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## AI technology for seizure forecasting

### Seizure forecasting

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#### Background

Artificial intelligence (AI)-based automated seizure detection systems hold the potential to create applications and digital solutions for patients but also generate paradigms for proper diagnosis and interpretation in healthcare. Electrical discharge and artefacts during the seizures could be an advantage for the detection.

In terms of seizure prediction or forecasting, we cannot wait for the ictal moment, so we need to detect small changes and patterns in pro-ictal or pre-ictal periods.

#### Materials & Methods

Wearable devices store all data in cloud servers where we can process the signals, adjust thresholds for artefacts and select continuous data for training. One of the most important aspects is the labelling of seizure periods, through the patient calendar and automatic detection software. Once data is prepared we can perform new training for different batches and adjust the best solution for a patient-specific model, which is updated in the application.

Machine learning techniques allow the use of specific features and characteristics to benefit of the explainability of AI and the capacity to understand why an AI system reached a particular decision.

#### Results & Conclusions

AI systems provide characteristics and indicators combined with machine learning, for the final models, but also generate features able to label different seizures and patterns, generating further information as different typologies of seizures or labelling interictal epileptiform activities, key new information for neurologists.

Epilepsy has a severe impact on patients because of seizures unpredictability, generating anxiety, depression, few social relationships and low quality of life index.

Going forward into seizure forecasting should help in the prevention of accidents and injuries, and, in future, with appropriate medications.

