

Tool 2:



### ***Motion Controls Emotion***

Everybody knows the benefits of exercise, right? It keeps you fit. It helps control your weight. It helps prevent heart attacks. But did you know that it also spikes your brain? Exercise is brain food. In addition to its many benefits for the body, it also makes you think more clearly.

You know that increasing your supply of oxygen and glucose increases your energy level. That same fuel combination also energizes your brain.

You've probably felt the effects of too little oxygen and glucose. Have you ever been at a party with a lot of people, a lot of cigarette smoke, and very little fresh air? If so, you may have gotten a headache, or felt light-headed or dizzy. If you were to stay in that environment for a long time you might have difficulty concentrating or even understanding what people are saying. The reason is lack of oxygen. With so many people and cigarettes using oxygen and very little being brought into the room, your brain gets less oxygen than it needs. It begins to "complain" by giving you a headache. If you don't get more oxygen fairly quickly, it will gradually begin to shut down.

If you've gone for long periods without eating, you may also have felt the effects of too little glucose. The symptoms are similar: you start to feel sleepy, you may have a headache, you lose your ability to concentrate or think clearly. Without enough glucose to provide energy, your brain starts to shut down.

So one ticket to higher brain power is feeding your brain lots of oxygen and glucose. Exercise — especially aerobic exercise — is a good way to do that.

## AEROBICS

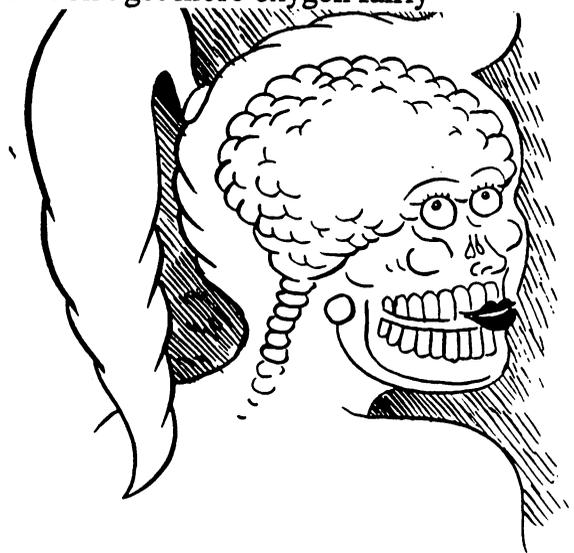
Aerobic exercise is exercise that makes you breathe deeply and regularly for an extended period of time. Running, skipping, biking, brisk walking, swimming, rowing and jumping rope are all aerobic exercises. When you do them you use the big muscles in your arms and legs, you get your heart pumping hard and fast, and you do the same movements over and over again without stopping.

By contrast, football and baseball are not aerobic exercise. The players stop and start, run and stand, throughout the game. Each time they run, their hearts pump fast; each time they stop, their hearts slow down. Aerobic exercise gets your heart beating fast and keeps it there for 15 minutes or more.

Why is aerobic exercise so good for you, and so good for your brain?

**1. Aerobics strengthens your heart.** Your heart is a muscle, and like any muscle, it gets stronger through exercise. Aerobic exercise makes it able to pump more blood with each contraction, which means more oxygen reaches your brain.

**2. Aerobics makes your body produce more red blood cells.** Red blood cells are your oxygen carriers. Most people have about 5 million red blood cells in a cubic milliliter of blood. People who do regular aerobics have about 8 million. That means almost twice as much oxygen is getting to their brains.



***How big is your brain? It depends on how you look at it. In terms of physical size, the brain is only about 2% of your whole body. Pretty tiny. But that 2% uses 25% of the body's energy. At any one time, one quarter of all the blood in your body is in your brain.***

**3. Aerobics increases your intake of oxygen.** The air we inhale contains approximately 21% oxygen. The air we exhale contains approximately 19% oxygen. We keep the rest to feed our cells. People who do regular aerobics, however, exhale air that contains only 17% oxygen. Their lungs have kept twice as much oxygen for making energy.

**4. Aerobics increases your glucose level.** Each time you eat you bring in more glucose than your body needs right away. Your body converts the extra glucose to a chemical called glycogen and stores it in your liver. Between meals your body changes the glycogen back into glucose, mixes it with oxygen and turns it into energy. It does this at a fairly steady rate, according to how much energy you normally use. Doing aerobics increases the amount of energy you normally use. Your body gets used to the higher amount and provides a higher flow of glucose throughout the day. That means more energy going to the brain.

**5. Aerobics adjusts your norepinephrine level.** Norepinephrine is the neurotransmitter that controls how energized you feel. Too little and you'll be asleep. Too much and you'll be tense and angry. But just enough norepinephrine and you'll feel energized and alert. Aerobic exercise causes your body to produce just the right amount of norepinephrine to give you a good shot of energy without tension.

**6. Aerobics increases your endorphin level.** Endorphins are the neurotransmitters that block pain and cause feelings of pleasure and relaxation. You've heard of "runners' high"? It's not a myth.

Researchers believe that during aerobics your body releases endorphins which make you less aware of discomfort and pain, and help you feel happy and relaxed. Some athletes say they feel like they are floating instead of running.

**7. Aerobics balances all your neurotransmitters** so you have just the right amounts of each to give you maximum energy without tension. In fact, doing aerobic exercise is like owning an inexhaustible stock of powerful, mood-altering drugs. They're free, they're safe, and they're always under your control because they're part of the standard equipment of your nervous system.

### **AEROBIC**

fast walking  
hard biking  
running  
swimming  
jumping rope  
rowing  
skipping  
basketball  
racquetball  
soccer  
tennis (played aggressively at the 4.0 level)

### **NON-AEROBIC**

slow walking  
slow biking  
football  
baseball/softball  
volleyball  
golf  
ping pong