

TAKING HEART

Preventive
cardiology
keeps
patients
healthier
longer

by Sally Pobojewski

Harold Peplau is a trim, fit 85-year-old with an attitude. Since he retired 20 years ago, Peplau — who describes himself as a stubborn Dutchman — has spent every day on his 40-acre farm south of Ann Arbor doing what he loves. A master gardener who thrives on hard work, he grows all his own vegetables, mows a huge lawn, shovels snow and works out three times a week on an exercise bicycle and step machine in his living room.



Peplau nearly lost the chance to enjoy his retirement years. Just four days after he retired, as he walked around a lake on his farm, he suddenly couldn't breathe and had severe pain in his back. Barely able to make it back to the house, Peplau called Carl Orringer, M.D., then a cardiologist at the U-M, who scheduled an emergency heart catheterization.

Orringer told Peplau to postpone any plans for a big spring garden. Major blockages in five coronary arteries meant Peplau needed bypass surgery in all five. He and his wife, Kay, sought a second opinion from a cardiologist who said he could fix the problem with just four bypasses.

"I've known quite a few people who had bypasses and they had memory loss and leg problems — one thing after another," Peplau says. "After working 39 years in business and then to get butchered four days after I retired just didn't make sense to me." He picked up a book by Dean Ornish, M.D., the California cardiologist who claimed that an extreme low-fat diet, exercise and meditation could reverse heart disease. Says Peplau, "I called Carl Orringer and told him I wasn't going to get the bypass."

Orringer's response was curt and to the point.



Harold Peplau
at home on
the farm

"He said, 'Get your butt in here right now,'" recalls Peplau. "Kay and I went and Carl spent about a half-hour telling us all the ramifications. I had a 30 percent chance of surviving if I didn't have surgery. But I told him I'd made up my mind and asked if he'd still take care of me if I went with medication, exercise and diet. He said yes."

Although he pushed Peplau to have bypass surgery because his blockages were so advanced, Orringer was an early believer in the importance of treating heart disease with diet and exercise. Before leaving the Medical School in 1992, Orringer established its first program in preventive cardiology and cardiac rehabilitation.

In 1991, Melvyn Rubenfire, M.D., a professor of internal medicine and director of preventive cardiology, came to the U-M from Detroit's Sinai Hospital and Wayne State University, where he had pioneered a lipid clinic and cardiac rehabilitation program. Rubenfire and a colleague gained support to develop a comprehensive prevention program — support that came from U-M leadership even at a time when prevention was a money loser. Harold Peplau was one of their first patients.

Rubenfire has seen a lot of changes in the 40 years he's been taking care of people with sick hearts and clogged arteries. The patients he sees in clinic today are much healthier than patients used to be.

Increased public awareness about risk factors and the availability of medications to lower cholesterol and blood pressure have extended the life span and improved the quality of life for people with heart disease, according to Rubenfire. Instead of dying from a heart attack in their 50s and 60s, Rubenfire says many people with heart disease, like Harold Peplau, are now living into their 70s and 80s.

"We're seeing an entirely different paradigm of care, which is why prevention is so exciting," says Rubenfire. "We've learned that you can identify 90 percent of people who will have a cardiac event within five to 10 years just by looking at their risk profiles. If we do all the right things, we can reduce the risk of future events by 50 percent or more."

In spite of these advances, cardiovascular disease remains America's No. 1 killer. One-third of American adults have some form of the disease and nearly 1 million of them will die from it this year, some suddenly from a heart attack or stroke, others from uncontrolled hypertension or heart failure.

Instead of spending billions of dollars every year to treat the deadly consequences of cardiovascular disease, Rubenfire believes we should devote more time, money and effort to preventing it in the first place.

MORE THAN CLOGGED PLUMBING

When he began his career in 1970, Rubenfire says heart disease was considered to be a plumbing problem. A waxy substance called plaque accumulated in arteries over time until it restricted the normal flow of blood to the heart — a condition called atherosclerosis. The best way to diagnose atherosclerosis was to insert a probe inside the artery and measure the amount of plaque. If the artery was more than 50 percent blocked, cardiologists recommended coronary artery bypass graft (CABG) surgery, which rerouted blood flow around the blockage, or an angioplasty procedure to open the artery and insertion of a stent to keep it open and maintain normal blood flow.

Only during the last 15 years have researchers who study heart disease learned that these big chunks of plaque may not be as dangerous as doctors used to believe.

“We now know that it’s not the degree of blockage that’s most worrisome,” explains Kim Eagle, M.D., the Albion Walter Hewlett Professor of Internal Medicine and a director of the U-M Cardiovascular Center. “More dangerous are smaller deposits of plaque that rupture and cause a heart attack. The problem is no one knows how to predict when or which plaque will rupture.”

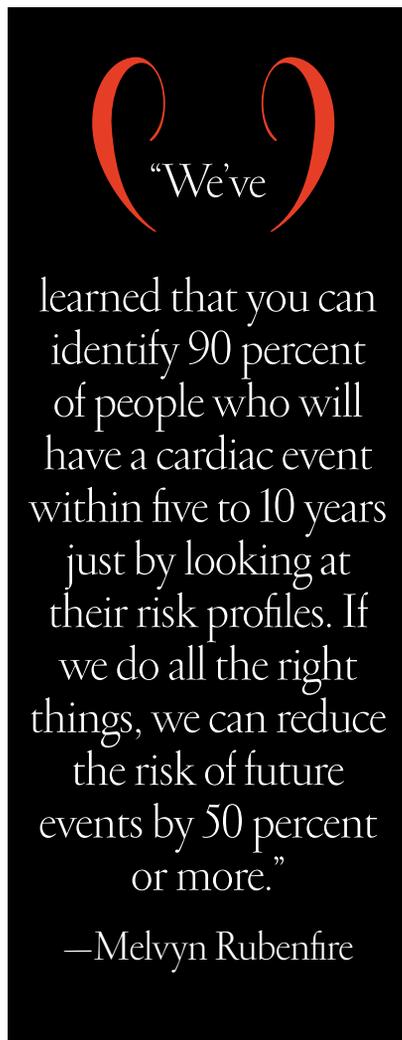
Healthy arteries are smooth and elastic, allowing blood to flow through freely. But aging, high blood pressure, diabetes, high cholesterol and smoking cause arteries to stiffen and the inside of the artery to become rough. As blood moves through the artery, cholesterol and white blood cells get stuck in these rough patches. Over time, they turn into waxy deposits of plaque covered by a fibrous cap. If the cap ruptures, a flood of cells and proteins move in to form a blood clot and seal off the injured part of the artery. If the clot is big enough, it can block the flow of blood to the heart muscle and trigger a heart attack. It’s often the modest waxy plaques rather than the more severe hard plaques that cause the heart attack.

Atherosclerosis can begin at an astonishingly early age. “In autopsies of teenagers who die in auto accidents, soft waxy plaque is often found in their coronary arteries and brain vessels,” says Rubenfire. “It can be seen in children by age 5.”

He emphasizes that atherosclerosis and coronary heart disease are not inevitable, nor are they a normal part of aging. Where you are born and how you live makes a big difference. Heart disease is most common in countries like the U.S., where high-fat diets, smoking and sedentary lifestyles are common. A comparison of international death rates, for example, shows that 169 of every 100,000 U.S. men aged 35 to 74 died of coronary heart disease in 2005, while only 50 in 100,000 Japanese men in the same age range died from the disease.

While they can be lifesaving for patients having a heart attack, Rubenfire maintains that invasive procedures like angioplasty and CABG are not the best way to prevent the progression of heart disease and reduce heart attacks. That requires intensive medical therapy, drugs to lower cholesterol and reduce high blood pressure, and major lifestyle changes.

“Most atherosclerosis is a lifestyle disease,” says Rubenfire. “There may be five out of 100 people with a genetic disorder that increases their risk for atherosclerosis. Most of us, even those with inherited traits, could delay or even prevent the atherosclerotic process by simply changing our lifestyle.”



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—Melvyn Rubenfire

REDUCING THE RISK

Fear can be an excellent motivator. There’s nothing like a heart attack to convince someone that it’s time to take heart disease seriously. More than half the patients at the U-M’s Cardiovascular Medicine at Domino’s Farms Program have had a heart attack or serious cardiac event. Many have been referred by physicians to the cardiac rehabilitation program. More than 90 percent have at least one major risk factor, and about 50 percent have the deadly combination of hy-



Director of Preventive
Cardiology Melvyn
Rubenfire

pertension, low HDL cholesterol and elevated blood sugar or diabetes, collectively known as metabolic syndrome. Some have a family history of heart disease. All of them want to know their risk for a future cardiac event and what they can do now to prevent it.

The first step is a complete blood lipid profile to determine the ratio of so-called “good” HDL cholesterol to “bad” LDL cholesterol, and to look for other substances in blood that place people at risk for atherosclerosis and heart attacks. A family history of coronary heart disease, especially before age 55 in men and 65 in women, is an important risk predictor that may be related to lifestyle and its interaction with genetics.

Lifestyle factors like excessive dietary fats and simple carbohydrates, lack of exercise, and particularly smoking are major risks; disturbed sleep patterns, poor dental hygiene, depression and stress also are factored into risk. Rubenfire emphasizes that it’s the total risk profile — not any single factor — that’s most predictive of a cardiovascular event.

Doctors have several assessment tools to help determine risk in persons with certain risk traits. The Global Risk Score, Rubenfire says, can identify the relative 10-year risk of an event in men and women of certain ages and risk factors with no prior history of disease. For some, he recommends a new test that uses a CT scan to measure the amount of calcium in coronary arteries.

It’s important to know your risk factors, but only if it motivates you to do something about them. Too often, people tend to focus on just one thing, like cholesterol or high blood pressure, which can be controlled with medication.

“People say: ‘I take Lipitor and my cholesterol is fine, so I’m not going to worry about diet or exercise,’” says Rubenfire. “That’s a serious error from the preventive point of view, because more than one risk factor increases the risk up to 15-fold. Statins reduce event rates by 25 percent, but that leaves 75 percent not prevented.”

Lack of adherence to medications is a big part of the problem. American Heart Association studies found that about half the people diagnosed with heart disease, even those who had a heart attack, stopped taking their prescribed medication within six months.

Also often ignored is the importance of making lifestyle changes in your 20s and 30s while your heart and blood vessels are still healthy. “Young adults don’t realize how important it is to pay attention to their blood pressure and lipids,” says Elizabeth Jackson, M.D., an assistant professor of internal medicine who specializes in preventive cardiology. “People don’t think about these things at this age, but that’s the perfect time to start preventing problems later on. Cardiologists don’t often see younger folks, so general internists and family practitioners need to do more outreach to this population.”

Harold Peplau is living proof that even high-risk patients can delay a heart attack for decades and can improve their quality of life if they do the right things. Peplau admits it was tough, especially adapting to a heart-healthy diet, but says it was all worth it. He went through a structured cardiac rehabilitation program, takes his medication and sees Rubenfire regularly and now has a stent in one artery.

“I did it so I could keep working,” Peplau says. “If I hadn’t done it, I wouldn’t be here today.

“Carl Orringer used to tell me ‘You’re going to last until 85 the way you’re going,’” says Peplau. “I called him when I turned 85 and said: ‘Hey, Carl, I made it.’” [M]

MORE ON THE WEB ✦ *A closer look at the preventive cardiology program*

COUNTERING MYTHS

Heart Disease and Women

Claire Duvernoy (M.D. 1990) has heard it too many times from patients and even from physicians. It's the belief that women don't get heart disease until after menopause. Not only is this wrong, it's also dangerous, because it prevents women and their doctors from taking symptoms seriously.

"The idea that heart disease is not a major risk for women is the biggest myth we need to counter," says Duvernoy, an associate professor of internal medicine and director of the Women's Heart Program. "The truth is that more women die from cardiovascular disease than men, and that's been true in this country since 1984."

Heart disease in women can be tricky to diagnose, because women's symptoms are often atypical and less specific than men's. Duvernoy says women are more likely to complain of shortness of breath and palpitations, and less likely to have the red-flag symptom of acute chest pain that radiates to the jaw and down the left arm.

Whatever the symptoms, Duvernoy says it's important for women to pay attention and take them seriously, especially if they have risk factors for cardiovascular disease.

Everything associated with heart disease seems to be more dangerous for women than for men. Women are more likely to have recurrent chest pain and repeated hospital stays after a heart attack. Smoking, diabetes and high blood pressure are particularly deadly to women.



Women's Heart Program Director Claire Duvernoy

"Cigarette smoking seems to be even worse for a woman's coronary arteries than for a man's," says Duvernoy. "We think there's an actual biochemical difference. It may be an interaction between nicotine and the estrogen receptor molecule inside blood vessels that accelerates the process in women."

"We think women tend to have more diffuse atherosclerotic plaque build-up," she adds. "Plaque is deposited throughout their arteries, instead of in just one area. Women may have more endothelial dysfunction — the inside lining of their blood vessels may be more reactive so it squeezes down inappropriately." Women also are more prone than men to experi-

ence coronary artery spasm, in which the smooth muscle cells inside blood vessels constrict abnormally. This may not be the type of coronary heart disease treatable with angioplasty or a stent, but it is real coronary heart disease nonetheless.

"Women tend to pooh-pooh their symptoms saying they are just out of shape or they've gained weight and think it's their fault," says Duvernoy. "I ask patients to evaluate what they are able to do. If they were able to keep up walking with friends last week and now are gasping for breath after two blocks, something is wrong. It could be serious coronary heart disease and it needs to be evaluated." —SP