

PHYSICAL EXERCISE TO REV YOUR METABOLISM

By Daniel G. Amen, MD

Excerpt from [The Amen Solution](#)

“I used to exercise for my butt. Now I exercise for my brain.”
-- David Smith, MD, Co-author of *Unchain Your Brain*

While conducting our study on retired NFL players, I made a startling discovery. I had assumed that these world-class athletes who used to spend hours in the gym and on the field to achieve peak conditioning would have continued some form of athletic training for the rest of their lives. Wow, was I wrong! I was shocked to find out that after they retire from professional football, many former players stop doing any kind of exercise at all. In fact, many of the former players in our study had turned into obese couch potatoes. It seemed ironic for me to be giving advice about exercising to men who, in their prime, could have run circles around me and knew more about exercise physiology. But I found that I had to give many of them a crash course in how exercise boosts the brain in order to motivate them to get off the couch.

By contrast, I wasn't at all surprised to discover that most of the people in our non-NFL weight-loss groups weren't very active. After all, it is no secret that our society has shifted to a sedentary lifestyle where most of us spend our days sitting—working on computers, watching TV, and driving. The problem is that a lack of physical activity robs the brain of optimal function and is linked to obesity, higher rates of depression, a greater risk for cognitive impairment... and worse. Physical inactivity is the fourth most common preventable cause of death.

If you want to lose your belly, get smarter, and be happier, you have to get off your butt

and move! Physical activity is one of the most important things you can do to burn calories, improve moods, and enhance brain function. In this chapter, I will show you what physical activity can do for your brain and body. Plus, you will learn the best kinds of exercise for your specific brain type.

Moving your body is only half the exercise equation. To supercharge your brain, you need to combine physical exercise with mental exercise. This chapter will also reveal the best mental gymnastics to help get your brain and body in gear.

Get Moving to Get Thinner

There is no shortage of research on the effects of exercise on fat loss. Decades of scientific evidence has found that exercise, when combined with a healthy eating plan, can help you lose the blubber and keep it off. Of course, exercise burns calories, which is one of the keys to weight loss and a trimmer figure. But burning calories isn't the only way that exercise can help you trim your waist. Check out these exercise benefits.

Turn off the obesity gene. Exciting new research out of Sweden shows that exercise can deactivate the “obesity gene.” Haven't heard of the obesity gene? Scientists have identified a gene variant, known in scientific circles as FTO rs9939609, that predisposes people to obesity. A person can have no copies, one copy, or two copies of the gene variant, and your likelihood of obesity increases with the number of copies you have. According to the Swedish study, having one copy of the gene

Get Smart to Get Thinner

“As part of my new brain healthy lifestyle, I decided to start swimming. I started out swimming just four laps of the pool. Then after a while, I was able to swim fourteen laps, and I thought, hey I can do this! Then somebody told me that sixty-four laps equals one mile, and that became my goal, and I did it!”

variant is associated with a higher BMI, greater body fat percentage, and larger waist circumference compared to those with no copies of the gene. Having two copies of the gene variant is associated with even higher BMI, body fat, and waist size.

What is so exciting about this study, which analyzed data from 752 European adolescents, is that those who had the gene variant but got at least sixty minutes daily of moderate to vigorous activity were no more likely to be overweight than those who had no copies. So even if you are genetically loaded to have a weight problem, you can blunt the effects of your genetic makeup. Your genes are NOT your destiny.

Improve how your brain uses fats. Exercise increases your brain's ability to regulate insulin and sugar. Maintaining blood sugar stability is critical. If you're insulin sensitive and you exercise, your body can handle sugar and insulin much better and you'll get off that blood sugar roller coaster.

Reduce cravings and overcome food addiction. New research shows that exercise is helpful in the prevention and treatment of addiction, including food addiction. Physical activity actually reduces cravings for addictive foods like sugary sweets and high-calorie, high-fat fare. When you eliminate your cravings, it can cut out hundreds or even thousands of calories from your daily diet.

Handle stress better. Working out helps you manage stress by immediately lowering stress hormones, and it makes you more resistant to stress over time. Raising your heart rate through exercise also makes you a better stress handler because it raises beta-endorphins, the brain's own natural morphine. Increasing your ability to manage stress can keep you from polishing off a whole bag of chips when you are under a lot of pressure.

Eat healthier foods. A 2008 study found that being physically active makes you more

inclined to choose foods that are good for you, seek out more social support, and manage stress more effectively. As you are learning in this book, all of these factors can help you rein in out-of-control eating so you can lose weight. Obviously, choosing brain healthy foods over junk food provides the foundation for lasting weight loss. Creating a solid support network to encourage your new brain healthy habits can help you stay on track. And as explained above, getting a handle on stress is one of the keys to staying on track.

Get more restful sleep. Engaging in exercise on a routine basis normalizes melatonin production in the brain and improves sleeping habits. Getting better sleep improves brain function, helps you make better decisions about the foods you eat, and enhances your mood. Chronic lack of sleep nearly doubles your risk for obesity and is linked to depression and a sluggish brain.

Get Moving to Get Smarter

Physical exercise is a powerful brain booster. Here are some of the many ways that physical exercise benefits the brain so you can make better decisions about what and how much you eat.

Increase circulation. Physical activity improves your heart's ability to pump blood throughout your body, which increases blood flow to your brain. As you have already learned in this book, better blood flow equals better overall brain function.

Grow more new brain cells. Exercise increases great stuff in your body called brain-derived neurotrophic factor (BDNF). BDNF is like an anti-aging wonder drug that is involved

Get Smart to Get Thinner

"At first, I thought I weighed too much to go to the gym, but this program encouraged me to give it a try. I started going and just doing a little bit, like using some light weights. But it got the habit started, and now I go regularly."

with the growth of new brain cells. Think of BDNF as a sort of Miracle-Gro for your brain.

BDNF promotes learning and memory and makes your brain stronger. Specifically, exercise generates new brain cells in the temporal lobes (involved in memory) and the prefrontal cortex (involved in planning and judgment). Having a strong PFC and temporal lobes is critical for successful weight loss.

A better memory helps you remember to do the important things that will help you lose weight, for example, making an appointment with your physician to check your important health numbers, shopping for the foods that are the best for your brain, and taking the daily supplements that will benefit your brain type. Planning and judgment are vital because you need to plan meals and snacks in advance, and you need to make the best decisions throughout the day if you want to lose the love handles.

The increased production of BDNF you get from exercise is only temporary. The new brain cells survive for about four weeks then die off unless they are stimulated with mental exercise or social interaction. This means you have to exercise on a regular basis in order to benefit from a continual supply of new brain cells. It also explains why people who work out at the gym and then go to the library are smarter than people who only work out at the gym.

Enhance brainpower. No matter how old you are, exercise increases your memory, your ability to think clearly, and your ability to plan. Decades of research have found that physical activity leads to better grades and higher test scores among students at all levels. It also boosts memory in young adults and improves frontal lobe function in older adults.

Getting your body moving also protects the short-term memory structures in the temporal lobes (hippocampus) from high-stress conditions. Stress causes the adrenal glands to produce excessive amounts of the hormone cortisol, which has been found to kill cells in the

hippocampus and impair memory. In fact, people with Alzheimer's disease, have higher cortisol levels than normal aging people.

Ward off memory loss and dementia. Exercise helps prevent, delay, and reduce the cognitive impairment that comes with aging, dementia, and Alzheimer's disease. In 2010 alone, more than a dozen studies reported that physical exercise results in a reduction in cognitive dysfunction in older people. One of them came from a group of Canadian researchers and who looked at physical activity over the course of the lifetime of 9,344 women. Specifically, they looked at the women's activity levels as teenagers, at age thirty, at age fifty, and in late-life. Physical activity as a teenager was associated with the lowest incidence of cognitive impairment later in life, but physical activity at ANY age correlated to reduced risk. This study tells me that it is never too late to start an exercise program.

Protect against brain injuries. Exercise strengthens the brain and enhances its ability to fight back against the damaging effects of brain injuries. This is so critical because brain injuries—even mild ones—can take the PFC offline, which reduces self-control, weakens your ability to say “no” to cravings, and increases the need for immediate gratification as in “I must have that bacon cheeseburger RIGHT THIS MINUTE!”

You don't have to lose consciousness to suffer from brain trauma. Even mild head injuries that do not typically show up on the structural brain imaging tests can seriously impact your life and increase your risk for overeating problems. That is because trauma can affect not only the brain's hardware or physical health, but also its software or how it functions. Head injuries can disrupt and alter neurochemical functioning, resulting in emotional and behavioral problems, including an increased risk for eating problems and substance abuse.

Each year, two million new brain injuries are reported, and millions more go unreported.

Brain trauma is especially common among people with addictions of all kinds, including food addiction. At Sierra Tucson, a world-renowned treatment center for addictions and behavioral disorders, our brain imaging technology has been used since 2009. One of the most surprising things the brain scans have shown, according to Robert Johnson, MD, the facility's Medical Director, is a much higher than expected incidence of mild traumatic brain injury among their patients.

Get Moving to Get Happier

Have you ever heard the term “runner’s high?” Is it really possible to feel that good, just from exercise? You bet it is. Exercise can activate the same pathways in the brain as morphine and increases the release of endorphins, natural feel-good neurotransmitters. That makes exercise the closest thing to a happiness pill you will ever find.

Boost your mood. Physical exercise stimulates neurotransmitter activity, specifically norepinephrine, dopamine, and serotonin, which elevates mood.

Fight depression. Type 4 Sad or Emotional Overeaters need to pay special attention to this. Exercise can be as effective as prescription medicine in treating depression. One of the reasons why exercise can be so useful is because BDNF, which I wrote about earlier in this chapter, not only grows new brain cells but is also instrumental in putting the brakes on depression.

The antidepressant benefits of exercise have been documented in medical literature. One study compared the benefits of exercise to those of the

Get Smart to Get Thinner

“Every day, I walk at least a couple miles, and I’m doing some running too. I take the dogs out and go to the track and do a couple of miles. My next goal is running three miles.”

prescription antidepressant drug Zoloft. After twelve weeks, exercise proved equally effective as Zoloft in curbing depression. After ten months, exercise surpassed the effects of the drug.

Minimizing symptoms of depression isn't the only way physical exercise outshined Zoloft.

Like all prescription medications for depression, Zoloft is associated with negative side effects, such as sexual dysfunction and lack of libido. Plus, taking Zoloft may ruin your ability to qualify for health insurance. Finally, popping a prescription pill doesn't help you learn any new skills. On the contrary, exercise improves your fitness, your shape, and your health, which also boosts self-esteem. It doesn't affect your insurability, and it allows you to gain new skills. If anyone in your family has feelings of depression, exercise can help.

I teach a course for people who suffer from depression, and one of the main things we cover is the importance of exercise in warding off this condition. I encourage all of these patients to start exercising and especially to engage in aerobic activity that gets the heart pumping. The results are truly amazing. Over time, many of these patients who have been taking antidepressant medication for years feel so much better that they are able to wean off the medicine.

Fighting depression is very important if you are overweight because depression and obesity go hand in hand. A 2010 review of the existing scientific literature on the subject involving seventeen studies and 204,507 participants showed a significant association between obesity and depression. The link appears to be stronger in women.

Research shows that people who are depressed are more likely to be overweight and experience a faster rise in BMI and waist size than people who are not depressed. On the flip side, weight problems also increase the risk for developing depression. Which came first, the depression or the weight

Get Smart to Get Thinner

"Even when I wake up and feel sluggish, I know that once I go to the gym, I will feel better."

problem, remains to be seen. But there is no doubt in my mind that getting depression under control can help you manage your weight, and losing the extra pounds can help alleviate depressive symptoms.

Ease anxiety. Listen up, Type 5 Anxious Overeaters! Although the research on the effects of exercise on anxiety isn't quite as voluminous as the evidence on exercise and depression, it shows that physical activity of just about any kind and at any intensity level can soothe anxiety. In particular, high-intensity activity has been shown to reduce the incidence of panic attacks.

*Before we get into specifics regarding how to get moving,
I'd like to make the disclaimer that you need to
check with your doctor before beginning any exercise program.*

Best Exercises for Your Brain

Aerobic exercise, coordination activities, and resistance training have all been found to benefit the brain and help you lose fat regardless of your brain type. Even walking at moderate intensity can help you keep weight off after you lose it. In a 2000 study, obese women were better able to maintain weight loss than women who did not increase their daily physical activity. Walking is a great place to start if you are new to a fitness program.

Get the most out of your aerobic exercise with burst training. If you want a higher calorie burner, a faster fat burner, a greater mood enhancer, and a better brain booster, try burst training. Also known as interval training, burst training involves sixty-second bursts at go-for-broke intensity followed by a few minutes of lower-intensity exertion. This is the type of workout I do, and it works. Scientific evidence says so. A 2006 study from researchers at the University of Guelph in Canada found that doing high-intensity burst training burns fat faster than continuous moderately intensive activities.

Get Smart to Get Thinner
“Now that I’m more active, I really want to go surfing. I never would have tried that before.”

If you want to burn calories with bursts, do intense exercise, such as fast walking (walking as if you were late for an appointment), for thirty minutes at least four to five times a week. In addition, in each of these sessions, you are to do four one-minute bursts. These short bursts are essential to get the most out of your training. Short burst training helps raise endorphins, lift your mood, and make you feel more energized. They also burn more calories and fat than continuous moderate exercise. Here is a sample of a heart-pumping thirty-minute workout with bursts:

Sample Burst Training Workout

3	minutes	warm up
4	minutes	fast walking (walk like you are late)
1	minute	burst (run or walk as fast as you)
4	minutes	fast walking
1	minute	burst

4	minutes	fast walking
1	minute	burst
4	minutes	fast walking
1	minutes	burst
4	minutes	fast walking
3	minutes	cool down

If you can't devote an entire thirty minutes to an aerobic burst routine, don't throw in the towel. Research from Massachusetts General Hospital in Boston shows that just ten minutes of vigorous exercise can spark metabolic changes that promote fat burning, calorie burning, and better blood sugar control for at least an hour. For the 2010 trial, researchers looked at exercise-induced metabolic changes in people of varying fitness levels: people who became short of breath during exercise, healthy middle-aged individuals, and marathon runners.

All three groups benefited from ten minutes on a treadmill, but the fittest individuals got the biggest metabolic boost. This indicates that as you increase your fitness, your body will become more effective at burning fat and calories with exercise.

Boost your brain with coordination activities. Doing coordination activities—like dancing, tennis, or table tennis (the world's best brain sport)—that incorporate aerobic activity and coordination moves are the best brain boosters for all types of overeaters. The aerobic activity

Get Smart to Get Thinner

"I had been riding a stationary bike but wasn't really getting my heart rate up. Learning about bursts changed that. Now I go really hard for a short time then back to my regular pace."

spawns new brain cells while the coordination moves strengthen the connections between those new cells so your brain can recruit them for other purposes, such as thinking, learning, and remembering.

What I really like about aerobic coordination activities is that many of them also work as burst training sessions. For example, in tennis and table tennis, you give it your all during the point, then you have a brief rest period before the next point begins. It is the same with dancing, where you dance to the song and then take a short break.

In general, I recommend that anybody trying to lose weight do some form of aerobic coordination activity at least four to five times a week for at least thirty minutes.

Have you typically avoided coordination activities because you have two left feet? This could be part of the reason why you have a hard time controlling yourself around food. That is because the cerebellum, which is the coordination center of the brain, is linked to the PFC, where judgment and decision-making occurs. If you aren't very coordinated, it may indicate that you are not very good at making good decisions either. This could make you more likely to continue eating even though you are full or to choose the cherry pie instead of the cherries. Increasing coordination exercises can activate the cerebellum, thereby improving your judgment so you can make better decisions.

Strengthen your brain with strength training. I also recommend adding resistance training to your workouts. Canadian researchers have found that resistance training plays a role in preventing cognitive decline. Plus, it builds muscle, which can rev your metabolism to help you burn more calories throughout the day. Extensive research

Get Smart to Get Thinner

“For some people, exercise is the hardest part of the program. Get an exercise buddy to make it more fun and keep you accountable.”

shows that adding resistance training to a controlled-calorie nutrition program results in greater loss of body fat and more inches lost than diet alone.

For example, a 2010 study from researchers at the University of Rhode Island compared body composition changes between two groups of dieters. Both groups followed the Dietary Approaches to Stop Hypertension (DASH) diet, but one group did moderate intensity resistance training while the other group did not. At the end of the ten-week trial, the group that participated in resistance training lost nine pounds of body fat compared to less than half a pound for the diet-only group. Plus, the resistance training group's thighs got skinnier while the other group's thighs remained the same size.

Calm and focus your mind with mindful activities. Yoga, tai chi, and other mindful exercises have been found to reduce anxiety and depression and to increase focus. Although they don't offer the same BDNF-generating benefits as aerobic activity, these types of exercise can still boost your brain so you can improve your self-control and reduce emotional or anxious overeating.