



EDITORIAL

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# Neuropsychiatric Electrophysiology

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The application of electrophysiological technologies in the investigation, clinical assessment or therapeutic intervention in neuropsychiatric disorders is increasing, as new technologies are introduced in addition to new methodologies being developed for existing technologies. This growing armamentarium requires special expertise in implementation, both in research and clinical endeavors. Probing complex multifactorial neuropsychiatric disorders with electrophysiological technologies has already created a huge volume of literature scattered over an equally large number of venues. Similarly, the clinical application of electrophysiological assessments of neuropsychiatric disorders is a field that remains in its formative stages, with yet to be developed guidelines for standards for recording, indications for obtaining a particular test, and the implications of the test results. Neurophysiological aberrations have been demonstrated in almost all major psychiatric disorders (Pritchep & John, 1992), and given the prevalence of electrophysiological aberrations associated with psychopathology, this new and evolving field has the potential to significantly impact the future practice of clinical psychiatry.

*Neuropsychiatric Electrophysiology (NPEP)* is a new open access journal dedicated to the growing field of neuropsychiatric electrophysiology. The journal will provide a unique venue for clinical and basic science researchers interested in the patho-neurophysiology and mechanisms of symptom development related to the full range of neuropsychiatric disorders.

*NPEP* will be a useful source for educators who are looking to enrich their teaching with the latest advances in the understanding of the neurophysiology of disease, the impact on diagnosis and management as well as the understanding of the rapidly advancing field of neuroevaluative technologies. *NPEP* positions itself to be valuable to the practicing clinicians as it will publish case reports and case series where the advancing technology has impacted the diagnosis and management of actual clinical cases. As an open access journal, *NPEP* will ensure that articles are immediately published upon acceptance, and will provide the necessary rapid and worldwide dissemination necessary for the growth of the field. All articles are archived in PubMed Central, and other freely accessible full-text repositories, complying with the policies of a number of funding bodies including the NIH, Howard Hughes Medical Institute and the Wellcome Trust. Article processing charges (APCs) cover the cost of publication thus allowing the immediate and free dissemination of the accepted article, with no additional charges for color figures, movies or large datasets.

As the prevalence, specificity and sensitivity of the different electrophysiological abnormalities become better defined, more clinical applications are likely to emerge. Electrophysiological measures that have been established as clinically useful, or have the potential to become so, include the standard, visually inspected, EEG (heretofore called standard or sEEG and not to be confused with stereo-EEG, used to invasively identify epileptic foci for surgical purposes), quantified EEG (qEEG), cerebral evoked potentials (EPs) including event-related potentials (ERPs), magnetoencephalography (MEG), and polysomnography (PSG). The sEEG remains the corner stone of this field and the one testing modality with the most established clinical applications (Boutros et al., 2011). In general, all current widely accepted clinical applications fall in the category of identifying medical causes of psychiatric symptoms. This is in marked contrast to differentiating among functional psychiatric disorders appearing on the same differential diagnosis list. A proscribed step-wise approach to translating promising biological findings to clinically useful laboratory tests has been proposed (Arfken et al., 2009) and should be useful in facilitating the field to move closer to the clinical world (Arfken et al., 2014).

The field of neuropsychiatric electrophysiology also encompasses a large and growing range of therapeutic applications. The well established electroconvulsive therapy (ECT) is being joined by transcranial magnetic stimulation (TMS; which has also proven to be a valuable investigative technique of cortical excitation/inhibition), vagal nerve stimulation (VNS), deep brain stimulation (DBS), transcranial direct-current stimulation (tDCS), and magnetic seizure therapy (MST). It is thus our prediction that a psychiatric electrophysiology subspecialty of psychiatry will evolve where physicians are trained on performing and interpreting all of the above technologies for the service of their psychiatry colleagues and psychiatric patients.

With the progressive technological advances in neuroevaluative technology, including electrophysiology recording techniques, the capability of such technology to detect changes occurring in the brain in association with various conditions is ever increasing and promises to revolutionize the practice of clinical psychiatry not in the too far distant future. *NPEP* is an ideal venue for efforts to combine the power of the various techniques within electrophysiology, and between electrophysiology and other disciplines like neuropsychology, neuroimaging or genetics.

Assisted by a highly experienced editorial board (<http://www.npejournal.com/about/edboard>), the aim of *Neuropsychiatric Electrophysiology* is to provide a forum for interdisciplinary research aimed at the integration of knowledge across a number of disciplines ranging from basic cellular and subcellular research to the actual bed side clinical practice. At the core of the mission of *NPEP* is facilitating the translation of replicated and reliable electrophysiological aberrations to diagnostically or prognostically useful laboratory measures. Assessment of available technologies and effort to standardize the conduct of clinical research using this methodology are also central to the mission of *NPEP*.

*NPEP* will also provide an ongoing forum and a medium for rapid communications among clinical investigators regarding varying and contradictory findings in particular populations. This will help move the field of neuropsychiatric electrophysiology forward in a more expedited and grounded fashion into the future where it will become a recognized subspecialty.

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