

The Role of Pharmacists in Optimising Drug Therapy

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Anne Spinewine, Stephen Byrne, and Olivia Dalleur

9.1 Pharmaceutical Care at Patient Level

9.1.1 Medication Review

Following a consensus consultative process undertaken in 2018 defined a medication review (MR) “*as a structured evaluation of a patient’s medicines with the aim of optimising medicines use and improving health outcomes. This entails detecting drug-related problems and recommending interventions*” [1]. The extensive consultative process included consultation amongst over 200 healthcare professionals (HCPs) across 35 countries and resulted also in a medication review classification, which also took into consideration the available sources of information.

The overarching aim of an MR is to improve the quality, safety and appropriate use of medicines. Such a review can be conducted by multiple HCPs themselves or in collaboration with the prescribing physician [2], and there is a growing body of evidence in the literature that medication reviews result in improved prescribing outcomes such as reduced polypharmacy, inappropriate prescribing and adverse drug effects for patients [3].

The complexity of the medication review is determined by the nature of the patient, their concurrent illnesses and their co-prescribed medications. The depth of the review is also influenced by the level of detailed information available to the

A. Spinewine · O. Dalleur

Université catholique de Louvain, Louvain Drug Research Institute and Faculty of Pharmacy and Biomedical Sciences, Brussels, Belgium

e-mail: anne.spinewine@chuucnamur.uclouvain.be; anne.spinewine@uclouvain.be; olivia.dalleur@uclouvain.be; olivia.dalleur@saintluc.uclouvain.be

S. Byrne (✉)

Pharmaceutical Care Research Group, School of Pharmacy, University College Cork, Cork, Ireland

e-mail: Stephen.Byrne@ucc.ie

HCP at the time of the review. The Pharmaceutical Care Network European (PCNE) group in 2018 also agreed through their consensus process on four subtypes of medication reviews, ranging from those conducted in a community pharmacy, to more comprehensive reviews, which require full access to patient's medical record (e.g. access to medical notes in hospital, long-term care or general practice settings). The subclassification of a medication review is as follows:

- **“PCNE Type 1: *Simple MR*:** A simple medication review is based on the available medication history in the pharmacy; this type of review occurs routinely during the medication supply/dispensing process, for example, drug–drug interactions, reviewing the appropriateness of a particular medication dosages, potential side effects and medication adherence issues.”
- **“PCNE Type 2A: *Intermediate MR*:** An intermediate medication review can be performed when the patient can be approached for information. Such a review is based on medication history and patient information.” Which builds upon a Type 1 review and expands the review to include issues such as drug–food interactions, issues with over-the-counter (OTC) medication and medication effectiveness issues.
- **“PCNE Type 2B: *Intermediate MR*:** An intermediate medication review can be performed if information from the general practitioner is also available. Such a review is based on medication history and medical information.” This type of review builds upon Type 2A by including the identification of potential medicines without a current clinical indication.
- **“PCNE Type 3: *Advanced MR*:** An advanced medication review is based on medication history, patient information and clinical information. This type of review is the most comprehensive and in-depth review and results in all of the above being addressed with the addition of the identification of an indication without a potential medication being prescribed for its treatment [1].

In addition to strong clinical and technical skills, interprofessional communication and collaboration are central to the effective implementation of medication review services for patients [4].

9.1.2 Continuity of Supply and Care

Continuity of medication supply and continuity of care is essential whenever patients' transition from one setting to another or from one HCP to another takes place. Principles ensuring continuity of care in medication management include: (a) developing processes of care and responsibilities across the caregivers to coordinate the medication discharge plan as early as possible after admission; (b) obtaining an accurate medication history upon admission; (c) evaluating the current medication list as compared to the medication history in order to detect and reconcile discrepancies, to perform medication review and to establish a treatment plan, on admission as well as at discharge; (d) involving the patient in the treatment plan decisions; (e)

ensuring the patient has been educated about the discharge treatment plan; (f) dispensing an adequate amount of medication at discharge and (g) communicating to follow-up healthcare [5]. A core concept that is closely related to these principles is medication reconciliation (MedRec) (see Chap. 8). MedRec has been defined as “*the process of identifying the most accurate list of all medications a patient is taking—including name, dosage, frequency, and route—and using this list to provide correct medications for patients anywhere within the health care system*” [6]. MedRec is a safety strategy adopted by most guidelines and health organisations that should be performed at each transition, ideally within 24 h.

MedRec prevents transcribing errors, improves monitoring of prescriptions, facilitates switch from medication taken at home towards formulary medicines upon admission [7]. By improving communication between HCPs and with the patient, MedRec reduces medication discrepancies and potentially harmful medication errors. In older patients specifically, pharmacist-led MedRec reduces medication errors [8]. However, evidence on patient-related clinical outcomes is inconclusive. Nevertheless, a meta-analysis focusing on the effectiveness of pharmacist-led MedRec on patient-related clinical outcomes during the transition to and from hospital settings showed a reduction in drug-related hospital revisits, emergency department visits and in hospital readmissions [9]. Additionally, there is evidence that pharmacist-led MedRec at discharge could be a cost-effective intervention by reducing readmissions [10].

Many pharmaceutical societies provide guidelines, practical tools and educational support for MedRec implementation. Strategies for implementing MedRec include the use of standardised forms, electronic reconciliation tools, collaborative models and patient engagement.

After discharge, many patients might have difficulties with medication management, including delays in filling their medications. Therefore, at discharge, additional pharmacists’ interventions complement MedRec to improve continuity of care, often evaluated in the literature in combination: supplying of medications, medication counselling of patients, provision of verbal and written information to the patient, communication between primary and secondary care providers, follow-up phone calls with the patient or the community pharmacist and home visits. These interventions are particularly recommended in older patients and can be performed by both the hospital pharmacist and the community pharmacist.

The written report that all patients and subsequent HCPs receive at discharge, also called discharge plan, contains a detailed list of all medications the patient is currently taking (name and respective indications, strength, form, timing, frequency, duration, date and time of the last dose), identification and explanation about medicines that have been started/stopped, any known adverse reactions and known allergies. This report is in a format suitable and adapted to the patient’s and/or carer’s health literacy.

9.1.3 Patient Education and Shared Decision-Making

Medication adherence has been defined as “*the process by which patients take their medications as prescribed*” [11]. Several factors influence adherence such as

knowledge and skills in managing medications, previous side effects, health literacy, beliefs about the medication and lack of involvement in the treatment decision-making process.

Patient education is a common intervention to improve medication adherence. Pharmacists-led education can be provided in several settings and formats: meeting during hospital stay, consultations, including in community pharmacies, provision of written information, home visits, phone calls and motivational interviewing [12]. Rather than just presenting information about medications, pharmacist discusses it and assesses non-adherence and beliefs about medication. Education to tackle non-adherence should include tailored practical suggestion (e.g. to the type of medicines or regimen, monitoring, use of a pill-box or reminders). Pharmacists also implement patient self-management plans, to support people with chronic conditions who want to be involved in managing of their own medicines. Patient education can be general or specifically focused on oncology medications, anticoagulation, antihypertensive drugs, analgesics, potentially inappropriate medications, fall-risk medications and so forth. Health literacy tools can help pharmacists adapt education and counselling.

Although evidence of pharmacists-led education in older patients on adherence and clinical outcomes is inconsistent, some studies have shown promising results on optimisation of medication in terms of deprescribing of inappropriate medications and benzodiazepines in ambulatory and hospital setting [13, 14].

Most patients, including the older ones, wish to be involved in making decisions about their own medicines. Shared decision-making (SDM) is “*an approach where healthcare professionals and patients share the best available evidence when faced with making decisions regarding healthcare, and where patients are supported to consider options to achieve informed preferences*” [15]. In older patients, SDM and patient involvement are important to reduce inappropriate polypharmacy. Moreover, SDM results in older patient to choose more conservative options (medication reduction or cessation, less initiation of new drugs), which support deprescribing and decrease of treatment burden [16, 17]. Pharmacists should integrate shared decision-making (SDM) with the patient in their medication review and treatment optimisation process. They can also help develop medication decision tools, which will support discussion but not replace it.

9.2 Pharmacists’ Role in the Education and Training of Other Healthcare Professionals

Pharmacy teams internationally have played a pivotal role in the education and training of fellow HCPs in both the acute and non-acute settings over several decades. Such education and training sessions take place both in formal, for example, lecture, and/or informal, for example, ward rounds settings, but one thing is clear, if our desire is to improve prescribing amongst older patients, then constant and up-to-date education of all prescribers including non-medical prescribers (e.g. nurse and other HCP prescribers) is crucial. There have been numerous educational

interventions published in the literature, which aim to enhance prescribing appropriateness [18, 19].

Several different approaches have been used to deliver these education sessions from traditional lecture sessions with pre-printed materials to more innovative approaches such as massive open online course (MOOC) and academic detailing [20–22]. Interestingly, the majority of reported educational interventions published in the literature examine the impact of an intervention on a single agent of a single drug class, for example, antibiotics [21] and hypnotics [19]. Relatively few educational studies have examined the broader issue of prescribing in an older population. The benefits of such single drug/drug class education interventions are that the prescriber's knowledge of that particular medicine/drug class is enhanced substantially, although broader educational issues, for example, pharmacokinetic and pharmacodynamic alteration in older patients, may be required by the prescriber to prepare them for the complex issues which are routinely present in this population.

In recent years, pharmacists have become increasingly involved in the delivery of educational materials via academic detailing [20]. Academic detailing is a means of delivering continuing education to HCPs by another trained HCP such as a pharmacist, nurse or doctor. The trainer visits the trainee, that is, the prescriber in their practice setting and provides evidence-based information on a selected topic [23]. These outreach educational sessions are interactive in nature and can be tailored to the needs of the trainee. They also facilitate discussion and feedback during the session.

Likewise, pharmacists have embraced the use of online educational platforms. These platforms have facilitated the delivery of materials simultaneous to large audiences via MOOC or E-learning platforms. These online modes of delivery have enabled broader topics such as altered pharmacokinetic and pharmacodynamic principles of an older population to be discussed and delivered to the audience [24, 25]. Both online delivery methods have their advantages and disadvantages, but a key advantage is the ability to deliver tailored materials to large numbers of prescribers simultaneously.

9.3 Models of Pharmacy Practice in Different Settings of Care and Countries

Clinical pharmacy services with a focus on older people (also called “geriatric pharmacy practice”) emerged in the mid-1970s, and since then a substantial body of published literature has accumulated, demonstrating patient safety and economic benefits of clinical pharmacy services for older people, including evidence from randomised controlled trials [26]. Clinical pharmacy services have been shown to improve prescribing, prevent adverse drug reactions and medication errors, improve patients' medication knowledge and adherence and, in some populations, reduce the risk of medication-related hospital admissions [26].

This movement of pharmacists' involvement in direct patient care away from the traditional medication-dispensing/supply functions is widespread globally, although

there is major inter- and intra-country variability in the practice models and their level of implementation [27, 28]. Below we describe and discuss these models of practice in each type of setting of care.

9.3.1 Ambulatory Care

The availability of MR services provided by pharmacists in ambulatory care is increasing worldwide, although it is varying in content, scope, implementation and level of interprofessional collaboration across countries.

European data show that at least one type of MR service is implemented in community pharmacy in more than half of European countries, either as a project or as an implemented service [29, 30]. Type 2A MR is the more widespread, because it is more convenient to implement in the community pharmacy setting [29]. Four countries (Switzerland, England, The Netherlands and Northern Ireland) had a reimbursed, fully implemented MR (type 2B or type 3) service in the community pharmacy [30]. Such pharmaceutical care service is also available in non-EU countries such as Australia, New Zealand and the United States of America. In Canada, the service is organised on a province level with variability in eligibility criteria and reimbursement of MR services. There is funding for providing specific recommendations to prescribers on various types of drug-related problems. Such pharmaceutical opinions, coupled to sending patients an educational deprescribing brochure, have shown to be effective in discontinuation of inappropriate prescriptions in older people [14].

MR services in the community pharmacy offer significant opportunities to support patients with managing comorbidities and complex medicine regimens, although many challenges remain to be overcome, ranging from poor public awareness and acceptance, organisational constraints, and issues over interprofessional collaboration [31]. As an example, a study of Bulajeva found that only half of intermediate MR services available in Europe incorporated reporting to the physician and a third included multidisciplinary case conferences during the review.

In a few countries, type 3 MR is performed by pharmacists outside the community pharmacy. In England, for example, since 2015, clinical pharmacists can be hired in general practitioner practices and perform, amongst other tasks, MR and medication reconciliation [32]. Evidence from published evaluations suggests that pharmacists in general practice can have a positive impact on clinical outcomes, may reduce medication-related hospitalisations. This model may provide advantages over a community pharmacy service, including (co-)location, access to medical records to inform the quality and appropriateness of recommendations, the potential for formal and informal communication and discussion of the pharmacist's recommendations and reduced fragmentation of care. In Australia, the Home Medicines Review program started in 2001 [4]. This Commonwealth-funded program aims to maximise patient benefit from medicines and prevent drug-related problems through a collaborative process involving both general practitioners and accredited pharmacists. It includes the following steps: the general practitioner

identifies and refers the patient for MR; an accredited pharmacist visits the patient at home and obtains a comprehensive medication history, then documents its medication review findings and recommendations in a report for the general practitioner (GP); then based on this, the GP and patient formulate a medication plan [4]. The positive impact has been demonstrated on medication use measures mainly [4].

9.3.2 Acute Care

Drug-related admissions, adverse drug events during hospital stay and after discharge are all frequent in older people with multimorbidity and polypharmacy. The involvement of clinical pharmacists to optimise drug therapy in older inpatients is, therefore, appealing. Various practices for pharmacists' involvement in the care of inpatients exist, ranging from single approaches such as simple or intermediate MR during hospital stay to more comprehensive, multifaceted and collaborative approaches implemented from admission to discharge or even post-discharge. Current evidence to date shows that medication reconciliation, patient education, HCP education and transitional care are essential elements that need to be implemented in addition to medication review to reach an effect on hospital readmissions [33–35]. Even though there has been some progress over the last decade, such comprehensive model of care is not yet widely implemented in hospitals in Europe and beyond. The role of the “ward-based clinical pharmacist,” whilst well established in some countries, is still a rarity in others. Lack of capacity, capability and support from managers are the commonly cited reasons for this [36, 37].

In the case of limited resources, pharmacists and hospital managers may decide to have a comprehensive model of practice implemented for a restricted number of older people at highest risk of drug-related problems, or to have a less comprehensive and more diluted approach implemented for a larger population. The former approach is probably preferable, although there are no strong direct comparison data available to date to confirm this.

9.3.3 Long-Term Care

Polypharmacy, together with other factors such as frailty and complexity of the medication use process, makes the safe use of medications for nursing home residents highly challenging, and pharmacists have been involved in many initiatives aiming to optimise the use of medicines in that setting. Pharmacists' contribution to optimise medicines use in the nursing home setting includes (a) practices directed at nursing home residents, often in the form of medication reviews, which can be uni- or multiprofessional, and aimed at specific drugs or the whole regimen and (b) practices directed at HCPs—often educational approaches directed at prescribers [19, 38]. These practices are described further below. Even though most activities performed to date by pharmacists focus on the prescription component, there is wide room for pharmacists' input towards improving administration

process—although only limited data are available on the practice models and evidence of effect [38].

In several countries such as the United Kingdom, Australia and the United States, comprehensive MR programs in nursing homes are funded. MRs are generally conducted collaboratively by the resident's general practitioner and a pharmacist who is accredited to conduct MRs (also referred to as consultant pharmacists). As an example, Australian guidelines recommend that a MR (called Residential Medication Management Review—similar to the Home Medicines Review program funded in ambulatory care) is provided as soon as possible after an individual first enters permanent residential care and when clinical circumstances change [4, 39]. Each review identifies an average of 2.7–3.9 medication-related problems per resident receiving the service, with general practitioners accepting 45–84% of pharmacists' recommendations [40]. Targeted MRs for people taking psychotropic drugs is also recommended and encouraged in several countries. There is evidence that such programs lead to more appropriate prescriptions and lower use of sedative and anticholinergics drug use, although certainty of the evidence was found to be low in a Cochrane review [19]. Some recent clinical trials showed positive results of collaborative and innovative approaches towards MR in the nursing home setting, for example, by involving nursing home residents and/or nurses in the process [41, 42]. Wider scale implementation of these approaches has yet to occur.

Pharmacists also contribute to optimised medication use in nursing homes through educational approaches, case conferencing, audit and feedback directed at other HCPs (or sometimes at nursing home residents and their families) [18, 28]. Such practices are less resource intensive—and may, therefore, be encouraged in countries where there is no government-funded MR program. They may contribute to better use of medicines, although probably with lower effect than comprehensive MR. As an example, in Switzerland there is funding for regular meetings (also called quality circles) between pharmacists, physicians and nurses active in a nursing home, with the goal of producing local prescribing consensus to improve drug use [43]. This approach led, in particular, to a reduction in drug costs and improved antibiotics stewardship.

9.3.4 Interprofessional Practice is Desirable But Challenging to Implement

Pharmacists have distinct expertise that can contribute to team knowledge and competence in managing older patients with polypharmacy and multiple chronic conditions. Importantly, evidence shows that globally, interventions developed by a pharmacist within a multidisciplinary team seem to provide greater benefits in terms of clinical outcomes and economic results than those carried out by individual pharmacists [34].

Pharmacists can be members of geriatric evaluation and management (GEM) teams. Such teams provide comprehensive geriatric assessment, which is by nature

interdisciplinary. Studies have shown that pharmacists working in geriatric evaluation and management teams have favourable effects on therapeutic, safety, hospitalisation, and adherence outcomes in older adults [27]. This is most easily implemented in the acute care setting with clinical pharmacists.

Interprofessional collaboration in the primary care setting is critical for sustaining high-quality care in the context of the increasing burden on primary healthcare services [44]. Several studies have shown positive effects of working as a team, including better care continuity and coordination, beneficial changes in patient behaviour, improvement of patient symptoms and satisfaction through better response to their needs [45]. However, health providers in primary health care settings—and pharmacists are no exception to this—face enormous ideological, organisational, structural and relational challenges whilst promoting teamwork and interprofessional collaboration [46]. A better understanding of barriers and enablers for effective interprofessional collaboration are essential for adapting services and context, whenever possible. For example, collaboration between general practitioners and community pharmacists is mostly facilitated by an environment with sufficient resources and a close distance between the two professions, clear and regular communication, experience with collaboration and understanding each other's capabilities and roles towards delivering patient care [44]. Although this takes time to evolve, progress is being made in the right direction.

9.3.5 The Prescribing Pharmacist

Traditionally the prescribing role has been a key domain of the medical practitioner, although globally numerous healthcare systems have broadened this authority to other HCPs, for example, nurses, pharmacist, physiotherapist, in the form of supplementary or independent prescribing [47]. The expansion of such authority has demonstrated several benefits in terms of increased patient satisfaction, cost effectiveness [37], concordance with therapeutic regimens [48], increasing continuity of care and increased medication access [49, 50]. This broadening of roles for other HCPs has been in response to changing service needs and increased specialist roles within these professionals [47].

Key drivers resulting in the expansion of prescription authority have been a desire by medical providers to reduce costs whilst simultaneously enhancing patient services, whereas a key barrier for many healthcare professions to take on such roles in the past has been the lack of access to patient's clinical data and medical notes. Without access to such data, it is hard for any professionals to provide clinically appropriate advice pertaining to either prescribing or indeed appropriate advice in relation to deprescribing [25, 47].

The impact of non-medical prescribing upon professional boundaries and relationships is often dependent upon whether supplementary or independent prescribing is legislated. In the former, continued medical authority/responsibility is retained by the physician with supplementary prescribing authority given to the pharmacist by the doctor after they have undertaken the clinical assessment and made the initial

diagnosis. This typically involves an agreed clinical management plan/protocol in advance for a given cohort of patient, for example, diabetic treatment plans [47, 51, 52], whereas the independent prescribing model is more self-governing/autonomous allowing the non-medical prescriber to diagnose and prescribe without direct involvement from a medical practitioner [47].

Within the countries where pharmacists have prescribing authorisation either as independent or supplemental prescribers, their scope of practice may vary considerably depending on whether formularies or agreed protocols are in existence [47]. The development of such protocols and formularies in collaboration with medical staff could potentially lead to restrictions being placed upon non-medical prescribers' scope of practice [53].

Generally, the literature has reported that in practice, non-medical prescribing increases effectiveness and independence of the HCP, but it also raises issues concerning confidence, workload and the need for continued specialist training in the form of CPD (continued professional development) [54]. Non-medical prescribers tend also to be aware of their limitations and are known to regularly consult with medical colleagues on complex cases [47].

The role of the pharmacist prescribing continues to grow in various healthcare setting internationally, although differences in legislative procedures/practices by professional bodies and governments has resulted in the implementation of several models of pharmacist prescribing worldwide [47, 54]. Nonetheless, prescribing pharmacists internationally continue to publicise that extending prescribing rights has allowed them to utilise their therapeutics knowledge, gain increased professional recognition and demonstrate enhanced patient care [47].

9.4 Conclusions and Perspectives

Pharmacists have specific knowledge and skills that are essential to optimising medication use in older people. At the patient individual level, pharmacists' activities most frequently encompass medication review, medication reconciliation and patient education. Several models of care have been implemented in different settings of care (ambulatory, acute and long-term care) in many countries, although there remains a large variability in the existence and implementation for such services worldwide. More comprehensive, patient-centred and interprofessional approaches seem to provide greater benefit, although there are more challenges to implementing these approaches, especially in the ambulatory setting. Standardisation and enhanced coverage/implementation of geriatric pharmacist practice are important challenges for the future.

Pharmacists also make an important contribution to optimising medication use in older people by educating other HCPs. This can happen through different approaches, from traditional lecture sessions to more innovative approaches such as massive open online course and academic detailing.

Finally, and even though this was not specifically addressed in the current chapter, the role of pharmacists as researchers—to measure the quality of medication

use, understand the barriers and enablers, and design and evaluate the effect of optimisation approaches—is also an important contribution towards optimising pharmacotherapy in older patients.

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