

What is Biofeedback?

Biofeedback is a treatment technique in which people are trained to improve their health by using signals from their own bodies. Physical therapists use biofeedback to help stroke victims regain movement in paralyzed muscles. Psychologists use it to help tense and anxious clients learn to relax. Specialists in many different fields use biofeedback to help their patients cope with pain.

Chances are you have used biofeedback yourself. You've used it if you have ever taken your temperature or stepped on a scale. The thermometer tells you whether you're running a fever, the scale whether you've gained weight. Both devices "feed back" information about your body's condition. Armed with this information, you can take steps you've learned to improve the condition. When you're running a fever, you go to bed and drink plenty of fluids. When you've gained weight, you resolve to eat less and sometimes you do.

Clinicians rely on complicated biofeedback machines in somewhat the same way that you rely on your scale or thermometer. Their machines can detect a person's internal bodily functions with far greater sensitivity and precision than a person can alone. This information may be valuable. Both patients and therapists use it to gauge and direct the progress of treatment.

For patients, the biofeedback machine acts as a kind of sixth sense which allows them to "see" or "hear" activity inside their bodies. One commonly used type of machine, for example, picks up electrical signals in the muscles. It translates these signals into a form that patients can detect: It triggers a flashing light bulb, perhaps, or activates a beeper every time muscles grow more tense. If patients want to relax tense muscles, they try to slow down the flashing or beeping.

Like a pitcher learning to throw a ball across a home plate, the biofeedback trainee, in an attempt to improve a skill, monitors the performance. When a pitch is off the mark, the ballplayer adjusts the delivery so that he performs better the next time he tries. When the light flashes or the beeper beeps too often, the biofeedback trainee makes internal adjustments which alter the signals. The biofeedback therapist acts as a coach, standing at the sidelines setting goals and limits on what to expect and giving hints on how to improve performance.

The Beginnings of Biofeedback

The word "biofeedback" was coined in the late 1960s to describe laboratory procedures then being used to train experimental research subjects to alter brain activity, blood pressure, heart rate, and other bodily functions that normally are not controlled voluntarily. At the time, many scientists looked forward to the day when biofeedback would give us a major degree of control over our bodies. They thought, for instance, that we might be able to "will" ourselves to be more creative by changing the patterns of our brainwaves. Some believed that biofeedback would one day make it possible to do away with drug treatments that often cause uncomfortable side effects in patients with high blood pressure and other serious conditions.

Today, most scientists agree that such high hopes were not realistic. Research has demonstrated that biofeedback can help in the treatment of many diseases and painful conditions. It has shown that we have more control over so-called involuntary bodily function than we once thought possible. But it has also shown that nature limits the extent of such control. Scientists are now trying to determine just how much voluntary control we can exert.

How is Biofeedback Used Today?

Clinical biofeedback techniques that grew out of the early laboratory procedures are now widely used to treat an ever-lengthening list of conditions. These include:

- Migraine headaches, tension headaches, and many other types of pain
- Disorders of the digestive system
- High blood pressure and its opposite, low blood pressure
- Cardiac arrhythmias (abnormalities, sometimes dangerous, in the rhythm of the heartbeat)
- Raynaud's disease (a circulatory disorder that causes uncomfortably cold hands)
- Epilepsy
- Paralysis and other movement disorders

Specialists who provide biofeedback training range from psychiatrists and psychologists to dentists, internists, nurses, and physical therapists. Most rely on many other techniques in addition to biofeedback. Patients usually are taught some form of relaxation exercise. Some learn to identify the circumstances that trigger their symptoms. They may also be taught how to avoid or cope with these stressful events. Most are encouraged to change their habits, and some are trained in special techniques for gaining such self-control. Biofeedback is not magic. It cannot cure disease or by itself make a person healthy. It is a tool, one of many available to health care professionals. It reminds physicians that behavior, thoughts, and feelings profoundly influence physical health. And it helps both patients and doctors understand that they must work together as a team.

Patients' Responsibilities

Biofeedback places unusual demands on patients. They must examine their day-to-day lives to learn if they may be contributing to their own distress. They must recognize that

they can, by their own efforts, remedy some physical ailments. They must commit themselves to practicing biofeedback or relaxation exercises every day. They must change bad habits, even ease up on some good ones. Most important, they must accept much of the responsibility for maintaining their own health.

How Does Biofeedback Work?

Scientists cannot yet explain how biofeedback works. Most patients who benefit from biofeedback are trained to relax and modify their behavior. Most scientists believe that relaxation is a key component in biofeedback treatment of many disorders, particularly those brought on or made worse by stress. Their reasoning is based on what is known about the effects of stress on the body. In brief, the argument goes like this: Stressful events produce strong emotions, which arouse certain physical responses. Many of these responses are controlled by the sympathetic nervous system, the network of nerve tissues that helps prepare the body to meet emergencies by "flight or fight."

The typical pattern of response to emergencies probably emerged during the time when all humans faced mostly physical threats. Although the "threats" we now live with are seldom physical, the body reacts as if they were: The pupils dilate to let in more light. Sweat pours out, reducing the chance of skin cuts. Blood vessels near the skin contract to reduce bleeding, while those in the brain and muscles dilate to increase the oxygen supply. The gastrointestinal tract, including the stomach and intestines, slows down to reduce the energy expended in digestion. The heart beats faster, and blood pressure rises. Normally, people calm down when a stressful event is over especially if they have done something to cope with it. For instance, imagine your own reactions if you're walking down a dark street and hear someone running toward you. You get scared. Your body prepared you to ward off an attacker or run fast enough to get away. When you do escape, you gradually relax.

If you get angry at your boss, it's a different matter. Your body may prepare to fight. But since you want to keep your job, you try to ignore the angry feelings. Similarly, if on the way home you get stalled in traffic, there's nothing you can do to get away. These situations can literally may you sick. Your body has prepared for action, but you cannot act. Individuals differ in the way they respond to stress. In some, one function, such as blood pressure, becomes more active while others remain normal. Many experts believe that these individual physical responses to stress can become habitual. When the body is repeatedly aroused, one or more functions may become permanently overactive. Actual damage to bodily tissues may eventually result.

Biofeedback is often aimed at changing habitual reactions to stress that can cause pain or disease. Many clinicians believe that some of their patients and clients have forgotten how to relax. Feedback of physical responses such as skin temperature and muscle tension provides information to help patients recognize a relaxed state. The feedback signal may also act as a kind of reward for reducing tension. It's like a piano teacher whose frown turns to a smile when a young musician finally plays a tune properly.

The value of a feedback signal as information and reward may be even greater in the treatment of patients with paralyzed or spastic muscles. With these patients, biofeedback seems to be primarily a form of skill training like learning to pitch a ball. Instead of watching the ball, the patient watches the machine, which monitors activity in the affected muscle. Stroke victims with paralyzed arms and legs, for example, see that some part of their affected limbs remains active. The signal from the biofeedback machine proves it. This signal can guide the exercises that help patients regain use of their limbs. Perhaps just as important, the feedback convinces patients that the limbs are still alive. This reassurance often encourages them to continue their efforts.

Should You Try Biofeedback?

If you think you might benefit from biofeedback training, you should discuss it with your physician or other health care professional, who may wish to conduct tests to make certain that your condition does not require conventional medical treatment first. Responsible biofeedback therapists will not treat you for headaches, hypertension, or most disorders until you have had a thorough physical examination. Some require neurological tests as well.

How do you find a biofeedback therapist? First, ask your doctor or dentist, or contact the nearest community health center, medical society, or State biofeedback society for a referral. The psychology or psychiatry departments at nearby universities may also be able to help you. Most experts recommend that you consult only a health care professional a physician, psychologist, psychiatrist, nurse, social worker, dentist, physical therapist, for example who has been trained to use biofeedback.

PROFESSIONAL ASSOCIATIONS

The Association for Applied Psychophysiology and Biofeedback (formerly the Biofeedback Society of America)

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AAPB is the national membership association for professionals using biofeedback. AAPB holds a national meeting, offers CE programs, produces a journal and newsmagazine and other biofeedback related publications.

The Biofeedback Certification Institute of America

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The BCIA was established as an independent agency to provide national certification for biofeedback providers.

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