

1. Intro to EEG:- The way the electrodes are applied on head and displayed are based on 10-20 international system. The numbers of the electrodes are a measure of the distance from the centre and represent the position (also the letters represent position) with respect to centre either left (odd on left) or right (even on right). The signal is recorded as a difference between the readings of two electrodes. The EEG signal is displayed as montages ex- bipolar montage, common average reference montage. Focal epileptiform discharge can be detected in the EEG readings of the person suffering from epilepsy and the diagnostic yield of detecting it depends on the time after which the EEG is recorded after first seizure.

2. Polarity:- In a channel between two inputs if there is an upward deflection then input 1 is negative w.r.t input 2 or input 2 is positive w.r.t input 1 and for downward deflection vice versa. If two channel shows that a particular electrode is negative or positive overall then it is the case of phase reversal.

3. Eye Movement:- The retina is relatively electronegative and the cornea is relatively electropositive.

When an eye blinks then the cornea moves up and the electrodes above it will reflect a positive charge while away from it will reflect a less positive charge and hence the blinking of eye can be detected.

During horizontal movement of eye as both the eyes move on the same side the plates on one side gets positive charge (specifically F7 for left horizontal movement) while the other gets negative charge (F8 for left movement) and before eye movement the lateral rectus moves having negative charge hence a negative spike is visible initially in the direction of movement.

4. EEG montages:- Anterior-Posterior Bipolar Montage, Transverse Bipolar Montage, Common Reference Montage in which a common plate is fixed and the readings are taken w.r.t that reference (ex-Cz reference montage, Ipsilateral Mastoid, Contralateral Mastoid), Common Average reference Montage.

Reference contamination if an electric charge is strong and confined in a small area then the average gets inclined towards that charge and hence all other electrodes will produce a channel showing them of opposite charge thus misleading the data.

Laplace Montage-In this we compare the electrode position with respect to its nearest neighbours but it has some limitations if the field involves a large area because as it compares to very nearest neighbours there may not be much difference between the electrodes hence deflecting the result.

5. Technical Issues:- Delta – less than 4 Hz, Theta-4 to 7 Hz, Alpha 8 to 13 Hz, Beta – more than 13 Hz and Gamma More than 30 Hz. Low frequency filter there is not 100 % cut off at the specific frequency it depends on the manufacturer of the filter same as case with high frequency filter.

Notch filter in this at specific frequency slightly above and below frequencies are removed and is used in cases where there can be disturbances from a certain frequency like there can be disturbance from the computers which operate on 60 Hz hence notch filter is useful.

6. Normal Awake:- Sensitivity – a measure of amplitude per mm, The alpha rhythm gets blocked when eyes open and continues when eyes closed. General Characteristics of Alpha Rhythm-

1. 8.5 to 12 Hz in most individuals
2. Fairly constant in an individual
- Can slow down in drowsiness

-Can slow down with older age

3. Reaches peak frequency in adolescence/early adulthood

Alpha Squeak- After eye close there is a high frequency in posterior region before returning to normal frequency.

Lambda Wave-In the posterior head region they are configured as two phases superficially, they represent Greek letter lambda ,they are electropositive wave forms and are more prominent when eyes are open.

Mu Rhythm- Arc Shaped, represent Greek symbol Mu ,Prominent when limbs are at rest, Blocked by movement(or thinking of movement) contralateral limb and also prominent when eyes are open as eyes closed the alpha rhythm blocks them.