**An electrophysiologic study (EPS)**

An electrophysiologic study (EPS) entails the percutaneous introduction and positioning of multiple special electrode catheters in strategic sites in the heart in order to Record, explore intracardiac sequence of impulse formation and activation, Stimulate and evaluate automaticity, conduction and refractoriness and Initiate, terminate, diagnose and manage arrhythmias.

**Electrophysiological techniques**

There are various techniques available to study and measure the [electromagnetic](https://en.wikipedia.org/wiki/Bioelectromagnetism) signals of the body.[[2]](https://en.wikipedia.org/wiki/Electrophysiological_techniques_for_clinical_diagnosis#cite_note-2) The [brain](https://en.wikipedia.org/wiki/Human_brain), the [heart](https://en.wikipedia.org/wiki/Human_heart) and [skeletal muscles](https://en.wikipedia.org/wiki/Skeletal_muscles) are prime sources of [electric](https://en.wikipedia.org/wiki/Electric_field) and [magnetic fields](https://en.wikipedia.org/wiki/Magnetic_field) that can be recorded and the resulting patterns can give insight on what ailments the subject may have. These electrophysiological techniques are named according to what data is measured and sometimes the [anatomical](https://en.wikipedia.org/wiki/Human_anatomy) location of the sources as follows:

**Electroencephalography (EEG)**

Electroencephalography is the measurement of brain activity through the surface of the scalp.[[3]](https://en.wikipedia.org/wiki/Electrophysiological_techniques_for_clinical_diagnosis#cite_note-3) Electroencephalography data can be processed through [analytical procedures](https://en.wikipedia.org/wiki/Data_analysis) and certain derived summary indices of these analyses are called [quantitative electroencephalography](https://en.wikipedia.org/wiki/Quantitative_electroencephalography) (QEEG).[[4]](https://en.wikipedia.org/wiki/Electrophysiological_techniques_for_clinical_diagnosis#cite_note-4) Data from [evoked potentials](https://en.wikipedia.org/wiki/Evoked_potentials) can also be used processed in certain ways that can be considered quantitative EEG as well. If QEEG data is mapped then it is a topographic QEEG (also known as [brain electrical activity mapping](https://en.wikipedia.org/wiki/Neuroimaging) or BEAM )

**Electrocardiography (EKG)**

The heart is the muscle that pumps oxygenated blood to the whole body. As a very active muscle, it has peculiar electrical activity that can be measured and analyzed. Electrocardiography is the measurement of these signals.

**Electromyography (EMG)**

Electromyography is the measurement and analysis of the electrical activity in skeletal muscles. This technique is useful for diagnosing the health of the muscle tissue and the [nerves](https://en.wikipedia.org/wiki/Nerves) that control them.[[5]](https://en.wikipedia.org/wiki/Electrophysiological_techniques_for_clinical_diagnosis#cite_note-5)

EMG measures action potentials, called Motor Unit Action Potentials (MUAPs), created during muscle contraction. A few common uses are determining whether a muscle is active or inactive during movement (onset of activity), assessing the velocity of nerve conduction, and the amount of force generated during movement. Of these uses, determining the onset of muscle activity has been shown to be the most accurate.[[6]](https://en.wikipedia.org/wiki/Electrophysiological_techniques_for_clinical_diagnosis#cite_note-6)

**Event-related potentials (ERPs)**

The firing of [neurons](https://en.wikipedia.org/wiki/Neuron) throughout the brain has been known to have localized relationships to certain functions, processes and reactions to [stimuli](https://en.wikipedia.org/wiki/Stimulus_%28physiology%29). With proper equipment it is possible to locate where in the brain neurons have been activated and measure their event related potentials. Event-related potentials can be classified as either: sensory, motor or cognitive.[[7]](https://en.wikipedia.org/wiki/Electrophysiological_techniques_for_clinical_diagnosis#cite_note-7)

**Evoked Potentials (EPs)**

Measurement of spontaneous electrophysiological activity does not always provide the desired information from the signals of interest. In such cases, the application of a stimulus to the desired target can produce [transient](https://en.wikipedia.org/wiki/Transient_%28oscillation%29) evoked potentials that can provide further insight not obtained from solely [passive recording](https://en.wikipedia.org/wiki/Electrodiagnosis) methods such as EEG, ECG, EMG or MEG.

**Magnetoencephalography (MEG)**

The measurement of the naturally occurring magnetic fields produced by the brain's electrical activity is called magnetoencephalography. This method differs from [magnetic resonance imaging](https://en.wikipedia.org/wiki/Mri) in that it passively measures the magnetic fields without altering the body's [magnetization](https://en.wikipedia.org/wiki/Nuclear_magnetic_moment). However, data from MEG and MRI can be combined to create images that approximately map the estimated location of the natural magnetic fields. This composite imaging process is called [magnetic source imaging](https://en.wikipedia.org/wiki/Magnetoencephalography#Magnetic_source_imaging) (MSI).