كلية المستقبل الجامعة
قسم الفيزياء الطبية
المرحلة الرابعة

Medical Physics

Neurophysics

Lecture 6

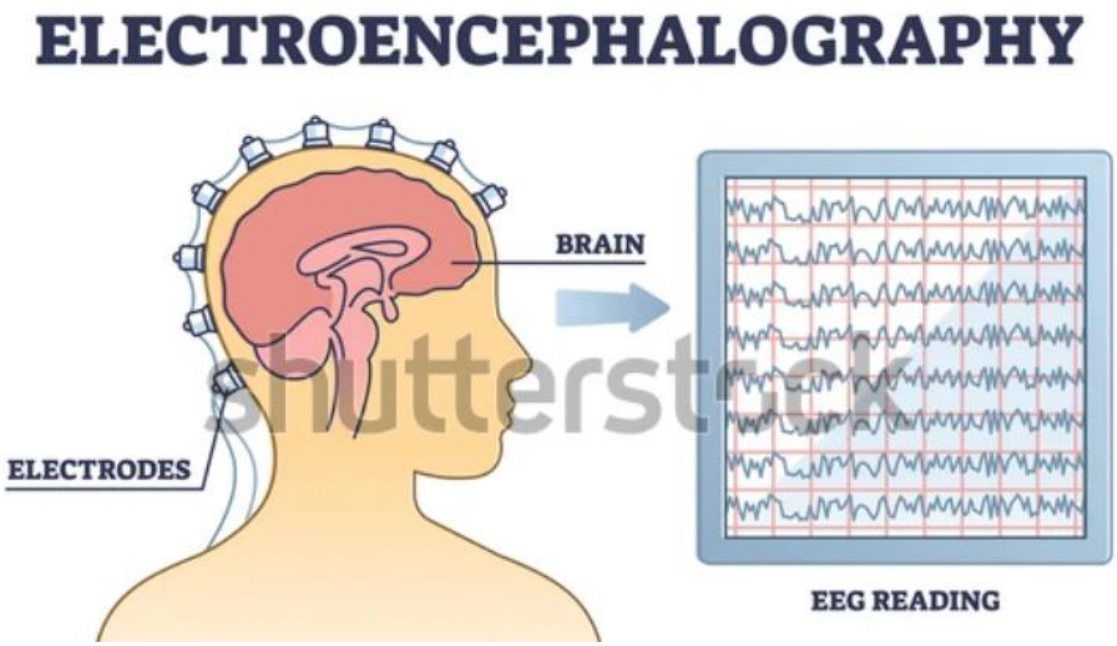
Lecturer: Mohammed Salih

Neurological Disease Detection Devices :

Electroencephalogram (EEG):

An EEG is a test that detects abnormalities in brain waves, or in the electrical activity of brain. During the procedure, electrodes consisting of small metal discs with thin wires are pasted onto scalp. The electrodes detect tiny electrical charges that result from the activity of brain cells.

The charges are amplified and appear as a graph on a computer screen, or as a recording that may be printed out on paper .



An EEG is one of the main diagnostic tests for epilepsy, can also play a role in diagnosing other brain disorders .

An EEG might also be used to confirm brain death in someone in a persistent coma. A continuous EEG is used to help find the right level of anesthesia for someone in a medically induced coma .

Test Requirements of EEG :

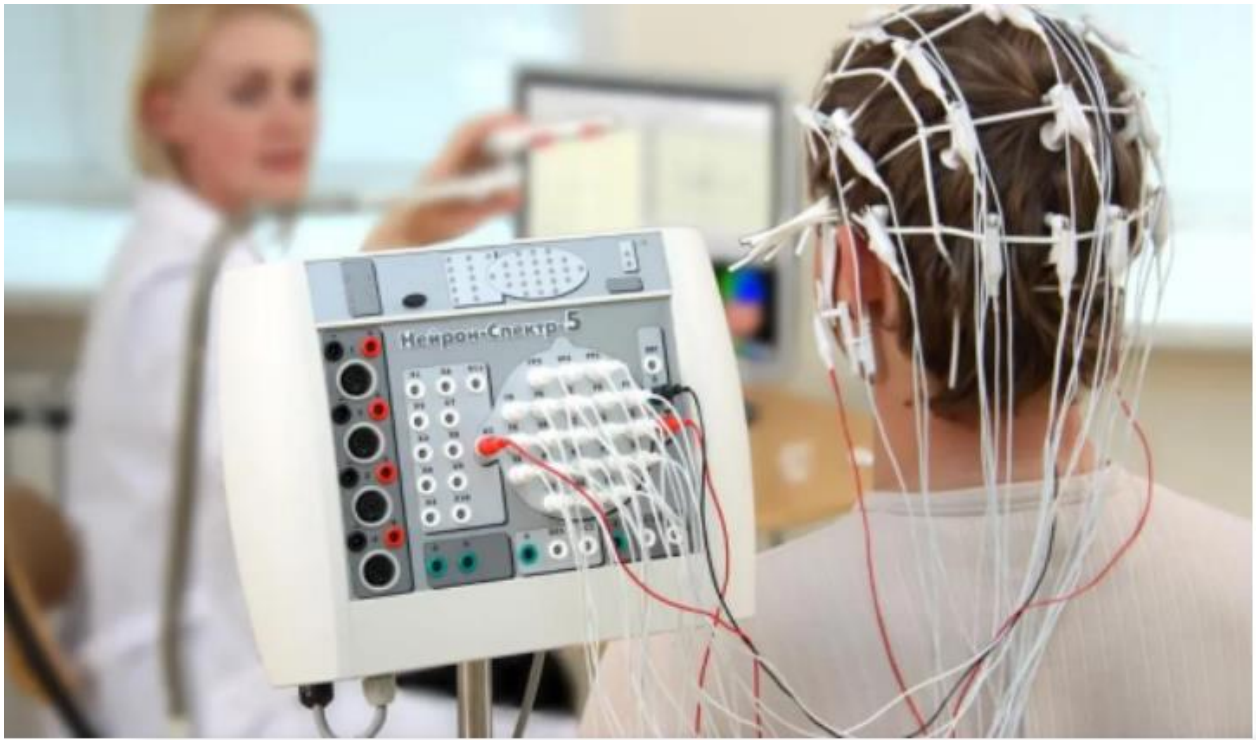
1-Wash hair with shampoo, but do not use a conditioner the night before the test. Do not use any hair care products, such as hairspray or gels .

2- Tell healthcare provider of all drugs and herbal supplements that are taking .

3- Avoid consuming any food or drinks containing caffeine for 8 to 12 hours before the test .

4- Avoid fasting the night before or the day of the procedure. Low blood sugar may influence the results .

5- If the EEG is to be done during sleep, adults may not be allowed to sleep more than 4 or 5 hours the night before the test.



Mechanism of EEG :

1- Must be to relax in a chair or lie on a bed and close eyes.

2- Between 16 and 25 electrodes will be attached to scalp with a special paste, or a cap containing the electrodes will be used.

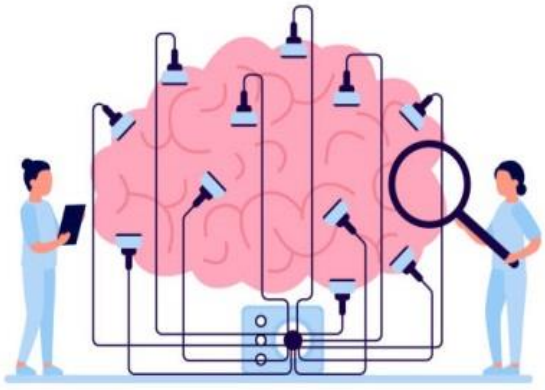
3- Once the recording begins, will need to remain still throughout the test. The recording may be stopped periodically to let you rest or reposition yourself.

4- May be test with various stimuli to produce brain wave activity that does not show up while you are resting. For example, you may be asked to breathe deeply and rapidly for 3 minutes, or you may be exposed to a bright flashing light .

5- This study is generally done by an EEG technician and may take approximately 45 minutes to 2 hours.

Factors Effecting on EEG Reading :

Several types of movements Trusted Source can potentially cause on an EEG recording that mimic brain waves. The person responsible for interpreting your EEG will take these movements into account. They include :



- Pulse and heartbeat .
- Oily hair or hair spray .
- Muscle movements .
- Low blood sugar .
- Some medications, such as sedatives .

When Use An EEG :

An EEG can determine changes in brain activity that might be useful in diagnosing brain disorders, especially epilepsy or another seizure disorder. An EEG might also be helpful for diagnosing or treating the following disorders :

- Brain tumor .

- Brain damage from head injury .

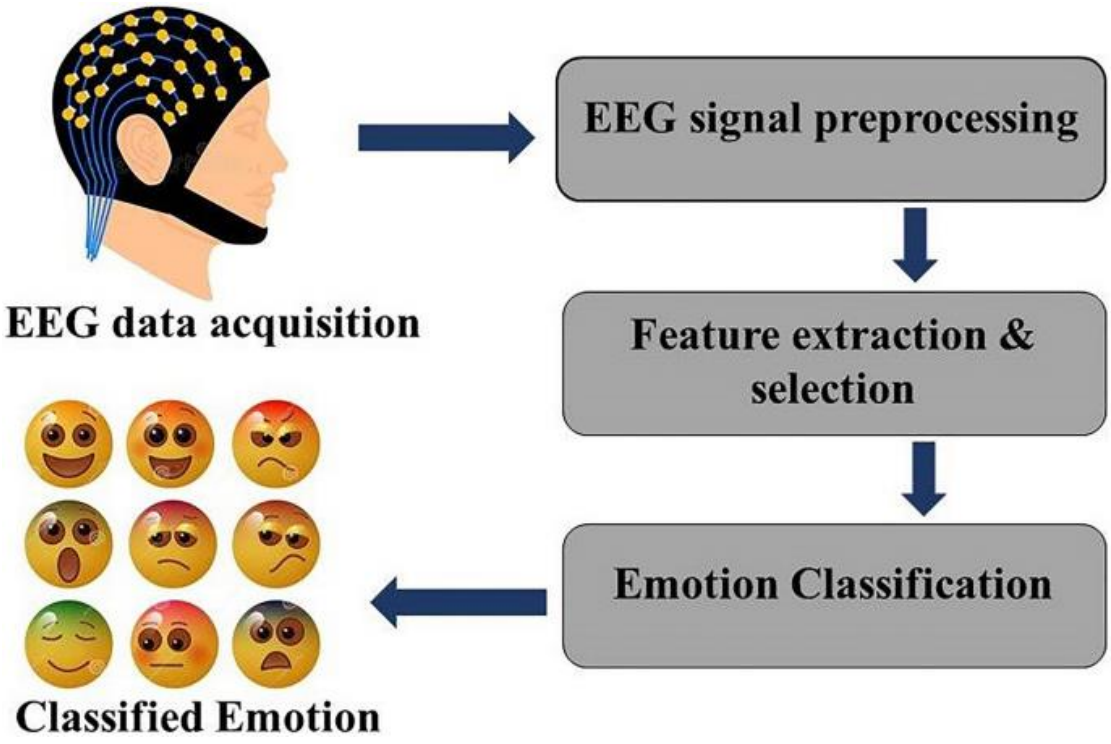
- Brain dysfunction that can have a variety of causes .

- Inflammation of the brain .

- Stroke .

- Sleep disorders .

An EEG might also be used to confirm brain death in someone in a persistent coma. A continuous EEG is used to help find the right level of anesthesia for someone in a medically induced coma .

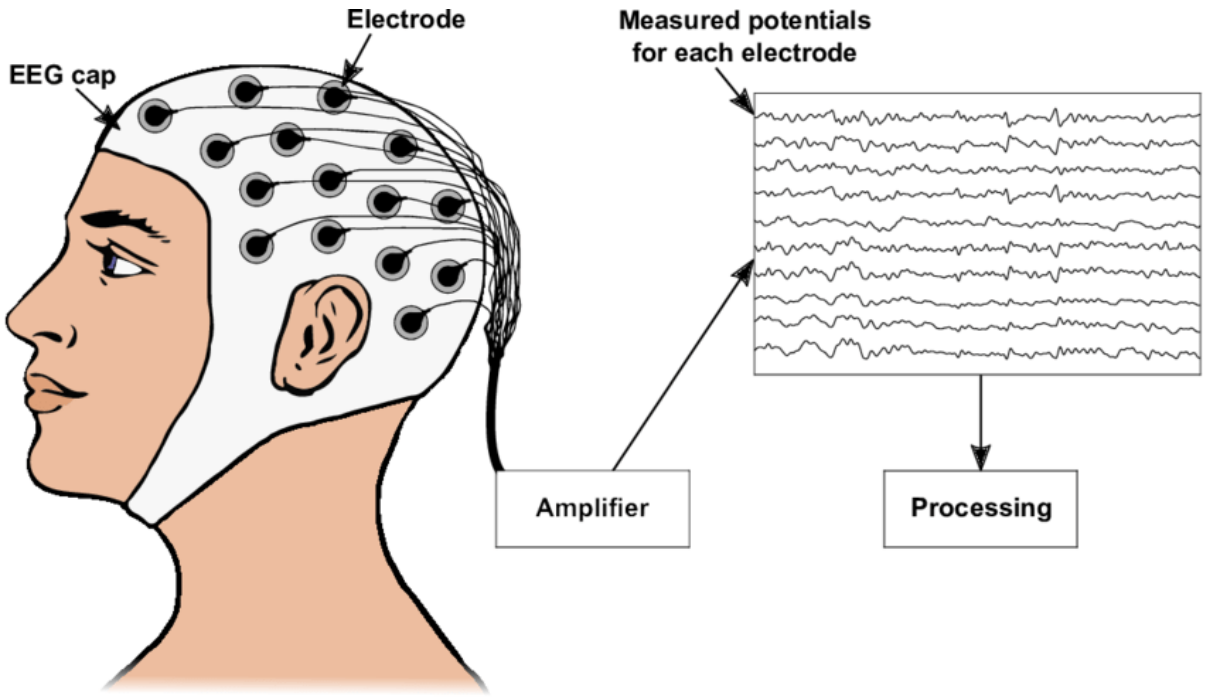


How Does Work EEG :

A technician measures your head and marks your scalp with a special pencil to indicate where to attach the electrodes. Those spots on your scalp might be scrubbed with a gritty cream to improve the quality of the recording .

A technician attaches discs (electrodes) to your scalp using a special adhesive. Sometimes, an elastic cap fitted with electrodes is used instead. The electrodes are connected with wires to an instrument that amplifies the brain waves and records them on computer equipment .

Once the electrodes are in place, an EEG typically takes up to 60 minutes. Testing for certain conditions require you to sleep during the test. In that case, the test can be longer .



Risks of EEG : There's a slight risk that the flashing lights and deep breathing of the EEG could bring on a seizure .