were localized to - hippocampus, amygdala hippocampus, hippocampus-temporal pole, ant. Cingulum, superior temporal gyrus, and frontal operculum. With direct CS, 7 (54%) had typical seizures (aura followed by seizures with impaired awareness), 4 (31%) had atypical seizures (aura and clonic activity), and 2 (15%) had both types. Localization of CS-induced seizures overlapped with spontaneous seizures in 9/13 (70%) patients. Overlapping was 100% with mesial temporal structures. 7 (54%) patients underwent surgery, and 3 had RNS placement.

Conclusion: Direct CS induced seizures complemented localization of spontaneous seizures in two-thirds of the patients who underwent stereo EEG investigation. The accuracy of direct CS in the localization of EZ is higher with infratemporal structures.

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F153. Role of the premotor and precentral negative motor area in praxis: A direct electrical stimulation study with behavioral analysis—Masaya Togo*, Riki Matsumoto, Akihiro Shimotake, Tamaki Kobayashi, Takayuki Kikuchi, Kazumichi Yoshida, Takeharu Kunieda, Susumu Miyamoto, Ryosuke Takahashi, Akio Ikeda (Japan)

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Introduction: The negative motor area (NMA) is defined as a cortical area where 50 Hz electrical cortical stimulation produces inhibition of the voluntary movement such as finger tapping. The function of NMA has not been well delineated since previous 50 Hz stimulation studies mainly focused on the all or none response, namely, arrest of finger tapping at high current intensity. We hypothesized that NMA plays a role in higher motor behavior such as praxic movements. Our objective was to clarify the praxis-related function of NMA by applying stimulation at smaller intensity to evaluate the effect of stimulation.

Methods: Subjects were 5 patients with intractable focal epilepsy who underwent implantation of intracranial electrodes in the inferior frontal area for presurgical evaluation (IRB#C1062). After defining NMA with 50 Hz stimulation at high intensity for clinical purpose, stimulation was delivered at the intensity 1–3 mA smaller than that of clinical mapping in the following tasks: finger tapping, reach-to-grasp task, imitation of meaningless finger gesture, and pantomime of tool-use. The stroke of finger tapping, and the maximum aperture and reaching velocity in reach-to-grasp tasks are evaluated quantitatively with 3D motion capture system. Finger gesture and tool-use pantomime were evaluated qualitatively because of technical difficulty in applying the motion capture system.

Results: NMA was identified in the precentral gyrus in 3 patients, the ventral premotor area in 1 and at their border in 1. In 3 patients with precentral NMA, quantitative analysis revealed the significant decrease of stroke in finger tapping and maximum aperture in grasping, while the reaching velocity did not change significantly. Qualitative analysis showed mild slowing of finger gesture in 1 out of 3 patients but did not change the performance of tool-use pantomime. In the more rostral NMA (in the ventral premotor area and at the border), quantitative analysis also showed the significant decrease of stroke and aperture in finger tapping and grasping, respectively. In addition, reaching velocity was significantly decreased. Qualitative analysis showed either mild slowing (at the border) or arrest of finger gesture (ventral premotor area), and arrest of tool-use pantomime in 1 out of 2 patients (ventral premotor area).

Conclusion: Precentral NMA seems to play a more role in controlling elementary finger movements than praxic movements, and, when impaired, could be responsible for limb-kinetic apraxia.

More rostral NMA is likely associated with more complex movements. These findings suggested functional subdivisions within NMA and may help understand the disability after focal resection of NMA.

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F154. Machine learning for the analysis of single pulse stimulation in electrocorticography—Emile d'Angremont*, Geertjan J. Huiskamp, Frans S. Leijten, Christoph Brune, Michel J. van Putten (Netherlands)

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Introduction: In patients with drug-resistant focal epilepsy, surgery can be considered. The goal is to remove the epileptogenic tissue, while sparing the eloquent cortex. Prior to surgery, a prolonged electroencephalography (ECoG) recording can assist in the delineation of epileptogenic tissue and functionality of the surrounding cortex. During these recordings, Single Pulse Electrical Stimulation (SPES) of the intra-cranial electrodes is performed to evoke pathological responses from the epileptogenic tissue, which occur >100 ms after stimulation. These responses are called delayed responses (DR). In the UMC Utrecht, they are visually analyzed by use of time-frequency images from approximately 2 s. around stimulation. Each image is scored by two human observers on the presence of an evoked DR in three different frequency bands, namely Spikes (S, 10–80 Hz), Ripples (R, 80–250 Hz) and Fast Ripples (F, 250–510 Hz). This visual analysis is very labor intensive. Therefore, we trained a Support Vector Machine (SVM) and a Convolutional Neural Network (CNN) to mimic the human observer in scoring the images.

Methods: The training data consisted of 47,197 images from 15 patients, with the consensus of two human observers as ground truth. The algorithms were tested on a total of 11,394 images from 4 other patients. For the SVM, 9 features were defined and extracted from each image. The CNN used the whole image as an input. Classification was based on 5 different outputs. F1 scores were calculated for all classes separately.

Results: The CNN achieved an average F1 score of 0.55. The SVM did slightly better with 0.60. Sensitivity and precision for the DRs were 0.88 and 0.65 for the SVM vs 0.96 and 0.42 for the CNN.

Conclusion: Two machine learning algorithms were trained to score time-frequency responses of SPES. Both models showed a high sensitivity but a lower specificity for DRs. This was more pronounced for the CNN than for the SVM. Nonetheless, a drastical decrease in time and effort needed for the analysis of SPES is already achieved. More data of the underrepresented classes should be created for the algorithms to improve. The algorithms will be applied to additional patient data to see whether the agreement with human observers is comparable with the inter-rater agreement. Future research will aim at relating the found DRs to the seizure onset zone.

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F155. Age related characteristics and normative values of F wave in 229 healthy chinese infants—Hua Pan^{1,*}, Jinxi Lin¹, Na Chen¹, Fan Jian¹, Lei Zhang¹, Shuo Yang¹, Ying Wang¹, Yongjun Wang¹, Yuzhou Guan¹, Liying Cui¹, Jun Kimura² (¹China, ²USA)

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Introduction: Clinical assessments of a peripheral neuropathy is difficult in infants. The conventional nerve conduction study also