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supplements

CIRCULATION

15 WAYS TO BOOST BLOOD FLOW
BEST FOODS FOR HEALTHY CIRCULATION

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Most of us don’t think much about circulation unless something goes wrong. But for Dr. Budoff, the heart and circulatory system are at the very center of his life’s work. As Program Director for the Cardiology Fellowship and Director of Cardiac Computed Tomography at Harbor-UCLA Medical Center in Torrance, CA, Matthew Budoff is at the forefront of the medical community’s efforts to develop early detection methods for heart disease, the number one cause of death in the U.S. In addition, Dr. Budoff is pursuing research to better understand lung disease—the second leading cause of death in America—and its potential link to cardiac conditions. He also recently completed a study looking at the incidence of heart disease among firefighters. A frequent lecturer on cardiology, Dr. Budoff has authored or co-authored over 400 research papers, six books, and 36 book chapters. He has been honored with a dozen awards recognizing his professional skills and accomplishments. Of particular note is his receipt of the Einstein Award for Scientific Achievement from the International Biographical Centre, Cambridge, U.K., as well as being awarded the Top Oral Abstract at the American Heart Association’s 2009 meeting. Dr. Budoff’s name often appears on various lists of top doctors in America. Most recently, he was included in the US News list of Top Doctors for 2011.
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Introduction

Your Circulatory Superhighway

We’ve all heard the old saying, “Cold hands, warm heart.” But here’s the real truth: Chronically cold hands and feet, tingling in the fingers and toes, and numbness can all be signs of poor circulation. While that might not sound earth shattering, these symptoms—which most of us consider nothing more than a nuisance—can actually be an indication of a more serious problem.
But before we get into what can go wrong with your circulatory system, let’s take a minute for a brief physiology lesson. Your circulatory system is a complex network of arteries, veins, and capillaries that transports oxygenated blood throughout the body. Your cells need a constant supply of oxygen. The brain, in particular, can only go a few seconds without oxygen before it begins to falter. Within minutes, an oxygen-deprived brain can suffer permanent damage as brain cells begin to die. Oxygen also plays a critical role in breathing and energy metabolism.

Your blood also moves crucial nutrients from your digestive tract to the cells and tissues throughout your body and removes used-up nutrients and other waste so they can be eliminated. Poor circulation can impair this process, potentially causing infection and disease.

The circulatory system serves as an internal “highway” that blood continually travels along to accomplish these life-giving tasks. When the blood vessels that make up this highway are healthy, blood flows unimpeded. But when the arteries, veins, and capillaries are damaged, they can narrow and stiffen, ultimately reducing the amount of blood that reaches your vital organs and extremities. When they are severely damaged, blood flow can even be blocked. If the blood traveling to the heart or brain is severely or completely blocked, it can lead to a heart attack or stroke.

**Going with the Flow**

Every time your heart beats, it pumps out blood that travels through about 60,000 miles of arteries, veins, and capillaries, carrying oxygen and nutrients to every single cell in your body. While the heart serves as the hub of this intricate network, the circulatory system is only as healthy as its blood vessels. This is particularly true of the arteries that serve to nourish and oxygenate the rest of the body.

Your arteries are made up of three layers—the inner lining, known as the endothelium; the elastic mid-portion, called the media; and the outer layer, called the adventitia. This makes them tough on the outside and smooth on the inside. The muscular media helps the heart pump the blood. When the heart beats, arteries expand as they fill with blood. When the heart relaxes, arteries contract, exerting a force that is strong enough to push the blood along. This rhythm between the heart and the arteries results in a highly efficient circulatory system.
Microcirculation

When it comes to circulation, your heart, arteries, and veins are all part of the big picture. But researchers are beginning to realize the vital role microcirculation plays in a healthy circulatory system. Just as the term suggests, microcirculation refers to the minute network of arterioles, capillaries, and venules (tiny veins that connect the capillaries to larger veins) that deliver the oxygen and nutrients that have been transported by the arteries into the individual cells. But that's just one of the roles microcirculation plays. It also regulates:

- blood flow and the amount of blood that infuses tissue
- blood pressure
- swelling
- the removal of metabolic waste from cells
- body temperature

Because microcirculation plays such an important role on so many fronts, when something goes wrong on this minute level, it can have an impact on your macrocirculatory system. If, for instance, these extremely small blood vessels become damaged or clogged, they can’t feed your arteries. As a result, plaque can build up inside the artery and eventually cause a blockage. That’s why it pays to sweat the small stuff when it comes to circulation. Adopting the tips found in these pages can help you foster both macro and micro circulatory health.
You can actually feel your arteries expand and contract. Since the arteries keep pace with the heart, we can measure heart rate by counting the contractions of the arteries. That’s how we take our pulse.

Arteries carry blood away from the heart. They are the thickest of all the blood vessels, with muscular walls that contract to keep the blood moving away from the heart and through the body. In the systemic circulation, oxygen-rich blood is pumped from the heart into the aorta. This huge artery curves up and back from the left ventricle, then heads down in front of the spinal column into the abdomen. Two coronary arteries branch off at the beginning of the aorta and divide into smaller arteries that provides oxygen and nourishment to the muscles of the heart.

The body’s other main artery is the pulmonary artery. This artery carries oxygen-deficient blood from the heart to the lungs, where it picks up oxygen. Newly oxygenated blood is then sent back to the heart so it can be dispatched to the rest of the body via the aorta. A network of arteries off the aorta delivers this oxygen-rich blood to your vital organs and other tissues via capillaries. As the arteries get farther from the heart, they become to smaller, less pliable arterioles.

Veins are another type of blood vessel that transports blood back to the heart. Although they are less flexible than your arteries, they contain unique valves that prevent the blood from flowing backwards. Without these valves, the veins in your legs and arms would not be able to push blood back up to the heart.

The walls of your veins are made up of the same three layers as your arteries. However, these layers are thinner and less muscular. The two largest veins are known as the superior and inferior venae cavae. The superior vena cava refers to the vein that is located above the heart. The inferior vena cava is found below the heart.

As complicated as the circulatory system is, it’s no wonder that things can—and often do—go wrong. As you’ll discover in the next chapter, damage to any of the arteries, veins, or capillaries in this complicated network can eventually lead to a variety of health problems, including heart attack, stroke, and peripheral artery disease (PAD).
Your circulatory system is only as healthy as the arteries that carry blood throughout your body. Ideally, your arteries should be flexible, with a smooth, undamaged endothelium that allows the oxygen and nutrient-rich blood to flow freely. But over time, heredity, unhealthy habits, and simply growing older can damage arteries. When these arteries become compromised—a condition called atherosclerosis—blood flow can eventually be hindered or even completely blocked.
Plaque Attack

Atherosclerosis is sneaky, silently developing over many years. It starts when the endothelium becomes damaged. This, in turn, triggers the formation of plaque at the site of the damage. Plaque is a fatty substance made up of cholesterol, calcium, cellular waste, and a blood-clotting material called fibrin that causes the endothelial tissue to malfunction. Over time, plaque accumulates, further damaging the arterial lining and causing the arteries to become narrow and stiff. As it grows, plaque can eventually reduce blood flow to the heart, brain, and other parts of the body. If plaque becomes unstable it can rupture, causing a blood clot to form that can block the artery completely and trigger a heart attack or stroke.

A Word about Homocysteine

Over the last decade, dozens of studies have linked a new blood marker called homocysteine to a higher risk of vascular damage. Homocysteine is the normal breakdown product of the essential amino acid methionine. Although the body uses small amounts of homocysteine, high levels in the blood can boost LDL cholesterol levels. Homocysteine also acts like an abrasive on the endothelium, contributing to the development of atherosclerosis by giving plaque a rough surface to adhere to. To make matters worse, homocysteine prevents the small arteries from dilating so they are more vulnerable to obstruction.

According to research conducted at Germany's University of Munich Medical Center, even a temporary spike in homocysteine can significantly reduce flow-mediated vasodilation, a marker of increased blood flow. Here's what happens: When there's more blood flowing through a blood vessel, the vessel dilates. This, in turn, triggers the release of nitric oxide, which helps the vessel relax and expand even more. But elevated homocysteine levels interfere with this process. Over time, chronically high homocysteine can damage both the arteries and veins. It can also harm the arterioles, capillaries, and venules that make up your microcirculatory system.

High levels of homocysteine can occur as the result of an inherited enzyme deficiency, a diet low in the B vitamins, smoking, too much caffeine, or from certain drugs. But don’t automatically think you’re safe if these risk factors don’t apply to you. Everyone is vulnerable to high homocysteine, since levels increase with age. And men are typically more prone to elevated levels than women.
4 Risk Factors to TALK TO YOUR DOCTOR About

1. **High cholesterol levels.** High levels of so-called “bad” LDL cholesterol contribute to the buildup of arterial plaque. But that’s not the whole story. Low levels of HDL cholesterol also play a role in atherosclerosis, since this “good” cholesterol is thought to divert LDL cholesterol away from your arteries so it can be eliminated from the body.

2. **High blood pressure.** The higher your blood pressure, the more your arteries swell and stretch. This injures the endothelium, causing plaque to accumulate at a faster rate. Blood pressure is considered high if it’s consistently at or above 140/90 mmHg.

3. **Coronary artery calcium score.** This is a direct measurement of the amount of plaque in your arteries. The higher the score, the more plaque you have—and the more preventive measures you and your doctor need to consider.

4. **Diabetes.** High blood sugar drives inflammation that can damage the endothelium and encourage the accumulation of artery-clogging plaque. Uncontrolled blood sugar is also associated with the narrowing of arteries, increased triglycerides (another type of blood fat), decreased levels of “good” HDL cholesterol, and high blood pressure. Taken together, these factors are why diabetes can more than double your risk for coronary artery disease and PAD.

4 Risk Factors YOU CAN TACKLE on Your Own

1. **Lack of physical activity.** A sedentary lifestyle can drive unhealthy cholesterol levels, encourage obesity, and foster chronic inflammation. What’s more, most couch potatoes eat a diet filled with unhealthy foods high in fat and sugar that also lead to weight gain and low-level inflammation. Check out Chapter 3 for tips on how to become more physically active.

2. **Obesity.** Not only does excess weight increase your odds of developing high cholesterol and blood pressure, it also triggers chronic inflammation. Losing just 5 or 10 pounds can help keep arteries healthy.

3. **Exposure to cigarette smoke.** Cigarette smoke constricts blood vessels and slows circulation. The carbon monoxide from smoke also creates free radicals that damage the endothelium and promote plaque buildup. In addition, nicotine causes the growth of new blood vessels inside existing blood vessels that provide nutrients to plaque. Smoking also decreases the blood’s ability to carry oxygen around your body, which increases the chances of a blood clot occurring. If you smoke, take steps to quit now.

4. **Alcohol.** Drinking an excessive amount of alcohol can cause high blood pressure and raise your blood cholesterol levels, increasing your risk of developing atherosclerosis and cardiovascular disease. Most heavy drinkers also tend to have other unhealthy habits, such as smoking, eating a high-fat diet, and not getting enough exercise. Limit yourself to no more than two drinks per day if you are a man or one drink daily if you are a woman.
As you can see on page 10, there are a number of factors that contribute to endothelial damage and plaque buildup. Some are things you have no control over, like advancing age or a family history of early heart disease. But there are plenty of preventable risk factors that you can do something about. And the earlier you take steps to lower your risk, the more likely your chances of keeping circulatory problems at bay.

Are Clogged Arteries Interfering with Your Circulation?

If you have one or more risk factors, your chances of having damaged arteries and reduced blood flow increases significantly. The problem is, by the time symptoms like numbness, tingling, or chest or leg pain show themselves, serious blockages are already present. Also, a heart attack or stroke can occur without any prior warning.

If you’re at risk for circulatory problems, especially atherosclerosis, it’s wise to see your health care provider. While severe blockages may require medical intervention, mild to moderate cases often respond well to targeted dietary supplements and lifestyle changes. Remember, atherosclerosis is progressive, but it’s also preventable.
The Complications of Poor Circulation

Poor circulation can lead to a number of serious conditions. Left untreated, these complications can be severe, even deadly.

- **Aneurysm** occurs when the wall of the artery thins and allows blood to balloon in the area. If an aneurysm bursts, it can be quite dangerous, even deadly.
- **Embolism** is a blood clot that is able to travel. This is dangerous because it could travel to the brain, lungs, or heart.
- **Erectile Dysfunction** can be caused by poor blood flow to the penile arteries due to atherosclerosis.
- **Gangrene** occurs if there is not a sufficient blood supply to an area, leading to tissue death.
- **Peripheral Artery Disease** is a common circulatory problem in which narrowed arteries reduce blood flow to your limbs.
- **Phlebitis** is a condition where the lining of a vein becomes inflamed and blood clots in the area. This leads to pain and swelling in the affected area.
- **Varicose Veins** are more than unsightly. People who have them are far more likely to develop deep vein thrombosis, blood clots, and persistent wounds on the lower legs.
Protecting your circulatory system from harm, especially as you age, is critical to overall cardiovascular health. Yet, as you’ve seen, over time plaque can accumulate and block blood flow. If you’ve been diagnosed with or are at higher risk of atherosclerosis or some other circulatory problem—or even if you simply want to enhance your circulation—the following supplements can help. While each individual supplement helps protect the intricate network of arteries, veins, and capillaries in one or more ways, taking them in combination can boost their effectiveness even more. For an easy and effective way to enhance circulation, look for a synergistic dietary supplement containing targeted combinations of the following herbs and nutrients:

**AGED GARLIC EXTRACT (AGE)**

This pungent herb is a real multitasker. Research, including several of my own studies at the David Geffen School of Medicine at Harbor-UCLA Medical Center in Los Angeles, suggest that AGE lowers both blood pressure and cholesterol levels, prevents inflammation, and improves the elasticity of blood vessel walls. Because of its antioxidant potential, AGE also reduces the oxidation of LDL cholesterol. But AGE’s benefits don’t stop there. In addition to this herb’s impact on blood pressure, cholesterol, and inflammation, a double-blind, placebo-controlled trial we recently completed found that AGE, when combined with other nutrients, can significantly reduce coronary artery calcification that contributes to reduced blood flow and less flexibility.

The study, which appeared in the journal *Preventive Medicine*, involved 65 cardiac patients who were given either an AGE supplement that also contained vitamins B6 and B12, folic acid, and L-arginine or a placebo daily for one year. By the end of the study, those taking the supplement had significantly less plaque buildup in their coronary arteries, lower total and LDL cholesterol, and lower homocysteine levels. Plus, their HDL levels had gone up.

During an earlier study that appeared in the *Journal of Nutrition*, we concluded that taking supplemental AGE may increase glutathione levels. Dubbed the master antioxidant, glutathione is a small molecule made up of three amino acids—cysteine, glycine, and glutamine—that’s found in each and every cell in the body. But, although small, it plays a mighty role in...
endothelial function, compensating for homocysteine’s damaging effects. Unfortunately, your natural ability to produce glutathione diminishes as you age. AGE may help increase your glutathione stores to more youthful levels, which helps protect your arteries.

Be aware, however, that you won’t see these benefits with ordinary garlic supplements. To create AGE, organically grown garlic is naturally aged for up to 20 months using a special proprietary process. This unique aging process converts the garlic’s harsh and unstable organosulfur properties into odorless, yet powerful compounds with a wide range of health benefits, especially for the cardiovascular and circulatory systems.

**ALPHA LIPOIC ACID**

Often called the universal nutrient because it is soluble in both fat and water, this vitamin-like antioxidant protects against free radicals that can damage the endothelium. Alpha lipoic acid can also reactivate other heart-healthy antioxidants, including glutathione and vitamin C. But that’s only one of the many ways this potent nutrient can keep your arteries healthy. According to scientists from Oregon State University and the University of Washington, alpha lipoic acid also helps to extinguish inflammation, prevents plaque formation in blood vessels, and lowers triglycerides—all of which help protect endothelial function and help ensure healthy blood flow.

**THE B VITAMINS**

Protecting your arteries from high homocysteine levels requires not one, but three B vitamins. Numerous studies have confirmed that the combination of vitamin B6, vitamin B12, and folic acid is the most effective way to lower this unhealthy compound. Eating a healthy diet filled with beans, lean protein, fruits, and vegetables is one way to boost these beneficial Bs. But if your homocysteine levels are heading north, it’s smart to also take a targeted B-complex supplement that provides adequate levels of each of these important nutrients.

**FISH OIL**

The secret to fish oil’s ability to protect blood vessels comes from two omega-3 fatty acids, docosahexaenoic acid (DHA) and eicosapentaenoic acid (EPA). Numerous studies show that these two omega-3s help reduce high blood pressure and triglyceride levels. They also modulate many of the mechanisms of atherosclerosis, including inflammation, blood clotting, and platelet aggregation (stickiness).

During one groundbreaking study that appeared in the *Annals of Internal*
CIRCULATION

Medicine, 223 patients with significant blockages in their coronary arteries were divided into two groups. One group was given 6,000 mg of supplemental fish oil daily for three months, followed by 3,000 mg daily for another 21 months. The second group received a dummy capsule filled with a non-omega-3 oil. After two years, the researchers rechecked the arteries of the participants using a specialized X-ray technique called coronary arteriography. Compared to the placebo group, the blockages among those in the fish oil group had progressed more slowly. And surprisingly, the blockages in 17 of those in the omega-3 supplement group actually regressed.

But you needn’t take fish oil long-term before experiencing benefits. Omega-3s can also bring immediate aid to your arteries. According to a 2010 trial at the University of Illinois, Urbana-Champaign, when 20 volunteers were fed a high-fat meal designed to dampen endothelial function and boost arterial stiffness, those who took 1,000 mg of fish oil after eating appeared to be protected against the dietary-induced damage. Of course, this doesn’t give you an excuse to dive into a greasy burger and fries. It’s simply an example of the protective properties fish oil has on your circulatory system. To truly reap all of the artery-healthy advantages fish oil has to offer, it’s smart to add an EPA/DHA fish oil supplement to your supplement routine every day.

Sip with Your Supplements

It’s estimated that your body is made up of 60 to 70 percent water—much of which is found in the blood. Replenishing the water you lose daily through sweat and urination is important for healthy blood flow. It also helps your circulatory system deliver nutrients to their intended targets. While it’s wise to drink at least 64 ounces of purified water throughout the day, make sure to take your supplements with at least 8 ounces of H2O for maximum benefit.
**GINKGO BILOBA**

Best known as the memory herb, ginkgo biloba is also a powerful weapon against the vascular problems that can impede circulation. Ginkgo flavone glycosides, which typically make up approximately 24 percent of the extract, are primarily responsible for ginkgo’s antioxidant activity and its ability to inhibit platelet aggregation. Ginkgo also boosts the production of nitric oxide, which dilates blood vessels and improves blood flow.

Because of these properties, ginkgo has been studied in people with PAD who experience pain when walking caused by reduced blood flow to the legs. During one of these trials, investigators at Stanford University gave 63 elderly patients with PAD either 300 mg of ginkgo biloba or a placebo daily. The researchers then compared the time the patients could walk on a treadmill without experiencing pain. After four months, those taking the ginkgo could walk up to 43 seconds longer than those taking the placebo, confirming an increase in blood flow to the legs.

Ginkgo is essentially free from any serious side effects, but some people may experience mild gastrointestinal upset. Although no interactions with commonly prescribed drugs are known, ginkgo shouldn’t be taken with blood thinners, whether pharmaceutical or herbal.

**L-ARGININE**

Arginine is an artery-protecting amino acid that boosts nitric oxide levels. This causes blood vessels to relax, permitting improved blood flow throughout the body. Some researchers also suggest that the uptick in arginine-induced nitric oxide may increase exercise capacity in people with heart disease. And, as mentioned earlier, when combined with AGE and B vitamins, arginine helps halt mild atherosclerosis.

According to Johns Hopkins cardiologist Charles J. Lowenstein, nitric oxide produced by supplemental L-arginine also has the power to block the release of inflammatory compounds by cells within the blood vessels. Normally, these cells activate a process that releases packets of molecules into the bloodstream that, like tiny hand grenades, explode and discharge
compounds that trigger inflammation. Nitric oxide can move in and target a protein within the endothelial cells called N-ethylmaleimide-Sensitive Factor (NSF) that stops the inflammatory process from happening by blocking the ability of NSF to push out the molecules.

Although the body can naturally produce this amino acid, you likely also receive significant amounts of L-arginine from your diet. However, as you get older, you may need more than your body and diet can supply. Fortunately, you can boost your intake of L-arginine through supplementation. While some studies have used up to 24 g of supplemental arginine, check with your doctor before taking more than 6,000 mg. It’s also wise to avoid this amino acid if you suffer from low blood pressure.

**NATTOKINASE**

Don’t let its pungent odor and slimy appearance fool you. The popular Japanese soy “cheese” known as natto harbors a powerful enzyme called nattokinase that can enhance circulation by thinning the blood and preventing blood clots. Hyperviscosity—thick and sticky blood that moves slowly through the circulatory system—encourages artery-damaging inflammation. Sluggish blood flow also makes it difficult to prevent blood clots from forming. And that’s where nattokinase’s clot-busting properties come in. In addition to thinning the blood, this soy-based enzyme reinforces the actions of plasmin, your body’s own enzyme that breaks down fibrin (the body’s clotting agent), thereby preventing abnormal thickening of the blood. Recent studies also indicate that nattokinase helps lower both systolic blood pressure and diastolic blood pressure by 10.9 percent and 9.7 percent, respectively.

This soy extract is extremely useful if you’re looking for natural support for healthy blood flow. It’s also beneficial for anyone suffering from blood clots or PAD. But, since nattokinase acts like a blood thinner, if you are taking an anticoagulant, ask your doctor if it is safe for you.

**NIACIN**

This old nutrient has discovered new life after a number of studies linked it to improved vascular health. In one analysis of seven trials involving more than 5,000 patients, researchers at Chicago Medical School confirmed that niacin can raise HDL levels by up to 35 percent in people with coronary artery disease. Other studies suggest that niacin prevents cells from clumping together and sticking to artery walls. This may effectively reduce arterial plaque.

While these actions would be enough to recommend this B vitamin, recent studies also suggest that niacin dilates blood vessels and enhances microcirculation. This is indicated by the famous flush that can occur after taking a niacin supplement. Although this reaction is harmless, it can
cause an uncomfortable tingling sensation and a feeling of mild to extreme warmth. You can help prevent this flush by taking your niacin at bedtime and with a dose of aspirin or stinging nettles. It’s also wise to take niacin under a doctor’s supervision since, like statin drugs, it may affect liver function at therapeutic doses.

**PHYTOSTEROLS**

Since cholesterol is a major component of artery-clogging plaque, it’s important to keep your levels in check. Plant-derived compounds called phytosterols can help you do just that. Similar in structure and function to cholesterol, these plant sterols attach to the spaces in the digestive tract usually reserved for cholesterol. As a result, less plaque-contributing cholesterol is absorbed into the bloodstream.

There is growing evidence that eating foods like margarine that are enriched with phytosterols can lower your cholesterol levels. One recent review showed that eating foods that provide 2 g of phytosterols per day can significantly lower total and LDL cholesterol levels, as well as triglycerides. The problem with this, however, is that it would require eating two to four tablespoons of a fortified margarine every day! Luckily, you can get plenty of phytosterols in supplemental form. Not only are phytosterol supplements more convenient, they’re also calorie free.

As beneficial as supplements can be for enhancing circulation and lowering your risk of vascular disease, they aren’t a magic bullet. You need to take a three-pronged approach to circulatory health: supplements, exercise, and diet. Each is important in its own way, and together they can reduce your risk of circulatory problems and keep your blood flowing optimally for a lifetime.

**Say ‘No’ to Stimulants!**

Not all supplements are safe or good for your circulatory system. Natural stimulants like caffeine, guarana, and yohimbe—which are often found in sports supplements and weight loss products—constrict blood vessels and can slow blood flow.
health care providers and fitness experts often call exercise “the wonder drug” because of its wide-ranging effects on health. Yes, it helps you maintain a healthy weight, improves mood, and boosts energy levels. It also helps ward off metabolic syndrome, type 2 diabetes, stroke, certain types of cancer, arthritis, and falls. But one of its greatest and most immediate benefits is its impact on circulation.

As you exercise, the blood vessels in your muscles dilate, boosting blood flow. When you work out regularly, your muscles become more efficient at using blood, your heart gets stronger, and your blood vessels become more limber so blood flows more easily. This increased blood flow delivers more oxygenated blood to the working muscle.

But you don’t have to be an athlete to get these benefits. Cardiologists recommend an average of 30 minutes of moderate aerobic exercise a day, which has been shown to increase life expectancy by three-and-a-half years. While you are exercising, aim to work your heart to about 50 to 70 percent of its maximum rate. Even this fairly conservative amount of exercise is powerful enough to combat other high-risk factors. In fact, a study out of the Cooper Institute in Dallas found that moderately fit people had half the death rates of those who were sedentary.
How to Exercise When You Have PAD

While PAD can make walking or working out painful, exercise is actually one of the most beneficial things you can do to reduce pain and enhance blood flow. According to a 2009 study of 156 people with PAD that appeared in the *Journal of the American Medical Association*, walking forces blood into the legs, which increases and strengthens the number of smaller blood vessels in them. Walking also helps to extract more oxygen from the blood that is present, which helps the leg muscles make better use of existing blood flow.

During the study, the PAD sufferers were randomly assigned to six minutes of supervised treadmill exercise, lower extremity resistance training, or to a control group. Over the next six months, the participants who did their regular six-minute walks increased their walking distance by about 69 feet while those who didn’t walk regularly actually experienced a decrease of 49 feet. Better yet, the study showed that those who walked had better blood flow in their legs—despite blockages.

Walking on a treadmill three times per week is ideal for those with PAD. Start by walking slowly (1.5 to 2.5 mph depending on your fitness level) until pain occurs—typically within 3 to 5 minutes. Stop and rest until the pain subsides, then repeat the process. Initially, you should try to complete a total of 10 minutes of this walk/rest cycle. Exercise time should be gradually increased by a few minutes each workout, until a total of 50 minutes of walking can be achieved. A good indication that you’re making progress is when the first 8 to 10 minutes of walking can be completed with much less pain. This is also a sign that the workload should be increased so that a moderate level of pain always occurs during walking.

Anyone just beginning an exercise program should check with his or her doctor. This is especially important if you have PAD. Depending on your starting fitness level and severity of PAD, you may need a medically supervised exercise program.
Aerobics for Better Circulation

Aerobic exercise develops the heart muscle much the way weight training develops other muscles. The heart grows thicker and stronger while the inside of the heart grows bigger, allowing more blood to be pumped with each heartbeat. Aerobic activity also improves the condition of your blood vessels by increasing nitric oxide.

A study presented at the 2009 Canadian Cardiovascular Congress reported that older diabetics could improve artery health by an impressive 15 to 20 percent in just three months with aerobic exercise. Here’s how: When you exercise, you force more blood through your blood vessels. This elevated blood flow stresses the walls of the vessels as it passes over them, reducing inflammation in a way similar to high doses of steroids.

Fast Fact

Exercise promotes the development of collateral blood vessels that circumvent blockages and help maintain blood vessel elasticity.

Get Your Cardio

When practiced vigorously for half an hour, these activities can be fun and heart-healthy.

- Biking
- Brisk walking
- Cross-country skiing
- Dancing
- Elliptical machine
- Hiking
- Jogging
- Kick-boxing
- Racquetball
- Rowing
- Running
- Soccer
- Spin classes
- Step aerobics
- Swimming
- Tennis
- Volleyball
- Zumba

No Excuses!

Don’t have time to exercise? Opt for mini-workouts throughout the day. Take the stairs, park your car further away from the store or office, do some gardening, or clean the house.
Walk Away from Circulatory Problems

Walking is one of the most popular ways to exercise. It’s also an excellent way to improve circulation. What’s more, walking doesn’t require any special equipment and carries the least risk of injury of any form of exercise. Best of all, you can do it anywhere, whether you live in the city, the country, or somewhere in between. If you’re not used to exercising, start slowly, limiting yourself to a 10-minute walk. As your stamina increases, you should be able to increase your walking time to 45 minutes or more.

The percentage your risk of coronary artery disease drops when you engage in a brisk walk three or more hours per week.
What’s Your Target Heart Rate?

The goal of aerobic exercise is to raise your heart rate to a certain level and keep it there for 20 minutes. When you exercise, your heart beats faster to meet the increased demand for more blood and oxygen. The more intense the activity, the faster your heart will beat. Therefore, keeping an eye on your heart rate during your workout can be an excellent way to monitor exercise intensity.

Figuring out your target heart rate—the optimal rate your heart should beat during aerobic exercise—is a simple, two-step process. First, calculate your maximal heart rate. Then, using that number, you can determine your target heart rate zone.

**Maximal Heart Rate:** This number is related to your age, since as you grow older, your heart naturally beats a little more slowly. To estimate your maximal heart rate, simply subtract your age from the number 220.

**Target Heart-Rate Zone:** This is the number of beats per minute (bpm) at which your heart should be beating during aerobic exercise. For most healthy individuals, this range is 50 to 80 percent of your maximal heart rate. So, if your maximal heart rate is 180 bpm, the low end of the range (50 percent) would be 90 bpm, and the high end of the range (80 percent) would be 144 bpm.

Once you’ve determined your target heart-rate zone, you need to know how to put that information to good use. These numbers serve as an indicator of how hard you should be exercising. If you are just beginning an aerobic program, you should aim for the low end of the zone and pick up the intensity as you become more comfortable with your workout. Keep in mind that the target heart rate zone is recommended for individuals without any health problems. Additionally, if you are taking medications that alter your heart rate, consult your doctor before starting an aerobic program.
Win with Weights

As wonderful as aerobic exercise is for the circulatory system, it should be balanced by resistance training, more commonly known as weight lifting. Resistance training improves the muscles and nerve pathways that direct and control movement. It also increases strength and general fitness, including enhanced function of the respiratory, cardiac, and metabolic systems.

For years, the cardiovascular benefits of resistance training were thought to be merely a side effect of lifting weights. But over the last decade, it has become clear that weight training decreases heart rate, reduces blood pressure, improves cholesterol profiles, fortifies the elasticity of arteries, and increases cardiorespiratory fitness.

Many health clubs, colleges, and recreation centers are equipped with both free weights and weight machines. But before you begin, make sure you get instruction on the proper way to use the equipment. Although committing to a regular weight-training routine—at least three times a week—may require a bit of willpower, you’ll be rewarded with a stronger, leaner body and a healthier circulatory system.
Chapter Four
Eating for Healthy Circulation

Supplements and exercise are logical ways to enhance circulation and protect your arteries. But what you put in your mouth matters, too. The food you eat can have a profound effect on your circulatory system. In fact, eating unhealthy fats and refined foods can severely inhibit blood flow. Case in point: In a 2006 Australian study, researchers found that eating just one fatty meal negatively affects blood flow and diminishes HDL’s protective qualities.

Adopting a healthy diet based on whole foods, however, can help protect your circulatory system and reduce your risk of developing atherosclerosis and other vascular problems. Here’s a handy “cheat sheet” of what you should be eating for optimal circulation.
Build A Better Diet

Color Your Plate with a Variety of Veggies. Packed with vitamins, minerals, and antioxidants, brightly colored vegetables are important to include in each meal and snack. One serving of cooked vegetables equals one-half cup, while a serving of raw vegetables comes in at one cup. Best options?

- Asparagus
- Beets
- Cooked tomatoes
- Green, leafy vegetables like spinach and kale
- Onions
- Orange vegetables like carrots, winter squash, and yams
- Red peppers

Focus on Fruits. Eat at least two cups each day. The following are especially artery-friendly fruits:

- Avocado
- Blueberries
- Cranberries
- Grapes
- Kiwi fruit
- Oranges
- Watermelon

Choose Whole Grains. Foods made with whole grains contain more fiber and nutrients than those made with refined grains. Good choices include:

- Barley
- Brown rice
- Oats
- Quinoa
- Whole wheat breads and pastas
Pick Lean Protein. Trade in that fatty ribeye for one of the following, and aim to include 3 to 4 ounces of healthy protein in every meal:

- Beans, lentils, and peas
- Bison
- Chicken breast
- Egg whites
- Fish, especially varieties rich in omega-3s like salmon
- Whey protein

Opt for the Right Fats. The type of fat you eat can be just as important as the amount of fat you eat. Research suggests that monounsaturated fats from vegetables and omega-3 fatty acids from fish and flaxseed are the healthiest fats for your circulatory system.

- Choose foods containing monounsaturated fats whenever possible. Nuts, seeds, and avocado are excellent sources of this healthy type of fat.
- Use monounsaturated oils such as olive or peanut oil for cooking.
- Limit saturated fat. You should obtain less than seven percent of your daily calories from saturated fats.
- Avoid trans fats often found in baked goods and commercially fried food. This man-made fat can raise your cholesterol and increase your risk for developing vascular disease. Foods containing partially hydrogenated oil, hydrogenated oil, or shortening have trans fats in them.
Shake the Salt Habit

Sodium attracts and holds water and is found in many foods. In the right amount, it helps maintain the correct balance of fluids in the body. But most of us eat much more sodium than we need. Hidden salt can be found in many processed foods and restaurant meals. Since a high salt intake boosts the risk of high blood pressure, it’s smart to limit yourself to no more than 2,300 mg (about a teaspoon) daily. But reducing the amount of salt you eat won’t just lower your blood pressure. Australian researchers recently found that eating a low-sodium diet can also help keep your blood vessels working properly.

The easiest way to reduce the amount of salt you consume is to take the salt shaker off the table. But it’s also important to check food labels. A product labeled “very low sodium” must have less than 35 milligrams of sodium in a serving, and “low-sodium” foods must have less than 140 milligrams of sodium. A food labeled “reduced sodium” must contain 25 percent less sodium than the original product. And watch out for those other seasonings. Soy sauce, steak sauce, bouillon cubes, Worcestershire sauce, and even cooking sherry are all loaded with sodium. Opt instead for low-sodium choices like lemon juice, vinegar, and herbs.

Fast Food = Sluggish Circulation

Scientists at the University of Maryland School of Medicine have confirmed that eating a fast-food breakfast high in salt, trans fat, refined carbs, and sugar can slow blood flow and have a detrimental impact on blood vessel tone.
The Not So Sweet Truth

Sugar—often listed on labels as sucrose or high fructose corn syrup—doesn’t just pack on the pounds. It also damages your vascular system by triggering inflammation, increasing triglycerides, and driving down HDL levels. Based on recent studies, the American Heart Association now recommends limiting your intake of added sugar to no more than 150 calories daily.

Chocolate As Medicine? You Bet!

A recent study in the journal *Circulation* found that the flavonoids in dark chocolate improve circulation. Flavonoids are naturally occurring antioxidants that may help lower blood pressure and decrease cholesterol, both of which are factors that contribute to endothelial dysfunction. Just make sure you bypass that Snickers bar in favor of no more than one ounce of dark chocolate that contains at least 60 percent cacao.

TIP: When shopping for leafy greens, always pick deep green varieties. The darker the green, the more antioxidants and nitric oxide–boosting nutrients it contains.
YOUR ACTION PLAN FOR Better Blood Flow

DIET
🔹 Add some cooked veggies like asparagus, mushrooms, or spinach to your morning omelet for an antioxidant-rich, high-protein breakfast.
🔹 Remove the skin from chicken and turkey to minimize unhealthy saturated fat.
🔹 Check ingredient labels for hidden salt, sugar, and trans fats.
🔹 Trade in that sugary dessert for a handful of grapes. People in one study experienced better blood flow just three hours after eating the equivalent of one and a quarter cups of grapes. At 60 calories a cup, that’s a pretty sweet deal.

🔹 Try to eat at least one fresh salad each day. Include a variety of leafy greens and raw vegetables for a dish that’s bursting with circulatory supporting nutrients.
LIFESTYLE

- If you work at a desk, take regular breaks every hour and walk around for 5 to 10 minutes.
- Rent an exercise DVD that features resistance exercises that use your own body weight.
- If painful joints make traditional exercise difficult, try swimming or join a water aerobics class.
- Stretch for a few minutes after your workout, when blood has a tendency to collect in muscles. Stretching helps keep circulation high and speeds muscle recovery.
- Take steps to stop smoking, even if you’ve tried and failed in the past. Tobacco use is the most detrimental thing you can do to your circulatory system.
- Indulge in a massage. Not only does a massage ease stress, it helps moves blood through congested areas.

SUPPLEMENTS

- Discourage plaque buildup while lowering both cholesterol and homocysteine levels by taking a combination of AGE, B vitamins, and L-arginine. But you needn’t take a handful of pills to get these benefits. Just two capsules of Kyolic Formula 108, taken twice a day with meals will give you a healthy dose of these artery-loving nutrients.

- Tame inflammation and help blood flow freely with a high-quality fish oil supplement like Kyolic EPA that also includes AGE.

- Support healthy blood pressure by exercising daily, watching your salt intake, and taking Kyolic Formula 109, a synergistic blend of AGE and nattokinase that may also thin the blood and prevent blood clots.

- Keep your cholesterol (a major component of artery-clogging plaque) under control with a dose of phytosterols like those found in ModuChol by Wakunaga. For best results, take one capsule with your two largest meals of the day.
Selected References


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