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DID YOU KNOW...

People who do not fill their prescriptions after suffering a heart attack are far more likely to die within a year than those who fill their prescriptions and take their medications as prescribed? Read more on page 4.



Is It a Heart Attack or Cardiac Arrest?

Knowing what steps to take if you witness one may allow you to save someone's life.

Heat disease is the most common cause of death in the United States, and most adults know what a heart attack is. But do you know what it means when someone has a cardiac arrest?

"They are very different events," says Venu Menon, MD, Director of the Coronary Care Unit at Cleveland Clinic. "Knowing the difference between heart attack and cardiac arrest, and what to do when someone experiences one or the other, could save their life."



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A sensation of pain or pressure in the chest is a common symptom of heart attack, but certainly not the only one. Some people simply get an overwhelming feeling that something is terribly wrong.

HEART ATTACK

Regular readers of *Cleveland Clinic Heart Advisor* know that a disease called atherosclerosis causes fatty plaques to form in the coronary arteries. If a plaque ruptures and spills its contents into the bloodstream, or grows large enough to narrow the channel, blood flow through the artery will decrease or stop. Starved of oxygen, the area of heart muscle nourished by this artery will begin to die. This is a heart attack.

Heart Attack Symptoms

The most common symptoms of heart attack are angina and shortness of breath. Angina is often called chest pain. However, most patients describe it as a feeling of pressure in the chest or a sensation of being squeezed or smothered. However, heart attack symptoms often differ in women, older adults and people of either sex with diabetes.

Surviving a Heart Attack

A number of variables determine whether you are likely to survive a heart attack.

Some of these—which area of the heart is affected, for example—are outside anyone's control. Nevertheless, the goal is to restore blood flow as fast as possible.

"The more quickly the blockage is opened with a stent or clot-busting medication, the greater the likelihood of surviving a heart attack," says Dr. Menon.

Responding to a Heart Attack

What should you do if you or someone you know suspects a heart attack is happening?

"Call 911 immediately. Do not wait, and do not drive to the hospital," he says.

The ambulance will begin lifesaving treatment en route and tell the emergency department to expect you. When you arrive, you will be taken immediately into a treatment room.

"If you drive to the hospital, precious time will be wasted while you are being processed and wait to see a triage

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HEART BEAT

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One Blood-Pressure Drug Appears to Reduce the Risk of Gout

Gout may be the subject of ridicule, but more than 7 million adults in the United States suffer from the painful condition. Gout occurs when uric acid crystals circulating in the blood settle in the joints, causing sudden pain, swelling and stiffness.

Gout is commonly caused by a diet high in red meat, seafood and alcohol, but it also may occur as a side effect of blood pressure management. Gout is a common reason that patients discontinue taking their blood pressure medication.

An analysis of data from more than 20,000 participants in the Antihypertension and Lipid-Lowering Treatment to Prevent Heart Attack Trial (ALLHAT) revealed that patients with hypertension who take the calcium-channel blocker amlodipine have a lower risk of gout than those taking the next two leading blood pressure drugs, the diuretic chlorthalidone and the beta-blocker lisinopril. Although the findings, published online Jan. 20, 2020, in the *Journal of Hypertension*, need to be confirmed in a second trial, they provide hope for patients who cannot take a blood-pressure medication without suffering this painful side effect.

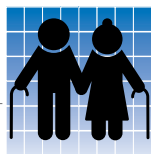


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Some Obese Individuals May Be Genetically Prone to Valve Disease

Obesity is a known risk factor for coronary artery disease, but it can affect the aortic valve, as well. Researchers in Denmark used data from the Copenhagen General Population Study to assess body-mass index (BMI), waist-to-hip ratio and waist circumference in patients with five genetic variations (alleles) associated with obesity. Using a statistical method called Mendelian randomization to assess the association between obesity and aortic valve stenosis and genetic variants, they found the risk of aortic valve stenosis was higher in adults with a high body-mass index (BMI) plus a high waist-hip ratio or waist circumference. The more alleles an individual had, the higher their risk. The researchers also found that adults with higher allele scores had higher BMIs. Each increase in BMI was associated with an increased risk for aortic valve stenosis and valve replacement.


Mendelian randomization cannot prove causality—meaning that the association does not prove obesity causes aortic valve disease. However, in their article published online Jan. 13, 2020, in the *Journal of the American College of Cardiology*, the researchers explained their assumption: Obesity causes blood pressure to rise, increasing stress on the heart. This may lead to changes in the left ventricle and aortic valve and contribute to the development of coronary artery disease. At the same time, obesity causes levels of cholesterol and other blood lipids to rise. The body may deposit these lipids on the valve leaflets, as well as in the artery walls.



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Assessing Whether Someone Is Too Old or Frail for TAVR

Transcatheter aortic valve replacement (TAVR) was developed as an alternative treatment for patients who are at unacceptably high risk for surgical valve replacement. A paper published online Jan. 20, 2020, in *JACC: Cardiovascular Interventions* examined how well these frail patients were able to tolerate TAVR. Researchers looked at data on more than 36,200 patients ages 65 and older who had undergone the minimally invasive form of valve surgery. All were enrolled in a database of TAVR procedures performed in U.S. hospitals. The researchers looked at the effect of three measures of frailty—low hemoglobin and albumin levels and poor five-minute walk speed—on mortality rates at 30 days and one year. They also looked at readmission for heart failure, heart attack, stroke, bleeding complications and length of stay at 30 days and one year. All three measures were found to be independently and significantly associated with a higher likelihood of death at both time points. However, the greatest risk was found in patients with albumin levels that had fallen below 3.5 milligrams per deciliter.

The findings do not suggest that frail patients should not undergo TAVR, the authors said, but do suggest physicians should discuss the possibility of a poor outcome with frailer patients prior to obtaining their consent to proceed. 

Heart Attack or Cardiac Arrest from page 1

nurse,” Dr. Menon explains. “Your treatment will certainly be delayed, and this may make the difference

between surviving and dying from your heart attack.”

CARDIAC ARREST

A healthy heart pumps effectively, because special electrical cells signal the top and bottom chambers to contract in sync. If a heart starts beating too fast or erratically, it begins to quiver, rather than contract. No blood is able to reach the brain and other organs. In a split second, without warning, the person loses consciousness. This is a cardiac arrest.

Responding to Cardiac Arrest

The response to cardiac arrest must be instantaneous. “If a proper heart rhythm isn’t quickly restored, the patient may sustain irreversible injury to the brain,” says Dr. Menon.

If you see someone collapse and drop to the ground, check their neck for a pulse and speak to them. If they are unresponsive and have no pulse, start cardiopulmonary respiration (CPR) immediately, while someone else calls 911 and looks for an automatic external defibrillator (AED). Until the heart can be shocked back to life, CPR must be performed to keep oxygen-carrying blood flowing to

the brain and vital organs.

Today, it’s no longer necessary to give mouth-to-mouth resuscitation to victims of cardiac arrest. Focus on performing chest compressions at a rate of 100 to 120 per minute.

“Push hard, but make sure you allow the chest to bounce back before pushing again,” Dr. Menon advises. “It’s very important that you don’t stop until a trained professional arrives and takes over with shock paddles.”

You Can Make a Difference

Your ability to take immediate action may help determine whether the victim is among the 10% of people who survive a cardiac arrest when it occurs outside a hospital.

“We never know when we will be called on to save a life, or whose life it will be. It could be a family member or friend. That’s why we want everyone to learn how to do CPR and use an AED,” says Dr. Menon.

Similarly, a suspected heart attack should prompt immediate action. Do not wait to see if the symptoms improve. Do not wait for someone to drive you to the hospital. “Call an ambulance,” he says. 🚑



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External shock paddles—AEDs—can be found in many public places, including shopping malls and airports. Knowing how to use them can save the life of someone in cardiac arrest.

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Heart Attack Symptoms

Men tend to experience:

- Chest pressure growing in frequency and intensity over two to three days (unstable angina) and often described as a squeezing sensation
- Pain in the left arm, shoulder, neck, or jaw that may or may not stem from pain in the center of the chest. It also may occur in the right arm
- Pain in the abdomen that may be mistaken for indigestion
- Sweating, restlessness, and anxiety
- Dizziness, faintness, and heavy pounding in the chest
- Shortness of breath
- Disorientation (more common in the elderly)
- Nausea or queasiness (more common in women)

Women may experience the same symptoms as men, but are more likely to have less-dramatic symptoms:

- Upper back or shoulder pain
- Jaw pain or pain that radiates to the jaw
- Pain that radiates to the arm
- Pressure or pain in the center of the chest
- Nausea or queasiness and indigestion
- Shortness of breath or feeling “winded”
- Unusual fatigue for several days
- Lightheadedness

Cardiac Arrest Symptoms

- Sudden loss of consciousness
- No pulse

Rx for a Longer Life

There are good reasons why you should take your heart medications as prescribed.

Every day, millions of people with heart disease or its risk factors are prescribed medications designed to make them feel better, improve their heart function and help them live a longer, healthier life. These medications work only if they are taken, and they work best when taken as prescribed. So it's surprising to learn that many people refuse to take these medications or stop taking them without their doctor's knowledge.

"This probably wouldn't happen, if they had been diagnosed with cancer," says Cleveland Clinic preventive cardiologist Dennis Bruemmer, MD. "People are more afraid of cancer than heart disease. They don't know they are more likely to die from a heart attack than they are from cancer."

The number of patients who fail to comply with a potentially lifesaving medical regimen is staggering. Following hospital discharge after a heart attack, 30% of survivors with diabetes never fill their prescription for antidiabetes medication. Of those who do, only half are still taking the medication one year later.

The impact of this casual attitude can be catastrophic. Heart-attack patients who do not fill their prescriptions are far more likely to die within a year than those who fill their prescriptions and take them as prescribed.

Barriers and Excuses

There are many reasons why heart patients do not accept medical therapy. One likely reason is that most cardiovascular risk factors simply don't hurt.

"If high blood pressure or obesity doesn't bother you, there's no compelling pressure to take action," says Dr. Bruemmer.

Some people worry about the potential side effects of a drug, or don't believe it will work.

Others use twisted logic to justify ignoring their doctor's recommendations. "Taking medications means they are sick. They don't want to be sick, so they won't take medications," says Dr. Bruemmer.

Failure to understand why you need a particular medication is an unfortunate occurrence, but it isn't an excuse. "It's your physician's responsibility to make sure you understand why a drug is being prescribed and how you should take it," he says. "If your doctor doesn't volunteer this information, ask him, or ask your pharmacist."

Improving Compliance

In her role as a cardiology pharmacist at Cleveland Clinic, Ashley Kasper, PharmD, encourages heart patients to comply by emphasizing that many cardiovascular drugs have been proven to help patients live longer.

She also tells them some of the medications they are prescribed will

control their symptoms and help make them feel better.

"Sometimes the short-term impact—feeling better—is more compelling at the moment than the promise of a longer life," she says.

Too often, she sees patients follow their prescribed medical regimen for a few weeks, then stop. She thinks these patients may not understand the difference between treating chronic and acute diseases.

"Heart disease is not like a cold: You can't stop taking your medications when you begin to feel better, or your disease can quickly worsen," she says.



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What Steps to Take If You Miss a Dose

You look at your watch and realize you forgot to take your medication. What should you do?

"As a general rule, if you remember on the same day, take the dose you missed," says Dr. Kasper. "If it's closer to the time of the next dose than the one you missed, skip it and return to your normal schedule."

Most drugs dosed twice a day can be taken at breakfast and dinner or bedtime. "Whatever schedule allows you to remember is fine," she says.

Prescriptions with directions to take the medicine every 12 hours are an exception: It's an indication the medication must be taken exactly 12 hours apart. However, medications dosed three times a day do not need to be taken eight hours apart unless so directed. Dr. Kasper advises taking the first dose upon rising, the third dose at your typical bedtime and the second dose midway between.

If you think your medications aren't working or they cause intolerable side effects, she advises calling your doctor right away.

"Don't stop taking a medication without your doctor's permission. You may end up feeling worse or needing hospitalization," she says.

When Cost Is an Issue

Due to the web of contracts insurance providers negotiate with pharmacies, your doctor likely does not know what a particular drug will cost you. If you are prescribed a drug you can't afford, ask the pharmacist if there's a less-expensive alternative. If the answer is yes, the pharmacist can call your doctor for permission to make the substitution.

On the other hand, if your health depends on a specific drug that you cannot afford, ask your doctor to contact the pharmaceutical company on your behalf, or check the company's website yourself. Some pharmaceutical companies will cover some or all of the cost for patients in your situation.

If it's hard for you to get to the pharmacy to pick up your prescriptions, call the pharmacy and ask if they deliver. Many national chains now offer this service free of charge.

The Final Word

If you have questions or concerns about any medication you have been prescribed, tell your doctor. Having an open, honest conversation is the key to a healthy doctor-patient relationship.

"We would much rather have a patient tell us they are concerned about a medication than stop taking it and end up having a heart attack or needing hospitalization," says Dr. Bruemmer. "We offer our patients the best advice we can. Ultimately, however, it's up to them to comply with our recommendations." ■



HOW THESE COMMON HEART DRUGS HELP

- ▶ ACE inhibitors and ARBs dilate blood vessels and lower blood pressure. They are essential in treating heart failure. They also may be used for high blood pressure.
- ▶ Aldosterone blockers lower the risk of death from heart failure by helping the heart work more efficiently.
- ▶ Antiarrhythmics are used to re-establish a normal heart rhythm. They must be taken exactly as directed. "Stopping them, or missing a dose or two, can be dangerous," says Dr. Kasper.
- ▶ Anticoagulants are essential to prevent blood clots in patients who have experienced a recent clot, have a mechanical valve or have atrial fibrillation. Anticoagulants should be taken at the same time every day.
- ▶ Antidiabetes medications lower blood sugar levels. A new class of these drugs lowers the risk of death and hospitalization for heart-failure patients with type 2 diabetes.
- ▶ Antihypertensives lower high blood pressure, and with it, the risk of heart attack and stroke. Many patients require multiple antihypertensive agents to do the job. All can have side effects, so bear with your physician until the right combination of agents and doses is discovered.
- ▶ Antiplatelet drugs are used to prevent a stent from becoming blocked with a clot. These drugs should be taken at the same time every day. Stopping them early can result in another heart attack from clot formation inside the stent.
- ▶ Beta-blockers slow the heart rate and lower blood pressure. Adding beta-blockers to other heart-failure drugs can improve survival by as much as 34%. Finding the optimal dose of beta-blocker takes time, and most side effects disappear when your body adjusts to the new dose.
- ▶ When beta-blockers are used to treat the fast heart rhythm known as tachycardia, discontinuing the medication can cause the tachycardia to recur.
- ▶ Calcium-channel blockers are easy-to-take drugs that help lower blood pressure. Some patients experience minor swelling in their legs.
- ▶ Digoxin is used to control atrial fibrillation and decrease heart failure hospitalizations. Your physician may want to closely monitor blood levels of the drug to maximize effectiveness and minimize side effects.
- ▶ Diuretics eliminate excess fluid buildup, reducing swelling, allowing the heart to pump more easily and making you feel much better.
- ▶ Nitrates dilate blood vessels to allow more blood into the heart. They are prescribed after a heart attack or incident of unstable angina to relieve chest pain. The pills dissolve quickly under the tongue. Their main side effect is headache, which can be managed with acetaminophen.
- ▶ Statins and other lipid-lowering drugs lower levels of dangerous LDL cholesterol in the blood to reduce the risk of heart attack or stroke.
- ▶ Vasodilators that are stronger than nitrates increase blood flow to the heart and lower blood pressure, making it easier for the heart to pump.

9 Common Misconceptions About Cardiac Rehab

It's a comprehensive program that provides the tools heart patients need to take control of their disease.

In searching for the latest medicine or procedure that will stabilize their heart condition and lower their risk, many patients overlook one of the most effective treatments available: cardiac rehabilitation.

Participation in a cardiac rehab program has been proven to lower the risk of death from heart disease, relieve symptoms and improve quality of life. Yet fewer than half of patients who are prescribed cardiac rehab take advantage of what it can offer. While there are a variety of reasons for passing up this opportunity, it appears many people simply misunderstand what cardiac rehab involves and what it can do for them.

We asked Michael Crawford, MS, manager of the cardiac rehabilitation program at Cleveland Clinic, to set the record straight on some of the most common misconceptions.

1 It's only for heart-attack survivors.

Cardiac rehab is an excellent way to help heart-attack survivors avoid another heart attack, but it is also beneficial for patients who have undergone coronary artery bypass grafting, angioplasty and stenting, heart valve repair or replacement, and heart transplantation. Some insurance companies also cover the cost of cardiac rehab for patients who have had an aortic aneurysm or congenital heart defect repaired.

Many people are unaware cardiac rehab can help improve quality of life for patients who are being treated medically. “We can help patients with chronic angina do more physically before their chest pain begins,” says Crawford.

“Cardiac rehab also can make heart-failure patients feel and function better, while reducing the



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Exercise is an important component of cardiac rehabilitation, but one that should not worry you. Exercise prescriptions are tailored to each individual and take into account age, physical condition, type of heart disease, presence of other medical issues that might make exercise difficult, and normal activity level. Starting slowly under the supervision of physicians and rehabilitation specialists is a safe way to strengthen your heart.

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likelihood of needing hospitalization,” he says. “Patients learn how to identify fluid retention earlier and alert their doctor, who can take steps to prevent heart failure from worsening.”

2 Rehab is just exercise. Exercise is only one small component of a cardiac rehabilitation program. Sessions cover heart-healthy nutrition and managing cardiac risk factors.

Because depression and anxiety are common after a heart event, the emotional health of participants is closely monitored, and resources for support are offered when necessary.

“Our goal is to provide the tools a patient needs to recover from their current heart condition and prevent them from developing another heart issue,” says Crawford.

3 You already know what to do. As anyone who has tried to keep a New Year’s resolution knows, knowing and doing are not the same thing. “The best developed plan is only as good as its execution,” says Crawford. “Cardiac rehab is about doing, not knowing.”

After a heart event, a lot of things can change. The medicines you take may affect your ability to exercise, what you eat or how your blood sugar responds.

If you received a device such as a pacemaker or implantable cardioverter-defibrillator or underwent a procedure such as aortic aneurysm repair, the type of exercise recommended for you may be different than you expect, or more restricted.

“A good rehab program will help you work through these changes,” says Crawford.



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In addition to exercise, cardiac rehabilitation sessions focus on lifestyle issues. These generally include the components of a heart-healthy diet, how to quit smoking and how to lose weight. Depending on the location and composition of the class, some sessions may deal with techniques for managing stress or other risk factors.

4 You're not in good enough shape. If you believe this, then cardiac rehab may be exactly what you need.

A cardiac rehab program is not set in stone. Your ability to exercise will be evaluated, and an individualized plan will be designed to improve your condition. All limitations will be taken into consideration.

"We can find comfortable exercise for almost everybody, so long as they are mobile," says Crawford.

"We encourage patients to set their own goals, which we help them achieve. Our job is to identify areas that need improvement, but we don't force patients to do anything. They must decide for themselves what they are willing to do."

5 Exercise is dangerous. Fear that exercise will be painful or cause another heart attack is common. In reality, cardiac rehab reduces the risk of cardiac events, death from heart disease, as well as heart-related hospitalizations.

Pain is uncommon, because patients ease gradually into an exercise program.

"It is very rarely dangerous to participate in cardiac rehab. In reality, it's safer exercising after heart surgery or a heart attack than before it

occurred, because you are in a controlled situation and monitored by trained professionals," Crawford explains.

6 It's too late. After a heart attack, you have to enroll in cardiac rehab within 12 months to obtain insurance coverage.

However, there is no statute of limitations

for other heart conditions. You can begin at any time—even years later—so long as you have a good reason: For example, you are still smoking, your blood sugar is out of control or you are very deconditioned.

Some people would simply like to go about their daily life without discomfort.

"You are never too old or too young to benefit from cardiac rehab. It can always make you better," says Crawford.

7 It's only for men. Just as many women as men are eligible for cardiac rehab, although more women than men find excuses not to participate. "Women are pulled in many directions and often find it difficult to make time for themselves," says Crawford.

8 You're done after 12 weeks. Cardiac rehabilitation is a lifelong process. The 12-week program simply teaches you what you

need to do to minimize the impact of risk factors on your heart. After graduating from cardiac rehab, you must continue practicing the good habits you learned on your own.

For those who need ongoing guidance or encouragement, some centers offer maintenance cardiac rehab classes or partner with other organizations to provide it.

9 It's too expensive. Medicare approves 36 visits, ideally completed within three months, as do some other carriers. This is considered optimal for obtaining good results.

If your carrier doesn't cover the entire cost, don't let that stop you. Some cardiac rehab programs will offer a payment plan, work with you to make rehab more affordable or waive responsibility, if you meet certain requirements.

"Ask about creative scheduling. Taking classes twice a week instead of three times will cut the cost by one-third," says Crawford. "If you do a good job at implementing the concepts you learn, you will need fewer rehab sessions.

"Some cardiac rehab is better than none, but completing all sessions is optimal," he says. 🦋



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It is not uncommon for participants in cardiac rehabilitation to form friendships with others in the class and look forward to spending time with them. Sharing a common experience can be bonding, and these friendships may last after rehab sessions end.



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I am trying to lose weight. Is it true that exercise won't help?

Weight loss is all about burning more calories than you take in. In other words, you need to increase your physical activity and decrease your food intake. While it's true that, in general, diet has a greater impact on weight loss than exercise, many studies have shown that exercise is associated with weight loss when it is done consistently at appropriate levels.

The American College of Sports Medicine recommends that you get at least 150 minutes, and up to 250 minutes, of moderate (brisk walking, swimming, mowing the lawn) to vigorous (running, advanced aerobics class) exercise each week to aid in weight loss. For this purpose, aerobic exercise is superior to resistance exercise.

So, how much exercise is needed to lose weight? You must burn 3,500 calories to lose one pound. A 160-pound person walking at 3.5 miles per hour (mph) or running at 5 mph on a level surface for one hour burns about 300 or 600 calories, respectively. This means you would need to walk for 11 to 12 hours or run for 5 to 6 hours in a week to lose one pound, if this is your only intervention.

That being said, exercise has the advantages of re-regulating carbohydrate metabolism, improving insulin sensitivity and reducing cravings. In older adults, exercise can help counter age-related loss of bone and muscle. Importantly, continued exercise after weight reduction is a "must" for weight maintenance.

If you use exercise as a substitute for reducing calorie intake or as an excuse to binge on processed and sugar-loaded foods, you will be disappointed in the results. Trying to lose weight with exercise alone can be challenging and time-consuming, but if you combine exercise with a consistently healthy diet, it can be a great tool to lose weight and keep it off.

My family is urging me to quit smoking. If I decide to do it, what are the best ways to stop? Will stopping really do me any good?

Tobacco use is the leading preventable cause of disability and death in this country, contributing to one-third of coronary heart disease (CHD) deaths. Smoking also can cause or worsen chronic obstructive pulmonary disease, asthma and lung infections. Not only is it associated with lung cancer, but also cancer of the kidney, bladder, pancreas and liver.

There is a benefit to quitting. The Atherosclerosis Risk in Communities (ARIC) study confirmed a dose-dependent increase in peripheral arterial disease (PAD), CHD and stroke in heavy and long-term smokers. After quitting, the risk had significantly decreased at five years, but some risk of PAD lingered for 30 years and CHD for 20 years.

Smoking cessation is a key component of American Heart Association guidelines for cardiovascular disease prevention. Tobacco dependence is now recognized as a chronic, relapsing substance abuse disease requiring a comprehensive program of medication and behavioral treatment. Seven drugs are currently FDA-approved for smoking cessation: bupropion (Zyban®), varenicline (Chantix®), and five forms of nicotine replacement therapy (NRT): gum, inhaler, lozenge, nasal spray and patch. Varenicline is the most effective. It and the nicotine patch are associated with lower relapse rates.

The current recommendation is to start with varenicline or a combination of NRT. Adding behavioral interventions, aggressive supportive counseling and supportive technologies (such as phone quit lines and smartphone apps) offer the best chance for success.

The single most important thing you can do for your cardiovascular health and family is to speak up when you see your doctor and ask for the resources you need to help you quit. ■

IN COMING ISSUES

How sleep apnea can affect your heart.

When it might be wise to get a second opinion.

Take a morning walk to lower your blood pressure.

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