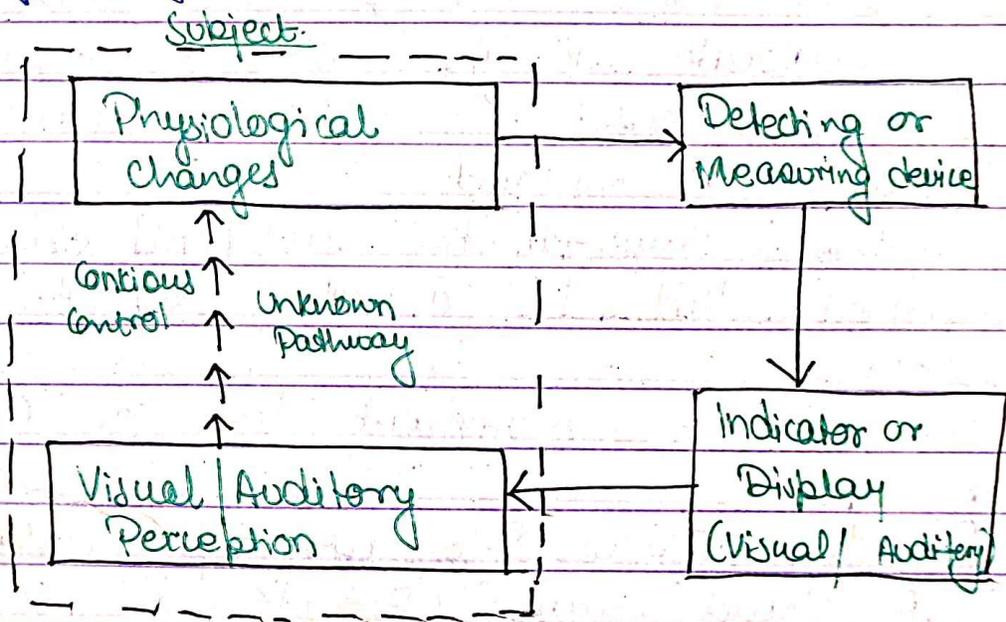


# BIO-FEEDBACK

A technique to reveal to human being some of their internal physiological events normal & abnormal in the form of visual & auditory signals in order to teach them to manipulate these otherwise involuntary or unfailed events by manipulating the displayed signals.

## Principle



- The concept of biofeedback is expressed in principle by the bio-feedback loop.
- The physiological changes are detected or measured by some device  
eg - The skin temp. is displayed on a digital indicator
- The subject perceives the information about the physiological function & makes conscious

attempts to alter it.  
→ A neuronal pathway & are involved is not known.

## Uses Of Biofeedback

Biofeedback is used for 2 main purpose

1. For the control of muscle activity & movement
2. for the control of stress related conditions

## Control of Muscle Activity And Movement

- To re-educate activity or wt. bearing  
̄ pressure sensor — control of movement by pressure measurement.
- In the myo-electric artificial limb, the artificial limb is controlled by the EMG activity.
- To re-educate movement lost in CVA patients.
- for the control of spasticity in case of CVA, head injury, CP etc.
- for the control of movement in dystonic disorders.  
for eg → spasmodic Torticollis.
- To re-educate specific muscle activity in case of trauma to a muscle or its attachment tendon or muscle transplant.
- for postural control in & head post<sup>n</sup> trainers are used.

## Control of stress Related Conditions

In this condition relaxation is beneficial & biofeedback provides the means & motivation for the continued practice of relaxation. It involves control of autonomic nervous system.

- for muscle relaxation & pain relief in tension headache.
- for BP control in hypertension.
- for HR control in arrhythmias
- for vasodilation of hand in case of Raynaud's disease.

## Technique Of Application Of EMG - Biofeedback.

### → Preparation Of Apparatus

Instruments for providing EMG Biofeedback vary in complexity. It may range from simplest one i.e. give only arranged meter unit response on a meter. The more complex machines allow changes in sensitivity from showing single meter unit response to those coupled with computing facilities & chart recorders. i.e. provide a permanent record of each training session.

Source of Interference like SWD & other electric field should be kept away.

Silver or AgCl (silver chloride) electrodes are used.

→ Preparat<sup>n</sup> of Patient.

→ Posit<sup>n</sup> of pt. depends on the aim of treatment, if relaxat<sup>n</sup> is attempted the body must be fully supported in lying or half-lying posit<sup>n</sup>.

→ If mov. is attempted the pt. is fashioned so that the particular mov. can occur unhindered & be visible to the pt.

→ The skin must be cleaned w<sup>th</sup> an alcohol wie & ~~sterilise~~ saline gel smeared b/w the skin & electrodes.

→ The electrode s/b fixed firmly in place w<sup>th</sup> sticking tape because mov. over the skin will lead to interference.

→ The positioning of electrode depends on the muscle involved usually over the belly of muscle or the point where it is most superficial.

→ Treatment

→ A full explanat<sup>n</sup> of the purpose of the treatment & what is expected of the pt. is given. The need to remain still is emphasised.

→ The training session consist of series of

attempts by the patient

→ The therapist encourages the patient verbally & suggest activities  $\leq$  may lead to desired muscle contract<sup>n</sup>.

→ As the voluntary control of ms. contract<sup>n</sup> improves, the sensitivity of device c/b gradually reduced to provide a new goal to the patient.

→ If relaxat<sup>n</sup> is the aim then sensitivity  $\uparrow$  as the pt. improves.

→ In case of spasticity once the motor unit activity in the muscle at rest is under control the pt. attempts to reduce the electrical activity in the muscle during various degrees & rate of stretch.

→ Long treatment session s/b avoided as the pt. has to concentrate hard during the treatment session.