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How Well Do You Understand PCI?

When you need revascularization, here's what to expect from angioplasty and stenting.

Every year in the United States, about 500,000 people undergo angioplasty and stenting to quickly restore blood flow through a narrowed or blocked coronary artery. This form of percutaneous coronary intervention (PCI) can relieve the symptoms of coronary artery disease (CAD) or stop a heart attack in progress.

PCI can make you feel a lot better. It may even save your life. But it's only a temporary fix.

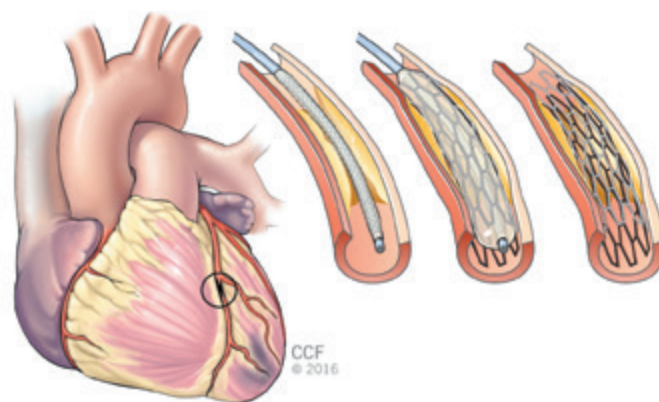
"PCI does not cure coronary artery disease (CAD). We don't have a cure for it," says Amar Krishnaswamy, MD, Head of Invasive & Interventional Cardiology at Cleveland Clinic.

What Makes CAD Serious

CAD is a product of atherosclerosis, a process in which cholesterol, fats and white blood cells accumulate inside the walls of coronary arteries, forming plaques. Young, soft plaques can rupture, triggering the body to form a blood clot that blocks blood flow. Older, harder plaques form through a slower process in which the inside channel of the artery grows narrower until blood flow is seriously impaired. Either way, a heart attack can result.

Atherosclerosis is a systemic illness that can affect arteries throughout the body. It's caused by a variety of risk factors, many of which are within our control (see "Major Modifiable Risk Factors for CAD" on page 7").

"It's imperative to understand that to optimize your cardiovascular health, you must address the issues that contribute to CAD," says Dr. Krishnaswamy.



Stenting is an alternative to open-heart surgery for restoring blood flow inside a blocked coronary artery. A balloon-tipped catheter is positioned in the blockage and inflated to push plaque aside. A wire stent is then placed to hold the channel open.

Explaining PCI

PCI is a less-invasive alternative to open-heart surgery (coronary artery bypass grafting, or CABG). PCI is performed under sedation in a cardiac catheterization laboratory.

A balloon-tipped catheter is threaded through the arteries into the heart and positioned with its tip inside the narrowed plaque. The balloon is inflated, pushing the plaque against the wall of the artery and making the center channel wider. A tube-shaped mesh scaffold called a stent is then positioned in the same location and expanded by a balloon. The balloon is collapsed and withdrawn, leaving the stent in place to hold the artery open.

Best Candidates for PCI

For patients in the throes of a heart attack or experiencing symptoms that are quickly worsening, PCI can save their life by immediately restoring blood flow to their heart muscle.

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HEART BEAT



Metformin Appears to Protect Diabetic Patients Undergoing Surgery

People with type 2 diabetes are at increased risk of complications and death from major surgical procedures. A study in the April 8 issue of *JAMA Surgery* suggests the diabetes drug metformin may offer them some protection.

The retrospective study of more than 10,000 patients who had undergone a surgical procedure with anesthesia found that those who had taken metformin for at least six months had a 27% lower risk of death at 90 days after the procedure (but not at 30 days) and a 22% greater likelihood of survival five years after the operation. Metformin offered protection for all types of surgical procedures, both elective and emergent, except neurosurgery. There were fewer hospital readmissions at 30 and 90 days, as well. If the results are duplicated in a randomized, placebo-controlled study now underway, giving patients metformin prior to surgery could conservatively prolong the life of 10,000 patients a year and reduce hospital admissions by 200,000.



Drug-Drug Interactions More Common with One New Bloodthinner

Patients find the new direct oral anticoagulants (DOACs) dabigatran (Pradaxa), rivaroxaban (Xarelto) and apixaban (Eliquis) much easier to use than warfarin (Coumadin). But if you also take certain medications for high blood pressure, your choice of DOAC matters.

A study published April 1 in *JAMA Network Open* found that patients with atrial fibrillation taking dabigatran to protect against stroke were at increased risk of internal bleeding if they were also taking verapamil or diltiazem for blood pressure, rather than amlodipine or metoprolol. The same increased risk was not seen in patients taking rivaroxaban or apixaban and any of the four blood-pressure medications. Other drugs likely to interact with dabigatran include proton-pump inhibitors, azole antifungal medications and some antidepressants.



Lowering Blood Pressure May Help Preserve Your Brain Function

High blood pressure (hypertension) is called “the silent killer,” because it rarely causes symptoms. Lack of symptoms is the reason why some people simply forget to take their blood pressure-lowering medications.

But untreated high blood pressure is a major risk factor for heart attack, stroke and kidney failure.

If the high risk of developing one of these cardiovascular diseases doesn't make you more inclined to remember your meds, maybe new information found in the May 19 issue of *JAMA* will. An analysis of 14 clinical trials revealed that patients with hypertension who were able to lower their blood pressure with medications had a significantly lower risk of developing dementia or cognitive impairment over a four-year period.



Study Finds Loneliness Is a Powerful Cardiovascular Risk Factor

Whether or not you have cardiovascular disease, a support system of family and friends is good medicine. A study presented May 22 at the European Academy of Neurology (EAN) 2020 meeting found that individuals who lacked a support system and felt socially isolated had a 40% increased risk of a cardiovascular event and a 50% increased risk of mortality.

The findings came from an evaluation of more than 4,100 participants in a long-term German study, who were free of cardiovascular disease when enrolled and were followed for more than a decade. The researchers gathered information on the participants' level of financial support, emotional support and support with everyday activities, along with degree of social integration or isolation using factors such as marital status, contacts with family and friends and membership in various social, religious and sports associations.

Annually, new heart attacks and strokes were tallied.

The researchers found significantly increased risks of cardiovascular events and all-cause mortality among individuals who were socially isolated and an increased risk of a new cardiovascular event in those who were financially stressed. ■

Illustrations by Marty Bee

Take Your Blood Pressure at Home

It's the best way to reveal potentially dangerous fluctuations.

Blood pressure is pretty easy to figure out. All it takes is a few seconds with an inflatable cuff wrapped around your bicep, and you know whether it's normal, above normal or too high. Or so you think.

Blood pressure fluctuates continuously, so your blood pressure at any moment in time may be very different from a reading taken several hours later. There are two scenarios where not knowing that a big difference exists puts you at risk.

Masked Hypertension

Normally, blood pressure drops 10 to 20 percent at night. With masked hypertension, this may not occur.

"Someone with masked hypertension will have a normal blood pressure reading in the office, so they think their blood pressure is under control. But they are actually living with uncontrolled blood pressure, which increases the risk they will suffer a heart attack or stroke," says Cleveland Clinic preventive cardiologist Luke J. Laffin, MD.

White-Coat Worries

People with white-coat hypertension have high blood pressure readings in the doctor's office, but their blood pressure drops as soon as they leave the office or get home.

The phenomenon was thought to be considered harmless, but now physicians know it is not benign.

"We think white-coat hypertension may gradually evolve into sustained hypertension. We miss the transition, because we don't look for it," says Dr. Laffin.

Both white-coat hypertension and masked hypertension can be dangerous. Unless hypertension is diagnosed and treated, it wreaks havoc on the body. Eventually, it may reveal itself by causing kidney failure, stroke or heart attack.

Don't Be Fooled

It's pretty clear that getting your blood pressure read once or twice a year doesn't provide an accurate look at how your blood pressure behaves day and night. This is why guidelines now recommend out-of-office blood pressure monitoring.

Monitoring your blood pressure over a 24-hour period is the best way to understand how it is behaving. It requires you to wear a cuff that inflates every 15 to 30 minutes for a full day and night. However, many doctors don't offer this test, and some insurers don't reimburse for it.

Anyone can monitor his or her own blood pressure at home using a blood pressure cuff bought in the local pharmacy. You just need to make sure your monitor is accurate and follow instructions for how to take your blood pressure correctly (see instructions below).

Doing this is particularly important if you have been diagnosed with hypertension, or you were told you had white-coat hypertension more than 10 years ago.

"Talk with your doctor about the best way to measure your blood pressure and the best device to use," says Dr. Laffin. "You don't need to monitor your blood pressure for 24 hours. If your blood pressure is stable, and you check it only a couple times a month, that'll be fine."

What Cuff to Buy?

If you are buying a blood pressure monitor for home use, check www.validatebp.org for a list of devices approved by the American Medical Association.

If you already have a device that's not listed on the site, go ahead and use it. "It doesn't mean your device isn't accurate: It's just that the recommended devices are more likely to be accurate," says Dr. Laffin.

Be sure to take your device to your medical appointments, so your doctor can check its accuracy. **■**



Source: American Heart Association

Are Your Kidneys Healthy?

Having heart disease puts you at risk for kidney disease. Here's what you need to know to protect yourself.

If you have been diagnosed with heart disease, the health of your kidneys may be the last thing on your mind. But if your heart isn't working properly, your kidneys may be affected, too. Heart disease is a risk factor for progressive loss of kidney function, a condition called chronic kidney disease (CKD).

"It's a two-way street," says Cleveland Clinic kidney specialist Tushar Vachharajani, MD. "If you have a heart problem, you are likely to develop kidney disease. If you have kidney disease, you have an increased risk of premature death from cardiovascular disease."

CKD is a risk factor for heart attack, stroke, heart failure, atrial fibrillation and blood clots in the legs. "Many people with CKD have a heart attack or a stroke before they even know that they have kidney disease," he says.

Small Organs, Big Job

Most people don't give their kidneys a second thought, but these small organs deserve a lot of respect. Each kidney has about 1 million tiny filters that clean waste and toxins from the



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In developed countries where unhealthy diets, obesity and sedentary lifestyles rule, chronic kidney disease is becoming increasingly common. In the United States alone, CKD has increased 30% over the last decade. Today, kidney diseases are the ninth leading cause of death in the U.S. Heart disease is Number One.

blood. The kidneys also help maintain the right amount of fluid in the body and play a role in secreting hormones that aid in the production of red blood cells.

When the kidneys don't work properly, waste builds up in the blood, and the body retains salt and fluid, which can contribute to heart failure. The body chemistry goes out of whack, which can cause arrhythmias.

Who Is At Risk?

Many traditional cardiovascular risk factors are also risk factors for CKD, including older age, male sex,

hypertension, diabetes, smoking, obesity and family history of cardiovascular disease.

High blood pressure, diabetes and obesity are the most common causes of CKD.

High cholesterol leads to atherosclerosis, which leads to narrowing of the blood vessels. High blood pressure and high cholesterol together increase the risk of both CKD and cardiovascular disease.

A review of participants in the National Health and Nutrition Examination Survey from 2013 to 2016 found that 31% of adults with high blood pressure and 37% of adults with diabetes had CKD. Among adults with a body-mass index greater than 30 kg, making them obese, about 17% had CKD.

Save Your Heart and Your Kidneys

Once kidney disease has been diagnosed, treatment is geared toward stabilizing the remaining function. This is done through healthy lifestyle choices that also reduce the risk of heart disease. They include:

- ➔ Never smoking or quitting now.
- ➔ Maintaining a healthy blood pressure, weight, and cholesterol and blood sugar levels.
- ➔ Eating a diet low in saturated fats, sugar and salt.
- ➔ Drinking plenty of water.
- ➔ Limiting alcohol intake.
- ➔ Getting 30 minutes or more of exercise 4 to 5 times a week.
- ➔ Avoiding taking over-the-counter nonsteroidal anti-inflammatory drugs (NSAIDs) for pain.

Kidney dysfunction can be slowed if diagnosed early enough. Herein lies the rub: You are unlikely to know your kidneys are on the fritz unless you have a blood or urine test. CKD is a silent killer.

"There's a huge opportunity missed if you don't go for an annual physical," says Dr. Vachharajani. "You can lose 70% to 80% of your kidney function before experiencing symptoms. By then it's too late, and there's no turning back." ■

How Kidney Function Is Measured

Blood urea nitrogen (BUN) and creatinine are traditional measurements of kidney function checked with a simple blood test. Levels of both rise as kidney function worsens. But these measurements are not ideal, because levels can vary among individuals. Estimated glomerular filtration rate (eGFR) is a more accurate way to assess kidney function. It's a calculated value that incorporates age, sex and body-mass index.

There are five stages of CKD based on eGFR. Symptoms generally do not appear until stage four and may include swollen ankles, fatigue, difficulty concentrating, decreased appetite, blood in the urine and foamy urine. At stage five, discussions about dialysis begin.

The goal of testing is to identify patients at stages one, two and three. "CKD is irreversible, but if risk factors are controlled, the patient can remain in that stage indefinitely and may not need dialysis," says Dr. Vachharajani.

Telemedicine: The New Norm for Outpatient Care

Virtual visits make it easy to see your doctor without leaving home.

Virtual visits have been an emerging technology for some time. Now the COVID-19 pandemic has made them standard for most outpatient appointments. Virtual visits are the best way to get medical care without spreading this virus—or any other contagious illness—to your doctor or other patients or getting sick yourself.

If you haven't yet had a virtual visit with your cardiologist, there's one in your future. Here's what you need to know about seeing your doctor from the comfort of your home.

The Advantages Are Many

A visit to your doctor's office can be exhausting and time-consuming. You have to get in the car, drive to the office, park, sign in and wait to be called. Afterwards, you do the same process in reverse. But when the doctor visits you virtually, a 30-minute appointment lasts 30 minutes. You don't need to buy gas, pay to park or navigate big buildings. You simply stay home.

It Works Like an In-Person Visit

You schedule your appointment by calling your doctor's office, just like you usually do. The scheduler will discuss options for seeing the doctor by smartphone (voice or FaceTime), tablet or computer.

Your doctor's office may call you before your appointment to review and update your information on medications, tests or symptoms.

At the time of your appointment or a few minutes before, you will simply call the number provided or log into a secure site with the information you are provided.

The Doctor Will See You Clearly

Thanks to today's advanced technology, you will be able to see your doctor clearly, and your doctor will be able to see you. There may be a slight delay in the audio. If you use short sentences, and wait until your doctor has finished speaking to answer questions, this won't be a problem.

Your doctor will ask about your concerns and symptoms.

If you have a chronic medical issue, your doctor may recommend you get a smart device to monitor your blood pressure, heart rate or weight at home. The device will automatically upload data to your doctor's office.

When an In-Person Visit Is Better

Cardiologists say that the lion's share of non-emergency appointments can be conducted virtually. However, an in-person visit is a better choice when:

- ➔ You need a test that cannot be done remotely, such as an echocardiogram
- ➔ You need a physical exam for a condition such as heart failure, where it is helpful to put a stethoscope to your chest.

PATIENTS LOVE VIRTUAL VISITS!

A Cleveland Clinic survey of electrophysiology patients revealed their satisfaction with virtual visits. The percentage of those who rated the following experiences "excellent" or "very good" is in parentheses:

- ➔ Physician's ability to communicate (98%)
- ➔ Transmitting arrhythmia data (88%)
- ➔ Asking all questions (98%)
- ➔ Level of care received (98%)
- ➔ Overall level of satisfaction (98%)



Tips for a Successful Virtual Visit

- ➔ Choose a quiet room with no background noise (no television, no dogs barking) for your virtual visit.
- ➔ If you want privacy and don't need their help, ask other family members to stay in a different room until your appointment is over.
- ➔ Place your phone, tablet or computer on a level surface. Sit upright, as you would in the doctor's office.
- ➔ Be sure the light source in the room is to the side or above you, and not behind you.
- ➔ Have paper, pen and a list of questions to ask your doctor handy.

"In-person exams are also the best way to cultivate a doctor-patient relationship," says Cleveland Clinic preventive cardiologist Luke J. Laffin, MD. "It's certainly more rewarding to see a new patient in person at their first visit."

Take Emergencies Seriously!

Do not delay seeking care if you have a medical emergency or experience new symptoms that frighten you. Call 911. Do not call your doctor's office or wait to see whether the symptoms pass. The emergency medical technicians will evaluate you quickly when they arrive and transport you to the hospital for further care. 🏥

Antioxidants: Key Ingredients in a Heart-Healthy Diet

These important compounds serve as bodyguards to protect your health.

A healthy diet contains all the vitamins and minerals your body requires. But did you know there are “power foods” that go beyond a healthy diet to reduce your risk of heart disease? Some of these foods contain chemical compounds that have an antioxidant effect.

“Antioxidants give you additional health benefits beyond vitamins and minerals,” says Cleveland Clinic dietitian Kate Patton, RD, LD. “We know they lower inflammation, boost the immune system, lower blood pressure and keep disease-fighting white cells strong.”

A Battle for the Body

To understand how antioxidants work, you need to understand free radicals.

A free radical is an atom with an unpaired electron that is created when oxygen binds with another molecule. Because the “extra” electron makes it unstable, a free radical will latch onto another cell to grab an electron. This process destroys the cell.

When the body is in balance, antioxidants keep free radicals in check. But certain lifestyle choices, sources of stress and environmental factors promote excessive free radical formation. This leads to oxidative stress, a condition that triggers inflammation, which plays a central role in increasing the risk of heart disease, cancer, diabetes or other serious illnesses.

Sources of Oxidative Stress

There are many sources of oxidative stress.

Some of the most powerful outside sources include exposure to air pollution, ozone, pesticides and

radiation. Our bodies also become stressed by bacterial, viral and fungal infections. We don’t always have control over these factors.



HOW TO EAT MORE ANTIOXIDANTS

Instead of this	Eat this
Chips	Nuts
Cold cereal with sugar	Oatmeal with berries
Fruit snacks	Dried, unsweetened fruit
Toast with butter or margarine	Sprouted-grain toast with almond or other nut butter
Chocolate pudding	Cocoa chia pudding
Tortillas	Leaf lettuce
White pasta	Zucchini noodles or spaghetti squash
Potatoes	Baked sliced apples

However, we do have control over our food choices and lifestyle habits that are known to cause oxidative stress. These include diets high in refined carbohydrates, sugar, animal-based proteins and saturated fat.

In addition, heavy alcohol consumption, cigarette smoking and exposure to secondhand smoke can increase oxidative stress.

A Winning Strategy

The way to overcome oxidative stress is by increasing the amount of antioxidants you consume. This means eating more plant-based foods.

“Antioxidants are primarily found in foods that come from

the ground—beans, nuts, seeds, grains, vegetables and fruits,” Patton explains. “Most Americans don’t get enough of these.”

There are hundreds of types of antioxidants. Take the carotenoid family, for example. There are 600 carotenoids, of which beta-carotene—the compound that makes carrots, pumpkin and squash orange—may be the most familiar.

Other carotenoids are found in dark green lettuce, broccoli, Brussels sprouts and cabbage.

Antioxidants of the flavonoid family are found in apples, pears, berries, citrus fruit, cranberries, peanuts, cinnamon, tea, cocoa, dark chocolate, grapes and wine.

Unexpected antioxidants include the spices turmeric and cinnamon.

The larger the variety of antioxidants you eat, the greater the chance that your body can fend off the damage caused by free radicals.

“This is why we urge people to eat more fruits and vegetables and to eat them every day,” says Patton. “Variety also matters. We suggest selecting several different colors of foods to take advantage of the different antioxidants they provide.”

Forget the Supplements

If you, or someone in your household, is a meat-and-potatoes eater, it may be tempting to pick up a bottle of antioxidant supplements at your local health food or drug store. You may want to reconsider.

“Studies have shown that antioxidant foods do a far better job of preventing oxidative damage,” says Patton.

Although no one is sure why, it appears that the antioxidants in food work synergistically with other compounds. Isolating them does not have the same effect.

“It’s best to get your antioxidants by eating whole foods,” she says. ■

PCI ... cont from page 1

When a patient has stable, but severe, CAD causing shortness of breath or chest discomfort on exertion, the decision to choose PCI or CABG is based on the number of narrowings, their location, certain technical issues and the patient's age.

"In many situations, we would expect PCI and CABG to provide equivalent results. In some cases, CABG may be the preferred treatment. However, if the stress of CABG might be too much due to the patient's age or overall condition, PCI may be the better choice."

What PCI Does and Doesn't Do

Chest pain, breathlessness and other symptoms of advanced CAD generally do not occur until an artery is narrowed by 70% or more. PCI will be performed when this degree of narrowing can be seen on an angiogram, or when a quick test taken during a cardiac catheterization confirms reduced blood flow to the heart muscle.

Yet only the severely affected vessel may be stented. "The patient may have other vessels with lesser degrees of narrowing that we're not stenting," says Dr. Krishnaswamy. "Those vessels can become narrower over time, unless steps are taken to slow plaque growth."

This means that while you avoided a heart attack this time, one could be lurking in your future.

"Unless you are having a heart attack—in which case we know that opening the artery could save your life and protect you from a future heart attack—stenting will not necessarily increase your lifespan or protect you from heart attack. However, it will alleviate your symptoms. This is the reason most patients undergo stenting," he explains.

Stent Design Evolution

Stent design and composition have continually evolved since the mid-1980s.



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PCI, performed in the cardiac cath lab, can prevent a heart attack or stop one that's in progress. However, it won't cure heart disease. To prevent a future heart attack, you will need to make lifestyle changes and, most likely, take certain medications, as well.

Today, most patients receive a metal stent coated with a drug that gradually leaks (elutes) into the surrounding tissue. Advances in technology, thinner stents and improvements in how the drugs elute have nearly eliminated blood clots and plaque growth inside the stents—problems that plagued earlier stents. As a result, long-term use of clot-preventing drugs after the procedure is no longer required.

"Dual antiplatelet therapy may be needed only for a few months, although baby aspirin is usually required for life," says Dr. Krishnaswamy.

PCI Progress

Until recently, the PCI catheter was inserted from an incision made in the groin. Today, the wrist is the site of choice, due to a lower risk of bleeding and better outcomes.

It's also more convenient, because the patient isn't required to lie flat for a period of time. Some patients may return home the same day.

Another recent advance is the ability to open a chronic total occlusion (CTO) with PCI. In these totally blocked arteries, blood flow has been stopped for more than three months, causing chest pain severe enough to impact quality of life or weaken the heart muscle. A Cleveland Clinic study found that when the heart muscle fed by the CTO is healthy,

opening the CTO greatly relieves symptoms and enables the heart to regain some of its pumping power.

"Our ability to open CTO with PCI is much better than it was even a few years ago. Today, we are able to open more than 90% of CTOs," says Dr. Krishnaswamy.

What the Future Holds

PCI continues to get better and safer as techniques and technology improve. Researchers continue to work on refining the procedure and learning how best to use it.

"We want to understand if there are better ways to predict who will benefit more or less from stenting and which narrowings should be stented or left alone. We are also working on ways to more accurately determine the severity of narrowings" says Dr. Krishnaswamy. "Ultimately, we want to make sure that only those who will benefit from PCI get it."

But even when the day arrives that the procedure is perfected, the doctors can only do so much. Atherosclerosis, the disease that clogs blood vessels, marches on.

"It's still up to the patient and their doctor to manage their cardiovascular risk factors to optimize their heart health," he says. ■

Major Modifiable Risk Factors for CAD

Controlling these risk factors with lifestyle changes and/or medications can slow the progression of atherosclerosis.

- ◆ Smoking
- ◆ High blood pressure
- ◆ High blood sugar
- ◆ Abnormal blood lipid levels
- ◆ Physical inactivity
- ◆ Obesity
- ◆ Diet high in saturated fat, triglycerides



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I had a heart attack and have been on statins. My doctor says my LDL cholesterol is not low enough. What should it be? What other treatment options exist?

Since individuals with atherosclerotic cardiovascular disease (ASCVD), particularly those with a previous heart attack, are at high risk for a recurrent event, LDL treatment goals are aggressive in these groups. Guidelines recommend an LDL no higher than 70 milligrams per deciliter (mg/dL) and less than 55 mg/dL in very high-risk patients.

We now have three therapies proven to lower LDL and reduce future ASCVD events. Statins remain the first-line therapy due to our experience with their use, safety profile, multiple beneficial outcome trials and cost. However, statins alone may not be sufficient to meet these aggressive cholesterol goals, due to very high initial LDL or limitations from side effects.

The non-statin drug ezetimibe (Zetia) lowers LDL-C an additional 20% when added to statins. The PCSK9 inhibitors evolocumab (Repatha) and alirocumab (Praluent) may lower LDL by an additional 60%, and have been shown to further reduce CVD events when added to statin therapy. If you are on a maximally tolerated dose of statin, and your LDL remains above goal, these drugs are now recommended as additional therapy to statins.

A new drug called bempedoic acid (Nexletol, or Nexlizet when combined with ezetimibe) is approved for use in patients with ASCVD or familial hypercholesterolemia. These drugs lower LDL by 18% and 38%, respectively, when added to statins. However, long-term outcome trials have not yet been completed.

Discuss the best next step with your cardiologist or lipid specialist. The specific side effects associated with each drug class, degree of LDL lowering needed, route of administration (oral or injection) and cost

need to be considered. Remember that with any drug regimen for lowering LDL cholesterol, combining lifestyle management with diet, exercise and weight loss is crucial.

I have a pacemaker for bradycardia. My current heart rate is 75 to 85 beats per minute. My doctor said my pacemaker works 93% of the time. Will I benefit from aerobic exercise, even though the pacemaker does most of the work for my heart?

After you have healed from pacemaker (PM) surgery, exercise is not only safe, but is just as important for heart health as before. The PM may initiate the electrical impulse for your heart to beat, but it does not do all the work. Aerobic exercise helps the heart pump more efficiently with each beat. It also strengthens muscles, improves mental health and circulation, reduces diabetes risk and improves heart risk factors, to name a few benefits. Walking, jogging and cycling are good choices. It is best to avoid contact sports, martial arts and heavy weightlifting. If you are deconditioned, start slowly.

How your PM responds to exercise depends on your underlying heart disease and rhythm, the type of PM and whether the PM is programmed to pace the upper (atrium) or lower (ventricle) heart chambers alone or together in sequence. A lower limit is set to prevent the heart rate (HR) from getting too low and an upper limit to prevent it from getting too high. If your native HR rarely increases on its own, a PM can be programmed to sense activity and increase the HR with exercise.

Since pacemakers are getting increasingly complex, it is important that you work closely with your cardiologist to determine the best exercise program for you and regularly monitor the PM. A cardiac rehabilitation expert can observe your rhythm and heart rates while you exercise and help individualize your exercise program. 🏃‍♂️

IN COMING ISSUES

Why low-fat diets are not advised

Special heart disease risk factors in women

Managing heart disease caused by radiation therapy

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