



Harvard Heart Letter

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11 ways to prevent stroke

It's never too late to strike out against a potentially devastating brain attack.

Like close cousins, heart disease and stroke share a common lineage. Both emerge from a mix of nature (genes), nurture (upbringing and environment), and personal choice (smoking, exercise, etc). For most of us, personal choice largely determines whether a stroke lies ahead. New guidelines on the prevention of stroke suggest that a healthy lifestyle can cut the risk of having one by 80%. No drug, device, or other intervention can come close to doing that.

The term “stroke” conjures up a frightening bolt out of the blue. It certainly feels that way when it happens. But the sudden onset belies a stroke’s decades-long development due to slow but steady damage to blood vessels,

the growth of artery-clogging plaque, or the development of atrial fibrillation. This long gestation means it is often possible to avoid a stroke by fighting arterial corrosion.

Two types of stroke

A stroke occurs when blood stops flowing to part of the brain. Cut off from their supply of oxygen, brain cells begin dying within minutes. Sometimes the damage is fatal—stroke is the fourth leading cause of death in the United States, accounting for almost 135,000 deaths each year. Most of the time, stroke isn’t a killer. The American Heart Association estimates that there are more than six million stroke survivors in the United States. Although some have no physical or mental reminders of the attack, many have long-lasting speech loss, paralysis, or other problems. In fact, stroke is a leading cause of disability—nearly one in three survivors is permanently disabled, and many more need long-term care.

Ischemic strokes occur when a blood clot or other debris blocks a blood vessel in the brain or one leading to it. These account for more than 80% of strokes. The rest are *hemorrhagic* strokes. These occur when a blood vessel in the brain bursts. The bleeding (hemorrhaging) deprives downstream brain cells of oxygenated blood and can also damage cells by increasing pressure inside the brain.

Though ischemic and hemorrhagic strokes require different treatments once they appear, efforts to prevent them are very similar.

Three types of risk

You can change some, but not all, of the factors that increase your odds of having a stroke (see “Risk factors for stroke” on page 2).

Nonmodifiable risk factors include your age, gender, genes, birth weight, and race or ethnicity. A 60-year-old African American

Different types of stroke

Hemorrhagic stroke
Brain tissue
Bleeding in the brain

Ischemic stroke
Ischemic (oxygen-deprived) brain tissue
Clot

Carotid arteries

There are two main types of stroke. Ischemic strokes are more common and occur when a blood clot blocks an artery in the brain. In some cases, the clot develops in the vessel itself (thrombotic stroke). In other cases, the clot forms in the heart or in an artery that carries blood to the brain; the clot breaks off and travels to the brain, where it lodges in a small artery (embolic stroke). Hemorrhagic strokes occur when an artery in the brain ruptures, releasing blood into the brain tissue.

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11 ways to prevent stroke *continued*

Risk factors for stroke

Factors you can't change

- Age
- Gender
- Race/ethnicity

Factors you can change

- High blood pressure
- Lack of exercise
- Smoking
- Diabetes
- High cholesterol
- Atrial fibrillation
- Sickle cell disease
- Use of oral contraceptives
- Obesity
- Presence of other cardiovascular disease
- Alcohol abuse
- Drug abuse

Harder to change or emerging evidence

- Obstructive sleep apnea
- Migraine
- Certain infections
- Gum disease
- Blood markers like factor V Leiden, lipoprotein(a), others

man who weighed less than 5.5 pounds at birth and whose father had a stroke is far more likely to have a stroke in the next 10 years than a 45-year-old Asian woman who weighed 8 pounds at birth and who has no family history of stroke. Even though you can't change these factors, they set your risk baseline. The higher it is, the more important it is to control the things you can change.

Modifiable risk factors are things that affect stroke risk over which you have some control. These range from high blood pressure and diabetes to smoking and a salty diet.

Many **emerging risk factors** are under investigation. These include migraine, obstructive sleep apnea (breath holding during sleep followed by explosive snoring), gum disease, blood markers such as lipoprotein(a), and infection.

11 strikes against stroke

You can fight stroke on many fronts. A single thrust is good; a many-pronged at-

tack is even better. Here are 11 things you can do to stay stroke-free:

- Know and control your blood pressure.
- Don't smoke; stop if you do.
- Lose weight if needed.
- Become more active.
- Identify and manage atrial fibrillation.
- Be aggressive about treating a transient ischemic attack (TIA, or mini-stroke).
- Treat circulatory problems like peripheral artery disease, sickle cell disease, or severe anemia.
- Know and control your blood sugar and cholesterol.
- If you drink alcohol, do so in moderation.
- Adopt a healthy diet low in sodium and rich in potassium.
- Know the warning signs of stroke (see "Stroke warning signs" below) and respond immediately.

Starting early is best. Acquiring healthy habits in childhood, the early teens, or young adulthood sets the stage for a healthy adulthood and old age. But if you are tardy in joining the prevention party, it isn't too late. Even small steps now can improve your health. ♥

Stroke warning signs

If you notice one or more of the signs below in yourself or someone else, or you're really worried that you or someone you are with is having a stroke, call 911 or your local emergency number right away:

- sudden numbness or weakness of the face, arm, or leg, especially on one side of the body
- sudden confusion or trouble speaking or understanding
- sudden trouble seeing in one or both eyes
- sudden problem with walking, loss of balance, or coordination
- sudden, severe headache with no known cause.

Fish oil questioned as treatment for heart disease

It may be okay for prevention. But eating fish is a better strategy than gulping pills.

Fish oil has been flying high as a supplement for the past few years. It has garnered a reputation as an easy way to protect the heart, ease inflammation, improve mental health, and lengthen life. Such claims are one reason why Americans spend more than \$1 billion a year on over-the-counter fish oil, and why food companies are adding it to milk, yogurt, cereal, chocolate, cookies, juice, and hundreds of other foods.

But as has happened with so many other supplements, fish oil may have hit its “Black Tuesday.” In a two-week period at the end of November, reports from four randomized controlled trials—the gold standard of medical research—showed that fish oil in one form or another didn’t work any better than placebo at preventing recurring heart problems among heart attack survivors or people with atrial fibrillation. (We’ve summarized the results of these four trials below).

Flip-flop on benefits

British physiologist Hugh Sinclair kindled interest in the heart-healthy prop-

erties of oily fish and fish oil in the 1940s by suggesting they helped keep the Inuit (Eskimo) people healthy in spite of their high-fat diet. Some long-term follow-up studies, such as the Nurses’ Health Study, showed that people who eat one or more servings of fish a week are less likely to have heart attacks or heart rhythm problems or die from sudden cardiac arrest. A few randomized trials in the 1990s that added fish or fish oil to the diet supported this notion.

So why do the results of the latest trials tell a different story? The early trials were done before the widespread use of heart-protecting medications such as statins, ACE inhibitors, aspirin, and beta blockers. Without them, fish oil by itself could have made a difference. The use of state-of-the-art medical therapy in the four most recent trials could have drowned out any small benefit provided by fish oil.

Of course, it is also possible that the trials weren’t large enough or didn’t last long enough to have shown a benefit from fish oil. If that’s the case, any benefit from fish oil is small.

These findings don’t mean fish oil is a complete flop. It may work against heart disease if started earlier, before cholesterol or high blood pressure damages coronary arteries. It could (stress on “could”) fight other types of cardiovascular disease or problems like depression. And it is a good treatment for high triglycerides. But if you already have heart disease, taking fish oil doesn’t seem to do much good.

Eat fish

Medical research tends to practice what philosophers of science call reductionism—trying to understand the nature of something complex (like nutrition and health) by reducing it to the interactions of its parts. Early studies showing that eating more fruits and vegetables was good for health led to a focus on food components, such as fiber, vitamins, and antioxidants. None come close to offering the benefits of food itself. The same story appears to be playing out with fish and fish oil.

If you have heart disease, taking fish oil doesn’t seem to replace eating fish, says Dr. Robert H. Eckel, past president of the American Heart Association and former member of its nutrition committee. The benefit could be due to fish oil in its natural state (in fish), something else in fish, or maybe the fact that eating fish means eating less red meat.

What if you just don’t like fish? Then make sure your doctor has prescribed the best medical therapy for your condition and you are following his or her advice. That is far more important than taking fish oil.

And what about the American Heart Association’s recommendation that people with documented coronary artery disease take in at least 1 gram of omega-3 fatty acids per day from oily fish or a supplement? “I think the time has come to reconsider those guidelines,” says Dr. Eckel. ♥

Latest fish oil trials

Omega-3s for atrial fibrillation: Men and women with occasional (paroxysmal) or continuous (persistent) atrial fibrillation (AF) took 4 grams per day of Lovaza, a prescription form of omega-3s, or a placebo for 24 weeks. Lovaza was no better than placebo at suppressing new episodes of AF among people with paroxysmal AF, and was slightly worse than placebo for preventing AF symptoms in participants with persistent AF (*JAMA*, Dec. 1, 2010).

SU.FOL.OM3 trial: Among survivors of a heart attack or ischemic (clot-caused) stroke, or those with unstable angina (chest pain at rest), taking 600 milligrams (mg) of omega-3s a day for almost five years was no better than placebo at reducing nonfatal heart attacks, strokes, or deaths from cardiovascular disease (*BMJ*, Nov. 29, 2010).

Alpha Omega trial: Daily use of a margarine made with an extra 400 mg of omega-3 oils for more than three years was no better than the same margarine minus the added omega-3 oils at preventing heart attack, stroke, the need for angioplasty or bypass surgery, or heart-related death (*New England Journal of Medicine*, Nov. 18, 2010).

OMEGA trial: Among heart attack survivors, 1,000 mg of purified omega-3 oils a day for one year was no better than olive oil at preventing sudden cardiac arrest, death, heart attack, stroke, or the need for bypass surgery or angioplasty (*Circulation*, Nov. 23, 2010).

Hybrid heart surgery expands options

Collaborative approach aims to improve cardiac care.

Heart problems tend to come in clumps. Arteries clog. Valves don't open or close all the way. The heart's rhythm becomes irregular. Many people face not one but two or more treatment decisions.

Just a few years ago, someone who required multiple cardiac procedures might have had separate procedures done by specialists working in different parts of a hospital. In a catheter lab, a cardiologist would insert a stent to re-open an artery. Later, in an operating room, a cardiac surgeon would fix or replace a faulty valve. Hours might pass in between, involving transport from a sterile environment to an unsterile one and back again. In some cases, the two procedures might even require separate hospital visits.

This fragmented approach to care is starting to change, thanks in part to a much-needed innovation in hospital design: the hybrid operating room. By including all the equipment needed for diagnostic imaging, minimally invasive procedures, and traditional surgery, it lets heart surgeons, cardiologists, electrophysiologists, and other specialists work together in the same space, at the same time. Specialists now travel to the patient, rather than the other way around. These high-tech operating suites make it possible for physicians to treat higher-risk patients and to expand the treatment options available.

Hybrid cardiac surgery is mainly available at academic medical centers for now, but the trend is catching on.

"Hybrid cardiac surgery is part of a larger effort to make interventions safer and less traumatic for the patient," says Dr. Peter Zimetbaum, director of clinical cardiology at Harvard-affiliated Beth Israel Deaconess Medical Center (BIDMC) and a member of the *Heart Letter* editorial board. "Some procedures that previously required large incisions and long periods of gen-

eral anesthesia can now be done with minimally invasive techniques because these operating rooms have the equipment we need to convert to a standard operation should the need arise."

Dr. Arvind Agnihotri, a cardiac surgeon at Harvard-affiliated Massachusetts General Hospital, sees another advantage. "A hybrid operating room allows us to go back and forth between open surgery and image-guided procedures." These view the heart from the inside using a flexible wire called a catheter that is inserted into a blood vessel.



Hybrid scenarios

To get a sense of what this means for someone needing several cardiac fixes, consider a few of the typical procedures that take place in a hybrid operating room.

Stent/valve. A man goes to a hospital because of chest pain. Doctors discover that he has both a partially blocked right coronary artery and a narrowed aortic valve (aortic valve stenosis). In a hybrid operating room, a cardiologist inserts a stent to restore blood flow in the blocked artery. Immediately afterwards, a cardiac surgeon replaces the faulty valve.

Combination revascularization. A woman has a partial blockage in one coronary artery and a complete blockage in another. In this case, a combination approach might work best to restore blood flow to the heart muscle. A cardiologist inserts a stent into one coronary artery to open it up, then a surgeon grafts a bypass vessel to let blood flow around the other blockage.

Minimally invasive procedures. Many people have heart problems that once required traditional surgery but

can now be repaired using minimally invasive techniques. As the *Heart Letter* reported a few months ago, one example is aortic valve replacement, which is now being done with less invasive surgery, or even with a nonsurgical method similar to angioplasty. (This experimental approach, known as transcatheter valve replacement, is

still being evaluated and is not yet widely available.) Such minimally invasive approaches require the sort of on-site, high-resolution digital imaging equipment available in hybrid operating rooms.

Arrhythmia ablation. One approach to fixing a heart rhythm abnormality (arrhythmia) involves catheter ablation. This involves threading into the heart a catheter tipped with an energy source. The catheter is maneuvered to destroy (ablate) the source of the rogue impulses that are causing the irregular heartbeat. Although this is usually a minimally invasive procedure, it can sometimes cause dangerously low blood pressure that requires temporary support on a circulatory assist device.

"Most of the procedures we do in a hybrid operating room are customized for each individual," says Dr. Kamal Khabbaz, chief of cardiac surgery at BIDMC. "Hybrid cardiac surgery fosters a collaborative approach that should reduce risk of complications, shorten recovery times, and improve outcomes."

To know that for certain, research to evaluate the results of many hybrid procedures is needed. As with any major procedure, you may not want to be the first on the block for new hybrid procedures. Make sure you ask your doctors how many times they've done it this way, and what their outcomes are. ♥

Transfusion and heart surgery: Only when needed

Unnecessary blood transfusion can do more harm than good.

Blood transfusion deserves a prominent place in the pantheon of medical advances. It has saved countless lives on the battlefield and in hospital emergency departments. It is a life-prolonging treatment for people with conditions that prevent the body from making blood or blood components, from kidney disease and cancer to disorders such as hemophilia and sickle cell anemia. But whether blood should be routinely transfused during or after heart surgery is a question that more and more people are asking. The answer is tilting toward “no.”



Questioning 30/10

The *theory* behind transfusing blood during and after coronary artery bypass grafting, heart valve repair or replacement, aortic aneurysm repair, or other cardiovascular surgery makes perfect sense. Loss of blood during an operation depletes the number of oxygen-delivering red blood cells in circulation. That could mean less oxygen available to tissues throughout the body, especially to surgically traumatized heart muscle.

Doctors measure the blood's ability to deliver oxygen in two ways:

Hematocrit. Blood is made up of red blood cells, white blood cells, platelets, and plasma (the liquid component). Hematocrit measures how much of the volume of whole blood is made up of red blood cells. A normal hematocrit is typically set at 36% or higher for women and 40% or higher for men.

Hemoglobin. Hemoglobin is an oxygen-carrying protein found in red blood cells. In women, a normal hemoglobin level is 12 grams per deciliter of blood (g/dL) or higher; in men, it is 14 g/dL or higher.

For years, doctors relied on a “30/10” rule of thumb, ordering a transfusion if the hematocrit fell below 30% or the hemoglobin below 10 g/dL. A growing body of evidence is challenging the wisdom of this arbitrary rule and suggesting that liberal use of transfusions may do more harm than good.

In an eye-opening British study published in 2007, people who received a transfusion during or after heart surgery were six times more likely to have developed a complication related to ischemia (insufficient oxygen delivery to the tissues), such as heart attack, stroke, kidney trouble,

and even death, when compared with those who did not get a transfusion. In a more recent clinical trial, individuals undergoing cardiac surgery were randomly allocated to one of two groups. Those in the liberal transfusion group were given blood if their hematocrit dropped below 30%, while those in the restrictive group were given blood only when the hematocrit fell below 24%. The restrictive strategy was just as effective as the liberal strategy, and led to fewer deaths and complications such as shock, breathing problems, or kidney failure (*JAMA*, Oct. 13, 2010).

Your blood is best

Blood banks across the country collect, store, and deliver more than 14 million units of blood each year. They are used by the five million or so Americans who require transfusions. Blood banks rigorously check blood to make sure it isn't carrying hepatitis C, HIV, or other infectious agents. What they can't do is provide blood that is as good as your blood.

Stored blood isn't nearly as effective as fresh blood at delivering oxygen to tissues. Chemical changes that oc-

cur during storage increase the likelihood that transfused blood will cause inflammation or make blood vessels constrict. Stored red blood cells lose their flexibility and can get stuck in capillaries, the tiny blood vessels that connect arteries and veins. A new European study showed that mixing stored blood with fresh blood activates platelets, making them stick together (*European Heart Journal*, Nov. 22, 2010). Sticky platelets can form the kind of blood clots that cause heart attacks and strokes. In addition, blood from another person can trigger an immune reaction and inflammation. These aren't the kinds of stresses you want to add when the heart is more fragile than usual.

Talking about transfusion

In some hospitals in the United States, more than 90% of people undergoing coronary artery bypass grafting receive a transfusion of red blood cells; in other hospitals, under 10% get one (*JAMA*, Oct. 13, 2010). This huge variation indicates that the transfusion decision is as much about a doctor's training and preferences as it is about medical necessity.

Minimizing the need for transfusion is not only possible, but safe and effective. Working with Jehovah's Witnesses, whose religion does not allow transfusion, surgeons have developed so-called bloodless surgery programs. These aim to improve a person's hematocrit and hemoglobin level before surgery, and then minimize blood loss and maximize blood recovery during surgery. These strategies are being used at hospitals across the country to reduce the need for transfusions among people who are not Jehovah's Witnesses who need heart surgery.

There isn't much you can do about whether you get a transfusion during

or after surgery—if your doctors think you need one, you’ll get it. What you *can* do is have a conversation about transfusion beforehand, say doctors at Harvard’s three main teaching hospitals who have given a lot of thought to transfusions: Dr. Adam B. Lerner, director of cardiac anesthesia at Beth Israel Deaconess Medical Center; Dr. Thomas E. MacGillivray, surgical director of the adult congenital heart disease program at Massachusetts General Hospital; and Dr. James D. Rawn, director of the cardiac surgery intensive care unit at Brigham and Women’s Hospital. In this conversation, ask your surgeon how his or her team decides who needs a transfusion, or if there is a hospital policy.

All three experts stressed that there are definitely times when the benefits of transfusion during or after heart surgery far outweigh the risks. They also agreed that transfusion should be done only when medically necessary.

If your doctor thinks you are likely to need a transfusion, ask if there is anything you can do beforehand to minimize the need for one. Also ask what transfusion-sparing steps the surgical team will take during the operation.

One possibility is to capture lost blood and return it to the bloodstream. Another possibility is a technique known as acute normovolemic hemodilution. It involves taking one to three units of your blood right

before surgery and replacing it with fluids called volume expanders. The blood is held at your bedside and then given back to you during or after surgery to replace any blood lost during the operation. This self-transfusion avoids the chance of acquiring an infection from a donor, developing an immune response, or facing the potential hazards of stored blood.

“In many parts of the world, blood is a precious resource,” says Dr. Deepak Bhatt, associate professor of medicine at Harvard Medical School and chief of cardiology for the VA Boston Healthcare System. “It is time we begin to view it the same way here, and be far more thoughtful about who should get a transfusion.” ♥

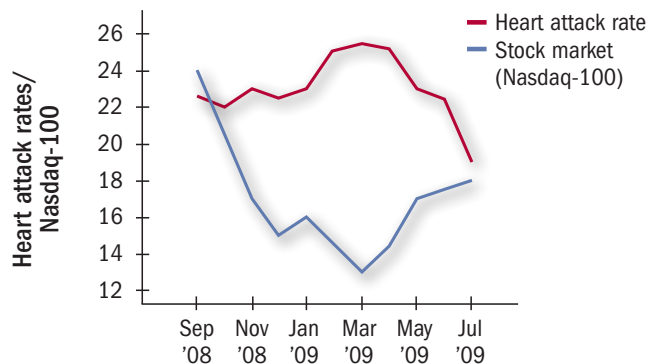
Heart beat

When stocks crash, heart attacks go up

The country’s financial downturn has caused a lot of economic pain, usually measured in terms of lost jobs and home foreclosures. It may be time to add a health dimension to the misery index, with heart attacks soaring as the stock market crashes (*American Journal of Cardiology*, Dec. 1, 2010).

Researchers at Duke University reviewed medical records for 11,590 people who had undergone testing for heart disease during a three-year period, and then compared monthly heart attack rates with stock market levels. Heart attacks increased steadily during one eight-month period—September 2008 to March 2009—that was particularly bad for the stock market (see graph).

While you can’t control the stock market, you can take extra precautions to protect your heart when the economy tanks. The basics consist of a healthy diet, regular exercise, stress management, and taking medications as prescribed. Think of these lifestyle habits as a long-term investment in your health.



Eyelids as windows into the heart

People who develop yellow bumps on their eyelids often visit a dermatologist to get them removed. They may want to see a cardiologist as well.

Such a skin lesion is actually a cholesterol deposit known medically as xanthelasma (ZAN-thuh-LAZ-muh)—derived from the Greek word for yellow. (The plural is xanthelasmata. You can see what they look like at www.health.harvard.edu/166.) Xanthelasmata are strikingly similar to the cholesterol deposits that develop inside blood vessels and contribute to atherosclerosis. This raises the question of whether the eyelids might provide a diagnostic window into the heart.

A large study on this topic generated a lot of interest at the American Heart Association’s annual meeting. Danish researchers found that folks diagnosed with xanthelasmata were 40% more likely than their fellow Danes to develop heart disease—and 51% more likely to have a heart attack—even after the researchers took established cardiac risk factors into account. In a surprise, half of the people who developed one or more xanthelasma had normal cholesterol levels, suggesting that these skin lesions might indeed be an independent sign of heart disease. But this preliminary research has to be confirmed before doctors will know for sure.

It’s not clear why xanthelasmata develop on the skin. One theory is that cholesterol may leak into the skin from small blood vessels known as capillaries. Another is that the structure of skin and internal tissue somehow allows the seepage.

Until more is known, it’s best to be on the safe side. If you develop a xanthelasma, ask your doctor whether you should have your heart checked along with your skin.

Dual-chamber pacemaker helps heart failure

A heart attack, high blood pressure, and other insults can reshape the heart in ways that derail the “beat now” signals that are vital to a healthy heartbeat. The two lower chambers, the right ventricle and left ventricle, should contract and relax together. In many people with heart failure, though, they don’t. This loss of synchronized squeezing costs the heart some of its pumping power.

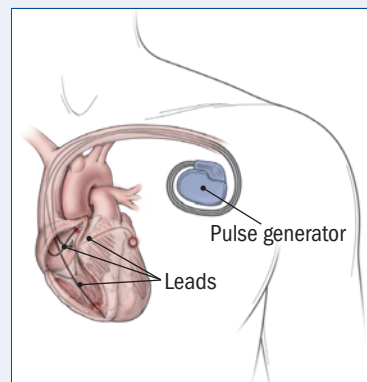
A biventricular pacemaker can fix this problem. It sends carefully timed signals that make the right and left ventricle contract and relax in unison. This is called cardiac resynchronization therapy. Biventricular pacemakers were initially approved for people with severe heart failure. Greater experience with them will almost certainly broaden the population of folks who could benefit from one.

Results of an international trial suggest that combining a biventricular pacemaker with an implantable cardioverter-defibrillator (ICD)—a device that can shock the heart out of a potentially lethal rhythm—helps prevent deaths from sudden cardiac arrest and hospitalizations for heart failure better than an ICD alone (*New England Journal of Medicine*, Dec. 16, 2010). The downside of this double

therapy is an increase in hospitalizations due to problems with the devices.

This dual therapy isn’t for everyone with heart failure. Instead, it could be a good option for those with moderate to severe heart failure

who have a low ejection fraction (a sign of imperiled pumping in the left ventricle) along with changes on an electrocardiogram that suggest the ventricles aren’t beating together (a wide QRS interval). And it definitely isn’t a replacement for medications, watching what you eat and drink, and balancing rest and exercise. But in combination with those strategies, a biventricular pacemaker and an ICD can help you feel better by keeping your heart in sync and help you live longer by halting potentially deadly rhythms.



Stay lean, live longer

For the past few years, the “obesity paradox” has been getting a lot of attention. It began when several studies suggested that people who packed on the pounds with age lived longer than those who stayed thin. But the research didn’t properly account for factors such as cigarette smoking or an underlying serious illness that can trigger weight loss and contribute to an early demise.

An analysis of studies that followed 1.5 million Americans over time may finally resolve the issue (*New England Journal of Medicine*, Dec. 2, 2010). After excluding smokers and people with underlying illnesses, the researchers found that the death rate across various age categories was lowest for people whose body mass index (BMI*) was in the normal range (20 to 24.9), and then increased steadily with BMI. People who were morbidly obese (a BMI of 40 or greater) were 2.5 times more likely to have died during the study period than those who maintained a normal weight. Of interest to *Heart Letter* readers, cardiovascular disease was the most common cause of death among people who were overweight or obese.

The study wasn’t perfect. It was based on white Americans, so the results may not apply to African Americans, Hispanics, or other ethnic groups. Still, at a time when 68% of Americans are overweight or obese, this new study provides a reminder that it’s important to keep your weight within the healthy range, or work to move it in that direction, to protect your heart and live longer.

* To calculate your BMI, multiply your weight in pounds by 703. Divide that number by your height in inches. Divide again by your height in inches. Or you can look it up at www.health.harvard.edu/bmi.

Rheumatoid arthritis should heighten heart awareness

Rheumatoid arthritis begins in the joints, but it doesn’t end there. The inflammation that causes swelling and pain in fingers, wrists, knees, and other joints can also affect the heart. A large study from Sweden suggests that a new diagnosis of rheumatoid arthritis should get you thinking about your heart, too.

In a group of 7,500 men and women with new rheumatoid arthritis whose health was followed for up to 12 years, more people than expected had a heart attack, developed chest pain with activity or stress (angina), or needed a procedure to open or bypass a blocked heart artery within five years of their diagnosis (*Journal of Internal Medicine*, December 2010).

This work emphasizes how important it is for everyone with rheumatoid arthritis, including those just learning they have it, to focus on improving heart health while coping with their joint problems. Although an arthritis-specific approach to warding off heart disease doesn’t yet exist, the basic steps for protecting the heart and arteries are a great start:

- exercise
- follow a healthy diet
- manage your weight
- control your blood pressure and cholesterol.

It’s possible that taking a baby aspirin or a cholesterol-lowering statin may be good options for people with rheumatoid arthritis, but these and other drug-based strategies haven’t yet been tested.



Why does my blood pressure rise in the afternoon?

Q I am a 50-year-old woman with newly diagnosed high blood pressure. As diets go, mine is definitely on the healthy side. I do not exercise at a health club, but I do a lot of housecleaning and gardening, and I do walk a fair amount, which I feel is equal to what I would accomplish at a health club. I weigh 150 pounds and my height is 5 feet, 6 inches. I take Toprol-XL. My blood pressure seems to be normal in the morning, averaging 121/74, but in the afternoon the upper number is often in the 140s to 150s. Is it normal for blood pressure to rise like this as the day goes on, especially while on a medication?

A It's great that you are paying close attention to your blood pressure readings. Beta blockers like metoprolol (Lopressor, Toprol-XL) are not great medications for lowering blood pressure when used all by themselves. So, as the day goes on, and you eat and exert yourself physically, my guess is that the metoprolol is just not strong enough to control your blood pressure. One option is to switch to another medication, such as a diuretic or an ACE inhibitor. If your doctor thinks you

need the beta blocker for some other cardiac condition, adding a diuretic or ACE inhibitor to the beta blocker makes sense. In fact, combining low doses of medications that fight high blood pressure in different ways is probably a more effective way to do it than with a high dose of a single medication.

I commend you for staying active, but want to add that the more activity you get, the better. Your blood pressure might fall, and cardiovascular health might improve even more, if you regularly did some aerobic exercise, like brisk walking. Your body mass index (a measure of weight for height) is 24.2, putting you just in the healthy weight category. My guess is that if you lost a few pounds and exercised more, it would help your blood pressure, and you might not need any additional medications.

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Is high potassium a problem?

Q You have written about low potassium in the blood and ways to improve it, but I never read about too much potassium in the blood. Can you tell me why it happens and what is done about it?

A Relatively few people develop high levels of potassium in the blood, since the kidneys are normally quite effective in clearing this mineral from the bloodstream. A normal blood potassium measurement is 3.7 to 5.2 milliequivalents per liter.

High potassium or, as doctors call it, hyperkalemia, can occur for several reasons. Problems with the kidneys, such as kidney failure or glomerulonephritis, can elevate potassium in the bloodstream. So can taking medications that cause the kidneys to hold

on to potassium. These include potassium-sparing diuretics such as spironolactone (Aldactone, generic) and triamterene (Dyrenium, generic); ACE inhibitors; angiotensin-receptor blockers (ARBs); and nonsteroidal anti-inflammatory drugs such as ibuprofen or naproxen. Two other causes of high potassium include using a salt substitute that contains potassium or taking a potassium supplement.

Treating high potassium depends on the severity and the cause. Severe hyperkalemia requires emergency treatment, since too much potassium in the blood can cause lethal heart rhythm problems. Milder cases are usually treated by halting medications that elevate potassium, adopting a low-potassium diet, and treating underlying conditions such as kidney or adrenal disease. -T.L.

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