

## HEALTHY LIVING

## Testing genes for future risks

High-tech procedure can help determine likelihood of disease

BY VIKKI CONWELL  
Cox News Service

Last year, Penny Jankovich was diagnosed with cancer in both breasts. A month after undergoing a lumpectomy, Jankovich, who was adopted and unaware of her biological family's medical history, received a genetic risk assessment to determine whether she carried the gene that would give her a greater than 70 percent chance of recurrence of breast and ovarian cancer. The results were positive.

"I thought I'd be on my way, but this little genetic test has changed everything, and thank God for it," said Jankovich, 46, who will undergo a double mastectomy with reconstruction and a hysterectomy. "Without it, I would've been a ticking time bomb."

Genetic testing, performed on a sample of blood, hair, skin or other tissue, identifies changes in chromosomes, genes or proteins associated with inherited disorders. The results can confirm or rule out a condition or your chance of developing or passing a genetic disorder to other family members who share some common genetic material.

Genetic testing is available for more than 1,500 disorders and diseases, including neurological and cardiovascular diseases, according to the National Society of Genetic Counselors. Cancer, for instance, is genetic — linked to a change or mutation in a gene — but less than 10 percent of cancer is hereditary.

"We're kind of looking for a needle in a haystack," said Kimberly King-Spohn, a genetics counselor with WellStar Kennestone Hospital in Marietta, Ga., which began conducting genetic risk assessment in

December.

A lot of cancers are part of syndromes, so if you test positive for a gene-causing cancer, you might be at a risk for other forms. If there are several family members who have the same type of cancer or developed cancer at a younger age, there may be an increased risk of a hereditary cancer syndrome link. So testing primarily targets people who have such a strong family history.

Carol Belcastro is one such case. Her father died of pancreatic cancer, and two of her first cousins were diagnosed with breast, ovarian and kidney cancer. Belcastro's genetic testing confirmed that she and one of her sisters carried the gene, making them predisposed to breast and ovarian cancer.

She underwent a partial mastectomy and a total hysterectomy. Her sister opted to monitor her health with mammograms.

"My decision was a no-brainer after seeing what both of my cousins and Dad went through," said Belcastro, 47, who has two daughters with a 50 percent chance of inheriting the gene. "I had the gift of prevention, and I felt I was extremely fortunate to be proactive."

Genetic testing equips people with the



PHOTO ILLUSTRATION BY CHRIS HUNT / COX NEWS SERVICE

A genetic test may predict the likelihood of developing a host of disorders.

information to better manage their health and make decisions about health risks, but it cannot detect all genetic changes that can

cause disease. Other genetic and environmental factors, lifestyle choices and family medical history also affect a person's risk of developing disorders.

"It's not about telling people what to do," said Angela Trepanier, president of the National Society of Genetic Counselors. "It's to provide the information to help people make informed decisions based on their own values and beliefs."

Still, genetic testing is helping doctors learn more about disease and treatment, said Andrew Faucett, director of the Genomics & Public Health Program at Emory School of Medicine, which has conducted genetic risk assessment for about 30 years, primarily for research and on infants. Instead of treating people after they get sick, genetic testing will allow doctors to identify a gene, better understand the illness and then target treatment. Eventually, doctors might be able to slow the onset or progression of a disease or even stop it from happening, he said.

"We've just opened the door for genetic testing to change the way medicine works," Faucett said. "Genetics will give us the tools to catch things before you're ill." ■

## Your saliva could hold clues about health problems

BY MARY ANN ROSER  
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The next time you spit, consider this: Your saliva might one day be used to diagnose or prevent a heart attack.

If research by scientists and dentists in Texas and Kentucky bears out, in several years, heart attack patients could be diag-

nosed in an ambulance by analyzing a few drops of saliva, saving precious time at the hospital, researchers said.

"It could save time — and lives," said Dr. Chris Ziebell, chief of emergency medicine at University Medical Center at Brackenridge in Austin, Texas.

Right now, heart attacks can be diagnosed in the ambulance with an electrocardiogram with the results transmitted by cellphone.

But less severe heart attacks can be missed by EKGs, requiring blood tests that now take more than two hours at the hospital, Ziebell said. The spit test would take 15 minutes in the ambulance, said John McDevitt, a University of Texas chemistry professor who is spearheading the new research.

He envisions ambulances being equipped with a toaster-size LabNow computer that he designed to analyze the saliva, which would be placed on a small

computer chip embedded in a credit-card-sized device. The LabNow computer — initially designed to diagnose AIDS patients in Africa — would spit out the results, showing whether certain chemicals or cardiac enzymes are high, indicating a heart attack, he said.

As far as the researchers know, no one else has discovered the heart disease markers in saliva. The team, which unveiled the research at a dental research meeting in Dallas recently, has found similar uses for saliva in diagnosing several cancers affecting women: uterine, cervical and breast, McDevitt said.

"Saliva's been a poor cousin to whole blood and serum" as a tool for diagnosing diseases, said McDevitt, a shareholder in the LabNow company developing the computer. But many of the same disease markers that "you can see in blood, you can see in saliva," he said. "You just have to look for it harder."

The team found 32 chemicals, or proteins, in saliva that are known to be related to heart activity, McDevitt said. Of those, the team studied eight that were significantly elevated during a heart attack and narrowed that to four that were "the most diagnostic of a heart attack," said Dr. Craig Miller, a professor of oral dentistry at the University of Kentucky College of Dentistry in Lexington, Ky.

Because most of the 56 heart attack patients in the researchers' study, which is being prepared for publication in peer-reviewed journals, had their saliva analyzed within 24 to 48 hours after the heart attack, the team needs

to find out whether those same markers can be detected within minutes to hours of a heart attack. That's crucial information, said Dr. Blase Carabello, a cardiologist and chief of medicine at the Michael E. DeBakey VA Medical Center in Houston.

If McDevitt's team is right about saving time, "that's great," Carabello said. But he said ambulances could just as easily be equipped with laptop-size analyzers that also can detect high levels of proteins in blood indicating a heart attack. He added that the researchers still need to prove their findings through clinical studies.

The saliva technology will be road-tested in San Antonio ambulances this summer, said a collaborator, Dr. Spencer Redding, professor and chairman of the Department of Dental Diagnostic Science at the UT Health Science Center at San Antonio.

They think that the high cardiac enzymes they found in saliva in patients having a heart attack also might be present in people at risk of a heart attack. They have asked some of the 56 heart attack victims in the study to freeze their saliva over the next six months so it can be tested, Miller said.

"About 15 percent of the people who had a heart attack will have another heart attack in six months," Miller said.

The good news, Redding said, is that there's lots of saliva. The average person, he said, makes about a quart of saliva a day while talking, eating and drooling on the pillow at night. ■



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University of Texas professor John McDevitt is the co-inventor of nanochip technology that he hopes will be on board ambulances in a few years to diagnose heart attacks.