

# BIOFEEDBACK

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# INTRODUCTION

- **Definition:** It is a process which enables an individual to learn how to change physiological activity for the purpose of improving health and performance through the signals of body.

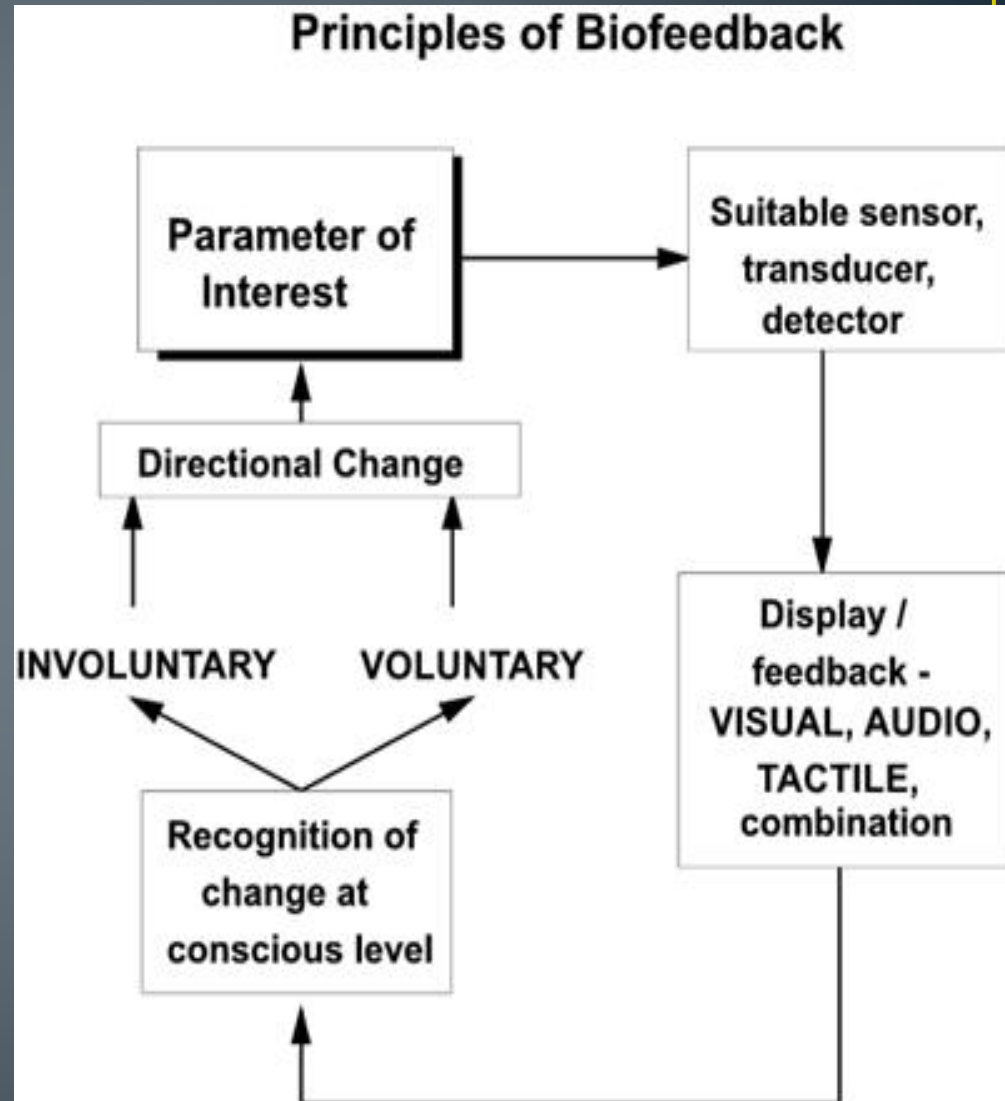
- It is a technique which enables the individual to readily determine the activity levels of a particular physiological process, and with appropriate training, learn to manipulate the same process.

- **Father of Biofeedback: John Basmajian.**

1. Oonagh M Giggins.et.al; Biofeedback in Rehabilitation; J Neuroeng Rehabil. 2013, Jun 18; 10:60.
2. Ana Secic.et.al; Biofeedabck training and tension type headache; Acta Clin Croat. 2016 Mar;55(1): 156-160.
3. Elizabeth Barba.et.al; Randomized, Placebo-Control led trial of biofeedback for the treatment of rumination; Am J Gastroenterol. 2016 Jul; 111(7).
4. Selcan Arpa.et.al; Does electromyographic biofeedback improve exercise effects in hemiplegic patients? A pilot randomized controlled trial; J Rehabil Med. 2019, Feb 1;51(2).

# PRINCIPLE

- Based on principle of motor learning.
- Intrinsic and extrinsic feedback mechanisms play key roles.
- Knowledge about one's performance and ability is the mainstay.



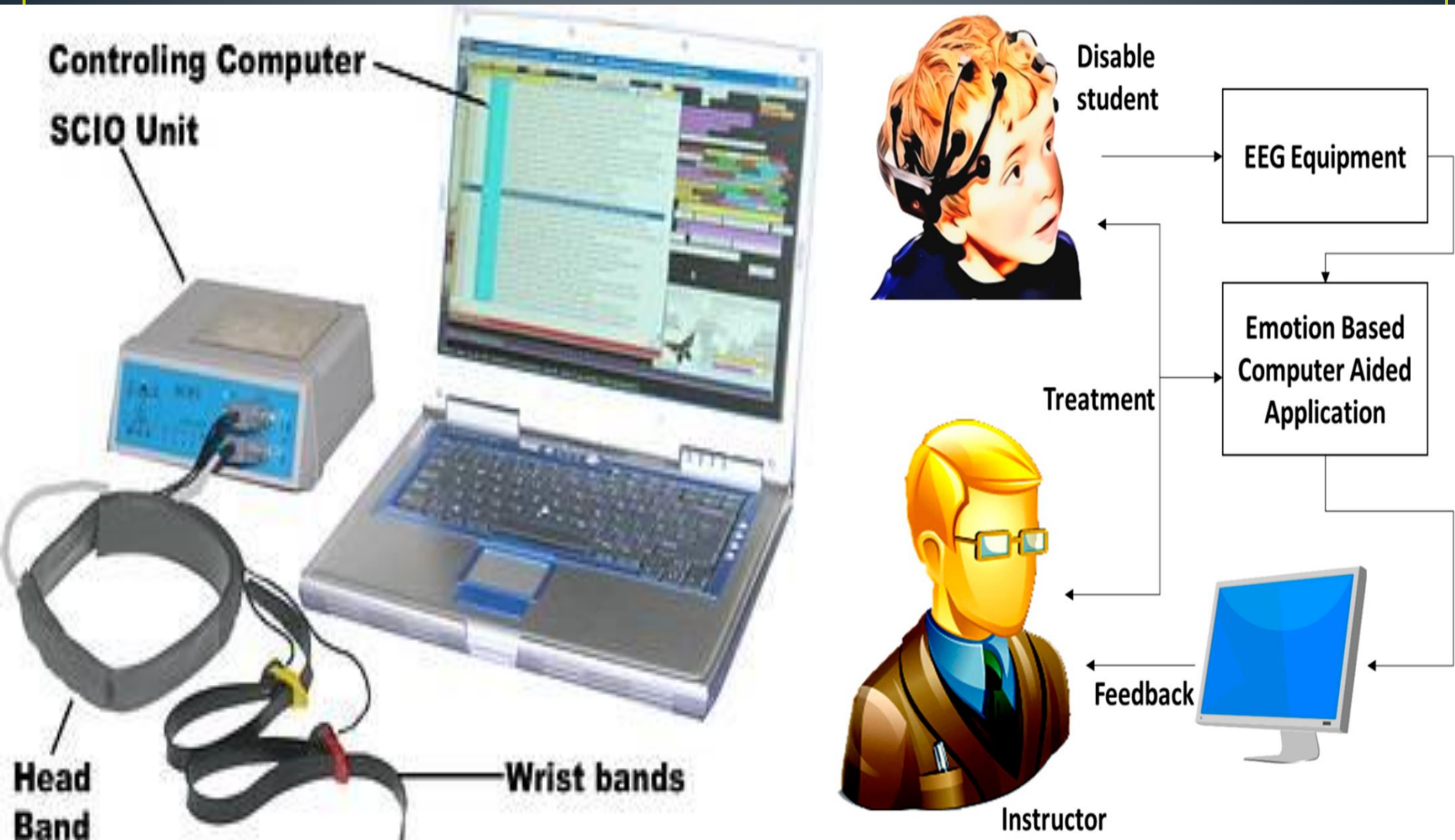
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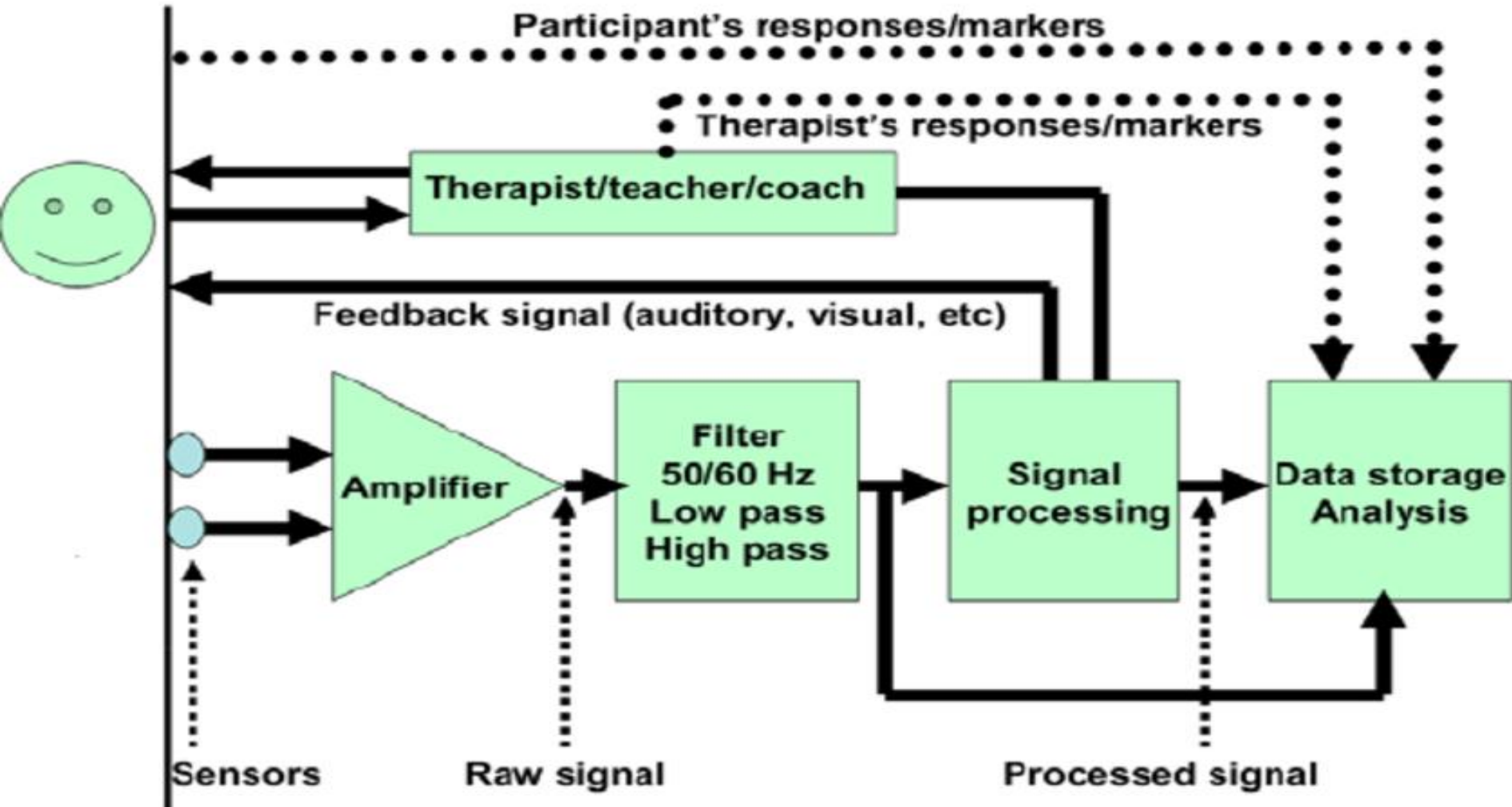
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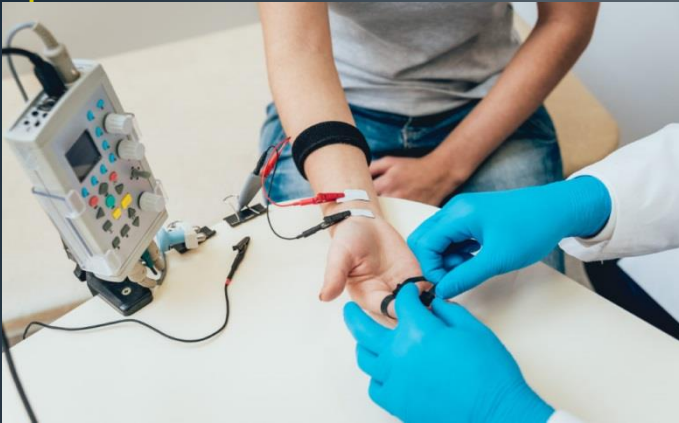
# BIOFEEDBACK EQUIPMENT



# PROCEDURE



# TYPES OF BIOFEEDBACK



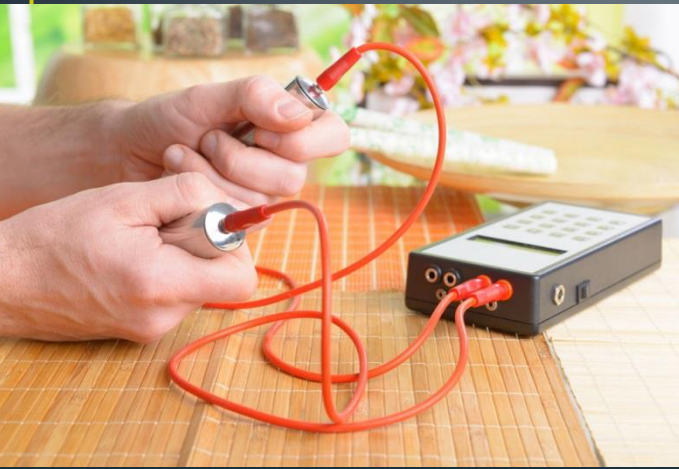
**Electromyography**



**Feedback Thermometer**



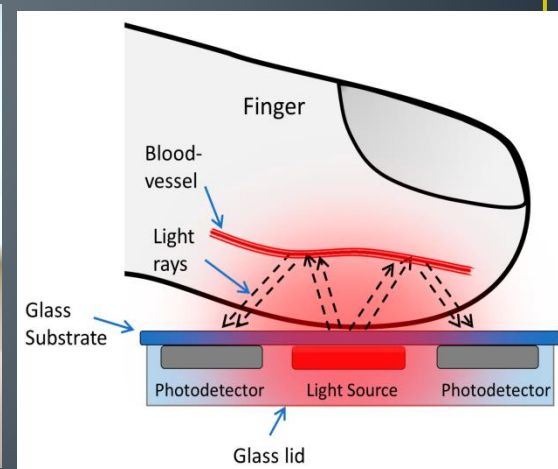
**Feedback Goniometer**



**Electrodermograph**



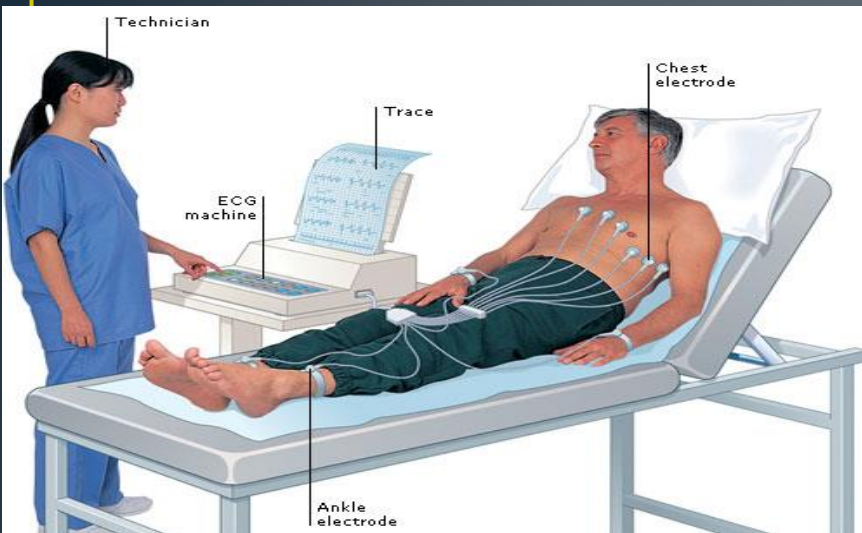
**Electroencephalography**



**Photoplethysmography**

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**Electrocardiogram**



**Pneumography**



**Capnometer**

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# INDICATIONS

**To overcome synergies developed by patients.**

**To reduce spasticity in patients and inhibit dynamic stretches which increase spasticity.**

**Improve muscle activity of paralyzed muscle**

**For muscle recruitment**

**In patients with facial paralysis**

**In vestibular rehabilitation**

**Balance training in geriatric, ataxic patients**

**Induce voluntary movements in incomplete Spinal cord injury patients**

**Recruitment of weak muscles**

**Neurological anomalies like SCI, TBI, hemiparesis, hemiplegia, etc.**

**Chronic pain**

**Urinary and fecal incontinence**



# CONTRA-INDICATIONS

Unhealed tendon grafts, avulsed tendons

Dermatological conditions like eczema, dermatitis

Unstable fracture and 3<sup>rd</sup> degree muscle tear

Patients unable to follow and execute commands

Allergy to electrode material and gel used

Patients with pacemakers

# ADVANTAGES AND DISADVANTAGES

## ADVANTAGES

- Allows small changes attempted by patients to correct their anomalies.
- Rectifies patient's wrong perception about the movements being followed by them.
- Motivate and encourage patients.
- Reduces depression and encourages positive practice attitudes.
- Increases self efficiency and confidence.
- Allows self administered treatment procedures which can be continued even in therapist's absence.
- Gives real time experience and results
- Can be used as a record for cumulating further improvement in patient's condition.

## DISADVANTAGES

- It is an expensive procedure
- It is prolonged and time taking because the intervention.
- Requires proper training of normal and abnormal movements and their diagnosis.
- Often a painful procedure.
- It could lead to infections.
- Not an independent outcome, requires proper outcome screening along with it.
- Not feasible at all set up or centers.

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# PRECAUTIONS

Skin sensation should be intact at the level of application.



Proper care to be taken while treating epileptic patients



Open wounds and scars should be checked before intervention.

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**THANK YOU**