heart of the matter

WHAT YOU NEED TO KNOW ABOUT CARDIOVASCULAR DISEASE

by Jon VanZile

One night in 1999, Gerald Triplett awoke with severe chest pain. It felt like he had pulled a muscle.

He got out of bed and walked around, hoping the pain would go away. But nothing worked. Triplett realized something wasn't right. He woke his wife, and they called 911.

A few hours later, Triplett was flown by helicopter to the University of Michigan's cardiac care center.

There, doctors diagnosed the otherwise healthy 68-year-old with the most lethal disease in America: coronary artery disease. One of the arteries that feeds blood to his heart muscle had become blocked with plaque, a condition known as atherosclerosis.

Serial Killer
According to the American Heart Association, cardiovascular disease (CVD)—which includes coronary artery disease, heart valve disease, congenital heart defects in children, and arrhythmia (abnormal heart rhythm)—is the leading cause of death in the United States. In all, CVD accounted for 39.4 percent of all deaths in 2000, claiming nearly 2,600 Americans each day.

Within this broad statistic, coronary artery disease looms as the largest problem. In 2000, it caused more than 20 percent of deaths in the United States. Every 29 seconds, an American will suffer from a coronary event, whether it's a heart attack or, like Triplett experienced, a kind of chest pain known as angina.

These numbers are grim, no doubt, and cardiologists and heart surgeons are always looking for ways to improve the odds of surviving heart disease. Fortunately, they have more tools than ever at their
disposal. Considering that modern open-heart surgery is less than 50 years old, the science of treating heart disease has moved forward at lightning speed.

In Triplett's case, his cardiologist used an angioplasty balloon and stent, which is inserted on a long tube called a cardiac catheter. The angioplasty balloon was threaded through his arteries to the obstruction and then rapidly inflated, crushing the plaque against the wall and opening the artery. Afterward, the stent, a tiny mesh tube, was permanently implanted to keep the artery open in the future. "After they put the stent in, I immediately felt better," Triplett says.

Take the Test
Most people's experience with the cardiac health system begins in a cardiologist's office. While cardiologists specialize in the heart, they don't perform open-heart surgery. Rather, they perform diagnostic testing, catheterization, implantation of cardiac defibrillators (ICDs) and pacemakers as well as conducting other noninvasive or minimally invasive procedures.

According to James Marsh, MD, chief of the division of cardiology for Wayne State University in Detroit, there are a few standard measures and tests cardiologists use to gain information. They include:

- **A medical history and standard physical.** Your medical history includes any family history of heart disease.
- **An electrocardiogram, or ECG.** In this test, electrode patches are placed on the chest. These sensors measure electrical activity in the heart—which provide information such as heart rhythm and heart rate—and measure the amount of oxygenated blood reaching the heart.
- **A stress test.** This test combines a standard ECG with moderate

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**Eat Your Heart Out**

"Preventative care is the No. 1 way to promote lifelong health," says Carolyn Flynn, MS, RD, LD/N, a dietitian with the Family Nutrition Center of South Florida in Margate. "Our lifestyles are so fast-paced that many people don't pay attention to their diets until there's a problem." Avoiding problems can be as simple as incorporating some of these guidelines into your diet.

- Limit your fat intake, especially saturated and trans fats. The cholesterol in these dangerous fats contributes to coronary artery disease. Saturated fats are found in animal products, while trans fats are commonly used in heavily processed foods. Any food containing partially hydrogenated oil is loaded with trans fat. New regulations dictate that by 2005, trans fat levels will have to be printed on the labels of all foods.
- Eat plenty of fiber, especially water-soluble fiber such as the kind found in oatmeal or flaxseed. "When you take fibers out of the diet, you have nothing to soak up the cholesterol," says Paula Mendelssohn, MPH, RD, LD, CCN, a dietitian with Boca Wellness & Nutrition Services in Boca Raton, Florida.
- Eat lots of green, leafy vegetables such as spinach and kale.
- Omega-3 fatty acids, which can be found in fish such as salmon and whitefish as well as in fish oil supplements, have a protective effect on the heart.
- Eat a lot of soy products. Studies show that soy competes with bad cholesterol and raises the blood level of good cholesterol.
- Consider taking coenzyme Q10. This powerful supplement helps oxygenate the heart muscle.
- The B vitamins—especially folic acid, B6, and B12—lower the blood's homocysteine level. High homocysteine levels are a risk factor for heart disease.
- The sulfides in garlic decrease the tendency for blood clots to form, and they lower levels of low-density lipoprotein (LDL), or "bad" cholesterol—two risk factors for coronary heart disease.
- L-carnitine is another important nutrient that plays a key factor in cardiovascular health. It has been shown to reduce common heart pain (angina pectoris), myocardial ischemia (which can lead to a heart attack), and the extent and severity of a heart attack.
- The US Food and Drug Administration recently expanded its guidelines regarding heart-health claims to include products that contain plant sterols. These nutrients have been shown in clinical studies to reduce average LDL levels by 8-15 percent.
- Vitamin K2 also plays a role in the reduction of heart disease—especially in the reduction of arterial calcification. In a recent Dutch study with more than 4,000 participants, those with the highest K2 consumption had 50 percent fewer heart attacks, 50 percent fewer CV-related deaths and 25 percent fewer deaths overall.
exercise such as walking on a treadmill. It enables cardiologists to see which areas of the heart aren’t getting enough blood. This can be a sign of coronary artery disease.

- A chest X-ray. Physicians use chest X-rays to see the size and shape of the heart and the size and shape of the arteries leading out of the heart. Doctors can also sometimes tell if calcium has collected in the coronary arteries or on the heart valves.

These tests are all noninvasive, meaning they don’t intrude into the body. Often, a cardiologist can diagnose heart disease from one of these tests alone. If further testing is necessary, however, a cardiologist might recommend an angiogram.

In this test, a catheter is threaded through the arterial system, and a

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### Risk Factors for Heart Disease

Although there is no single cause of heart disease, physicians have identified a number of risk factors that often predict it.

- **Lack of exercise.** The heart is a muscle like any other and needs regular, aerobic workouts. Walking, swimming or bike riding will help keep your heart in peak shape. “Regular exercise cannot be stressed enough,” says James Marsh, MD, chief, division of cardiology at Wayne State University in Detroit.

- **A family history of heart disease.** Your genes matter.

- **High cholesterol levels.** The American Heart Association recommends that people have their cholesterol levels checked regularly, beginning in their thirties. “In the 1950s, [the emphasis was that] everybody should know their blood pressure,” says Marsh. “In the 21st century, everybody should know their good and bad cholesterol [levels].”

- **Lifestyle factors such as smoking.** Cigarette smoke is full of poisons that damage the coronary arteries.

- **Obesity.** There is a direct correlation between body mass index and heart disease. “Obesity affects more than how you look,” says Marsh. “It’s a matter of health.”

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special contrast dye is injected into the coronary arteries. This dye shows up on an X-ray and allows physicians to see if the arteries are blocked and if the blockage is severe enough to warrant some kind of therapy.

"From these tests, we decide whether you need medication, angioplasty, or open-heart surgery," says Marsh.

Surgical Matters
When patients' coronary arteries are severely blocked, they may be referred to a cardiothoracic surgeon for a coronary artery bypass graft (CABG) operation. In this surgery, patients are supported by a heart-lung machine while a heart surgeon operates on the stopped heart. The surgeon uses vein grafts, usually from a leg vein, to bypass the blocked portion of the artery and reestablish good blood flow.

Although open-heart surgery has an excellent record of success, it is a traumatic surgery that requires several weeks of rehabilitation. In recent years, heart surgeons have begun migrating toward "off-pump" surgeries. Basically, this means operating on the still-beating heart, often through a smaller incision in the side of the chest, without using the heart-lung machine.

"I think for CABG surgeries, nationally perhaps 20 to 25 percent are done off the machine," says Larry Stephenson, MD, specialist and chief of cardiothoracic surgery at Detroit Medical Center and author of State of the Heart: The Practical Guide to Your Heart and Heart Surgery. "It depends on two things: One, is it safer to do it on the heart-lung machine because of where the blockage is? And two, it depends on the surgeon."

According to Stephenson, the first bypass surgeries in the 1960s were done on a beating heart. Over time, however, use of the heart-lung machine increased because it was easier for the surgeon to control the operation.

"In the past 8 or 9 years, there's been a resurgence in cases done off the heart-lung machine," Stephenson says. "Surgeons are exploring where the edges are of what you can do off the machine."

Future Promise
As amazing as these procedures are, the future is expected to deliver great things for heart patients. A new kind of stent, for example, was recently introduced into the United States. These new stents, called drug-eluting stents, are coated with special drugs that may...
combat restenosis, or reclosure, of the clogged artery.

Studies have shown that about 50 percent of bare-metal stents restenose, and the patients end up in the doctor's office again. Drug-eluting stents, on the other hand, have a restenosis rate of about 20 percent, according to some preliminary studies.

But the jury is still out.

"Stents aren't perfect," says Marsh. "They do re-erose. All data indicate that drug-eluting stents are at least as good as the old bare-metal stents. But we need absolute rates."

**Even Better**

The next major leap forward in cardiology, according to Marsh, will come in the area of diagnostics. He predicted that noninvasive imaging of the coronary arteries using ultrafast CT scans or MRIs is just around the corner.

"We'll be able to get two-thirds as good information as with an angiogram just lying down and taking two deep breaths," Marsh says. "You don't even have to take your shirt off."

In heart surgery, physicians are working toward developing better off-pump technology, and they are using lasers and even sophisticated robots for certain heart-valve operations.

One new procedure, called transmyocardial revascularization (TMR), uses a powerful laser to bore a hole through the exterior of the heart into the left ventricle, the heart's main pumping chamber.

Although no one knows exactly why, this operation improves blood supply to the heart for patients with advanced coronary artery disease.

**Ounce of Prevention**

Hopefully, you'll never need any of this technology—especially if you adopt lifestyle changes right away (see "Eat Your Heart Out," p. 38).

Tripletts knows this firsthand. Three years after his first stent was placed, he spent an afternoon moving decking lumber around his house. Shortly afterward, the pain returned in his chest. This time, his wife drove him directly to the hospital, and physicians discovered another blockage in a different coronary artery. They put in three more stents and sent him home with reams of information on exercise and eating right.

"You never think your time is up," Tripletts says. "But you have to think in terms of being careful of what you eat and how you exercise. You have to be smart about it."

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