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ROCHESTER, Minn. -- October is National Breast Cancer Awareness Month, and Mayo Clinic breast cancer experts are available to discuss risk factors, screening and treatments.

After skin cancer, breast cancer is the most common cancer diagnosed in women in the United States, with more than 238,000 new diagnoses estimated this year. While breast cancer is predominantly found in women, about 1 percent of all breast cancers are diagnosed in men. As with all cancers, patients should be aware of the importance of prevention and early detection in order to give themselves the best opportunity to be treated if cancer is found.

### Reducing risk

Women with a family history of breast cancer unfortunately are at a higher risk of developing the disease, but there are some lifestyle changes they can make to lower their overall risk, says Sandhya Pruthi, M.D., a specialist in the Mayo Clinic Breast Clinic. "Lifestyle changes have been shown in studies to decrease breast cancer risk even in high-risk women," Dr. Pruthi says. She recommends that patients take the following steps to lower their risk:

\* Don't smoke. Accumulating evidence suggests a link between smoking and breast cancer risk, particularly in premenopausal women. In addition, not smoking is one of the best things you can do for your overall health.

\* Limit alcohol. The more alcohol you drink, the greater your risk of developing breast cancer. If you choose to drink alcohol -- including beer, wine or liquor -- limit yourself to no more than one drink a day.

\* Control your weight. Being overweight or obese increases the risk of breast cancer. This is especially true if obesity occurs later in life, particularly after menopause.

\* Be physically active. Physical activity can help you maintain a healthy weight, which, in turn, helps prevent breast cancer.

\* Breast-feed. Breast-feeding may play a role in breast cancer prevention. The longer you breast-feed, the greater the protective effect.

\* Limit dose and duration of hormone therapy. Combination hormone therapy for more than three to five years increases the risk of breast cancer. If you're taking hormone therapy for menopausal symptoms, ask your doctor about other options.

Dr. Pruthi is also available to discuss research on the benefits of preventive medications to reduce breast cancer risk among high risk women, especially those with a family history of breast cancer or personal history of precancerous breast changes.

### Genetic testing

“When a woman with a strong family history of breast cancer undergoes testing for the most common breast cancer genes, BRCA1 and BRCA2, it is usually because she wants to know if she has a high risk of developing breast or ovarian cancer,” says Fergus Couch, Ph.D., a geneticist at Mayo Clinic and an international expert in breast cancer risk. However, Dr. Couch says that a negative test result for BRCA1 and BRCA2 doesn't mean that a patient is in the clear, because several other susceptibility genes are known and more remain to be identified. Likewise, testing positive doesn't indicate a tumor will develop in the future because only about 65 percent of women with mutations ever develop breast cancer in their lifetime.

Dr. Couch has teamed up with colleagues from around the world to form the Consortium of Investigators of Modifiers of BRCA1/2. This international team is using genome wide scans to identify genetic variants (single-gene polymorphisms) that could explain the great variability in breast cancer risk among individuals.

So far, the consortium has tested DNA from 17,000 BRCA1 mutation carriers and 9,000 BRCA2 mutation carriers and has already uncovered a number of mutations that could take a woman

with a 65 percent average risk of developing breast cancer up to as high as 90 percent or down to as low as 30 percent, depending upon her specific mutations. Dr. Couch and his colleagues continue work to identify and catalogue the remaining genetic risk factors for breast cancer. Dr. Couch says, "Rather than giving a woman some number that really just represents the average risk of disease, we want to be able to give her a risk that takes into account her specific environmental and genetic influences."

### Personalized Treatment

Mayo's Breast Cancer Genome Guided Therapy Study is helping physicians tailor chemotherapy for breast cancer patients based on their individual genomes and the genomes of their tumors, says Matthew Goetz, M.D., an oncologist at Mayo Clinic and study co-leader with Judy Boughey, M.D., a Mayo breast surgeon. "What is so exciting about our research is the ability to develop new drug therapies for patients at highest risk of breast cancer recurrence," says Dr. Goetz. Another research focus for Dr. Goetz is estrogen receptor positive breast cancer and tailoring drugs for individual anti-cancer therapy.

His work in the area of metabolism of the anti-cancer drug tamoxifen has led to studies to develop a metabolite of tamoxifen -- endoxifen -- as a drug for patients with hormone receptor positive breast cancer.

### Surgery

Currently, most patients whose breast cancer has spread to their lymph nodes and are treated with preoperative chemotherapy have the majority of the lymph nodes in their armpit area removed after chemotherapy to see if any cancer remains. Judy Boughey, M.D., a breast surgeon at Mayo Clinic led a national study through the American College of Surgeons Oncology Group of 756 women with cancer in their lymph nodes to study a less invasive procedure known as sentinel lymph node surgery. The procedure successfully identified whether cancer remains in lymph nodes in 91 percent of patients with node-positive breast cancer who received chemotherapy before their surgery.

"In sentinel lymph node surgery, only a few lymph nodes, the ones most likely to contain cancer, are removed," explains Dr. Boughey. "Since treatment with chemotherapy before surgery can

eliminate cancer in the lymph nodes in some patients, approximately 40 percent, we were interested in evaluating whether sentinel lymph node surgery could successfully identify whether cancer remained in the lymph nodes after chemotherapy.” Dr. Boughey says removing only a few lymph nodes also reduces the risk of surgical complications such as numbness and arm swelling.

### About Mayo Clinic Cancer Center

As a leading institution funded by the National Cancer Institute, Mayo Clinic Cancer Center conducts basic, clinical and population science research, translating discoveries into improved methods for prevention, diagnosis, prognosis and therapy. For information on cancer clinical trials, call 507-538-7623 [begin\\_of\\_the\\_skype\\_highlighting](#) end\_of\_the\_skype\_highlighting.

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