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## SAFETY AND PRECISION IN NEUROSURGERY: THE ROLE OF INTRAOPERATIVE NEUROPHYSIOLOGY

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### Resumen

“The best way to deal with a paraplegia is to prevent it from happening in the first place” M. Nuwer

In the past three decades, intraoperative neuromonitoring (IONM) has blossomed into a major area of clinical neurophysiology, now widely used, and offering diverse techniques and applications.

The main goals of IONM are to promptly recognize an impending injury to the nervous system (enabling the surgeon to change his/her strategy) and to confirm that the surgical strategy is appropriate (encouraging more aggressive surgery).

Also, IONM allows predicting the neurological outcome improving the postoperative clinical management of the patient. And last but not least, IONM provides documentation for medico-legal purposes.

Roughly, IONM techniques are divided into two groups: a) Mapping techniques that are used to identify neural structures by electrical stimulation, and b) Monitoring techniques that provides a continuous feedback on the functional integrity of the nervous system.

Neurophysiological mapping is used in many types of surgeries and provides consistent information about the location of different neural tissues. It can be applied in brain, brainstem, posterior fossa, spinal cord and peripheral nerve surgeries. In most of those pathologies it is necessary the combination of “mapping” and “monitoring” techniques since mapping does not offer information in real-time about functional integrity of the neural structures involved in the surgical procedure.

Not many years ago, M Taniguchi (1993) described a paradigm of stimulation with a short train of stimuli (250 Hz) that opened a giant field in front of intraoperative neurophysiology. It represented an historical landmark for IONM providing reliable, continuous and real time information about the functional integrity of nervous system in patients under general anesthesia

In conclusion, in the “era of functional neurosurgery”, the functional assessment offered by IONM is an essential tool to guarantee safer and more precise surgery.