceutical Care

HP-PC046

Fingolimod safety in patients with multiple sclerosis

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Background and objective: Spanish Agency of Drugs and Health Products(AEMPS) published in 2012 an alert recommending monitoring of cardiac function and performing eye examinations to patients with multiple sclerosis who started treatment with fingolimod(Gilenya®).

The objective is evaluate the safety of use of fingolimod after issuing the alert.
Setting and method: A retrospective observational study of patients who started treatment with fingolimod at a dose of 0.5 mg/day orally, according to data sheet, from July 2012 to February 2014.

We considered all patients who have taken at least 4 months of treatment, period in which you have to do eye examinations, in order to assess safety.
Main outcome measures: Demographic variables(gender and age),efficacy(Expanded Disability Status Scale or EDSS at baseline and during treatment, previous treatments and causes of change to fingolimod) and safety data(cardiac monitoring, eye examinations and other side effects) were recorded.

The data were obtained from the Electronic Medical History(SIAS®) and application of medication dispensing outpatient, Abucasis®.
Results: 17women started with oral fingolimod, with a mean age of 43 ± 8 years (34–55 years);16patients currently being treated an average of 12 ± 5 months(4–27 months).

6patients received pre-treatment with glatiramer(Copaxone®),3 with interferonß-1a(Avonex®),2 with interferonß-1b(Extavia®),3 with natalizumab(Tysabri®) and 3 with azathioprine(Imurel®).
Reasons for switching to fingolimod were:14patients(82 %) due to progression of disease and 3patients(18 %) risk of developing progressive multifocal leukoencephalopathy.

Mean EDSS at initiation of treatment with fingolimod was 3(1–6.5). At 6 h after onset, cardiac monitoring was performed on all patients, and the results were within the normal range for 15patients(88 %). In 2patients(12 %),episodes of bradycardia were recorded and in 1 atrioventricular block first degree, which normalized within 8 h following the start of treatment.

All patients were ophthalmological controls at 4 months of treatment: in 14patients no ocular involvement was seen. In 2patients,a macular involvement occurred and in 1patient an episode of uveitis, but in no case led to the withdrawal of treatment.

During the study other adverse effects were reported: lymphopenia in 7patients(41 %),persistent fatigue in 6patients(35 %),elevated liver enzymes in 3patients(18 %),dyslipidaemia in 3patients(18 %),neurological disorders such as amnesia and headache in 3patients(18 %) and 1patient with dermatological reactions(6 %). Also in 3patients(18 %) new outbreaks were recorded; only 1patient had to stop treatment due to disease progression.

The average of last EDSS of patients recorded during June 2014 was 3(1–6.5),same result as the start of treatment.
Conclusions: Treatment with fingolimod is a safe therapy and oral way is preferable for patients. Most adverse effects observed have no clinical impact. However, the sample size and time tracking aren't enough in context of a chronic treatment.
Disclosure of interest: None Declared.

Hospital Pharmacy: Pharmaceutical Care

HP-PC047

Clinical decision support systems: a satisfaction survey in a Belgian academic hospital

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Background and objective: This project aim at collecting the opinion of the doctors about the Clinical Decision Support Systems (CDSS) implemented in the Computerized Physician Order Entry (CPOE) of our hospital and to identify priorities for improvements.
Setting and method: Survey sent by e-mail to all the physicians of a 975-bed academic hospital. The physicians were questioned about (a) the information they need in drug prescribing, (b) their opinions about the current CDSS design and (c) the impact and the limitations of the alerts currently implemented as CDSS (i.e. "drug–drug interaction" and "renal dosage" alerts). Demographic data of the participants were collected.
Main outcome measures: The answers of each question were recorded, summarized and categorized by the physician's type (junior/senior).
Results: 154 physicians participated to the study (87 seniors, 40 juniors and 27 unknown). More than 60 % of all the physicians find it helpful to have information on drug–drug interactions, dose adjustments to renal failure and the patient's allergies when prescribing. More than half of physicians are satisfied with the content, layout and the number of "drug–drug interaction" and "renal dosage" alerts. Over 80 % of physician report reading the alerts frequently or very frequently. However, 69 % of the juniors and 61 % of the seniors rarely change their prescription after reading the warnings. The two main reasons for not following the recommendation of the alerts in the daily practice are inappropriate content (useless, inadequate, incorrect) and the excessive number of alerts.
Conclusions: To improve the quality of prescribing with the CDSS and the user's satisfaction, several actions could be taken: improving the relevance of the alerts, reducing redundancy, implementing population-specific alerts (e.g. paediatrics) and providing information about the patient's allergies. Other further steps would be to implement a justification system when ignoring an alert and to record alerts actually by-passed relative to total number of alerts displayed, in order to analyse the efficiency of the system.
Disclosure of interest: None Declared.

Hospital Pharmacy: Pharmaceutical Care

HP-PC048

The challenge of pain management after hospital discharge in hip- and knee replacement patients

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Background and objective: The use of fast-track surgery means that the patients have to handle most of the postoperative analgesia on their own. There is a lack of studies exploring how the patients manage this period. The objective of this study was to investigate how patients experienced and handled their pain management after discharge.
Setting and method: Prospective study at Diakonhjemmet Hospital, Oslo, Norway. All patients admitted for elective total hip- or knee replacement surgery (THA/TKA) within an 8-week period were invited to participate.

For 14 days after discharge, the patients filled out a diary with structured questions about pain, adverse drug reactions (ADRs) etc. A clinical pharmacist performed a structured telephone interview 2–3 weeks after discharge.
Results: Of the 56 patients included (mean age 65 years, 59 % women), 60 % reported problems with their pain management; mainly insufficient pain relief and ADRs.

71 % experienced to some extent troublesome ADRs. 58 % of them found a solution to their problem, of which 44 % chose solving the problem by reducing drug dosage.

36 % reported being reluctant to take the analgesics prescribed, mainly due to experience/fear of ADRs or fear of addiction. 71 % had taken their pain medication at scheduled intervals, whereas 22 % kept changing doses, intervals and medications on their own; trying to optimise their regime. Within 2–3 weeks after discharge, 21 % had seen a physician and been prescribed a new pain regimen.

23 % had experienced problems with dose tapering by the time of the telephone interview (18 % had not started reducing their pain regime yet).

Among those who reported that their overall pain management had gone "not-so-well" or "badly" (39 %), there were significantly more knee- than hip replacements ($p = 0{,}003$), and significantly more women than men ($p = 0{,}043$). Those reluctant to analgesic usage were also in significant majority ($p = 0{,}003$).
Conclusions: Inadequate postoperative pain management was observed in a larger number of patients than expected. Insufficient pain relief and troublesome ADRs were the main problems. Few consulted health professionals with their problems. It should be investigated whether closer cooperation with health-care professionals during this period can optimise the postoperative pain management.
Disclosure of interest: None Declared.

Hospital Pharmacy: Pharmaceutical Care

HP-PC049

Follow-up of nutritional deficiencies before and after bariatric surgery

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Background and objective: Over the last decades, the prevalence of obesity has increased dramatically. This results in an increased demand for bariatric surgery. As bariatric surgery may be associated with nutritional deficiencies, extensive follow-up of patients and uniform guidelines for prevention and treatment of these deficiencies, are mandatory.
Setting and method: Semi-structured interviews with healthcare professionals involved in the screening and follow-up of bariatric patients in 12 hospitals in Flanders, Belgium were performed. Interviews were transcribed verbatim and were analysed with Nvivo 10.0 by 3 researchers.
Main outcome measures: Current pathways applied for the follow-up of bariatric patients before and after surgery with focus on prevention and follow-up of nutritional deficiencies
Results: In this study, 45 healthcare professionals with diverse background were interviewed.

Regarding nutritional deficiencies, each hospital, except one, performs pre- and postoperative biochemical screening. In one hospital, diagnosis of post-surgery deficiencies was based on clinical symptoms. Remarkably, in 9 hospitals blood collection for follow-up was performed by the general practitioner, while the results were discussed with the surgeon. In ten hospitals a standard multivitamin preparation was started in all patients after surgery. In one of the other hospitals, multivitamins were only started if a patient developed a deficiency; in the other hospital all patients received a supplement of vitamin D and calcium instead of a multivitamin preparation. We further observed that the timing of initiating a multivitamin preparation varied between a few days to six months after surgery. Moreover, the duration of supplement intake varied from one year to lifelong.

If a nutrient deficiency was developed, both pre- and postoperatively, a specific micronutrient supplement was initiated in every hospital.

In one hospital, the GP was responsible for the entire follow-up of deficiencies. Only one hospital had a clinical pharmacist in the multidisciplinary team. This pharmacist was only involved preoperatively, and did not give advice about micronutrient supplements postoperatively.
Conclusions: In order to prevent nutritional deficiencies after bariatric surgery, standardized guidelines need to be developed and followed. As micronutrient supplements might interact with prescribed medicines, pharmacists have a role in advising the right supplements, but are so far not consulted.
Disclosure of interest: None Declared.

Hospital Pharmacy: Pharmaceutical Care

HP-PC050

Clinical pharmacist interventions in oncology setting in a tertiary hospital in Greece

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Background and objective: Clinical pharmacist's participation in multidisciplinary oncological teams has been proved beneficial. It is associated with prevention of adverse drug events and prescribing errors as well as with cost-saving. However, the role is still not well established in Greece. Our aim was to analyse the clinical pharmacist's contribution in a private Greek hospital.
Setting and method: Data were recorded from 1 April 2013 until 31 May 2014. Analysis of the clinical significant interventions (dose, wrong or missed chemotherapy agent, drug–drug interactions, dilution, method of administration, pre and post-medications) made by clinical pharmacists during chemotherapy order check before administration as required by quality standards of the hospital. All of the included interventions were documented and accepted by responsible physician.
Main outcome measures: Intervention types and impact of clinical pharmacist's contribution.
Results: During the study period 401 individual patients were treated and a total number of 6938 chemotherapies were administrated. A total number of 181 interventions recorded, 103 (57 %) in dose, 27 (15 %) in pre-and-post-medications, 17 (9 %) in dilution, 16 (9 %) in wrong or missed chemotherapy agent, 11 (6 %) in administration and 7 (4 %) in drug–drug interactions. Of the 103 interventions made in dose 68 % regarded inappropriate increased dose and 32 % decreased. More specific, the reasons for increased dose were wrong creatinine clearance (CrCl) calculation 41 %, protocol deviation 23 %, wrong body surface area calculation (BSA) 19 % and toxicities not taken into account 17 %. For the decreased doses the main reason was protocol deviation 55 %, followed by wrong BSA 24 % and CrCl 21 %.
Conclusions: For first time in Greek hospital, a study records the usefulness of clinical pharmacists in preventing medication errors in oncology/haematology patients. According to our results the most common preventable medical errors relate to the assessment of CrCl and incorrect calculation of BSA. The mandatory approval of chemotherapy by clinical pharmacist before administration to the patient lead to decrease in costs and to a significant improvement in safety and quality of patient care.
Disclosure of interest: None Declared.

Hospital Pharmacy: Pharmaceutical Care

HP-PC051

Evaluation of medication information at discharge from hospital

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Background and objective: The Norwegian patient safety program strongly focuses on safe medication use. One of the recommended actions is to focus on medication reconciliation at discharge from hospital. At Ålesund hospital (medical department) two interventions have been carried out: 1) Implementation of a template of structured discharge information (June 2010) and 2) Introduction of a computerized physician order entry (CPOE) system (March 2013). Both were expected to improve the quality of the medication information at discharge. In this study we investigated how the medication information changed during the period of these two interventions. In addition we explored physicianś perceptions of medication information at discharge.
Setting and method: We extracted *quantitative data* at five points of time from the electronic health record (Ålesund). Medication information was evaluated according to the national patient safety program scoring tool for medication information at discharge. The five points of time were chosen to make quality measures both before and after each intervention.

We collected *qualitative data* through nine focused interviews of physicians from medical departments at Ålesund Hospital and at St. Olavs Hospital.
Main outcome measures: Quality of medication information at discharge both to 1) the next level of care and to 2) the patients, were represented by a score (0–16 points) and changes in total score were measured. In addition the transcribed interviews of physicians were analysed concerning perceptions of medication information at discharge.
Results: In total, 124 discharge letters to next level of care and 95 discharge letters to patients were evaluated. For both groups the scores in the period after introduction of the CPOE system was significantly higher compared to the other four periods, ($P < 0.001$). No improvement was observed due to implementation of the standard template.

The physicians expressed various opinions concerning the potential value of CPOE. In order to assure that correct and updated medication information always is available for health care personnel responsible for the patients' treatment, a need for more cooperative digital systems between the care levels was pointed out. The physicians agreed that it was of most importance to inform the patients about new medications and changes in existing medications in addition to compiling a correct medication list at discharge.
Conclusions: Introduction of a CPOE system significantly increased the scores of written medication information at discharge, indicating that quality increased. This was not the case for the template for structured discharge information. According to hospital physicians, a correct and well-presented medication list combined with oral information, as well as more cooperative digital systems in-between health care levels are factors important for safe mediation use after discharge.
Disclosure of interest: None Declared.

Hospital Pharmacy: Pharmaceutical Care

HP-PC052

Potential drug interactions and pharmacist intervention at a provincial hospital in Spain

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Background and objective: Drug–drug interactions (DDI) represent a potentially serious problem that can result in preventable adverse drug events.Pharmacoepidemiological studies *have also shown that they* increase the rate of hospital admissions. *The aim of this study was to identify common interactions with clinical significance and to evaluate the effect of the* pharmacist interventions *at a Spanish 110-bed General Hospital.*
Setting and method: *Intervention study with a follow-up period of 3 months. Prescriptions from inpatients received at the Hospital Pharmacy Service were daily evaluated. Clinical significance of potential drug interactions was identified by using the* Lexi-Interact™ online *database. Dear Doctor Letters (DDL)* were used to inform health care professionals about drug *interactions. In order to avoid* alert fatigue, where practitioners become desensitized to the alerts, only DDL containing information about interactions with *moderate or major clinical significance were sent.* Pharmacist interventions were recorded and analysed. Each DDI was counted once per patient over the entire study period.
Main outcome measures: Classification of the potential important DDIs according to their clinical significance; Common interactions; Main involved drugs; Rate of acceptance of the pharmaceutical interventions by the prescribers.
Results: Data from 1324 patients were collected. The analysis of the 8849 prescriptions yielded a total of 81 potential important DDIs. According to their clinical significance, 59.3 % and 40.7 % were classified as major and moderate, respectively. Common interactions were: QT interval prolongation (42.0 %), extrapyramidal reactions or neuroleptic malignant syndrome (14.8 %), enhanced serotoninergic activity (11 %) and antabuse effect (6.1 %). Common drugs implicated included levofloxacin, haloperidol, citalopram/escitalopram, metoclopramide, ondansetron and trazodone.

It was not possible to evaluate the impact of 6 pharmacist interventions because of the patienťs discharge. The pharmaceutical interventions on major and moderate DDIs had rates of acceptance by the prescribers of 41 % and 39 %, respectively. Among the reasons why the pharmaceutical interventions were not accepted, the prescribers cited the medical conditions, the lack of non-interacting therapeutic alternatives and other circumstances.
Conclusions: Clinicians' recognition and detection of clinically significant DDIs is not optimal. Pharmaceutical interventions through a system of DDL are valuable and lead to changes in a high percentage of prescriptions.
Disclosure of interest: None Declared.

Hospital Pharmacy: Pharmaceutical Care

HP-PC053

Drug-drug interactions between anticancer agents and non-anticancer agents: evaluation of interaction databases

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Background and objective: The Multidisciplinary Oncology and Therapeutic Innovation (MOTI) department is in charge of patients receiving complex chemotherapy treatments. The patients from MOTI are often under multiple complementary medications and chronic therapies.

The prescription of anticancer agents is made using Chimio® software and the prescription of non-anticancer agents is made using Pharma® software. This process is facing an issue because the 2 software are not communicating with each other. The aim of this study is to understand if the fact of non-cross checking the results of each software could make us miss some interactions between all the prescriptions.

Setting and method: During 3 weeks, we collected 80 prescriptions that represent all the prescriptions made for patients under chemotherapy treatments at the MOTI. The different types of drug–drug interactions (DDI) are classified in 4 divisions: To take into account, Precautions for use, Disadvised Associations, Contraindications to use.

First of all we analysed the different prescriptions using Theriaque® database. In a second time we analysed the same prescriptions using different types of sources such as Vidal®Hoptimal, "CNHIM"folder, HAS recommendations and scientific publications.

Results: For the 80 prescriptions studied, 17 DDI were identified using Theriaque database and 87 using bibliographic sources.

Theriaque®:

– To take into account : 1
– Precautions for use : 1
– Disadvised associations : 15
– Contraindications to use : 0

Bibliographic sources:

– To take into account : 33
– Precautions for use : 30
– Disadvised associations : 23
– Contraindications to use : 1

Conclusions: The discrepancies between the DDI listing from Theriaque® database and other sources suggest that the Theriaque® database is not taking into account enough information concerning the DDI of anticancer agents. Unfortunately due to the previous issue we haven't been able to verify the consequences of non-cross checking.

This study also underlines the complexity of the analysis due to the use of generic anticancer drugs with different chemical formulation that can be responsible for other interactions.

In conclusion we must remain vigilant about the limitation and risks of databases in computerization. For a safe pharmaceutical analysis in MOTI, the results show the need to take action so that pharmacists are able to take better account of the DDI. Improvement action requires a strong mobilization of all actors particularly physicians and pharmacists for patient care.

Disclosure of interest: None Declared.

Hospital Pharmacy: Pharmaceutical Care

HP-PC054

Prevention and treatment of chemotherapy-induced nausea and vomiting in adults with non-small cell lung cancer

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Background and objective: Pharmacists prescribe and monitor, in consensus with Oncology, individualized Post-Chemotherapy antiemetic regimes for all patients in our Hospital. Antiemetic therapy prescribed to Non-Small Cell Lung Cancer (NSCLC) patients in the last five years is evaluated.

Setting and method: Retrospective observational study of NSCLC patients treated with standard chemotherapy who received antiemetic therapy between 2009 and 2013. Depending on emetogenic potential (EP) of the chemotherapy scheme, the pharmacist assigned and explained to the patient/family the most suitable antiemetic regime as:

– Low EP: metoclopramide 10–20 mg tds as needed (PRN).
– Moderate EP (Kit-1): dexamethasone 4 mg tds 2 days, then 4 mg bid 2 days, then 4 mg od 2 days, and metoclopramide 10–20 mg tds PRN.
– High EP (Kit-3): Kit-1 plus granisetron 1 mg at evening of chemotherapy.

When patient had no emesis on previous cycle, a reduction on regime was done, but if nausea/vomiting were felt, there was reinforcement on the regime: dosing metoclopramide around-the-clock, adding dexamethasone/granisetron of the next higher group, aprepitant on those with cisplatin-based therapies or lorazepam in anticipatory nausea/vomiting. Patient/family was always involved in treatment decisions. Patient data, prescriptions and monitoring were collected from Oncofarm® application and "Antiemetic Therapy" Pharmacýs Database, and analysed using SPSS statistical package.

Main outcome measures: Number of patients, gender, type of chemotherapy, type of antiemetic regime prescribed, type of intervention (reduction/reinforcement).

Results: 64 NSCLC patients (12.5 % female) received a total of 346 chemotherapy cycles. 268 antiemetic prescriptions were dispensed, so 77.46 % of times a patient received chemotherapy, came to pharmacy for antiemetic drugs. 40(62.5 %) patients came every time they had a cycle, 5(7.8 %) never did it, and 19(29.7 %) were absent in some cycles (7 for optimal control and no antiemetics needed). 59(92 %) patients started with Kit-3. Reduction of antiemetics was performed in 50.8 % of patients and 16.9 % required reinforcement. 37 patients received cisplatin-based chemotherapy, but only 4(10.8 %) needed aprepitant for better antiemetic control.

Conclusions: The large number of antiemetic prescriptions states the good acceptance from patients of the healthcare provided by the pharmacy. Progressive reduction of antiemetics in a half of patients and low use of aprepitant in high emetogenic schemes shows the good control and monitoring of nausea/vomiting with the antiemetic therapy prescribed.

Disclosure of interest: None Declared.

Hospital Pharmacy: Pharmaceutical Care

HP-PC055

Improving medication safety in patients with renal failure: the pharmacist's perspective

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Background and objective: The aim of drug therapy is to optimize clinical outcomes while minimizing drug-therapy problems (DRPs). To accomplish this, pharmacists often work in close cooperation with clinicians, with the ultimate goal of improving patient safety.

The objective of this study was to screen eligible patients for existing DRPs and then to subset those with renal insufficiency (RI). By doing so, we were able to compare risk factors in the renal group with those with normal renal function.

Setting and method: Three month study in an acute care hospital involving patients from surgical, gastrointestinal and cardiology units. All DRPs identified were discussed with the physician. Risk-related parameters were tabulated in both groups and compared using independent Student's t-test with alpha = 0.025.

Main outcome measures: Identification of risk factors in RI patients and create a list of drugs most frequently involved in DRPs in RI.

Results: Of 617 patients screened (263 male, Ø 71.2 years, Ø number of drugs 8.5, and 28.5 % on antibiotic therapy), 254 (41.1 %) had 390 DRPs. 197 patients with RI were identified (GFR < 60 ml/min; 68 male, Ø age 81, Ø number of drugs 9.7). 98 RI patients (49.8 %) had 173 DRPs, of which 34 were caused by antibiotic therapy. Categories of DRPs in renal patients: 47 drug interactions, 64 dosing problems, 1 adverse drug reaction, 32 incorrect drug choices, and 29 others, 31 patients needed DARI. As expected, there was a significant difference ($p = 0.025$) between RI patients vs. patients with other DRPs in the following parameters: age and serum creatinine levels. There was no significant difference in the average number of prescribed drugs. The 10

most frequently involved drugs in RI patients covered 73 % of the dose adjustments. Medication included esp. antihypertensive and antidiabetic drugs. Ranking list: Ramipril, Hydrochlorothiazide, Simvastatin, Metformin, Glimepiride, Cefuroxime, Sitagliptin, Enalapril, Spironolactone, Olmesartan.
Conclusions: Renal patients have an urgent need for medication review. Pharmacists are not always at the hospital, but knowing just ten critical drugs for DARI covers 3/4 of their DRPs. Data gathered here can serve as a working and learning tool for physicians in various settings.
Disclosure of interest: None Declared.

Hospital Pharmacy: Pharmaceutical Care

HP-PC056

Errors associated with computerized prescribing systems detected by a pharmacist

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Background and objective: The transition to Computerized Physician Order Entry (CPOE) has reduced transcription and prescription errors[1]. However, the CPOE can induce new types of errors. Many studies have described decreases in medication errors when the hospital moves from a paper system to a CPOE. The originality of this study is to highlight the errors related to the CPOE. Both objectives were: 1) To identify and compare errors encountered with the CPOE before (= period 1) and after (= period 2) improvements in the computer system. 2) To estimate the time needed by the pharmacy to resolve these errors.
Setting and method: A prospective study was conducted in an academic hospital from 23/02/2012 to 29/03/2012 for the period 1 and from 25/02/2013 to 25/03/2013 for the period 2 in all services using CPOE. Between the two periods, some improvements in the computer system were implemented.
Main outcome measures: A pharmacist working in the drugs dispensing sector recorded all errors related to the CPOE and estimated the time spent to solve them during these two periods.
Results: 12 094 prescriptions were analysed during the period 1 and 250 errors were then listed. Errors that didn't depend on the prescriber and those related to CPOE were distinguished. 46.8 % (n = 117) of the errors were caused by the computer system, 28.4 % (n = 71)involved a problem of units and 11.6 % (n = 29) a choice of inadequate packaging. 11 919 prescriptions were analysed during the period 2 and 225 errors were identified. A decrease in the number of errors between the two study periods for most encountered error categories was observed. The mean time to resolve one error has been estimated at 80 min.
Conclusions: The identification of errors related to the CPOE and the implementation process of resolving errors will allow optimizing the organization of the medication flow, to ensure that the right drugs are prescribed, dispensed and administered to the right patients at the right time, with an optimum risk–benefit ratio for the patient.

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Disclosure of interest: None Declared.

Hospital Pharmacy: Pharmaceutical Care

HP-PC058

Characteristics of DRPs documented in a DRP-database at Danish hospitals

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Background and objective: In 2010, a database of drug related problems (DRPs) was implemented to assist clinical pharmacy staff in documenting clinical pharmacy activities locally in Denmark. According to a study of quality, reliability and generalizability of the DRP-database, national analyses of the data may be conducted. Analyses at the national level may assist in identifying and subsequently preventing DRPs by performing national interventions. Hence, the aim of the study was to explore the characteristics of DPRs as documented by clinical pharmacy staff at hospital pharmacies in the Danish DRP-database during a three-year period.
Setting and method: The DRP-database is available to all clinical pharmacists at hospital pharmacies in Denmark, but the use is voluntary. Data documented in the DRP-database during the initial three years after implementation were analysed retrospectively. The DRP-database contains DRPs reported at hospitals by clinical pharmacy staff. The analyses focused on DRP categories, implementation rates and drugs associated with the DRPs.
Main outcome measures: Characteristics of DRPs.
Results: In total, 72,044 DRPs were documented in the DRP-database during the first three years of implementation, and the number of documented DRPs increased every year (1styear = 15,901, 2ns year = 27,203 & 3rd year = 28,940). The most frequently identified DRP categories were: "Dose", "Non-adherence to guidelines" and "Supplement to treatment", but the frequencies varied between the three years. An overall stable implementation rate of approximately 58 % was identified, and the highest implementation rates of DRP categories were similar for each of the three years: "Non-adherence to guidelines", followed by "Therapeutic duplication" and "Dosing time and interval". The top 25 drugs were involved in 58 % of the DRPs, and the drugs most frequently documented were paracetamol (4.6 % of all DRPs), simvastatin (3.0 %) and lansoprazole (2.7 %).
Conclusions: The study found that a national database on DRPs contained multifacetted DRPs, however evenly distributed for each of the three years. Even though the top 25 drugs were involved in 58 % of all DRPs, multiple drugs were associated with DRPs. The study emphasizes the importance of detecting and intervening for DRPs.
Disclosure of interest: None Declared.

Hospital Pharmacy: Pharmaceutical Care

HP-PC059

Dose adjustment of antibiotic drugs in obese adult patients

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Background and objective: An increase in the volume of distribution and/or drug clearance for some antibiotics has been described in obese subjects. This suboptimal drug exposure can lead to clinical failure and increase the risk of drug resistance.
objective: To evaluate the acceptance of pharmacotherapeutic recommendations for antibiotic dose adjustment in obese adult patients when necessary.
Setting and method: A 14-month prospective study in a private hospital of 160 beds. Height and weight were registered by nurses for all patients admitted to wards and Body Mass Index (BMI) was calculated by the clinical pharmacist (within the first 24 h after admission). When BMI was higher than 32, and there was no kidney dysfunction a dose adjustment recommendation was given to the physician according to the "Empirical Antimicrobial Therapy Guidelines" of our community. The patient's demographic data, kind of infection, description of antimicrobial dose adjustment and its acceptance were registered in a specific database.
Results: The study included 38 patients with a mean age of 61.4 ± 15.9 years [29–88]. Twenty two(57.9 %) were women. Twelve(31.6 %) patients had grade 1 of obesity (BMI 30–34.9), 21(55.3 %) grade 2 (BMI 35–39.9) and 5(13.1 %) grade 3 (BMI 40–50). Ten(26.3 %) patients had intra-abdominal infections; 10(26.3 %) respiratory tract infections; 8(21.1 %) genitourinary infections; 7(18.4 %) skin and soft tissue infections; and 3(7.9 %) fever of unknown origin.

The clinical pharmacist made 40 pharmacotherapeutic recommendations. In 20(50 %) cases higher doses were recommended and in 20(50 %) cases the recommendation was to use shorter administration intervals. These drugs were: 15(37.5 %) quinolones; 13(32.5 %) penicillines; 10(25 %) cephalosporins; 1(2.5 %) glycopeptides and 1(2.5 %) aminoglycosides. Finally, 18(45 %) pharmacotherapeutic recommendations were accepted and 22(55 %) were rejected because of: 8(36.4 %) low severity of infection; 6(27.3 %) hospital discharge in few hours; 5(22.7 %) prophylactic therapy; and 3(13.6 %) to avoid adverse drug events.

Conclusions: Despite it being very evident and safe that higher doses of antibiotics (or more frequent administration) are needed in obese patients a lot of them receive standard doses. The low acceptance of these pharmacotherapeutic recommendations could be explained both by the kind and severity of infection.

Disclosure of interest: None Declared.

Hospital Pharmacy: Pharmaceutical Care

HP-PC060

Quality of medication information, summary and comparison of medication errors at the transfer of elderly patients from hospital to nursing homes

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Background and objective: The mean age of Icelanders has increased rapidly in recent decades, according to figures from Statistics Iceland. In 2010, people 67 years and older were 10 % of the total population and it is expected that in year 2015 they will be 15 % of the total population of Iceland. With increased age, increase of the likelihood of diversing health problems and polypharmacy, factors that respectively are associated with worse fate. Although drugs can reduce morbidity and decrease symptoms they may lead to drug related problems that are common among the elderly. When patients transfer from hospital to another service level there is a risk of failure in medication information.

Setting and method: Setting: Patients 67 years and older discharged from Division of Internal Medicine at Landspitali—The National University Hospital of Iceland. Methods: The patients medication list, confirmed by a doctor, was sent to a machine dispensed multidose medication packages pharmacy, dispensed by the pharmacy and sent to the patients nursing home. The study group (prospective) received a medication report designed and written by the researcher, and the control group (retrospective) received no medication report. This study evaluated the risks of medication errors and the number of medication errors with or without a medication report at discharge. Quality of drugs were investigated, inappropriate drugs documented and classified according to Beers and IPET criteria.

Main outcome measures: Assessment of the quality of drug information, summary and comparison of medication errors for patients at discharge transferring from Landspitali hospital to nursing homes.

Inappropriate drugs according to Beers and IPET criteria.

Results: The average number of medications at discharge were 11 per patient. Patients that received a medication report, 53 % had one or more medication errors, versus 78 % in the control group. The most common type of discrepancy was omission (the medication at discharge did not appear on the pharmacy dispensing card). According to Beers criteria 78 % of patients had one or more inappropriate medication and according to IPET criteria 43 % of patients had one or more inappropriate medication.

Conclusions: Both medication errors and inappropriate medications are common in elderly patients. From the data collected it is impossible to conclude whether the percentage of medication errors are due to intentional medication changes made by the patient's doctor or if they are due to errors.

Disclosure of interest: None Declared.

Hospital Pharmacy: Pharmaceutical Care

HP-PC062

HIV post-exposure prophylaxis adherence in a weekly dispensation program

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Background and objective: Post-exposure prophylaxis (PEP) is a short-term antiretroviral treatment to prevent a potential HIV infection after exposure. It has been shown that PEP has a high success rate in adherent patients. The standard PEP regimen in our institution is the combination of Truvada® (emtricitabine/tenofovir) qd plus Kaletra® (lopinavir/ritonavir) bid for 28 days. Instead of a single dispensation of the full treatment, a dispensation PEP protocol on a weekly basis and a multidisciplinary follow-up was introduced two years ago in our centre in order to achieve full adherence. The aim of this study is to evaluate PEP adherence with the weekly dispensation protocol.

Setting and method: A retrospective observational study was performed in a tertiary university hospital in Barcelona from April 2012 to March 2014 (24 months). All patients >18 year-old with negative baseline HIV test starting PEP were included. Data were obtained from the pharmacy dispensation files and the electronic medical records.

Main outcome measures: The main endpoint was the number and percentage of patients who completed the four weeks prophylaxis regimen.

Results: A total of 103 patients were included. Records showed that only 83 out of 103 patients (80.6 %) consulted on weekly basis in order to pick up the medication and completed the PEP regimen. Twenty out of 103 patients (19.4 %) did not present to any of the follow-up appointments (10, 5 and 4 patients attended to the 1st, 2nd or 3rd visit, respectively). There is no information about PEP in one patient.

Conclusions: A new weekly PEP dispensation and follow-up protocol showed an adherence rate lower than expected. New strategies are needed to achieve full PEP compliance.

Disclosure of interest: None Declared.

Hospital Pharmacy: Pharmaceutical Care

HP-PC063

Introducing self-reporting questionnaires about adverse drug reactions to patients: attitude towards their first experience

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Background and objective: To explore patients' attitude towards self-reporting of Adverse Drug Reactions (ADRs).

Setting and method: A cross-sectional study was conducted at outpatient departments of two university hospitals. Patients, taking statins at least one month, received self-reporting questionnaires about ADRs which also contained 12 statements covering attitude towards self-reporting ADRs by patients.

Main outcome measure: 5-point Likert scale, ranging from strongly disagree (1) to strongly agree (5), was provided for each statement. Scores in negative statements were converted from strongly agree (1) to strongly disagree (5) before calculating total attitudinal score. Total score was classified into low to moderate (score 12–44) and high (>44) which were used to explore factors associated with attitude. Four experts including doctors and pharmacists validated content and structure of the questionnaire. Fifteen patients underwent pilot test of the modified questionnaire, in which Cronbach's α coefficient was 0.734.

Results: All 12 attitudinal statements were completed by 615 patients, most of them (76.3 %) also reported at least one adverse symptom potentially related to statins. Both patients reporting ADRs and those not reporting ADRs similarly had positive attitude towards preparedness for the reporting of ADR by regularly monitoring themselves [Median (IQR): 4 (4–5) vs. 4 (4–5); $P = 0.108$], prevention of ADRs is their direct responsibility [4 (3–5) vs. 4 (3–5); $P = 0.300$], and patients' ability to provide complete ADR information to health professionals (HCPs) [4 (3–5) vs. 4 (3–5); $P = 0.693$]. Additionally, both groups similarly had negative attitude towards participation in ADR reporting to HCPs is wasting time [2 (1–2) vs. 2 (1–2); $P = 0.058$]. Patients reporting ADRs significantly chose more attitudinal scales as agree or strongly agree than patient not reporting ADRs for not knowing that the adverse

reactions were caused by statins or other causes [4 (3–4) vs. 3 (2–4); $P < 0.001$], reporting ADRs by themselves is difficult [2 (2–4) vs. 2 (1–3); $P < 0.001$], and needing HCPs to support ADR reporting [4 (4–5) vs. 4 (4–5); $P = 0.005$]. Multivariate analysis indicated that attitude towards self-reporting ADRs was better in patients having less than 2 concomitant diseases [OR 1.446; 95 % CI 1.018, 2.054; $P = 0.040$] and patients reporting no ADRs [OR 2.071; 95 %CI 1.412, 3.039; $P < 0.001$].
Conclusions: Patients generally had awareness in ADR monitoring and willingness in self-reporting ADR. Nonetheless, they might experience difficulty in ADR reporting, especially in differentiating symptoms between diseases and medicines.
Disclosure of interest: None Declared.

Hospital Pharmacy: Pharmaceutical Care

HP-PC064

Pharmacological treatment of Clostridium difficile infection (CDI)

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Background and objective: To describe the characteristics and risk factors of patients with Clostridium difficile infection (CDI), as well as the treatments used for the control of such infection. To analyse the adherence to guidelines and the pharmaceutical interventions to improve treatment.
Setting and method: A retrospective study was made of patients with CDI from 2009 to 2013 in a third level hospital.
Main outcome measures: A case report form was used to record the following data: demographic variables, risk factors related to CDI, treatment and outcome and pharmaceutical interventions.
Results: Sixty episodes of CDI were recorded (12cases/year). 53.4 % were men, with a mean (SD) age of 70.37 (18.21) years. Fifty-five (91.6 %) presented more than 3 liquid depositions/day, 35,5 % had fever (>38°), 28,3 % with acute renal impairment and 90 % abdominal pain. Risk factors included age >64 years in 90 % of cases, previous hospital admission (3 months) in 49 %, use of antimicrobials (previous 3 months) in 40 %. Initial combined treatment was administered to 6,7 % of patients, all of them were considered severe infection. Metronidazole was alone used in 65 % and vancomycin alone in 5 %. The mean of duration was 12,4 (5,4) days. There was no recurrence in any case. There were collected 22 pharmaceutical interventions to improve posology (5 to election of drug, 10 to change dose, 5 to stop duration and 2 to change the route of administration), and all of them were accepted.
Conclusions: Standard treatment with Metronidazole and/or Vancomycin was associated to resolution of diarrhoeas without recurrence, so concurrent protocol of clostridium difficile infection is effective. There was a high adherence to the hospital guidelines. Pharmacists can help to improve treatments
Disclosure of interest: None Declared.

Hospital Pharmacy: Pharmaceutical Care

HP-PC065

The role of the clinical pharmacist in a pediatric service

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Background and objective: The paediatric population is at risk because of its pharmacological characteristics, the difficulties with the administration of drugs that are often inadequate for children and the lack of clinical trials in this population. Thanks to his expertise, the clinical pharmacist finds his own place in a paediatric service. The objective of this work is to measure the impact of his presence, through a survey of the pharmaceutical interventions.
Setting and method: During seven weeks, the pharmacist resident working in the paediatric nephrology and cardiology services—twenty beds—recorded all the pharmaceutical interventions, based on the grid established by the French Society of Clinical Pharmacy.
Results: 127 interventions over 1,332 of each item for each prescription (9.5 %) were recorded during 29 days of presence (around 5.6 per day [0;28]). It concerned 44 children (19 girls and 25 boys), with an average age of 4.8 years [7 d; 17.5 y] and an average weight of 19.8 kg [3.3; 78.4]. 52 % of the drugs concerned were administered orally and 44 % parentally. Around one-third of pharmaceutical interventions belongs to the A ATC class (alimentary track and metabolism), 24 % to the J class (antiinfectives for systemic use), 10 % to the B class (blood), 10 % to the L class (antineoplasing and immunomodulating agents) and 10 % to the N class (nervous system). The main issues identified are untreated indication (23 %), overdose (20 %), inappropriate route or administration (17 %) and underdose (16 %). A dose adjustment was suggested to solve 34 % of pharmaceutical interventions. 26 % of pharmaceutical interventions led to an addition of treatment, 17 % to an optimisation of administration modalities and 13 % to an interruption of treatment. The purpose of 9 % of pharmaceutical interventions was to help the physician prescribe. Only 4 % of interventions were not accepted.
Conclusions: This survey shows the interest of the clinical pharmacist in a service caring for a population at risk, such as paediatrics. In addition, the excellent acceptance rate of the interventions not only demonstrates their relevance, but also shows the importance for the pharmacist to be within a multidisciplinary team to be able to intervene as close as possible to the patient.
Disclosure of interest: None Declared.

Hospital Pharmacy: Pharmaceutical Care

HP-PC066

Delivering safe opiate infusions for analgesia in children

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Background and objective: Opiate infusions are essential therapy for children with severe pain. These infusions require complex dose calculations, multiple manipulations and complicated administration rate adjustments. This project aimed to minimise the risk of medication errors in nurse- or patient-controlled analgesia (N/PCA) for children.
Results:
Program description: A system management approach was used to minimise complex calculations and individualised medicine manufacture by providing standard dose-banded concentrations of morphine infusion, manufactured aseptically, for N/PCA administration using pre-programmed safety pumps.

Observation of current system used to prepare morphine N/PCA infusions (153) for 128 children (7.5 ± 5.6 years; mean ± SD) identified variety of techniques were used by anaesthetists and nurses to prepare these syringes. Analysis of the content of 78 morphine syringes made for N/PCA use in children showed that 61.5 %(48/78) had concentration outside pharmacopoeial limit (± 7.5 %), 75 %(36/48) were in excess with 28 %(10/36) deviating by >+ 20 % and one deviating by +100 %.

Therefore, changes were needed to ensure accuracy and consistency of morphine concentrations in syringes prepared for N/PCA for children. Prefilled syringes of varying strengths can be accurately, batch manufactured.

Having considered a) ability of pumps to deliver both continuous infusion and bolus; b) produce as few different concentrations as possible (safety and cost perspective); c) no more than 3 syringe changes daily; d) total daily volume of morphine infusion not >15 % of child's total daily fluid allowance, three standard concentrations of morphine were established:

– 3 mg/50 mL glucose 5 % for weight ≤3.99 kg
– 10 mg/50 mL sodium chloride 0.9 % for weight ≥4 kg–19.9 kg
– 50 mg/50 mL sodium chloride 0.9 % for weight ≥20 kg

Pilot implementation of standardised morphine infusions (n = 35 to date) was well-received by anaesthetists and nurses. Colour coded protocols and labels were regarded as lowering the risk of wrong selection. New system safety is being measured by number of medication errors before vs after implementation. Nurses and anaesthetists' satisfaction will be assessed through focus groups.
Conclusions: Whilst it is known that standard concentration morphine infusions can be utilised in paediatrics, this project demonstrates for first time that

they can also be used for N/PCA; eradicating unacceptable variation in individually prepared medicines. Preliminary data has suggested the system is easy to use, safe and quicker compared to previous system.
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Hospital Pharmacy: Pharmaceutical Care

HP-PC067

Clinical pharmacist coordinate cross-sector healthcare team in a psychiatric hostel

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Background and objective: Divergent medication lists may lead to potential adverse drug events (ADEs). This may affect the patient safety, especially in the interface between primary and secondary health care.

A study at a Social psychiatric Residential Institution (hostel) showed a lack of coordination of the patients' medication lists at the institution, in the hospital patient health records and medication administration systems. This is problematic because the patients are treated by physicians in both primary and secondary care.
Therefore, a clinical pharmacist was included to coordinate the medication treatment in the intersectionel health care team.
The objective was to evaluate whether implementation of a clinical pharmacist in a psychiatric intersectionel health care team may increase patient medication safety within the drug treatment.
Setting and method: The intersectional healthcare team included:

Primary care: general practitioner and care staff.
Medication documentation: Medication administration lists.
Secondary care: psychiatrist, district nurse and clinical pharmacist.
Medication documentation: Patient health record, medication history and medication administration lists, respectively.

The tasks of the clinical pharmacist included reconciliation of medication lists and medication review of all residents in the period April–May 2012.
Patient medication safety measures included the number of updated, available medication histories and medication reconciliation discrepancies at baseline, after a half and 1½ year.
Results: Based on 43 observed residents, 35 (81 %) were included at baseline.

At 17 residents (39.5 %) a current medication history was available.

In total, 385 (11/residents) discrepancies in relation to medication reconciliation were registered .

At follow-up, the number of present medication history increased to 42.2 % and 95.1 %, respectively.

The number of medication reconciliation discrepancies decreases to 7.5/residents and 4.2/residents, respectively.
Conclusions: The implementation of a clinical pharmacist in the intersectional psychiatric health care team showed an increase in the number of present medication histories (58 %) and a decrease in medication reconciliation discrepancies (62 %). These improvements are likely to reduce the number of potential unintended incidents and contributes to increased patient safety, within the drug treatment of psychiatric patients.
Disclosure of interest: None Declared.

Hospital Pharmacy: Pharmaceutical Care

HP-PC068

Compliance to guidelines on antibiotic prophylaxis in orthopaedic surgery: prospective study of 483 patients

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Background and objective: antibiotic prophylaxis (ABP) in orthopaedic surgery is one of the most important steps to avoid post-operative infections by resisting to bacterial growth. In 2010 the French Society of Anaesthesiology sat up guidelines to prevent wound infections during surgery. The objective of this study was to evaluate the compliance to guidelines in orthopaedic surgery when ABP is needed.
Setting and method: prospective study of medical records the day after the surgery for 500 patients underwent surgery for which ABP was required. The study was conducted in a 112 beds orthopaedic department in a French teaching hospital
Main outcome measures: patients (age, weight, BMI), type of intervention and duration, sequence of operating room, ABP realised (nature, dosage, time from perfusion to incision) according to booth anaesthetist file and surgical file
Results: 500 patients among 668 consecutive patients required/received ABP due to surgery. 17 received ABP without indication. For the 483 remaining, medium age was 56.6 [from 14 to 99], medium BMI was 25.5 [from 15.4 to 45.2], medium pass in operating room was 156′ [from 60 to 480] and medium surgery duration was 86′ [from 3 to 507]. Principal AB prescribed were cefazolin (69.2 %), co-amoxclav (15.5 %) and vancomycin (10.3 %). According to anaesthetist file compliance with guidelines was 17.8 % and 13 % according to surgical file. According to the anaesthetist file, the antibiotic kind, the dosage and the delay to incision were appropriate in respectively 98.6, 89.9 and 16.7 % of patients. Cefazolin was administrated too early (median/median difference) +12′ and +12.5′, Co-amoxiclav and vancomycin to late (medium/median difference) respectively −12′/−35′ and −12′/−21′. No significant difference was observed with the sequence of surgery ($p > 0.05$) or the kind of AB ($p > 0.89$).
Conclusions: this study highlights the limited compliance to ABP guidelines in orthopaedic surgery in our institution. While nature and dosage are respected, the major problem concerns the duration between infusion and incision which requires improvement by a better coordination between anaesthetists and surgeons teams in the care process.
Disclosure of interest: None Declared.

Hospital Pharmacy: Pharmaceutical Care

HP-PC071

Feasibility study on anticipated compounding of anticancer monoclonal antibodies and waste costs assessment

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Background and objective: Based on the dose banding concept, a feasibility study was conducted on anticipated compounding of anticancer monoclonal antibodies (McAb) in a French teaching hospital. The aim of this study was firstly to propose McAb standardized doses (SD) to cover the whole annual production, secondly to determine drugs for which SD can be prepared in advance and thirdly to assess cost savings incurred with SD.
Setting and method: A retrospective study over 12 months on McAb computerised prescriptions was carried out to gather the most frequently prepared doses. Ranges with a standard deviation of 5 % and 10 % were calculated. A bibliographic review of each McAb stability data was then conducted in order to select drugs that could be compounded in advance. Finally, the cost of drug waste was assessed.
Results: Eight different MbAc are compounded in our chemotherapy aseptic unit, representing 4389 doses, equivalent to approximately 10 % of the whole production (42012 doses in 2013). The proposed limit of ± 5 % for dose banding didn't seem appropriate to cover the majority of annual production. Therefore a standard variation of ± 10 % between SD and prescribed doses was defined. This range allowed SD to cover at least 75 % of the whole annual compounded doses. Regarding bevacizumab, five SD were chosen (300, 400, 500, 800 and 1000 mg) covering 84,3 % of annual prescribed doses. Six cetuximab SD (400, 500, 700, 800, 900 and 1000 mg) covered 96,5 % of prescribed doses. For ipilimumab, four standardized rounded doses (150, 200, 250 and 300 mg) covered 96 % of the whole production. For panitumumab, three SD were defined (300, 400 and 500 mg) representing 95 % of the annual compounding. For rituximab, selected SD (600, 700 and

800 mg) covered 90 % of production. Finally, regarding trastuzumab, four SD were defined (300, 370, 450 and 560 mg) and represented 86,8 % of the annual compounding. Only three drugs fulfilled the selected criteria (long-term stability over several months and annual production of at least 150 doses), allowing their anticipated compounding: bevacizumab, rituximab and trastuzumab. The waste costs of actual production represented 291 970€ over a year and standardized rounded doses could result in significant cost savings. Regarding the three MbAc for which production can be anticipated, waste cost was 239 976€.

Conclusions: These findings were similar to data previously published. In two French cancer centres, three SD and a standard variation of ± 10 % for rituximab and trastuzumab were retained (600, 700, 1000 mg and 300, 370, 450 mg respectively). Moreover, Jarkowski and al. showed that dose rounding of ipilimumab had the potential to result in significant cost savings by eliminating drug waste. Study results were presented to a committee composed of oncologists, haematologists and pharmacists. The emergence of subcutaneous doses as a new route of administration for MbAc was discussed and may call for a reflection on the future position of intravenous doses.

Disclosure of interest: None Declared.

Hospital Pharmacy: Pharmaceutical Care

HP-PC072

Content validation of a new Tool for the assessment of Drug Associated Risks (DART)

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Background and objective: During a patient's hospital stay, his medication undergoes many changes. This can cause drug related problems (DRPs) and rehospitalisation. Identifying patients with a high risk for drug-related problems (DRPs) might optimise the targeting of clinical pharmacy services during the hospital stay and upon discharge to those patients that most likely can benefit therefrom. A new screening tool, the Drug Associated Risk Tool (DART) has been developed in the format of a self-assessment questionnaire to identify patients at risk for DRPs. The questions in the DART based on a previously established consensus list of risk factors for DRPs [1]. The DART has been validated with 64 patients addressing feasibility, comprehensibility, and acceptability [2].

The objective of this study was to test the content validity of the DART.

Setting and method: The study was conducted on the medical, geriatric and orthopaedic wards of two general teaching hospitals. Consenting patients without any exclusion criteria filled in the DART and we compared their answers with objective patient data from medical records and laboratory data. Exclusion criteria were: age <18 years, ambulatory or palliative patients; a health status not allowing meaningful communication (e.g. severely demented) and no sufficient knowledge of spoken and/or written German to complete the DART.

Main outcome measures: Sensitivity and specificity of each item of the DART.

Results: A total of 164 patients (mean age: 69 years [range: 20–95 years], 49 % female) completed the DART. The questions of the DART reached an average specificity of 0.95 (range: 0.82–1), whereas the average sensitivity was 0.58 (range: 0.21–1). Questions about diseases with a strong influence on the patient's quality of life or about drugs which need special monitoring showed the highest sensitivity. For examples, oral anticoagulants requiring INR measurement showed a sensitivity of 1. In contrast, hepatic impairment as a disease that often remains without any subjective symptoms in the early stage of the illness showed a sensitivity of only 0.33.

Conclusions: The DART shows a consistently high specificity. False positive results can be excluded with a high probability. The sensitivity shows big variations among the different questions. An in-depth analysis of every question of the DART with special regard to the false positive and false negative answers will enable to explore the reasons for the low sensitivity and to improve the questions.

[1] Kaufmann C. et al. Drug-related problems and their contributing risk factors: A multidisciplinary approach. 41st European Symposium on Clinical Pharmacy (ESCP), Barcelona, Spain. October 2012

[2] Kaufmann C. et al. Validation of a new Tool for the assessment of Drug Associated Risks (DART); 42nd European Symposium of Clinical Pharmacy (ESCP), Prague, Czech Republic. October 2013

Disclosure of interest: None Declared.

Hospital Pharmacy: Pharmaceutical Care

HP-PC073

Medication reconciliation in an orthopaedic surgery unit: a preliminary study

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Background and objective: As provided by the ministerial order of April 6th 2011, a risk mapping and a plan to reduce risks of drug's dispensation was established in our orthopaedic surgery unit in order to improve security and quality of the Medicinal Therapy. Among the corrective measures suggested by this plan, Medication Reconciliation (MR) would allow to avoid most of described dangerous situations.

In order to assess the real impact of MR, a preliminary study was performed by analysing prescription errors at patient's admission.

Setting and method: This study was performed by a pharmacy resident during 3 weeks. Patients of 65-years old or more or with at least 3 home medications at admission could be included. MR was conducted in 3 stages: At first, collection of the Best Possible Medication History (BPMH) obtained by patient's interview and confirmed by another source (regular doctor, usual pharmacist, last prescription…); Then, identification of unintentional discrepancies (UD) comparing BPMH with prescription at admission and interviewing the prescriber; and, finally, correction of the prescription. BPMH, UD and corrections were analysed.

Results: Over the 129 patients hospitalized during this period, 62 corresponded to selection criteria (48 %) and 30 were enrolled in this study (23 %). 18 of them were hospitalized by emergency department and 12 had a programmed surgery. The patients were on average 78 years-old and had 5.3 medicines. UD occurred in 70 % of them (78 % of emergency patients and 58 % of programmed patients). Those were mostly omissions of recording home medication (50 %) and wrong dosages (47 %). These discrepancies concerned 1.4 drugs per patient on average, mostly cardiovascular medicines (60 %). Regarding prescription's corrections, 75 % of prescriptions were not corrected within 24 h after MR. The time dedicated to each MR differed from 35 min to several days (20 to 40 min for collecting BPMH, 10 min to 48 h for interviewing the prescriber and 5 min for correcting prescriptions).

Conclusions: The results of this study showed that recording patients' home medication is often incomplete or incorrect in our orthopaedic surgery unit. MR is able to detect these errors and to correct many situations described in the risk mapping. However, important waiting period to get the prescriber's interview can be a limiting factor for correction. The method must be improved in order to perform the MR in all patients corresponding to the inclusion criteria, to reduce the time spent on it and optimize the corrections.

This study proves the need for MR process in this unit. It will be the starting point to explain this project to the whole department members and should allow planning the strategy in order to perpetuate this process.

Disclosure of interest: None Declared.

Hospital Pharmacy: Pharmaceutical Care

HP-PC075

Hyponatremia and serotonin reuptake inhibitors consumption: is there a correlation ?

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Background and objective: In a study published in 2004, Fabien *et al* have found six cases of hyponatremia following treatment with paroxetine (on the fifteen patients included in the study). These authors considered that hyponatremia is a common side effect occurring treatment with serotonin reuptake inhibitors (SRI) and serotonin norepinephrine reuptake inhibitors (SNRI).

In the psychiatric hospital Guillaume Regnier, SRI, SNRI and some molecules such as carbamazepine and oxcarbazepine are widely used in the medical care of depressive and bipolar patients.

The first objective of this study is to find if there is a correlation between the number of patients with hyponatremia and consumption of classes of drugs known for giving this side effect.

The second objective is to study the possible differences in the frequency of hyponatremia among those molecules.

Setting and method: We have carried out a five years retrospective study regarding simple macro-indicators: the number of patients suffering from hyponatremia concurrently with the use of SRI/SNRI, oxcarbazepine and carbamazepine.

The total consumption of these molecules was quantified from the prescription database.

The hospital laboratory extracted the hyponatremia cases from it database during the same period.

Correlations between those parameters have been tested using simple linear regressions.

Results: There is no correlation between the cumulative SRI and SNRI consumption and hyponatremia ($R = 0.16$).

On the other hand there is a correlation between fluoxetine consumption and hyponatremia cases ($R = 0.60$).

Citalopram ($R = 0.68$), paroxetine ($R = 0.69$) and escitalopram ($R = 0.90$) have also led to the same observations.

Moreover, we got to the same conclusion as to carbamazepine ($R = 0.77$).

But others factors such as sex, age and co-prescription of diuretics may also explain these discrepancies.

Conclusions: The use of macro-indicators have enabled us to demonstrate a relation between the occurrence of hyponatremia and the administration of fluoxetine, citalopram, paroxetine, escitalopram and oxcarbazepine.

Thanks to the number of prescription of those molecules, we will be able to anticipate the number of hyponatremia expected and enhance the control of natremia.

Those macro-indicators will help us to initiate the most efficient clinical audits.

Keywords: hyponatremia, SRI/SNRI, macro-indicators

Disclosure of interest: None Declared.

Hospital Pharmacy: Pharmaceutical Care

HP-PC076

Bridging the gap between hospital and city for patient on oral chemotherapy

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Background and objective: To bridge the gap between hospital and city, we established an hospital city relationship between pharmacist/general practitioner (GP) and hospital pharmacist. This link aimed at ensuring a safe patient discharge and improving patients' management with oral chemotherapy.

Setting and method: Study is conducted in oncohematology unit over a period of 1 year. Patients treated by RFC and escalated BEACOPP protocols are enrolled after giving their consent. An interview with the patient is conducted by the hospital pharmacist resident to explain the chemotherapy and supportive cares. To anticipate patient discharge, the pharmacist is contacted to order specific drugs. Patient's medication plan is sent to pharmacist and GP by fax or email with a satisfaction questionnaire. The impact of this new activity in oncohematolgy unit, is also assessed.

Results: The pharmacist resident has been approached for meeting more patients, on other protocols with oral chemotherapy. Hospital-city relationship is performed for 29 patients: 14 RFC, 13 BEACOPP, 1 R-chloraminophene, 1 RCD. 18 pharmacists returned the satisfaction questionnaire: this activity was known by only 22 % of them. 94 % are satisfied and hope to develop this relationship. This relationship allows to inform on treatment modification and to adapt pharmaceutical advice. Documents sent are shared with the entire pharmacist team and then archived. According to clinicians, this activity is integrated to oncohematology unit: 100 % of them are satisfied and recommended it for all patients under oral chemotherapy. The key elements highlighted by clinicians are, first an useful information about drug availability before patient discharge. Secondly, in their view, a better information may help patient to enhance drug adherence especially thanks to his own pre-established medication plan.

Conclusions: Hospital-city relationship must be developed. Results of this study are promising and underline health professionals' involvement. Moreover, relationship between hospital pharmacist and oncohematologic physician is improved. This process should be developed on other unit as suggested by clinicians. The deployment of secure email will strengthen this activity.

Disclosure of interest: None Declared.

Hospital Pharmacy: Pharmaceutical Care

HP-PC077

Hematologic complications in patients treated linezolid

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Background and objective: To determine the proportion of hematologic complications in patients treated with linezolid.

Identify risk factors associated with haematological toxicity of linezolid.

Setting and method: We evaluated all linezolid treatments over 14 days duration between January 2007 and December 2012. Classified patients according to sex, age, duration of treatment and infectious focus. Thrombocytopenia considered x103/uL values under 100. The criterion of anaemia was a haemoglobin at baseline. Statistical analysis was performed using SPSS v 15 software, considering $p < 0.05$ as statistically significant.

Results: A total of 200 patients received linezolid over 14 days. The mean treatment duration was 38 days. In 52 % of the cultures was isolated methicillin-resistant Staphylococcal aureus. The age and duration of treatment were related to the development of anaemia (30 % in patients >65 years and 40 % in treatment greater than 84 days). No variable was correlated with the onset of thrombocytopenia. The anaemia appeared in 17 %, thrombocytopenia in 7 %,

Conclusions: A high percentage of patients treated with linezolid presents hematologic complications. The risk of anaemia increases with duration of treatment and is more common in elderly patients. Given the high rate of hematologic complications, any treatment with linezolid should be combined with regular analytical monitoring.

Disclosure of interest: None Declared.

Hospital Pharmacy: Pharmaceutical Care

HP-PC078

Efficacy of biological therapy in rheumatoid arthritis

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Background and objective: Analyse failure rate attributable to inefficiency and the line that are used different biological treatments: anti-TNF (adalimumab, etanercept and certolizumab), inhibitors of T-cell co-stimulation (abatacept) and inhibitors of interleukin-6 (Tocilizumab) in treatment of rheumatoid arthritis (RA) in first, second and third line.

Setting and method: Retrospective descriptive study in which treatment with biologic therapy from the start of treatment requests contained in the Pharmacy Department from January-2009 to June-2013 were evaluated.

Main outcome measures: Data were obtained from medical records (SIAS®) of each patient and Appendix IV of the statement as Health and Economic

Impact Treatments of biological drugs used in rheumatology. Variables were: biological treatment, line that they are used, discontinuation, time to discontinuation and reason for failure.

Results: Biological first line therapy was instituted in 91 patients: 3 patients received abatacept, 12 adalimumab, 11 certolizumab, 57 etanercept and 8 tocilizumab. Due to inefficiency (poor control of pain, swelling and laboratory parameters) 8 treatments with adalimumab (66.6 %), 3 with certolizumab (27.3 %), 21 with etanercept (36.84 %) and 3 with tocilizumab (37.5 %) broke and no treatment with Abatacept. 38.5 % of first line treatments were suspended due to inefficacy.

44 s line treatments were initiated: 7 abatacept, 18 adalimumab, 9 certolizumab, 9 etanercept and 1 tocilizumab. Ineffectiveness was disrupted by 2 treatments with abatacept (28.57 %), 5 with adalimumab (27.7 %), 4 with certolizumab (44.4 %), 4 with etanercept (44.4 %) and none with tocilizumab. The overall failure rate in this line stood at 34.4 %.

Finally 19 third line treatments were started: 9 abatacept, 3 certolizumab, 2 etanercept and 5 tocilimumab. Ineffectiveness led to interruption of 4 treatments with abatacept (44.4 %), 1 with certolizumab (33.3 %), 1 with etanercept (50 %) and 3 with tocilizumab (60 %). The overall inefficiency is 47.3 %.

Among the three lines 154 treatments were initiated: 30 with adalimumab (suspended 13−43.3 %), 23 with certolizumab (suspended 8−34.8 %), 19 with abatacetp (6 of which suspended −31.5 %), 68 with etanercept (suspended 26−38.2 %) and 14 with tocilizumab (suspended 6−42.8 %). 38.3 % of all initiated treatments were suspended by efficiency problems.

Conclusions: RA is a disease that presents a difficult therapeutic approach because it can be addressed with multiple drugs that often have a high failure rate. The anti-TNF drugs have a higher percentage of inefficiency which act by different mechanism. We can see that in first and second line you opt for treatment with anti-TNF while in the third therapeutic target changes (inhibition of interleukin-6 and T-cell co-stimulatory signal).

Disclosure of interest: None Declared.

Hospital Pharmacy: Pharmaceutical Care

HP-PC079

Long-acting olanzapine: clinical practice analysis in a psychiatric hospital

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Background and objective: Olanzapine pamoate is a long-acting injectable antipsychotic indicated in maintenance treatment of schizophrenia in adult patients stabilized with oral olanzapine, available in France since April 2010. Special precautions are to be taken when using long-acting olanzapine, during reconstitution and administration of the drug (deep intramuscular gluteal injection); the occurrence of a post-injection syndrome must also be monitored 3 h in a medical facility able to handle an overdose.

Since April 2010, 94 olanzapine pamoate treatments have been initiated in a French psychiatric hospital. We studied patients' characteristics, regimen used and olanzapine pamoate treatment safety.

Results: The sex ratio was 2.24 (65 males, 29 females), the mean age was 38 years old (youngest patient: 18, oldest patient: 83). Among the 94 patients who received long-acting olanzapine injections, 54 discontinued treatment (mean treatment duration: 6.53 months), 40 were still under olanzapine pamoate therapy (mean treatment duration: 18.43 months). The main indication for the use of long-acting olanzapine was schizophrenia (87 patients), 7 patients were treated for bipolar disorder.

More than half of the patients (47) were stabilized by 15 or 20 mg per day of oral olanzapine before initiation of long-acting olanzapine treatment, and started olanzapine pamoate at 300 mg given twice a month. A third (30) of the patients were stabilized with oral doses of olanzapine over 20 mg per day (ranging from 25 to 60 mg/day), 5 of them thus started the long-acting treatment at an off-label initial dose of 405 mg twice a month. The maintenance dose of long-acting olanzapine (after the first 2 months) was predominantly 300 mg, twice a month (37 patients) or 405 mg per month (24 patients); 15 patients discontinued treatment in less than two months.

Main discontinuation causes were: persistence of symptoms leading to switch to another antipsychotic (14 patients), patients who did not show up for following injections after discharge from the hospital (6 patients), patients who stopped to show up after several injections (9), excessive weight gain (4 patients gained from 8 to 12 kg), and sedation (4 patients). No adverse effects were reported by physicians among the other patients, and no post-injection syndrome was observed in the population studied.

Conclusions: Four years after its first approval, olanzapine pamoate took its place among the other long-acting injectable antipsychotics. Its safety profile appears similar to that of oral olanzapine and so far no serious adverse effects have been reported. Security measures implemented in the hospital appear to have been effective in preventing medications errors and adverse effects.

Disclosure of interest: None Declared.

Hospital Pharmacy: Pharmaceutical Care

HP-PC081

Identifying the gaps—implementing a similar pharmaceutical service in two hospitals

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Background and objective: Since January 2011 clinical pharmacists have conducted medication history and medication review for elderly patients in the Emergency Department (ED) at North Zealand Hospital, Hillerød (HIH). Inclusion criteria are patients over 50 years using ≥5 drugs. In January 2013 the implementation of the same service was initiated at Bispebjerg Hospital (BBH). The aim of the service is to identify drug-related problems increase patient safety and contribute to a safer medication process.

The objective is how to implement a well described and well implemented method of pharmacist-conducted valid medication history and medication review from one hospital to another using the model of improvement (Plan-Do-Study-Act).

Results: The method of the pharmaceutical service was transferred without further adjustments, as the two hospital wards were considered comparable.

However, during the period of implementation at BBH it was evident that the setting at the two hospitals differed as follows:

Patient population
–May influence changes in inclusion criteria and prioritizing of included patient

Patient flow
– Influences the amount of time available for the pharmacist to conduct the medication history and review
– The flow-analysis showed that the peak of admissions during the day differs resulting in different working hours

Hospital culture
– Adaption in regard to the organizational culture in the hospital

Location of work station for the clinical pharmacists
– Physical location of the pharmacist, close to nurses and physicians

Experience in performing medication review
– Greater experience at HIH

Workflow and efficacy
– Audit and observation at BBH by pharmacist from HIH in order to optimize the workflow

A number of parameters were found identical for the EDs at the two hospitals e.g.: Standard Operating Procedures, Communication plan, Post training education, Audit of medication reviews and method of communicating interventions to the physicians.

Conclusions: Adaption is crucial in order to optimize the service for a new setting and hence increase patient safety. To obtain a successful implementation of a well described method for pharmacist-conducted medication history and medication review, it is necessary to identify specifically how the two EDs differentiate, and adapt the method to new settings.

Disclosure of interest: None Declared.

Hospital Pharmacy: Pharmaceutical Care

HP-PC083

Medication review of in-patients in St. Elisabeth Cancer Institute Bratislava–the role of the hospital pharmacist

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Background and objective: The position and responsibilities of hospital pharmacist are changing in Slovak republic during last years—from the medication supplying of departments and clinics to the patient-centred pharmaceutical care. The goal of this study was to establish and evaluate processes to obtain and analyse medication review of in-patients leading to improve the pharmaceutical care and patientś safety.

Setting and method: The study was realised in the St. Elisabeth Hospital Pharmacy and Oncogynecology Clinic, St. Elisabeth Cancer Institute in Bratislava, Slovak republic.

Medication history was obtained during face-to-face interview between hospital pharmacist and patient as soon as possible after admission. The proclaimed medication was compared to "brown-bag review" and physicianś database. Medication history was analysed and the potential drug related problems were discussed with physicians.

Main outcome measures: Design of "yellow cards"—form of medication history, its analysis focused on drug-related problems, especially potential interactions. Drug interactions were assigned according the Drug Interaction Foundation Classification System. Yellow cards became part of medical reports.

Results: During 5 months were interviewed 167 female patients, for all of them were created yellow cards and analysed pharmacotherapy. Average age was 60.5 years, average number of used drug were 5 per patient. Of 167 patients, 56 % used less than 5 drugs, 12 % used 5 drugs, 8 % used 6 drugs, 7 % used 7 drugs and 17 % of patients used more than 8 drugs. The most used drugs were cardiovascular drugs (66.6 %), psychiatric agents (10 %), hypolipidemic agents (5.9 %), antidiabetic agents (5.6 %), analgesics and nonsteroidal antiflogistics (2.1 %). Three potential serious drug interactions were identified (digoxin-amiodarone; warfarin-amiodarone and spironolactone-potassium chloride). The medication history was analysed also in elderly patients ($\geq$65 years) using Beerś criteria. Four patients used amiodarone, 3 patients used propafenone, 3 patients used alprazolam, two patients used diclofenac. The hospital pharmacist counselled found drug-related problems with prescribers and noticed on identified interactions and inappropriate drugs. The hospital pharmacist also compared data from brown-bag review and physicianś database. Of 167 patients, 24 did not mentioned 1 prescribed drug, 7 patients did not mentioned 2 drugs and 2 patients have forgotten 3 prescribed drugs during the medication history interview with the hospital pharmacist.

Conclusions: The role of the hospital pharmacist in improving the pharmaceutical and health care in general is necessary. The hospital pharmacist could detect important information in patientś medical history reviews and be helpful in patient safety. To avoid medical errors and patientś damage, the cooperation with physicians is needed as well.

Disclosure of interest: None Declared.

Hospital Pharmacy: Pharmaceutical Care

HP-PC084

A qualitative exploration of the patient pathway leading to hospital admission with an infection, focusing on self-care

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Background and objective: Self-care relates to individuals looking after their own health, ranging from completely independent self-care with patients assuming total responsibility for their health to supported self-care, involving the clinical judgement of health professionals.[1] There is limited evidence that patients consult their general practitioners (GPs) with symptoms of coughs and colds, rather than adopting self-care approaches or seeking community pharmacy advice.[1] However, there is a lack of research on self-care strategies adopted by those admitted to hospital with infective episodes. The aim of this study was to explore the patient pathway leading to hospital admission due to an infective episode, with focus on self-care strategies.

Setting and method: The study was conducted at the infection and acute medicine admission unit of a Scottish teaching hospital. Patients commenced antibiotic therapy post-admission were included. Exclusion criteria were: <16 years; no capacity to consent; insufficient command of English. Pre-piloted semi-structured face-to-face interviews were conducted, audio-recorded, transcribed verbatim and analysed thematically. University and local NHS ethics approvals were obtained.

Main outcome measures: Symptoms prior to admission; self-care strategies; triggers for seeking professional advice; and reflections on any professional advice prior to admission.

Results: Twenty-one patients were invited to and consented to participate. Eighteen transcripts were available for analysis (2 failed recordings; 1 patient unwell). Mean patient age was 56 years (range 18–89); 8 were female; 11 were prescribed an antibiotic prior to admission; the most common diagnoses were skin and soft tissue infection (n = 9) and respiratory infections (n = 6). Severity of symptoms and insistence of family and friends were main triggers to seek professional advice. No patients reported seeking community pharmacy advice. Several instances of delayed GP appointments were reported, as were perceived instances of a delay in GP referral to secondary care. Few patients self-medicated.

Conclusions: While self-care or professionally supported self-care may not have altered the outcomes for these patients, there were delays in GP care and an over-reliance on GP services, as reported elsewhere in the literature.[2] Findings are limited by small sample size and one geographical setting, limiting transferability. However, results have relevance in terms of patient education including the need for all health professionals to promote red flag symptoms for infection and assist patients on judging severity of symptoms.

Disclosure of interest: None Declared.

Hospital Pharmacy: Pharmaceutical Care

HP-PC087

Introducing clinical pharmacy services: efficacy in a respiratory diseases clinic and physicians perceptions toward the services at a University Hospital in Northern Cyprus

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Background and objective: Background: Clinical pharmacists are a primary source of scientifically valid information and advice regarding the safe, appropriate, and cost-effective use of medications having wide scope in Drug Information and utilization, yet hospital based pharmaceutical care is not established in Cyprus. It's necessary to evaluate efficacy of ward based services and how physicians will percept and interact with such a practice which is thought to be the dominant pharmacy practice in the few coming years.

objectives: Aim of this study was to introduce and evaluate ward based clinical pharmacy services (CPS) in a Respiratory Diseases clinic in a university Hospital in North Cyprus, and assess its efficacy and physician's perceptions toward the services.

Setting and method: Methods: The study was a prospective interventional study introducing CPS's and documenting it over the study period of 60 days in a tertiary university hospital. A questionnaire investigating physicians' perceptions was also delivered to all physicians' at internal-medicine department including Respiratory Diseases physicians on baseline. After the end of the study physician's experience was evaluated, DTPs and Interventions were classified using DTP classification tool obtained from studies, and later evaluated by an independent clinical committee for their feasibility.

Main outcome measures: number and type of interventions and percentage accepted. physicians perceptions before and after introducing CPS's

Results: 82.35 % of the targeted physicians sample have responded to baseline survey,(n = 17) majority (92 %) did not had any previous interaction with clinical pharmacists,they generally well perceived and had high expectations to pharmaceutical care services in general. In implementing CPS, 118 interventions were done, 86.6 % accepted and regarded as clinically relevant.

Interventions mostly related to cardiovascular agents. Add/change/stop medications were the most common type of interventions (21 %). Most common resultant outcome was to avoid adverse effects or toxicities. Intervention were significantly related to number of drugs used($r = 0{,}487$; $p = 0{,}006$), rate of acceptance significantly was higher to services compared to interventions ($p < 0.005$).

Conclusions: The introduction of CPS's with-in the healthcare team lead to clinically relevant and highly accepted optimization of medicine use in different wards and clinics including respiratory diseases clinic in the case of this study, it was relatively well perceived by physicians, but also could be more valued if more optimized and practiced by talented proactive clinical pharmacists in ward-based manner.

Disclosure of interest: F. Rasmussen: None Declared, R. Demirdamar: None Declared, A. Abdi Other The authors declare that there are no conflicts of interest.

Hospital Pharmacy: Pharmaceutical Care

HP-PC089

Reuse and reimbursement of the surplus chemotherapy in Turkish hospital

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Background and objective: The costs to the health services of the diagnosis and treatment of cancer are substantially increased. Delivering chemotherapy efficiently and economically to the right patient at right time with right dose and right route requires advanced technology and centralized chemotherapy unit. Such a unit is necessary when the number of weekly reconstitutions in a hospital reach one hundred. The standard centralized chemotherapy preparation unit require advanced technology device equipped with software and highly aseptic condition, controlled by oncology clinical pharmacist. According to the national laws or guidelines in Turkey the chemotherapy doses are individually tailored, and so in many occasions there will be a quantity of surplus material in the vial after the dose has been prepared. To measure the economic impact of the surplus chemotherapy and to determine the important role of the highly aseptic robot system in reusing the surplus chemotherapy, and maintaining patient and staff safety.

Setting and method: Statistical analysis for the surplus chemotherapy was done during three months for 1200 patient admitted to Kartal oncology centre in Turkey.

Main outcome measures: The quantity in mg that purchased for each individual patients including all type of chemotherapy with a mean of 1,7 per order have been calculated and subtracted from the actual quantity that have been prepared for the same patients. The same calculation was done after reusing surplus chemotherapy with highly aseptic robot system, and its economic impact was determined.

Results: Reusing surplus chemotherapy Saved 15€ per patient per day, the safety standard for both patient and staff was efficiently achieved, and the time for chemotherapy preparation was significantly decreased. The average preparation time per dose is 3–4 min.

Conclusions: Centralized chemotherapy unit with highly aseptic robot system is highly effective in saving time and cost, we achieved more efficient and less stressful work both in the pharmacy and the ward. The Turkish Ministry of Health should introduce the robot system to all oncology centres in Turkey.

Disclosure of interest: None Declared.

Hospital Pharmacy: Pharmaceutical Care

HP-PC090

Analysis of pharmacological interactions in patients with oral anticoagulation

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Background and objective: To assess the pharmacological interactions of patients treated with oral anticoagulants, to analyse its impact on the INR, and carry out interventions for this purpose to avoid serious health consequences for patients.

Setting and method: Pilot study carried out in a regional tertiary care hospital during March 2014. All inpatients electronically prescribed with acenocoumarol or warfarin were selected. All their concomitant treatment was checked if it had any interaction with the oral anticoagulant, and if it had any influence on the INR. The information was obtained from the electronic prescription program and electronic case history (Diraya®). The INR levels established for each diagnosis were taken from various bibliographical sources and confirmed by the haematology service. Physicians were alerted of significant interactions in the section of yellow footnotes of the electronic prescription, proposing alternatives, or readjusting the doses of anticoagulant.

Results: 305 patients were selected. The indications for the oral anticoagulant were: atrial fibrillation (61 %), valvular prosthesis (20 %), ischemic cardiopathy (8 %), deep vein thrombosis (4 %), flutter (1.7 %), and brain damage (3.5 %). 112 (37 %) patients had a significant interaction. The identified interactions were with AAS (30.3 %), Acetylcysteine (14.2 %), Allopurinol (7.1 %), Amiodarone (23.21 %), Atorvastatin (33.03 %), Ceftriaxone (8.9 %), Ciprofloxacin (0.89 %), Ketorolac (5.3 %), Levothyroxine (11.6 %), Omeprazole (4.4 %), Paroxetine (1.7 %), Sertraline (0.89 %) and Simvastatin (12.5 %). 47.3 % of patients who had any interaction presented an INR below the recommendation for his pathology, and 17 % above the recommended INR. 16 patients (14 %) had an interaction with clinical significance that needed adjustment of the prescribed treatment. In six cases the medicine was replaced with another, other three withdrew, and the six remaining patients suffered an overdose that was reverted by vitamin K.

Conclusions: The interactions suppose one of the principal causes of destabilization of the anticoagulant treatment, leading to serious effects such as haemorrhages or thromboembolism, either from addition of, or withdrawal from, habitual medicines with maximizing or inhibiting function. Monitoring by the pharmacist of these at-risk medicines acquires great relevance in the hospital sphere for the broad prescription of new medicines, the target being to avoid these interactions and to protect the health of the patient.

Disclosure of interest: None Declared.

Hospital Pharmacy: Pharmaceutical Care

HP-PC091

Determination of CYP2C19 polymorphisms, adverse drug reaction, and medication adherence in patients utilized selective serotonin reuptake inhibitors

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Background and objective: The aim of the study is to determine cytochrome P-450 2C19 (CYP2C19) enzymes polymorphisms, adverse drug reactions, and medication adherence in patients who were diagnosed with major depression utilized selective serotonin reuptake inhibitors.

Setting and method: This study was conducted in outpatient psychiatry clinic between December 2012 and May 2013. The patients were eligible if they used selective serotonin reuptake inhibitors (sertraline, citalopram or escitalopram) at least four week and were 18 years and older; and accepted to participate to the study.

Main outcome measures: Polymorphisms were determined from genomic DNA by using 'Real-Time Polymerase Chain Reaction' method. 'Toronto Side Effects Scale' (1) and the four items (Morisky, Green and Levine) adherence scale (2,3) were evaluated.

Results: Fifty-three major depression patients (mean of age: 33.25 ± 11.29 years old; male/female: 7/46) were included in this study. The patients were treated with sertraline (58.5 %), escitalopram (37.7 %), citalopram (3.8 %). The most common adverse drug reactions that patients reported were drowsiness/daytime somnolence (54.7 %), malaise or fatigue (43.4 %), sweating (43.4 %), nausea (41.5 %) and dry mouth (41.5 %). Only nine (17 %) patients were found high adherent to their medication. When evaluating the CYP2C19 polymorphisms of patients, 37.7, 24.5 and 20.8 % of the patients

were classified as intermediate, extensive and ultra-rapid metabolizers; respectively. Allele frequencies of CYP2C19*17 and CYP2C19*2 was calculated as 24.5 % and 27.4 %; respectively. When compared with individuals with extensive metabolizers, it was found higher adverse drug reaction scores in individuals with intermediate phenotype and lower adverse drug reaction scores in individuals with ultra-rapid phenotype, but these differences were not statistically significant ($p > 0.05$).
Conclusions: Large-scale studies are needed to put forth more clearly the relationship between adverse effects, medication adherence, and treatment outcomes depending on the pharmacokinetic characteristics.

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Disclosure of interest: None Declared.

Hospital Pharmacy: Pharmaceutical Care

HP-PC093

Monitoring of administration and adverse reactions of human normal immunoglobulin, intravenous: experience from a University Hospital in Thailand

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Background and objective: Human normal immunoglobulin, intravenous (IVIG) has been used for several immunological disorders. In Thailand, IVIG is considered as an essential drug. According to the Thai guideline for rationale use of essential medicines, use of IVIG requires special monitoring of rate of administration and adverse drug reactions (ADR) due to its common adverse effects on cardiovascular system and less common but life-threatening ones on hematologic system. This study was aimed to review IVIG administration and ADR monitoring of IVIG at the Srinagarind Hospital, a tertiary care university hospital.
Setting and method: This study was a retrospective study. Patients receiving IVIG during January, 2011 and August, 2013 were included in the study. Patient data was collected from a database of the department of pharmacy service and medical records.
Main outcome measures: Drug administration and ADR monitoring were evaluated whether they were in accordance with the national guideline.
Results: A total of 128 patients receiving 190 courses of IVIG were included in this study. Most were male (68; 53.1 %). Majority of the patients was in age of 18 or older (36 patients, 28.1 %), following by 1 month or younger (33 patients, 25.8 %), and over a year to six years (28 patients, 21.9 %). The three most common uses of IVIG were for primary immunodeficiency diseases (65 courses, 34.2 %), severe Guillian-Barre' syndrome (28 courses; 14.7 %), and sepsis with disseminated intravascular coagulation (14 courses, 7.4 %). Among 123 courses receiving IVIG as a single dose, IVIG was administered in accordance with the national guideline in most of the courses (104 course; 84.6 %). However, only 6 courses (4.9 %) followed the criteria for vital sign monitoring. Out of 67 courses of multiple doses, IVIG administration for the first and later doses met the criteria in 47 courses (70.2 %) and 43 courses (64.2 %), respectively. Vital sign monitoring was observed to be in accordance with the criteria in 20 courses (29.8 %) and 12 courses (17.9 %), respectively. It is important to note that monitoring of ADR was documented in only 75 treatment courses (39.5 %). Premedication was provided partly to the patients (40 courses; 21.1 %), two of these were reported adverse reactions from IVIG. Among 150 non-premedication courses, 8 were found IVIG adverse reactions.
Conclusions: Most of treatment courses were appropriate in drug administration. However, ADR monitoring is importantly urged to assure patient safety.
Disclosure of interest: None Declared.

Hospital Pharmacy: Pharmaceutical Care

HP-PC094

A case report of self-induced overdose of dabigatran and nebivolol

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Background and objective: Self-induced overdoses trigger emergencies, especially when molecules are life threatening. Caring for a patient who is intoxicated from dabigatran is challenging as this direct oral anticoagulant has no antidote and it may lead to severe blood loss.
Setting and method: A case report of self-induced overdose of dabigatran and nebivolol.
Results: The patient, a 69-year old woman, was found unconscious after ingesting sixteen dabigatran 150 mg capsules and eighteen nebivolol 5 mg tablets. The beta blocker intoxication was objectified by bradycardia to 25 bpm and was treated with continuous infusion of isoprenaline 1 mg/hr. Plasma concentrations of dabigatran were measured by HEMOCLOT® assay, about 6 and 15 h after the ingestion. They were 259 and 400 nanogrammes per millilitre (ng/ml) respectively. Haemostatic evaluation at admission showed an activated partial thromboplastin time higher than 150 s, which is at least 4.5 times more than the reference time, and an activated thrombin below 1 per cent. On the sixth day of hospitalization, an MRI was performed due to hand tremors that might have been caused by cerebral haemorrhage, but nothing was found.

The RE-LY study has demonstrated that the probability of haemorrhagic stroke increases with the blood levels of dabigatran. High blood residual concentrations, up to 1000 ng/ml, could be found in some patients from the trial but no bleeding was filled.

This case confirms that it is not possible to determine a critical rate beyond which the haemorrhage risk is high.
Conclusions: This case shows that massive intoxication from dabigatran is not always associated with haemorrhage despite high plasma concentrations and haemostatic disorder. Intoxications from direct oral anticoagulants remain underreported, due to their recent marketing, complicated pharmacology and high inter-individual variability.
Disclosure of interest: None Declared.

Hospital Pharmacy: Pharmaceutical Care

HP-PC095

Perceived need to take medication is associated with non-adherence in rheumatoid arthritis

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Background and objective: In patients with rheumatoid arthritis (RA), medication adherence is suboptimal. Different studies demonstrate that patients' beliefs about medication are associated with non-adherence. However, this is the first study which aims to examine associations between beliefs about medication and non-adherence taking psychological confounders into account.
Setting and method: For this cross-sectional study, eligible patients (diagnosed with RA for ≥one year, ≥18 years and using ≥one disease-modifying

anti-rheumatic drug) were included by their rheumatologist during regular outpatient visits between September 2009 and September 2010. Included patients received questionnaires. Associations between beliefs and non-adherence, and the influence of demographical, clinical and psychological factors (symptoms of anxiety/depression, illness cognitions, self-efficacy) were assessed using logistic regression.
Main outcome measures: The Beliefs about Medicines Questionnaire (BMQ) was used to measure the perceived need to take medication (necessity beliefs), the concerns about taking medication (concern beliefs), general medication beliefs, and attitudes towards taking medication. Medication non-adherence (no/yes) was measured using the Compliance Questionnaire Rheumatology (CQR).
Results: 580 of the 820 eligible patients willing to participate were included in the analyses (68 % female; mean age 63 years; 30 % non-adherent to their medication). Weaker necessity beliefs (OR: 0.8, 95 % CI 0.8–0.9) and an unfavourable balance between necessity and concern beliefs (OR: 0.9, 95 % CI 0.9–1.0) were associated with CQR non-adherence. Also, having an indifferent attitude towards medication (no/yes) was associated with CQR non-adherence (OR: 5.3, 95 % CI 1.1–25.8), but the prevalence of patients with an indifferent attitude towards medication was low. The associations were barely confounded by demographical, clinical and psychological factors.
Conclusions: (Weaker) necessity beliefs about medication, a more unfavourable balance between necessity and concern beliefs about medication, and having an indifferent attitude towards medication were associated with medication non-adherence. Psychological factors hardly confounded those associations. Of the BMQ constructs associated with non-adherence, increasing necessity beliefs about medication in clinical practice might be most worthwhile to improve medication adherence in RA patients.
Disclosure of interest: None Declared.

Hospital Pharmacy: Pharmaceutical Care

HP-PC096

Safety measures of high-alert medications in paediatrics hospital

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Background and objective: High-alert medications are drugs associated with the highest risk of injury when they are misused. Paediatric population itself is at high risk of drug misuse. In a previous study, a list of 17 high-alert medications was identifying in our department.

The aim of this study is to identify the list of safety measures to reduce errors on high-alert medications use process.
Setting and method: A three-step process was set: (1) literature review, (2) electronic survey sent to clinicians (seniors and residents), nurses and pharmacists working in a paediatric hospital. The participants were asked to select safety measures from the list constructed from the literature search and to suggest other measures for the use of high-alert medications. (3) A consensus staff approved a list of safety measures for the hospital with a prioritization of action.
Main outcome measures: Obtain a list of paediatric measures to secure high-alert medications process.
Results: The review of literature identified 69 safety measures. The response rate to the survey was 20 % and nurses were the most represented category (64 %). Survey participants suggested improvement to safety measures in the following areas: incident reporting, drug administration protocol, clear and accessible information about medications, and double-checking implementation. The consensus list was composed of 53 measures. Several working groups are created to set up these projects. Some high-alert medications are daily used, for example insulin in endocrinology and anaesthetics in operating rooms. The medical staff working in these departments is not bound to implement the complete measures, but these exceptions are notified on the protocol. 26 % of these measures are already set up.
Conclusions: We proposed additional safety measures to prevent medication errors associated with high-alert medications. These measures addressed human, technical, organizational, and environmental factors such as information sheets for each high-alert medications, development and standardization of safety procedures and identification of high-alert medications in stockrooms at the pharmacy and the health care units. The implementation of these measures in paediatric hospital should help to prevent medication errors, and subsequent studies will be carried out to confirm their effectiveness. The outcomes expected are a reduction of medications errors, an increase of reporting incidents of errors and nearly errors.
Disclosure of interest: None Declared.

Hospital Pharmacy: Pharmaceutical Care

HP-PC097

Four-year follow-up of surgical sites infections (SSIs) in orthopaedic surgery: impact of implemented measures

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Background and objective: In France, SSIs rate in orthopaedic surgery is about 0.9 % (SOFCOT 2007). A national program (RAISIN 1999) and a standardised follow-up (2005) were set up to minimise the occurrence of SSIs. In our department SSIs are followed up 4 times a year during the multidisciplinary morbidity and mortality review (RMM). In the last 4 years, the SSIs rate increased and measures had to be implemented. The main objective of this work was to describe the actions and to assess their efficiency on the SSIs rate
Setting and method: Four-year retrospective and observational survey of total hip prosthesis (THP), total knee prosthesis (TKP) and unipolar hip prosthesis (UHP) SSIs rates according to the decisions made during the RMM. During each session, the quality technician submitted SSIs data. Following the analysis, the team selected feasible and relevant actions to improve patients care. Their efficiency was assessed through the variations of SSIs rates at the following sessions
Main outcome measures: For each surgical procedure: ASA score, NNISS score, SSIs rate; implemented measures
Results: From 2010 to 2013, 1 612 interventions were analysed (707 THP, 534 TKP, 371 UHP). The SSIs rate was significantly different ($p < 0.005$) between THP/TKP (2.41 %) and UKP (5.54 %); ASA and NNISS scores were steady. A non-significant decrease in SSIs rate started in 2013, explained by a progressive benefit of the implemented actions. Actions consisted in a sensitization of the healthcare team, an audit of practices, the improvement of prophylactic antibiotic, dressings and stitches methods
Conclusions: This preliminary analysis showed no significant influence of implemented actions on SSIs rate, which does not seem to be the best indicator of effectiveness. The latter targeted superficial SSIs which disappeared in 2013. Finally, measures were recently introduced so the feedback was insufficient to conclude on their efficacy.
Disclosure of interest: None Declared.

Hospital Pharmacy: Pharmaceutical Care

HP-PC098

Inhalation technique in hospitalized asthma and COPD patients: should patients be regularly assessed before discharge?

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Background and objective: Correct inhalation technique is crucial for optimal effect of drugs used in the treatment of patients with obstructive lung diseases. Studies have shown that skills and knowledge with regard to the use of inhalation devices is variable in both patients and health professionals. We aimed to investigate whether hospitalized patients used their inhalation medicines

correctly and furthermore, to assess whether certain patient parameters could predict poor inhalation technique.
Setting and method: Asthma and COPD patients who used inhalation medicines were eligible for the study; the patients were recruited from Department of Medicine at Ålesund Hospital, autumn 2013. A clinical pharmacist interviewed the patients and tested their inhalation technique close to discharge. Patient information and data on possible risk factors was collected through medical records and a questionnaire. Karnofsky performance scale was used to evaluate patient performance. Furthermore, patients were asked to perform two lung function tests; peak inspiratory flow and spirometry. Simple checklists developed for different devices were used to assess the inhalation technique.
Main outcome measures: Number of patients with poor, intermediate or good inhalation technique and parameters predicting patients with poor inhalation technique.
Results: Altogether 43 patients were included in the study. The mean age of the patients was 69 years, 22 men and 21 women. On average, the patients used 13.2 drugs, and 35 patients (81 %) used two or more inhalators. A large proportion, 46.5 % of patients had intermediate or poor inhalation technique. Nine patients (21 %) claimed they had never received any training in use of the inhalators. There was no significant correlation between age, performance status, lung function, vision, number of inhalers or previous training, and the inhalation technique. However, there was significant correlation between use of certain "risk" drugs (anxiolytics, hypnotics, sedatives, antidepressants and certain anticonvulsants) and poor inhalation technique.
Conclusions: Our results show that there is a need to improve inhalation technique in hospitalized patients with asthma and COPD. We believe that regular assessment of the technique, combined with training, will improve patients' inhalation technique. We did not find any patient parameters that could easily predict poor inhalation technique, but perhaps one should pay particular attention to patients using certain "risk" drugs. Hospital admission gives possibilities to evaluate the patient's inhalation technique and to provide appropriate training before discharge.
Disclosure of interest: None Declared.

Hospital Pharmacy: Pharmaceutical Care

HP-PC100

Exploring health professionals' views and experiences of medicines management for elderly, hospitalized patients in Abu Dhabi

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Background and objective: Elderly patients are at risk of medicines related issues due to several factors including alterations in pharmacokinetics and pharmacodynamics; and polypharmacy. While there is no standardized, universally accepted definition of 'medicines management', this basically refers to 'getting the best from medicines'. The objective of this qualitative study was to explore health professionals' views and experiences of medicines management for elderly, hospitalized patients in Abu Dhabi, as an initial step in the development of medicines management guidelines.
Setting and method: The research was conducted in five major hospitals in Abu Dhabi, United Arab Emirates (UAE). An online sampling questionnaire was circulated to all nurses, pharmacists and physicians. Health professionals were purposively selected to participate in a face-to-face interview (20–30 min). Interviews were audio-recorded, transcribed verbatim and analysed independently by two researchers using the Framework Approach.
Main outcome measures: Views and experiences of: medicines related issues in elderly hospitalised patients; current healthcare structures and processes (e.g. training, documentation, communication) relating to medicines management; changes to structures and processes required to optimise patient outcomes.
Results: Saturation of themes was deemed to occur at interview 27 (7 nurses, 13 pharmacists, 7 physicians). Key themes were multi-morbidities and polypharmacy requiring careful medicines selection and monitoring. It was acknowledged that this process was complex and at times sub-optimal. Evidence based guidelines were highlighting as focusing on patients with single conditions only. Further themes were the difficulties in obtaining completed medication histories, medication non-adherence in the elderly and patient education. Several noted the need for training and the development of standard operating procedures to optimize patient outcomes while acknowledging a lack of staff specialized in this area.
Conclusions: The key themes identified in this research indicate the need to develop a more structured approach to medicines management in elderly hospitalised patients in the UAE. One limitation is that the research findings are not necessarily transferable out with the UAE. The next stage of the research is to use the findings to aid the development of statements on medicines management to be use in a Delphi study to determine levels of consensus agreement amongst an expert panel.
Disclosure of interest: None Declared.

Hospital Pharmacy: Pharmaceutical Care

HP-PC101

Compatibility of HERCEPTIN SC with sc administration materials

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Background and objective: Herceptin SC was developed as a new formulation to allow subcutaneous administration of Trastuzumab (Herceptin™) and received approval by EMA in August 2013 for the treatment of HER-2 positive early and metastatic breast cancer. Herceptin SC was developed as ready-to-use solution in a single-dose vial and does not require any dilution prior to administration; however, needs to be prepared for injection by health care professionals. The study purpose was to assess the physico-chemical stability and compatibility under simulated use conditions for up to 4 weeks and subsequent simulated SC administration.
Setting and method: Herceptin SC formulation was transferred aseptically under a laminar flow hood from product vials into disposable, single-use polypropylene and polycarbonate syringes and stored for up to 4 weeks at 2–8 °C. Subcutaneous administration was simulated after an additional hold time of the syringes at 30 °C to simulate ambient conditions using conventional stainless steel injection needles as well as disposable infusion sets made of polyvinylchloride or Polyurethane/Polyethylene. Physico-chemical quality of Herceptin SC was evaluated by using compendial and product formulation specific analytical methods and acceptance criteria.
Results: All physico-chemical attributes tested were comparable to controls, independent of the administration materials tested. A slight increase of charge variants was observed for those samples stored at temperatures above 2–8 °C which, however, can be attributed to the known temperature dependency on the formation of charge variants for Trastuzumab.
Conclusions: After simulated preparation, storage and administration, Herceptin SC remained stable from a physico-chemical point of view for up to 4 weeks at 2–8 °C and was found compatible with tested administration materials. Hold times above 2–8 °C should be avoided in general due to formation of charge variants.

Application of Herceptin SC is to be according to the local package insert and from a microbiological perspective, the product should be used immediately and aseptic procedures followed for preparation in order to maintain sterility.
Disclosure of interest: None Declared.

Hospital Pharmacy: Pharmaceutical Care

HP-PC102

Off-label use of medicines in hospitalised children and adolescents in two wards in Norway

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Background and objective: The purpose of this study was to collect information about the use of off-label and unlicensed medicines in children and

adolescents admitted at two paediatric wards at Oslo University Hospital, Ullevål, Norway.
Setting and method: Patients admitted at either the medical or the infectious diseases paediatric ward were included in the study during a 5-week period. A standardized Data Collection form (DCF) was used to collect patient data (age, weight, diagnosis), and medication data (dose, indication, form, route of administration, handling). Information was primarily obtained from the patient's drug chart and their journal. The use of marketed medicines was considered as either within or outside the approved Summary of Product Characteristics (SmPC), described as on- or off-label use respectively. Additionally, the use of unlicensed medicines was also recorded. Descriptive analyses were performed on patient characteristics, off-label use of medicines and the use of unlicensed medicines.
Results: During the data collection period a number of 434 medication orders were made for a total of 86 patients. In total, 146 medicines were used, of which 47 were unlicensed. 80 % of the patients received at least one unlicensed or off-label medicine. Unlicensed and off-label medicines constituted two thirds of all the medication orders. The highest number of medication orders for off-label and unlicensed medicines were made to children aged 1–4 years (27 %). Furthermore, the most frequent off-label parameter was route of administration (32 %).
Conclusions: The use of off-label and unlicensed medicines is prevalent in children at the wards surveyed in this study. Actions are needed to ensure evidence-based use of medicines in children and adolescents.

Where data on efficacy and safety is lacking, studies should be undertaken. When the use of a medicine in a child is clinically justifiable and evidence-based, but not specified in the SPC, the documentation of the use in children should lead to changes in the SPC. Additionally, there is a need for a number of unlicensed paediatric medicines to be authorized also in Norway. These changes will however take time. One preliminary action that has been taken in Norway is the development of a nationally agreed medicine administration guide for children. Another example is the compilation of medicine information, in Norwegian language, for medicines not licensed in Norway but licensed in other countries.
Disclosure of interest: A. Teigen: None Declared, S. Wang: None Declared, S. Bergan: None Declared, K. Bjerknes Grant/Research support from Medicines for Children Network Norway (MCNN).

Hospital Pharmacy: Pharmaceutical Care

HP-PC103

Prescriptions errors at discharge: a six months prospective and interventional study

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Background and objective: In our university hospital, medication reconciliation is usually done in wards by pharmacy students. Control over discharge prescriptions is more difficult even if a pharmacist can be useful to intercept medication discrepancies at this time. The aim of this study was to evaluate medication discrepancies at discharge in order to improve the quality of care.
Setting and method: Six months prospective and interventional survey of prescriptions in a surgery ward. Discharge prescriptions were checked and analysed by a pharmacist, a resident or a student. Pharmaceutical interventions (PI) were written on a prescriptions' copy. Intercepted and non-intercepted errors were collected and classified according to the *French Society of Clinical Pharmacy* (SFPC) classification: dosing error, forgetting treatment, non-indicated treatment and patient mistaken identity, also the statute of prescriber (resident, senior) was collected.
Main outcome measures: Discrepancies rate, intercepted errors rate, non-intercepted errors rate, PI acceptance rate.
Results: One hundred and twelve prescriptions for 243 patient's discharges from the ward were reconciliated (46 %) whom 75 were done by the resident (67 %). We highlighted 38 errors corresponding to 37 patients (errors rate: 33 % of prescriptions), and 23 was intercepted before patient's discharge (60.5 %). The most common error found was dosing mistake (42 %). Only one of the 38 PI was refused by the practitioner (acceptance rate: 97 %). Chronic medications were not reported on 13 prescriptions (11.6 %). P. Walker and al. [1] demonstrated an error rate at discharge around 33.5 %, according to those results, we can expect around 81 errors over 6 months for 243 patients, and 27 additional errors could be stopped with PI and the same intercepted errors rate.
Conclusions: Those data showed that: medication discrepancies at discharge are frequent, PI in a surgical ward are well accepted by the surgical team. This preliminary analysis showed a real benefit of the clinical pharmacist in checking prescriptions at discharge. However, the non-intercepted errors rate remains high and it makes us changing our process, asking for a systematic orders review before the discharge. Following it, a thesis started in order to improve patients' output, including a pharmaceutical consultation and a link between hospital and community practitioners.

[1] Arch Intern Med. 2009 Nov 23;169(21):2003–10

Disclosure of interest: None Declared.

Hospital Pharmacy: Pharmaceutical Care

HP-PC104

Chemotherapeutic agents in onco-haematology unit: How to learn from our mistakes?

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Background and objective: Chemotherapies are intrinsically toxic medicaments, with an extremely complex process. As a result, they create high-risk situations in which medication errors were reported to us. Their intrathecal (IT) administration is particularly critical, and thus registers it in the Never-Events list (circular of 14/02/2012). In order to improve patient safety in onco-haematology units, a medication-error analysis was conducted, leading to the implementation of an action plan, according to the ministerial order of April 6th, 2011, regarding patient medicinal care quality management
Setting and method: A retrospective analysis of medication errors submitted in 2013, relative to cancer chemotherapies, was realized. Every report was subjected to a multidisciplinary evaluation of the causes and criticality, using ishikawa diagram and the severity scale of the French society of clinical pharmacy (SFPC). The root-cause analysis of maximal criticality errors (C3) allowed to set the priority improvement action.
Results: Over the 6 reports, 33 contributory factors to EM occurrences were identified, among which: 55 % (18) were bound to administration stage, 36 % (12) to preparation and 9 % (3) to prescription. Two errors were classified as C3: a labelling error on an IT chemotherapy and an administration oversight (protocol failure). Although none of them caused any significant patient harm, they were highly risk-bearing.

From this thorough analysis, three main axes for improvement ensued:

– IT-circuit reassurance: separate routing and storage protocol, list of doctors allowed to prescribe IT, list of medicine authorized for IT, administration-independent double check (traceability sheet).

– New update on the chemotherapies-management software, facilitating nurses' access and providing them with real-time administrations logging.

–Therapeutic computerized protocols review (doctors, pharmacists and nurses) to clarify and improve the legibility and the chronology of the administrations from the nursing care plans.

Conclusions: All the actors of the anticancer-chemotherapies process participating in this analysis facilitated the implementation of the improvement actions, in order to improve patient safety. It also introduced bi-annual, onco-haematology-specific, medication errors reviews, using the SFPC methodology.
Disclosure of interest: None Declared.

Hospital Pharmacy: Pharmaceutical Care

HP-PC105

Impact of drug reconciliation at discharge and communication between hospital and community pharmacists on drug-related problems: study protocol for a cluster randomized cross-over trial

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Background and objective: patients are at risk of drug-related problems (DRPs) at transition points during hospitalization. The community pharmacist (CP) is often the first healthcare professional that patients visit after discharge. CPs lack sufficient information about the patient, so they may be unable to identify problems in medications, which may lead to dispensing the wrong drug and/or wrong dosage and/or giving wrong information. The objective of this study is to e valuate the impact of a complex intervention comprising medication reconciliation (MR) performed at discharge by a hospital pharmacist (HP) with communication between the HP and CP on DRPs during the 7 days following discharge.
Setting and method: The study is a cluster randomized cross-over trial (each unit = a cluster). During 2 consecutive 14-day periods, randomly assigned as "experimental" or "control" (usual care) periods, we recruit 28 patients (>18 and visiting the same CP for at least 3 months). We exclude patients with hospital length of stay >21 days, who don't return home, and in palliative care. During the experimental period, the HP will perform a MR that will be communicated to the patient. The HP will inform the patient's CP about the patient's drug therapy [modification in home medication, acute drugs prescribed, non-prescription treatments and/or lab results]. The study will concern 42 care units—medical and surgery—in 21 French hospitals.
Main outcome measures: the primary outcome is a composite outcome of any kind of drug misuse during the 7 days following discharge assessed at day 7 ± 2 post-discharge by a pharmacist in charge of the study who will contact both patients and CPs by phone. The secondary outcome will be unplanned hospitalizations assessed by phone contact at day 35 ± 5 after discharge.
Results: N/A
Conclusions: this study will assess the impact of MR performed at patient discharge followed by communication between the HP and the patient's CP. It will allow for identifying the type of patients in France for which the intervention is most relevant and could be generalized to other countries with the same care organisation.
Trial registration: This study was reported to ClinicalTrials.gov (no. NCT02006797) and began the January 21th at May 13th 384 patients were enrolled.
Disclosure of interest: None Declared.

Hospital Pharmacy: Pharmaceutical Care

HP-PC106

Contraindications involving Escitalopram : relevance of the pharmaceutical analysis ?

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Background and objective: Escitalopram, the therapeutically active (S)-enantiomer of citalopram, is indicated for the acute and maintenance treatment of major depressive disorder in adults and in adolescents and for generalized anxiety disorder. Nevertheless escitalopram is still associated with dose dependent QT interval prolongation and QT prolongation is a key issue for patients who receive psychotropic medications. In hospital, Pharmacist Interventions (PI) are performed to prevent these contraindications, but, related to poor satisfactory therapeutic alternatives, PI are not always followed. The objective of our work is to study the relevance of IP involving Escitalopram Absolute Contraindication (EAC).
Setting and method: We studied all EAC detected in a French polyvalent hospital of 600 acute beds during 1 month. All the data were extracted from computerized prescriptions, involving 500 beds.

We analysed whether the PI was accepted or refused by physicians and reasons of refusal. In this practice, we followed two steps daily (i) Extraction of all EAC detected by the software DXcare® which is interfaced with the Vidal database and (ii) Analysis of all EAC.
The analysis included all medications associated with escitalopram and the following parameters were studied: dosage, contraindication, indications, interactions, availability and medications i.e. level 1 of the French classification (SFPC). In case of Absolute Contraindication (AC), the pharmacist informed the prescribing doctor about the contraindication (phone or short computerized message in DXCare) and the intervention follow-up evaluated.
Results: 10700 prescriptions were analysed. We retrieved 380 AC (117 patients) including 20 EAC (10 patients). The mean age of patients was 82 years. Among EAC, the different therapeutic classes concerned were antiarrhythmic (4/10), neuroleptic (3/10), antiemetic (2/10) and antibiotic (1/10). The first half of the contraindications was related to an increased risk of QT interval and the second half was related to heart arrhythmia. Electrocardiogram (ECG) had been performed by physicians during patient hospitalization for 7 patients. Among the 10 PI mentioned during the study only 4 PI were accepted by the prescriber. The main cause of PI rejection was patients controlled with cardiac examination (5 of 6 refusals), and one patient on palliative care.
Conclusions: Despite pharmaceutical analysis, physicians prescribe drugs with absolute contraindication. In this study, the risk associated with escitalopram is the QT prolongation, risk partly controlled through ECG control. Nevertheless, we need additional data to better document the interest of ECG control to detect and prevent this potential harmful drugs interaction. Local prospective clinical pharmacy activity should be developed to better document and evaluate this AC; an analysis of cases of adverse drug reaction related to EAC will be performed from the pharmacovigilance centres.
Disclosure of interest: None Declared.

Hospital Pharmacy: Pharmaceutical Care

HP-PC107

Contraindicated drugs in myasthenia gravis patients: elaboration of a tool to optimize drug therapy

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Background and objective: Myasthenia gravis (MG) is an autoimmune disorder of the neuromuscular junction. The complexity of the disease and its treatments make MG patients particularly susceptible to adverse effects. Numerous drugs can induce acute exacerbations or induction of myasthenia crisis. However, there is no complete and updated French list of these drugs. The objective of this work is to elaborate a practical tool to help prescription and pharmaceutical analysis.
Setting and method: Literature review (Pubmed database and French recommendations); identification of incriminated therapies, design and validation of drug-induced or drug-related myasthenia gravis list.
Main outcome measures: Drugs are classified into two categories according to the accountability level and adverse effects frequency and seriousness in MG patients: absolute contraindications and relative contraindications (molecules used in hospitals, required special monitoring during treatment and neurologist opinion).
Results: Nine literature review or pre-existing lists and 42 original articles (including case reports) have been selected.

Several classes of drugs have been associated with definite, probable or possible clinical worsening of existing myasthenia gravis or induction of myasthenia crisis: anti-infective (aminoglycosides, beta-lactamine group including aminopenicillin and imipenem, fluoroquinolones, macrolides, antimalarial drugs), cardiovascular drugs (beta blocker, antiarrhythmic agent, statins), anaesthetics (curares, ketamine), nervous central system drugs (anticonvulsive medication, neuroleptics, benzodiazepines), immunity (vaccines, Corticosteroids) and others (magnesium, anticholinergic drugs, beta blockers collyrium, radiocontrast agents…). Some recommendations are also suggested for usual medical prescriptions.
Conclusions: Commonly prescribed agents that have an association with exacerbation of MG, unmask or aggravate MG, produce a myasthenic syndrome or prolong effects of neuromuscular-blocking agents. Some drugs like statins were not present in pre-existing list. Knowing specific risk of these patients could lead to a better detection of drug-induced or drug-related myasthenia gravis. The clinical pharmacist and the neurologist have a key role

in the medical care of these patients: awareness of these possible outcomes is necessary to prevent myasthenic complications.
Disclosure of interest: None Declared.

Hospital Pharmacy: Pharmaceutical Care

HP-PC108

Harmonisation of medication reconciliation processes in a teaching hospital centre: assessment at six months

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Background and objective: Medication reconciliation (MR) optimises patient therapeutic care and contributes to their safe transition. In our hospital, until December 2013, MR was carried out in cardiology, geriatrics and internal medicine. However methods and tools were different making global effectiveness analysis difficult. It was therefore decided to harmonize processes and tools.
Setting and method: Project was carried out in 4 steps: 1/Identification of pharmacists' expectations about MR 2/Harmonisation and improvement of existing tools 3/Training of hospital pharmacy students (HPS) 4/MR assessment. Firstly, we did a phone survey to assess pharmacies' needs. Items assessed were: MR satisfaction, MR' benefits in professional practice, expectations and unsatisfied needs despite of existing tools
Results: 10 pharmacies participated to phone survey. All are satisfied. MR allows them a better understanding of patient's pathology (50 %), medicine order improvement (50 %), anticipation of prescription preparation (30 %) and better patient monitoring (10 %). They would like to receive information about: treatment modifications during hospitalization (50 %), changing treatments reasons (20 %) and management plan for drugs (20 %) to improve their patients' advices. This study allowed us to improve and harmonize MR processes and tools. We developed a training plan for HPS and implemented MR in diabetology. In each unit the common inclusion criteria are « elderly patient with multiple drugs » . In practice, our MR takes place in 5 steps: 1/Develop a list of currents medications before hospitalization 2/Comparison of this first list with medications prescribed on admission to identify possible medication errors and correct them with doctors 3/Interview with patient to explain treatment changes and complete a management plan sheet to know how and when to take medicines at home and improve compliance 4/Complete and sent to the patient's referent pharmacy a connected sheet "hospital-pharmacy" which summarizes treatment changes made during hospitalization 5/MR' evaluation. After 6 months, 22 HPS have been trained. 125 patients benefited from MR in 3 units, and 74 medication errors were identified and avoided.
Conclusions: This project shows interest of MR and relationships between hospital and pharmacies and allowed us to perform our process. Results are quarterly presents to each medical team, which helps strengthen MR processes and our collaboration.
Disclosure of interest: None Declared.

Hospital Pharmacy: Pharmaceutical Care

HP-PC111

Medication errors detected at hospital admission in elderly

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Background and objective: Medication errors constitute a problem with a major health, social and economic impact. The aim of the study was to analyse the medication errors detected on admission in older patients admitted at hospital
Setting and method: We carried out a retrospective study during 5 months (January-May of 2014) at a third level hospital. We reviewed the prescribed medication list at admission of all patients included in the study to detect medication errors. They were included all the patients older than 65 years who were admitted to the hospital.
Main outcome measures: The medication errors classification was: Dosage adjustment for kidney impairment, Inappropriate dose or frequency of administration, Inappropriate drug or dose for elderly, Double medication, Exceed length treatment or Drug-drug interaction.
Results: During the period study, 754 patients prescription were analysed. The main services involved were: Surgery (220 patients), Internal Medicine (177), Traumatology (298) and urology (59). Mean age (± SD) was 71,6 ± 6,6 years.

Overall, we detected 639 errors in 292 (38,7 %) of them.

Frequency distribution of medication errors was: -Dosage adjustment for kidney failure = 153 (23,9 %)-Inappropriate dose or frequency of administration = 92 (14,4 %)-Inappropriate drug or dose for elderly = 62 (9,7 %)-Double medication = 2 (0,3 %)-Exceed length treatment = 232 (36,3 %)-Drug-drug interaction = 98 (15,3 %). Antiinfectives ATC group was by far the most frequently detected in the medication errors, followed by medicines belonging to the nervous system
Conclusions: Medication errors constitute an important health problem especially in elderly population. Thus, knowledge of the incidence and type of medication errors in this population group should be carefully analysed. Although the incidence of found errors in our study was not too high we would like to highlight the relevance of medication prescription review at admission where pharmacist may play an important role.
Disclosure of interest: None Declared.

Hospital Pharmacy: Pharmaceutical Care

HP-PC113

Local geriatric tool elaboration to optimize medical care of the elderly and first impacts

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Background and objective: Drug therapy in the elderly represents an important public healthcare issue, in terms of iatrogenia. Therapeutic optimizations can be initiated by using existing tools from the literature, but they are sometimes inappropriate to a concrete use, French clinical practices, and new international scientific recommendations for example. As part of the medicinal treatment optimization program of "Annecy-Rumilly-Saint Julien-Pays de Gex-Bellegarde" gerontological network, our objective was to elaborate locally an adapted and clear tool usable in the everyday life of medical and clinical pharmaceutic teams.
Setting and method: Literature review (Beers, Laroche, Lang and Grenoble hospital university works); design of prescribing local guidelines tool by a clinical pharmacist; validation by senior clinician for each medical speciality and geriatricians, test and dissemination to trained practitioners; implementation of multidisciplinary proofreading sessions in elderly inpatients (geriatrician, clinical pharmacist, referring doctor).
Main outcome measures: Categorisation into inappropriate drugs (« STOP ») and appropriate drugs (« START »); review of prescription multidisciplinary proofreading sessions in elderly inpatients to define the tool impact in terms of drug optimization in the elderly (« STOP » and « START »).
Results: The first part offers main adverse effects list in the elderly, and an anticholinergic properties drugs list. The second part identifies inappropriate and appropriate drugs with « STOP » and « START » criteria's, categorised into 8 therapeutic areas (pneumology, cardiology, gastrointestinal system, urology, musculoskeletal and central nervous systems, endocrinology, analgesics). One example from the cardiovascular system can be: « STOP

furosemide in first intention in essential hypertension; there are more effective alternatives with less negative impacts » .

During an 18 month review of 145 patients in 107 prescription multidisciplinary proofreading sessions, 230 « STOP » and 63 « START » were identified, leading to end, substitute or start a treatment.

Conclusions: This geriatric tool helped to promote sessions of prescription multidisciplinary proofreading into different care units of the hospital. In addition to the optimization of drug prescription in the elderly, this tool leads to increase awareness of everyone whose involved in these proofreading sessions to "just prescribe" in the elderly (physicians and pharmacists).

Disclosure of interest: None Declared.

Hospital Pharmacy: Pharmaceutical Care

HP-PC114

Orthostatic hypotension and hospital medications in geriatric inpatients

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Background and objective: Orthostatic hypotension (OH) is frequent and can be caused by multiple factors in geriatric patients. We analysed associations between OH and 1) patient's medical and geriatric characteristics, 2) inhospital medications with potential blood pressure lowering effect.

Setting and method: Cross-sectional study upon admission in the geriatric ward of an academic hospital. Testing was performed in 100 older patients ($\geq$75 yrs) able to stand up (3 min) to detect OH (decrease of $\geq$20/10 mmHg in systolic/diastolic blood pressure). Special attention was paid to medications affecting the vascular (V) system [diuretics, ACE inhibitors/angiotensin inhibitors, calcium channel blockers, β-blockers, central α-agonists, peripheral α-blockers, nitrates] or the central nervous (N) system [benzodiazepines, neuroleptics, antidepressants, opiates]. Each hospital medication was expressed in Defined Daily Dose (DDD).

Main outcome measures: Relation between OH and 1) geriatric characteristics, 2) medication DDD

Results: 1) Patients with OH ($n = 47$) differed from those without OH ($n = 53$) in recent fall history (79 *vs.* 56 %, $p = 0.01$), diabetes mellitus (32 *vs.* 13 %, $p = 0.03$), stroke history (34 *vs.* 25 %, $p = 0.03$), gender (51 *vs.* 33 % male, $p = 0.04$), but not in age (85.6 *vs.* 85.4 years old). 2) No statistically significant association was observed between the dosage of V or N medications (expressed in DDD) and the presence of OH. Multivariate analysis yielded similar results. OH was associated not with V or N medication dosages, but with geriatric characteristics such as fall (OR:4.4, $p = 0.04$), male sex (OR:4.2, $p = 0.02$), diabetes mellitus (OR:7.8, $p = 0.03$) and vitamin B12 deficiency (OR:11.4, $p = 0.02$).

Conclusions: OH does not seem to be associated with V nor with N medication dosages. If an association existed, it would probably be of low clinical significance. We plan to further analyse these hundred patients to look for a potential correlation between an orthostatic diminution of blood pressure and the dosage of medications.

Disclosure of interest: None Declared.

Hospital Pharmacy: Pharmaceutical Care

HP-PC115

Adherence with clinical pain guideline in neonatal care units

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Background and objective: The goal of clinical guidelines is to ensure evidence-based treatment. If guidelines are not implemented sufficiently, malpractice and poor patient safety may become evident. Therefore, it is relevant to examine health care staff adherence to clinical guidelines in order to identify potential poor adherence and address this issue for the benefit of the patients.

The objective of this study was to investigate adherence of a locally developed clinical guideline of the use of oral sucrose/glucose as pain management at two neonatal care units at Odense University hospital.

Setting and method: Data were collected by structured observations and a questionnaire study. One hundred and fifty observations (150) were included in the study. Structured observations investigated the amount of time from administration of oral sucrose/glucose mixture to the heel prick procedure; whether the neonate was comforted; whether the correct amount of sucrose/glucose mixture was administered and whether the sucrose/glucose mixture was administered to the neonate. The questionnaire was given to 64 healthcare professionals. The respondents were nurses, nurse students, care staff and a bio analyst. The response rate was 38 %.

Results: The observations showed how 27 % of the health care staff adhered to the guideline. In 83 % of the observations, sucrose/glucose mixture was administered. The sucrose/glucose mixture was administered timely in 37 % cases. Most infants were secured comfort (86 %), while the correct amount of sucrose/glucose mixture was administered in 98 % of the observations. In 66 % of the observations the healthcare staff administered the sucrose/glucose mixture with an adherence rate of 28 %. Parents administered the sucrose/glucose mixture in 35 % of the observations with an adherence rate of 43 %. From the qualitative comments obtained from the observations and from the questionnaire, business and lack of communication particularly was shown to influence adherence.

Conclusions: Adherence to the guideline was suboptimal with an adherence rate of only 27 %. However, not all aspects of the guideline were found suboptimal, but primarily timely administration of the sucrose/glucose mixture before the procedure was lacking. Suboptimal adherence may have been caused by business and lack of communication between the professions.

Disclosure of interest: None Declared.

Hospital Pharmacy: Pharmaceutical Care

HP-PC116

Patient safety—special attention is needed when drug shortages occur and drug tenders are implemented

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Background and objective: In Danish hospitals tender and drug shortages imply changes in the drugs available in the medication ward stock. Drug changes challenge the prescription and dispensing of the right drug posing a potential patient safety risk in the medication process.

The aim of the present study was to investigate how often prescriptions needs to be generically substituted as a result of drug shortage or tender causing changes in drugs available in the medication ward stock.

Setting and method: The study was designed as a cross sectional survey. Data were collected from five medical departments in the Capital Region and North Region of Denmark. Six pharmaconomists reviewed all prescriptions in 4 to 21 days depending on the ward. Data were collected in the period of annual tender implementation in 2013 and 2014. The pharmaconomists compared the prescriptions to the drugs available in the ward stock and assessed if the prescription had to be changed by the doctor, should be generic substituted before dispensing or if the drug for other reason were not available in the ward stock.

Results: A total of 7326 prescriptions were reviewed and assessed by the pharmaconomists. On average generic substitution was required in 9.7 % of the prescriptions due to drug tender causing changes in drugs available in the ward stock. In comparison, 1.8 % of the prescriptions needed to undergo generic substitution as a result of drug shortage. The major part of the generic substitutions due to drug shortage was caused by shortage of a single frequently used drug.

Conclusions: The present results show that drug changes due to drug tender and drug shortage imply generic substitution posing a potential challenge to

patient safety in the medication process. In particular, drug changes and subsequent generic substitution may hamper correct documentation of the medication but it may also challenge identification of the correct drug in the medication process. Thus, the present results emphasize that focus on improved implementation of drug changes could potentially improve patient safety and reduce the resources used by personnel involved in the medication process.
Disclosure of interest: None Declared.

Hospital Pharmacy: Pharmaceutical Care

HP-PC117

Survey in 11 surgical departments: biological monitoring of heparin treatment and french guidelines accordance

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Background and objective: Risk–benefit balance of heparin regimen is well known but is also associated with high risk of bleeding. Since 2012, national guidelines on the follow up of heparin therapy are available. To evaluate good practices of biological follow up of patients treated with unfractionated heparin (UFH) according to these guidelines.
Setting and method: The study took place during 2 months in 11 surgical units (urology, orthopaedics, digestive surgery, stomatology, kidney transplant unit). All patients who received UFH regimen were included.
Main outcome measures: We checked out type of heparin (calcium, sodium), dosage, and analysed French guidelines accordance (platelets count at the start of the treatment and after twice a week; activated Partial Thromboplastin Time (aPTT) or Anti-factor Xa assay every day). When values of biological parameters were except the norms, changes of dose were also analysed.
Results: 56 patients received UFH during the study period. Majority of unfractionated heparin treatments in this study were used to prevent thrombosis (N = 53, 93 %); only 3 patients needed curative regimen. Platelets were well monitored for all patients. On another hand, monitoring with aPTT or Anti-factor Xa assay was not in compliance with guidelines: 17 patients (30 %) had no biological monitoring (on average they were treated during 4.6 days). Among the 8 patients only monitored with aPTT, no dosage adjustment was found for 5 of them despite parameters except the norms; and at last, among 31 patients monitored with both aPTT and Anti-factor Xa assay, among 10 values of Anti-factor Xa outside standards, only 3 (33 %) led to a dosage adjustment. Average time between two blood samples was 2.5 days.
Conclusions: This study shows noncompliance regarding the national guidelines: biological monitoring frequency too low, limited use of Anti-factor Xa while aPTT can be disrupted by other reasons than heparin treatment; and dosage adjustments too sporadic. But on the other hand, there was no clinical consequence related to this lack of monitoring probably because of the short duration of treatment. Nevertheless it has allowed us to remind to prescribers therapy guidelines in order to increase efficiency of monitoring. A multidisciplinary approach with clinicians, clinical biologist and pharmacist should be probably the key to manage the patient with the most efficiency in our hospital.
Disclosure of interest: None Declared.

Hospital Pharmacy: Pharmaceutical Care

HP-PC118

Polymedication as an underestimated contributor to medication errors

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Background and objective: The potential for harm from misuse of medications is poorly documented in France resulting in health professionals being specially unaware of medication errors risk during transitions of care. Recently National Health Requirements for Elderly pinpoints the threshold of 2 criteria to alert physicians in reviewing medication regimens : polymedication (10 and over) and age (65 and over). This presentation analyses the relevance of the chosen threshold when polymedication is bundled to hospital admission.
Setting and method: Luneville hospital is a French public health institution with 420 beds for a territory of 77 000 inhabitants. The design is a retrospective observational study. From February 2010 to January 2014, 3630 patients aged 65 and over were included, hospitalized from emergency department and reconciled at admission. Number of medications prescribed in primary care and number of medication errors intercepted during the usual and on-going reconciliation process are registered, age too. Chi square test with a 2-sided alpha level of 0,05 is used.
Main outcome measures: The rate of inpatients having experienced at least one medication error is analysed considering the number of medications and also a 5-year scale of age.
Results: Among the eligible population subjected to medication reconciliation, at least one medication error occurred for 2174 (59,9 % ± 1,6 %). The number of home medications [95 % CI: 7,88 to 8,12] [min 1; max 22] is linked to the rate of inpatients with at least one medication error showing a significant trend to increase ($p < 0{,}001$). When 5 medications and over are prescribed, more than half of the patients have at least one medication error. Age [95 % CI: 81,45 to 81,95] is also linked ($p < 0{,}025$) but with no significant trend.
Conclusions: Hospitalization, polymedication, age are 3 leading contributors to iatrogenic diseases. General practitioners have to be alerted when 10 medications and over are prescribed. But for inpatients it is still relevant with 5 medications. We focused on a threshold of 7 to perform in reviewing their medication regimens.
Disclosure of interest: None Declared.

Hospital Pharmacy: Pharmaceutical Care

HP-PC119

ESA clinical audit and economic evaluation in a haemodialysis unit

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Background and objective: Treatment with Erythropoiesis-Stimulating Agent (ESA) in renal impairment is important to preserve patients' quality of life and physical functions. Thus, ESA are critical components in managing the anaemia in haemodialysis patients with a significant cost.

We assessed a clinical audit on ESA use, integrated as a Professional Practice Evaluation.
The main objective was to evaluate therapeutic management and biological monitoring in a haemodialysis unit and to enhance economic impact as a secondary objective.
Setting and method: We conducted a retrospective analysis of all patients on dialysis with ESA prescriptions during a week, using medical prescriptions and medical records. Data collected were: ESA form, dosage, patient weight, indication, haemoglobin, iron status monitoring and ESA management.
Results: Eighty-two dialyzed patients were treated by ESA (46: Epoetin-α, 36: Darbepoetin-α).

Indication and haemoglobin monitoring were conform for all patients. Iron status was missing for one patient.
Haemoglobin was in the target ranges for 49 patients. Among the other 33 patients, dosage was adjusted for 11 patients, and not adjusted for 2 patients. For 20 patients, the dosage was "not applicable" (i.e. compliant file) for the following reasons: either a previous modified dosage was too recent, or a too recent biological monitoring was performed (not seen during medical prescription), or biological monitoring was closed to the target ranges.

Finally 79 (96.3 %) files were considered conform to the recommendations.
Conclusions: Concerning therapeutic management of anaemia in the haemodialysis unit, we highlighted:

– a conformity with ESA medical prescription
– a conformity of biological monitoring
– a conformity of therapeutic adjustment when laboratory evaluation is not in accordance with guidelines.

Concerning cost optimization, if all patients received Epoetin-α vs Darbepoetin-α, therapeutic cost would be 4 times lower.
From these results, we could objectively discuss the efficiency improvement of anaemia management in the institution. Systematic pharma-

ceutical prescriptions analysis, pharmaceutical presence in dialysis unit, and medical-pharmaceutical cooperation could optimize ESA use.
Disclosure of interest: None Declared.

Hospital Pharmacy: Pharmaceutical Care

HP-PC121

Gentamicin: ensuring optimum use and maximising patient safety

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Background and objective: Gentamicin is the focus of a Regional Quality Improvement Collaborative. Safe, effective therapy with gentamicin requires good practice in dose selection and monitoring of serum levels. Suboptimal therapy occurs with breakdown in the process of drug dosing, serum blood sampling, laboratory processing and level interpretation. Unintentional underdosing or toxicity may result. In a 210 bedded general hospital in Ireland, baseline and re-audits post extensive education demonstrated poor compliance with the local adult gentamicin protocol approved in 2011 mainly due to sub-therapeutic dosing and levels taken at the incorrect time. The aim of this project was to optimise the use of gentamicin locally using a regional collaborative approach and process improvement methodology in order to enhance patient outcomes.
Setting and method: Regional antimicrobial pharmacists collaborated and considered process measures critical to quality. Baseline practice was examined through audit. Root cause analysis informed improvement measures. These included a standardised monitoring schedule inclusive of assay sampling and drug administration timing which maximised local capabilities. The Quality Improvement Methodology was followed using Aim-Measures-Ideas:

Aim: to ensure therapeutic efficacy whilst minimising nephrotoxicity and ototoxicity

Measure 1: potential for failure to treat infection due to underdosing or doses missed/delayed

Measure 2: potential for nephrotoxicity and ototoxicity due to trough levels taken later than recommended

Measure 3: potential for non-standardisation of practice due to rotating doctors regionally

Ideas: develop a regional adult gentamicin once daily treatment protocol including:

– renal dosing
– modification of trough window to 18–22 h post dose to facilitate processing in the laboratory
– maximum dose 480 mg
– gentamicin calculator inbuilt in antimicrobial App
– continuous education for doctors and nurses

Results: A safe and effective standardised adult once daily gentamicin treatment protocol was achieved collaboratively and approved by the D&T committee in April 2014. This will assist doctors and nurses to utilise gentamicin appropriately. To date, it had been extended hospital wide via multiple education sessions, ward visits and email alerts.
Conclusions: It is vital to adhere to this protocol as a matter of routine in order to enhance patient outcomes. Compliance with the revised guideline will be audited through a structured localised approach with multidisciplinary stakeholder involvement. Any advancements in best practice will be discussed both regionally and locally and thereafter implemented.

Disclosure of interest: None Declared

Hospital Pharmacy: Pharmaceutical Care

HP-PC122

Evaluation of the double-check in a daily dose unit drug distribution system

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Background and objective: Our pharmacy department carries out a daily dose-unit drug distribution system to half of the hospital inpatient capacity (200/400). Within four decentralized pharmaceutical units in paediatric, medicine, surgery and geriatric wards, unit-dose drugs are prepared daily in carts by technicians according to the medical prescription. Then a final random check is ensured by a pharmacy resident or a senior pharmacist. The aim of this study is to assess the quality of the double-check process and to offer an action plan to optimize it.
Setting and method: A retrospective analysis of collected data over the last three years was performed. Within the four pharmaceutical units, the daily time dedicated to the pharmaceutical check was measured by each pharmacist over one month. A statistical analysis was made to assess the frequency of each type of preparation errors and identify associated factors. The differences between frequencies were checked with the Chi Square statistical test.
Results: Over the last three years, 56 % of dose units were checked daily by pharmacists. This represents a total of more than 340.000 dispensed doses checked. An average of one minute was spent per drawer. Pharmacists identified one preparation error every 140 lines of prescription. The most frequent errors detected were errors in quantities (41 %) or dose omissions (24 %). Replacement pharmacy residents detected more qualitative errors like packages and drawers labelling than pharmacy residents usually in charge of the unit (0.21 % and 0.06 % respectively; Chi square test; $P < .001$). The number of errors detected was not correlated with the number of doses checked (correlation coefficient $r = 0.296$; $P < .001$) but depended on who prepared and who checked (Chi square test; $P < .001$).
Conclusions: Results reveal a decreased vigilance in regular pharmacy residents and a lack of practice of replacement technicians. These failures induce fragility in the drug dispensing process and risk of severe medication errors. As time for checking cannot be extended, the pharmaceutical team decided to (i) review the operating procedure for the check process with a targeted control on high-risk patients and high-risk medicines, and (ii) educate and train the staff and (iii) organise some quarterly follow-up and evaluation meetings. This approach would likely lead to an increase of efficiency and safety in the drug dispensation process.
Disclosure of interest: None Declared.

Hospital Pharmacy: Pharmaceutical Care

HP-PC123

Safety assessment of darbepoetin alfa in chronic renal failure and cancer

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Background and objective: To analyse the safe use of darbepoetin alfa in patients with associated chronic renal failure (CRF) anaemia or cancer, according to the European guidelines recommend that to prevent cardiovascular events.
Setting and method: Retrospective observational study in patients treated with darbepoetin alfa for anaemia associated with CRF and cancer from January to May 2014.
Main outcome measures: Values of haemoglobin (Hb) were analysed to see if they were within the recommended range for the European guidelines, which are explicit in that CRF, the values of Hb must be under 12 g/dl and if overcome 12 g/dl is recommended to reduce the dose of darbepoetin alfa. In cancer patients the Hb values should never exceed 12 g/dl and if they do it is not recommended to reduce the dose, but discontinuation of epoetin alfa treatment.

GAIA data base was used to locate patients receiving darbepoetin alfa treatment through the Outpatient Unit of the Pharmacy Service of a second line hospital. Analytical data were obtained from the SIAS program.
Results: Patients treated with darbepoetin alfa were diagnosed CRF 122, of these 25.4 % had Hb values at or above 12 g/dl, 72.9 % were below and 2 patients had no data analytic controls. All patients showed recent analytics except 10 in which analytic controls predated 6 months.

Of the 40 cancer patients treated with darbepoetin alfa Hb < 12 g/dl was obtained in 15 % while the rest (85 %) was within the required values and in all cases the analytical checks were performed periodically.

Regarding the diagnosis of cancer patients only 3 had a diagnosis for which it is specified for darbepoetin alfa: lung adenocarcinoma (1), neo kidney (1) and lymphoproliferative syndrome (1) and the others indications were off-label: myelodysplastic syndrome (29), iron deficiency/anaemia thalassemia (1) and chronic hepatitis C (3).

Conclusions: The use of this drug improves a frequent and serious complication in patients with CRF or cancer such as anaemia. However it is noted that he is not paying attention to the risk of cardiovascular complications that can happen and why increased monitoring of Hb values in patients being treated with this drug is recommended.

Disclosure of interest: None Declared.

Hospital Pharmacy: Pharmaceutical Care

HP-PC125

Pharmacist Intervention in a Psychiatric Setting

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Background and objective: Around 12 % of people suffering from global disease account for psychiatric disorders. It has been identified that these patients are amongst the most challenging to manage.[1] This study aimed to introduce and evaluate a pharmacist intervention when dealing directly with psychiatric patients and their family members.

Setting and method: This study took place at Mount Carmel Hospital, the main local psychiatric hospital. A group of 20 psychiatric patients who self-administer their medication and a group consisting of another 20 family members in charge of their ill relatives were interviewed using a validated medication adherence questionnaire before and after the distribution and explanation of a personalised medication chart. The 'Medication Chart Evaluation Form' was also completed post-intervention. Data was analysed using SPSS version 21.

Main outcome measures: Medication adherence, patient/family member knowledge pre- and post- intervention

Results: The mean percentage score for 'knowledge of the dosage regimen' after the intervention (97.97 %) exceeded the score before the intervention (88.95 %) ($p = 0.001$). The mean percentage score for 'knowledge of the medicine indication' after the intervention (89.31 %) exceeded the score before the intervention (59.19 %) (p approx. = 0)

Apart from forgetfulness (10/20), 12 patients revealed that their lack of adherence was due to: the annoyance of having to take medication (mentioned twice), the wish for an alcoholic drink (mentioned once), side effects (mentioned 4 times), out-of-stock medicines (mentioned twice), not seeing beneficial outcomes (mentioned once), feeling that there was no more need of certain medications(mentioned once), a nasty pill's scent (mentioned once).

Conclusions: This study highlights the importance of the pharmacist's role as an educator. The distribution and explanation of the medication chart acted as an empowerment tool to improve medication awareness and knowledge which was found to be an important factor needed to increase medication adherence.

Reference

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Disclosure of interest: None Declared.

Hospital Pharmacy: Pharmaceutical Care

HP-PC126

Management of chemotherapy—induced neutropenia

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Background and objective: Chemotherapy-induced neutropenia is a common complication of chemotherapy which is addressed by the use of Granulocyte-Colony Stimulating Factor (G-CSF).

To analyse the incidence of neutropenia in patients receiving chemotherapy, outlining factors, such as age, gender and comorbidity that could increase a patient's predisposition to suffer from neutropenia. To evaluate effectiveness of G-CSF, amongst patients who are being treated for Hodgkin and non-Hodgkin lymphoma.

Setting and method: Medical Investigations and Treatment ward at Mater Dei General Hospital where treatment for lymphoma is undertaken.

A 'Patient Characteristics Checklist' was completed for 22 patients after each cycle for 4 chemotherapy cycles. 'Patient Interview on the Occurrence of Side Effects' was performed as an interview to the patients after each cycle for 2 chemotherapy cycles. The administration of G-CSF during the cycles was noted.

Main outcome measures: Incidence of neutropenia, treatment modifications, use of G-CSF

Results: Patient demographics: 9 male, 13 female, 9 suffered from Hodgkin's lymphoma and 13 suffered from Non-Hodgkin's lymphoma. In total, 88 chemotherapy cycles were followed, and of these 38 included the use G-CSF. Individual patient factors, such as age or previous episodes of febrile neutropenia, were considered when determining the need for prophylactic G-CSF.

Patients not administered with G-CSF experienced neutropenia hospitalisation in 20 out of 50 cycles, while in patients receiving G-CSF, 5 out of 38 cycles were followed by neutropenia hospitalisation (p-value 0.02). Gender was identified as a trait which increased predisposition to neutropenia, with females and males having an average neutrophil count of 2.6×10^9/L and 4.2 x 10^9/L respectively, following chemotherapy.

From the 44 interviews carried out 15 of the cycles involved the use of G-CSF. Patients receiving prophylactic G-CSF claimed that they experienced less side effects, with the occurrence of fever and sore throat following 3 of the cycles in which G-CSF was administered and following 12 cycles without G-CSF (p-value 0.02).

Conclusions: G-CSF proved effective in preventing occurrence of neutropenia in patients receiving treatment for Hodgkin lymphoma or non- Hodgkin lymphoma.

Disclosure of interest: None Declared.

Hospital Pharmacy: Pharmaceutical Care

HP-PC127

Analysis of the use of monoclonal antibodies in colorectal cancer

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Background and objective: Analyse the use of monoclonal antibodies approved for colorectal cancer in a tertiary hospital.

Setting and method: A retrospective observational study was conducted for one year (January 2013-December 2013), in which all patients with cancer colorectal who started treatment with intravenous were included. Of these we selected those who started therapy with monoclonal antibodies and the following variables were collected: age, sex, type and stage of disease, type K-RAS gene (mutated or native), the previous lines of chemotherapy, and which line treatment is prescribed the monoclonal antibody. All of these were obtained from electronic medical records of the patient and the prescription program Oncofarm®. For data analysis was used the Microsoft Excel® software.

Results: During the time period in which the study was developed 85 patients with colorectal cancer began with intravenous chemotherapy. In 25 of these patients (29.41 %) was prescribed one or more monoclonal antibodies.

Regarding patients receiving monoclonal antibody therapy, 74.1 % were men and 25.9 % women. All of them were in the metastatic stage of the disease. The mean age was 59 years. The most prevalent types of cancers were the rectum and colon (both in 28 % of patients); colorectal cancer and

subsequent sigma were in the same proportion the two (20 %), and finally cancer blind (4 %).

Of the 22 patients treated with bevacizumab, 55.6 % had native K-RAS gene. In 16 patients was used in the first line, and the combination with FOLFOX was the most frequent (43.8 %), followed by the combination with XELOX (25 %) and FOLFIRI in 18.75 % of patients; 3 patients received in the second line (2 in combination with FOLFIRI); 2 in third line, one associated with FOLFOX and FOLFIRI another; and one patient was prescribed in fourth line, along with capecitabine.

3 patients was treated with cetuximab. 2 in first line, one associated with FOLFIRI and FOLFOX another. The other patient received the monoclonal antibody in second line with FOLFIRI, he had previously received BEVACIZUMAB + FOLFOX.

3 patients were treated with panitumumab. 66.7 % of patients were treated in first line, one of them associated with FOLFOX and FOLFIRI another. The other patient received second-line in combination with FOLFIRI, having received bevacizumab with first-line XELOX.

All patients had received cetuximab and panitumumab the KRAS gene not mutated.

Conclusions: Based on our results, we can say that in our Hospital monoclonal antibodies are not incorporated in the routine treatment of colorectal cancer; in fact prescribed in only less than one third of the patients, all with advanced disease, with the most used Bevacizumab.

Disclosure of interest: None Declared.

Hospital Pharmacy: Pharmaceutical Care

HP-PC128

Medication error reported in a hospital: severity and improvement plans

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Background and objective: A medication error is any preventable event that may cause or lead to inappropriate medication use or patient harm, while the medication is in the control of the health care professional or patient. Aims of this study were:

– To analyse medication errors(ME) reported in a hospital.

– To assess the severity of ME and describe in which ME was carried an improvement plan.

Setting and method: Notifications of ME were registered retrospectively from January to December 2013 in a hospital. Data were extracted from three different reporting systems [one general system(GeRS) and two specific systems, paediatric(PeRS) and Intensive Care Unit(ICURS)]

Main outcome measures: The variables collected were; type of system in which the ME were reporting, drug involved, severity, and action or improvement plans that were notified (this just in case that one was done)

The clinical severity was classified by NCC MERP Index(National Coordinating Council for Medication Error Reporting and Prevention), in four groups: potential errors(categories A), errors without harm(categories B,C and D), errors with harm(categories E,F,G and H) and death errors(Category I).

Results: A total of 53 ME were reported. 34 % from PeRS, 34 % ICURS and 32 % GeRS. The drugs involved were aminoglycosides, amlodipine(2), asparaginase, BAL, bicarbonate(2), bisacodyl, cisatracurium, chlorhexidine(3), dexamethasone, ethanol, etoposide, flucytosine, gabapentin, gamma-globulin, haloperidol, heparin(2), insulin(2), iodinated contrast, ions, ivermectin, levothyroxine, lidocaine, mesna, metoclopramide, midazolam(2), morphine(3), mumps-vaccine(2), parenteral nutrition, pavilizumab(2), phenytoin(2), serums, steroids, thymoglobulin, tobramycin, valproic.

The severity was; 6 %(3) category A, 79 %(42) category B,C,D. 15 %(8) caused damage (category E 11 %(6), category H 4 %(2)). No mortal error was reported. Only 36 %(19) reached the patient.

Four improvement plans were developed; prescribing circuit was improved by the implementation of electronic prescribing(implied 16 % of ME). Was performed a FMEA(Failure Mode and Effects Analysis) of semiautomatic cabinets (15 %ME). Three pictures were sent to the Institute for Safe Medications Practices(ISMP) (6 %ME-look-alike). Asparaginase ME was resolved with a double-checked when chemotherapies were prepared (2 %ME)

Conclusions: Establishing specific notifications systems for each unit increases the amount of reporting ME and improvement the safety culture.

Reporting errors those which cause harm as well as those which doesńt, are useful to establish improvement plans, which increases the number of preventable errors.

Disclosure of interest: None Declared.

Hospital Pharmacy: Pharmaceutical Care

HP-PC129

A plan for improving pharmaceutical services in psychiatric patients

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Background and objective: To evaluate the level of pharmaceutical processes at ward level at Mount Carmel Mental hospital and to identify weaknesses and propose solutions to the treatment gaps with particular focus to the emphasis of a multidisciplinary care approach.

Setting and method: Mount Carmel Hospital, Attard, Malta where institutional level psychiatric care is provided in Malta. In 2014 MCH was allocated 8 % of total state health expenditure amounting to €26 million[1].

Two wards at Mount Carmel Hospital (MCH), these being the Dual Diagnosis Unit (DDU) and the Female 3B ward (F3B), were analysed via surveys, to obtain medication usage frequencies and trends, medication costs. Interviews were undertaken with nine nurses, four from the DDU and five from the F3B ward to determine different usage patterns within the wards and strengths and weaknesses of the system implemented. The rehabilitation hospital Karin Grech (RHKG) was chosen as a comparator for a standard multidisciplinary approach and a side-by-side analysis was carried out. Forty-two patient files of patients at MCH and RHKG were accessed to obtain the relevant treatment schedules and a statistical overview of medication frequencies and costing was developed.

Main outcome measures: Weaknesses extracted from the comparison study and the qualitative perceptions drawn from the interviews with ward staff as a primary outcome. Medication frequency and costing were secondary outcomes.

Results: Four nurses in the DDU were 60 % satisfied whilst the remaining five nurses were only 26 % satisfied with the system at MCH. Hydroxyzine and lorazepam were the drugs most commonly prescribed, whilst patients tend to retain the same treatment over an extensive period of time. Statistical analysis identified that a total expenditure of around €1 m out of a total of €26 m budgeted for 2014 was allocated to Mount Carmel, in terms of both chronic and acute medications. A lack of multidisciplinary care integration and no IT system to enable comprehensive medication management were the two weaknesses mostly identified.

Conclusions: From this study it has been identified that the health care team including the pharmacists, must work in collaboration and with great determination in order to improve existing systems. Taking into consideration the limitations to the system at Mount Carmel, a re-evaluation of expenditures after the introduction of an electronic patient medication record system is suggested. The impact of these changes on the evolvement of delivery of pharmaceutical care services can be studied.

Disclosure of interest: None Declared.

Hospital Pharmacy: Pharmaceutical Care

HP-PC130

Pharmaceutical interventions in geriatrics

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Background and objective: Among older adults, polypharmacy is a common public health problem which increases the risk of adverse drug reactions. Thus, with regard to criteria of certification from French National Authority and requirements fixed by the order of April 6th, 2011, geriatrics prescriptions are analysed by pharmacists twice a week in our hospital. When therapeutics

problems are detected, a pharmaceutical intervention (PI) is emitted for the attention to the prescriber.

The purpose is to describe over 6 months the PIs realised in short geriatric stay.

Setting and method: A prospective study that included all patients hospitalised, was conducted from November 2012 to April 2013. PIs were coded according to the French Society of Clinical Pharmacy (SFPC) classification and were recorded in an Excel file by type of problem, Anatomical Therapeutic Chemical (ATC) Classification and stemming from PI.

Main outcome measures: 407 prescriptions were analysed, which led to 29 PIs (7 %). PIs were accepted by the medical team in 62 % of cases. PIs concerned mainly drug switches (44 %) and dose adjustment (28 %).

Results: The studied population concerned 252 old patients of 83,6 ± 8,1 years. We raised 12 PIs (41 %) for contraindications, 8 (28 %) for drugs interactions, 4 (14 %) for overdose, 3 (10 %) for indications untreated and 2 (7 %) for inappropriate administration. The ATC classes frequently involved were: blood and blood forming organs (34 %), alimentary tract and metabolism (24 %), cardiovascular system (18 %), antiinfectives for systemic use (13 %) and nervous system (8 %). The majority of contraindications were related to renal insufficiency or to combination therapies.

Conclusions: This first experience of clinical pharmacy in short geriatric stay, shows a good adhesion of the prescribers. SFPC classification is a practical tool in coding and evaluation of PIs. This work encourages widening pharmaceutical analysis of prescriptions in other care units. By limiting iatrogenic risk, collaboration with physicians will ensure that elderly patients are receiving most effective and safe medication.

Disclosure of interest: None Declared.

Hospital Pharmacy: Pharmaceutical Care

HP-PC131

Pharmaceutical care in rheumatology: which place for a clinical pharmacist?

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Background and objective: During one year we studied pharmaceutical presence at two levels of the therapeutic support of patients in a rheumatology unit (RU): on drug prescription and administration in a full hospitalisation unit and during therapeutic education of patients with chronic inflammatory rheumatism.

Setting and method: One year prospective/observational study in a 23 beds RU (full hospitalisation); daily presence during the medical round; full pharmaceutical analysis of the prescriptions: medication reconciliation at admission, biological and clinical parameters, adequacy between medication and diseases taking care of pathophysiology, posology, contraindications, undesirable effects and drug–drug interactions with an on-line system [Theriaque®]. Clinical impact of pharmaceutical interventions (PI) was assessed by a team associating a nephrologist, a hospital-based general practitioner (GP) and a clinical pharmacist. Clinical impact was classified as follow from 0 (no impact) to 3 (vital impact). Patient therapeutic education: two hours session every two months with at most 8 patients; teaching aid.

Main outcome measures: Total number of PI; average length of stay; medical assessment of PI clinical impact

Results: 920 patients tracked, 8,312 prescriptions' lines analysed and 319 PI realised (3.8 % of total prescriptions and 34.7 % of patients). 285 (89.3 %) PI were from the pharmacist to the physicians and 34 (10.7 %) were questions asked by physicians.

Among those from pharmacist to physicians, 254 (89.2 %) have been accepted and led a prescription modification. Average length of stay during the study period was 6.13 days vs. 6.47 days last year ($p = 0.10$). According to the pharmacist, 18 (6.3 %) IP had no impact, 267 PI were presented to physicians: 99.6 % were considered relevant for patients. Since 2011, 98 patients participated in the therapeutic education multidisciplinary program. Pharmacist is responsible for pain and side effects management with symptomatic drugs (analgesics, NSAID) and disease-modifying therapy (DMARDs and biodrugs).

Conclusions: Results of our work reflect the importance of the pharmacist's presence in a rheumatology unit for medical team and for patients. Pharmaceutical expertise represents a dual interest for patient: in the ward to optimize drugs prescriptions and administration, in therapeutic education session to evaluate compliance with medication and overall disease management

Disclosure of interest: None Declared.

Hospital Pharmacy: Pharmaceutical Care

HP-PC132

Novel monoclonal antibodies for HER2-positive metastatic breast cancer: early experience at a tertiary referral hospital

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Background and objective: Two novel HER2-targeted agents, pertuzumab and trastuzumab-emtansine (TDM-1), have recently been approved by the EMA. The aim of this study is to describe the experience of use of these agents in the patients of our centre.

Results: Herein, we discuss the cases of three patients in treatment with these two agents.

TDM-1 experience:

Patient 1: 49-years-old female with metastatic (bone and liver) HER2-positive breast cancer (HER2 + BC) detected in April 2009, initiating combination therapy with carboplatin, paclitaxel and trastuzumab as first-line treatment, achieving a partial response. In November, 2009 the patient underwent modified radical mastectomy. In April, 2010 PET/CAT showed brain metastases. From April, 2010 to December, 2013 she received several schedules of chemotherapy. In February, 2014 given the disease progression, the patient was scheduled to receive TDM-1 on a compassionate use program. On day 15 cycle 1, grade 3 thrombocytopenia and grade 2 elevation in serum aminotransferase levels appeared. These adverse reactions add to the ECOG-PS deterioration led to the TDM-1 treatment discontinuation (1 cycle at least). The patient finally deceased in March, 2014.

Patient 2: 48-years-old woman, diagnosed with stage IIIC HER2 + BC (pT1cN3cM0) in April 2012, underwent left mastectomy in June, 2012, initiating adjuvant treatment with paclitaxel weekly, trastuzumab ± pertuzumab every 3 weeks (APHINITY phase III clinical trial) from August, 2012 to October, 2013 achieving stable disease. 4 months after, CAT showed a liver lesion with increased CA 15–3 levels (29.94 U/ml), so it was decided to start TDM-1 at a dose of 3.6 mg/kg every 3 weeks in February, 2014. Currently the patient received 6 cycles (3.56 months duration) showing a partial response of the liver lesion (CA 15–3 reduction levels > 50 %), already deemed to be respectable. Treatment has being well tolerated, with no grade ≥3 toxicity (asthenia grade 1, nausea and vomiting grade 1, arthralgia grade 1).

Pertuzumab experience:

Patient 1: 49-years-old woman diagnosed with stage IV HER2 + BC (cT3N1M1) in January 2014 with elevated CA 15–3 levels (40.33 U/ml). According to the age and patient's ECOG-PS, a first-line treatment, including docetaxel, trastuzumab y pertuzumab, was planned in March, 2014. Pertuzumab was administered as a 840 mg loading dose, then a 420 mg maintenance dose every 3 weeks thereafter. The treatment is still active, 6 cycles administered (3.36 months duration) with a considerable decrease of CA 15–3 marker levels (27.72 U/ml). The patient is tolerating therapy without any adverse effects.

Conclusions: The role of HER2 targeted agents, such as pertuzumab and TDM-1, will continue to evolve in the treatment of patients with HER2 + metastatic BC, and may lead to curative therapeutic plans. Our results suggest that these agents are well tolerated and show partial response in our patients, nonetheless the maturation of more evidences is needed.

Disclosure of interest: None Declared.

Hospital Pharmacy: Pharmaceutical Care

HP-PC133

Implementation of an inpatient anticoagulation management system

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Background and objective: Anticoagulants are high-risk medications that are among the most common medications that cause adverse drug events (ADE's) in hospitalized patients (Zaidenstein R. et al. 2002, Piazza G. et al. 2011). More than 70 % of anticoagulant-associated ADE's among inpatients are potentially preventable (Piazza G. et al. 2011).
Setting and method: Based on clinical experiences and the results of a multidisciplinary medical record review on adverse events requiring a higher level of care in vzw Jessa Hospital, the focus of the inpatient anticoagulation management system (iAMS) was determined (Marquet K. et al. 2014). Because of the fact that vitamin K antagonists, low molecular weight heparins and new oral anticoagulants are the most common anticoagulants in causing (preventable) ADE's, these are the first focus in the iAMS. A medication safety self-assessment (Institute for Safe Medication Practices) was performed by three pharmacists and used to determine the needs for a safe hospital medication system. The iAMS will be implemented hospital-wide. After implementation of the iAMS, the medication safety self-assessment will be used to evaluate the iAMS and to determine new needs for a safe hospital medication system.
Results: Critical points for safe use of anticoagulants were identified using the medication safety self-assessment. The most important concerns were the lack of standardised protocols and guidelines, education for patients and health care providers and the absence of a computer order entry system with clinical decision support and interface with the lab management system. All the identified points from the self-assessment, critical and less critical, were used to determine the focus of the iAMS. The implementation of all these points was realised using different key areas of the iAMS. The goals of the iAMS are summarized in seven key areas: (1) protocols and guidelines, (2) implementation of a trigger tool method, (3) implementation of a new computer order entry system, (4) education of health care providers, (5) patient education, (6) care transitions and (7) outcomes and risk management.
Conclusions: Anticoagulants are high-risk medications associated with a significant rate of ADE's among hospitalized patients. An iAMS can be used to reduce preventable ADE's caused by anticoagulants.
Disclosure of interest: None Declared.

Hospital Pharmacy: Pharmaceutical Care

HP-PC134

Place of a clinical pharmacist in a multidisciplinary mortality and morbidity conference: example of an implementation in a thoracic surgery ward

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Background and objective: In our university hospital, pharmacists manage multidisciplinary mortality and morbidity conference (M&MC) in three orthopaedic surgery wards. Our experience in this field has enabled us to offer some help to thoracic surgeons. The objective of this study was to hold a quadrennial multidisciplinary M&MC in this ward, including surgeons, anaesthetists, pharmacists and the health framework.
Setting and method: Every day, pharmacists participate in the multidisciplinary rounds prescribing time and in medication reconciliation associated community pharmacists' information for eight months. The multidisciplinary team recognizes interesting cases with potentially preventable errors and suggests them for M&MC. The surgery and the pharmacy residents are in charge of organizing and animating these meetings.
Main outcome measures: Adequate indicators designed, risk events monitoring, corrective actions.
Results: Two multidisciplinary M&MC have been made in March and June 2014. Three indicators have been designed during the two sessions: time before pleural drain removal, surgical site infections rate and average length of stay in hospital based on the surgery. Two cases involving acute renal failure were treated, one functional and one organic. These 2 cases were due in part to unsatisfactory perioperative drugs management. Another case involved a massive hemothorax due to a radiologic supervisory failure. The last one concerned ineffective immunosuppressant treatment through under-dosage. Four corrective actions were taken: 1) update of postoperative diuresis monitoring protocol, 2) formalization of perioperative drug management according to the *French Society of Anaesthesia and Resuscitation* (SFAR) including a higher pharmacist involvement, 3) protocolization of radiologic controls frequency, 4) reporting of a non-compliance with the biological outcomes software. Eight risk events were recognized between the two sessions, including the two last case reports, of which three led to resolving actions.
Conclusions: Those experiences show that implementation of multidisciplinary M&MC with involvement of pharmacists give rise to improve quality of care, patient's safety and provide practical measures. The next stage will be the participation of the ward's nurses to build new knowledge on the problems that will be raised.
Disclosure of interest: None Declared.

Hospital Pharmacy: Pharmaceutical Care

HP-PC135

Can interdisciplinary patient-specific medicine management raise the overall quality in the medicine administration process on a ward?

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Background and objective: Patient-specific clinical pharmacy services practiced in Danish hospitals have undergone a rapid development over the past decade. Dispensing and administration is a very time consuming process for the nursing staff and process with a high risk of medication errors. In order to relive the nursing staff and raise the quality in the medication process one of the frequently requested services at the Capital Region Pharmacy is dispensing and administration of oral medication on the wards. This study focused on the quality the administration process by use of a pharmacist/pharmaconomists in an interdisciplinary medicine management team on a ward. The objective of this study was to whether the use of a pharmacist/pharmaconomist can increase the quality in the medicine administration process on a ward.
Setting and method: The Capital Regions medicine guidelines require patient bar-code verification with a Personal Digital Assistant (PDA) to identify patients prior to medicine administration. Usage rates of the bar-code verification is used as a proxy for the quality of the medication administration process.

21871 consecutive medicine administrations were reviewed for patients hospitalized with acute hip fracture from Sept. 2013 to Oct. 2013. Data was obtained from the database under the Electronic Medication Profile (EPM) and spitted between daytime (pharmacist/pharmaconomist), evening-/night (nursing staff) and weekend (nursing staff).
Results: Patient identification before medicine administration was completed 86 ± 11 % (7662 of 8916) in the daytime by the pharmacist/pharmaconomists. In the evening/night and weekend time the nursing staffs identify the patient in 51 ± 33 % (3612 of 7017) ($p < 0{,}001$) and 56 ± 30 % (3348 of 5928) ($p < 0{,}001$) before medicine administration.
Conclusions: This study confirms that the patient identification before medicine administration is significant higher in the time periods where the pharmacist/pharmaconomists perform the process. Administration of oral medicine by a pharmacist/pharmaconomist can reduce the incidence of medicine errors due to administering medicine to the wrong patient.
Disclosure of interest: None Declared.

Hospital Pharmacy: Pharmaceutical Care

HP-PC136 Use of structured medication report at transition from hospital to community health care

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Background and objective: The aim of this study is to investigate whether a structured medication report from the hospital can reduce the number of

medical errors in the medicine lists in the community health care. Earlier studies have proved that drug related problems (DRP) often find place in the transition point between health care levels, especially when elderly patients is discharging from hospitals to primary care. The main objective of this study is to prove if structured medical reports can increase quality of the information and thus reduce the number of DRPs when patients transfers to primary care. Previously developed method will be used to form a structured medical report for the patients in the intervention group. The study is related to the ongoing Coordination Reform which is a systematic approach for strengthening the cooperation between health care providers in Norway.

Setting and method: Prospective, controlled study in 100 patients, hospitalized to medical device at Akershus University hospital, planned to be transferred to primary care for further health care. In the intervention group, patients will receive a structured medical report provided by pharmacists and approved by physicians at discharge. The control group will not receive a structured medical report, but standard care upon discharge. The medicine lists in primary care will be investigated within ten days after discharged from hospital. Discrepancies between the medication list at discharge and in primary care will be evaluated. DRPs will be discussed and classified into clinical relevance from particularly relevant (stage 1) to little relevant (stage 4).

Quest back from health care personnel in primary care related to the two different patient groups will subsequently be compared in how much time they spent in contacting the hospital, to see if the time is reduced in the intervention group.

Results: The pilot study including eight patients showed totally 17 discrepancies between medicine list from the hospital and medicine list in the community health care. Numbers of drugs, drug strength, doses, time for administration and administration form are examples of inconsistencies. For some of the patients, the same drugs where indicated both as permanent and non-permanent drug in the lists sent from the hospital.

Conclusions: In the pilot study fewer errors was seen in the intervention group which indicates that structured medication report enhancing the quality of transmission of important drug related information.

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Hospital Pharmacy: Pharmaceutical Care

HP-PC138

Medication Reconciliation integrated in the patient electronic medical records

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Background and objective: Our Healthcare Area has joined the implementation of Medication Reconciliation (MR), as one of the four Safe Clinical Practices developed by The European Union Network for Patient Safety and Quality of Care (PasQ). We describe how we have developed an MR application what is integrated in the Andalusian electronic medical records System.

Setting and method: Diraya® is the information system of the Andalucian Public Healthcare, it integrates all the information of the patient in a single medical history, and enables electronic prescribing, which currently covers 94 % of the population. A hospital pharmacist and a computer programmer designed an application that could be integrated into the patient's electronic medical records, print current medication's list, generate an MR Form for admission and discharge, and a registration system for MR records remain stored in the electronic medical records and were available for Hospital Doctors, General practitioners and the rest of care providers.

Main outcome measures: Capability of register discrepancies, capability of select between justified and unjustified discrepancies. Capability of register episodes into electronic medical records.

Results: The application is capable of printing the MR form for the interview with the patient/family, record the discrepancies between chronic and acute medication, integrate every episode in the electronic medical records of the patient and keep them available for the following health care provider. In MR at discharge, it generates a warning system for the general practitioner who is in charge of the patient and allows feedback of information between professionals of different levels of care.

Conclusions: The MR application facilitates the information between the different levels of care. Integrates the process of reconciliation into the electronic medical records and by this way make it available for every healthcare provider.

Disclosure of interest: None Declared.

Hospital Pharmacy: Pharmaceutical Care

HP-PC139

Evaluation of the proper use of vancomycin in neonates and the interest of pharmaceutical follow-up of this prescription

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Background and objective: Vancomycin is widely prescribed at a dose of 30 mg/kg/day as 24 h IV infusion in the neonatal intensive care. An inadequate administration is regrettable in terms of inefficiency and toxicity for newborns. When the pharmaceutical team began to go in service to valid prescriptions, we realized that few plasma assay was done and they often showed underdosing. The objective of this study is to evaluate the proper use of vancomycin in this service, and to demonstrate the interest of pharmaceutical follow-up.

Setting and method: The study took place from January to October 2013, in the neonatal intensive care. The pharmaceutical follow-up has begun in June. A data collection has been produced from patients treated with vancomycin more than 48 h (only curative treatment). Several tools were used : the software of laboratory result (to note the state of renal function, and the result when it's dosed of serum vancomycin concentration), the software of computerization of antibiotic dispensations (to note the dose and duration of vancomycin treatment), and the monitoring sheets treatments (to record the baby weight). For the recommendations, we used the summary of product characteristics (SPC) and we made a bibliographic research.

Results: From January to October, we identified 104 treatments with vancomycin, 45 new-borns (44.23 %) have received a determination of serum vancomycin concentration : 11 (23.91 %) of which are effective concentration, 23 (50 %) are under dosed, and 11 (23.91 %) are overdosed (which 6 patients with renal failure). Before June, 17 of the 58 patients received a plasma assay (29.3 %). After June, 28 of the 46 patients received a plasma assay (60.87 %). Overall, on 19 patients treated with 30 mg/kg/day of vancomycin, with normal renal function : 5 (26.3 %) of which are effective concentration, and 8 (63.2 %) are under dosed. On the 104 study patients, 40 had treatment for more than 10 days, it seems to be ineffective. According to the SPC, the recommendations for use of vancomycin are as follows : 15 mg/kg/8 h by infusion. In a study (Nantes 1998), two groups of new-borns are treated with vancomycin in continuous : the group that had the loading dose has 88 % of blood levels in the target range (against 56 %, without loading dose).

Conclusions: We observe that only a quarter of blood dosages shows an effective concentration, and half shows an ineffective concentration. Excluding patients with renal failure, there is not much of overdose. A change in practice with the introduction of loading doses or follow the SPC could allow to have quickly an effective vancomycin concentration, and so to make only one plasma assay, especially in neonates where blood samples are risk of anaemia. Pharmaceutical follow-up has increased the number of plasma assay from 29.3 % to 60.87 % : it can adapt more quickly the posology. The daily presence of the pharmaceutical team allow to discuss with doctors, and to emphasize the important points : several months after, plasma assay is done almost all the time.

Disclosure of interest: None Declared.

Hospital Pharmacy: Pharmaceutical Care

HP-PC140

Choice of a benzodiazepine molecule for a safety use in psychiatric indications

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Background and objective: Appeared in the early sixties, benzodiazepines (BZD) are a subject of controversy despite of its anxiolytic, hypnotic and muscle relaxant effectiveness. The risk of addiction and dependency remains a major concern. These risks are accompanied by a misuse or voluntary or involuntary intoxications. For all these reasons and in the absence of actual bioequivalence, it makes sense to classify these molecules according to their use and ease of use. Currently, the choice of a BZD among the 22 molecules marketed in France is often based on the habits of prescriber who didn't generally know drug packaging. The objective of this study is to find a reference molecule which gathers several criteria for a better adaptation in daily use and limits the adverse effects of BZD.
Setting and method: Department of Psychiatry of a 740 beds French teaching Hospital with 45 beds.

A review of the scientific literature was performed from PubMed and French National Security Agency of Medicines and Health Products' recommendations. This mode of analysis for the BZD allows a choice based on evidence that is far from mercantile considerations or prescribing individual choices and this is a novelty compared to literature data on psychiatric treatments where shaping studies are usually cleverly constructed to verify the hypothesis.
Main outcome measures: BZD were compared and studied according to five criteria: half-life, packaging, hepatic metabolism, pharmacological actions and prices.
Results: The use of short or intermediate half-life BZD could limit the risk of addiction and reduce side effects as nausea after the intake and the risk of dementia. BZD are responsible for 67 % of suicide attempts by drug ingestion in 2009.The packaging promotes the transition to the suicidal act. BZD concerned and therefore to avoid are: bromazepam, lorazepam, loflazepate. A thermoformed packaging is preferred. The decrease of hepatic metabolism (elderly, liver disease, etc.) causes an increase of adverse effects and BZD without hepatic metabolism are preferred: lorazepam, oxazepam, temazepam. In experimental conditions, it would be interesting to use BZD targeting subunit of the GABA-A receptor in particular to have only one effect at a time. The last selective criterion is the price but all the benzodiazepines are affordable and the daily cost varies a little from one molecule to another (between 0.09 to 0.52 € per day).
Conclusions: The criteria of the molecules that should be prescribed in order to reduce the adverse effects associated with the use of BZD in French population are: short half-life, thermoformed packaging and no active metabolites. Molecules corresponding to these criteria are: oxazepam and alprazolam. This work has been presented at the Clinical Department of Psychiatry of the hospital and allowed to change treatment protocols in the use of BZD.
Disclosure of interest: None Declared.

Hospital Pharmacy: Pharmaceutical Care

HP-PC141

Evaluation of requests telaprevir/boceprevir for the treatment of chronic hepatitis C

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Background and objective: The appearance of telaprevir/boceprevir for treatment of chronic hepatitis C (CHC) has been a health and economic impacts. The Department of Pharmacy published recommendations to ensure rational use of these drugs and equal patient access to these treatments.

Validate clinical data in protease inhibitor drugs (telaprevir/boceprevir) requests for the treatment of CHC with data from clinical history, analysing economic impact that may have discrepancies found in treatment approval, according to recommendations.
Setting and method: Retrospective observational study of treatments telaprevir/boceprevir, referred to the Pharmacy Service for 12 months (April-2012 to March-2013).
Main outcome measures: Mandatory data in request are analysed: patient type (naïve or pre-treated); categorizing response to previous treatment according to viral load reduction (relapsed-patient, partial-responder, null-responder, unknown-response); degree of fibrosis (F0-F4); IL28B polymorphism; contained in requests for treatment and are compared with data from the clinical history (SIAS).
Results: 32 requests for telaprevir/boceprevir treatment, of which 5 were naïve patients (15.6 %) and 27 pre-treated-patients (84.4 %), were received.

Only discrepancies between data of request for treatment and clinical history in pre-treated-patients were found, regarding the response to previous treatment and the degree of fibrosis.
Depending on response, they are distributed in 16 relapsed-patients (59.2 %), 4 partial-responders (14.8 %), 5 null-responders (18.5 %) and 2 with unknown-response (7.4 %).

In relapsed-patients (detectable viral load at 24 weeks after 48 weeks undetectable), discrepancies in the degree of fibrosis in 7 applications (43.7 %) were found. In 2 of them, the degree of fibrosis of request is higher than shown in medical record; and in remaining 5, the degree of fibrosis in request is ignored, although recorded in clinical history, with F2 or less in all cases.

In partial-responders (reduction of at least 2log viral load from baseline at week 12) and in unknown response, discrepancies in assessment of response in all requests were found. According to data from clinical history, all patients were null-responders.
Finally, in 5 null-responders (less than 2log decrease in viral load), no discrepancies were found.

Therefore, 32 requests for telaprevir/boceprevir received, in 13 of them (40.6 %) were found discrepancies with clinical history, in relation to the type of response and the degree of fibrosis. Of these, 6 may modify criteria for approval of treatment, so it is questionable benefit/risk ratio in these patients. This represents a reduction in health expenditure of €172,191.84 (18.7 %).
Conclusions: A high percentage of discrepancies between information provided in requests for telaprevir/boceprevir regarding medical history exist. It is important to validate claims data with clinical history, prior to evaluation, in order to ensure rational use of these drugs in treatment of CHC.
Disclosure of interest: None Declared.

Hospital Pharmacy: Pharmaceutical Care

HP-PC143

Challenges with drug changes due to EU tenders

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Background and objective: The Hospital Pharmacy Central Denmark Region, Randers department wants in partnership with The Regional Hospital of Randers (RHR) and the department of health IT (HIT) to explore challenges when drugs are changing from one trade name to another due to EU tenders. When a drug in the electronic medication module (EMM) is prescribed, it is a specific trade name and not a generic prescription. The Regional guideline about dispensing drugs describe that nurses are not allowed to make a substitution between generic drugs. Therefore it is important that there is conformity between the drug that are prescribed in the EMM and the drug that are stored in the medicine room at the ward.
Objective: To increase the patients safety due to medication. To organize the routine about drug changes at RHR. To illustrate challenges if the pharmaconomist are changing the drug within 24 h in the EMM and in the medicine room over the entire hospital. Further to illuminate how much medicine that are discarded.
Setting and method: The project runs for 3 months.

When a pharmaconomist is ready to change a drug at a ward, she notifies the pharmacist. The pharmacist sends a mail to the other pharmaconomists about the change.

The discarded drug is registered in our electronic system (Apovision), at each ward and the amounts of drugs are photographed.
Results: 22 wards were involved. 27 drugs were changed from one trade name to another. 488 packagings were discarded. The expenses were 14.400 kr.
Conclusions: The routine about drug changes has been organized at the RHR, so drugs are changed over the entire hospital within 24 h. Some of the challenges observed during the project are:

– Large amounts of drugs were discarded on a ward due to extra drugs in the medicine room because off holidays.

– HIT was responsible for correcting the standard treatment regime (STR) in the EMM. HIT cannot keep up with all the drug changes, which means that

drugs in the STR are not changed within 24 h. Therefore there is a possibility that there is not conformity between the drug that are prescribed in the EMM (ST) and the drug that are stored in the medicine room at the ward.

Disclosure of interest: None Declared.

Hospital Pharmacy: Pharmaceutical Care

HP-PC144

Use of rilpivirine in HIV patients and its economic impact in a third level hospital

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Background and objective: Rilpivirine is a new antiretroviral that is indicated for the treatment of HIV-1. This is a non-nucleoside analog that acts by competitive inhibition of the reverse transcriptase.

The present study aims to describe the use of this medicine in its two commercial presentations: Edurant® (Rilpivirine) and Eviplera® (Tenofovir, Emtricitabine, Rilpivirine) and know the economic impact caused following its inclusion in the pharmacotherapeutic guidance of a third level hospital.

Setting and method: We collected the number of patients who began treatment with rilpivirine since its approval by the Pharmacy hospital Committee(April/2013) until January/2014. Medical histories were reviewed in order to meet the previous lines of antiretroviral therapy, whether the patients continued the treatment with rilpivirine at the date of the study or otherwise the reason for discontinuation. Economic costs brought about by this new drug during the study period and the annual economic impact compared to alternative antiretroviral therapies exist for each case were also evaluated.

Results: 116 patients were treated with rilpivirine: 56 with Edurant® and 60 with Eviplera®. Of the former, 8.92 % were naive, 48.21 % came from Atripla®(Tenofovir/Efavirenz/Emtricitabine), and 19.64 % Kivexa®(Lamivudine/Abacavir) plus Sustiva®(Efavirenz), and a minority with others. Only 3 of the 56 patients discontinued treatment with Edurant®, in two cases due to gastric intolerance ranitidine unyielding, and the other one for renal failure.

From Eviplera®, 18.33 % were naive, 60 % of patients came from therapy with Atripla®, 6.66 % with Prezista® + Norvir® + Truvada®, and the rest with other antiretroviral. 6 patients had to discontinue Eviplera®, 4 had gastrointestinal intolerance, 1 due to digestive upset after ingestion and 1 for insomnia.

Edurant® spending throughout the period was 89.491,74€, while Eviplera® was a total of 223.789,63€. Comparing the annual expenditure of rilpivirine with alternative therapies, treatment with Edurant® was a saving of 2.543,28€ regarding Isentress®, 2.545,68€ compared to Reyataz® + Norvir®, and 2.437,44€ to Prezista® + Norvir®. Compared to Atripla®(reference drug), Eviplera® represented an annual saving of just 576€.

Conclusions: Rilpivirine has been a change in the treatment of patients with HIV-1. The safety profile of these drugs appears to be favourable, however the two main adverse effects reported were related to gastrointestinal intolerance. In terms of economic impact, both have been a savings over alternative therapies. Therefore, this new drug seems to be a good alternative to the lines of previous antiretroviral treatment.

Disclosure of interest: None Declared.

Hospital Pharmacy: Pharmaceutical Care

HP-PC145

Results of the implement of a double check dispensing process in a Hospital Pharmacy Department

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Background and objective: Medication errors can occur during pharmacy dispensing. A study carried out in France between 2005 and 2009 by the Medication Errors Office showed that on 1420 medication errors identified, 12 % occurred while pharmacy dispensing[(1)]. Additionally, data from scientific literature showed independent double-check during drug administration enables a 70 % reduction of drug-related adverse events. The aim of this study is to evaluate the decrease in medication errors due to dispensing when using an independent double-check process, in order to optimize patient's safety.

Setting and method: This study was performed prospectively over 2 years (2012–2014) in a University Hospital, in 5 distinct sites (80 care units). Pharmacy technicians prepared drug doses ordered by physicians after pharmaceutical analysis. Two pharmacy students randomly checked drug dispensations under control of a pharmacist and a pharmacy resident. Drug and quantity delivered were checked. Qualitative error was defined as either a wrong drug, a wrong formulation or a wrong dosage prepared by technician. Quantitative error was defined as a wrong number of doses prepared by technician. Total of qualitative and quantitative errors were calculated.

Main outcome measures: Determine high alert medications and high alert units to focus the double check on them.

Results: Over 2 years, 379 random double-check were performed. At least one error was found in 80 dispensations (21 %). Of these, 15 (19 %) were qualitative errors and 65 (71 %) were quantitative errors. Among qualitative errors, wrong dosage (overdosing and underdosing) counted respectively for 53 % and 7 %, wrong drug delivered for 26 % and wrong formulation for 7 %. About antibiotics, errors occurred in 7 % of dispensing double-checks.

Conclusions: Dispensing double-check improved medication errors detection, and possibly decreased drug-related adverse events. In order to improve pharmacy dispensing safety, training will be provided to pharmacy staff (pharmacists, residents, technicians and also pharmacy students). Additionally, high-alert units are currently being identified in our hospital and will be targeted for systematic dispensing double-check, particularly in neonatal and paediatric units.

1. Guichet des erreurs médicamenteuses : Présentation et bilan depuis la mise en place—Juin 2009—Afssaps

Disclosure of interest: None Declared.

Hospital Pharmacy: Pharmaceutical Care

HP-PC146

The development of a software tool designed to support oncology clinics (for patients receiving chemotherapy treatment)

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Background and objective: Until recently, anti-cancer clinics in order to plan and schedule chemotherapy treatments applied time-consuming methods, characterized by a high risk of error occurrence. Considering all the barriers that make chemotherapy treatment a demanding procedure, the purpose of this study is to evaluate if a chemotherapy management program could improve the administration of such treatments. The authors developed "Carci", a software tool designed to support anti-cancer clinics.

Setting and method: The particular software program aims to provide an improved administration system for injectable anticancer agents and eliminate medication errors that could yield fatal events. The program records patients' data, selects the appropriate treatment protocol, calculates drug dosages and the correct preparation and administration of injectable solutions and updates the secretariat work. When comparing the manually and the computerized method, the use of "Carci" resulted in a decrease in the time required and increase in the calculated accuracy of the patients' Body Surface Area (BSA) and in a decrease in the occurrence of errors concerning the dosage of medication administered.

Main outcome measures: Statistical Package for the Social Sciences (SPSS) was used for data analysis. All calculations have been performed using Matlab® R2007 a Technical Software.

Results: A total of 18 cancer patients were assigned to this pilot study. Significant differences were observed in BSA values ($p = 0.0391$) and dosage ($p = 0.0042$) between the computerized method "Carci" and manually by the doctor. Although this has been a pilot study, we further evaluate this software program on breast cancer and GI cancer patients. A larger sample of patients is required in order to introduce for hospital use.

Conclusions: In summary, "Carci" is a software tool that enables us to make fast and precise preparations of injectable anticancer agent mixtures. Although this has been a pilot study, "Carci" may be a promising software tool for the safe and cost effective management of medication in cancer chemotherapy.
Disclosure of interest: None Declared.

Hospital Pharmacy: Pharmaceutical Care

HP-PC147

Impact of pharmacist intervention in use of daptomycin in a teaching hospital: a 3 years survey of prescribing practices

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Background and objective: At Pitié Salpêtrière hospital, daptomycin is dispensed to hospital inpatients with pharmaceutical control. Its use is limited to resistant staphylococcal infections (MRSA, coagulase negative staphylococcus (CNS)) but can also be used for empiric treatment, which require a previous agreement (bacteriologist and/or physician specialized in infectious diseases).

The aim of our study is to assess the efficacy of this controlled delivering system set up in the hospital pharmacy from 2011 to 2013.
Setting and method: We retrospectively studied daptomycin prescriptions from 2011 to 2013 in the Pitie-Salpetriere teaching hospital.
Main outcome measures: The characteristics of patients treated with daptomycine were collected: empirical treatments, identified bacteria, location of infection.
Results: From 2011 to 2013, 49 patients received daptomycin (respectively N = 6, 22 and 21). Main indications are: endocarditis [100 % of patients in 2011, 46 % (N = 10) in 2012, 57 % (N = 12) in 2013], sepsis [36 % (N = 8) in 2012, 29 % (N = 6) in 2013], and bone infections [18 % (N = 4) in 2012, 9.5 % (N = 2) in 2013]. Only one case of dermo-hypodermal infection was raised in our study. The majority of bacteria identified in 2011 were: MRSA (50 %) [Other bacteria: SMSA (33 %) and CNS (17 %)]. In 2012 and 2013, proportions are respectively: MRSA (41 % vs 38 %) and CNS (41 % vs 43 %). Other bacteria isolated are in lower proportion SMSA (13 % in 2012 vs 10 % in 2013), enterococci (5 % vs 4.5 %) and streptococci (4.5 % in 2013).
Conclusions: The number of patients remained stable. The requirements are consistent with our guidelines: limited to resistant cocci gram positive bacteria; the others are justified by contraindications requiring treatment with daptomycin. Our controlled dispensing system seems to be justified and should be continued in our pharmacy. Moreover, in 2013, we noticed that 50 % of prescriptions were off-limits doses (8–10 mg/kg), corresponding to serious infection diseases, but many publications recommend such doses in these cases. It would be interesting to develop therapeutic monitoring of daptomycin, in order to optimize patient's care.
Disclosure of interest: None Declared.

Hospital Pharmacy: Pharmaceutical Care

HP-PC148

High 5′s Medication reconciliation, project in Cardiology: assessment at 4 months

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Background and objective: One of objectives of High 5 s MedRec international project, "Action for patient safety, is safety of drug prescribing through Medication reconciliation (MR). It's an interactive process which ensures the continuity of drug therapy between home and hospital. Our hospital participated in this study since December 2013.

Setting and method: This project was carried out in Cardiology. Criteria patient inclusion: age > 65 years old, hospitalized in short stay after passing through an emergency department. In our hospital, we focused on patients with acute coronary syndrome. MedRec project concerns only the MR input. We expanded it to MR output in order to improve patient compliance and strengthen the city-hospital link. On admission MR allows to detect and correct possible medication errors. During hospitalization a pharmaceutical prescription analysis is routinely performed.
Results: 44 patients (SR: 3.4, median age 76.6 [65; 90], median hospital stay: 9 days) are included.. 369 discrepancies were observed between the complete list of treatments taken before hospitalization (performed by pharmacist) and treatments prescribed by physicians in admission: 347 were intentional and 22 (6 %) were unintentional. The unintentional discrepancies (UD) are sources of medications errors. Among UD, 76 % were omissions of drug' prescription, 14 % medication errors (in the same pharmacological class), 5 % under-dosing and 5 % overdose. 71.2 % of these UD was correct: 66.7 % omissions, 75 % medication errors and 100 % wrong dose errors. The time needed for MR for one patient is over 52 min; this includes pharmaceuticals interviews, comparison and pharmaceutical analysis of drugs prescriptions and preparation of various documents necessary. 21 patients answered a satisfaction survey. Overall, were very satisfied with pharmaceutical interview done at admission and before they leaves. 16 pharmacies answered a satisfaction survey. Overall (100 %) are very satisfied with MR process. They appreciate receiving information's concerning hospital patient' management and treatment modifications performed during hospitalization, in order to ensure the continuity of this support.
Conclusions: Even though it is time consuming, MR is a very interesting approach because it allows: the fight against drug' iatrogenic, supporting patients in managing of their treatment at home and construction of bridge between city and hospital, which is now essential for any patient. In Cardiology, MR will be extended to other pathologies at the request of physicians.
Disclosure of interest: None Declared.

Hospital Pharmacy: Pharmaceutical Care

HP-PC149

The anesthesic form: a key step to introduce medication reconciliation for patients with planned surgery

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Background and objective: Since January 2011, pharmacy department conducted Medication History (MH) for patients admitted both in visceral and orthopaedic surgery wards. Among 1800 annual MH, 40 % involved patient with planned surgery. We developed a continuous improvement program to increase the concordance between AF and MH. Since July 2013, the anaesthesia form (AF) is officially used as prescription for the preoperative time. A "dosage" column and the medication administration traceability for preoperative time were integrated to the AF.

The aim of our study was to evaluate qualitatively and quantitatively the use of the new AF. The secondary objective was to assess to concordance between MH and AF in terms of medication.
Setting and method: A prospective study has been conducted between January 15th and February 28th 2014. The inclusion criterion was: all patients with planned surgery in orthopaedic or visceral wards.
Main outcome measures: We evaluated the version of the AF used, if instructions for administration the previous evening or the morning before surgery were notified by the anaesthetist, if administration was documented by the nurse. Finally, discrepancies between AF and MH were split into two groups: medication (additional or missing drug, discordant or omitted dosage) and administration plan (discordant or omitted).
Results: Seventy-five patients were included (mean age: 53 years old; mean treatments per patient: 3.3). The "July 2013″ version was used for 53 % of AF. The instructions for administration were given in 68 %, the administration traceability was missing (39 %), partial (18 %) or total (43 %). Twelve AF were not concerned because the patient had no treatment.

MH mentioned 249 medications, 223 on the AF. The overall concordance (the right medication with the right dosage and administration plan) between AF and MH was 44 %. The discordance in terms of medication was 30 % and

concerned older patients (62.2 years old), with an average of 4.7 prescribed treatments. The discordance in terms of dosages was 9 %: missing on AF (7 %) or discordant with MH (2 %). The discordance in terms of administration plans was 12 %: missing on AF (10 %) or discordant with MH (2 %).
Conclusions: We raised awareness of chirurgical, anaesthetic teams and nurses on the importance of using the right AF, which is adapted to a prescription form. Most of the time, the anaesthetists correctly mentioned the instructions for administration, but the administration was correctly notified by the nurses in less than a half of the new AF.

The next step of our continuous improvement program is to conduct MH upstream during pre-anaesthesia consultation. A reassessment will be scheduled after this implementation.
Disclosure of interest: None Declared.

Hospital Pharmacy: Clinical education

HP-CE003

Impact of medication reconciliation in a department of diabetology

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Background and objective: Medication reconciliation (MR) may prevent the occurrence of a pre-admission iatrogenic event or lead to interrupted drug therapy during hospitalization. The aim of this study was to evaluate the interest of MR in clinical practice in diabetology.
Setting and method: This study was conducted between February and May 2014. Reconciliated patients were type 2 diabetic and polymedicated ($\geq$5 drugs). We obtained an accurate list of each patient's home medication. Comparing this list with medication order allowed correction of discrepancies which, when unintended, are a source of iatrogenic events. Two pharmaceutical interviews were also conducted: one for admission, to assess the knowledge of patient's treatment, and a second one for hospital discharge, to provide treatment information using different tools. A city-hospital's link is conducted with pharmacist, physicians and/or nurse to ensure the continuity in the transmission of information.
Results: Twenty seven patients were included: SR: 0.7, mean age: 67.3 years [46; 82], with an average of 9.8 treatments for each patient (cardiovascular drugs (32 %), cholesterol (9 %) and diabetes (24 %)). Patients did not know about half of their treatment (46 %). For these unknown drugs, we found cardiovascular (34 %), cholesterol (11 %) and diabetes (16 %) drugs. Interviews conducted at hospital discharge are therefore important and contribute to the improvement of the knowledge and observance. 100 % of patients were satisfied with these interviews. We identified 25 unintended discrepancies (UD). The average number of UD was 1.02 per patients. 14 patients had one or more UD at admission (56 %). The most common errors were: the omission of a regular used medication (72 %) or an incorrect dosage (16 %). Our intervention resulted in order changes by the physicians for 13 UD (52 %).
Conclusions: The admission to the hospital is a critical transition for the continuity of care in medication management. MR can identify and resolve errors due to inaccurate medication stories. It also allows helping patients in the management of their treatments at home and could improve patient compliance. This study underlines the interest of MR in patients with type 2 diabetes. This process is now included in the care of patients in the department of diabetology.
Disclosure of interest: None Declared.

Hospital Pharmacy: Clinical education

HP-CE004

Improving the quality of medication history on admission at Aalesund Hospital, Norway

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Background and objective: In 2011 a descriptive study mapping the quality of medication history recorded on admission to Aalesund hospital in Norway was conducted. The study revealed that nearly two thirds of the patients had discrepancies. Based on these results medication reconciliation, performed by trained health care personnel, was introduced in 2012. The purpose of this study was to investigate the effect of this new procedure in the surgical clinic.
Setting and method: The study was conducted as a prospective controlled study in the surgical ward at Aalesund Hospital, Norway. The quality of medication histories before and after implementation of medication reconciliation was compared. The endpoint was discrepancies between best possible medication history obtained by the pharmacist and the medication list recorded according to the ward procedures. The method used to collect best possible medication history was derived from the model of Integrated Medicines Management (IMM).
Results: 191 patients were enrolled in the study (77 control group, 114 intervention group). Average number of discrepancies per patient was reduced from 1.21 in the control group to 0.45 in the intervention group. Proportion of patients with discrepancies was reduced from 52.0 % to 25.4 %.
Conclusions: Medication reconciliation performed by nurses in the surgical ward improved the quality of medication history on admission to Aalesund hospital.
Disclosure of interest: None Declared.

Hospital Pharmacy: Clinical education

HP-CE005

Results of an education programme in improving according to guidelines

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Background and objective: To describe the implementation methodology of two quality prescribing indicators in a Bone and Joint (B&J) team and measure their compliance after an educational program had finished.
Setting and method: Into the quality indicators that the Andalusian Public Healthcare Service developed years ago, based on the selection of drugs which support better evidence of efficiency, there are two specific for bone and joint (B&J) diseases: Naproxen, diclofenac and ibuprofen as first-selection NSAIDs, and Calcium, Vit.D and alendronate as first-selection drugs for fracture prevention. This retrospective observational study measures the prescription percentage of these two indicators before and after an educational program consisting of clinical sessions, meetings with the head of the B&J team and/or Medical Directorate, and written reports for the doctors about their results every three months. The prescription rates were measured in October 2012, before the beginning of the educational program, and in August 2013. Prescribing data were obtained from the computerized records of reimbursed drugs Program (Microstrategy®) of all members who belonged to the B&J team at least one month during the time studied.
Main outcome measures: percentage of NSAIDs considered of first-selection (naproxen, diclofenac and ibuprofen) prescribed versus total of NSAIDs and percentage of alendronate, Calcium and Vitamin D versus total of drugs approved for fracture prevention.
Results: Three clinical sessions were given by the pharmacist in charge, plus two meetings between him and the chief doctor, and another two between the pharmacist, Chief Doctor and Medical Director. The initial team of six doctors was monitored. At the end of the study no one had left and no new doctors were incorporated. First selection NSAIDs prescribing was 18.23 % at the beginning and increased to 46.06 % ten months later and the percentage of first-line drugs for fracture prevention (Ca, vit. D and alendronate) rose from 27.05 % to 42.50 % at the end of the study.
Conclusions: Prescription of first-selection NSAIDs and first-selection drugs for fracture prevention was improved in a B&J Unit due to an educational prescribing program based on clinical evidence guidelines. The program had good acceptance between the doctors, and the implication of the Medical Direction was essential to obtain these results.
Disclosure of interest: None Declared.

Hospital Pharmacy: Clinical education

HP-CE006

Vitamin K antagonists: a leading cause of admission to emergency department

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Background and objective: Vitamin K antagonists (VKAs) require rigorous and continuous adjustment to biological results (international normalized ratio) in order to obtain a clinical efficacy and limit the risk of either bleeding or clotting. They are known to lead to many adverse effects due to difficulty to adjust dosage.

The aim of this study was to analyse frequency of adverse drug event (ADE) related to VKAs in patient admitted to emergency department (ED) of the university hospital of Montpellier.

Setting and method: Since November 2011, as part of an observatory of ADE, all patients admitted to the ED during working hours were studied. Data of patients taking VKAs were selected and analysed.

Results: From December 2011 to November 2013, 4667 patients were included and 402 (8.9 %) were treated with VKAs. The VKA population included 200 women and 202 men (sex ratio: 1.1) with a medium age of 81 years old. 240 of these patients (60 %) handled their treatment on their own, 124 (31 %) were helped by another person and 38 (9 %) were in a nursing home that took care of treatment for them. These patients took an average of 8 different drugs. Forty one percent of these patients had an INR outside the therapeutic window.

ADE was observed in 77 cases (19,2 % of VKAs population) whereas only 16,4 % in total population. The patients had different clinical symptoms : 19 patients (25 %) showed signs of digestive bleeding, 18 other patients (23 %) had hematomas, 12 patients (16 %) had haematuria, 5 patients (6 %)presented intracranial haemorrhage, 3 patients (4 %) suffered from heart failure, 6 more (8 %) from epistaxis and the last 14 (18 %) from other nonspecific bleeding. ADE had various consequences for patients. It lead to patient's death in 2 cases (3 %) to a severe degradation of patient's clinical condition in 4 cases (5 %), to a hospitalization in 43 cases (56 %), and in 28 cases (36 %) the ADE decreased with appropriate medical care.

Conclusions: This study highlights that patients treated by VKAs need specific attention and regular INR monitoring since the dosage is difficult to adjust leading frequently to ADE that may be severe. It is one of the pharmacist's responsibilities to make sure that the patients have a good understanding of their treatment and it's monitoring.

Disclosure of interest: None Declared.

Hospital Pharmacy: Clinical education

HP-CE007

Antineoplastic agents and infertility: informing patients to improve decisions

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Background and objective: Infertility is a potential adverse effect of cancer antineoplastic therapy. As the number of survivors increase, future fertility becomes an important issue and shared decision concerning fertility preservation (FP) must take place at the time of diagnosis. This decision has to be informed and meet patients' preferences. However, despite international recommendations, many cancer patients are still not adequately and timely informed on infertility risks associated with their cancer treatments and on available FP options.

Our aim was to produce quality information resources on infertility risks/FP options, tailored to cancer patients' needs, in order to facilitate discussion of infertility risks and support FP decision.

Setting and method: To assess information needs, questionnaires were developed and administered to cancer patients in follow-up consultations at CHUC, EPE. Furthermore, a search was conducted on Medline/PubMed to identify published studies on these topics.

Guidance on quality written information for patients, production of decision aids and the published evidence on infertility risks and FP options in cancer patients were identified through literature search.

Quality was assessed using EQUIP, a tool designed to evaluate all types of written health care information and DISCERN, an instrument that rates the quality of information on treatment choices. Resources were also tested for readability and pre-tested in a sample of patients regarding contents, language, layout and usefulness.

Main outcome measures: Information needs; Readability results; Patients' opinion regarding contents, language, layout and usefulness; results of EQUIP and DISCERN tools.

Results: Two types of patient information hand-outs were developed, both tailored to male and female cancer patients: (1) informing on cancer and cancer treatment effects on fertility, highlighting the need for a timely discussion of these issues; (2) describing all available FP options, conceived to support shared-decisions on FP.

Resources will be distributed through the CFP website, primary care, cancer care institutions, and cancer patients' associations.

Conclusions: This multidisciplinary program confirms the pharmacist vital role as patient clinical educator on adverse drug effects and their effective management. Evidence-based tailored information resources on infertility risks and FP options were successfully developed to contribute to timely, shared and informed clinical decisions regarding FP.

Disclosure of interest: None Declared.

Hospital Pharmacy: Clinical education

HP-CE008

Fertility preservation in cancer patients: an information booklet for oncologists

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Background and objective: Cancer antineoplastic therapy has a potential to cause infertility as an adverse effect. As the number of young survivors increase, future fertility becomes an important issue and shared decision concerning fertility preservation (FP) must take place at the time of diagnosis. Health care providers should address the possibility of infertility with patients treated during their reproductive years and be prepared to discuss fertility preservation options and/or to refer all potential patients to reproduction specialists. However, many cancer patients are not adequately informed and oncologists point the lack of information as one of the barriers to debate it with them.

Our aim was to produce a comprehensive, evidence-based information resource on the topics of infertility risks and FP options, tailored to oncologists' needs, in order to facilitate discussion of infertility risks with patients and support their FP decision.

Setting and method: To assess information needs, questionnaires were developed and administered to cancer care clinicians at several departments of CHUC, EPE. Furthermore, a search was conducted on Medline/PubMed to identify published studies on these topics. The latest published evidence on infertility risks and FP options was identified through literature search.

Opinion on contents, organization, layout, language and usefulness for clinical practice will be assessed in a sample of oncologists.

Main outcome measures: Information needs; Oncologists' opinion on contents, organization, layout, language and usefulness for clinical practice.

Results: A booklet with information concerning infertility risks and FP in cancer patients, tailored to the identified needs, was produced. This booklet includes 3 main sections: the first on the relevance of infertility risk assessment and FP on cancer patients; the second detailing all the available FP options, for male and female patients and, at third, a list of systematized answers to common questions arising in clinical practice.

This information will be distributed through the CFP website, clinicians in cancer care institutions and oncology medical societies.

Conclusions: Pharmacists, as medicines' information specialists and active members of the cancer care clinical team, must be prepared to educate patients but also other healthcare professionals. This multidisciplinary program supports the pharmacist's role as a clinical educator regarding effective and evidence-based management of adverse drug effects.

The information resource was successfully developed to contribute to timely, shared and informed clinical decisions regarding FP in cancer patients.

Disclosure of interest: None Declared.

Hospital Pharmacy: Clinical education

HP-CE009

Evaluation of Professional Practices (EPP): prescriptions in elderly patient on a given day

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Background and objective: A national survey on care related side effects realized in 2009 showed that patients older than 65 years old were particularly concerned by serious adverse drug events. In our hospital, a study group composed by physicians and pharmacist was constituted to evaluate therapeutic cares in elderly patients and propose adapted recommendations on prescription in elderly patients. The objective of this work is to assess drugs prescriptions in elderly patients.

Setting and method: First of all, National Health Authority (NHA) recommendations on prescriptions in elderly patients were diffused to physicians by the study group. Then, a collection grid assessing prescription was performed according the template of EPP drug prescription in elderly patients proposed by the NHA. Criteria picked up was: age, weight mentioned on prescription, number of psychoactive drugs and benzodiazepine prescribed, presence of non-steroidal anti-inflammatory drug, and prescription of vitamin-K antagonist associated to antiplatelet. Physicians realized a prospective auto-evaluation of patients older than 80 years' prescriptions on 2014/01/28. Only physicians working in services where prescriptions were computerized for medication participate to the survey, that is to say 55 % of hospital services.

Results: 6 physicians have participated to the survey. 75 prescriptions were assessed. 48 % of patients were hospitalized in a long-term care unit (LTCU), 12 % in cardiology, 12 % in acute care and rehabilitation (ACR), 17 % in geriatrics, 8 % in hepato-gastroenterology and 3 % in cardiac intensive care unit (CICU). Patients' average age was 88 years old. 7 % of prescriptions contained more than 2 psychoactive drugs (including benzodiazepine). No prescription presented more than 1 non-steroidal anti-inflammatory drug. 1 prescription had more than 1 benzodiazepine. Patients' weight figured in 71 % of prescriptions. 32 % of patients had vitamin-K antagonist associated to antiplatelet in their prescription. The association was found in 2 patients hospitalized in CICU and cardiology, 1 patient in ACR and 19 patients in LTCU.

Conclusions: The EPP shows that prescription in elderly patients in our institution is globally conform to NHA recommendations. However, some points may be improved easily, such as indicate patient's weight in the prescription. Furthermore, physicians must be sensitized to risk linked to vitamin-K antagonist and antiplatelet association.

Disclosure of interest: None Declared.

Hospital Pharmacy: Clinical education

HP-CE010

Mind the gap: factors that influence e-Health implementation in hospitals

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Background and objective: Systems for electronic prescribing, dispensing and administration of medicines have the potential to significantly increase patient safety by reducing medication errors. A systematic review (SR) was carried out to identify healthcare professionals' perceptions towards system implementation in hospitals.

Setting and method: A SR protocol was registered with the international prospective register of systematic reviews (PROSPERO)[2]. MEDLINE, CINAHL, IPA, PsycARTICLES, PsycINFO, The Cochrane Library and the CRD were searched up to August 2013. Searches were limited to the English language. Grey literature and the references of included studies were further examined. All studies that focused on clinicians, nurses and allied healthcare professionals and technologies for prescribing, dispensing and administration of medicines in the hospital setting were included. Initial independent, duplicate screening of titles, abstracts, and full texts was performed by SR team members. Data extraction of each included study was undertaken using a standard data extraction form. Studies were critically appraised using standardised tools. Synthesis of the findings from each of the included studies was carried out and a narrative summary of healthcare professionals' perceptions of key facilitators and barriers formulated.

Results: The search identified 2566 titles. Screening of title, abstract and full texts resulted in the inclusion of five papers. Reasons for exclusion were: duplicate publication, non-hospital setting, no focus on implementation processes, and a lack of investigation of healthcare professionals' perceptions. Included studies used qualitative interview methods and were conducted in the USA, Australia and Sweden. Results demonstrate that healthcare professionals perceived that increased patient safety, better access to patients' drug history, effective leadership and equipment availability and reliability can facilitate the successful implementation of electronic prescribing, dispensing and administration of medicines. Perceptions of barriers that hinder implementation include: technical problems in use such as being automatically logged out of the system and failure in information saving as well as network and hardware problems, altered work practices and diminished interpersonal communication.

Conclusions: There is a need to investigate this area further given the importance of such systems in improving patient safety and the fact that few studies have been conducted in Europe. Future work, such as in-depth case studies, could help further explore the facilitators and barriers among healthcare professionals. This work will provide evidence for policy makers and healthcare organisations and enable the successful implementation of electronic systems.

Disclosure of interest: None Declared.

Hospital Pharmacy: Clinical education

HP-CE011

Involvement of hospital pharmacists in diabetes education for prisoners: assessment of workshops on treatment compliance

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Background and objective: Prison takes away autonomy. However, prisoners should meet national standards of care, including health self-management education. In our institution, a transdisciplinary type II diabetes patient education program has been developed to help prisoners to adopt healthy behaviours. The purpose of this work was to develop workshops focused on diabetes medication compliance, and assess its effectiveness.

Setting and method: Within a three months prospective study, pharmacists conducted workshops on medication and drug compliance combining theoretical exchange and practical training about empowerment of patient in their treatment. At the end of the sessions, self-rating questionnaires were performed to assess outcomes of three learning objectives (LO):

LO1: Identifying their diabetes therapeutic;

LO2: Using medication(s) safely and for maximum therapeutic effectiveness;

LO3: developing self-management decision making in case of side-effects or acute complications.

Main outcome measures: The impact of workshops was estimated by crossing relevance, learning outcomes and achievement transfer.
Results: Thirty male patients with type II diabetes volunteered for this program. At this stage, fifteen patients participated to workshops related to medications. Patients involved showed a significant decrease in HbA1c three month after inclusion in regard with those that did not participate yet (-1.18 ± 0.52 % *vs* $+0.26 \pm 0.28$ %; $p < 0.001$).
Relevance: All participants consider themselves 'satisfied' or 'very satisfied' and ready to take part to other sessions.
Learning outcomes: Post-workshop score were significantly improved for LO1 (4.2 ± 0.9 *vs.* 2.2 ± 1.4 $p < 0.05$ %) and LO2 (4.5 ± 0.9 *vs.* 2.6 ± 1.3; $p < 0.05$ %). Improvement in using medication knowledge (LO2) was statistically correlated to the decrease in HbA1c at three months ($R = -0.692$; $p < 0.05$; $Y = 0.946–1.134$*
LO2; $R^2 = 0.478$). The teaching effectiveness is illustrated by relative improvements of 77.4 % for LO1 and 78.8 % for LO2.
Achievement transfer: To an open question exploring the learnt skills that will be set up after the workshops, key points from all LOs were reported with an average of one new skill per patient. Face to virtual cases, 70 % of participants would have adopted healthy strategies which they declared to be unaware of before (LO3).
Conclusions: These results illustrate the positive impact of the workshops and highlight the additive value of pharmacists' involvement in the transdisciplinary of health programs in prison. Our study shows that short term improvement of knowledge may be linked to middle term clinical outcomes.
Disclosure of interest: None Declared.

Hospital Pharmacy: Clinical education

HP-CE012

Protocol for the use of antiplatelet treatment in acute coronary syndrome

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Background and objective: The aim of this study is to describe the development of a protocol performed by the Provincial Commission for the Rational Use of Drugs to optimize the use of antiplatelet agents in Acute coronary syndrome (ACS) in order to achieve greater efficiency and security as well as control the expense of the pharmacological treatment of these pathologies.
Setting and method: A working group composed of health care professionals (Cardiology, Intensive Care, Pharmacy). Based on literature and recommendations of clinical practice guidelines of the European Society of Cardiology, the American College of Cardiology and the American Heart Association, was described an algorithm for the treatment of ACS. Likewise joined the algorithm using a line of research related to pharmacogenetics, which focuses on evaluating the usefulness of genotyping for a polymorphism in the cytochrome P219 in the choice of antiplatelet therapy patient with ACS undergoing percutaneous coronary intervention (PCI) with stent implantation.
Results: · STEMI: clopidogrel will be administered in patients without reperfusion therapy (fibrinolysis or primary PCI). Those for whom primary percutaneous coronary intervention planned:

- At the time of diagnosis (before PCI): Prasugrel or ticagrelor, the latter in cases with a history of transient ischemic attack (TIA) or creatinine clearance (CrCl) < 60 ml/min. In case of high risk of bleeding (CRUSADE criteria) clopidogrel.
- After more ICP stenting conducting pharmacogenetic test is proposed:

Clopidogrel: sensitive.
Prasugrel: resistant to clopidogrel.
Ticagrelor: resistant to clopidogrel and prior stroke or TIA.

NSTEMI: clopidogrel will be administered on low ischemic risk. In patients with moderate-high ischemic risk (scale TIMI), >75 years and <60 kg, or a history of TIA or CrCl < 60 ml/min, it is likely that ICP is raised: then proceed as in patients with STEMI.

Conclusions: The formalization of the treatment of ACS has allowed to include a new drug, ticagrelor, pharmacotherapeutic guide, optimize antiplatelet therapy to strengthen its safety and efficacy, while controlling spending this group of drugs poses to the hospital.
Disclosure of interest: None Declared.

Hospital Pharmacy: Clinical education

HP-CE013

Vitamin B12 associated biomarkers in metformin treated type 2 diabetes patients

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Background and objective: Treatment of diabetes patients with metformin is associated with reductions of 10–24 % in vitamin B_{12} (VB12) levels. Therefore, annual assessment is recommended to screen for VB12 deficiency. Recent findings question whether low serum VB12 in metformin-treated patients actually reflect impaired VB12 status. Holotranscobalamin (holoTc) is considered more adequate to assess VB12 status in this population. In this preliminary pilot study VB12, holoTc and homocystein (Hcy) levels were assessed in type 2 diabetes patients with and without metformin treatment and compared with a reference-group of non-diabetic patients with low VB12 level.
Setting and method: Observational cross-sectional study; Diabetes patients with- (MetDM) and without (DM) metformin treatment were recruited during a routine visit at their diabetologist and a reference group of non-diabetic patients with low VB12 levels (Ref-LVB12) at their general practitioner. Venous blood samples were analysed for VB12, holoTc and Hcy. Cut-off values defining VB12 deficiency were VB12: < 200 pmol/L, holoTc: <37 pmol/L and Hcy: > 15 mmol/L. Patient's characteristics were assessed by questionnaires.
Main outcome measures: Biomarker serum concentrations: VB12, holoTc and Hcy.
Results: 34 diabetes patients (MetDM = 21; DM = 13) and 11 Ref-LVB12 were recruited between February and March 2014. Median VB12 and holoTc levels did not differ between MetDM and DM (VB12: 245 vs. 224 pmol/l; holoTc: 84.6 vs. 85.1 pmol/l,ns. both). Serum VB12 values <200 pmol/L in MetDM (n = 8) and in DM (n = 4) were present in both groups (Chi square test, ns.). Within all diabetics, a moderate inverse correlation between VB12 and Hcy was found ($r = -0.34$; $p = 0.03$), whereas holoTc and Hcy correlation was not significant ($r = -0.17$). Comparison between a subgroup of all diabetes patients with low VB12 and Ref-LVB12-group showed 23 % lower median holoTc levels in Ref-LVB12 ($p = 0.02$). Confirmation of low VB12 values by low holoTc/hyperhomocysteinemia was found in 36 %/18 % of Ref-LVB12 and in 8.3 %/50 % of diabetes patients (ns.).
Conclusions: Inverse correlation between Hcy and VB12 in diabetes patients and a lower frequency of vitamin B_{12} deficiency when assessed by holoTc levels in comparison to non-diabetic patients support a lower sensitivity of holoTc assessments in metformin-treated patients. Whether this finding is attributable to the metformin-exposure or to diabetes itself should be studied in a prospective study within a larger population.
Disclosure of interest: None Declared.

Hospital Pharmacy: Clinical education

HP-CE014

Potentially inappropriate medications for the elderly: an analysis based on the STOPP List in medicine department of a French general hospital

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Background and objective: Many studies have assessed inappropriate prescription for the elderly; one of the tools available is the STOPP list [1]. Due to a high rate of elderly in our hospital, we proceeded to a prescription review to

assess inappropriate prescriptions (misuse or overuse) in this population, according to the STOPP list.
Setting and method: A 3-month prospective study is conducted by a tandem pharmacist–physician, in 30-bed medicine department. For each prescription, the STOPP list has been applied to each line of medication.
Main outcome measures: Data such as age, sex, drug group and pharmaceutical interventions were recorded.
Results: From March to May 2014, 41 prescriptions were reviewed. The average age of patients was 85.2 years (sex ratio M/F = 0, 52). 378 lines of medications were analysed (9 medications per patient). According to the STOPP list, 20 prescriptions (48.78 %) were concerned by misuse or overuse prescriptions. 31 pharmaceutical interventions were performed. The main drug group concerned is Alimentary tract and metabolism (38.71 %) followed by Nervous system group (35.49 %) and Cardiovascular system group (12.90 %). After the review, the acceptance rate of pharmaceutical interventions was 54.84 %, 32.26 % were refused and 12.90 % were not assessable (discharge of the patient). In case of changes of treatment, 47.06 % of the drugs were arrested immediately or gradually, 41.17 % of the drugs were modified by adjusting the dose and 11.77 % by substitution drugs. There is no significant difference in the number of medications per patient (8.8 medications).
Conclusions: These data show that misuse or overuse medication for the elderly is often prescribed. In the literature, similar results were found[2]. Other studies need to be performed in other department. Then a multidisciplinary meeting (tandem pharmacist–physician, geriatrician…) will establish a clinical guideline to help physicians to choose the most appropriate drugs for the elderly.

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Disclosure of interest: None Declared.

Hospital Pharmacy: Clinical education

HP-CE016

Designing a safe system of prescription, preparation and administration for the cystostatic medication

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Background and objective: As the cytostatic medication is a narrow therapeutic index group of drugs, it is necessary to develop new mechanisms to improve its safety from the prescription to the administration in the hospital in order to avoid fatal errors.
So, our aim is developing a system that ensures that the prescription process, development and administration of cytostatic drugs meets the criteria: right patient, medication, dosage, route of administration and time
Setting and method: Along with the centralization of the drugs preparation in the pharmacy service, it has been designed a computer system for the management of the administration of cytostatic drugs consisting of: portable digital assistant (PDA) with barcode reader, label printer for barcoded medications, patient identifying wristband and developing a specific program for verification and administration register.
Results: Every chemotherapy prescription is sent to the cytotoxic admixture unit mixer where it is validated by a pharmacist checking the following items: name and number of patient history, diagnosis, stage, line treatment, drugs, dose and route of administration. The computer program generates drug label containing the bar code which identifies the preparation. Each patient has a label with the bar code of the history number.

Before the administration of each cycle, the responsible nurse has to read the patient bar code with the PDA. On the screen of the device will appear the drug and the right order for that patient. Nurses should read the bar code of each drug to be administered and the system controls if it is the right medication and order, alerting visually and acoustically if error occurs. The system records the nurse and time of each drug administration
Conclusions: The implementation of the project is given by the need for security mechanisms in the management of high-risk medications, being cancer treatments a narrow therapeutic index group of drugs.
The system ensures the five security keys: patient, medication, dose, route of administration and time.
Disclosure of interest: None Declared.

Hospital Pharmacy: Clinical education

HP-CE017

Survey on activity of pharmaceutical validation of the computerized prescriptions

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Background and objective: Computerized medical files using software traksare program has started on November 2012. Pharmacists are divided into two hospitals and account for 15 departments. We aim to describe the method of validation of computerized prescriptions. We will focus on the disparity of these methods in an attempt to promote them.
Setting and method: A questionnaire provided to pharmacists include 3 parts : procedures of pharmaceutic validation, different practical activities and main issues.
Results: Two pharmacist and three medical residents valid an average of 3 care units or more daily for a meantime of 2,16 h. Their colleagues from others specialities valid only one care unit for a duration of 30 min. Average duration of pharmaceutic validation for one first prescription is 5 min. Criteria essentially considered the cause for hospitalization (9 people on 12) and the anthropometric characteristics (7/12). Biological data mainly evaluated the ionogramme (7/12), monitoring of anticoagulants (7/12) and of the renal clearance (6/12). The frequent intervention concern the replacement therapy (11/12) and the input error of prescriptions (doubloons, errors units) (7/12). The pharmaceutical comments concern especially the dosage non-compliances (8/12) and the drugs interactions (5/12). Their mean frequency is once a week. The difficulties are especially relative off-label use (4/12) and to the validation of antibiotic treatments (3/12). Eight pharmacist/internes consider the interest of their interventions is limited.
Conclusions: Availability and specialization of pharmacist represents the main causes of the heterogeneity of practice. Measures of harmonization of pharmaceutical validation were studied. An evaluative repertoire common will include different necessary tools for the pharmaceutical validation (replacement therapy commonly observed, bibliographical references about the off-label). Symposia will be organized with the medical practitioners of the establishment. These measures will allow to ameliorate the efficiency and to facilitate the adaptation of the residents to practices of hospital.
Disclosure of interest: None Declared.

Hospital Pharmacy: Clinical education

HP-CE018

Evaluation of patient education program in kidney transplantation: Results and benefits of a qualitative approach

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Background and objective: Understanding and integrating issues concerning immunosuppressive drugs (IS) is for the kidney transplant patient a major challenge and may reduce the risk of graft rejection. The approach of the current therapeutic education program applied in our transplant centre is based on explaining immunosuppressive therapy to patients. The purpose of this

study was to assess the efficacy of these educational activities in order to improve this program.
Setting and method: A qualitative study was realized. This method allows flexibility for interviewer to evaluate knowledge gained, and to explore needs and opinions of patients. Two semi-directive interviews were conducted: the first within 24 h prior to hospital discharge following transplantation and the second, by phone, one month after hospital discharge.
Results: Fifteen patients were included.

Program evaluation showed that names, indications and appropriate use of IS were acquired. Nevertheless, different points required particular attention: the immunosuppressive indication of corticosteroids (ten patients), the risks induced by the consumption of medicinal plants (three patients) and the reason for blood work (six patients didn't know which drug was dosed: tacrolimus).

Prior to discharge patients were mainly concerned of non-IS therapy: antiviral prophylaxis (seven patients), homeopathy (one patient), the issue of generic drugs (two patients), anticoagulants (two patients). We highlighted the needs of patients to verbalize their fear of oversights and of precautions taken to avoid them. Finally, the fear of rejection was also very present.

Preliminary analysis of phone interviews showed that new difficulties appeared at home and a few non appropriates behaviours. Patients related mainly side-effects: sleeping difficulties, or steroid dependent facial oedema (three patients), trembling linked to tacrolimus (five patients), diarrhoea related to mycophenolate mofetil (one patient) and pain (four patients). The inappropriate behaviours were an exceeding of the recommended posology of paracetamol, and one patient didn't call hospital in an emergency situation.

Ten patients spontaneously expressed their satisfaction and seven out of nine patients found this phone interview interesting.
Conclusions: The findings showed that most of the information provided by the program was globally acquired. This qualitative approach suggested that patients were not only concerned about their immunosuppressive treatment but also about the rest of their medications. The therapeutic educational program should take in account all treatments and an educational follow up should be considered.
Disclosure of interest: None Declared.

Hospital Pharmacy: Clinical education

HP-CE019

Analysis of reconciliation situation in general surgery

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Background and objective: Medication reconciliation at admission and discharge has been designated as a required hospital practice to reduce adverse drug events in patients undergoing surgery. Our objective is to analyse the domiciliary treatment reconciliation process at admission and discharge of patients admitted to a surgical clinical management in a tertiary hospital.
Setting and method: Descriptive and observational study conducted by internal audits of general surgery and digestive system clinical management units.

We selected a random sample of patients admitted from January to June 2014 in these units.
For each patient it was determined if reconciliation of home treatment was made at admission and discharge time and if it was reflected in the medical record.

To assess the degree of reconciliation a Coverage Program Indicator was calculated at admission and discharge (ratio between the number of patients in which reconciliation was made at admission and discharge time and all the sample of patients). Only patients in which reconciliation was made at admission and discharge time were considered adequate to calculate the overall Coverage Program Indicator.
The sources consulted were the electronic medical records and the electronic pharmacy prescribing program.
Results: 30 patients were selected.

The Coverage Program Indicator at admission was 42.4 % and 81.5 % at discharge. The overall Coverage Program Indicator was 41.4 %.

The reconciliation process was incomplete in all patients (all doses or treatment duration of all prescribed drugs were not specified).
Conclusions: The overall medication reconciliation level in a general surgery and digestive system clinical management unit is moderate, being almost twice the reconciliation made at the time of discharge by comparison with admission time.

Possible areas identified for improvement are: enhancing reconciliation of income, promoting nursing participation in the reconciliation process and the delivery of clinical sessions about reconciliation for the physician and nursing staff.
Disclosure of interest: None Declared.

Hospital Pharmacy: Clinical education

HP-CE020

Implementation of pharmaceutical consultation meeting (cmpharm): method and first profits

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Background and objective: Pharmaceutical prescriptions analysis (PPA) is an important step in the patient drug management. To improve the quality of PPA and promote continuing education, a CMPharm was implemented within a team of junior and senior hospital pharmacists.
Setting and method: Each week a prescription is selected and sent to pharmacists with clinical and biological data needed for PPA. Each pharmacist submits via an online form its PPA and suggested pharmaceutical interventions (PI). The CMPharm is open to specialist clinicians in order to share clinical point of views and professional recommendations or practices. A reference PI is established at the end of each meeting. At 3 months, a first assessment of this exchange experience was carried out through an anonymous satisfaction survey distributed throughout the pharmaceutical team.
Main outcome measures: Satisfaction rate concerning the objectives, methodology and results of CMPharm.
Results: 12 clinical cases were presented during 11 meetings between January and April 2014. 6/11 CMPharm took place in the presence of clinicians. 14 pharmacists (79 %) replied to the survey (8 Juniors and 6 Seniors). The average satisfaction score assigned to CMPharm is 7.3/10. The most satisfied were Juniors (average score: 8.2/10) and regular participants (average score: 8.7/10 for those who attended at least 6 meetings of 12). For all, the presence of clinicians had a positive impact by improving clinical relevance of discussions. 71 % of participants found this meetings approach rather instructive and 29 % very instructive. 50 % of junior pharmacists found it very instructive. 72 % of participants considered that CMPharm helped them with their daily PPA (83 % of Juniors and 62 % of Seniors). 93 % of pharmacists would like continuing their participation in CMPharm. However, improvements are desired concerning the method used for collecting and selecting cases and for disseminating meetings minutes.
Conclusions: CMPharm appears to be a satisfactory tool for junior and senior pharmacists education. It helps develop closed collaboration between pharmacists and clinicians in order to improve PPA practices. A common choice of cases, the diffusion of a thesaurus that allows consulting previous discussed PPA and the large participation of clinicians must be set up in order to benefit from experiences and knowledge of the whole team.
Disclosure of interest: None Declared.

Hospital Pharmacy: Clinical education

HP-CE021

Immunoglobulins' administration at home: interest of collaboration between hospital pharmacist and home care nurses for patient education

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Background and objective: Immunoglobulins (IG) for treatment of autoimmune disease or immune deficiency can be done at home. It is made monthly by a nurse (Intravenously) or weekly (Subcutaneously) by a nurse or patient

himself when he has been specifically trained. It is generally well tolerated, but can cause serious side effects, usually linked to a noncompliance with administration' conditions and/or misunderstanding of main precautions for use and of parameters to be monitored. The objective of this work was to provide to patients and home care nurses synthetic and reliable information' sheets.
Setting and method: The project was carried out in 4 steps: 1/Identification of patients' needs by questions collected by nurses at home. 2/Writing and multidisciplinary validation of educational information on IG. 3/Factsheets' presentation to patients by pharmacists at hospital and by nurses at home. 4/Assessment of patients' satisfaction.
Results: The main patients 'concerns when IG is administrated at home were adverse events, traceability (role and holding of the traceability book), storage in case of travel, management of biohazard waste and injections. Pharmacist in collaboration with medical team has developed factsheets providing synthetic and educational information. They are given individually to patients in hospital after a pharmaceutical interview or at home after an interview with nurse. Forty patients (mean age: 55 [19; 85]) responded to satisfaction survey to assess the sheets: 92.5 % were satisfied with the informations' relevance, 97.5 % are satisfied with the informations' adaptation in their daily lives, 95 % are satisfied with the informations' clarity. 97.5 % are generally satisfied with these sheets. These sheets have been transversally validated with Pharmacy and departments of neurology, internal medicine and oncohaematology. They are also a teaching tool for nurses in hospital and at home.
Conclusions: The tool that we developed is an opportunity for hospital pharmacists to develop clinical pharmacy. The project has been well received in care units. Following this work, pharmaceutical interviews have been implemented in internal medicine unit for patients before their first administration of IG at home. They will also be implemented in others units. This work enabled us to build bridges between home care nurses and hospital with the aim to optimize and secure patients' support with IG at home.
Disclosure of interest: None Declared.

Hospital Pharmacy: Clinical education

HP-CE022

Management of non-malignant chronic pain conditions with opioids; cross-sectional challenges

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Background and objective: Changes in opioids prescribed at admission to, during treatment at and after discharge from the Multidisciplinary Pain Centre, MPC, Rigshospitalet.
Setting and method: A prospective research of opioids prescribed to elderly patients (+60) with chronic non-malignant pain. Prescriptions of opioids were identified in 30 comprehensive medication reviews conducted by a clinical pharmacist at the MPC, Rigshospitalet. The national electronic database "Personal Electronic Medication profile" (PEM), GP medication records, hospital medication records were consulted and patients interviewed. Formulation and dose of the prescribed opioids were recorded in a database, doses were converted into daily dose in mg oral morphine equivalences (OME) and daily dose in mg extended release morphine equivalences (extOME). The data were analysed using descriptive statistics.
Main outcome measures: Active pharmaceutical ingredient, OME and extOME measured at admission, during treatment, at discharge and 6 months after discharge from MPC.
Results: Nineteen patients were prescribed opioids on admission to the MPC and 4 of those in a combination of pure opioid agonist and tramadol. At discharge 13 patients were prescribed opioids and 3 of those in combination of two pure opioid agonists. OME were 30 mg at admission, 23 mg OME during treatment and 33 mg OME at discharge. At admission extOME were 73 mg per patient, 90 mg extOME during treatment and reduced to 49 mg extOME at discharge. Six months after discharge patients were prescribed 38 mg OME and 45 mg extOME.
Conclusions: After admission the MPC patients were shifted to extended release formulations of opioids and hereafter opioids were phased out according to general principles in chronic pain management. Unfortunately, after discharge GP's tends to re shift to or add conventional opioids, indicating a need for better communication between pain specialist and GP's regarding the optimal treatment of the single patients across the health care system.
Disclosure of interest: None Declared.

Hospital Pharmacy: Clinical education

HP-CE023

Evaluating the interest of a pharmaceutical interview while dispensing antiretroviral drugs to outgoing patients

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Background and objective: The communication of information regarding the good use of medicines represents one of the pharmaceutical missions. In 2013, 387 ambulatory patients living with HIV received antiretroviral drugs (ARV) from our hospital pharmacy consultation. It is now widely recognized that therapeutic education is major for compliance to HIV medication. The aim of this study is to evaluate the interest of a pharmaceutical interview with HIV-positive patients.
Setting and method: A questionnaire was developed and proposed to ambulatory HIV-positive patients while dispensing their ARV by a pharmacy resident during a pharmaceutical interview. All patients were adults and independently selected (no sex or treatment instauration date criteria). Five parameters were analysed: Knowledge of the illness; Medicinal treatment; Attitude toward their medication; Knowledge of the side effects; Satisfaction of the whole information distributed by the pharmaceutical team. Each interview was realized in a confidential area and all the questionnaires were rendered anonymous.
Results: Thirty-one patients were interviewed for 10 to 25 min. Ninety percent of the patients estimated that they well knew their illness, 84 % knew at least the name or what looked alike each one of their tablet, 87 % knew the role of their medicine, 84 % knew the consequence of drug omission and 66 % knew what to do in case of omission. One third of the patients didn't know that they could benefit of a 12 h window to take the once a day prescribed and forgotten medicine. In accordance with their prescription 90 % took their treatment at the right time, 90 % during or outside the take of the meal and 84 % in a consistent schedule. Nineteen percent didn't know what a side effect was. Eighty-four percent were satisfied of the whole information delivered by the pharmaceutical team. Most patients understand their illness (cause/consequences of HIV infection). Medicinal treatment is well managed and the ARVs'compliance is well known.
Conclusions: Some points were frequently discussed due to a lack of knowledge and allowed to adapt the therapeutic education regarding:

- What to do when a tablet is not taken (most patients used to skip the drug administration).
- Knowledge of the frequent side effects and of the importance of their notification to the healthcare professionals.

The information satisfied the patients and those who never had any advice thought that the interview was useful. Such pharmaceutical interviews could reasonably and widely be adapted to other ambulatory patients for other chronic diseases.
Disclosure of interest: None Declared.

Hospital Pharmacy: Clinical education

HP-CE024

Evaluation of use and resistance to three broad-spectrum antibacterial drugs in North Estonia Medical Centre

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Background and objective: There is a growing tendency to use broad-spectrum antibiotics over narrow-spectrum ones. Drug utilization analyses are widely used to recognize the misuse of broad-spectrum antibiotics and its impact on hospital microflora. Purpose of this study is to evaluate trends in three broad-spectrum antibacterial drug use, assess them in relation to antibiotic resistance and to present the use of four narrow-spectrum antibiotics as background.
Setting and method: The study was conducted in North Estonia Medical Centre (NEMC), tertiary care hospital, during 2009–2013. Antibiotics studied were selected with similar broad antibacterial spectrum: ampicillin with sulbactam, sultamicillin, amoxicillin with clavulanic acid (AC) and cefuroxime (CF), including both oral and intravenous dosage forms. Ampicillin with sulbactam and sultamicillin (AS) have been used together for later analysis. Narrow-spectrum antibiotics presented were oxacillin, ampicillin, amoxicillin and benzylpenicillin. Data about use of antibiotics was obtained from hospital pharmacy and number of hospital days (hd) from hospital database. Antibiotics use was described using Defined Daily Dose (DDD) per 100 hd in accordance with WHO DDD methodology. The pathogens selected for assessment of resistance were two main Extended Spectrum Beta-Lactamase (ESBL) producing bacterias Escherichia coli and Klebsiella pneumoniae. The data about resistance was obtained from hospital microbiology lab.
Main outcome measures: The use of broad-spectrum antibiotics as DDD/100 hd and proportion of resistance to broad-spectrum antibiotics.
Results: The use of broad-spectrum antibiotics has increased continuously: AS from 10.37 to 15.34 DDD/100 hd (47.9 %) and AC from 1.67 to 3.11 DDD/100 hd (86.2 %). For CF, there has been a slight growth from 3.69 to 3.82 DDD/100 hd (3.5 %). Compared to upward trend in use of broad-spectrum antibiotics, the decrease of four narrow-spectrum antibiotics use has varied from 15.9 to 47.1 %, which reflects the tendency to prefer broader empiric treatment in routine clinical practice. Within 5 years, proportion of Klebsiella pneumoniae resistance to broad-spectrum antibiotics has increased, to AS from 21 to 36 %, to AC from 29 to 43 % and to CF from 13 to 32 %, which is in accordance with total raise of ESBL-producing Enterobacteriaceae resistance in the hospital. Exceptionally, Escherichia coli resistance to AS has declined from 33 % to 18 % despite the increased drug use.
Conclusions: Considering the increasing resistance to broad-spectrum antibiotics, the local recommendations of antibiotics choice should be overlooked and the use of narrow-spectrum antibiotics should be emphasized in routine clinical practice.
Disclosure of interest: None Declared.

Hospital Pharmacy: Clinical education

HP-CE026

Assessment of patients' knowledge and attitude towards methotrexate utilization

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Background and objective: The aim of this study is to retrospectively determine the knowledge and attitudes of patients towards methotrexate utilization.
Setting and method: A retrospective descriptive study was conducted in rheumatology clinic of a training and research hospital. The patients were eligible for the present study if they were 18 years and older, and accepted to participate after being informed about the present study, using methotrexate for at least four weeks.
Main outcome measures: The questionnaire designed by investigators was applied to patients to assess knowledge and attitudes of patients towards methotrexate utilization.
Results: Among 50 participants, 72 % of them were female and the mean age of the patients was 51.76 ± 12.90. The most of the patients were married and had a low education level. When evaluating usage of methotrexate, thirty-eight participants utilized orally, while twelve of them used parenteral dosage form. Most of them utilized methotrexate once a week and more than six months along. In the study 52 % of them were not declared correctly *a reason for administration of methotrexate* and 36 % of them did not know *what to do if they missed a dose of methotrexate*. Most of them (96 %) did not know anything about *adverse effect of methotrexate*. Among nine of fifty patients, who had an indication for contraception, it was determined that 89 % of them did not use any contraception method during treatment with methotrexate. Of all participants, 82 % used folic acid concurrently with methotrexate treatment.
Conclusions: As a conclusion, it was found that participants of the present study have poor knowledge and attitudes towards methotrexate utilization. Pharmacists could be involved in management of patients treated with methotrexate by providing patient education and monitoring.
Disclosure of interest: None Declared.

Therapeutic Drug Monitoring and pharmacokinetics

TDMP003

Therapeutic Monitoring of Systemic Vancomycin Therapy at an ICU -Is it worth the efforts?

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Background and objective: To investigate if optimising the procedures in vancomycin therapeutic drug monitoring (TDM) by changing the administration times and increasing the doses, could improve the therapeutic outcome.
Setting and method: Observational design; data collection was performed before and after implementing new TDM procedures. Data was obtained from patients more than 15 years of age admitted to the ICU during the study period and undergoing IV vancomycin therapy for at least 48 h.
Main outcome measures: The following parameters were registered throughout the whole treatment period: Daily dosage, time of administration, time of blood sampling, serum concentration, dose adjustments during therapy.
Results: Pre-phase data from 30 patients (322 vancomycin therapy days), and post-phase data from 50 patients (417 vancomycin therapy days) were included. A total of 279 (79 %) of the doses were administered at the prescribed administration times, compared to 71 % before the new TDM procedures, 67 % of the blood samples were collected within the correct time range compared to 50 % before the intervention, and measurements initiated at presumed steady-state had increased from 21 % to 70 %. However, 29 % of vancomycin serum levels were within the recommended concentration range compared to 35 % before, and 46 % versus 40 % of concentrations were below the target range.
Conclusions: The new TDM procedures have resulted in an improvement in the precision of the practical procedures. However, the proportion of samples with vancomycin concentrations above the minimum concentration has decreased. Thus development of new alternative strategies for improvement is mandatory if TDM should be considered as an integral part of vancomycin therapy, else abandoning TDM should seriously be considered.
Disclosure of interest: None Declared.

Therapeutic Drug Monitoring and pharmacokinetics

TDMP004

Current vancomycin dosing recommendations for paediatric patients: a pharmacokinetic evaluation

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Background and objective: Current vancomycin (VANC) dosing schemes for children recommend using 40–60 mg/kg bodyweight/day, divided over 3–4 doses and adjusted afterwards according trough value (optimum range 10–20 mg/L). From local observations, multiple dose escalations over several days after start of therapy are needed to obtain adequate plasma levels, potentially compromising patient outcome.

Objective: to evaluate the current dosing scheme in our hospital (15 mg/kg, 4 times daily) against the optimal PK/PD parameter for VANC (AUC/MIC ≥400) and trough levels.
Setting and method: Setting: paediatric ward in a tertiary care university hospital, with large proportion of haematological patients.

Methods: Patients >1 year and <18 years, who received VANC in intermittent infusion between 2011 and 2013 were included. Exclusion criteria were ICU patients, continuous VANC infusion, < 4 doses given and no serum creatinin or VANC levels available. Age, sex, main diagnosis, comorbidities, bodyweight, body length, VANC dose & frequency, infusion time, vancomycin trough levels, fluid balance and (nephrotoxic) co-medication were obtained from the electronic patient files. VANC clearance, distribution volume and Area Under the Curve (AUC) were obtained using JPKD© software (Kaoshiung Medical University–Taiwan) using a 1-compartment, first-order kinetic Bayesian analysis. The Minimum Inhibitory Concentration (MIC) was set to 1 mg/L according EUCAST recommendations. For analysis, patients were stratified according age: <6, 6–12 and >12 years. Statistical analysis was done using SPSS 22.0.
Main outcome measures: Actual VANC doses needed to obtain AUC/MIC ≥400 or trough levels 10–20 mg/L.
Results: Twenty-four patients (21 haematological; median age 6.3 years (range 1–15)) could be included with 183 available trough levels. VANC clearance was significantly correlated with total administered fluid ($\rho = 0.410$, $p < .0001$) and excreted fluid volume ($\rho = 0.368$, $p < .0001$) and inversely correlated with age ($\rho = -0.624$; $p < .0001$;) and weight ($\rho = -0.616$, $p < .0001$). Agreement between trough levels between 10 and 20 mg/L and AUC/MIC ≥400 was 86.0 %. To obtain AUC/MIC ≥400, the median required VANC dose was 29.36 mg/kg 4 times daily (23.96–39.90) for children <6 year; 21.52 mg/kg (17.63–27.08) between 6 and 12 years; and 13.95 mg/kg (13.54–14.71) > 12 years. These differences were highly significant (Kruskal–Wallis: 65.75; $p < .0001$). Similar median dosing values (24.89 mg/kg (19.55–29.69), 20.83 mg/kg (17.50–27.08) and 13.95 mg/kg (13.54–13.95) 4 times daily for <6 years, 6–12 years and >12 years respectively) were needed when considering adequate trough values only.
Conclusions: Current vancomycin dosing recommendations are insufficient for paediatric patients and should take patient's age more into account. In order to quickly obtain adequate levels, we propose following initial dosing scheme: <6 years: 4 × 25–30 mg/kg/day; 6–12 years: 4 × 20 mg/kg/day; >12 years: 4 × 15 mg/kg/day. A larger prospective study will be needed to confirm the recommended paediatric dose regimen for vancomycin.
Disclosure of interest: None Declared.

Therapeutic Drug Monitoring and pharmacokinetics

TDMP005

Disposition of different formulations of metoprolol before and after gastric bypass

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Background and objective: Roux-en-Y gastric bypass (RYGB) is a common treatment for morbid obesity. It alters the anatomical structure of the GI-tract by reducing gastric capacity and bypassing duodenum and proximal jejunum. These changes can result in modifications of the bioavailability of drugs. We evaluated the disposition of metoprolol tartrate (both immediate and controlled release formulation), before and after RYGB.
Setting and method: A single-dose pharmacokinetic study with 200 mg of metoprolol tartrate immediate release (Lopresor®) and controlled release (Slow-Lopresor®) was performed in obese patients before and six to nine months after RYGB. Both formulations were tested in all patients before and after RYGB, with an interval of at least 5 days between the study procedure for the immediate and slow release formulation. After oral administration, blood samples were collected at 15, 30, 60, 90 min and 2; 2.5; 3; 3.5; 4; 5; 6; 7; 8; 9; 10 and 24 h. The determination of the concentration of metoprolol was performed by a validated HPLC method with fluorescence detection (ex.271 nm, em.302 nm). The AUC_{0-24h} obtained before and after surgery was compared by a paired t-test.
Main outcome measures: Disposition of metoprolol tartrate, immediate and controlled release formulation, before and after RYGB
Results: Fourteen patients participated in the study. After oral administration of Lopresor®, the AUC_{0-24h} was 8.88 ± 1.53 μM*h before RYGB reaching a maximum concentration of 1511 ± 201nM after 1.25 h (range 0.50–2.50 h). After RYGB, the AUC_{0-24h} was 11.99 ± 2.51 μM*h with a C_{max} of 1991 ± 361nM after 1.00 h (range 0.50–4.00 h). The difference in AUC was not significant (paired *t*-test: $p = 0.07$). For the controlled release formulation, the AUC_{0-24h} was 7.17 ± 1.55 μM*h before and 8.72 ± 1.66 μM*h after RYGB (paired *t*-test: $p = 0.07$).
Conclusions: The disposition of metoprolol tartrate from an immediate release formulation and a controlled release formulation remains unchanged after RYGB.
Disclosure of interest: None Declared.

Therapeutic Drug Monitoring and pharmacokinetics

TDMP006

The impact of clinical pharmacists in the therapeutic drug monitoring (TDM) and therapeutic dose individualization of gentamicin for effective and safety therapy

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Background and objective: In spite of the fact that gentamicin has been used in clinical practice for several years, its administration requires individualized dosage according to TDM. Clinical pharmacists play an integral role in the therapeutic drug monitoring and therapeutic dose individualization of gentamicin at the beginning and during the therapy. The aim of the study is to determine the impact of clinical pharmacist in achieving therapeutic pharmacokinetic targets.
Setting and method: Our prospective study includes 310 (242 men, 58 women) adult patients hospitalized at the Teaching Hospital Nitra and treated by gentamicin during four years (June 2010–June 2014). Therapeutic drug monitoring was applied by pharmacists to all patients. Gentamicin concentrations were measured by the FPIA (Fluorescence Polarization Immunoassay) method. The frequencies between the groups were compared using the Chi square test. Value of $p < 0.01$ was considered highly statistically significant.
Main outcome measures: Proportion of patients achieving optimal levels of gentamicin with clinical pharmacist interventions at the beginning and during therapy and without clinical pharmacist involvement.
Results: The study had 2 phases.
The first phase without clinical pharmacist involvement at the beginning of therapy included 224 patients. Only 30 patients of them (13 %); (62 ± 8 years; $ClCr_{CG}$ ABW 86.9 ± 39.8 ml/min/1.73 m^2) had both levels optimal and the next adjustment of the dose has not been within the entire therapy needed. On the other hand 194 patients (87 %) needed intervention of clinical pharmacist during the therapy because gentamicin levels were not in the therapeutic range. 169 patients (50 ± 15 years; $ClCr_{CG}$ ABW 105.6 ± 36.4 ml/min/1.73 m^2) in this group needed higher dosage. Even 30 patients of them (55 ± 15 years; $ClCr_{CG}$ ABW 109.2 ± 47.1 ml/min/1.73 m^2) required further intervention of the clinical pharmacist and higher dosages. 25 patients (74 ± 11 years; $ClCr_{CG}$ ABW 56.3 ± 23.4 ml/min/1.73 m^2) needed lower dosage.

On the basis of these results clinical pharmacist individualized dosage regimen at the beginning of therapy of gentamicin in the second phase of our study.
The second phase with clinical pharmacist intervention (dose adjustment) at the beginning of the therapy included 86 patients.

All patients (100 %) $p < 0.01$vs.13 %; (56 ± 17 years; $ClCr_{CG}$ ABW 92.8 ± 28.2 ml/min/1.73 m^2) in the second phase had optimal both levels at the beginning and during therapy.
Conclusions: The interventions of clinical pharmacist decrease risk of underdosing or suboptimal therapy especially in younger patients with higher ClCr and decrease toxic effect of gentamicin especially in elderly patients with

renal insufficiency. The clinical pharmacist involvement optimizes doses, personalizes therapy and contributes to the safety and efficacy of the therapy for individual patients.
Disclosure of interest: None Declared.

Therapeutic Drug Monitoring and pharmacokinetics

TDMP007

Extended interval dosing of gentamicin–is it suitable for patients over 70?

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Background and objective: To assess safety and efficiency of extended interval dosing of gentamicin in patients over 70 years of age considering achieved through drug levels ($C_{through}$) and clinical outcomes
Setting and method: 18-month retrospective study in a large teaching hospital in Slovenia; all patients over 70 initially treated with gentamicin according to extended interval dosing regimen that were applied for TDM service; categorisation into groups based on creatinine clearance (CrCl) according to hospital dosing protocol: >60, 40–59 and 20–39 mL/min; comparison of initial dosing interval to protocol recommendation (24-, 36- and 48-hours for each group respectively); safety (target $C_{through}$ <1 mg/L); percentage of positive clinical outcomes (infection cured, patient recovered).
Main outcome measures: Conformity with hospital dosing protocol; achieving recommended T_{rough} after initial dosing.; evaluation of clinical outcomes.
Results: 36 patients (15 male) were treated with gentamicin for 3–22 days (mean 7.6 ± 4.8 days), all of them initially on 24-hour interval, which is not in accordance to hospital protocol for groups 2 and 3. All adjustments of dosing regimen were done by Clinical pharmacy TDM service, intervention followed on average after 3.2 ± 1.9 days. In 2 patients acute kidney injury was established; 1 received vancomycin concomitantly, 1 suffered multi-organ failure (MOF). In both cases duration of therapy was above average (14 and 21 days respectively).

Group 1 (CrCl > 60 mL/min): 7 patients (6 male), mean age 76.5 ± 3.0 years, mean CrCl 85.1 ± 9.6 mL/min, 8.0 ± 5.2 treatment days. 4 patients (57.1 %) initially achieved target $C_{through}$ (1 borderline), 2 were switched to 36-hour interval, 2 to conventional dosing regimen. Positive clinical outcomes: 100 %.

Group 2 (CrCl = 40–59 mL/min): 14 patients (3 male), mean age 79.2 ± 6.3 years, mean CrCl 49.4 ± 6.6 mL/min, 8.5 ± 5.5 treatment days. 5 patients (35.7 %) initially achieved target $C_{through}$, 6 were switched to longer dosing interval (1 to 48-, 5 to 36-hour), 2 to conventional dosing regimen. Clinical outcomes: positive in 12 (85 %).

Group 3: (CrCl = 20–39 mL/min): 11 patients (3 male), mean age 79.2 ± 4.9 years, mean CrCl 32.0 ± 3.1 mL/min, 7.8 ± 5.0 treatment days. None of the patients initially achieved target T_{rough}; 4 were switched to 36- and 4 to 48-hour interval, 3 to conventional dosing regimen. Clinical outcomes: positive in 8 (72.73 %).
Conclusions: Despite existing hospital dosing protocol discourages extended interval dosing of gentamicin for patients over 70, many physicians still prefer it due to its' simplicity. Our study shows that in some patients it could be used. To ensure safety, initial dosing interval should be based consistently on patients' kidney function, but with consideration, that latter could be falsely interpreted as good in elderly due to apparently normal creatinine concentration. In each individual patient, early consultation of TDM service is necessary for optimal results.
Disclosure of interest: None Declared.

Therapeutic Drug Monitoring and pharmacokinetics

TDMP008

Telaprevir-induced increase of serum creatinine levels in coadministration with amlodipine: a case report

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Background and objective: Telaprevir is an inhibitor of the HCV NS3/4A protease used in combination with peginterferon and ribavirin for treatment of chronic hepatitis C genotype 1. Telaprevir is a substrate and an inhibitor of CYP3A and the drug transporter, P-glycoprotein, thus predisposing possible drug interactions. Amlodipine is a substrate of CYP3A and is among the most frequently used drugs by patient with hepatitis C. The co-administration of telaprevir with amlodipine may result in an increase of amlodipine Cmax and AUC and clinical monitoring is recommended. The objective is describing a case of increase of serum creatinine levels associated with telaprevir treatment in co-administration with amlodipine.
Setting and method: The patient chart was reviewed, a literature search was performed, a thorough analysis of risk factors has been performed and the treatment has been modified.
Main outcome measures: Analysis pharmacokinetics of telaprevir and amlodipine; analysis of drug interactions; viral load (HCV RNA level), serum creatinine level.
Results: A 65-year-old man was enrolled to chronic hepatitis C genotype 1 triple therapy (Peginterferon + Ribavirin + Telaprevir). His body weight was 64 kg (BMI 24,9) and the current medications consisted of amlodipine (10 mg/day). Initial laboratory tests indicated a haemoglobin level of 12,6 g/dl, mildly elevated aminotransferase levels, normal platelet counts, level of blood glucose of 103 mg/dl. The initial serum creatinine level was 0,8 μ mol/L and the initial viral load (HCV RNA level) was 1518241 IU/ml. In May 2014 he initiated triple treatment with telaprevir, peginterferon a-2a (180 mcg) and ribavirin (800 mg) with good adherence. After two weeks, the viral load was not detected. In June 2014 the patient was admitted to hospital due to increase of serum creatinine levels (1.7 μmol/L) and a significant increase of blood glucose levels. After performing a risk factor analysis and rehydrated the patient, it has been decided to suspend the administration of amlodipine, to continue the administration of telaprevir and reduce ribavirin to 200 mg/die. After 24 h it has been observed a slight decrease of creatinine levels and this trend continued in the following days. After four days, the creatinine levels returned within the normal range (1.2 μmol/L).
Conclusions: Telaprevir therapy induces modification of pharmacokinetic parameters of drugs co-administered. Clinical monitoring, a correct assessment of risk factors and the modification of the treatment allowed in our case the prosecution of the triple therapy on a patient who had high chances of successful outcome. Interprofessional collaboration between doctors and hospital pharmacist has been a critical factor for the identification and correct management of drug interactions.
Disclosure of interest: None Declared.

Therapeutic Drug Monitoring and pharmacokinetics

TDMP009

A new MEPS/HPLC assay to quantify venlafaxine and its main metabolite in human plasma

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Background and objective: Venlafaxine (VEN) is a widely prescribed antidepressant drug. However a large inter-individual variability has been observed in its pharmacological response, requiring the therapeutic drug monitoring (TDM) to optimize the therapy. For that purpose, fast and reliable bioanalytical methods are essential. Therefore, in order to quantify VEN and its main active metabolite, *O*-desmethylvenlafaxine (ODV), in human plasma, the present work aimed at developing and validating a high-performance liquid chromatography-fluorescence detection (HPLC-FLD) assay using the microextraction by packed sorbent (MEPS) for sample preparation.
Setting and method: The target analytes (VEN and ODV) and licarbazepine [used as internal standard (IS)] were extracted from human plasma samples through a protein precipitation with trichloroacetic acid followed by the MEPS procedure using a C_{18} cartridge: 20 x 200 μL of methanol + 2 x 200 μL of water for activation/reconditioning, 3 draw-eject cycles for sample loading, 50

μL of water for washing and 200 μL of methanol for elution. Chromatographic separation was performed on a reversed-phase C_{18} column at 45 °C employing an isocratic elution with a mobile phase composed of 10 mM phosphate buffer with 0.25 % triethylamine (pH 3.3)/acetonitrile (83:17, v/v). The detector was set at 233/315 nm. Method validation was assessed considering the international guidelines.
Main outcome measures: Selectivity, linearity, limit of quantification, precision [given by coefficient of variation (CV)], accuracy (given by bias) and recovery.
Results: Chromatographic analysis was achieved within 6 min; endogenous interferences and several drugs frequently co-prescribed did not eluted at the retention times of VEN, ODV and IS. Calibration curves were linear ($r^2 \geq 0.9976$) in the ranges of 10–1000 ng/mL for VEN and 20–1,000 ng/mL for ODV. The overall precision was ≤5.05 % and accuracy varied between −10.28 % and 8.74 %. The mean absolute recoveries of VEN and ODV ranged from 72.66 % to 82.51 % (CV ≤3.45). The method was also successfully applied to real plasma samples with VEN.
Conclusions: Validation results were clearly in agreement with the requirements of international guidelines, demonstrating the feasibility of the method which emerges as a fast and cost-effective tool for TDM and clinical pharmacokinetic and toxicological studies involving VEN.
Disclosure of interest: None Declared.

Therapeutic Drug Monitoring and pharmacokinetics

TDMP010

Accidental methotrexate overdose: Case report

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Background and objective: Methotrexate is a folate analogue with anti-inflammatory, anti-proliferative and anti-neoplastic properties widely used in the treatment of rheumatoid arthritis, psoriasis and cancers. To prevent toxicity of High-dose MTX (HD-MTX) prescribed in many cancers, folate, hydratation and urine alkalinisation are systematically administered.
Setting and method: The present study is a case report of an overdose of MTX occurred in a patient treated by HD-MTX, and corrective actions that have been consecutively done to prevent further incidents in Pitié-Salpêtrière hospital (Paris, France).
Main outcome measures: A 70-year-old male suffering from brain lymphoma. The dose of MTX was 3.5 g/m^2, it was the second cycle administered to the patient. Methotrexate plasma level 24 h after administration was found to be very elevated (61 μmol/L; normal standards at H24: [1.0 to 5.0 μmol/L]). Laboratory investigations showed acute renal failure (creatinine clearance = 19 ml/min).

Department of pharmacology alerted immediately so that glucarpidase (Voraxaze®—Temporary Authorization Use)–an enzyme that converts MTX to its inactive metabolites–was started without delay, according to clinical signs of toxicity (hepatic, renal and cutaneous). Because of its reactivity, the patient finally survived with reversion of all of the symptoms but required acute follow-up and extended hospitalization.
Results: Analysis of medical record showed that overdose of MTX was caused by multiple medical errors due to insufficiency of hydratation and urine alkalinisation and to inadequacy of folate rescue regiment. Moreover it appears that these errors are caused in oncology department by the lack of treatment rescue protocols to prevent MTX toxicity, and by the presence of double support of medical prescription.

After this event, a multidisciplinary group including physicians, pharmacists, nurses and pharmacologists, was set up to implement corrective procedures and prevent further iatrogenic events. This group concluded that only one support of prescription would be used; protocol of MTX management toxicity should be written and exhibited in the oncology department and a notice of MTX toxicity management would be systematically given with glucarpidase when prescribed.
Conclusions: This case report shows the interest of a posteriori risk analysis in a multidisciplinary approach: it allows identifying the critical steps in care of inpatients so that targeted improvements emerge to prevent further iatrogenic incident.
Disclosure of interest: None Declared.

Therapeutic Drug Monitoring and pharmacokinetics

TDMP011

Vancomicin dose adjustment in intesive care unit by trough drug concentration and pk/pd index

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Background and objective: To compare vancomycin dose adjustment in patients by evaluating trough drug concentrations ($C_{through)}$ and the pharmacokinetic/pharmacodynamic (PK/PD) correlation.

Setting and method: Retrospective observational study of patients from the intensive care unit (ICU) treated with Vancomycin and monitorized by the clinical pharmacokinetic unit during 2013. The probability of achieving the PK/PD target associated with the success of antimicrobial therapy was evaluated. The vancomycin PK/PD target was set at AUC/MIC ≥400. Vancomycin clearance and area under the drug concentration–time curve (AUC) were estimated individually assuming a one-compartment pharmacokinetic model and the distributions of minimum inhibitory concentration (MIC) for methicillin resistant Staphylococcus aureus (MRSA) were calculated by microdilution and given from microbiology's section. PK/PD analysis was performed by Monte Carlo simulation. A 10,000-subject simulation was executed with SimulAr®. The probability of target attainment and the cumulative fraction of response (CFR) were calculated. The vancomycin was predicted to be effective if CFR ≥90 % for an index AUC/MIC ≥400. This dose adjustment was compared with what had been done in clinical practice by $C_{through}$
Results: Pharmacokinetics study was performed on 15 patients who were 54,3 ± 16.3 years old, 46.6 % were men, had 90.2 ± 34.8 ml/in of glomerular filtration and who were treated with vancomycin intravenously with an initial dose of 2687.5 ± 1352.5 mg/day. MICs distribution at our hospital in 2012–2013 was: 25.9 % of isolates MIC = 0.5, 68.9 % with MIC = 1, 1.4 % with MIC = 1.5 and 3.7 % CMI = 2. Vancomycin standard dosages led to a 33.3 % risk of not achieving the recommended AUC/MIC breakpoint for MRSA. All of these patients didn't achieve the $C_{through}$ recommended for vancomycin ($C_{through}$ = 3.46 ± 0.63 mcg/ml)). No dose was modified in 13.3 % of patients with $C_{through}$ compared to 20 % with the PK/PD index, and the dose was reduced in 30 % of patients with trough determination, and with the PK/PD index dose which had decreased in 46.6 % of patients. Recommendations for dosage adjustment made with the two methods were not statistically significant (Pearson $Chi^2(2) = 1.2256$, $p = 0.542$). Moreover, we observed that 40 % of patients exceeded the recommended PK/PD breakpoint AUC/CMI > 700 with de initial dose, that could be considered nephrotoxicity.
Conclusions: Data for bacterial susceptibility combined with measured data for antibiotic concentrations, using PK/PD models, predict the dose adjustment for individual ICU patients increasing the probability of clinical success in the antimicrobial treatment.
Disclosure of interest: None Declared.

Therapeutic Drug Monitoring and pharmacokinetics

TDMP012

Left ventricular ejection fraction and clopidogrel polymorphisms

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Background and objective: The choice of antiplatelet therapy guided by genotyping of CYP2C19 and ABCB1 polymorphisms, can prevent the loss of effect of clopidogrel and improve prognosis after percutaneous coronary intervention with stent (PCIs) in acute coronary syndrome (ACS). Our goal is to

analyse the impact of this strategy on the left ventricular function measured by ejection fraction (LVEF)
Setting and method: Patients with ACS undergoing PCIs were selected. Genetic study was conducted, choosing clopidogrel in the absence of alleles with loss of function (sensible group: CYP2C19 * 2 1/1 and ABCB13534 CC or CT) and prasugrel/ticagrelor for the rest (resistant group: CYP2C19 * 2 1/2 or 2/2 or ABCB13534 TT). LVEF was determined at discharge and was used as the dependent variable for analysis using a multivariate linear regression model using the genotype as an independent variable
Results: 244 patients were included, of whom 145 (59.4 %) were considered sensitive and received clopidogrel, and 99 (40.6 %) were resistant to clopidogrel (95 received prasugrel and 4 ticagrelor). The baseline characteristics of both groups were similar except for a shorter time to genetic diagnosis, and a greater number and length of stents per patient in the sensitive group. On average LVEF decreased 15.6 % with a history of CHF (95 % CI −23.3 to −7.9 %, $p < 0.00009$), 5.5 % with AMI (95 % CI −8.5 to −2.5 %, p 0.0004), 2.5 % with coronary artery disease or 3-vessel (95 % CI −5.3 % to 0.43, p 0.09) and 3.9 % if received Prasugrel/Ticagrelor prior to genotyping (95 % CI −7.4 to −0.4, p 0.03). The genotype was not a determinant of LVEF (resistant group had a 1.9 % lower, 95 % CI −4.3 to 0.5, p 0.12).
Conclusions: The choice of genotype-guided antiplatelet therapy had no effect on left ventricular function after ACS with ICPs. This may suggest that in genetically sensible patients, treatment with clopidogrel offers similar prognosis to other more potent antiplatelet.
Disclosure of interest: None Declared.

Drug Information

DI003

Encounters with immigrant customers: perspectives of Danish community pharmacy staff on challenges and solutions

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Background and objective: To explore the challenges that Danish community pharmacy staff encounter when serving non-Western immigrant customers. Special attention was paid to similarities and differences between the perceptions of pharmacists and pharmacy assistants.
Setting and method: A questionnaire was distributed to one pharmacist and one pharmacy assistant employed at each of the 55 community pharmacies located in the five local councils in Denmark with the highest number of immigrant inhabitants.
Results: The total response rate was 76 % (84/110). Most respondents found that the needs of immigrant customers were not sufficiently assessed at the counter ($n = 55$, 65 %), and that their latest encounter with an immigrant customer was less satisfactory than a similar encounter with an ethnic Danish customer ($n = 48$, 57 %) (significantly more pharmacists than assistants: odds ratio, OR, 3.19; 95 % confidence interval, CI, 1.27–8.04). Forty-two per cent ($n = 35$) perceived that immigrant customers put pressure on pharmacy staff resources, while 27 % ($n = 23$) found that the immigrant customer group make work more interesting. More pharmacists than assistants agreed on the latter (OR, 3.43; 95 % CI, 1.04–11.33). Within the past 14 days, 86 % ($n = 72$) experienced that their advice and counselling were not understood by immigrant customers, whereas 49 % ($n = 41$) experienced lack of understanding by ethnic Danes; and 30 % ($n = 25$) had consciously refrained from counselling an immigrant, whereas 19 % ($n = 16$) had done so with an ethnic Dane. Use of under-aged children as interpreters during the past month was reported by 79 % of respondents. Regarding suggestions on how to improve encounters with immigrant customers, most respondents listed interventions aimed at patients, general practitioners and pharmaceutical companies.
Conclusions: Community pharmacy staff report poorer quality in their encounters with immigrant customers, including sub-optimal counselling and frequent use of under-aged children as interpreters. Our study also reveals certain differences across personnel groups, which may be explained by differences in level of education.
Disclosure of interest: None Declared.

Drug Information

DI004

Intravenous artesunate for the treatment of severe malaria in the pitie salpetriere hospital in 2013

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Background and objective: Severe malaria occurs when infections are complicated by serious organ failure. Patients should immediately be treated in an ICU (Intensive Care Unit) and receive parenteral treatment. In France the first-line treatment of severe *P. falciparum* malaria is Intravenous Artesunate. It is available via a Named Patient Program (NPP) called "the ATU Procedure" (Temporary Authorization for Use). The aim of the study is to analyse the conditions of prescription and use of Artesunate and to assess the patient monitoring in management of severe malaria throughout the year 2013 in the Pitié Salpêtrière Hospital.
Setting and method: The access to ATU procedure is authorized if patients present at least one WHO (World Health Organisation) clinical criteria for severe malaria. Physicians must describe patient monitoring. This information is collected by the ANSM (National Agency for Medicines) and the CNR (National Reference Centre for Malaria).
Main outcome measures: Analysis of Artesunate prescription (dose, treatment duration, adverse events), evaluation of the patient monitoring in management of severe
P.falciparum malaria.
Results: Severe *P. falciparum* malaria has been diagnosed in 12 patients in the Pitié Salpêtrière Hospital in 2013. The major clinical criteria include hyperparasitemia (n = 5/12) and neurological failure (n = 4/12). All patients were travelling in sub-Saharian area. No one had taken a chemoprophylaxis. The treatment has always been started once the diagnosis had been confirmed by laboratory investigations. Intravenous Artesunate (2,4 mg/kg) is given until patient are well enough to continue oral treatment: Piperaquine-dihydroartemisinine (n = 3/12), Atovaquone-proguanil (n = 2/12), Artemether (n = 2/12). Intravenous Artesunate has rarely been continued for longer than 48 h. Only one patient had an adverse event (anaemia). Few malaria complications were recorded in patients treated with artesunate (n = 4/6).
Conclusions: The conditions of prescription and use of intravenous Artesunate in the Pitié Salpêtrière Hospital are conform to French official guidelines (PTU : Therapeutic Use Protocol). Intravenous Artesunate is an emergency treatment and can be switched to oral therapy after 24 h. Tolerance seems excellent. None of the patients had grade 3 or 4 adverse event.
Disclosure of interest: None Declared.

Drug Information

DI005

Prescribing patterns and evaluation of appropriateness of combination of cox-2 inhibitors and proton pump inhibitors for pain management

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Background and objective: COX-2 inhibitors (COX-2i), celecoxib and etoricoxib, have less upper gastrointestinal complications than traditional nonsteroidal anti-inflammatory drugs (NSAIDs) in patients with moderate to high gastrointestinal risk whom had more than 1 risk factors for NSAIDs-induced gastropathy or had complicated ulcers like gastrointestinal bleeding or perforation. According to the clinical data and recommendation of selecting NSAIDs for pain management indicated that co-prescribing of gastroprotective agents, proton pump inhibitors (PPI), with COX-2i in patients with high gastrointestinal risk demonstrated lower recurrent gastrointestinal bleeding than using COX-2i alone. In Thailand, there were high rate of prescribing COX-2i with PPI. Thus, the aim of this study was to determine the prescribing patterns and appropriateness of co-prescribing PPI with COX-2i in outpatients at the Priest Hospital, Bangkok, Thailand.

Setting and method: The drug use evaluation criteria for co-prescribing COX-2i with PPI was developed and validated by the experts. According to the criteria, we performed a retrospective chart review in outpatients who were prescribed COX-2i and PPI by the same physician during July 1, 2010 to July 31, 2011. Evaluation was composed of 2 steps, indication and dosage regimen. Determination the appropriateness of therapeutic indication was done first. If it was decent, then dosage regimen was evaluated. Appropriateness of using these combination defined that it had to pass both steps. This study protocol was approved by the IRB of the Priest Hospital.
Main outcome measures: Prescribing pattern of COX-2i and PPI was described and the appropriateness of these combination was revealed in a descriptive manner.
Results: A total of 35 medical records of outpatients was analysed. Most of them were priest (80 %) and aged less than or equal to 65 year old (54 %). The majority of the prescriptions were indicated for osteoarthritis. The combination that widely prescribed was celecoxib and omeprazole (43 %) and the others were celecoxib and pantoprazole, etoricoxib and pantoprazole, and etoricoxib and omeprazole (31, 17, and 9 %, respectively). Concerning the appropriateness according to developed criteria, 14 % of prescriptions composed of COX-2i and PPI were appropriate indication and only 2.8 % of prescriptions met both criteria for indication and dosage regimen.
Conclusions: Inappropriate use of combination between COX-2i and PPI was found in high frequency. Interventions either by pharmacist or policy maker for promoting more appropriate use of this combination should be implemented.
Disclosure of interest: None Declared.

Drug Information

DI007

Oseltamivir utilization pattern in patients admitted to third level hospital during 2013–2014 flu period

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Background and objective: The diagnosis of influenza A/H1N1 is mainly clinical, particularly during peak or seasonal flu outbreaks. A diagnostic test (RT-PCR) should be performed in all patients with fever and flu symptoms that require hospitalization. Antiviral administration should start early (<48 h from the onset of symptoms), with a dose of 75 mg every 12 h, and with a duration of at least 5 days or until clinical improvement is observed.

The objective of this study is to assess the degree of adherence to antiviral treatment guidelines and the effect of oseltamivir in clinical evolution of patients admitted in hospital.
Setting and method: Secondary analysis of a prospective study of patients admitted in hospital with influenza during 2013–2014.
Main outcome measures: Data was recorded in the adult patients with influenza confirmed by rt-PCR during period 2013–2014. Database records specified drug treatment (length, doses, frequency, adverse effects) and medical characteristics of patients.
Results: 367 PCR tests were made during 2013–2014, 105 tests (28,6 %) were positive. 55 % were A (H1N1). 89 patients (84,8 %) were admitted in the hospital, most of them adults (83,2 %), men (55,7 %) and with a mean age of 51,88 (25,67)years. Viral pneumonia was present in 32,5 % of cases. The mean number of co morbidities was 1.91(1,41). Chronic obstructive pulmonary disease was the most frequent (20,51 %), followed by obesity 9.1 %, and haematological disease 7,8 %.

Oseltamivir was used in 87 % of them, the mean duration of treatment was 5.49 days (1.59). Early antiviral treatment was established in 21.5 % of patients and empirically in 56.1 % of cases. In 44.9 % of cases was prescribed the standard treatment. In 22.4 % of patients the therapy was extended to 10 days for non-resolution of symptoms. Only 1 % of patients received higher doses (300 mg/day). The global adherence to hospital guidelines was of 84 %. Earlier administration of Oseltamivir seemed to be associated with a reduced duration of fever (median 2.5 days when antiviral treatment began <48 of symptoms onset, vs 3,5 days when drug was initiated >48 h), $p = 0.06$. Time of alleviation of symptoms was 4.8 days (2,3). Oseltamivir was well tolerated, and no adverse events were detected.
Conclusions: Adherence to antiviral guidelines (according to onset of administration, doses, frequency and length) was high. Early oseltamivir administration seems to resolve earlier fever. No problems of safety have been observed with Oseltamivir
Disclosure of interest: None Declared.

Drug Information

DI008

Perception of use of liquid capsules

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Background and objective: Liquid-filled capsules are capsule containers filled with liquid and can be classified either as soft capsules or hard capsules[1]. The objective was to compare hard liquid capsules with other oral solid dosage forms.
Setting and method: An on-line review was carried out. On-line questionnaires, which included a photograph of different oral solid dosage forms, were developed. These were filled in by 212 patients, 154 pharmacists and 33 physicians. A comparison of consumer prices of hard liquid capsules with other oral solid dosage forms was carried out.
Main outcome measures: Patients', pharmacists' and physicians' perception of liquid capsules, price comparison.
Results: Hard liquid capsules were chosen by the patient as the top dosage form for: efficiency ($n = 118$), gentleness on the stomach ($n = 98$), fast action ($n = 112$), high quality ($n = 110$), distinguishability ($n = 94$) and modern look ($n = 123$). Pharmacists and physicians gave the same reasons except for distinguishability as tablets were preferred for this property. Hard liquid capsules were found to be around the mid-price range, with other products found such as tablets, capsules and soft gels having similar active ingredients, being cheaper and others more expensive. One hundred and seventy patients would be ready to pay more for liquid capsules.
Conclusions: Participants' perception of hard liquid capsules seems to be very positive and this could result in an increased number of products being produced as hard liquid capsules. The majority of participants preferred liquid capsules as the top dosage form for efficiency and action. Patients claimed that they would be ready to pay a higher fee for this dosage form and this is probably due to the added aesthetic appeal of liquid capsules and their properties, such as fast action.

References:?A3B2 tpb=2mm?>
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Disclosure of interest: L. A. Brincat Ruffini Grant/Research support from Alta Care Laboratoires, L. M. Azzopardi : None Declared, A. Serracino Inglott: None Declared

Drug Information

DI010

Development of a tool for management of drug interactions with three new direct antivirals for chronic hepatitis C: sofosbuvir, simeprevir and daclatasvir

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Background and objective: In 2014, three new direct antivirals for chronic hepatitis C are available: sofosbuvir, simeprevir and daclatasvir. These new molecules are transported or metabolized through common pathways to other medications.

Considering their strong effects on the virus and the few side effects, these molecules have become part of all guidelines for treatment of chronic hepatitis C.
Given the limited information we have on their use in practice, the objective of this work was to carry out a simple tool to assist prescribers in the management of these interactions.
Results: The developed tool takes the form of a double-entry table. Colums refer to the prescribed antiviral and rows refer to co-administered drugs which are grouped by therapeutic class.

Data are extracted from the monographs of the medications. Some drug interactions have been studied by the laboratories. If they haven't been, the interactions are assumed to be depending on the pharmacokinetic properties of co-administered drugs.
Four colours are used to visualize the degree of interaction:

– red for contraindications
– orange if monitoring is recommended
– blue if the two drugs should be administered remotely
– green if the interaction has no impact.

With sofosbuvir which is transported by the P-glycoprotein (P-gp), only nine contraindications have been detected.

Simeprevir is a moderate inhibitor of intestinal CYP3A4, but also metabolized by CYP3A4 and transported by the P-gp. Thirty contraindications have been detected, leading to a loss of therapeutic effect or to increases in plasma concentrations of simeprevir.

Daclatasvir is also metabolized by CYP3A4, transported by the P-gp and inhibitor of the P-gp. Twenty-nine contraindications have been detected. In the case of daclatasvir, the monograph gives, in some cases, dose adjustments of daclatasvir.
Conclusions: Many drug interactions are already described, and the clinical experience will provide new information.

This underlines the importance of notifying every adverse effect that might be related to a medication. The pharmacovigilance is essential to have the most up-to-date information on new medicines.
The developed tool must be updated as soon as new interactions are identified.
Disclosure of interest: None Declared.

Drug Information

DI011

Design of a protocol before the change of presentation of a narrow therapeutic window drug in a third level hospital

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Background and objective: In November 2013 the Spanish Medicines Agency announced one of the two digoxin intravenous ampules presentations was going to be temporary out of stock due to manufacturer problems.

The major issue from this change was the discontinued presentation is 0.25 μg/1 ml whereas the new one is 0.5 μg/2 ml. So, although it is the same concentration, the ampule dose is double leading to an overdose risk.

Under these circumstances, the Pharmacy Service developed a protocol to inform the Hospital staff and prevent medication errors which could result from this situation.
Setting and method: Two weeks before introducing the new presentation in the Hospital it was edited a leaflet exposing the situation, showing photos of the old and new presentations and indicating the potential danger of administrating a double dose of digoxin. In addition, each ampule was individually labelled in orange with the printed message: "Alert. Double dose".To spread the information to different professionals:

– At the monthly general hospital meeting, physicians were communicated the change of presentation and were given copies of leaflet so they could expose it in the medical rooms on each floor.
– Nursing supervisors of each Service were convened to inform the change of presentation to the staff of their Services. They also received copies of the leaflet to expose them in the nurses rooms.
– The pharmacist in charge of the Unit Dose Dispensing System went to different hospital departments to ensure the information was known and there were no doubts.

Results: Since the new presentation format was introduced seven months ago, the Pharmacy has received some queries about the presentation change, especially the first month. However, there have been no reported incidents of confusion in pharmaceutical forms nor dosage.
Conclusions: Facing the presentation change of a narrow therapeutic window drug, proper dissemination of information from the Pharmacy Service to the rest of the Hospital has proved to be effective in preventing medication errors.
Disclosure of interest: None Declared.

Drug Information

DI012

Carboxymethylcellulose solution to administrate dabrafenib via gastrostomy tube in metastatic melanoma. Case report

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Background and objective: In several studies, the use of selective BRAF inhibitor Dabrafenib and MEK inhibitor Trametinib in patients with metastatic melanomas with BRAF-mutated, has shown benefits in survival.
Objective: To formulate a suspension in order to allow the administration of Dabrafenib in a patient with a gastrostomy tube.
Setting and method: Dabrafenib and Trametinib were prescribed to a 35-year-old woman with metastatic melanoma with BRAF-mutation. However, she suffered from dysphagia and, because of that, she was unable to ingest both drugs.

Dabrafenib could not be dispersed in water, so we thought about the possibility of dispersing it in a gel. Therefore, Dabrafenib laboratory was consulted about the stability of this drug dispersed in a gel.
Dabrafenib laboratory provided us a protocol to make a 2.5 mg/ml Pharmacoat® 603 solution, but this preparation could not be elaborated because Pharmacoat® is not available in our hospital.

However low viscous carboxymethylcellulose, which is available in our hospital has similar properties to Pharmacoat®, a low viscous hypromellose. According to laboratory data, we made the suspension in 1.5 % carboxymethylcellulose in order to obtain viscosity properties which were similar to those of Pharmacoat®.
Results: Trametinib was dispersed in water and Dabrafenib was administrated in a suspension. Both of them were administrated immediately after preparation, via gastrostomy tube and the patient was informed about these special handling conditions. Dabrafenib/Trametinib treatment started in April 2014 and nowadays the patient has stable disease with mild side effects, such as anorexia grade two and skin reactions grade one.
Conclusions: The suspension of Dabrafenib in carboxymethylcellulose has shown to be safe and effective, allowing the patient to use the prescribed treatment for metastatic melanoma in spite of her dysphagia.
Disclosure of interest: None Declared.

Drug Information

DI013

Preparation, efficacy and comparison of costs for compounded preparation of 3,4-diaminopirydine on the treatment of lambert-eaton miastenic syndrome: about a case

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Background and objective: The Lambert-Eaton miastenic syndrome (LEMS), associated normally to small cell lung cancer, is characterized by the presence

of symptoms similar to those of Myasthenia Gravis, with muscular weakness linked with the transmission blockage on the neuromuscular junction.

Our purpose is to describe the formulation of 3,4-diaminopyridine (3,4-DAP) for the treatment of LEMS and to evaluate its efficacy and security on the patients treated at the hospital.

Setting and method: The formulation was designed according to the results of bibliography research in Pubmed. The product was obtained for off-label use from Fagron.

The initial dose of 3,4-DAP for our patient was 10 mg every 8 h, and modified afterwards depending on patient's evolution.

The cost of the elaboration was compared to its acquisition from foreign sources.

The response to treatment was evaluated by the Service Of Neurology, and monitorized by revision of the medical chart and contact with neurologist.

Results: FORMULATION: The 3,4-DAP was formulated as oral capsules, with lactose as excipient and volumetric filling for 2 patients.

COSTS: 11 euros (considering only the active principle) whereas the acquisition from foreign sources would be 2,548 euros. These amounts are related to one month treatment.

EFFICACY: One patient died due to the severity and evolution of the tumor. The other patient, after four months treatment, has a satisfactory clinical evolution, without developing any secondary effects.

Conclusions: The elaboration of 3,4-DAP capsules is an easy and very economic process in the treatment of LEMS. According to bibliography, it is a safe treatment with limited adverse effects, as it has happened with the case we are presenting. Anyway, long term monitorization will be needed. Its formulation allows dosage individualization depending on symptoms evolution. Our patient is currently being treated with 20 mg 3 times a day, after gradual dose raise, thanks to the good tolerance for the treatment.

Disclosure of interest: None Declared.

Drug Information

DI014

Balanced isotonic crystalloid solutions (BICS) vs. isotonic crystalloid solutions (ICS): a decision-making case study

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Background and objective: The European Medicinal Agency has restricted the hydroxyethyl starch's (HES) use for vascular filling since October 2013, due to safety concerns. Following this European decision, the AGEPS needed to reassess crystalloid solutions. Using BICS was reported to decrease the risk of electrolyte disturbances vs. ICS. The decision-making process of drugs selection in the AP-HP is based on effectiveness, safety and economics. The aim of this study was to assess the interest to use BICS for vascular filling, in order to list one or not for our hospital drug formulary (HDF).

Setting and method: An analysis was conducted by TET and submitted to the AP-HP Committee of Medicinal Products (COMED), based on: i) scientific assessment of ICS (comparison of products' characteristics, French Society of Anesthesia and Intensive Care's (SFAR) opinions review), ii) request of AP-HP experts' opinions by a questionnaire (each conflict of interest was checked).

Main outcome measures: i) Scientific assessment synthesis, ii) experts' questionnaire answers.

Results: 3 BICS are marketed in France. Their compositions differ: ringer lactate (RL) contains more specifically: calcium, lactate, chlorine at 111 mmol/L; Isofundine®: magnesium, calcium, acetate, malate, chlorine at 127 mmol/L; Plasmalyte Viaflo® (PV): magnesium, acetate, gluconate, chlorine at 98 mmol/L, no lactate, no calcium. RL is contraindicated in case of lactic acidosis and is at risk of oedema. 0.9 % sodium chlorine (SC) is a non-BICS. In 2012, the SFAR couldn't (lack of beneficial proof) recommend to use balanced crystalloid solutions in all acute or perioperative patients. Nevertheless, they should be preferred (demonstrated efficacy and safety, link between preventing hyperchloremic acidosis (HA) and infusing balanced solutions (BS), deterioration of organ function and mortality increase with non BS). 5 of 17 requested experts responded with all a positive opinion. 3 main directives: i) HA occurs frequently when infusing SC high volume, ii) BICS should be preferred, especially as they have the same vascular filling efficacy vs. non BICS, iii) more using crystalloid remains logic due to HES's European restrictions. In addition, PV's low chloride level reduces the risk of HA vs. SC. PV could replace RL in its all indications, as containing no lactate is an advantage in case of lactic disturbances and containing no calcium is compatible with blood. All experts signalled a risk of confusion with the look-alike drug named Plasmalyte Viaflo G5® containing glucose. Moreover, PV's price is about 6 times RL's.

Conclusions: Despite of the interesting concept, the COMED gave a temporary unfavourable opinion to list PV in AP-HP HDF, due to: i) insufficient level of scientific evidence, ii) risk of confusion, iii) too high price. New strong comparative clinical data (a hospital clinical research project has been submitted) might change COMED's decision.

Disclosure of interest: None Declared.

Drug Information

DI015

The Italian Society of Hospital Pharmacy (SIFO) web space for patients: Independent, high-quality information for responsible citizens

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Background and objective: Citizens/patients today claim for a more active role in the decision-making process about their health. More and more patients search information on mass media and on Internet without any guarantee of quality and accuracy. Patients/citizens have to access to correct information which make them understand their condition (*information right*), so that they are consciously able to choose among possible solutions (*choice right*) and take care of their health more responsibly (*patient empowerment*). The "Scientific Information, Health Education and Information" Area of The Italian Society of Hospital Pharmacy (SIFO) in collaboration with the Editorial board of Sifo website, developed a project to meet patients/citizens' need of correct information through the realization of a space devoted to them on the Sifo website. A partnership with Cittadinanzattiva (Active citizenship), an Italian non-profit organization, independent from political parties, trade unions, private companies and public institutions, was build up in order to take into consideration citizens 'point of view .

Results: Program description: A banner in the homepage of Sifo website (www.sifoweb.it) links visitors to the page devoted to patients/citizens. The Working Group realized practical guidelines about the production of patient information materials for all colleagues interested in this task (http://www.sifoweb.it/images/pdf/spazio_cittadini/Linee_guida_per_materiale_per_i_pz-g.pdf.) Visitors have the possibility of asking for information directly to SIFO pharmacists through a form they can easily fill in. A first Patient Information Leaflet (PIL) on generic drugs was developed and loaded on the website together with a short questionnaire assessing the usefulness and clarity of the information provided. Preliminary results are encouraging: the information was found very clear and clear by 25.0 % and 75.0 % of the respondents respectively; for 87.5 % of the respondents the PIL satisfied their needs of information, only 12.5 % rated the information as insufficient. As far as the safety and efficacy aspects of generic drugs are concerned, 62.5 % estimated them as safe and efficacy as the branded ones, the remaining evaluated them less safe and efficacy than the branded ones.

Conclusions: the project is in its beginning phase, and our plan is to implement and improve it. Citizens need qualified assistance to make the best use of drug therapies and, at the same time, pharmacists need patient's experience and values to understand how best offer them clinical care. Citizen and pharmacist, talking each other, can contribute to improve the management (access and use) of drugs.

Disclosure of interest: None Declared.

Drug Information

DI016

Safe drug prescribing and medication for children through a web-based medicine database

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Background and objective: In pharmacological treatment of children dosing is calculated by weight, height and age. Errors due to incorrect dosing, dispensing, administration or documentation of medications constitute an ongoing major challenge. Additionally 70–90 % of all prescriptions for children are off-label.

The objective is to establish an instrument to minimize medication errors by an accurate and safe procedure for calculating the dose based on available evidence.

Setting and method: For approved indications the posology is given in the Summary of Product Characterization (SmPCs). For off-label used drugs, data will be built on the recommendations of e.g. Kinderformularium.nl, British National Formulary for Children (BNFc) and Food and Drug Administration (FDA). For products not included in these databases, literature reviews will be performed.

Main outcome measures: -A Danish web-based paediatric medicine database; free of charge.

– A calculation module for simplified and safe prescriptions.
– Uniform and safer medical treatment of children; reduction of medication errors.
– Saving time for physicians and nurses.
– Avoiding prolongation of hospitalization.

Results: A web based database with a calculation module is under construction. It can be accessed in two ways:

1. Active substance and brand names can be searched.
2. Active substances, brand names indications can be found through a hierarchical Anatomical Therapeutic Chemical (ATC) classification system.

With subsequent entering of patient's age, weight and height, the system will indicate:

(1) if the selected drug is approved for children or not and if extemporaneous production is existing, (2) possible route(s) of administration and available pharmaceutical form(s), (3) if the tablets can be crushed, divided and/or suspended.

Furthermore calculate: (1) an estimated age, height and/or weight, (2) minimum and maximum daily dose for the patient including compensations for reduced kidney functions, (3) data for intravenous administration.

Conclusions: Medications errors in children will be reduced and greater awareness about off-label use will be achieved. This awareness will lead to wider use of labelled drugs when possible. Furthermore the database will ensure rational pharmacotherapy and timesaving for the persons involved in prescribing and administrating medicine for children.

Disclosure of interest: None Declared.

Pharmacoepidemiology

PE005

Comparisons of the health-related quality of life impact of urological conditions on patients and their families using SF-36 and FROM-16©

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Background and objective: The Family Reported Outcome Measure (FROM-16©) is a generic, validated instrument that measures quality of life of families of patients with chronic conditions. FROM-16© is compromised of two domains: emotional domain (6 items) and personal and social life domain (10 items). The aim of this study was to assess the impact of urological conditions on family members using FROM-16© and correlate this with the impact of urological conditions on patients, using the Short Form Health Survey (SF-36); a generic, validated quality of life measure.

Setting and method: The study was conducted in the Urology clinic at the University Hospital of Wales over a six week period. Patients were asked to complete the SF-36 (n = 47) and family members completed FROM-16© at two separate time points, 5 days apart. Test–retest reliability was assessed using Spearman's rank correlation coefficient.

Results: 47 patients completed the SF-36 and 47 family members completed FROM-16© at time point 1 and 17 at time point 2. The mean age of patient participants (male, n = 35; female, n = 12) was 65.58 years (SD = 16.013) and the mean age of family member participants (male, n = 12; female, n = 35) was 63.02 (SD = 14.816). Correlations were seen between FROM-16© emotional domain with physical functioning, bodily pain, general health, vitality, social functioning and mental health domains of the SF-36. Correlations were also seen between FROM-16© personal and social life domain with physical functioning, role-physical and role-emotional domains of the SF-36. Correlations observed were weak to moderate (-0.326 to -0.494). Reliability of the FROM-16© total score was moderate (test retest Spearman's rank correlation coefficient = 0.533, $p = 0.028$).

Conclusions: The findings indicate that a correlation exists between urology patients' quality of life and their family members' quality of life. The FROM-16© was shown to be reliable in families of patients with urological conditions, supporting previous studies.

Disclosure of interest: None Declared.

Pharmacoepidemiology

PE006

Gerontopharmacological interventions in hospitalised post surgical frail elderly: assessment of nature, extent and risk factors

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Background and objective: Frailty is a clinical state in which there is an increase in a patient's vulnerability for developing increased morbidity and mortality when exposed to a stressor such as pharmacological treatment—possibly resulting in adverse drug events (ADE's). We determined the nature and extent of clinical pharmacologists' gerontopharmacological interventions and assess risk factors in hospitalised patients during a weekly multidisciplinary frail elderly consultation (FEC).

Setting and method: Digital medication charts of patients admitted to surgical wards throughout a large general teaching hospital from September 1st 2012 up until December 31st 2013 meeting the criteria for frail elderly (aged >70 yr, delirium CAM score, SNAQ/MUST score) were eligible for structured gerontopharmacological screening. Odds Ratio's with 95 % CI's were estimated based on case–control analysis.

Main outcome measures: In a 16 month-period 63 FEC's were held resulting in 341 suggested pharmacological interventions in 159 included patients aged 65–99 years (average 1.4 per patient; range 1–5). Of these 305 (89,4 %) were effectuated (cases); 36 were not considered clinically relevant (controls). The average number of drugs used was 12 (range: 1–25). Cessation and initiation of drug treatment accounted for 34,9 % and 22,7 % respectively of all interventions. An additional 19,6 % involved dose reductions and reductions in length of period of use. Furthermore, less frequent interventions were enhanced laboratory (drug) monitoring or functional organ testing (8,9 %), dose increases (5,3 %), therapeutic substitution (3,9 %)and change of administration route (1,1 %).

Results: Drug groups most involved were analgesics, in particular opioids, laxatives, psychiatric drugs (sedatives and antipsychotic drugs against delirium), cardiovascular and neurological drugs. Risk factors for interventions within this particular subset of post-surgical frail elderly were age >75 yrs (OR 1,8 95 %CI 1.5–2.3), cardiovascular co-morbidity (OR 2.1 95 %CI 1.2–3.3), >9 drugs used prior to admission (OR 1,2 95 %CI 1.1–1.4) and kidney function GFR <30 ml/min/1.73 m^2 (OR 2.6 95 % CI 2.3–16.0).

Conclusions: Findings are in line with similar research outcomes indicating the feasibility of clinical pharmacologists intervening in high-risk prescribing in frail elderly patients; polypharmacy (≥5 medicines), hyperpolypharmacy (≥10 medicines), a negative Drug Burden Index (DBI) as well as inappropriate use of anticholinergics and sedatives on geriatric wards appear equally common in our surgical patients. The risk factors we assessed will help to focus on high risk post-surgical frail elderly.
Disclosure of interestinterest: None Declared

Pharmacoepidemiology

PE007

Drug use evaluation of conventional versus new oral anticoagulants at discharge from a department of internal medicine

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Background and objective: The recently introduced Oral Direct Anticoagulants (ODAs), presumably safer, and with comparable efficacy to the Vitamin K Antagonists (VKAs), may re-shape the world of anticoagulation medicine. To analyse this potential change, this study aimed to review the prescription habits of ODAs and VKAs at discharge.
Setting and method: We performed a one year retrospective study in the department of internal medicine of a regional hospital (HVs Sion) using Electronic Medical Records. All patients receiving an ODA were included and matched to a patient treated with a VKA.
Main outcome measures: The appropriateness of prescription at discharge was defined by an adequate indication and dosing, the absence of contraindication, a minimal risk of drug–drug interactions and no major bleeding or venous thromboembolism during the hospitalization. The HAS-BLED score was calculated when the indication was atrial fibrillation (AF).
Results: Out of the 44 patients included (22 with an ODA and 22 with a VKA), 32 received an appropriate prescription according to all criteria. Seven patients had an inadequate dosing. A potential drug–drug interaction was detected in 3 patients receiving a VKA and in 1 patient receiving an ODA. No major contraindication was found, but a relative contraindication was discussed in 3 cases. The majority of patients receiving an ODA for an AF had a minor bleeding risk.
Conclusions: No significant difference was ascertained between the two groups regarding the appropriateness of prescription. Our results suggest that ODAs were cautiously used in our setting.
Disclosure of interest: None Declared.

Pharmacoepidemiology

PE008

Medication regimen complexity in older people with and without medication-administration problems: a nested case–control study

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Background and objective: Older people often have multiple medical conditions necessitating treatment with multiple medications. This often results in complex medication regimens. The objective was to investigate the association between medication regimen complexity and medication-administration problems in a population-based sample of older people.
Setting and method: Data were collected as part of the Swedish National Study of Aging and Care Kungsholmen (SNAC-K) study, a prospective population-based cohort study including people aged ≥60 years [1]. Using a nested case–control design, the first 50 consecutive people with medication-administration problems (MAPs) were individually matched (age, sex and number of medications) with 50 people without MAPs. Mann–Whitney U tests were used to compare medication regimen complexity and the number of people who received support to manage their medications in people with and without MAPs.
Main outcome measures: Medication regimen complexity was calculated using the 65-item validated Medication Regimen Complexity Index (MRCI) [2]. MAPs were self-reported by participants during structured physician interviews.
Results: Of 3353 eligible participants, 64.9 % (n = 2175) were female and the median age was 72.5 years (range 60–105). The median number of regular and as-needed medications was three (range 0–23), 13.8 % of the participants (n = 463) used no medications, and 70.6 % of participants (n = 2366) managed their own medications. Of all participants, 6.8 % (n = 229) self-reported one or more MAPs. Of those, 78.6 % (n = 180) were female and the median age was 81.3 years (range 60–104 years). The most common MAPs were 'package difficult to open' (n = 474, in 82 people) and 'it was difficult to pay for medication' (n = 127, in 37 people). The mean MRCI for people with and without MAPs was 20.3 and 19.3, respectively. There was no significant difference in MRCI between people who did and did not self-report MAPs (p = 0.91) or those who received support to manage their medications (p = 0.39).
Conclusions: There was no difference in medication regimen complexity or support to manage medications in people with and without MAPs.
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Disclosure of interest: None Declared.

Pharmacoepidemiology

PE009

Antibiotic prescribing in Primary Care: scheduled visits versus emergency visits

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Background and objective: To compare the appropriateness of antibiotic prescribing to local guidelines performed in primary care visits (PCV) and primary care emergency visits (PCVEV).
Setting and method: Cross-sectional study (prescription-indication) carried out in Aljarafe Primary Care Area (Spain). Participants: patients with antimicrobials prescribed in official prescriptions during 2012. Patients with antibiotic prescriptions and diagnosis of infection were selected by simple random sampling (confidence level:95 %; accuracy:5 %). Data Sources: prescriptions billing system and Health Digital Records.
Main outcome measures: Appropriateness of antibiotic prescriptions to recommendations of the local guides.
Results: Random sample included 833 patients. 709 patients received antibiotics from PCV and 174 from PCVE. Patients treated at PCV and PCVE differed in terms of age: 38 years (standard deviation (SD):1.03; 95 %CI 35.9–39.9) in PCV *vs* 33 years (SD:1.8; 95 %IC 28.9–32.5) in PCVE; pharmacy type: 67.7 % in PCV *vs* 77.0 % (p = 0.01), and gender: 58.7 % of patients in PCV and 63.8 % in PCVE were women. The proportion of antibiotic groups prescribed and the type of infection treated were also different: 70.0 % beta-lactams in PCV *vs* 79.3 % PCVE (p = 0.008), 13.0 % fluoroquinolones in PCV *vs* 7.5 % in PCVE (p = 0.036) and: 18.9 % urinary infections in PCV *vs* 12.6 % in PCVE (p = 0.031), 7.5 % skin infections in PCV *vs* 12.1 % in PCVE (p = 0.039), 4.2 % odontogenic infections in PCV *vs* 8.6 % PCVE (p = 0.019). There were no significant differences in the percentage of respiratory infections, which accounted for 65.4 % and 63.2 % in PCV in PCVE respectively. No significant differences were found in the percentage of appropriateness of antimicrobial prescriptions between PCV and

PCVE: 58.3 % and 51.7 %, respectively (p = 0.071). The reasons for inadequate treatments were similar: inappropriate antibiotic selection (55.4 % in PCV *vs* 45.2 % in PCVE), wrong treatment duration (29.1 % *vs* 38.1 %), and unnecessary treatment (12.5 % *vs* 9.5 %) (p = 0.099).
Conclusions: These results show differences in the characteristics of patients and type infections treated at PCV and PCVE. Adherence to the recommendations of the local guides was similar at both levels, with significant areas of improvement to be addressed taking into account the reasons for inappropriateness detected.
Disclosure of interest: None Declared.

Pharmacoepidemiology

PE010

Comparison of combination and monotherapy of rasagiline in Parkinson's disease

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Background and objective: Rasagiline is a potent, selective and irreversible monoamine oxidase B-inhibitor. There is increasing evidence from clinical and in vivo studies, to suggest that the long-term use of this agent might have some disease modifying affects. The aim of this study was to compare the tolerability and therapeutic effects of rasagiline for treatment of Parkinson's disease both as combination and monotherapy in early disease and as an adjunct therapy in advanced disease.
Setting and method: Data from the Welsh Movement Disorder eNetwork (WDeN) disease register were retrospectively analysed. All patients diagnosed with PD and treated with rasagiline (Azilect®) from 2006 to 2012 were included (n = 182). The primary outcome of the study was clinician's global impression (CGI) i.e. whether a patient was rated as improving, not-changing or worsening by a clinician.
Results: The mean age of the patients was 67 (range: 28–88) years for monotherapy, 69 (range: 47–89) years for combination therapy and 69 (47–89) years for adjunct therapy. The share of patients above 65 years was 63.2, 66.1 and 67 %, respectively. Proportion of patients rated as improved/unchanged were 74 % (n = 36), 78.6 % (n = 12), and 81.3 % (n = 71) for adjunct therapy. In monotherapy and combination therapy the likelihood of improving vs. remaining unchanged was predicted by patient's baseline H & Y score alone [monotherapy, OR = 0.1; combination therapy, OR = 0.11]. In adjunct therapy, the duration of PD therapy was the only significant [1 additional year: OR = 1.36]. A trend towards improvement vs. remaining unchanged was noted for monotherapy and combination therapy in patients ≥65 years relative to those <65 [monotherapy: 36.4 % vs. 29.4 %; combination therapy: 52.6 % vs. 12.5 %]. In adjunct the reverse was observed [32.8 % vs. 45.2 %, respectively]. Analysis was carried out separately for monotherapy (early disease treated with rasagiline only), combination therapy (where a second therapy was added to rasagiline) or adjunct therapy (rasagiline added to a current therapy).
Conclusions: The data provided by the WMDeN registry permitted the assessment of the therapeutic effect from rasagiline, in the real world setting. The findings of this study indicate that treatment of PD with rasagiline has clinically relevant benefit for most patients, including those aged above 65 years. The results suggest that rasagiline remains well tolerated and that its effect may be cumulative.
Disclosure of interest: None Declared.

Pharmacoepidemiology

PE011

Interpretation of the constructs of Hyperhidrosis Quality of Life Index (HidroQoL ©) by two different cultures same language using classical and modern techniques

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Background and objective: The HidroQoL is a disease-specific quality of life measure in hyperhidrosis, developed and validated using both classical test—and item response theories. The aim of this study was to assess whether the HidroQoL remained invariant when used across different patient populations
Setting and method: Patients were recruited through online social networking communities related to hyperhidrosis [U.S.A, n = 559, Canada n = 36 and the U.K., n = 115]. Rasch item parameter estimates were compared using Scatterplot. Confirmatory factor analyses were carried out for each patient population separately.
Results: Rasch analyses showed that four items were more difficult for the UK patients than for patients from U.S. and Canada. Nonetheless, parameter estimates for all items were within 95 % confidence interval lines of the scatterplot. Confirmatory analyses results supported metric invariance of the HidroQoL
Conclusions: The findings of this study indicate that the construct of QOL being assessed by the HidroQoL is interpreted in a similar way between North America and the UK. This suggests that a single English version for the different Anglo-Saxon cultures is realistic.
Disclosure of interest: None Declared.

Pharmacoepidemiology

PE012

Appropriateness of pregabalin prescription in a Primary Care Service

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Background and objective: Currently, pregabalin prescription stands out as being one of those which is increasing more in cost and in the number of packages dispensed in our country[1]. The main aim was to evaluate the appropriateness of these prescriptions according to the authorised indications and/or those exposed in the literature[2,3].
Setting and method: Primary Care Service (assigned population: 427,336 inhabitants in December 2012). A prescription-indication study was performed by the review of the information contained in the patient electronic health records. Period of study: 2004-July 2013. A systematic random sample of patients with a pregabalin active prescription in May 2013 (N = 3,074) was obtained.
Main outcome measures: Research variables: age, gender, diagnostic encouraging the prescription, dosage, beginning and duration of the treatment, the prescriber and the percentage of appropriated prescriptions (main outcome) according to the diagnostic and considering the authorised indications and/or those exposed in the literature.
Results: The final sample was 350 patients: average age of 60 ± 14 years (range 16–87 years); 71.4 % women. In the 29.7 % (n = 104) of the analysed prescriptions, the appropriateness could not be determined, because of the lack of diagnostic registration. Among those that were analysable (n = 246), the 55.3 % were inappropriate according to the authorised indications: 59 prescriptions were for soft tissue disorders (mainly fibromyalgia and other rheumatic conditions), 26 for mental disorders distinct from generalised anxiety disorder and 25 for dorsophaties cursing without neuropathic pain. These treatments were mainly initiated by a specialist physician (57.4 %, n = 78) (rheumatologists (n = 35), psychiatrists (n = 22) and traumatologists (n = 11) and by general practitioners (n = 45). Taking into account the published literature, the 38.2 % of the prescriptions were inappropriate, because pregabalin was still being considerably prescribed for indications with limited scientific evidence. In the 34.3 % (n = 120) of the prescriptions, the daily dose was less than 150 mg and in 6 cases more than 600 mg. The 44.3 % (n = 155) of the treatments exceeded the three years of duration (average: 37.6 ± 24.5 months). The year in which more treatments were initiated was 2012 (n = 89).

Conclusions: Pregabalin was prescribed mainly for non-authorised indications by either specialists or general practitioners, and, sometimes, in an inappropriate doses. A lot of these prescriptions were also not supported by sufficient scientific evidence in the literature.

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Disclosure of interestinterest: None Declared

Pharmacoepidemiology

PE015

Heath-related quality of life and preferences in patients with urinary stone disease: A systematic review

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Background and objective: Urinary stone disease is a common, painful and often recurrent condition that can affect kidney function, require surgical treatment and has significant impact on patients' health-related quality of life (HRQoL). There is limited information on the impact of stone disease or its treatment on patient's HRQoL and the preferences of patients of these treatment options. The primary outcome of current therapy is to achieve a high stone free rate (SFR). Improving patient's HRQoL is often a secondary gain. The aim was to examine the evidence from all studies including an element of HRQoL measurement and patient treatment preference in patients with urinary stone disease.
Setting and method: Ovid MEDLINE(R) 1946 to present, Ovid MEDLINE(R) In-Process & Other Non-Indexed Citations, EMBASE 1947-Present, SCOPUS, EconLit and Web of Science 1900–2014 with no language restriction were searched. All study designs with adult participants were included. Two independent authors individually assessed the studies and extracted the data. Narrative data synthesis was performed.
Results: 9 abstracts and 31 full-text articles were assessed.27 studies met the inclusion criteria (5 RCTs and 22observational studies) from 12 countries, including 3833 patients. 11 studies showed that stone formers had worse HRQoL than the general population or controls and 1 study showed stone formers were more likely to suffer with depression. 2 studies showed this to be true for those without active stone disease. Domains of HRQoL affected by stone disease were general health, physical function, role limitations due to physical health problems, bodily pain, general health perception, social function, trouble "looking after the home", lower urinary tract symptoms and sleep disturbance. Women have significant lower HRQoL than men and this was seen in 6 studies. No studies showed better HRQoL scores in women. 20 studies used a generic (validated) HRQoL measure and 7 a disease-specific, none of which have been validated (one is in the process of validation). Studies with regard to patient preference were heterogeneous.
Conclusions: The findings of this review clearly indicate that there is a need to shift the paradigm of treatment outcome for urinary stone disease from achieving high SFR to a more patient-centric approach. A well-constructed, validated, robust, disease-specific outcome measure is required for urinary stone disease.
Disclosure of interest: None Declared.

Pharmacoepidemiology

PE016

Use pattern of sedatives in menopausal women_A pharmacoepidemiologic survey in Taiwan

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Background and objective: Insomnia and sleep disorders are common health problem of the modernized society. Studies show the percentage of women suffering from sleep disorder is higher than men. In particular, women may suffer from insomnia secondary to menopause, pregnancy, or the use of oral contraception. The effectiveness of female hormone replacement therapy as an insomnia treatment in menopausal women and women with hysrectomy/oothectomy is still debatable. In addition, there is currently no specific study in Taiwan investigating the prevalence of insomnia in menopausal women and the drug utilization pattern of hypnotics in this population group.
Setting and method: This study uses data collected from the National Health Insurance Research Database to examine the drug utilization of hypnotics in the menopausal women in Taiwan, to estimate the occurrences of insomnia in the menopausal women, and women with hysterectomy/oophorectomy and the drug utilization pattern of sedatives in this population and to analyse the relationship between the occurrences of insomnia and the use of female hormone replacement therapy.
Results: Data were collected from a total of 70,565 women which were further divided into the control group (n = 18,632), the naturally occurring menopause group (n = 46,048) and the surgical menopause group (n = 5,885). The percentage of confirmed insomnia diagnosis in the control group, the naturally occurring menopause group and the surgical menopause group are 21.2, 37.9 and 30.3 % respectively. The percentage of confirmed insomnia diagnosis and treated with sedatives are 14.9 % in the control group, 77.6 % in the naturally occurring menopause and 7.5 % in the surgical menopause group. The most frequently prescribed sedatives in the group confirmed insomnia diagnosis are Zolpidem, Lorazepam and Alprazolam in descending order.
Conclusions: The results revealed whether natural menopause or surgical menopause, may more prone to insomnia problems, and more will be used to insomnia drugs. Clinical recommendations for postmenopausal insomnia can be more aggressive. Zolpidem is the most widely used sedatives currently. Although this drug has less likely to cause withdrawal or rebound symptoms and less addictive, but should also pay attention to the clinical use of central nervous system side effects.
Disclosure of interest: None Declared.

Pharmacoepidemiology

PE017

Use of sedatives in patients with acute pancreatitis in intensive care units

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Background and objective: Patients with acute pancreatitis (ICD code K85) are often hospitalized to ICU due to multi-organ dysfunction syndrome (MODS) and delirium, thus needing appropriate sedation. Our aim was to compare the use of sedatives in patients with acute pancreatitis hospitalized in ICUs of two Baltic tertiary care hospitals—Tartu, Estonia and Riga, Latvia.
Setting and method: Data of hospitalized patients in 2012–2013 were collected retrospectively from the medical notes.
Results: 140 patients (n = 31 Tartu, n = 109 Riga, no of ICU days 747 and 944, respectively) were included. The mean duration of hospitalization in ICUs (days ± SD) was 24.10 ± 34 in Tartu and 8.66 ± 9.19 in Riga. The main causing factors were alcohol and gallstones in both ICUs. MODS occurred more often in Tartu ICU: 77 % *vs* 42 %. Also the time of mechanical ventilation was longer in Tartu (percentage of days of total 83 % *vs* 26 %). Only in Tartu ICU RASS scale was used for assessment of sedation. The mean number of different sedatives per day was 1.49 ± 1.22 (range 0–5) in Tartu and 1.41 ± 1.22 (0–7) in Riga. Phentanyl infusion was often used in both ICUs: of 30 % hospitalization days in Tartu and 31 % in Riga. The choice of other sedatives was different: in Tartu midazolam (27 %), clonidine (14 %), propofol (11 %) and diazepam (7 %), in Riga midazolam (9 %) and sodium oxybutyrate (5 %) infusions were used most commonly. Among non-infusion sedatives in Tartu more frequently were used propofol (9.6 %) and midazolam

(6.4 %) mostly as bolus injections and diazepam (6 %) mostly in peroral form. In Riga–peroral chlorprotexine (23 %) and bromazepam (14 %). Combination of phentanyl and midazolam infusion was more common in Tartu ICU (21 % *vs* 4.8 %), but in Riga ICU the most frequent drug combination was phentanyl infusions and chlorprotexine tablets (8 %).

Conclusions: Although the patients in Tartu ICU seem to have more severe disease than in Riga, the mean number of sedatives used per day was similar in both hospitals however the choice of the medicines was different. In Riga enteral route of administration was used more often. These results may be explained by the different local hospital formularies and guidelines and possibly with differences in severity of disease and duration of mechanical ventilation.

Disclosure of interest: None Declared.

Pharmacoepidemiology

PE018

Consumption of antiinfectives for systemic use in North Estonia Medical Centre during 2009–2013 and effective contribution of hospital pharmacists for decreasing the costs

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Background and objective: Antiinfectives for systemic use (antiinfectives) are among top four drug groups with continuous increase in consumption and important impact to hospital medication budget where hospital pharmacist are key players in optimizing of expenditures. The aim of this study is to analyse consumption and cost of antiinfective drugs in North Estonia Medical Centre (NEMC) during the years 2009–2013.

Setting and method: Drug consumption and expenditure data for antiinfectives (codes J01, J02, J05, ATC classification) was obtained from hospital pharmacy database and amount of hospital days (hd) from hospital database for the years 2009 to 2013. Collected data has been analysed by the use of defined daily doses (DDD) methodology per 100 hd (DDD/100 hd). The DDD values used were obtained from World Health Organization (WHO) Collaborating Centre for Drug Statistics Methodology database.

The study was conducted in NEMC, tertiary care hospital in Tallinn, Estonia.

Main outcome measures: Consumption and expenditure of antiinfectives in hospital presented as the DDD/100 hd and EUR.

Results: Total consumption of antiinfectives increased from 47.99 to 53.64 DDD/100 hd, respectively. Consumption of antimycotics (J02) and antivirals (J05) remained similar during study period, but the consumption of beta-lactam antibacterials (J01C) increased from 19.26 to 24.58 DDD/100 hd. Moreover, consumption of other beta-lactam antibacterials (J01D) increased from 8.86 to 10.25 DDD/100 hd.

The expenditure for antiinfectives decreased from 1.41 to 1,17 million EUR, respectively, being highest of 1,58 million EUR in 2011. The cost of antimycotics decreased from 0,21 million EUR to 0,18 million EUR, being highest (0,45 million EUR) in 2011. The expenditure for antivirals (J05) decreased from 0,11 to 0,09 million EUR, accordingly.

The cost of other beta-lactam antibacterials (J01D) decreased from 0,51 million EUR to 0,44 million EUR.

Conclusions: The overall consumption of antibacterials (J01) has increased during the five year period, mainly due to increased consumption of beta-lactam antibacterials (J01C) and other beta-lactam antibacterials (J01D).

We reached the reduction of cost of antiinfectives from year 2012, which reflects systematic effective work of hospital pharmacists, who are responsible for public tenders and hospital drug formulary policies.

Disclosure of interest: None Declared.

Pharmacoeconomics

PEC001

Plasma derivatives (PD), Creutzfeldt-Jakob disease (CJD) and patient information: legal review and proposition of French decisional algorithm

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Background and objective: In October 2012, the *Laboratoire français du Fractionnement et des Biotechnologies*, at the request of ANSM (French Drug Security Agency), proceeded to a batch recall of 16 PD specialities, following the probable discovery of the sporadic form of CJD in a blood donor. This recall concerns more than 160 children in Robert-Debré Hospital (Assistance Publique-Hôpitaux de Paris).

Objective: Compare laws regarding PD recalls and related risks of transmission of CJD, in Europe and North America, in order to clarify the donate blood process and develop a flowchart for prescribers and pharmacists about how to deal with a PD removal.

Setting and method: · Literature research on PubMed and Google Scholar® (keyword: plasma derivatives, Creutzfeld Jakob disease, Creutzfeld Jakob syndrome, plasma derived products, plasma substitutes)

- Review of Légifrance/ANSM/Health Protection Agency/EMA (European Medicines Agency)/FDA (Food and Drug Administration)/Canadian Blood Services and HémaQuébec websites.
- Critical analysis of documents
- Analysis of the French legal context

Main outcome measures: 11 legislations and 8 articles were selected. The risk of CJD transmission and new variant CJD (nvCJD) by PD is debatable. Distribution and infectivity of nvCJD are higher than those of sporadic CJD. The risk of developing nvCJD if the donor has lived in Great Britain (GB) between 1980 and 1996 is recognized.

Results: English donors and those who have stayed in GB for more than 2 months (FDA), 3 months (Canadian Blood Services) or 1 year (EMA and ANSM) are excluded from plasma donations. The selection concerns also donors who have lived 3 months (Canadian Blood Services) or 5 years (FDA) in France. Unlike Canada Blood Services, ANSM, EMA and FDA recommend the removal of PD from nvCJD donors diagnosed after the donation. ANSM also recommends removing PD from donors who have developed CJD. Patient information depends on the context and country. In GB, patients who have received PD between 1990 and 2001 from donors diagnosed with nvCJD were informed if possible. In Canada, physicians can advise patients if they received PD from French or British donors between 1992 and 1998. In USA, physicians are advised for withdrawals related to nvCJD, and are free to decide to inform the recipient patient. In France, ANSM recommends to inform patients, if risks are proven, and patients who are holding PD at home and/or haemophiliacs. The decisional algorithm to help health professionals consisted in 6 steps and will be presented in the ESCP communication.

Conclusions: As recommended by EMA and FDA, only cases of nvCJD are concerned for recalling; France is today the only country, under the precautionary principle, that recalls PD following a case of classical CJD. Patient information affected by withdrawals of PD related CJD/nvCJD is not systematically given the theoretical risk of transmission, each country adopting its own legislation based on the criteria for selection of blood donors.

Disclosure of interest: None Declared.

Pharmacoeconomics

PEC002

Eculizumab: The highest drug expense of the University Hospital Necker–Enfants Malades

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Background and objective: Eculizumab (EZB) is a monoclonal antibody approved for the treatment of paroxysmal nocturnal hemoglobinuria (PNH) and the atypical haemolytic uremic syndrome (aHUS). In 2013, it was the highest drug expense of the University Hospital Necker–Enfants Malades (UHNEM), with about 6.6 million euros spent for the drug (*i.e.,* 18 % of the overall budget for hospitalization). Because of its status, costs and supply arrangements, EZB is closely monitored by the department of clinical pharmacy.

The aim of our study was to evaluate EZB prescription patterns at the UHNEM.

Setting and method: The study is a retrospective study including all EZB patients, since the availability of the drug in 2009. The patient cohort was followed from their personal prescriptions and medical files. For each patient, the indication at the beginning of the treatment, the dose, the infusion rate and the duration of treatment have been studied. These terms were then compared to those defined in the prescribing information (PI).
Results: We identified 58 patients including 24 children. We observed an increasing number of patients receiving EZB per year from 2009 to 2011, followed by a stabilization since then.

In the cohort, 20 patients were treated for an aHUS and 8 for a PNH. The dosing schedule of these patient was in accordance with the PI. We also reported 4 indications that are not mentioned in the marketing authorization, including the prevention of graft failure of bone marrow (1 patient), the treatment of the graft failure of bone marrow (4), the prevention of the recurrence of the aHUS after a kidney transplantation (5) and typical HUS (14).

Before 2011, EZB was available through compassionate use. Since then, the expenses due to EZB have rapidly increased, with 1.2 M € and 6.6 M € spent in 2012 and 2013 respectively. The increased cost was concomitant to the application for extending the indication of EZB for the treatment of aHUS and to the end of its compassionate use.

This study shows that EZB is used off-label in 52 % cases. The proportion is constant since 2009, the end of the compassionate use hasn't modified the practice.
Conclusions: To conclude, since the availability of EZB, we have observed its frequent use for unapproved indications. A pluridisciplinary consultation about these new posological schemas will be organised, as well as regular audits in close co-operation with the prescribers.
Disclosure of interest: None Declared.

Pharmacoeconomics

PEC003

Contribution of medication reconciliation to the optimization of exit treatment cost

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Background and objective: Medications reconciliation is an interactive process increasingly practiced in hospital settings which ensures the continuity of drug therapy between home and hospital, and is performed at the entrance and at the exit of the patient. We have performed a pharmacoeconomic preliminary study of the treatment optimization impact during exit conciliation of patients in a geriatric department of Bordeaux Hospital University. At hospital entrance of the patients, the treatment should be adapted to the therapeutic booklet which refers hospital drugs, and some of these have to be substituted by drugs referenced to hospital. But the hospital treatment may persist after patient exit, while it is not the less expensive. The objective of this study is to demonstrate that hospital pharmacist can reduce the cost of exit treatments thanks to prescription optimization during exit medication reconciliation.
Setting and method: We have studied the economic impact of exit medication reconciliation on 55 drugs hospital prescriptions for which an optimization was made between September 2012 and January 2014 for different patients. We have compared the total daily cost of the 55 drugs before exit medication reconciliation with the cost after exit medication reconciliation. The exit medication reconciliation consists of a substitution by a generic drug if possible, or by a substitution with another less expensive drug. We have calculated the total daily cost of these 55 drugs on the basis of the price of reimbursement by health care system. The comparison was done on the sum of each daily drug cost for these 55 drugs before and after medication reconciliation.
Results: The total daily cost of the 55 drugs before exit medication reconciliation is 57.46€ whereas the cost after exit medication reconciliation is 47.87€, corresponding to an economy of 0.174€ per reconciliated drug for the health care system per day, with only 10.9 % of substitution by generic.
Conclusions: This pharmacoeconomic preliminary study of the impact of exit medication reconciliation by hospital pharmacist shows a tendency to reduce the cost of the treatments, even if the first objective is to improve the medical care of patients. However, this result has to be confirmed on a large scale study.
Disclosure of interest: None Declared.

Pharmacoeconomics

PEC004

Assessment of an spillover effect between the tertiary and primary care concerning dalteparin

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Background and objective: The spillover effect is known as the impact of listing drugs in hospital formularies on the healthcare system as a whole. This effect may have positive consequences on the quality of care through decreasing prescription variability.

The aim of our study is to examine the spillover effect on the primary care setting of including dalteparin as the low molecular weight heparin (LMWH) of choice in a tertiary hospital drug formulary.
Setting and method: Retrospective observational study developed in a healthcare area that provides primary and tertiary care to a total population of half a million people.

We analysed quarterly the dynamic spillover effect of listing dalteparin in the drug formulary during the year after its inclusion (June 2013–May 2014) and the quarter before (quarter 0).

Data related to any LMWH prescription for outpatients carried out during the study period were collected. The spillover effect was estimated thanks to an administrative registry called MicroStrategy® owned by the Andalusian Public Health Service. This software compiles information from any prescription dispensed within the primary care setting.
Main outcome measures: For every LMWH we collected the number and percentage of prescriptions dispensed in the outpatient setting. They were compared with the overall LMWH prescription. Secondly, we analysed the absolute change between prescription rates at the beginning and end of the period.
Results: During the study period the number of LMWH prescriptions dispensed were the following: 3606 (quarter 0), 3017 (1st quarter), 3917 (2nd quarter), 3799 (3th quarter) and 3773 (4th quarter). The total number of prescription for each drug as well as its rate of prescription within the LMWH group were as follows: enoxaparin [3044 (84.4 %); 2538 (84.1 %); 3131(79.9 %); 2994 (78.8 %); 2868 (76 %)], dalteparin [19 (0.5 %) 48 (1.6 %); 197 (5.0 %); 252 (6.6 %); 268 (7.1 %)], nadroparin [37 (1.0 %); 22 (0.7 %); 28 (0.7 %); 23 (0.6 %); 32 (0.8 %)], tinzaparin [147 (4.1 %); 116 (3.8 %); 111 (2.8 %); 108 (2.8 %); 183 (4.9 %)], bemiparin [359 (10.0 %) 292 (9.7 %); 433 (11.1 %); 415 (10.9 %); 418 (11.1 %)]. These data corresponds with an absolute change in the prescription trend of −8.4 % for enoxaparin, 6.6 % for dalteparin, −0.2 % for nadroparin, 0.8 % for tinzaparin and 1.1 % for bemiparin.
Conclusions: The inclusion of dalteparin in the hospital formulary led to a moderate spillover effect on the outpatient setting in detriment of enoxaparin. This probably allows unifying the prescription criteria between the primary and tertiary care in a longer period of time, enabling an improvement on the quality of care.

Disclosure of interest: None Declared.

Pharmacoeconomics

PEC005

Non-fulfilment of PET-CT examinations in nuclear medicine : budgetary impact and areas for improvement

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Background and objective: A PET-CT (Positron Emission Tomography-Computed Tomography) examination requires administration of a radiopharmaceutical labelled with fluorine-18. This imaging examination is currently widely used and the rising demand at Saint-Louis hospital (APHP) has led to an increasing number of examinations that are not carried out. This study aims to estimate the annual loss to a nuclear medicine department generated by the non-fulfilment of PET examinations and to identify its causes as well as possible solutions.

Setting and method: The annual loss was estimated for the hospital through the following costs: quantities of RP ordered but not used, radiological protection equipment, staff and non-reimbursement by the French healthcare system. Radiopharmaceutical costs were calculated from the average cost of a dose. Equipment costs were estimated from the purchase and maintenance costs in relation to the number of examinations carried out since the date of purchase. Staff-related costs were determined according to the occupation and the time spent for each examination. A comprehensive retrospective study of the non-fulfilment causes was led between 2011 and 2013 in order to implement corrective measures.

Main outcome measures: The main outcome measures are the economic loss and the non-fulfilment causes.

Results: Over those three years, 607 out of the 9125 examinations planned were not carried out (6.6 %). Financial loss amounts to 659953€ (i.e. 219984€/year and 1216€/patient), split as follows: 120373€ (radiopharmaceutical costs), 3502€ (equipment and supplies), 57665€ (staff) and 478413€ (non-reimbursement).

Two types of causes were identified: ones without solutions (38 %) [camera failure (15 %), issue with the production of the radiopharmaceutical (8 %), condition of the patient (7 %), high glucose level (4 %), others (4 %)] and ones with solutions (62 %) [patient no-shows (28 %), non-fasting patient (13 %), appointment had not been cancelled (12 %), incompatible treatments (5 %), others (4 %)].

Conclusions: Better communication and information between the patients and the different services could help prevent the majority of avoidable causes. We would suggest sending reminders and having the appointments confirmed by telephone, email or text message the day before the examination, as well as reminding the patient of examination conditions.

The non-fulfilment of PET-CT examinations represents an important economic loss for hospitals, which could significantly be significantly reduced by improving the way patients and services are informed.

Disclosure of interest: None Declared.

Pharmacoeconomics

PEC006

How generic drug change the spending and modify logistic: the case of capecitabine in the national cancer institute of Milan

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Background and objective: Generic drugs represent a significant opportunity to reduce costs while still maintaining the health of patients. Capecitabine, one of the most commonly used oral medications at National Cancer Institute (INT), is used in several diseases such as breast cancer and colorectal cancer: like all oral chemotherapy drugs is expected to use more and more significant in the near future.

Setting and method: The pharmacist, in the medical oncology ambulatory, has traced all the prescriptions of capecitabine considering all the diseases in which it is used. It is analysed, by a specific database, the use of capecitabine in the 1st quarter of 2014, since when the generic was introduced into clinical practice with the same period of 2013, namely with the use of the only brand available.

Results: In the 1st quarter of 2013 were treated 139 patients with 383 dispensations for an expenditure of over € 80,000, while in the same period of 2014 were treated 241 patients with 691 dispensations spending about € 20,000. Cost reduction has allowed clinicians to treat many more patients who previously could not be treated with oral therapy for several reasons such as economic, logistical and therapeutic. The incidence and type of adverse effects it is almost similar in both periods, as reported by all patients in therapy. The pharmacy has changed both its logistics (every brand produces different packages that can occupy even the double space compared to the previous brand) that the approach to the patient: through specific counselling, each patient who has found a different drug from the previous cycle, was followed in changeover from one brand to another, responding to the questions that were put.

Conclusions: This change has seen several positive effects: the reduction of spending has allowed us to free up resources for new therapies and at the same time has reduced access to infusion therapy. In the future other generics will be available and will represent one of the key factors to ensure the assistance from the NHS.

Disclosure of interest: None Declared.

Pharmacoeconomics

PEC007

An economic and feasibility testing for Point-of-care-testing for total cholesterol using Accutrend® Plus and Multicare-In® in community pharmacies

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Background and objective: Investment appraisal techniques help to establish whether future gains from an investment will make the initial outlay lucrative. [1] Two investment appraisal techniques were identified; the Average Rate of Return (ARR) and the payback method. The objectives of this study were; to examine local total cholesterol point-of-care (PoC) testing; to determine consumer demand; and to ascertain the most economically feasible device by determining the ARR and payback period for the Accutrend® Plus and the Multicare-In®.

Setting and method: Two questionnaires were directed to pharmacists and patients. The pharmacist questionnaire asked whether pharmacies offer a PoC testing service for total cholesterol, the device used, the demand for the service, the price charged by pharmacies and profits generated. The patient questionnaire mainly established how much patients are willing to pay. 117 pharmacist questionnaires were collected and 100 patients filled in the patient questionnaire. The cost of the devices, their consumables and the cost of quality control tests were recorded, whilst data regarding gloves, lancets, alcohol swabs and batteries was gathered from a pharmacy database selecting the cheapest brands. This information together with questionnaire data were used to work out the two investment appraisal techniques chosen.

Main outcome measures: The ARR for the two devices was calculated using the formula: [2] ARR (%) = [Average Annual Profit/Average Investment] X 100. The payback period for the two devices was determined. The most economically feasible device would be the one whose initial outlay is recouped first.

Results: 30.77 % of the participating pharmacies (n = 36/117) offer total cholesterol PoC testing. Of these, 33 pharmacies use the Accutrend® Plus whilst the other 3 use the Multicare-In®. The average price charged per test was €3.67. This price is €0.87 higher than what patients (n = 100) are willing to pay (€2.80). The ARR for the Accutrend® Plus was 214.21 %, as opposed to −9.19 % for the Multicare-In®. The payback period for the Accutrend® Plus was calculated to be 312 days. This implies that initial outlay will be recouped in the first year, signifying that cholesterol PoC testing using this device is very economically feasible. Conversely, the Multicare-In® will not recoup the initial outlay within its lifetime expectancy.

Conclusions: The choice of the device must not only be based on profit maximisation, as a good correlation with the standard laboratory is vital. Pharmacists must be confident in the results obtained in order to provide a professional service for chronic disease management.

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Disclosure of interest: None Declared.

Pharmacoeconomics

PEC008

Economic optimization of biological therapy in the treatment of inflammatory bowel disease

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Background and objective: Get the most cost-effective drug treatment for each patient is essential in the hospital pharmacy. The objective of this study is the identification of patients with inflammatory bowel disease (IBD) treated with infliximab involving an additional cost compared to treatment with adalimumab.
Setting and method: Were selected those patients receiving biologic therapy with infliximab and adalimumab for IBD in March 2014. For each patient, was consulted the weight and the administered dose in the medical record. The patient's weight is a very important factor that will determine the cost of treatment with infliximab.
Main outcome measures: Data were collected in a table in which fields were included: age, sex, weight, date start of treatment (dose and number of doses), drug unit cost, treatment cost and annual cost. The annual cost of therapy was estimated by multiplying the price per milligram of infliximab by the dose of the patient, and by the number of doses administered per year. In the case of adalimumab, was calculated using the unit price of the drug and the number of dispensations per year.
Results: A total of 56 patients were included in the study, 16 in treatment with adalimumab and 40 with infliximab. Adalimumab patients received a maintenance dose of 40 mg every 15 days (representing an annual cost of 12.492 €). In the infliximab group, 15 patients received maintenance treatment of 300 mg every 8 weeks, and the remaining patients had doses ranging from 200 mg to 400 mg with dosing intervals ranging from 5 to 12 weeks. There were 27 infliximab patients with a less expensive annual therapy than that resulting from treatment with adalimumab. However, the remaining 13 patients were treated with infliximab with a pattern that is more expensive compared to adalimumab therapy, which represents an additional annual total cost of 16.855 €.
Conclusions: Being a drug with dosage according to weight, treatment with infliximab should be assessed in obese patients. In situations of therapeutic equivalence, adalimumab is an alternative to reduce the cost without reducing effectiveness in this patients. The future goal is to assess together with the medical team if the patients who have an expensive therapy (due to their high weight) should change treatment to save costs or maintain the current treatment.
Disclosure of interest: None Declared.

Pharmacoeconomics

PEC009

Pharmacoeconomical impact of clinical trial participation for a multidisciplinary oncology and therapeutic innovation unit (MOTI)

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Background and objective: The cost of new anti-cancer drugs has dramatically increased. Sponsored clinical trials that provide drugs free of charge may be a useful tool in order to reduce drug costs. In our hospital, a pharmaco economical study has been performed in order to evaluate the effect of clinical trials on pharmaceutical expenditure saving for a multidisciplinary oncology unit and on the National Health Service. Intravenous and oral therapies were considered.
Setting and method: From January 2013 to August 2013, a daily report of therapeutics provided by sponsor was achieved thanks pharmaceutical computer software: Chimio®. It allowed to get an overview of the expenditure incurred by sponsors for the development of clinical trials. The second step of the study was to define the standard of care chemotherapy protocol for each patient included.
Main outcome measures: The standard of care was considered as a reference and was used to value cost saving from participation to clinical trials for the clinical unit.
Results: Among the 67 clinical trials open at the Multidisciplinary Oncology and Therapeutic Innovations unit (MOTI), 28 had dispensation during the 8 months of the study. We evaluated at €1 994 320 the sponsor provided drug cost which represent 22,4 % of global pharmaceutical expenditures of the unit. The cost saving from the use of sponsor provided drugs evaluated by standard of care was €530 870 for eight months. 81 %of this amount, or €428 461, consisted of expensive drug status and represents cost saving for the Social Security system. The remaining €102 409, made of usual drugs, generate cost saving for the hospital.
Conclusions: Drug costs saving from clinical participation are substantial and profitable for the National Health Service: Social Security system and hospital. Another study realized in 2011 in the same unit on intravenous clinical trials enhances our results. It shows that the cost saving was €652,170 for a year whether €434,780 for 8 months.
Disclosure of interest: None Declared.

Pharmacotherapy

PT006

Clinical impact of targeted therapies in patients with metastatic clear-cell renal cell carcinoma

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Background and objective: Renal cell cancer (RCC) is the third most frequent among urologic cancers, it represents 3 % of all newly diagnosed cancers, with 11,080 cases, causing 3,840 deaths (2.6 % of all cancers), in France in 2011. Clear-cell carcinomas account for roughly 75%–80 % of RCC. Surgical resection of the primary renal tumor is the current standard treatment. Management of metastatic clear-cell renal cell carcinoma (mccRCC) has undergone a transformation in the last decade. Novel targeted therapies have considerably expanded the number of treatment options for this indication. The aim of this retrospective clinical study was to assess the potential effect of targeted therapies on overall survival (OS) of patients with metastatic clear-cell renal cell carcinoma (mccRCC) in daily practice.
Setting and method: From January 2000 to December 2010, all consecutive patients with histologically confirmed mccRCC who received systemic therapy in two oncology treatment centres in our Franche-Comté region were included in the analysis. Two cohorts of patients were defined according to their systemic therapies: "targeted therapy" cohort and "immunotherapy" cohort.
Main outcome measures: The primary end point was OS. The analysis of prognostic factors was performed using a two-step approach: univariate then multivariate analysis with a stepwise Cox proportional hazards regression model.
Results: For the entire cohort of 111 patients, only 28 patients (25 %) received only immunotherapy, and the other 83 patients (75 %) were included in the "targeted therapy" cohort. The median OS was 17 months (95 % confidence interval [CI]; 13–22 months) and the two-year OS was 39 %. Three prognostic factors were independent predictors of long survival: prior nephrectomy (hazard ratio = 0.38 [0.22–0.64], $p < 0.0001$); systemic therapy by targeted therapy (hazard ratio = 0.50 [0.31–0.80], $p = 0.005$); and lack of liver metastasis (hazard ratio = 0.43 [0.22–0.82], $p = 0.002$). Median OS was 21 months [14–29 months] for patients who received at least one targeted therapy compared with 12 months [7–15 months] for patients who were treated only by immunotherapy agents ($p = 0.003$).
Conclusions: Our results suggest that targeted therapies are associated with improved OS in comparison with cytokines, which is in line with other publications.
Disclosure of interest: None Declared.

Pharmacotherapy

PT007

Analysis of the prescription of biological therapies in rheumatoid arthritis

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Background and objective: To study the prescription/indication of biological therapies in rheumatoid arthritis.
Setting and method: Retrospective observational study of all patients included in the application of the Andalusian Health Service "SAS Information System of biological therapy in chronic rheumatic diseases", resulting in a total of 114. To exploit the data a database was made in Microsoft Access®, where data such as age, date arthritis rheumatoid diagnosis, biological therapy (BT) start date, date of symptom onset, disease activity parameters (DAS28 and HAQ), established BT and concomitant therapy were included.
Results: The average age of patients was 52.75 ± 12.7 years (men 24.5 %). The period of time between the onset of symptoms and the diagnosis was 1.7 years, and between the diagnosis and the onset of BT was 7.3 years. The average value for the parameter DAS28, at the start of BT, was 6.2 and 1.59 for the HAQ. The proportion of prescribed biologic drugs was: Etanercept 63.1 %(72), Adalimumab 31.5 %(36), Tocilizumab 4.4 %(5) and Certolizumab 0.8 %(1). The main reason for the prescription of BT was not reach the therapeutic goal in 99 %. Toxicity or intolerance was observed in 22.2 %, and progression of radiographic lesions in 40.9 % after treatment with disease-modifying ant rheumatic drugs (DMARDs). The most frequent drug associated with BT proved to be in 68 % methotrexate. Medium cost was 10,154.6€ to 15,669.6€ for the first year of treatment and 10,154.6€ to 14,155.4€ for the successive.
Conclusions:

-The high cost associated with the new biological drugs requires the implementation of protocols/clinical practice guidelines based on evidence and rational use of them. The application of the protocols established from the SAS has ensured that 100 % of patients meet the requirements for prescribing BT.

– Loss of efficacy over time of DMARDs is demonstrated in the main reason for indication of BT (99 % treatment failure), in addition to presenting a high incidence of intolerance/toxicity and radiological progression.

– As DMARDs, the BT shows loss of efficacy over time so it can be interesting to delay the onset of these. In our study this occurs after 7.3 years from diagnosis.

– The lack of comparative studies declines the election of BT to indirect comparative studies and cost effectiveness criteria.

Disclosure of interest: None Declared.

Pharmacotherapy

PT008

Efficacy of telaprevir after bitherapy in non-responders patients with hepatitis c

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Background and objective: Patients infected with hepatitis C genotype 1 respond worse to conventional therapy with peginterferon and ribavirin (bitherapy). Telaprevir acts by inhibiting a serine protease essential for the virus replication. Its incorporation to standard therapy in patients infected with genotype 1 provides new opportunities of treatment.

The objective of this study is to know the effectiveness of triple therapy with telaprevir in the treatment of Hepatitis C (genotype 1) in patients who have failed treatment with bitherapy.
Setting and method: A retrospective analysis of the patients who had started triple therapy from January 2012 to February 2014 was carried out. Patients who had not received treatment before the triple therapy were excluded.

We selected the patients who had failed after receiving bitherapy using the Pharmacy Landtools® software. The duration of treatment with telaprevir and suspensions of triple therapy were also registered. The degree of hepatic fibrosis at the time the triple therapy was started and the responses obtained were recorded through electronic medical histories.

It was considered that there had been response to triple therapy if the viral load was undetectable in week-12 post-treatment (sustained viral response).
Results: 34 patients were selected. 9 % of the patients with telaprevir dropped out from treatment before the first four weeks. Telaprevir was suspended during the weeks 4–11 in 15 % of patients. 76 % completed the 12-weeks treatment with telaprevir. Drop-outs were due to adverse effects of the triple therapy (rash, anaemia, nervousness). The suspensions occurred by adverse effects (anal fissure and gastrointestinal upset) and resistance to telaprevir.

6 % presented moderate degree of hepatic fibrosis, 32 % advanced fibrosis and 62 % cirrhosis. In terms of the response to the triple therapy, 62 % of patients had undetectable viral loads in the week-12 post-treatment: 71 % had relapsed after previous treatments, 10 % were patients with previous partial response and 19 % had no response to previous drugs.
Conclusions: Telaprevir has provided new therapeutic options for those patients who had failed standard treatment, achieving cure in 62 % of them. The adequate management of adverse effects is essential to reduce the number of drop-outs and withdrawals, which could result in a higher rate of recovery.
Disclosure of interest: None Declared.

Pharmacotherapy

PT009

Analysis of pharmacotherapy in relation to off-label drug use in paediatric ambulatory care

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Background and objective: The safety and efficacy of drugs that are commonly prescribed to children and adolescents are not confirmed. Many medicinal products are often prescribed outside the terms defined in the Summary of Product Characteristics (SPC), i.e. *off-label*. The aim of our work was to analyse data on the pharmacotherapy of paediatric patients in outpatient setting in relation to *off-label* drug use in the Slovak Republic.
Setting and method: Prescriptions for patients (0–18 years) dispensed in two community pharmacies from Bratislava which were prescribed for the treatment of children in outpatient setting for the period 1 January 2013 to 31 March 2013 were analysed.

Currently valid SPCs were the primary source of information on prescribed drugs. Age, diagnosis and medicinal products prescribed to paediatric patients were recorded. Drugs in the analysed datasets were evaluated in terms of manner of prescription and use, which included two categories: *off-label* and labelled drugs.

Categorical variables were characterized by frequencies and percentages and for their comparison Pearson's Chi square test in contingency tables was used.
Main outcome measures: Proportion of the drugs prescribed in *off-label* manner to paediatric patients in ambulatory care.
Results: In total, we analysed 5982 prescriptions that included 420 active substances. Overall, the drugs for the diseases of the respiratory system, sensory organs, anti-infectives for systemic use and dermatologicals were the most commonly prescribed.

In total, 9.2 % of all prescribed drugs were classified as *off-label* and 17.2 % of the patients were prescribed at least one *off-label* drug. The administration of medicinal products to children outside the recommended age limit according to the SPC was the cause of 64.7 % of off-label drug use. The lack of any information on the use in children was found in 27.5 % and the drugs were contraindicated in 7.8 % of all *off-label* identified drugs. The highest proportion of *off-label* prescribed drugs was documented in the group of toddlers (13.7 %) and the smallest in the group of 2–6 years old children (7.3 %).

Off-label prescribed drugs were present in almost all ATC groups. Dermatologicals, antineoplastic and immunomodulator agents and drugs for diseases of central nervous system, cardiovascular and genito-urinary system significantly contributed to the *off-label* prescription rate in children treated in the outpatient setting ($p < 0.001$).
The most *off-label* prescribed drugs in the dataset included transfer factor, erdosteine and fusidic acid.

Conclusions: Our analysis which has not been performed in the Slovak Republic yet points out similar extent of *off-label* used drugs prescribed to paediatric patients in ambulatory care to other European countries.

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Disclosure of interest: None Declared.

Pharmacotherapy

PT010

Identification of benzodiazepines contraindications in the elderly

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Background and objective: To identify and quantify the main contraindications related to the benzodiazepines prescription in the elderly.
Setting and method: Observational prospective study carried out in a tertiary care hospital during two months. Patients aged above 65 years and currently taking a benzodiazepine were selected. A benzodiazepines contraindications research was done in the literature as well as in clinical guidelines and data sheets to identify the main pathologies and clinical situations in which benzodiazepines aren't recommended to be used. They were classified in absolute or relative contraindications. Accumulated contraindications were also quantified. Clinical data was searched in the digital history (Diraya®).
Results: 110 patients were selected. The medium age was 81 years (65–95). They were 71 women (64 %) and 39 men (36 %). 79 patients had one or more of the following contraindications: 1) Falling risk: 45.5 %, 2) Memory impairment: 13.2 %, 3) Obstructive sleep apnoea: 4.1 %, 4) Respiratory failure: 33.9 %. 5) Glaucoma: 7.4 %, 6) Liver disease: 5.8 % and 7) Renal impairment: 9.1 %. The patients had a number of accumulated contraindications as follows: a) Without any contraindication: 31 patients (28.1 %), b) 1 contraindication: 40 patients (36.4 %), c) 2 contraindications: 27 patients (24.8 %), d) 3 contraindications: 11 patients (9.9 %) and e) 4 contraindications: 1 patient (0.8 %).
Conclusions: Benzodiazepines are very used nowadays in elderly. However, a high percentage of them (71.9 %) have one or more contraindication to benzodiazepines. This may lead to adverse drugs effects as fallings, dizziness, sleepiness or asphixya. This research points out the need of evaluate every patient before prescribing benzodiazepines or another drug.
Disclosure of interest: None Declared.

Pharmacotherapy

PT011

Patient-safe pain management of hip fracture patients requires focus on the renal function

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Background and objective: The Hospital Pharmacy of the Capital Region and Hvidovre Hospital has continually focused on improving patient safety. Hip fracture patients often have severe co-morbidity including Chronic Kidney Disease (CKD). In addition Acute Renal Dysfunction (ARD) is a serious complication after hip fracture surgery in an aging population and CKD is a known predictor. ARD is often reversible, but the mortality and hospitalization is significantly increased. Caution is required with the use of drugs for patients suffering CKD and ARD. For this group of patients the use of medical standard treatment can challenge the patient safety. The objective of this study was to evaluate the safety of NSAIDS and Morphine in standard doses in patients hospitalized with acute hip fracture.
Setting and method: 202 consecutive hip fracture patients (71 % female, mean age 78 (range 22–97)) admitted through the ER from Sept 2012 to March 2013 were included.

The patient's upper and lower estimated Glomerular Filtration Rate (eGFR) was recorded between admission and discharge. CKD was estimated as the highest measured eGFR during hospitalization. The severity of ARD was classified by the RIFLE criteria (R-risk, I-Injury, F-failure, L-loss, E-end stage) classification. The frequency of NSAID and Morphine treatment was evaluated among patients developing ARD.
Results: In the study population 45 % (n = 91) had normal kidney function (CKD I), 34 % (n = 69) mildly reduced kidney function (CKD II), 20 % (n = 38) moderately reduced kidney function (CKD III), 1 % (n = 3) severely reduced kidney function (CKD IV). A single patient had terminal renal insufficiency (CKD V). RIFLE $\geq$2 occurred in 20 cases (10 %). Among these cases 50 % (n = 10) had been treated with NSAID and 35 % (n = 7) had received oral Morphine. During hospitalization 47 % (n = 95) achieved an eGFR $\leq$50 mL/min and for 16 % (n = 32) eGFR was $\leq$30 mL/min. Patients classified as CKD II-V had four times greater risk of developing ARD compared with patients in CKD I (p = 0.02).
Conclusions: This study confirms that ARD is a frequent complication of hip fracture surgery. Pain management among this aging patient group therefore requires continuously focus on the kidney function in the post-operative period. In order to increase patient safety the use and dosage of NSAIDs and Morphine should be individually assessed.
Disclosure of interest: None Declared.

Pharmacotherapy

PT012

Low molecular weight heparin : use and pharmaceutical interventions in an university parisian hospital

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Background and objective: For 10 years, low molecular weight heparin (LMWH) prescriptions in our hospital have been controlled by pharmacists thanks to nominative individual prescription systematic control. The objective of our study is to describe LMWH use.
Setting and method: A retrospective study of 5 months period (January -May 2014) of LMWH use [(enoxaparin (ENX), tinzaparin (TNZ), fondaparinux (FPX)]. Pharmaceutical interventions (PI) and validations were collected and analysed during this period.
Main outcome measures: Our pharmaceutical validation process included for each prescription of LMWH : indication of use, posology, renal function and weight of patient which recorded in a computer file. These are evaluated according to Drug Marketing Approval (DMA). Pharmaceutical interventions are any action initiated by a pharmacist who directly induces a change in the prescription of the patient. These were collected and analysed during the study period.
Results: On 588 prescriptions (ENX n = 359; 61 %, TNZ n = 191; 32.5 %, FPX n = 38; 6.5 %) analysed, 458 prescriptions (78 %) were complying with DMA most common recommendations: thrombosis prevention in atrial fibrillation, pulmonary embolism, deep vein thrombosis (ENX n = 275; 77 %, TNZ n = 155; 81 %, FPX n = 28; 74 %). 140 (22 %) prescriptions were prescribed off-label recommendations. For 96 prescriptions (16.3 %), at least one PI was observed. PI were mainly on missing data like weight and renal function (n = 44; 45.8 %), higher posology than DMA recommendations (n = 14; 14.6 %) or lower (n = 33; 34.4 %) or on increased risk of bleeding due to addition of pharmacological action (n = 4; 4.1 %). Because of renal function <30 mL/min, 3 PI led to refuse LMWH dispensation and to substitute by unfractionated heparin. During this period 1 case of a massive bleeding was notified which led to an extended hospital stay for the patient.
Conclusions: In our hospital, LMWH prescriptions seem to be largely well controlled in the light of low number of PI. To reduce the risk of bleeding event, clinicians mostly decrease the LMWH posology. Biological Anti-Xa monitoring is generally used to adjust the dosage only in case of overdose. This study led us to focus on new oral anticoagulants which have not biological monitoring and by the way need a deeper pharmaceutical validation.
Disclosure of interest: None Declared.

Pharmacotherapy

PT014

Proposing a framework for pharmacist prescribing within a multidisciplinary team context

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Background and objective: Pharmacist prescribing is an activity that has been described and implemented to various degrees in different countries throughout the world. Currently no prescribing rights for pharmacists are implemented in Malta. The study aimed to propose a framework for pharmacist prescribing and to determine the perception of pharmacists and general practitioners on the implementation of this prescribing authority framework.
Setting and method: Department of Pharmacy, University of Malta; community and hospital pharmacies.

A draft discussion paper 'Implementing pharmacist prescribing in Malta' by Tabone[1] was updated with the objectives to define the perceptions of pharmacist prescribing locally and to propose areas for implementation. Intensive literature review was carried out and the proposed areas for implementation were identified and validated through focus group discussions made up of pharmacists and physicians. The validated proposals were distributed to 50 community pharmacists selected by stratified random sampling and to 12 hospital and clinical pharmacists identified by convenience sampling. Respondents were asked to complete an evaluation questionnaire describing the proposals.
Main outcome measures: Development, validation and evaluation of proposed framework for pharmacist prescribing.
Results: The developed framework presents two activities namely: 1) Pharmacist prescribing in the management of minor ailments, self-diagnosed by patients through the use of guidelines in the community setting, and 2) Repeat prescribing by clinical and hospital pharmacists in the management of diabetes, hypertension and patients receiving oral anticoagulants based on a management plan agreed between physicians, clinical and hospital pharmacists and patients. Forty-one community pharmacists (n = 44) and all 11 clinical and hospital pharmacists were in favour in implementing pharmacist prescribing in the management of minor ailments. Pharmacists were in favour of the community pharmacist prescribing intervention in nasal congestion (n = 50), dry cough (n = 50) and rhinorrhoea (n = 47). Pharmacists were in favour of the repeat prescribing system in the management of hypertension (46) and diabetes (45). Only 27 pharmacists were in favour of repeat prescribing in patients receiving oral anticoagulants.
Conclusions: A positive response was obtained from pharmacists towards pharmacist prescribing in the management of minor ailments and on the repeat prescribing system in the management of diabetes and hypertension. The framework emphasis the multidisciplinary team context and this is essential for a pharmacist prescribing framework to be implemented.

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Disclosure of interest: None Declared.

Pharmacotherapy

PT015

Multidisciplinary medication reconciliation and medication review in home care services

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Background and objective: Medicines are important in prevention and treatment of disease. Increasingly complex drug regimens and increasing numbers of elderly lead to more side effects and higher probability of drug interactions. Drug-related problems (DRPs) lead to extensive morbidity and mortality, high health care expenditure. The objective of this study was to explore the drug related problems (DRPs) identified in multidisciplinary team meetings.
Setting and method: Public and private home care services in Oslo, Norway, took part in a 9-month learning network on medicines reconciliation and medication review as a follow-up of a national patient safety program pilot. The network included nurses in home care services, general practitioners and clinical pharmacists. Classification of DRPs were performed according to a validated national system (1) based on a classification published by Pharmaceutical Care Network Europe (2). A website with links to the methods was coordinated by one local health authority within Oslo.
Main outcome measures: Number of medicines reconciliation where lists reconcile, DRPs and outcome of these ca 4 weeks after the medication review.
Results: Medicines reconciliation and medication reviews were performed on 110 patients (aged 45–110) receiving home care services. About half of the patients had lists of medicines that did not reconcile between the general practitioner and the home care services. General practitioners, nurses and clinical pharmacists identified 611 DRPs (mean 5.5). Of these, 95.6 % were effectuated after the multidisciplinary meetings.
Conclusions: The methodology used in the multidisciplinary team meetings proved effective in identifying and resolving drug related problems in patients receiving home care services.

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Disclosure of interest: None Declared.

Pharmacotherapy

PT017

Subcutaneous administration of ceftazidime: a new administration route?

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Background and objective: Parenteral antibiotics are commonly used at hospital. However, in some contexts (i.e., limited venous access, anticoagulation therapy, haemophilia …) intramuscular and intravenous routes are contraindicated, leading to consider other administration methods (i.e., subcutaneous perfusion …). We report a subcutaneous administration of ceftazidime, for which no data of patient safety and efficiency is available.
Setting and method: case report
Results: A 39-year-old man was admitted to our hospital for a pneumopathy, in a context of muscular dystrophy (DMD) and terminal chronic respiratory failure (invasive ventilation and tracheotomy). It should be noted that the administration of drugs by intramuscular and intravenous routes was contraindicated for this patient, because of DMD and limited venous access, leading to consider only oral and subcutaneous routes. A probabilistic antibiotherapy by amoxicillin and clavulanic acid (3000/750 mg/day) was implemented orally immediately after admission. The presence of *Pseudomonas aeruginosa* resistant to ciprofloxacin, methicillin-sensitive *Staphylococcus aureus* and multiresistant *Achromobacter xylosoxidans* in the bronchoalveolar fluid limited the potential therapeutic alternatives. Despite a lack of data for subcutaneous administration in humans, an antibiotherapy by subcutaneous ceftazidime (6 g/day; 15 days), associated with tobramycine (3 mg/kg/day; 5 days) was introduced, based on a safe and efficient administration reported in animals and a multidisciplinary meeting. Ceftazidime was diluted in sodium chloride 0.9 % (50 mL), before a subcutaneous administration over 30 min. Clinical tolerance was good, without skin necrosis, injection site infection or pain, despite no local anaesthesic or systemic analgesic drugs before or during administration. After 4 days, the antibiotherapy effectiveness was confirmed clinically and biologically.
Conclusions: To our knowledge, this is the first report of subcutaneous administration of ceftazidime in humans. Despite a lack of data, this case report suggests that the subcutaneous administration of ceftazidime should be considered for patients in whom other parenteral administrations are not possible. Further studies have to be conducted to confirm the safety and the effectiveness of this practice.
Disclosure of interest: None Declared.

Pharmacotherapy

PT018

Cidofovir in the treatment of BK virus-associated haemorrhagic cystitis following hematopoietic stem cells transplantation: a retrospective study

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Background and objective: After Hematopoietic Stem Cell Transplantation (HSCT), Haemorrhagic Cystitis (HC) due to BK virus (BKV) is a common complication with an incidence varying from 7 to 70 %[1,2]. Even if supportive measures have been the standard of care for many years (bladder irrigation, blood transfusions, and symptomatic relief treatment), several studies showed cidofovir efficacy[3,4]. Cidofovir is not currently licensed for this indication and its known renal toxicity is the main restriction to its use. The aim of this retrospective study is to describe the treatment by cidofovir of BKV-HC and to assess its efficacy and renal toxicity.
Setting and method: All patients treated with cidofovir in the Blood and Marrow Transplantation Unit (Hospices Civils de Lyon, France) between March 2011 and June 2013 were enrolled. Data from cidofovir administration (dose, number of injections, duration of treatment and route of administration), clinical efficacy and toxicities were retrospectively collected from medical files.
Main outcome measures: Efficacy criteria were complete clinical response (CR) and partial clinical response (PR).

Renal toxicity was evaluated using creatinine clearance calculated with Cockcroft and Gault formula.
Results: 27 patients were enrolled: 24 were treated with intravenous injections of cidofovir (88.9 %), 1 with intravesical instillation (3.7 %) and 2 with both routes of administration (7.4 %). Regardless of administration route, the average dose used was 5 mg/kg per administration, with a median of 4 injections [1–11], from twice a week to once every two weeks. A CR was achieved for 23 patients (85.2 %), 2 patients had PR (7.4 %) and 2 treatments failed (7.4 %).

8 patients presented a renal failure (29.6 %, 6 moderate, 2 severe). The mean decrease of creatinine clearance was 35 mL/min. For 6 patients (22.2 %), creatinine clearance decreased by more than 50 %. 3 renal insufficiencies and haematological toxicity led to a discontinuation of the treatment or a switch to intravesical instillation. For 3 patients, cidofovir doses were reduced due to nephrotoxicity.
Conclusions: This study demonstrated the effectiveness of intravenous cidofovir for BKV-HC treatment in HSCT patients, but it requires a renal toxicity management. Given the retrospective methodology and probably the multifactorial origin of renal insufficiency, results should be interpreted with caution. Cidofovir treatment (high dose, intravesical instillation or low dose (1 mg/kg)) have to be investigated in prospective studies.

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Disclosure of interest: None Declared.

Pharmacotherapy

PT019

Argatroban clinical follow-up in a critically ill patient: a case report

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Background and objective: Argatroban is a direct thrombin inhibitor which provides an alternative method of anticoagulation for patients with heparin-induced thrombocytopenia (HIT). According to the summary product characteristics (SPC), its initial infusion rate depends on the clinical state of the patient (critical or altered hepatic function) and is modified according to Activated Partial Thromboplastin Time (aPTT) or Activated Clotting Time (ACT) in percutaneous coronary interventions.

The objective was to assess the clinical follow-up of argatroban in a critically ill patient based on clinical and coagulation parameters.
Setting and method: This was a descriptive study set in a tertiary care university hospital.

A 57 year old, 70 kg white man with myocardial infarction Killip IV, waiting for cardiac transplantation, was connected to an intra-aortic balloon pump to maintain adequate coronary perfusion. Unfractioned heparin (UFH) was prescribed and after 6 days of treatment, platelet count fell from 203000/μL to 10000/μL. Antibodies to heparin–platelet factor 4 (antiPF4) were positive which confirmed the HIT diagnosis. UFH was discontinued and argatroban therapy was started. ACT and aPTT measurements were monitored every 6 h. [Optimal aPTT: 70–80 s; optimal ACT: 180–220 s]
Main outcome measures: Demographics, hepatic/renal biochemical data, platelet count, antiPF4 and data related to argatroban monitoring were obtained from medical record.
Results: The patient had a slightly altered hepatic function (aspartate transaminase: 119 IU/L; alanine transaminase: 98 IU/L; bilirubin: 0.9 mg/dL) and moderate renal impairment (creatinine clearance by Crockoft- Gault: 32.9 mL/min).

Argatroban was initiated according to the SPC at a dose of 0.5 mcg/kg/min. The infusion rate was gradually increased at intervals of 0.1 mcg/kg/min up to 2.8 mcg/kg/min, based on optimal aPTT. Just then; the patient suffered an active respiratory bleeding. At this moment, aPTT was 73.2 s (within therapeutic range), although ACT was 325 s, clearly above of the optimal range for this patient.

A lineal correlation between aPTT and the infusion rate was observed during the first hours of argatroban infusion up to 70 s, but when this value was reached, the correlation was not present any longer. In contrast, when ACT is monitored, a linear correlation with infusion rate was observed throughout treatment despite its value.

Argatroban was previously prescribed in other two critically ill patients. Both of them were monitored through aPTT and had active bleeding at therapeutic doses.
Conclusions: Observed adverse effects suggest that both coagulation parameters (aPTT and ACT) might be monitored in order to assess optimal anticoagulant therapy. Our results showed a better correlation between infusion rate and ACT than with aPTT. This result has raised concerns about argatroban safety for critically ill patients according to aPTT values.
Disclosure of interest: None Declared.

Pharmacotherapy

PT020

Chronopharmacology in Type-I Diabetes

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Background and objective: *'Chronopharmacology is the investigative science that elucidates the biological rhythm dependencies of medication'* [1]. Chronopharmacology signifies the investigation of the effects of drugs on biological timing and the effect of circadian rhythm on the pharmacokinetics of the drug. In this study 'insulin' was the drug being investigated.

The objectives in this study were to establish a relationship between '*timed*' administration of short or intermediate/long acting exogenous insulin and glycaemic control, to investigate the presence of Dawn and Somogyi Phenomena correlated with glycaemic control, both using a Continuous Glucose Monitoring System (CGMS) [2]; to establish a relationship between '*counselling*' on '*timed*' exogenous insulin administration, and/or changing the insulin being administered by the participants appropriately and the resultant glycaemic levels in the Type I diabetics, by re-assessment after three and six months, using HbA_{1C} as a tool.

Setting and method: The study was conducted in the Diabetes and Endocrine Centre at the Mater Dei General Hospital in Malta.

Thirty, Type I diabetic participants aged 20 to 55 years were identified from the Maltese Population attending Mater Dei Hospital and analysed over a period of 72 h using a CGMS. A questionnaire supported by a diary, were drawn up to group participants into two; those who administer their exogenous insulin in a regular *'timed'* manner in relation to their daily meals (Group 1, n = 13) and those who did not (Group 2, n = 17). Results were collected using Com-Station™ device with data automatically downloaded via CGMS System Solutions™ program and analysed using SPSS version 19.

Main outcome measures: Blood glucose fluctuations in Type I diabetics and evaluation of the importance of administration of exogenous insulin in a timed regular manner throughout the day in order to obtain best glycaemic control.

Results: Timely administration of short or intermediate/long acting insulin manifested in better glycaemic profiles with significant p values of 0.005 and 0.000 respectively. The presence of both Dawn (n = 22) and Somogyi (n = 11) Phenomena were evident in Type I diabetic participants studied in this study. After counselling on the way to time the exogenous insulin administered, Group 2 participants showed significant improvement in their HbA_{1C}, after three and six months, with p values 0.0195 and 0.037 respectively.

Conclusions: Regular timing of exogenous insulin administration in Type I diabetics in this study resulted in better blood glucose levels which may be of future importance in reduction of chronic diabetic complications.

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Disclosure of interest: None Declared.

Pharmacotherapy

PT021

Efficacy and tolerance of gemtuzumab ozogamicin in refractory acute myeloid leukaemia

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Background and objective: Support of adults patients affected by acute myeloid leukaemia (AML) is based on induction of conventional chemotherapy (anthracyclin associated with cytarabin), followed by strengthening of intensive chemotherapy cycles (high doses cytarabin with topoisomerase inhibitor type II). In absence of full remission with these treatments, there is an alternative drug, the Gemtuzumab (Mylotarg®), an anti-CD33 humanized monoclonal antibody being in temporary authorization for use. Therefore, we studied the efficacy and safety of Gemtuzumab Ozogamicin (GO), used as salvage therapy in patients with relapsed AML.

Setting and method: In order to evaluate the efficacy and safety of GO in clinical practice, a single-centre retrospective study was conducted in our institution. Since 2009, all patients treated by Gemtuzumab were listed. We have identified the following items : anterior chemotherapy lines, dose, intensity, toxicity, length of survival and calculation of median survival by Kaplan–Meier method, and the rate of full remission.

Results: 19 adults patients (medium age: 46; 10 women and 9 men) were treated from January 2009 to December 2013. All patients received at least one line of chemotherapy based on anthracyclin before treatment initiation with Mylotarg®. To the initiation, patients presented renal failure (clearance <60 mL) (1), an elevation of PAL (5), an elevation of transaminases (4) and an anaemia (19). After administration of gemtuzumab, the most toxicities encountered were neutropenia (17), anaemia (19), thrombocytopenia (19), infections (11), haemorrhagic disorders (3), digestive disorders (4), hepatic disorders and liver arterial occlusive disease (5). In average, patients received 2 treatments. The rate of full remission was 21 % and the median survival for all patients was 13 months.

Conclusions: Therefore, it appears that Mylotarg®'s tolerance profile is different from classical chemotherapy; hepatic disorder and liver arterial occlusive disease are the most important side effects. Results of survival are extremely disappointing but not representative because of the low size of our sample. Research and study of predictive response factors could help targeting patients who would respond positively to treatment and so, reach a full remission.

Disclosure of interest: None Declared.

Pharmacotherapy

PT022

Medication at Admission to Hospital and the Risk of Re-Admission and Dead in a 3 Month Follow-up Period

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Background and objective: The number of medication-related problems increases with age and the number of medications used. Approximately 20 % of all acutely admitted 65 + years are acute hospital re-admissions. It is unknown how many of these re-admissions there are related to medications. For older patients with a high usage of medication in combination with decreasing physical capacity and declining organ function, it is relevant to investigate, whether hospital re-admissions and medication might be associated.

OBJECTIVE: The aim of the study was to investigate the relationship between re-admissions and medication among older medical patients over a 3-month period.

Setting and method: An initial retrospective qualitative study of 24 patients aged ≥65 years readmitted to an emergency department was carried out. By reviewing medical records possible implicated medicines were identified. Subsequent we tested our findings in a prospective quantitative study with 386 patients aged ≥65 years. Cox proportional-hazards regression was used to compute unadjusted and adjusted hazard ratios with 95 % confidence limits for factors associated with rehospitalisation and death within 3 months after discharge from hospital. The adjusted analysis included age, gender, polypharmacy, co-morbidities and mobility as covariates.

Results: In the initial study diuretics and non-steroidal anti-inflammatory drugs (NSAID) and acetylsalicylic acid (ASA) were found to be potentially associated with hospital re-admissions. In the prospective study there were none significant relationship, unadjusted or adjusted, between the treatment with diuretics and increased risk of hospital re-admissions, neither for NSAID nor ASA unadjusted. However, patients treated with loop-diuretics, unadjusted, had an increased risk of death. Likewise, patients being treated with NSAID and ASA, had adjusted significantly lower risk of hospital re-admission when the analysis. These patients did not have a significantly changed risk of death, adjusted or unadjusted.

Conclusions: The retrospective reviews of medical records indicate that diuretics and non-steroidal anti-inflammatory drugs and acetylsalicylic acid increase the risk of hospital re-admission. None of these findings could be confirmed in the prospective cohort study though. Patients being treated with loop diuretics had unadjusted a significantly increased risk of death.

Disclosure of interest: None Declared.

Pharmacotherapy

PT023

Evaluating the appropriateness of prescriptions in elderly patients according to the IPET criteria

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Background and objective: Elderly patients suffer from many chronic disorders and consequently make use of more medications than any other age group. Aging alters the pharmacokinetic and pharmacodynamic processes of

many drugs, influencing choice, dosage and frequency of administration. The goal of our study is to evaluate the appropriateness of therapies in elderly patients upon admission and during the hospital stay.
Setting and method: The study was conducted by ISMETT Clinical Pharmacists (CPs) and involved patients aged ≥65 years admitted at ISMETT from January 1 to December 31, 2012. Appropriateness of therapies upon admission and during hospitalization was assessed with IPET (Improving Prescribing in the Elderly Tool). At the same time, CPs provided training to physicians to promote safer prescriptions according to IPET. Correlation between co-morbidities and inappropriateness detected by IPET was described using the Spearman correlation coefficient.
Main outcome measures: Data on the patients' clinical history and therapy was retrieved from the electronic medical record. Patient morbidities, drugs, dosages, and therapeutic indications were placed in a database.
Results: 1,027 patients aged ≥65 were recruited for this study. 87 % (893/1027) of them had from 2 to 6 co-morbidities. Upon admission, only 887 out of 1,027 patients already followed a therapy at home. 28 % (249/887) received at least one potentially inappropriate medication according to IPET. During hospitalization and after training conducted by CPs, 25 % (261/1027) of patients received at least one potentially inappropriate medication according to the IPET criteria.

Statistical analysis showed a significant correlation between the number of co-morbidities and the inappropriateness of therapies recognized by IPET.
Conclusions: Optimizing the treatment of elderly patients with multi-morbidity and a wide range of medications therapy is a complex challenge. Enforcing a multidisciplinary approach and promoting tools that guide prescribing physicians can ensure safer therapies in elderly patients reducing the risk of adverse reactions.
Disclosure of interest: None Declared.

Pharmacotherapy

PT024

Drugs and elderly: appropriateness of therapies according to the implicit criteria

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Background and objective: Managing therapies in elderly patients is a critical issue in primary care. The physio-pathological status of these patients is usually complex and multiple drugs are typically prescribed with an according higher risk of onset of adverse effects. Many tools have been developed to cope with this issue and to identify drugs inappropriate for the elderly. The goal of our study is to evaluate the appropriateness of therapies in the elderly according to implicit criteria.
Setting and method: The study was conducted by ISMETT Clinical Pharmacists (CPs) and was addressed to outpatients aged ≥65 years enrolled, randomly, from September 1, 2013, to March 31, 2014. Therapy appropriateness was evaluated applying three sets of implicit tools: Lipton Criteria, MAI (Medication Appropriateness Index) and POM (Prescribing Optimization Method). A questionnaire designed by CPs was used to assess information provided to patients by physicians, and adherence to therapy.
Main outcome measures: Data on the patients' clinical history and therapy was retrieved from the electronic medical record. Patient diagnosis and allergies, drugs, dosages, pharmacology indications, and questionnaire results were placed in a database.
Results: 265 patients aged ≥65 were recruited for this study. 83 % (220/265) of patients had from 2 to 6 co-morbidities. All prescriptions complied with pharmacology indications; dosages were in range in 95 % (252/265) of patients. Enrolled patients did not take medications that had caused adverse reactions in the past; the therapy included no drug–drug interactions or unnecessary drug duplications. Only 33 % (88/265) of patients reported being thoroughly informed about the prescribed therapy and main side effects. 91 % (242/265) of patients reported full compliance with the dosing schedule.
Conclusions: The overall assessment of elderly patients, with particular reference to co-morbidity, is essential to select the best customized therapy. For this reason it is of vital importance to have the support of tools allowing for safer therapeutic choices. Implicit indicators allow to reduce the number of medications and inappropriate prescriptions, avoid drugs with greater potential for interactions, and promote patient compliance. CPs organized training sessions to promote the use of customized tools developed and validated to ensure appropriateness of therapy in elderly patients.
Disclosure of interest: None Declared.

Pharmacotherapy

PT026

Off-label and compassionate medication use for four years in a third level hospital

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Background and objective: Spanish Ministerial Decree 19 June 2009 on the use of medicines in special situations, represents the legislative frame defining Off-label and Compassionate Medication use (OCU). Accordingly, an off-label and compassionate use of medication can be requested to the local Off-label and Compassionate Medication Committee (OCMC) from each Hospital. This Committee, after studying them carefully, reviewing the evidences in the main sources of clinical and scientific information decide whether they are authorized or not. Some of them are approved as long as the results are regularly reported and they are satisfactory.

The aim of this surveillance was to achieve a picture of the OCU requested to the OCMC at a third level Hospital for four years and its resolutions, as well as to highlight the most frequent requested drugs and its uses.
Setting and method: All the OCU requested to the OCMC were obtained from the Hospital Pharmacy database. They were classified by date, drug, use requested and the resolution given by the Committee in the timeframe between June 2010 and June 2014.
Results: The OCMC received 205 OCU requests (177 authorized and 28 denied) involving 75 drugs. Twenty four programs were approved in oncology (43 %), sixteen in autoimmune/neurological diseases (28,5 %) and sixteen in other different services (28,5 %). The highest number of patients requested suffered from breast metastatic cancer (12) and Lupus (10). The most representatives drugs from the 205 OCU requests were Rituximab

(30 patients), Adalimumab (13), Everolimus (8), Tocilizumab (7), Infliximab (6), Lenalidomide (6), Interferon alfa 2a (5), Bevacizumab (5) and Romiplostim (5).
Conclusions: OCU have proved to be a therapeutic choice for those patients who have not alternative treatment options available. As the OCMC becomes more experienced and obtained reports from the approved treatments is easier to make decisions regarding new OCUs.
Disclosure of interest: None Declared.

Pharmacotherapy

PT027

Effectiveness of medication review in patients with polypharmacy

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Background and objective: Medication review in elderly patients with polypharmacy is an essential activity to improve treatment adequacy and reduce the risk of potential security problems (PSP). The aim of this study was to analyse implementation effectiveness of a structured medication review.
Setting and method: Quasi-experimental before-after study was carried out in Primary Care Centres. Participants: Primary Care physicians attending patients aged ≥65, under treatment with 5 or more drugs, and belonging to 7 Primary

Care Areas in 5 different towns. Patients should at least have one of the following PSP: a)concomitant use of an antihypertensive drug with a non-steroidal anti-inflammatory drug (NSAID), anticoagulant or antithrombotic drug; b)use of two or more benzodiazepines. Two clinic units were randomized per area to be included in the study. Thirty patients per clinic unit were randomized to be enrolled for intervention. Intervention: clinical sessions with Primary Care teams were held by a Primary Care pharmacist, a general practitioner or a nurse, identification of patients with PSP, feedback to Primary Care physicians of patients requiring completion of the review, and e-mailing of relevant information concerning current clinical evidence to all the participants. Clinical sessions provided advice on stopping medicines and reducing PSP. Intervention period: May 2013-May 2014.
Main outcome measures: PSP reductions. Other secondary measures: age, sex, concomitant diseases, Barthel test (basic activities of daily life), adverse events, and minor symptoms.
Results: A total of 420 patients were selected to be reviewed (average age 74, women 69 % of the patients). Two semi-annual interventions were held during the study. PSP reductions after the first and second interventions were: patients with antihypertensive drugs and NSAID, 46 % and 47 %; with antithrombotic drugs, 44 % and 13 %, and with anticoagulants, 50 % and 25 %; patients with two benzodiazepines, 38 % and 10 %, respectively. Adverse events occurred in 38 patients (9 %) associated with medication. PSP reductions compared with number of drugs and comorbidity showed a negative result (coefficient 2.8; $p = 0.004$). Secondary measures had no significant effect on PSP reduction.
Conclusions: Intervention addressed to general practitioners based on providing clinical recommendations and information about inappropriate prescriptions showed to be successful in reducing PSP. Such an intervention was more effective in patients with less comorbidity.
Disclosure of interest: None Declared.

Pharmacotherapy

PT029

Drug related problems in polymedicated institutionalized elderly: opportunities for pharmacist intervention

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Background and objective: Aging and the increasing prevalence of chronic diseases have increased the use of medicines. Portugal is one of the European countries where more medicines are consumed and the associated expense is higher.

Medicines yield enormous health benefits but can also cause illness and death. A drug-related problem (DRP) is an "an event or circumstance involving drug therapy that actually or potentially interferes with desired health outcomes". In the U.S. they represent the 4th–6th leading cause of death and many could be avoided.

Elderly have increased risk of DRP due to multi-pathology/polypharmacy, complex dosing regimens, pharmacokinetic/pharmacodynamic alterations and functional/cognitive changes. Pharmacists' role as an essential element of healthcare has been recognized. Pharmaceutical care, a patient-centered activity focusing on pharmacotherapy-related needs, contributes to guarantee drug expenditure is a good investment, with benefits outweighing risks.

To evaluate the need for pharmaceutical care implementation in institutionalized polymedicated elderly.
Setting and method: Descriptive cross-sectional study in 6 Portuguese nursing homes, selected by convenience (Nov-Dec 2013). Each institution selected 5–6 patients (age $\geq$65 years, medications $\geq$5 and capability of interview). All signed an informed consent. Demographic data and information on health problems and medications used was gathered from clinical records and patients' interviews. To identify DRP, drug information sources were consulted and the STOPP-START tool was used. The ATC/ICD-10/The PCNE Classification V 6.2 classification systems were used for medicines/health problems/DRP classification, respectively. For each medicine, the less costly equivalent was identified.
Main outcome measures: Number of health problems and medicines/patient; total and individual number/type of DRP; cost-reduction analysis.
Results: The sample included 31 elderly (64,52 % female, mean age 81,65 $\pm$ 6, 86). Subjects presented a mean of 7,94 $\pm$ 2.76 health problems, with diseases of the circulatory system being the most common. A median of 10 medicines/patient was found. Cardiovascular, nervous and digestive systems medicines were the most used. A total of 484 DRP was found. The most common were *Adverse Drug Event, non-allergic* (49,51 %), *Drug treatment more costly than necessary* (19,11 %), and *Effect of drug treatment not optimal* (14,82 %). Our cost-reduction proposal would lead to € 3.950/saving/year.
Conclusions: These results reinforce the need for pharmaceutical care services in this population, to improve clinical outcomes and reduce costs.
Disclosure of interest: None Declared.

Pharmacotherapy

PT030

Paediatric injectable adrenaline: interest of low dosage

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Background and objective: To treat cardiovascular shock or bradycardia in neonatal or paediatric patients, nurses or clinicians have to dilute 1 mL of adult adrenaline solution (1 mg/mL) in 9 mL of Sodium Chloride 0.9 % w/v solution to obtain a solution of adrenaline 0.1 mg/mL. Errors in this dilution performed in emergency can result in severe damage to the patient and death. Our objective was to provide a paediatric injectable adrenaline.
Setting and method: To study the use of adrenaline in neonate or paediatric patients, a prospective observational study was performed during four weeks (06/06/2014–04/07/2014) in emergency units of French hospitals. A pharmacy student from the EPHP called 32 physicians including paediatricians, intensivists, and anaesthetists and sent them a questionnaire via internet. The study will be extended for another four weeks.
Main outcome measures: The questionnaire consisted of 9 questions:

– 5 about the use of adult adrenaline dosage (1 mg/mL): available dosages, dilution protocol; responsible of dilution, management of the risk; route of administration,

– 4 about the eventual need of paediatric dosage (0.1 mg/mL): interest, importance of using a low dosage and/or to continue to dilute the adult dosage, storage risk management, general comments

Results: 11 answers at the time of submission of the abstract:

– Use: available adrenaline 1 mg/mL (11/11)–dilution of 1 mL adrenaline (1 mg/mL) in 9 mL Sodium Chloride 0.9 % w/v (11/11)—done by physicians (10/11) or nurses (8/11)—according to a protocol (11/11) + double verification (2/11)—route of administration intra-venous (10/11); intra-tracheal (4/11); intra-osseous (5/11);

– Needs: interest (11/11)—future users of low dosage (9/11), will continue dilution (2/11)—proposition of management storage risk (11/11)—general comments (10/11).

Conclusions: These first results confirm the usefulness of a paediatric adrenaline solution to avoid dilution errors. They confirm EPHP's decision to develop and distribute for French hospitals a diluted solution 0.1 mg/ml. The development of this medication is in the scope of the EPHP missions for public health and patient safety.
Disclosure of interest: None Declared.

Pharmacotherapy

PT031

Good use of ciprofloxacin in urinary tract infections

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Background and objective: Fluoroquinolones are antibiotics which may induce bacterial resistances. Following to a 40 % increase in the use of ciprofloxacin in our hospital between 2011 and 2012, a survey was conducted on the conditions of its use in urinary infections.

To evaluate the suitability of ciprofloxacin prescriptions to treat urinary infections in hospitalised patients.

Setting and method: Inclusion criteria: all hospitalised patients between September 13, 2013 and January 9, 2014, who were treated with ciprofloxacin. Data was collected on each patient. The prescription was considered relevant when the molecule's choice was correct and considered consistent when the posology was adequate.

Results: Urinary pathologies motivated 70 patients of ciprofloxacin prescriptions, concerning 30 patients with a sex ratio (M/F) of 1.1, and a median age of 83.5 years. The average duration of treatment was 5.3 days. Only two out of thirty prescriptions were relevant. Non relevant prescriptions were: empirical treatment n = 5 (17.9 %), Enterobacteriaceae resistant to nalidixic acid n = 4 (14.3 %) and preference of ciprofloxacin versus ofloxacin due to sensitivity to nalidixic acid n = 19 (67.8 %). Six patients (20.6 %) had a change in their treatment after the intervention of a pharmacist and an infectiologist. Only seven patients (24 %) were re-evaluated after 48–72 h.

Conclusions: There is a wide misuse of ciprofloxacin in urinary tract infections within our institution. Actions will be implemented to convey the good practices in the use of quinolones to the prescribers. These actions include a dedicated call number with a mobile team of infectiologists, a website with the last good practices and a targeted pharmaceutical control of anti-infections drugs.

Disclosure of interest: None Declared.

Pharmacotherapy

PT032

Efficacy and safety of a desensitization protocol to benznidazole

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Background and objective: Benznidazole is considered the first choice in Chagas disease. Due to migration flows has become a disease diagnosed in urban areas and a public health problem in non-endemic countries. In order to prevent the use of 2nd line drugs as nifurtimox, the desensitization treatment was considered as the best option. Our objectives are:

1. Describing of Desensitization protocol to benznidazole.
2. Checking the effectiveness and security of the protocol through two cases.

Setting and method: We studied two patients (both women) with a mean age of 36 years diagnosed with Chagas disease who reported to be allergic to benznidazole. The clinical manifestations observed were pruritus and erythematous punctate lesions that led to interrupt the treatment. From the Infectious Disease Service it was requested to the Allergy Service a benznidazole desensitization. Thus, the Pharmacy Service developed a protocol to induce tolerance to benznidazole.

The desensitization protocol was selected by the Allergy Service and consisted in increasing administrated doses of benznidazole until reaching a total cumulative dose like the therapeutic dose. The protocol of increasing doses of benznidazole established in the protocol was: 2, 4, 6, 8, 10, 12, 14, 16, 18, 20, 22, 25, 30, 40, 50, 60, 70, 80, 90, 100 mg, at intervals of 8 h each one, the cumulative daily dose was 6, 12, 18, 24, 30, 36, 42, 48, 54, 60, 66, 75, 90, 120, 150, 180, 210, 240, 270, 300 mg respectively.

Desensitization is considered to be effective if we manage to administer, tolerate and maintain therapeutic dose until the end of treatment without hypersensitivity reactions. Patient data and clinical outcome were obtained from medical records.

Results: The result of the technique was effective and safe for patients showing a positive progress decreasing initial hypersensitivity caused by the drug. Patients completed treatment with benznidazole without showing any reaction or complications related to hypersensitivity

Conclusions: The desensitization protocol and magistral formula prepared is considered a valid strategy for patients. It could be a useful tool in allergic patients with no other therapeutic alternative available.

The multidisciplinar collaboration of the professionals involved has allowed patients desensitization, permitting them to continue treatment with benznidazole.

Disclosure of interest: None Declared.

Pharmacotherapy

PT033

Drug induced rhabdomyolysis: spontaneous case reports

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Background and objective: Rhabdomyolysis (RM) is a syndrome characterized by muscle necrosis and the release of intracellular muscle constituents into the circulation. Creatine kinase levels are typically markedly elevated, and muscle pain and myoglobinuria may be present. The severity of illness ranges from asymptomatic elevations in serum muscle enzymes to life-threatening disease associated with extreme enzyme elevations, electrolyte imbalances, and acute kidney injury. A large number of prescription drugs and drugs of abuse can cause rhabdomyolysis. In addition to alcohol, other drugs of abuse that have been implicated as causes include heroin, cocaine, amphetamines, methadone, and D-lysergic acid diethylamide (LSD). In one large series, the prescription drugs most commonly responsible were antipsychotics, followed by statins, selective serotonin reuptake inhibitors, zidovudine, colchicine, lithium, antihistamines, and several others.

Setting and method: Retrospective analysis of the drug-induced rhabdomyolysis spontaneously reported in Slovakia. Data, from years 2007 to 2014, were collected from the SIDC database.

Main outcome measures: Summarized are type, frequency, and seriousness of adverse drug events, and suspected drugs and their possible interactions.

Results: During the followed period 12 inpatients with the drug induced rhabdomyolysis (aged 4–85 yrs, 6 males and 7 females) were reported. The main clinical manifestations were: RM (100 %), renal failure (42 %), hepatotoxicity (25 %), and heart failure (17 %). The severity of ADEs ranged from muscle pain or elevations in enzyme serum levels to life threatening reactions and one case of death. The patient was male, 69 yrs old, indication for drug use was cerebral infarction. The drug with suspected causal relationship to the ADR was atorvastatin 80 mg, 1 x daily, during one month. The adverse event manifested as rhabdomyolysis, acute renal failure, acute liver failure, and patient died due to acute heart failure.

The drugs quoted in our case reports were: cholesterol-lowering agents—HMG CoA reductase inhibitors (atorvastatin, simvastatin, and rosuvastatin), fibrate (fenofibrate), anaesthetic (propofol), and antibiotic (roxithromycin). Combination of fenofibrate and atorvastatin is also described.

Conclusions: There are multiple potential causes of rhabdomyolysis: e.g. traumatic, exertional, or related to toxins, infections, alcohol, and illicit and medical drugs. Thus any pharmacist may be asked for consultation by a patient who complains on muscle pain, pigmented urine and eventually takes medication with elevated risk of causing RM. Clinical pharmacists in the inpatient and outpatient setting may be directly involved in the monitoring of pharmacotherapy. With early recognition and careful pharmacovigilance most patients with rhabdomyolysis can have a good prognosis.

Disclosure of interest: None Declared.

Pharmacotherapy

PT034

Antimicrobial use evaluation in a first class hospital

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Background and objective: Appropriate use of antimicrobials is essential both to improve the prognosis of patients who need such, as well as the ecological impact that transcends its use. The objective of our study is to determine the adequacy of antimicrobial prescriptions made in a regional hospital.
Setting and method: A cross-section study was performed by reviewing the medical records, laboratory and/or diagnostic tests of all patients who were at that time under an active anti-infective treatment. A form for data collection was designed. It included among other variables: assignment of medical service to the patient, presence or suspicion of infection, type of infection, type of antimicrobial treatment (surgical prophylaxis/other prophylaxis/empirical/targeted therapy), prescribed treatment (drug/dose/route of administration/duration). The appropriateness of prescribing was established according to whether it was consistent with the guidance of empirical antimicrobial treatment recommendations developed by the multidisciplinary working PROA hospital group, based on the best and highest level of evidence available today.
Results: 95 patients were receiving antimicrobial therapy, with proven or suspected infection in 72.6 % of them. The most frequent recorded infections were the respiratory, urinary, diabetic foot and surgical wound infection. Depending on the purpose of treatment, the prescription profile was: 12.6 % surgical prophylaxis, 11.6 % other prophylaxis, 65.3 % empirical treatment and 10.5 % targeted therapy. The rate of inadequate antimicrobial treatment was 40 %, focusing on Urology (77.8 %), ENT (71.4 %), Surgery (50.0 %) and Internal Medicine (34.6 %) services. The inadequacy was mainly due to excessive length in the case of prophylactic prescriptions, and failures in the spectrum, either by default or by excess, in empirical and targeted therapies.
Conclusions: Antimicrobial prescriptions in our hospital are not complying fully with the current recommendations for this purpose, which can affect the clinical results obtained, the adverse effects associated with their use and/or treatment efficiency.
Disclosure of interestinterest: None Declared

Pharmacotherapy

PT035

Patient Safety through National Therapeutic Indicators

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Background and objective: The use of indicators to influence prescribing quality and safety has become well established over the last ten years. The National Therapeutic Indicators (Scotland) were first developed in 2011. This study focuses on the four indicators selected for their potential to optimise patient safety. The objective was to see if a contractual incentive (SQPI) to use the indicators resulted in a shift towards safer prescribing.
Setting and method: The Scottish National Prescribing Programme (2011 to 2014) was established to improve collaborative working between the fourteen NHS Boards. One key objective was to design, build, publish and support a set of twelve National Therapeutics Indicators. Four indicators were chosen for their potential to improve patient safety. Prescribing data was analysed. Achievement against the indicators was measured for every practice in Scotland and the distribution compared.
Main outcome measures: 1. The total use of antibiotics; safety aim was a reduction
2. The use of the 4C (cephalosporins, clindamycin, c0-amoxiclav and ciprofloxacin) antibiotics; safety aim was a reduction
3. The use of quinine; safety aim was a reduction
4. The use of inhaled corticosteroids (ICS); safety aim was a reduction
Results: The results compare the shift in prescribing behaviour for all eligible Scottish general practices.

1. Total antibiotics: 727 eligible practices; 54 SQPI practices; 42.6 % achieving target
2. 4C antibiotics: 722 eligible practices; 102 SQPI practices; 72.5 % achieving target
3. Qunine: 723 eligible practices; 189 SQPI practices; 88.9 % achieving target
4. High strength ICS: 725 eligible practices; 119 SQPI practices; 36.1 % achieving target

Conclusions: The use of NTIs in Scotland allows a novel way of benchmarking prescribing between general practices. The four safety NTIs encompass areas of prescribing where it may be particularly challenging to change prescribing behaviour and patient expectation. The ultimate aim is to increase safer use of medicines. The results suggest that when a resourced contractual agreement is made with general practices the shift in prescribing behaviour is greater. Follow-up work has been agreed to analyse the statistical significance of this change with the intention to seek publication as a scientific paper.
Disclosure of interest: None Declared.

Pharmacotherapy

PT036

Use and security analysis of abiraterone in metastatic prostate cancer

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Background and objective: Abiraterone is a testosterone production inhibitor and is a treatment option for hormone-resistant metastatic prostate cancer patients (HRPCm). The aim of this study is to explore the results and security of those patients in treatment with abiraterone.
Setting and method: Observational retrospective study carried out in a tertiary care hospital from May 2012 to December 2013. Patients who were treated with abiraterone during this period were selected. The data was obtained from the electronic software used in the hospital (Landtools®). Prescribing service, indication, duration, adverse drugs effects, discontinuation and prostate specific antigen (PSA) level were collected from the patients' digital history. Disease progression was considered with a PSA level increase of 25 % from the baseline as well as radiological or clinical progression.
Results: 14 patients were included. The median age was 71 years (63–84). The prescribing services were Oncology (64 %), Radiotherapy (28 %) and Urology (7 %). The treatment duration median was 154 days (21–502). The main reasons to use this drug were: 57 % of patients had previous progression to chemotherapy (14 % of them with ketoconazole) and 43 % of patients were ineligible for chemotherapy because of their comorbidities or age. Abiraterone was discontinued in a 78 % of patients for: 1) Disease progression (55 %), 2) Adverse drug effects (18 %) and 3) Exitus (27 %). Patients who had taken previous ketoconazole had a duration treatment median of 66 days (21–112). PSA level changed during the treatment with abiraterone as follows: 1) Increase (64.3 %), 2) Decrease (14.3 %) and 3) No change (21.4 %).
Conclusions: Abiraterone is an therapeutic option for patients with post-chemotherapy HRPCm or in those which chemotherapy wasn't an option. An efficacy reduction was observed in patients who had taken previous ketoconazole. 18 % of patients discontinued abiraterone for drug toxicity.
Disclosure of interest: None Declared.

Pharmacotherapy

PT038

Effectiveness of telaprevir/boceprevir-based triple therapy for chronic hepatitis c

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Background and objective: Telaprevir and boceprevir are new direct action antivirals against genotype 1 hepatitis C virus(HCV) which act as NS3/4A serine protease inhibitors.

Purpose: to analyse the effectiveness of triple therapy(TT) based on telaprevir or boceprevir combined with peginterferon alfa2a plus ribavirin for the treatment of chronic genotype 1 HCV monoinfected patients following the recommendations of the AEMPS(Spanish Medicines Agency).
Setting and method: Retrospective observational study. Sample: 100 % patients who started TT. Period: January 2012-December 2012. Data sources: Pharmacotherapy records(Silicon® computer programme) and electronic medical records(IANUS® application). Statistical analysis: intention to treat. A

comparison of proportions using Chi squared test was made. The population was stratified in cirrhotic(F4) or non-cirrhotic(F3) patients and in naïve + relapsers or non-responders + partial responders by response probability.
Main outcome measures: Main effectiveness variable: plasmatic HCV RNA level (PL). Analysis during treatment at weeks: 4, 12, 24, 48 and week 12 after the end of the therapy (evaluation of sustained viral response (SVR) if undetectable plasmatic HCV RNA level at week 12 after the end of therapy or relapse in case of detectable plasmatic HCV RNA level).
Results: 41 patients (48.8 % boceprevir and 51.2 % telaprevir). Average age: 52.8(24–77) years-old, 28 men(68.3 %). Response to previous therapies: 14.6 % naïve patients, 43.9 % relapsers, 12.2 % partial responders, 24.4 % non-responders, 4.9 % unknown response. Liver fibrosis: 31.7 % F3, 68.3 % F4. 63.4 % patients completed therapy. 36.6 % stopped therapy. Stopping reasons: 22 % stopping rule(no response), 12.2 % adverse effects and 2.4 % hepatocellular carcinoma and liver transplantation. Undetectable plasmatic HCV RNA level at the end of therapy: 65.9 %. Sustained viral response: 56.1 %. Relapse (detectable plasmatic HCV RNA level at week 12 after the end of therapy) 9.7 %. 1 patient stopped therapy at week 28 instead of at week 48 due to adverse effect and reached SVR. SVR by subgroups: F3 = 70 % vs F4 = 50 %($p = 0.25$); naïve + relapsers = 68 % vs non-responders + partial responders = 41 % ($p = 0.11$).
Conclusions: We have detected a clinical difference in SVR between F3 and F4 and between naïve + relapsers and non-responders + partial responders. These differences are not statistically significant due to the little size of the sample. Due to high costs and high incidence of adverse effects of these therapies, patients require close pharmacotherapy monitoring.
Disclosure of interest: None Declared.

Pharmacotherapy

PT039

Evaluation of aminoglycosides use in a university hospital in France

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Background and objective: The latest recommendations on the good use of aminoglycosides (AG) issued by the French health Authorities are from 2011. The aim of this study was to evaluate the use of AG and the application of these recommendations in our hospital.
Setting and method: During 2 weeks in February 2014, 2 pharmacists recorded patient's characteristics for consecutive patients treated by AG.
Main outcome measures: Qualitative and quantitative data were collected and evaluated in regard of national recommendations.
Results: 41 patients (pts) were included including 26 (63 %) pts with amikacin, 12 (29 %) with gentamicin and 3 (8 %) with tobramycin. The median age was 60 years old, 34 pts (83 %) had prior hospitalization, 11 (26 %) were in intensive care units (ICU) and 28 in medicine/surgery departments (dpts). A total of 25 pts (60 %) received antibiotics (ABX) before admission and 11 pts (24 %) had impaired renal function. AG were mainly used for pulmonary (54 %), septic shock (22 %), osteo-articular (15 %), urinary (12 %) and endocarditis (5 %) infections. Treatment initiation was empirical for 26 pts (63 %). For all cases, AG were associated with either betalactams or glycopeptide ABXs and were administrated with a single daily injection. The median daily dose was 4 mg/kg [1–5] and 3 mg/kg [2–3] for respectively gentamicin and tobramycin. This one for amikacin was 28 mg/kg [18–31] in ICU and 16 mg/kg [8–22] in medicine/surgery dpts. The AG treatment was >3 days for 10 pts (25 %), in relation to the site of infection or the severity of illness or in case of *pseudomonas sp* infections. Therapeutic drug monitoring (TDM) was realized for 27 pts (66 %). TDM indications were not in accordance with recommendations for 18 (44 %) pts [through dosages not indicated (n = 9), peak not realized (n = 3), too many through dosages realized (n = 3) or peak dosages (n = 3)]. Two pts with anuria (5 %) were observed during the treatment.
Conclusions: All prescriptions were in accordance with the recommendations (indication and the duration of treatment). Local antibiotic committee decided to reduce the variability of daily doses between different dpts and made recommendations to optimize TDM and adaptation of posology.
Disclosure of interest: None Declared.

Pharmacotherapy

PT040

Evaluation of antibiotic utilization for staphylococcus aureus at a provincial hospital

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Background and objective: There is consensus that the implementation of safe medication practices to reduce adverse sequelae of antimicrobial use, including antimicrobial resistance, are of first importance. *The aim of this study was to determine the Staphylococcus aureus (SA) antimicrobial susceptibility at our hospital, the extent of antimicrobial usage, and its associated implications.*
Setting and method: *1 year retrospective and observational study conducted at a Spanish 110-bed General Hospital; Identification of patients infected by SA strains among Microbiology Laboratorýs records; Analysis of antibiotićs use according to microorganisḿs susceptibility and to a clinical guideline for treatment of Methicilin-Resistant SA (MRSA); Evaluation of* response to treatment and costs.
Main outcome measures: Prevalence of MRSA isolates; rate of appropriate antibiotic use; rate of recovery; average length of stay at hospital; direct costs.
Results: *30 strains of SA were isolated.* Resistance rate to methicilin was 40 % (12/30). Vancomycin Minimum Inhibitory Concentration (MIC) for 5 MRSA strains was ≥2 μg/ml (E_{test}).
Targeted antibiotics were used in 14/18 patients infected by *Methicillin-Susceptible SA (*MSSA). *It was not possible to evaluate clinical response in 3 patients. Recovery was observed in 80 % of patients.*

Antibiotic usage according to guidelinés criterion was completely adequate in 6 patients infected by MRSA. One of them received linezolid for MRSA with MIC ≥2 μg/ml (antibiotic with a restrictive usage at hospital). On the other hand, in 4 patients vancomycin was used to treat strains with a MIC ≥2 μg/ml and therapeutic monitoring of serum drug concentrations was not carried out in 4/8 treated with this antibiotic. Despite the misuse of antibiotics, treatment was effective in 75 % patients.
Average length of stay at hospital was higher in patients with MRSA (16.7 (8–32) vs 12.1 (1–46) days). Direct costs associated to antibiotic treatment for MRSA and MSSA were 13.85 € and 4.06 € per day, respectively.
Conclusions: *The prevalence of MRSA isolates at our hospital is similar to the reported level in Spain (>30 %).*

The low adherence to the guideline for treatment of MRSA highlights the need to continuous education and training of healthcare professionals.
Disclosure of interest: None Declared.

Pharmacotherapy

PT041

Efficacy and safety of tolvaptan in the treatment of hyponatremia caused by the Syndrome of Inappropriate Antidiuretic Hormone Secretion (SIADH)

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Background and objective: Tolvaptan is an orally active vasopressin V_2 receptor antagonist that induces the excretion of electrolyte-free water without changing the total level of electrolyte excretion. It is indicated to treat clinically significant hypervolemic and euvolemic hyponatremia. Our objective is to

evaluate the efficacy and safety of tolvaptan in the treatment of hyponatremia caused by SIADH.
Setting and method: Retrospective observational study of patients treated with tolvaptan from November 2012 to June 2014. The data were obtained from the program of dispensing to outpatient and by the review of medical records and clinical analysis. The efficacy of tolvaptan was assessed based on the normalization of serum sodium concentration (135- 145 mmol/l) after drug administration, while safety was evaluated according to serum sodium correction speed, which should not exceed 12 mmol/l/24 h or 18 mmol/l/48 h to prevent osmotic desmyelination.
Results: 6 patients were included, aged between 48 and 65 years, diagnosed with hyponatremia secondary to SIADH (4 associated to small cell lung carcinoma, 1 to chronic treatment with carbamazepine and 1 idiopathic origin). All patients were pre-treated with water restriction and hypertonic saline solutions without achieving normalize serum sodium, so they began treatment in the hospital with tolvaptan (3 patients with 7,5 mg, 2 with 15 mg and 1 with 30 mg orally once daily) monitoring serum sodium levels and performing daily dosage adjustments. Of the 6 patients, 3 required a maximum dose of 60 mg every 24 h. Average sodium levels at baseline was 122,17 ± 6,04 mmol/l. Tolvaptan allowed to reach levels of serum sodium over than 135 mmol/l in 4 patients, after a median of 4,5 days (interquartile range = 3- 12). In none of the cases the increase in natremia was fast enough as to stop the treatment.
Conclusions: Tolvaptan may be useful in the management of hyponatremia secondary to SIADH in patients whom water restriction and hypertonic saline solutions are not effective. However, it requires close monitoring and continuous dose adjustment in order to avoid problems of rapidly rising serum levels of sodium.
Disclosure of interest: None Declared.

Pharmacotherapy

PT042

0.02 % tacrolimus Ophthalmic ointment for treating ophthalmic diseases: method development and clinical results

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Background and objective: To describe the method development from the 0.02 % tacrolimus ointment used in patients with different ophthalmic autoimmune diseases, inflammatory ophthalmic diseases and corneal transplants with acute rejection episodes refractory or intolerant to corticosteroids. Evaluation of the clinical results.
Setting and method: Describe the elaboration of tacrolimus ophthalmic ointment

Conducting a 4-month retrospective study in which the clinical outcomes of patients evaluated with 0.02 % tacrolimus eye ointment.
Results: The ointment is composed of tacrolimus, petrolatum and liquid paraffin sterile. To ensure aseptic preparation all materials were sterilized (mortar and spatula in ethylene oxide, ointment tubes in autoclave). The liquid paraffin undergoes a double sterilization process, first by heat and when adding it to the mixture sterilizing filtration (0.22 micron filter) is used. The development is done in a vertical laminar flow hood.

30 patients treated with 0.02 % tacrolimus ointment were included in a retrospective study. Clinical topical inflammation score decreased by 60 %, conjunctivitis decreased by 75 %; eosinophils conjunctival decreased by 80 %, a lymphocytes decreased by 50 %; there were no significant changes in visual acuity and refraction and there were serious adverse effects or signs of immunosuppression.
Conclusions: The 0.02 % tacrolimus ointment is effective in treating atopic keratoconjunctivitis, allergic conjunctivitis, associated with rosacea keratoconjunctivitis, corneal transplant patients, both staphylococcal as seborrheic blepharitis, meibomian dysfunction and atopic conjunctivitis.

The use of tacrolimus helps reduce/eliminate the use of topical corticosteroids although it is associated with an increased risk of infection by varicella or herpes simplex.
Disclosure of interest: None Declared.

Pharmacotherapy

PT043

Hydroxypropyl-beta cyclodextrin in Niemann-Pick type C disease

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Background and objective: Niemann-Pick type C causes an abnormal accumulation of cholesterol in the lysosomes of various tissues, causing hepatosplenomegaly, severe neurological symptoms and short life expectancy. We report the case of a 11 years old boy diagnosed with this disease since age 3, with significant psychomotor retardation and progressive neurological deterioration.
Setting and method: Based on the promising results of a clinical trial in U.S.A. in two twins treated with intrathecal HPBCD since 2010, the medical team of the Paediatric Service decided to apply this treatment as compassionate use in this child. In May 2010 the FDA granted the HPBCD the orphan drug designation, and in August 2011 received the same status by the EMA. In October, the Pharmacy Service started the process to purchase the product for the first time in Spain and requested its inclusion in the list of Drugs in Special Situations of the Spanish Agency for Medicines and Health Products. After obtaining the approval of the treatment by the Commission of Rational Use of Medicines Hospital, the development of intrathecal solution was designed. This is prepared in the Pharmacy Service, referencing to the protocol of the clinical trial development in the twins.
Results: In May 2012 the first administration was performed by placing an intrathecal catheter reservoir. The product is administered every 15 days. The first two doses were 175 mg and 350 mg, respectively, and successive 525 mg. The drug was well tolerated, with no renal toxicity, liver or other. Have been observed subjectively positive results related to some improvement in the patient's muscle tone and significant decrease in the frequency of seizures. Most notable was an improvement of 10 dB in the threshold of response to Auditory Evoked Potentials in the left ear with respect to the initiation of treatment.
Conclusions: The Pharmacy Service of this hospital has been a pioneer in the acquisition and use of HPBCD in Spain. In fact, it is still a landmark for new cases of NP-C disease arising in Spain and other countries. Current data suggest that HPBCD has potential therapeutic value in the treatment of patients with NP-C.
Disclosure of interest: None Declared.

Pharmacotherapy

PT044

Clicinal and economic impact of transfer from efavirez/emtricitabine/tenofovir to rilpivirine/emtricitabine/tenofovir in a third level hospital

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Background and objective: In May 2013 was introduced in the hospital the combination of Rilpivirine/Emtricitabine/Tenofovir(Eviplera®) in a single tablet. Since then, certain patients have been transferred from Efavirenz/Emtricitabine/Tenofovir (Atripla®) to this new treatment in order to avoid neuropsychiatric effects (caused mainly by efavirenz) and save money for the National Health Service at the same time.

One year later, our objective is evaluating the clinical and economic impact caused by this action.
Setting and method: From the Outpatients Program it has been extracted the number of patients on Eviplera® from May 2013 to May 2014 who were taking Atripla® previously.

By interviewing the patients when they came to the Hospital Pharmacy to collect their antiretroviral treatment we obtained information regarding the neurological (insomnia, dizziness, impaired concentration, headache, blurred vision, drowsiness) and psychiatric events (confusion, severe depression, suicidal thoughts, aggression, extreme fear, hallucinations, unusual behaviour, anxiety,

decreased libido) after they changed from Atripla® to Eviplera®.If further information was required, it was obtained from the electronic clinical history.

Checking the prices on the Economic Gestion Program for both drugs we calculate the amount for this period of time for each one. By comparing them we get the quantity which has been saved.

Results: During the studied period 53 patients were transferred from Atripla® to Eviplera® because of the neuropsychiatric events. 33 of them(62,26 %) have decreased neurological effects and 18 (33,96 %) have decreased psychiatric effects.

Dispensing Eviplera® to this 53 patients has cost 96.727,92 € to the National Health Service (550€ per month and patient).In case they would have been treated with Atripla® it would have cost 123.298,20 € instead(701.08 € per month and patient) It shows 26.570 € have been saved in one year just by introducing Eviplera® in the Hospital.

Conclusions: The availability of Eviplera® to be prescribed for certain patients instead of Atripla® is an effective alternative to avoid significantly neuropsychiatric effects in patients as well as a way to save up and adjust the expenses to a tight budget.

It is necessary selecting properly the patients to be transferred (less than 100,000 copies per ml) as it may be risky for their security in case of not doing so.

Disclosure of interest: None Declared.

Pharmacotherapy

PT045

Clinical analysis of fibromyalgic patients taking care of, what about specialized centre for pain ?

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Background and objective: Fibromyalgia is a complex pain syndrome for which there is no authorized therapy in France. The estimated prevalence range from 1.4 % to 2.2 % in the country. Considering the difficulties related to the diagnosis, the management and lack of real consensus, a multidisciplinary team of a University Hospital has wished to analyse how patients are taken care of.

Setting and method: The survey was carried out on 30 randomly selected adult patients of a Centre for Pain Research. Patients' characteristics as well as drug treatments and non-drug treatments were studied in two stages with a one year interval.

Results: Included patients were essentially 50 years old women (sex ratio 1 : 6.5). Among the sample, 28 patients had pharmacological treatment at the very beginning (about 3.75 drugs per patient) when 30 patients received treatment one year later (about 4.4 drugs per patient : significant difference). Prescriptions were in accordance with the guidelines (analgesic, antidepressant and anxiolytic drugs) with the exception of transdermal lidocaine prescribed to a majority of patients ($p < 0.01$). Non-drug therapies, rarely used outside hospital (for 10 patients) were prescribed to 29 patients while they were taken care of, with a higher variety of them ($p < 0.01$).

Conclusions: Transdermal lidocaine prescription seems specific of the Centre. It doesn't reduce other treatment prescriptions but this is in favour of neuropathic chronic pain relief. There is currently no standard treatment for patients suffering from fibromyalgia. Models of care are available, usually patient-centered, that aim at improving patient's quality of life.

Disclosure of interestinterest: None Declared

Pharmacotherapy

PT047

Harmonizing the management of severe febrile neutropenia in adult patients and set up of a new prescription form

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Background and objective: Anti-infectious management of febrile neutropenia is described in IDSA-ECIL international guidelines. These frequently-updated recommendations specify that every health institution should define and re-evaluate a local treatment strategy based on various parameters (patient-related factors, local microbiological ecology, etc.).

The vital prognosis of patients at high risk of severe infection will depend on the admission in a specialized unit or not and on the administration, in emergency, of an appropriate intravenous treatment.

Setting and method: Physicians and pharmacists reviewed and harmonized the antibacterial and antifungal protocols used in the hospital.

Results: An institutional protocol named "antibiological treatment of febrile neutropenia in adults" and the corresponding prescription forms were created and submitted to the hospital's "anti-infectious drugs committee". This protocol recalls the definition of a "febrile neutropenia", the good and bad prognosis factors (high risk/low risk stratification) and the treatment strategies (first and second line treatments, periodic re-evaluation).

Conclusions: The hospital has adopted treatment protocols for severe infection. In febrile neutropenia, laboratory tests and medical imaging are hardly useful. The use of protocols prevents the inappropriate use of anti-infectious drugs, the emerging of drug-resistant bacterial strains and improves the patient's prognosis.

Some physicians, emergency physicians for example, also have to deal with this kind of patients.

In this context, this workgroup would like to plan a specific formation on this subject.

Disclosure of interest: None Declared.

Public Health

PH006

Exploring aspects of medication wastage in Malta: survey of healthcare professionals and the general public

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Background and objective: Medication wastage is a global issue, with key public health implications in terms of safety, the environment and the economy. A recently conducted systematic review of the published literature identified a lack of focus on the views of healthcare professionals (HCPs) and the general public. To explore issues of awareness, attitudes and behaviours relating to medication wastage amongst the general public and targeted HCPs in Malta. This was the first step in the development and implementation of wastage reduction strategies.

Setting and method: Survey methods were employed. Pre-piloted questionnaires were developed from several theoretical frameworks. Questionnaire items were contextualised for HCPs and the public respectively. The public questionnaire also included the 8-item validated Morisky Medication Adherence Scale to determine any association between levels of adherence and wastage related outcomes. Questionnaire items comprised open, closed and 5-point Likert scales. For the public questionnaire, a random sample of 1920 was obtained from the Maltese electoral register 2013; the HCP questionnaire was distributed to all 164 dentists and 816 pharmacists and 700 randomly selected doctors. Ethical approvals were obtained from Robert Gordon University and Maltese University Research Ethics Committee.

Main outcome measures: Awareness and interest around medication wastage; association of levels of adherence and awareness/interest; factors potentially contributing to wastage.

Results: Response rates were 20.4 % (391/1920) for the public and 26.4 % (444/1680) for HCPs. The majority of the public (70.6 %) strongly agreed/agreed that they were fully aware of the issue of wastage compared to less than half (42.1 %) HCPs. However, three quarters (71.9 %) of the public disagreed/strongly disagreed that they had no interest in wastage compared to 94.1 % HCPs. The following were significantly related to awareness in medication wastage for the (1) public: age ($p = 0.003$), type of occupation ($p = 0.011$), on regular medications ($p = 0.021$) and obtaining free medications ($p = 0.026$) and (2) HCPs: age ($p < 0.001$) and innovation theory ($p < 0.001$). Public interest was significantly related to obtaining free medications ($p = 0.022$) or purchasing medications ($p = 0.028$). While three quarters (75.1 %) of those prescribed regular medication self-reported not being fully adherent, there were no associations between non-adherence and awareness ($p = 0.100$) and interest

in wastage ($p = 0.385$). Analysis of responses from public and HCPs on factors leading to wastage identified themes which included: 'free healthcare system'; 'collecting medications that are not required'; 'incorrect prescribing'; and 'lack of education/information'.
Conclusions: This study has demonstrated that more effort is warranted to raise awareness of the public and HCPs as an initial step in promoting behavioural change.
Disclosure of interest: None Declared.

Public Health

PH007

A public health survey of expired and waste medicines returns in the long-term care facilities

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Background and objective: Waste medicines refer to unused or expired prescriptions. Most people do not realize that the waste medicines need to be returned. Residents of long-term care facilities often have co-morbidities which are treated with multiple medications. In particular, elderly people in the long-term care facility often show poor compliance (adherence) to pharmacologic treatments thus result in excessive leftover or expired medications. The aim of the study are to educate the residents of the long-term care facilities on the proper disposal of unused medications and to investigate the sources and causes of waste medicine, the attitude for the waste medicine, and the types of original prescriptions.
Setting and method: Targeting the residents of long-term care facilities in Taipei, education on the concept of proper unused medication disposal was offered to the resident. Furthermore, assistance was also provided to sort medication waste for proper destruction. Questionnaires were given at the same time to collect data for investigation and analysis.
Results: The result of the questionnaires showed that most (69.8 %) of surveyed people understood improper disposal of unused medications may result in pollution to the environment. In the residents of the long-term care facilities, the most commonly way for drug disposal includes return to the hospital (41.1 %) and direct disposal to garbage (37.0 %). The main source of medication wastage is prescription medication (89.4 %). The most common reason for medication disposal is the disposal of excess leftover medication (59.0 %). The most common reasons for residents generating unused medications are symptom relief which negates the need for medication (37.3 %) and change of prescription by the doctor (34.0 %). The medication waste mainly belongs to solid dosage forms (89.9 %). The most common type of medication waste is analgesic/antipyretic medication (43.0 %) and common cold remedies (36.3 %), and gastro-intestinal medication (29.9 %).
Conclusions: The compliance and adherence of people remains to be further improved. The useful solutions to medication wastage may be to focus on providing patient education and pharmacist counselling on the proper drug usage.
Disclosure of interest: None Declared.

Public Health

PH008

Medication reconciliation and review at sector transition from a psychiatric centre to residential care

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Background and objective: Almost half a million Danes (490.000) suffer from a psychiatric disorder. Several of these are poly-pharmacy patients. A study has shown that 13 % of hospital-discharged psychiatric patients are re-admitted to hospital within 90 days. Therefore, an identification of drug-related problems (DRPs) at a sector transition for psychiatric patients is needed.

The aim of the study was to identify DRPs among psychiatric patients at a sector transition from a psychiatric centre to a residential care setting.

Setting and method: Medication lists, journals and para-clinical data from the psychiatric centre and from the Mental Health services were collected. In addition, medication lists and notes from two residential care settings were collected. Medication reconciliations and medication reviews were identified in accordance with material from The Danish Pharmaceutical Association. Half of the patients (four) were interviewed. The DRPs were classified by Hepler and Strand's classification system. Intervention proposals to the treating doctor were conducted.
Results: Eight patients with a psychiatric disorder were included in the study. Patients received an average of 16.1 medications. Hundred-and-sixty-three (163) DRPs were identified, corresponding to an average of 20.4 DRPs per patient. Through medication reconciliation 8.8 DRPs per person were identified and 11.6 DRPs per person were identified through medication reviews. Eighty-three (83) intervention proposals were identified. A third of the suggestions (30 %) were accepted by the treating doctor, 59 % were rejected and 11 % were delivered to another doctor. Most DRPs were located in the groups "untreated indication", "inappropriate use by the patient", "side effects" and "other drug-related problems", mainly in the ATC code N. Patients from one of the residential care settings had several more DRPs than patients from the other residential care setting.
Conclusions: The study showed a higher number of DRPs by medication reviews than medication reconciliation. A significantly higher number of DRPs were identified in sector transition compared to DRPs identified in a primary care setting.
Disclosure of interest: None Declared.

Public Health

PH009

Technology to promote patient safety: digital literacy training experiences and needs of healthcare students and their teaching staff at RGU, Scotland

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Is this work original?: No
Abstract submitted before to: Royal Pharmaceutical Society conference 2014
Background and objective: In Scotland, the 2020 Workforce Vision emphasises, 'more and better use of technology and facilities to increase access to services and improve efficiency,' including patient safety promising to ensure everyone, 'is supported to make the best use of new technology.' The abilities of healthcare staff in using technology, digital literacy, defined as, 'being able to make use of technologies to participate in and contribute to modern social, cultural, political and economic life.' The aim of this research was to explore the digital literacy training experiences and needs of healthcare students and their teaching staff. Ethical approval was gained from RGU Faculty review panels.
Setting and method: Invitations to participate in focus groups were circulated to healthcare students (nursing, midwifery, nutrition/dietetics, pharmacy, physiotherapy) and their teaching staff at RGU. Consent forms gathered demographic data and self-reported digital literacy. Focus groups were activity-based: defining digital literacy (post-its), sharing experiences of using and learning to use technology (rich picture), SWOT (strengths, weaknesses, opportunities, threats) analysis of digital literacy in healthcare curricula and related staff training. Qualitative data were analysed thematically using five-step approach (familiarisation, coding, indexing, reviewing, summarising).
Results: Four focus groups were conducted: 2 with students ($n = 6$; $n = 7$); 2 with staff ($n = 6$; $n = 5$). The majority of students ($n = 10$) and all staff were female with pharmacy well-represented ($n = 12$; $n = 4$). Staff self-reported their digital literacy more highly than did students. The wealth of data captured showed the variation in technologies accessed at different stages in life and the range of formal (training course, teacher-led) and informal (self-, peer-, parent-taught) teaching and learning experienced. Key themes noted were assumptions associating age with digital literacy, variation in awareness of IT help and resources available. The quality of IT-related course provision was a recognised strength with promotion, timing/breadth of training provision perceived as weaknesses. Threats acknowledged by both staff and students related to potential impact on coursework marks, workplace preparedness and career progression, effectiveness of delivery of teaching. Opportunities identified were provision of flexible, targeted, on-demand, multi-media resources preparing both staff and students to be more confident and effective in using IT resources for teaching and learning.

Conclusions: Although limited to 4 focus groups, this study shows healthcare students and their teaching staff have varying levels of digital literacy acquired through formal and informal teaching and learning. Findings indicate digital literacy should be formally recognised in healthcare curricula with training provided for teaching staff to prepare the future healthcare workforce to make more and better use of technology to promote patient safety.
Disclosure of interest: None Declared.

Research development

RD004

Overview of systematic reviews assessing the impact of clinical pharmacy services

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Background and objective: Pharmacists' interventions have showed positive impact on patient health outcomes in several medical conditions. However, the evidence is controversial for other areas. This study aimed to gather the evidence published about the impact of clinical pharmacy services (CPS) on the medication use process and in patient outcomes.
Setting and method: PubMed was searched for systematic reviews (SRs) assessing the impact of CPS on medication use process or patient outcomes published between 2000 and 2010. Exclusion criteria applied included: 1) SRs in which the pharmacist intervention could not be isolated; 2) overviews of SRs or studies reviewing guidelines; 3) SRs analysing non-clinical activities; 4) studies published in a language other than English, Spanish, Portuguese, French or German; and 5) SRs not including at least one randomized controlled trial (RCT). The methodological quality of each review was assessed with the R-AMSTAR tool.
Main outcome measures: Impact of CPS on the medication use process or clinical, economic and humanistic patient outcomes.
Results: Of the 343 potentially relevant records identified, 49 SRs were included, comprising a total of 269 RCTs published between 1973 and 2009. CPS focusing on specific medical conditions like hypertension or diabetes mellitus revealed positive impact on outcomes (reduction range 8 to 11 mmHg systolic blood pressure and 0.9 to 2.1 % glycated haemoglobin). For other medical conditions, however, the results were not conclusive (e.g. dyslipidemia or thromboprophylaxis). Interventions targeting medication adherence also produced inconclusive results, with some studies reporting a significant improvement in the adherence rate, while others reported no effect of the intervention, being the variability of the methods used to assess adherence a potential cause of heterogeneity in the results found across studies. Similarly, the impact of CPS in prescription appropriateness was questionable since different studies used different tools to assess medication appropriateness.
Conclusions: Clinical pharmacy services are likely to be more successful when targeting specific conditions for which there are unequivocal and tangible outcomes to measure. Other clinical interventions, such as adherence enhancement or improvement of prescription appropriateness will require standardisation of procedures and indicators to demonstrate their impact.
Disclosure of interest: None Declared.

Research development

RD005

Baseline audit of handwritten hospital immediate discharge letters

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Background and objective: Hospital electronic prescribing and medicine administration (HEPMA) has been implemented into several United Kingdom hospitals with limited published formal evaluation. There is particular need for research about information communication on patients' hospital discharge. The aims of this baseline audit were to ascertain immediate discharge letter (IDL) information content, accuracy and prescribing error percentage with an assessment of time to discharge letter receipt at GP practices using traditional paper based systems prior to HEPMA implementation.
Setting and method: Retrospective hospital case note baseline audit of 159 random patients' clinical notes, inpatient prescription charts and IDLs. Participants were adult inpatients discharged from a district general hospital during April to June 2013 after a minimum 24 h hospital stay excluding mental health, maternity and paediatric patients. A modified version of the Scottish Intercollegiate Guidelines Network discharge document template was the data collection tool. Data were extracted by the principal investigator and a random 10 % sample validated by an independent assessor. GP practices were contacted to obtain receipt and receipt time. Data were managed using SPSS© 21 software and analysed using descriptive statistics.
Main outcome measures: Prescribing errors were classified as medication omissions, medication commissions, incorrect dose, incorrect frequency, incorrect duration, drug interactions, therapeutic duplication or missing or inaccurate allergy documentation.
Results: Errors were detected in 99.4 % of patients when documentation and allergy information accuracy was considered. Prescribing errors occurred in 84 % of IDLs. Prescribing errors included: omitted medicines 42 %; medicine commission 6 %; incorrect dose 9 %: incorrect frequency 19 %; incorrect duration 27 %; drug interactions 4 % and therapeutic duplications 3 %. Interim results for GP receipt information ($N = 50$) showed 89 % of IDLs were received by GP surgeries with a time delay ranging from 0 to 26 days with a median receipt time of 3 days post hospital discharge
Conclusions: Prescribing errors and delays with traditional processes were identified. The majority of IDLs contained prescribing errors mainly due to information omission. Median delay to receipt of communication by GP was 3 days with a small proportion not received. This highlights potential patient safety issues with essential information gaps for GPs after patients' hospital discharge. A similar study will be conducted six months post HEPMA implementation.
Disclosure of interest: None Declared.

Research development

RD006

Computerized physician order entry system in paediatric and neonatal intensive care setting: Development of an e-learning formation module

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Background and objective: Medical errors (MEs) and potential adverse drugs events (pADEs) are common in paediatric and neonatal intensive care unit (PNICU) [1]. Several technical or organizational strategies have been proposed to decrease the rate of MEs and pADEs including Computerized Physician Order Entry (CPOE) or Clinical Pharmacist (CP). However, some MEs are specifics of a CPOE and appear after implementation. Furthermore, the implementation of a CPOE has an impact on the organization of health care units and requires formations for physicians and nurses. Our objective is to develop an e-learning program for physicians and nurses in order to prevent the apparition of medicals errors related to CPOE.
Setting and method: The choice of the support for the e-learning program is based on the simplicity of the utilization, the accessibility online and offline and the practicability aspect of the support. We decided to focus on medical prescription, which are the leading cause of medical errors in PNICU, for this e-learning program [1].
Results: The online support Prezi® was used based on its accessibility and its simplicity. We perform video capture of all kind of prescriptions with

explanations on how to do a good prescription. Explanations are comments, inserted at each step of videos captures of medical prescriptions, using specific software. We also focus on specificities and details of the CPOE. The link of this e-learning program was send to all physicians and residents of the PNICU. Presentations of this online support have already been done in the PNICU.
Conclusions: The Prezi® Support allowed us to build an e-learning program easily and fast. In order to evaluate this e-learning program and to assess its efficiency on medical errors, we will perform a comparative and prospective study, with medicals errors as a main outcome.

[1] Potts and al. Computerized Physician Order Entry and Medication Errors in a Paediatric Critical Care Unit. Paediatrics 2004;113;59

Disclosure of interest: None Declared.

Research development

RD007

Does oral delivery influence the use of the pharmacist note?

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Background and objective: The objective of this retrospective study is to investigate if oral delivery by the pharmacist to the physician enhances the physician's use of the pharmacist note (PN).

Today, clinical pharmacists generate PN primarily for patients ≥50 years using ≥5 drugs at the Emergency Department, North Zealand Hospital. The PN consists of a validated medication history and a medical review.
This clinical pharmacist service and PN are continuously evaluated to improve medication therapy evaluations and recommendations written in the PN to be used by primarily physicians. Since August 2013, data of the physician's use of orally delivered PN has been collected and there has been a focus on oral delivery of the PN to the physician.
Setting and method: Every fourth week an audit is performed by one pharmacist according to an audit plan. The pharmacist monitor if the PN has been used by the physician in the physician's admission notes. Since 19th of August 2013 it is has been registered whether the PN undergoing audit has been delivered orally to the physician in addition to or only by the electronic journal system. A Chi squared 2-sample test for equality of proportions without continuity correction is used
Main outcome measures: Has the PN been used by the physician in the physician's admission notes? Yes/no

Has the PN been delivered orally to the physician? Yes/no
Results: 322 PN have been audited. Of these, 34 patients were discharged immediately from the Emergency Department and excluded from this study. Overall 207(72 %) of the 288 PN have been used by the physicians in the physician's admission notes. 192 PN were orally delivered by the pharmacist. 152 (79 %) of these have been used. 96 PN were delivered only by the electronic journal system. Only 55 (57 %) of these were used. Oral delivery of the PN enhances the physicians use of the PN ($p < 0.0001$)
Conclusions: This retrospective study shows that oral delivery significantly enhances the physicians' use of the PN.
Disclosure of interest: None Declared.

Research development

RD008

Chemical stability study of Isoproterenol Hydrochloride (Isuprel®) in parenteral preparations

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Background and objective: Isoproterenol Hydrochloride (Isuprel®) is a sympathomimetic catecholamine administered in continuous perfusion of 0,004 mg/ml. Several relevant stability studies have investigated its shelf life as well as influence of solvent type and content. However, there are no studies assessing duration of use over than 6 h once it has been diluted in a 5 % glucose solution. The objective of this work is to determine chemical stability of Isuprel® 0,004 mg/mL solution under the storage conditions used in clinical practice regarding light and temperature. Extending the duration of use for this preparation will allow medical teams to gain precious time for other medication cares and aims to improve the safety of patient care.
Setting and method: A high-performance liquid chromatography method coupled to a UV detector was used. At first, analytical method was validated according to International Conference on Harmonisation (ICH) standards. Four storage conditions of Isuprel® preparation were studied using a temperature of +25 °C or +45 °C and for both groups a half was exposed to a UV light (λ from 320 to 400 nm) whereas the other half was protected from light exposure with aluminium foil. Experiments were made on samples obtained at time 0, 5, 24, 48, 72, 96 and 120 h after dilution and analysis on each of them was tripled. pH value was also monitored over five days. This study was performed three times, each time with a different batch of Isuprel® and with 5 % glucose bags of 50 mL from the same batch.
Main outcome measures: Based on actual guidelines, 0,004 mg/mL is the target concentration of Isoproterenol Hydrochloride in a valid Isuprel® preparation. Sample's concentrations were determined with the mean areas under the concentration–time curve values and losses relative to the mean concentration measured at time zero were calculated. The ICH Q1A guidelines and European consensus specify a maximum acceptable percentage of degradation of 5 %. pH also needs to remain conform to guidelines.
Results: In each group, the results up to 24 h are consistent with the guidelines of ICH Q1A whatever the condition used as described above. Maximum degradation of Isoproterenol Hydrochloride was 2,79 % after 24 h, 5,28 % after 48 h and losses reached 6,71 % after 120 h. Furthermore, no significant differences were observed between 25 °C or 45 °C and no colour change was observed during the five days. pH remained between 4,10 and 4,15.
Conclusions: According to guidelines, the percentage of degradation for Isoproterenol Hydrochloride indicates that the preparation is chemically stable during the first 24 h of the four storage conditions studied. This chemical study points out that Isuprel® is therefore stable at 0,004 mg/mL in a 5 % glucose solution for 24 h at +25 °C or +45 °C even if there is a light exposure. This work would mean that medical teams could then change the infusion bags daily which is more suitable for clinical practice and improve patient safety.
Disclosure of interest: None Declared.

Research development

RD009

Metastatic colorectal cancer. Role of cetuximab

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Background and objective: To protocolize the role of Cetuximab in metastatic colorectal cancer (mCRC) respect available alternatives.
Setting and method: 5 pivotal clinical trials described in the data sheet were considered.

On 05/03/14 the following literature searching was performed in PubMed: (Therapy/Narrow [filter]) AND (cetuximab and (colon or colorectal)). Three clinical trials regarding the efficacy of Cetuximab and six studies corresponding to reanalysis, updates or combined analysis of the studies were included. The baseline characteristics were balanced between groups, assigning patients to treatments was performed randomly, and the method specified.
The trials design was opened, phase III, except for two (phase II). Inclusion criteria: patients with mCRC with receptor expression of epidermal growth factor receptor (EGFR) gene with wild-type RAS, who had not received prior chemotherapy for mCRC. ECOG Performance status: 0–2. Patients with initially unresectable metastatic disease were included, but after the treatment could be candidates for resection.
Results: First-line treatment: In patients with resection of the primary tumor, liver metastases not candidates for resection at first but potentially resectable, the addition of cetuximab to Fluoropyrimidines based schemes (FOLFIRI/

mFOLFOX-6), provides an increase in overall survival (SG) with a median of 30.9vs.21.0 months, hazard ratio (HR) 0.54(95 % CI 0.33–0.89); P: 0.013. The addition of cetuximab to FOLFIRI increased SG 23.5vs.20.0 months, HR: 0.796(95 % CI 0670–0946); P: 0.0093.

Third line treatment: Cetuximab offers increased SG, with a median difference of 9.5vs.4.8 months, HR: 0.62(95 % CI 0.44–0.87); P: 0.006 and a median progression-free survival (PFS) was 3.7vs.1.9 months, HR: 0.42(95 % CI 0.30–0.58); $P < 0.001$. Among patients with tumors K-ras wild type Cetuximab has shown an improvement in overall health status at 8 weeks, with an average score of 3.2vs.−7.7(95 % CI 4.2–17.6) and a difference of 10.9; P: 0.002, compared to the best supportive care, and less deterioration at week 16: −18.1vs.−0.2 points, difference 17.9(95 % CI 7.6–28.2); $P < 0.001$.

Conclusions: Adding Cetuximab to FOLFIRI/mFOLFOX-6 increase SG.

In patients with resectable metastases, Cetuximab or Panitumumab (anti-EGFR), would be preferable over Bevacizumab because, although provides increased responsiveness, the increase of resectability offers a dubious benefit.

In patients without resectable metastases with acceptable prognosis, will be interesting the reserve of anti-EGFR as third line.

Disclosure of interest: None Declared.

Research development

RD010

Taking forward the research agenda: assessing the needs of pharmacists employed by Hamad Medical Corporation in Qatar

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Background and objective: Traditionally, pharmacists in Qatar have very limited formal training related to research. The aim was to determine the needs of Hamad Medical Corporation (the principal public healthcare provider) pharmacists in relation to research education, training and practice.

Setting and method: A cross-sectional survey of all pharmacists (n = 401). Questionnaire items were in domains of: knowledge, skills and attitudes; education and training; facilitators and barriers; professional change; and demographics. Responses were analysed using descriptive and inferential statistics, and principal component analysis of attitudinal items.

Main outcome measures: Views and attitudes towards research, research management, training needs.

Results: The response rate was 53.1 % (213/401). High levels of interest were expressed for all aspects of research other than 'writing a research proposal'. Respondents were generally less experienced and less confident in research. Principal component analysis identified four components of: general attitudes towards aspects of research; confidence, motivation and access to departmental support; research culture; and support from others. Respondents generally held positive attitudes, with a median overall score of 13 (IQR 8–18), range possible 6–30, with 6 representing best positive attitude. Scores for other components were: confidence, motivation and access, median overall score was 30 (IQR 24–35); research culture, median overall score was 20 (IQR 15–23); support from others, median overall score was 12 (IQR 9–15). Half of all respondents (50.7 %, n = 108) had either never thought about being involved in research or had taken no action. In multivariate binary logistic regression analysis, those more ready to undertake research had a more positive general attitude (odds ratio 2.4 (95 % CI 1.27–4.55) $p < 0.001$). Just under half (44.9 %, n = 96) had never thought about research training or had taken no action. Almost all (90 %, n = 172) expressed interest in research training.

Conclusions: Results indicate high levels of interest to participate in some form of research training. Notably, individual attitudes, motivation, confidence, access to departmental support, research culture and support from others could be both facilitators and barriers. There is a need for a strategic approach to research training to realise the full potential of HMC pharmacists in contributing to the Qatar National Research Strategy. The approach taken in this study could be adopted in other institutions and countries.

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Research development

RD011

An Interactive Approach to the Newsletter for the Department of Pharmacy

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Background and objective: Electronic newsletters are peer reviewed periodicals distributed via electronic mail[2] offering the advantages of being a traceable, cost effective and fast means of communication[3]. The study aimed at compiling an interactive e-newsletter to keep pharmacists, Pharmacy Department students and staff up-to-date with events organized by the Department of Pharmacy of the University of Malta. The e-newsletter was evaluated by the audience in terms of content, presentation and distribution via an evaluation questionnaire.

Setting and method: The study was carried out at the Department of Pharmacy, University of Malta. Information regarding e-newsletter content and design, focus group implementation and questionnaire compilation was reviewed. The name used for the hardcopy version of The Pharmacy Department Review was retained. The e-newsletter was compiled using information gathered by attending events organized by the Department of Pharmacy. The issues were designed using Microsoft Office Publisher 2007® and Adobe Photoshop®. The first issue of the e-newsletter consisted of a four page spread recounting activities and a supplement consisting of interviews. A focus group consent form, evaluation questionnaire and a readers' evaluation questionnaire were compiled. The e-newsletter and readers' evaluation questionnaire were reviewed by the focus group. Following dissemination of the e-newsletter the results of the evaluation questionnaire were collected and analysed using IBM SPSS™ Version 21.

Main outcome measures: Evaluation of the e-newsletter developed

Results: The e-newsletter and evaluation questionnaire were distributed to 752 pharmacists, 176 students and 27 staff members. It was completed by 212 pharmacists, 45 students and 10 staff members resulting in a 29, 25 and 36 % response rate respectively with 66.67 % of the respondents being females and 33.33 % being males reflecting the gender distribution in pharmacy. The respondents' ages ranged between 18 and 71 years.

Conclusions: The audience found the e-newsletter to be informative, easy to comprehend, professionally laid out and that division of information over two publications helped in locating personal points of interest (mean rating scores of 2.38, 2.08, 2.35 and 2.33 respectively with a maximum score of 1 for each statement). The respondents stated that the e-newsletter did enhance communication between the Pharmacy department and the targeted audience with a mean rating score of 2.26.

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