

# Potential

This article was checked by pedagogue



This article was checked by pedagogue, but more than year ago.

Signature: Carmeljcaruana (talk)



## Electrical Potential

### Introduction

An electric potential AT A POINT IN A FIELD is the amount of electric potential energy that a POSITIVE unitary point electric charge would have if located at THAT point in THE FIELD.

This can simply be looked at as the stored energy a charged particle has by being in a certain location in an electric field.

### Its Importance in Clinical Medicine

Electric potential has a great importance in clinical medicine by helping in diagnosis and treatment of disease. FOR EXAMPLE THE ELECTRICAL ACTIVITY OF THE HEART PRODUCES A POTENTIAL FIELD AROUND IT. MEASUREMENT OF THIS Electric potential is IMPORTANT in electrocardiography. SIMILARLY IN electroencephalography and electroretinography.

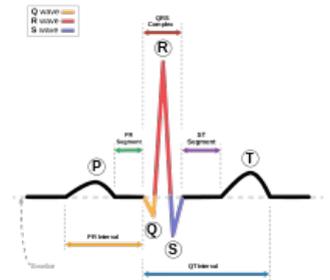
Electrocardiography (ECG) is a process in which the electric POTENTIAL of the heart is recorded over a period of time using electrodes which are places on the body of the patient. The electrodes detect changes OF POTENTIAL on the skin which are due to depolarization of the heart muscle. Electrocardiography at present has no risks, however there may be some heart conditions that can go unnoticed as they don't produce any specific ECG changes.

Electroencephalography (EEG) is a method which measures the electric POTENTIAL of the brain using electrodes. The electrodes are normally non-invasive and placed ON the scalp however in specific circumstances, invasive electrodes are used. The uses of EEG are mainly diagnostic in clinical medicine e.g. epilepsy, sleep disorders, coma etc. One example of this is in the diagnosis of epilepsy which uses EEG, where epilepsy is detected by the occurrence of abnormalities in the readings.

Electroencephalography has its benefits by providing good temporal resolution. However, a slight disadvantage to this is that provides poor spatial resolution so identifying where the activity is coming from in the brain is not very precise.

Electroretinography (ERG) is a way of measuring the electrical responses of different types of cells in the retina. This method also uses electrodes which are placed usually on the cornea and the skin near the eye. During this process, the patients eyes will be exposed to stimuli and the results of the electrical activity from the stimuli are recorded.

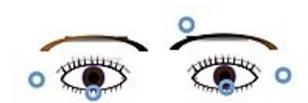
Electroretinography has its pros with being non-invasive and being cost-effective in diagnosis. However it has its cons too, where there is the possibility of error in the accuracy of the results due to other affecting factors and there is also the risk of obtaining a disease due to poor sanitation of the equipment.



SinusRhythmLabels



Spike-waves



ERG-placement-of-electrodes

### Conclusion

Relating back to the point earlier on, the use of electric potential in clinical medicine is vital and especially in diagnosis of disease. The three methods which were talked about above are used in diagnosis by trained professionals to identify a disease by the abnormalities on recorded electric activity. The detection allows further necessary steps to be carried to treat the patient. Further development of the methods is taking place to improve results and to ensure that diseases don't go undetected.

## References

1. The Electroretinogram: ERG by Ido Perlman (<http://webvision.med.utah.edu/book/electrophysiology/the-electroretinogram-erg/#The%20origin%20of%20the%20major%20ERG%20waves>)
2. Electrocardiography - Surgery Encyclopedia (<http://www.surgeryencyclopedia.com/Ce-Fi/Electrocardiography.html>)
3. Electroencephalography - Britannica (<http://www.britannica.com/science/electroencephalography>)