

## **Intraoperative neuromonitoring in cranial neurosurgery:**

### **Introducing a new neurostimulation technology**

Intraoperative neuromonitoring (IONM) offers many advantages for cranial neurosurgical interventions. By using IONM, surgeons can record motor evoked potentials at latencies of a few milliseconds and are thus able to preserve cranial nerve function. Unfortunately, with the standard stimulation method, these potentials may be superimposed by the electrical artifact of the stimulation impulse, which makes it difficult to interpret the signal. A new stimulation artifact reduction technique has been successfully trialled in a recent study\* conducted by neurophysiologists at the University Hospital of Zurich in collaboration with inomed Medizintechnik GmbH. The results of the study were published in the journal "Clinical Neurophysiology" in April 2021.

### **New technique improves signal-to-noise ratio of the physiological response**

The new stimulation method was tested during 21 neurosurgical interventions with facial nerve motor evoked potentials (FNMEP) recording using an inomed ISIS Neurostimulator to generate stimulation impulses. In contrast to conventional stimulation with immediate return discharge, the new stimulation technique delayed the return discharge of the stimulating pulse beyond the latency of the evoked physiological response and therefore improved its signal-to-noise ratio. This was achieved by temporarily cutting off the current flow immediately after the stimulation, resulting in pulse artifacts with a tail of <10 ms. In addition, the delayed return discharge was controlled to prevent any unintended physiological response.

### **Study results open up new opportunities for future surgical interventions**

The study shows that the new stimulation technique, which reduces the width of the stimulation artifact, provides a more reliable interpretation of cranial nerve evoked potentials than the standard stimulation method. The authors of the study also emphasised, however, that intraoperative recordings may vary significantly in daily practice depending on various factors. Nevertheless, in the context of their research, the new stimulation method helped the surgeons to achieve more meaningful results compared to the conventional technique. In some surgeries, only the new stimulation method generated clearly identifiable response signals. This study constitutes a promising approach for future surgical procedures and may result in an increased number of patients undergoing cranial neurosurgery with intraoperative neuromonitoring.

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Further information: <https://www.inomed.com/>  
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### **[\\*Improving intraoperative evoked potentials at short latency by a novel neuro-stimulation technology with delayed return discharge](https://doi.org/10.1016/j.clinph.2021.02.396)**

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### **inomed Medizintechnik GmbH**

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