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## Foreword

# Evoked potentials



George H. Kraft, MD, MS

This is a very special issue of the *Physical Medicine and Rehabilitation Clinics of North America* for a number of reasons. First, it is a very large issue; 14 articles are presented on a variety of topics related to evoked potential. Second, it is a very elegant and sophisticated issue, dealing with many cutting-edge areas of clinical neurophysiology. Dermatomal somatosensory-evoked potentials, motor-evoked potentials, event-related brain potentials, P50-evoked potentials, and auditory brain responses are some of the techniques presented. Third, new applications of these techniques, such as coma prognostication, intraoperative monitoring, spinal stenosis assessment, central nervous system motor deficit assessment, cognitive evaluation, and traumatic brain injury, dementia, and geriatric assessments are all discussed.

This issue is also of special interest as we have become more aware of the importance of measuring physiology in diagnosing and evaluating diseases. Physicians too often rely only on structural evaluations such as X rays, MRI, and CT. Although these are important, neurophysiology assesses function, and neurophysiological assessments provide additional information in the evaluation of a large number of human illnesses, ranging from carpal tunnel syndrome to spinal stenosis, from multiple sclerosis to coma, and from radiculopathy to myelopathy. In many disorders, such as coma and brain injury, physiology may be the only “objective” test available.

I, along with the readers of the *Physical Medicine and Rehabilitation Clinics of North America*, are indebted to Dr. Henry Lew, who accepted the huge task of assembling a large number of international experts to contribute to this issue. Although the *Clinics* are subtitled *North America*, Dr. Lew has included well-known authorities from Europe and Asia as well as the North American continent. This is truly an international issue.

As one would expect, with such a variety of sources of information, a variety of approaches are presented herein—and the reader benefits from this breadth of experienced authors. Essentially, all of the techniques presented are relatively new, having been developed in the last few decades. Consequently, very little has been standardized throughout the world. The potentials recorded depend on the stimulus given, the montage used for recording, and the equipment used. Different laboratories and investigators use different standards and different terminologies. I advise readers to keep this in mind when reading each article. For example, the American Association of Electrodiagnostic Medicine (AAEM) has defined “SEP” as the abbreviation for somatosensory evoked potentials (all components: short, mid-, and long latency), and “SSEP” as the abbreviation for short-latency somatosensory evoked potentials (that component less than 25 milliseconds for upper limb stimulation and less than 40 seconds for lower limb stimulation) [1]. Not all authors follow this terminology, but all define their abbreviations within each article. (This distinction may be moot for much of clinical practice; early components are almost always the only ones studied.)

In addition, techniques vary, depending on the background of the investigator. For example, those coming from the electroencephalography field may sedate patients and necessarily average relatively more stimuli, whereas those with an electromyography background may pay more attention to patient relaxation, refrain from using sedatives, and use fewer stimuli. That is one of the wonderful things about the field of central nervous system neurophysiology: it is the meeting place of two complimentary disciplines.

This issue of the *Physical Medicine and Rehabilitation Clinics* stands as a major contribution to the evoked potential literature. My thanks to Dr. Lew for taking on this task. We are all the beneficiaries of his and the authors’ dedication.

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## Reference

- [1] American Association of Electrodiagnostic Medicine. Glossary of terms in electrodiagnostic medicine. *Muscle and Nerve* 2001;(Suppl 10):S1–50.