bands. We also automatically detected IEDs and estimated their number and spread over each recording. Statistical models: Each 10-min period was labeled as 'preictal' if at least one electroclinical seizure occurred in the next 24h, or 'interictal' if no seizure. The ability of iEEG and IEDs to discriminate between preictal and interictal periods was assessed by a nonlinear support vector machine (SVM) classifier. Prospective daily forecasts: For each day to predict, we trained SVM models from the previous days and then computed its probability of belonging to the preictal class, reflecting the risk of upcoming seizures.

Results: Connectivity in the theta band was found to provide the best prediction performances (AUC ≥0.7 in 80% of patients). In comparison, IED-based models displayed weak performances (AUC <0.6). Daily prospective probabilistic forecasts were accurate: mean Brier score and Brier skill score of 0.13 and 0.72, respectively.

Conclusion: Our findings suggest that iEEG connectivity, obtained from vigilance-controlled resting-state recordings, can provide a daily and reliable signature of upcoming seizure(s).

887 | A machine learning algorithm for detection of ictal and continuum patterns

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Purpose: Machine learning algorithms are transforming the interpretation of EEG and are increasingly valuable for screening high volume critical care monitoring datasets. While classifiers have traditionally focused on classical ictal patterns, it is increasingly understood that periodic and rhythmic patterns also pose clinical risk even when they are inter-ictal and subclinical. Here we describe a classifier model capable of identifying classically ictal, rhythmic, periodic, and sporadic patterns.

Method: We propose a unified classifier model capable of characterizing a continuum of epileptic and nonepileptic abnormalities. Raw EEG time samples from a 10-20 recording configuration are taken as input, and the model outputs the probability that the EEG contains seizure, periodic discharges (PD), rhythmic delta activity (RDA), or any other pattern, for every 1 second in the input recording. In addition, the model outputs whether abnormal patterns are generalized or lateralized. Our outlined model is a 12-layer U-Net with roughly 3.4 million parameters, trained to allow sparse, missing, and multiple expert labels for any given segment. This allows for the utilization of datasets with diverse labelling methodologies. The model was trained, validated, and tested using studies drawn from 6428 subjects (>40,000 labels) selected from our internal Beacon DataStore and the Temple EEG dataset.

Results: Preliminary results demonstrate equivalent to human expert performance in identifying other patterns, and close to human performance for seizure detection. Detection of generalized RDA was superior to PDs and lateralized RDA.

Conclusion: A multiclass classifier capable of identifying ictal and interictal patterns is feasible. We demonstrate a model capable of classifying a continuum of pathological EEG patterns that can be trained on highly diverse labelled data. The incorporation of ictal-interictal continuum patterns is of critical importance given their broad association with neurological risk – making automated identification of these diverse patterns a necessity in critical care medicine.

935 | Clinical added value of interictal automated electrical source imaging in the presurgical evaluation of MRI-negative epileptic patients: a monocentric prospective study

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Purpose: The aim of this prospective study is to assess the clinical added value of a fully automated ESI analysis in the presurgical evaluation of MRI-negative epileptic patients.

Method: All consecutive patients, referred to our Center for pre-surgical evaluation between 15/01/2019 and 31/12/2020, meeting the inclusion criteria, were recruited. Interictal ESI was realized on low-density long-term EEG monitoring (LD-ESI) and, whenever available, high-density EEG (HD-ESI), using a fully automated analysis (Epilog PreOp). The multidisciplinary team was asked to formulate hypotheses about epileptogenic zone (EZ) location at sublobar level and make a decision on further management for each patient at two distinct moments: i) blinded to ESI and ii) after presentation and clinical interpretation of ESI. Results leading to a change in clinical

management were considered contributive. Patients were followed up to assess whether these changes lead to concordant results on SEEG or successful epilepsy surgery.
Results: Data from all included 29 patients were analyzed. ESI lead to a change in the management plan in 12/29 patients (41%). In 9/12 (75%), modifications were related to a change in the plan of the invasive recording. Eight out of these 9 patients finally underwent an invasive EEG. In 6/8 (75%), SEEG confirmed the localization of the ESI at a sublobar level. So far, 5/12 patients, for whom management plan was changed after ESI, were operated and have at least one-year postoperative follow-up. In all cases, the EZ identified by ESI was included in the resection zone. Among these patients, 4/5 (80%) are seizure-free (ILAE 1) and one patient experienced a seizure reduction of more than 50% (ILAE 4).
Conclusion: In the presurgical evaluation of MRI-negative cases, interictal automated ESI provides non-redundant information, especially in helping to plan the invasive recording, as long as ESI results are integrated into the whole multimodal evaluation and clinically interpreted.

953 | Periodic EEG discharges and epileptic spasms involve cortico-striatal-thalamic loops on arterial spin labeling MRI

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Purpose: Epileptic spasms (ES) in clusters and periodic EEG discharges (PD) share many electroclinical characteristics as etiologies, similarity of EEG pattern, periodicity and ictal phenomenology. Their pathophysiological mechanism remains poorly understood. In order to disclose their cerebral generators, we retrospectively analyzed ictal and inter-ictal cerebral blood flow (CBF) changes in pediatric patients having presented generalized or lateralized PDs or ES during arterial spin labelling magnetic resonance imaging (ASL-MRI) acquisition and compared these findings to those of inter-ictal ASL-MRI of patients with drug-resistant focal epilepsy and age-matched healthy controls.
Method: ASL-MRI values were analyzed in cortex, striatum and thalamus, all segmented and divided in six functional subregions: prefrontal, motor (rostral, caudal), parietal, occipital, temporal. Rest CBF values, absolute and relative to whole brain, were compared to those of age-matched controls for each subregion. Ictal exams were acquired in five patients with PDs [subacute sclerosing panencephalitis (1), stroke-like events (3), West syndrome with cortical malformation (1), two of them also had inter-ictal ASL-MRI]; inter-ictal group included patients with drug-resistant ES of various aetiologies (14) and structural drug-resistant focal epilepsy (8).
Results: Main findings were diffuse striatal as well as cortical motor CBF increase during ictal exams in generalized PDs with motor manifestations and focal CBF increase in corresponding cortical-striatal-thalamic subdivisions in lateralized PDs with or without motor manifestations with straight topographical correlation with the EEG focus. For inter-ictal exams, patients with ES disclosed CBF changes in corresponding cortical-striatal-thalamic subdivisions, more frequently when compared drug-resistant focal epilepsies, not related to Vigabatrin treatment.
Conclusion: Our results suggest that corresponding cortical-striatal-thalamic circuits are involved in PDs including ES, opening new insights in their pathophysiology and new therapeutical perspectives. Based on these findings we propose a model for the generation of periodic discharges and of epileptic spasms combining existing pathophysiological models of cortical-striatal-thalamic network dynamics.

994 | Recurrent isolated sleep paralysis as a clinical expression of focal seizures

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Purpose: According to the International Classification of Sleep Disorders 3, recurrent isolated sleep paralysis (RISP) with or without hallucinations is a REM sleep parasomnia occurring primarily in young subjects with an estimated