

# THE MONTHLY

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## In Good Health:

Breast Matters | What to know about the female breast and the risk of cancer, from youth to menopause. | By Noelle Robbins

Being born a female breast means leading a complex life. Let's be honest—breasts generate a lot of mixed emotions: pride, embarrassment, fear. Fear? Of what? The possibility of developing cancer. Except for some forms of skin cancer, breast cancer is the most common type afflicting women. The lifetime risk of breast cancer for American women is about 1 in 7. Approximately 182,500 women in the United States will be newly diagnosed with invasive breast cancer in 2008, and about 40,500 will die from this disease.

### Childhood

From the moment of birth, I, the female breast, am different from every other organ in the body. While the heart, liver, brain and kidneys are fully formed at birth, I am not. Other organs grow in size during the move from infant to adult, but I completely change my cellular structure as I mature.

As the hormones of puberty begin flowing through me, my single duct expands quickly, branching like a tree. By the time I reach my mid- to late teens I appear grown-up, however, I am not fully mature until I experience my first pregnancy and my cells are ready to produce milk.

This is why what happens in my early years can affect my risk of developing cancer later in life. Immature cells are much more vulnerable to the effects of hormones, chemicals, X-rays, diet and lifestyle because they are less able to repair DNA damage.

The age at which I reach puberty is an important predictor of my susceptibility to breast cancer. The earlier menstrual periods start before age 12, the higher the probability of developing breast cancer later in life, according to the National Cancer Institute. This is possibly due to longtime exposure to estrogen, which promotes growth and division of breast cells. The more often cells divide, the more susceptible they are to



Mind your mammaries: Monthly breast self-exams are some of the important ways women can help detect breast cancer early. Experts also recommend annual exams and mammograms for women over 40. Photo by Andrey Sheldumov.

mutation. But what controls when I launch into adolescence? And what can I do in my childhood that may protect me as I grow older?

At Kaiser Permanente's division of research in Oakland, Dr. Lawrence Kushi, associate director of prevention research, is conducting the Cygnet Study to determine what contributes to early puberty and breast development in young girls. The timing of puberty, and the length of time between puberty and the first live birth, is critical for breast cell development. More than 400 Bay Area girls who entered the study in 2005 at ages 6 to 8 are evaluated annually, in part to see whether they are reaching puberty earlier than previous generations. "One reason may be obesity, linked to early puberty because body fat tissue makes estrogen," says Kushi.

Researchers are documenting diet and physical activity, which can affect estrogen levels, and are sending blood and urine samples to the Centers for Disease Control to analyze environmental toxin exposure. "Higher estrogen levels promote early breast development," says Kushi, "but we don't know if it will lead to a higher risk of breast cancer."

Researchers at Breast Cancer Fund in San Francisco "see cancer as a disease of estrogen and are focused on identifying sources of artificial estrogen in environmental toxins which may trigger breast cancer," says program director Brynn Taylor. "There are no simple answers or connections between exposure to environmental toxins or hormone disrupters and the development of breast cancer. It's a big web, with a lot of interactions." But because what causes cancer to grow later in life may be something my still-developing cells come in contact with in my childhood environment—like the chemicals in personal-care products, plastics, household cleansers and the food on my plate—early awareness is critical.

There is evidence that multiple chest X-rays before the age of 20 can raise the risk of later cancer. In July 2006, the Journal of Clinical Oncology reported on a French study which found that women born after 1949, who were exposed to chest X-rays in their childhood or teens, had an increased risk of breast cancer which the investigators suggested may be due to the effects of radiation on more vulnerable breast tissue.

Antibiotic use may be linked to an increased likelihood of breast cancer as well, according to a study from Group Health

## Abreast of the Facts

American Cancer Society, 1710 Webster St., Oakland, (510) 893-7900; [www.cancer.org](http://www.cancer.org)

Breast Cancer Fund, 1388 Sutter St., Suite 400, San Francisco, (415) 346-8223; [www.breastcancerfund.org](http://www.breastcancerfund.org)

Carol Ann Read Breast Health Center, Alta Bates Medical Center, 3100 Summit St., Oakland, (510) 869-8377; [www.altabates.com/clinical/breasthealth.html](http://www.altabates.com/clinical/breasthealth.html)

National Cancer Institute, U.S. National Institutes of Health, Cancer Information Service, (800) 422-6237; [www.cancer.gov](http://www.cancer.gov)

My Treatment Decision, Genomic Health, Redwood City, (866) 662-6897; [www.mytreatmentdecision.com](http://www.mytreatmentdecision.com), [www.genomichealth.com](http://www.genomichealth.com)

Program on Breast Cancer and Environmental Risk Factors, Cornell University, [www.envirocancer.cornell.edu](http://www.envirocancer.cornell.edu)

Zero Breast Cancer, (formerly Marin Breast Cancer Watch), 4340 Redwood Hwy., Suite C400, San Rafael, (415) 507-1949; [www.zerobreastcancer.org](http://www.zerobreastcancer.org) Breast Cancer.org; [www.breastcancer.org](http://www.breastcancer.org)

Cooperative in Seattle, published by Journal of the American Medical Association in 2004. The study found that women who took antibiotics for more than 500 days, or more than 25 prescriptions over about 17 years, had more than twice the risk of breast cancer as women who never took these medications. The study is quick to point out there is no proof that antibiotics cause breast cancer, only an association. But since many young breasts are exposed to antibiotic prescriptions for childhood illnesses like ear infections, these findings may be something to consider.

### Reproductive Years

Having navigated puberty, I am now in my 20s and 30s—my reproductive years—and look forward to having my first baby (a choice I know not all women can or will make and not all breasts will experience). I have known since birth that my cellular make-up does not include the genetic mutations which result in about five to 10 percent of breast cancer cases linked to family health history. But I cannot ignore the fact that my lifestyle during my reproductive years can influence my chances of developing cancer.

“Don’t smoke or be around cigarette smoke, as it raises the risk for all kinds of cancer, including breast cancer,” says Dr. Jon Greif of Bay Area Breast Surgeons in Oakland. “Limit alcohol to no more than one glass per day. And avoid red meat.”

There is increasing evidence that alcohol consumption raises the risk for breast cancer possibly because it increases estrogen levels in the body; possibly because it affects liver function, which is crucial to filtering carcinogens out of the body. Women who consume more than one serving of red meat every day have double the risk of developing breast cancer than those who eat three servings or less each week, according to a study in the November 2006 Archives of Internal Medicine. Cooking or charring meat at high temperatures raises the concentration of carcinogenic chemicals.

Most studies are quick to point out that connections between diet and breast cancer do not prove cause and effect. But why take chances? Greif also recommends adequate intake of Vitamin D3, derived from judicious sun exposure and fatty fish like salmon, which may help prevent cancer development.

Following my first pregnancy, most of my breast cells will be

less vulnerable to DNA damage. Pregnancy before age 30 lowers the risk because my milk-producing cells are now mature; and breast-feeding itself may further reduce my sensitivity to mutations. Regardless of how mature my cells are, however, the American Cancer Society recommends that breasts between 20 and 39 years old undergo a clinical breast exam by a health-care provider every three years and monthly breast self-exams.

#### 40 Plus

With childbearing behind me, and menopause coming, my tissues continue to experience hormone fluctuations, and environmental and lifestyle influences. I know that aging is one of the greatest risk factors for the development of breast cancer. In fact, 95 percent of breast cancer cases and 97 percent of breast cancer deaths occur after the age of 40. The American Cancer Society says the median age for breast cancer diagnosis is 61 years, which means half of the cases are diagnosed before that age.

Yearly clinical breast exams performed by experienced doctors for women over 40 are critical for catching cancer early, says Greif. The California Department of Health conducts a training course for physicians on methods of performing effective exams, he adds.

“Women should also be familiar with their own breasts,” Greif says. Breast self-exams are important tools in early detection. And he urges yearly mammograms for women once they reach 40. Breast cancer in pre-menopausal women is usually more aggressive, and because younger breasts are denser, lesions may be harder to detect.

I receive my annual digital mammogram at the Carol Ann Read Breast Health Center at Alta Bates Summit Medical Center in Oakland. Dr. Ira Kanter, the Breast Center’s co-founder, says there is a significant increase in the ability to discover minimal cancers in the 40 to 50 age group using digital instead of analog mammography. In addition, he says, there is a 50 percent decrease in radiation to the breast using digital technology. “One key to accurate diagnosis is clarity of image,” he says. “The other is experienced, dedicated radiologists reading the images.” The Breast Health Center has both, in addition to complete follow-through for women diagnosed with breast cancer.

Treatment for women with breast cancer is based upon a profile that predicts the risk of recurrence anywhere in the body, says Dr. Lisa Bailey, Breast Health Center medical director. Women at low risk usually receive hormone therapy; women at high risk receive chemotherapy. Just as every breast is different, so is every case of breast cancer—Bailey explains that 21 genes play a role in triggering breast cancer development. In treatment, Bailey says that 70 percent of women choose lumpectomies, which remove the cancerous lumps but not the entire breast. Many women who opt for mastectomies have reconstructive surgery at the same time. Bailey says the most important thing to remember about a diagnosis of breast cancer is: “Don’t panic. Take time to learn about your options. Request double reads of biopsies, get second opinions.”

## Epilogue

As a mature breast, I vigilantly monitor my health and am always on the lookout for new information. I know vital research continues on possible triggers of breast cancer, prevention strategies, methods of detection and recommendations for effective treatment.

A new test called the Oncotype DX evaluates breast cancer tumors on a molecular level to help determine the most effective treatment for each individual. Gary Palmer, vice president of medical affairs for Redwood City’s Genomic Health, the company that developed the test, says more doctors are now using this test since its debut in 2004. “This test is prognostic and predictive,” he says. “It can predict outcomes of treatment with hormone treatment alone. Chemo given early could prevent distant recurrence (cancer in organs other than the breast) but won’t necessarily benefit women who are at low risk for this outcome. Our patient education website, [www.mytreatmentdecision.com](http://www.mytreatmentdecision.com), includes conversation starters so women can ask their physicians the right questions about treatment options.”

Lawrence Berkeley Lab scientist Mina Bissell has “a hopeful view of cancer. Every cell in the body has the same genetic material. When a cell forgets what it is supposed to be [a healthy breast cell, for example] it can become cancer eventually if the architecture of the tissue it is in loses organization,” she explains. The extracellular matrix—the micro-environment surrounding each cell and tissue—conveys information to each cell communicating whether it is normal or

malignant. “Half the secret of the cell is outside the cell,” she says, “like seed and soil.” Her theory: Convince a tumor cell, through extracellular communication, that it is normal, and it can revert to a normal behavior despite the fact that the genome is still malignant. “But we need more information to determine how these things work and also how we can treat the cells surrounding the tumors,” says Bissell. “We and many others are working hard to make these a reality.”

New discoveries about breast cancer triggers, diagnosis and treatments make me feel hopeful, too.

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