

Optimizing Brain Function

Daniel G. Amen, MD

The brain is a three-pound supercomputer. It is the command and control center running your life. It is involved in absolutely everything you do. Your brain determines how you think, how you feel, how you act, and how well you get along with other people. Your brain even determines the kind of person you are. It determines how thoughtful you are; how polite or how rude you are. It determines how well you think on your feet, and it is involved with how well you do at work and with your family. Your brain also influences your emotional well being and how well you do with the opposite sex.

Your brain is more complicated than any computer we can imagine. Did you know that you have one hundred billion nerve cells in your brain, and every nerve cell has many connections to other nerve cells? In fact, your brain has more connections in it than there are stars in the universe!

Optimizing your brain's function is essential to being the best you can be, whether at work, in leisure, or in your relationships.

From my work as a clinical neuroscientist, psychiatrist, and brain-imaging expert, here are seven ways to enhance the functioning of your own brain and enhance your life.

1. Protect Your Brain

Protecting the brain from injury, pollution, sleep deprivation, and stress is the first step to optimizing its function. The brain is very soft, while the skull is really hard. Inside the skull there are many sharp bony ridges. Several brain areas are especially vulnerable to trauma, especially the parts involved with memory, learning, and mood stability. In order to be your best it is essential to protect your brain from injury. Wear your seatbelt when you're in a car, and wear a helmet when you ride a bicycle, motorcycle, or go snowboarding. Make sure children wear helmets. My eleven-year-old knows that if she rides her bicycle without a helmet she'll be grounded from it for a month. One head injury can ruin a life. Along the same lines, do not let children hit soccer balls with their heads. Soccer balls are heavy. Repeatedly slamming a child's head against a soccer ball may cause minor repetitive trauma to the brain. At this time there are not enough studies to say heading soccer balls is safe. I encourage my children to play golf, baseball, and tennis, rather than football, soccer, or hockey.

Current brain imaging research has shown that many chemicals are toxic to brain function. Alcohol, drugs of abuse, nicotine, much caffeine, and many medications decrease blood flow to the brain. When blood flow is decreased the brain cannot work efficiently. In one study done at UCLA, cocaine addicts had 23% less overall brain blood flow compared to a drug free control group. Those cocaine addicts who smoked cigarettes had 45% less blood flow than the control group. In a study I performed on chronic marijuana users, 85% had less activity in their temporal lobes than the control group. The temporal lobes are involved with memory and mood stability. Caffeine constricts blood vessels and has been shown to decrease brain activity. A little bit of caffeine probably doesn't hurt much. Unfortunately, many people use excessive amounts, such as 6 to 10 cups of coffee, tea, or sodas a day. It

is hard to be your best when brain activity is diminished. Stay away substances known to be toxic or those that decrease brain activity.

In a similar way, sleep deprivation also decreases brain activity and limits access to learning, memory, and concentration. A recent brain imaging study showed that people who consistently slept less than 7 hours had overall less brain activity. Sleep problems are very common in people who struggle with their thoughts and emotions. Getting enough sleep everyday is essential to brain function.

Scientists have only recently discovered how stress negatively affects brain function. Stress hormones have been shown in animals to be directly toxic to memory centers. Brain cells can die with prolonged stress. Managing stress effectively is essential to good brain function.

2. Feed Your Brain

The fuel you feed your brain has a profound effect on how it functions. Lean protein, complex carbohydrates, and foods rich in omega 3 fatty acids (large cold water fish, such as tuna and salmon, walnuts, Brazil nuts, olive oil, and canola oil) are essential to brain function. Unfortunately, the great American diet is filled with simple sugars and simple carbohydrates, causing many people to feel emotional, sluggish, spacey, and distracted.

What do you have for breakfast? Do you even have breakfast? Today, many children, teens, and adults start the day with either nothing at all or by loading up on simple carbohydrates, such as sugar cereals, Pop Tarts, muffins, bagels, waffles, pancakes, or donuts. In our fast paced society these foods are simple to prepare for the family rushed in the morning, but they cause brain fog and lower performance in many people. Start the day with a healthy breakfast that includes protein, such as eggs, lean meat, or dairy products.

Many people struggle with energy and mental clarity after lunch. I have found that eliminating all simple carbohydrates at lunch (sugar, white bread or other products made from white flour such as bagels and white pasta, potatoes, and rice) can make a dramatic difference in energy and focus in the afternoon. An additional benefit of skipping sugar and simple carbohydrates at lunch is that most people do not feel hunger until dinnertime. I also believe taking a 100% vitamin and mineral supplement is important. Many people do not eat like they should on a regular basis.

3. Kill the ANTs That Invade Your Brain

The thoughts that go through your mind, moment by moment, have a significant impact on how your brain works. Research by Mark George, MD and colleagues at the National Institutes of Health demonstrated that happy, hopeful thoughts had an overall calming effect on the brain, while negative thoughts inflamed brain areas often involved with depression and anxiety. Your thoughts matter.

I often teach my patients how to metaphorically kill the ANTs that invade their minds. ANTs stand for Automatic Negative Thoughts. The ANTs are automatic. They just happen. But they can ruin your whole day, maybe even your life. For example, I once treated a college student who was ready to drop out of school. He thought he was stupid because didn't do well on tests. When his IQ (intelligence level) was tested, however, we discovered that he had an IQ of 135 (in the superior range). He just wasn't a good test taker. I have identified nine different kinds of ANT species, or

ways your thoughts can distort incoming information to make you feel bad. Here are four ANT species:

1. Mind reading --- predicting you know that another person is thinking something negative about you without them telling you. I often tell my patients that, "A negative look from someone else may mean nothing more than he or she is constipated. You don't know. You can't read minds. I have 25 years of training in human behavior and I still can't read anyone's mind."
2. Fortune telling -- predicting a bad outcome to a situation before it has occurred. Your mind makes happen what it sees. Unconsciously, predicting failure will often cause failure. For example, if you say, "I know I will fail the test," then you will likely not study hard enough and fail the test.
3. Always or never thinking - this is where you think in words like always, never, every time, or everyone. These thoughts are overgeneralizations which can alter behavior. For example, I have a friend who asked out an attractive woman. She turned him down. He told himself that no one will ever go out with him again. This ANT prevented him from asking out anyone else for over nine months.
4. Guilt beatings -- being overrun by thoughts of "I should have done... I'm bad because... I must do better at... I have to..."). Guilt is powerful at making us feel bad. It is a lousy motivator of behavior.

You do not have to believe every thought that goes through your head. It's important to think about your thoughts to see if they help you or they hurt you. Unfortunately, if you never challenge your thoughts you just "believe them" as if they were true. ANTs can take over and infest your brain. Develop an internal anteater to hunt down and devour the negative thoughts that are ruining your life.

Once you learn about your thoughts, you can choose to think good thoughts and feel good or you can choose to think bad thoughts and feel lousy. You can train your thoughts to be positive and hopeful or you can just allow them to be negative and upset you. That's right, it's up to you! You can learn how to change your thoughts and optimize your brain. One way to learn how to change your thoughts is to notice them when they are negative and talk back to them. If you can correct negative thoughts, you take away their power over you. When you think a negative thought without challenging it, your mind believes it and your brain reacts to it.

4. Work Your Brain

Your brain is like a muscle. The more you use it, the more you can use it. Every time you learn something new your brain makes a new connection. Learning enhances blood flow and activity in the brain. If you go for long periods without learning something new you start to lose some of the connections in the brain and you begin to struggle more with memory and learning.

Anatomist Marian Diamond, PhD, from the University of California at Berkeley studied aging in rats. Those rats who were allowed an easy life without any new challenges or learning had less brain weight than those rats who were challenged and forced to learn new information in order to be fed. New learning actually caused increased brain density and weight. Strive to learn something new everyday, even if it is just for a short period of time. Einstein said that if a person studies a subject for just 15

minutes a day in a year he will be an expert, and in five years he may be a national expert. Learning is good for your brain.

5. Make Love For Your Brain

In a series of studies by Winnifred B. Cutler, PhD and colleagues at the University of Pennsylvania and later at Stanford University it was found that regular sexual contact had an important impact on physical and emotional well being of women. Sexual contact with a partner at least once a week led to more fertile, regular menstrual cycles, shorter menses, delayed menopause, increased estrogen levels, and delayed aging. Brain imaging studies at UCLA have shown that decreased estrogen levels are associated with overall decreased brain activity and poor memory. Enhancing estrogen levels for women through regular sexual activity enhances overall brain activity and improves memory.

In Dr. Cutler's study the occurrence of orgasm was not as important as the fact that sex was with another person. Intimacy and emotional bonding may be the most influential factors in the positive aspects of sex. As a psychiatrist I have seen many people withhold sex as a way to show hurt, anger, or disappointment. Dr. Cutler's research suggests that this is self-defeating behavior. The more you withhold the worse it may be for you.

Appropriate sex is one of the keys to the brain's fountain of youth.

6. Develop A "Concert State" For Your Brain

Optimal performance is best achieved when a "concert state" exists in the brain. By "concert state" I mean "a relaxed body with a sharp, clear mind," much as you would experience at an exhilarating symphony. Achieving this state requires two simultaneous skills: deep relaxation and focus.

Deep relaxation is easily achieved by most people through diaphragmatic breathing exercises (learning how to breathe with your belly). This is the most natural, efficient way to breathe. Have you ever seen how a puppy or a baby breathes? They breathe almost exclusively with their bellies. A quick way to learn belly breathing is to lay on the floor and put a book on your belly. As you breathe in make the book rise as you fill your lower lungs with air. As you breathe out make the book fall as you use your belly to exhale all the air out of your lungs. Take slow, deep breaths, less than 7 a minute. One of my patients told me that it was impossible for him to be anxious or mad when he breathed in this way.

Use music to help develop concentration skills. In a famous study at the University of California at Irvine, students who listened to Mozart's Sonata for 2 Pianos (K448) increased visual-spatial intelligence by about 10 percent. Another recent study demonstrated that students who play a musical instrument scored higher on average on the SAT than children who did not play music. Music can either help or hurt concentration. In a recent study from my clinic, we had 12 teenagers play the game Memory while they listened to different types of music: rock, rap, classical, and no music. Rap was associated with the worst performance. The rock group also scored poorly. Interestingly, the group did slightly better with classical music than no music at all.

Another technique for developing clear focus is the "One Page Miracle." On one piece

of paper write down the following headings:

- * relationships,
- * work/school
- * money
- * physical health
- * emotional health
- * spiritual health.

Next to each heading write down what you want in each area. For example, under relationships, "I want to have a kind, loving, connected relationship with my children." When you finish writing all of your goals make multiple copies of it and prominently display it where you can see it several times each day. Frequently ask yourself, "Is my behavior getting me what I want?" This exercise helps to keep you focused on the things that are most important in your life.

Work to develop a "concert state" by relaxing your body and developing mental clarity.

7. Treat Brain Problems Early

Many people sabotage themselves by denying they have brain problems until significant damage has been done to their lives. Most psychiatrists feel that there is a significant brain component to depression, anxiety problems, attention deficit disorder, obsessive compulsive disorder, substance abuse problems, and even violence. Unfortunately, the stigma associated with seeing a psychiatrist still prevents people from seeking help for obvious problems.

Clearly, the earlier people seek help for these problems the less negative impact they will have on their lives. If you struggle with any of these problems you are not alone. According to the National Institutes of Health 49% of Americans will have a psychiatric illness (depression, anxiety, ADD, OCD, substance abuse problems, etc.) at some point in their lives. Successful people have problems, they are smart enough to seek help.

The earlier the better.

Your life can only improve with an optimized brain.