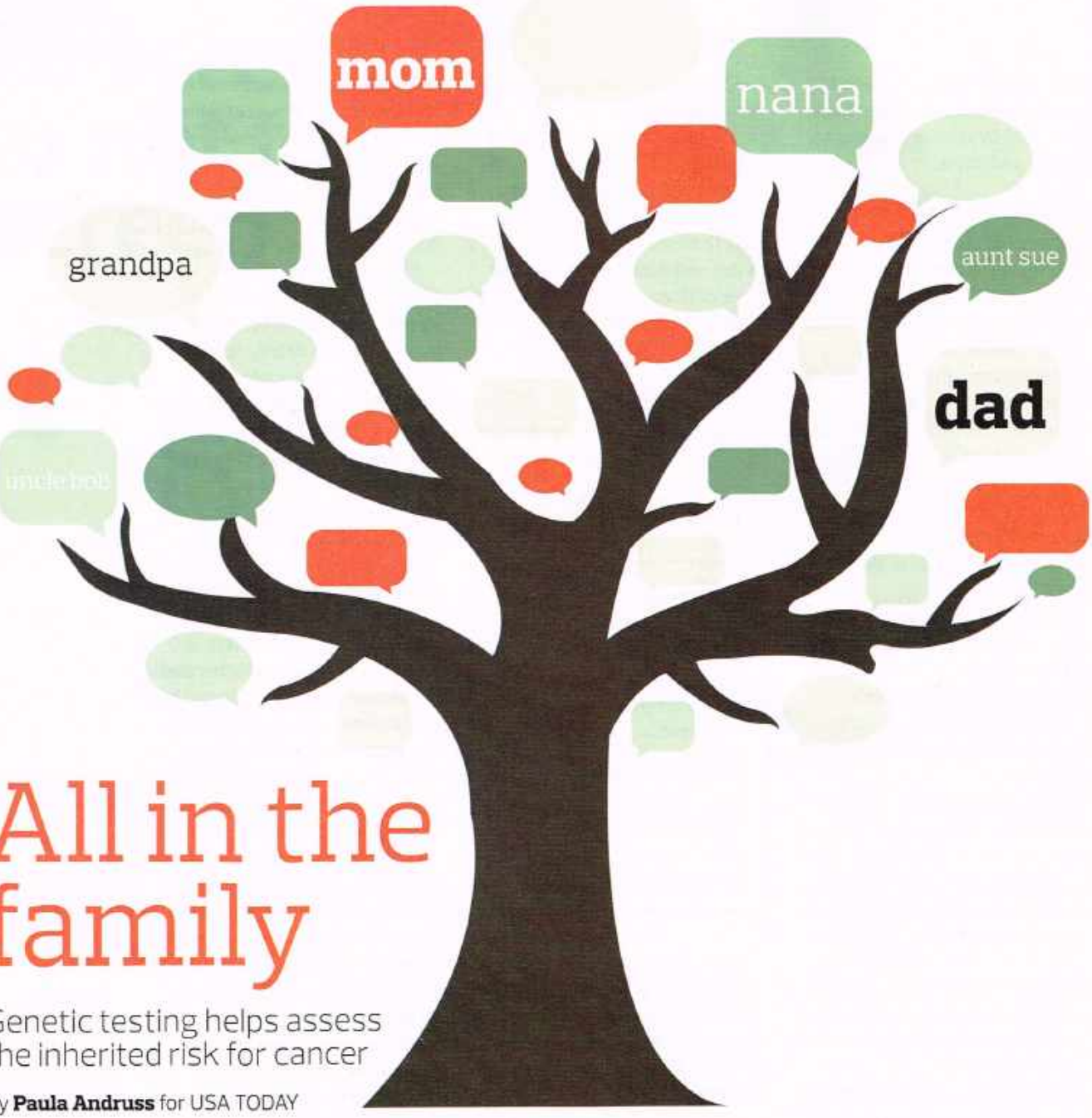

All in the family

Genetic testing helps assess the inherited risk for cancer

By **Paula Andruss** for USA TODAY

JENNIFER FINK HAS ALWAYS BEEN AWARE OF HER OWN RISK FOR BREAST CANCER because of her family history.

"I have memories of my mom going to get mammograms [because of her breast cancer history], and I remember visiting my grandma with breast cancer in the hospital when I was very young," says the Mayville, Wisc., resident. "It was just ever-present, and I grew up knowing that I was at risk."

ILLUSTRATION ISTOCKPHOTO

While any cancer diagnosis is alarming, a family history of the disease can be especially worrisome to relatives who are afraid they might develop cancer too.

She thought about getting genetic testing to find out whether she might develop cancer because of her family history, but finding doctors who would satisfactorily address her concerns about her family, her risk, and her health was a daunting challenge. After more relatives on her mother's side were diagnosed with breast cancer, however, Fink finally sought genetic testing. The positive result has been both frightening and empowering for the 39-year-old mother of four, because she now has proof that she is at a higher risk for cancer, something medical professionals tend to take seriously.

Fink's sister, MaryBeth Wondra, also grew up assuming she would one day get breast cancer, but she has declined to undergo genetic testing to see if she has the same gene mutation. "Getting the genetic testing to help confirm that, knowing that for sure, won't be any comfort or discomfort to me," Wondra says. "Also, I don't know about future healthcare laws, and I don't want it to be considered a preexisting condition somewhere down the line."

TERMS TO KNOW

GENETIC TESTING: Tests on blood and other tissue to find genetic disorders

GENE MUTATION: An alteration in a gene. Mutations can be inherited, occur randomly, or be caused by an environmental factor, such as cigarette smoke.

GENETIC COUNSELOR: An expert who provides information and support to people who have or may be at risk for genetic disorders

Evaluating family history

While any cancer diagnosis is alarming, a family history of the disease can be especially worrisome to relatives who are afraid they might develop cancer as well. But today experts have identified many of the familial and genetic factors that pose the biggest risks, so relatives can prepare and protect themselves as much as possible.

Many cancers have been linked to family history, but researchers say the most common cancers with a hereditary component are breast, ovarian, colon, and prostate.

Determining whether family history raises your chances of developing cancer can be very confusing, because several factors come into play, including how many relatives have cancer and how closely they are related to you.

"If you have an aunt and a grandmother with breast cancer, that may be just as concerning as having a mother with breast cancer," says medical geneticist Sharon Plon, a professor of both pediatrics and molecular and human genetics at Baylor College of Medicine. That's because having several relatives who have the same cancer can mean there's a genetic link.

Beth Peshkin, a senior genetic counselor at Georgetown Lombardi Comprehensive Cancer Center, says that in addition to the number of relatives with a specific cancer, an early age of diagnosis is also relevant.

"If you're a woman and you tell me your grandmother had breast cancer at the age of

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FAMILY HISTORY CHECKLIST

When someone in your family has cancer, it's natural to be concerned that you may also develop it. Researchers have identified several factors that affect your chances of receiving the same diagnosis. If any of them apply to you, talk with your doctor about your next steps.

- ☐ **Two or more close relatives** on either your mother's or your father's side of the family who have the same or a related type of cancer
- ☐ **A close relative** who's had more than one type of cancer, such as ovarian and breast cancer or colon and pancreatic cancer
- ☐ **A relative who developed** the same cancer in two locations. For example, breast cancer in both breasts or kidney cancer in both kidneys
- ☐ **A relative whose cancer** was diagnosed before age 50
- ☐ **A relative who has a rare cancer**, such as male breast cancer

The National Institutes of Health has a **family health portrait** on its website that allows you to enter your family's health information and develop your own family health history tree. Find it at genome.gov/11510372.

GENETIC TESTING 101

Faced with a family history of cancer, many people wonder whether to seek genetic testing. Here are the answers to some common questions.

WHAT IS GENETIC TESTING?

Gene tests, which look for alterations that may increase the risk of cancer, are generally done on a blood sample or cells swabbed from the inside of the mouth. Samples are sent to specialized genetics labs. Results can take a few weeks to several months to come back.

WHAT CAN IT DO?

Genetic testing often begins by testing the affected relative for a gene mutation that may be linked to the kind of cancer he or she has. Family members can then be tested to see if they inherited the same mutation. If they did, Peshkin notes, the doctor or genetic counselor can recommend preventive screening and drugs or surgery that may help keep cancer from developing. If they didn't inherit the mutation, the results can provide reassurance to people concerned about their family history.

SHOULD I BE TESTED?

There's no easy answer to that question. The number of relatives with the same type of cancer and their relationship to you may indicate a genetic predisposition. A doctor or genetic counselor can advise whether genetic testing is recommended.

HOW MUCH DOES IT COST?

The cost can range from under $100 to more than $2,000, depending on the nature and complexity of the test, according to the National Institutes of Health.

70, that's not very suggestive of anything," Peshkin says. "But if you say your father had colon cancer in his 30s or your mother had breast cancer in her early 40s, that can be significant."

Peshkin says a good way to learn about your genetic risk is to record a family health history. Ask family members on both your mother's and your father's side to share as much information as they can, as far back as they can remember, about their siblings, cousins, parents, aunts, uncles, and grandparents. Find out the type of cancer, the age of diagnosis, whether they're still living or the age at which they died, and relevant environmental factors, such as smoking and excessive sun exposure.

"If we can get all of those generations, we can get a pretty good picture," she says.

Peshkin adds that it can also be helpful to review family medical records closely with a health professional who can accurately interpret them. "Sometimes people say their aunt had bone cancer or their uncle had lung cancer, but it could be that that's where the cancer spread, not where it started. It's important to have pathology reports read by people who understand them," she says.

> "If you have a brother diagnosed with colon cancer, that's going to change the age that your doctor recommends that you begin getting colonoscopies."
>
> **Sharon Pion,** *medical geneticist, Baylor College of Medicine*

Taking steps

Pion explains why it's important to know your family history of cancer. Guidelines specify the age at which screening for different cancers should start and how often to have the test, but doctors often modify those recommendations because of a family history or genetic tendency.

"If you have a brother diagnosed with colon cancer, that's going to change the age that your doctor recommends that you begin getting colonoscopies," she says. "Similarly, if you have a close relative diagnosed with breast cancer, that may change decisions about mammograms or the use of MRI."

Some people with a family history of cancer choose genetic counseling to assess their risk of developing the disease. Genetic counselors can help concerned family members figure out if they are candidates for genetic testing or if they should simply talk to their primary care physician about how a family history of cancer may or may not affect them.

"If you're worried, [you] can request a consultation with a genetic counselor who can take a thorough history and weigh in other factors," Peshkin says. "Even if people have six relatives with cancer, we may be able to still say it doesn't look like a pattern of hereditary cancer."

Fink's maternal grandmother, aunt, and mother all had breast cancer, and her mother developed ovarian cancer as well. Fink went ahead with testing to see whether she carried a gene mutation linked to hereditary breast and ovarian cancer. The test revealed that she did, which raises her lifetime risk for both cancers.

"I think I would have been more surprised if it came up that I didn't have the mutation," says Fink. "Now I know it's more than just a family history. It's solid evidence that [cancer is] definitely a genetic risk for me, and there are actual research statistics to back that up."

After learning that she carried the gene mutation, Fink decided to do her best to keep those cancers from developing. She participated in a cancer research study to help advance understanding of breast cancer, and she aims for regular screenings.

"When you know this is your family history, you have to be more vigilant," she says.