

Biofeedback is a treatment technique in which people are trained to improve their health by using signals from their own bodies. Electric impulses generated by the brain are read by electrodes which are placed on the body depending on what kind of biofeedback is desired. These impulses are read by the computer which then feeds the information back to the user in the form of audio or visual signals, often in the form of a game or challenge. If the user is able to produce the correct wave forms then they are able to control the computer output. Using this feedback, a patient learns how to control their brainwaves to produce a desired outcome.



There are many different types of biofeedback among them: **Electromyogram (EMG)**, this type of biofeedback measures muscle tension. Two electrodes are placed on the desired muscle to monitor. This machine is capable of helping rehabilitate patients paralyzed by stroke because it is often able to detect slight electrical activity still present in the muscle and allows the user to focus on and augment this activity and eventually cause more nerve endings to grow in the affected muscles. But mainly EMG is used to help patients learn to relax their muscles. EMG has been used to treat tension headaches, backache, neck pain, Bruxism and stress related illnesses like asthma and ulcers. **Galvanic Skin Response (GSR) or Electrodermal Response (EDR)**, measures the electrical conductance in the skin associated with the activity of the sweat glands. This method runs a very slight current through the patient's skin in order to measure changes in the salt and water in the sweat gland ducts. The more emotionally aroused the patient becomes, the more active the sweat glands become and the greater the electrical conductivity of the skin. Hence, this form of biofeedback is useful in treating phobias, anxiety, excessive sweating, and sometimes stuttering. It can also be used as a lie detection test. **Temperature Biofeedback** monitors skin temperature. Generally, a

sensor is attached to the foot or to the middle or small finger on the dominant hand of the patient. If the patient is tense or anxious their skin temperature will drop. This method is also useful in learning how to manage stress and promote relaxation. It also may reduce the frequency of migraine headaches. **Electroencephalogram (EEG)** monitors brain wave activity. This method is used in a variety of ways since the brain emits different electrical signals of varying frequencies. For example, in the treatment of AD/HD the patient would like to increase the activity of the Beta waves (responsible for conscious thinking) versus a patient being treated for insomnia or epilepsy who would aim to increase their alpha wave activity (responsible for trance-like thinking). It is hoped that in the future this method will become more refined and applied to more neurological diseases. Other forms of biofeedback include machines that monitor heart rate and blood pressure.

Biofeedback is useful for many reasons. It enhances the ability of the patient to access and maintain various states of physiological arousal; meaning that the patient is more capable of controlling muscle groups. It also enhances and supports the mechanisms through which the brain manages cortical hyperexcitability (the part of the brain responsible for receiving and processing sensory information). This reduces stress and promotes relaxation. It also allows the patient to reinforce equilibrium states, or homeostasis which translates into a more relaxed state of mind. Patients also noticed improvements in finishing tasks, listening better, less impulsiveness, higher motivation, focus and self esteem.

Prices of the systems vary depending on what kind of a system you want to buy. Systems that focus on one area only, such as temperature, generally cost less. Prices range anywhere from \$150 for a simple one input computer program to \$7,000 for a complex multi tasking system. The cost of therapy widely varies and can be anywhere from \$50 to \$100 a session at 2 to 3 sessions a week for approximately 50 sessions depending on the severity of the case.

Bibliography:

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