

Clinical neurophysiology provides a range of important investigations to help in the diagnosis and management of patients with neurological disease. These tests fall into two main areas: the study of brain function (electroencephalography (EEG)), and the study of the peripheral nervous system (nerve conduction studies and electromyography (EMG)). These areas have little in common clinically, but are linked by common approach to measurement of small electrical signals, which in turn has led to them being done in the same laboratory with the same technical staff.

The relation between neurology and neurophysiology varies across the world. In some countries, such as the UK, these are separate but closely related specialties, with only a small number of specialists with a foot in both camps. Neurophysiologists will generally be involved in both EEG and nerve conduction studies and EMG, but not in the clinical management of the patients. In other countries, such as Australia, neurologists with an interest in epilepsy will report EEGs, and those with an interest in neuromuscular disease will do nerve conduction studies and EMG, so that the specialist neurophysiologist's expertise is narrower but linked to their clinical expertise. In other countries the distinction between neurology and neurophysiology does not exist, with neurophysiology being regarded as part of the range of subspecialties expertise that neurologists may develop. This supplement has been designed with neurological trainees in the UK particularly in mind. These trainees will not ordinarily be expected to undertake EEG reporting or nerve conduction and EMG. However, it is essential that they understand what neurophysiology offers, what it can do, and what it cannot do.

EEG is an investigation that was used inappropriately in the past to look for structural disease—for which it is very poorly suited—and as a result was cast aside when better imaging modalities became available. Since then there has been a steady increase in understanding what it can offer in episodic brain disease, especially epilepsy, particularly with the development of videotelemetry and ambulatory EEG recording. The supplement starts with a consideration of the current role for EEG, both in the diagnosis of epilepsy and in other neurological conditions, by Shelagh Smith.

To help you get a flavour of EEG reporting we introduce a new game—"EEG Happy Families"—to give you a chance to match up the EEG with its report and request form.

Evoked potentials are another neurophysiological test whose role has changed. Before magnetic resonance imaging this was an essential adjunct to imaging in the diagnosis of multiple sclerosis. Peter Walsh, Nick Kane, and Stuart Butler consider the current clinical role of evoked potentials. Arup Malik and Andrew Weir introduce nerve conduction studies and highlight potential pitfalls. Kerry Mills introduces EMG, discussing both simple and more advanced techniques. Finally, Geraint Fuller discusses the uses and abuses of nerve conduction studies and EMG and how to get the most out of these investigations.

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