

# Biofeedback for Sleep Disorders

## **What is biofeedback and what exactly happens in the biofeedback clinic?**

Biofeedback is a technique in which a patient is trained to improve his or her health by developing a greater awareness and voluntary control over the physiological processes affected by stress. Using a computer, special software, and sensors placed on the body, stress levels are recorded and the patient can learn to control normally involuntary processes such as heart rate, blood pressure, and muscle tension that increase under stress. The machine "feeds back" the efforts and eventually patients will not only be able to recognize the stress but also relieve the stress and relax.

Depending on the type of technique used, the level of stress and anxiety are measured by placing electrodes or sensors on the scalp, forehead, around the chest and abdomen, fingertips, etc that record biological signals. Patients can hear, see, and measure the stress levels and learn to relax. The therapist acts as a coach by teaching patients how to relax, thereby further reducing stress and anxiety. Relaxation is the key component in biofeedback.

The most commonly used forms of treatment are EMG biofeedback, respiratory biofeedback, thermal biofeedback and neurofeedback.

The following is a brief overview of different sessions. However, not all patients require all of these sessions. A decision is made on the number and type of sessions at the end of the first session based on various factors including the stress/anxiety levels, ability of the patient to relax, the patient's motivation to change, etc.

### **Session I:**

- Introduction to biofeedback
- Equipment review with patient
- Goal setting

### **Session II:**

- Progress review
- Respiratory biofeedback

### **Session III:**

- Progress review
- EMG biofeedback

### **Session IV:**

- Progress review
- Neurofeedback

### **Session V:**

- Progress review
- Combination of EMG, respiratory and neurofeedback
- Plan for "booster sessions," if necessary

**Where and who offers biofeedback treatment?**

Biofeedback treatment is offered at the Sleep Center by a Psychologist trained in biofeedback.

Biofeedback at the sleep center may be considered a treatment option for the following problems:

- Patients with insomnia associated with anxiety accompanied by muscle tension, an inability to relax, racing thoughts, etc
- Patients who cannot tolerate continuous positive airway pressure (CPAP) for sleep apnea because of anxiety/claustrophobia
- Patients with generalized anxiety disorder, panic disorder associated with insomnia, sleep apnea, or other sleep disorders

**Types of Biofeedback**

**EMG biofeedback:** Also known as electromyography biofeedback, this form of biofeedback measures the tension in muscles. Typically, sensors are placed over the forehead or the neck muscles although any group of muscles can be tested. The sensors determine muscle tension, which is displayed on the computer screen. The goal of EMG biofeedback is to help patients not only realize the level of stress/tension they are carrying in their muscles, but also learn how to relax and get rid of the stress.

**Respiratory biofeedback:** The breathing pattern of patients who are anxious or stressed is often shallow and rapid. Upper chest and neck muscles tend to be used to breathe instead of abdominal muscles. With respiratory biofeedback, belts with sensors are placed around the chest and the abdomen and the breathing pattern is visualized on the computer screen. The therapist teaches patients how to relax, breath using abdomen muscles, and also breath slowly and deeply to alleviate the anxiety.

**Neurofeedback:** The electrical activity in the brain reflects the state of the mind. Patients who are very anxious or stressed with racing thoughts are very alert and find it hard to relax. This is reflected in the form of fast brain activity. In neurofeedback, sensors are placed on the head and the patients can see for themselves how the electrical activity changes from fast to slow waves, as they relax. Here, again the therapist teaches patients how to relax and get rid of the stress by using this biofeedback technique.

**Thermal biofeedback:** Skin temperature of the hands and feet vary according to the activation of the sympathetic nervous system. High activation (stress response) produces cool or cold skin, low activation (relaxation response) results in warm skin temperature. With this type of biofeedback, temperature measuring sensors are attached to the fingers of the dominant hand. A digital readout of temperature, similar to the readout of the time given by a digital watch, is displayed. There is also a sound that rises in pitch as the temperature increases. As with the other types of biofeedback, the therapist helps patients learn to control their stress, using skin temperature as a monitoring tool.

**Resources:**

*The Cleveland Clinic Guide to Sleep Disorders* by Nancy Foldvary-Schaefer, DO