Breast Cancer Overview

Breast cancer is the most common type of cancer among women in the United States other than skin cancer and is second only to lung cancer as a cause of cancer death in American women. Each year in the United States, more than 192,000 women are diagnosed with breast cancer. Over the past several years, however, deaths from breast cancer have decreased a little bit every year as cancer prevention, detection and treatment options have improved.

The UC Davis Breast Cancer Program provides comprehensive, multidisciplinary care for patients with all stages of breast cancer. Patients receive all of their care in one location, from a team of top academic physicians.

Risk Factors

No one knows the exact causes of breast cancer. People who think they may be at risk should discuss this with their doctor. Risk factors for breast cancer include the following:

- Older age
- Menstruating at an early age
- Older age at first birth or never having given birth
- A personal history of breast cancer or benign (non-cancer) breast disease
- A mother or sister with breast cancer
- Treatment with radiation therapy to the breast/chest
- Breast tissue that is dense on a mammogram
- Taking hormones such as estrogen and progesterone
- Drinking alcoholic beverages
- Being white

Signs and Symptoms

Early breast cancer usually doesn't cause symptoms. But as the tumor grows, it can change how the breast looks or feels. The common changes include:

- A lump or thickening in or near the breast or in the underarm area
- A change in the size or shape of the breast
- Dimpling or puckering in the skin of the breast
- A nipple turned inward into the breast
- Discharge (fluid) from the nipple, especially if it's bloody
- Scaly, red, or swollen skin on the breast, nipple, or areola. The skin may have ridges or pitting so that it looks like the skin of an orange.

If you have any of these symptoms, you should tell your doctor so that the problems can be diagnosed and treated.
Diagnosis

UC Davis Comprehensive Cancer Center recommends that women have regular clinical breast exams and mammograms to help find breast cancer early. Treatment is more likely to work well when breast cancer is detected early.

- **Clinical Breast Exam**
  - During a clinical breast exam, your doctor looks for differences in size or shape between your breasts and checks for rashes, dimpling, or other abnormal signs. Your doctor will also check the lymph nodes near the breast to see if they are enlarged.

- **Mammogram**
  - A mammogram is an x-ray picture of tissues inside the breast. Mammograms can often show a breast lump before it can be felt.
  - Before they have symptoms, women should get regular screening mammograms to detect breast cancer early:
    - Women in their 40s and older should have mammograms every 1 or 2 years.
    - Women who are younger than 40 and have risk factors for breast cancer should ask their health care provider whether to have mammograms.
  - If the mammogram shows an abnormal area of the breast, your doctor may order clearer, more detailed images of that area.

- **Other Imaging Tests**
  - If an abnormal area is found during a clinical breast exam or with a mammogram, the doctor may order other imaging tests, including:
    - Ultrasound: An ultrasound device sends out sound waves that bounce off breast tissues. A computer uses the echoes to create a picture. The picture may show whether a lump is solid, filled with fluid (a cyst), or a mixture of both.
    - MRI: Magnetic Resonance Imaging uses a powerful magnet linked to a computer to make detailed pictures of breast tissue. These pictures can show the difference between normal and diseased tissue.

- **Biopsy**: A biopsy is the removal of tissue to look for cancer cells. You may need to have a biopsy if an abnormal area is found. Your doctor or a surgeon will remove fluid or tissue from your breast in one of several ways:
  - Fine-needle aspiration biopsy: Your doctor uses a thin needle to remove cells or fluid from a breast lump.
  - Core biopsy: Your doctor uses a wide needle to remove a sample of breast tissue.
  - Skin biopsy: If there are skin changes on your breast, your doctor may take a small sample of skin.
  - Surgical biopsy: Your surgeon removes a sample of tissue.
Treatment

The close collaboration between our doctors and our research scientists means that new drugs and treatments developed in the laboratory can quickly move to the clinic, offering our patients immediate access to the latest therapies.

For example, our surgeons were among the first in the country to pioneer a treatment known as non-surgical lumpectomy, or radiofrequency ablation. This investigational treatment employs heat to destroy small, early stage breast cancers. Our scientists are also developing a new CT breast-imaging machine that could become an alternative to standard mammography.

Clinical Trials

UC Davis Comprehensive Cancer Center has a large clinical trials network, allowing our patients access to the newest drugs and therapies before they become widely available. During all stages of your treatment you should talk to your medical specialist about what clinical trials may be available for you.

Support

The UC Davis Breast Cancer Program is dedicated to caring for the whole patient. We offer:

- New patient support specifically for breast cancer patients (WeCARE Peer Navigator Program)
- "Look Good... Feel Better," an American Cancer Society workshop
- Psychosocial counseling
- Patient education classes, lectures and newsletter
- A cancer resource center

Why Support breast cancer research at UC Davis Comprehensive Cancer Center?

All women are at risk for breast cancer. It is the most common cancer diagnosed in American women and the second leading cause of cancer deaths among women. Steady and dramatic improvements in the early detection of breast cancer over the last 30 years have resulted in equally dramatic improvements in outcomes for hundreds of thousands of women. In the last decade, advances in surgical techniques and post-operative treatments have greatly reduced the physical and emotional impact wrought by this disease.

However, more than 200,000 new cases (1/3 of all cancers) of breast cancer are seen each year in the United States. In spite of marked improvements in treatments and outcomes, the tremendous efforts devoted to identifying the common link to the many varieties of malignancies have largely yielded more questions.
Under the direction of Dr. Helen Chew, the UC Davis Comprehensive Cancer Center has developed a highly successful, multidisciplinary approach to the treatment of breast cancer. Our clinical programs include the Breast Health Center, which works with a network of primary care physicians with particular interests in women's health; the Breast Cancer Clinic, a multi-disciplinary team that coordinates care of the Cancer Center's breast cancer patients; and the Cancer Genetics Clinic, offering genetic counseling to families at high-risk for breast cancer.

Our strong clinical trials program in breast cancer includes breakthrough technologies with profound implications for the treatment and diagnosis of breast tumors.

**Less invasive breast cancer surgery**

UC Davis Comprehensive Cancer Center radiologist Karen Lindfors, M.D., is one of the lead investigators in a national study involving 2,500 women in the Sacramento area that is comparing the effectiveness of newly developed digital mammography to the conventional film-screen technique. Screening conventional mammograms for breast tissue abnormalities requires uncanny skills and experience, and when lesions are detected and removed, the majority proves non-cancerous.

Digital mammography, developed by scientists at Lawrence Livermore National Laboratory, relies on powerful computing technology and high-resolution displays to help physicians in two important ways: identify tumors earlier and distinguish between threatening and non-threatening lesions. In other words, women with cancerous tumors will be treated earlier; and women with benign growths will be spared the emotional and financial costs of invasive biopsies.

**New mammogram technology**

Radiology professor and biomedical engineer, John Boone, Ph.D., shares Dr. Lindfors' aspirations for more effective breast imaging, although his groundbreaking work takes a different tack. He will be among the first to tell you that the mammogram's increasingly widespread use has greatly contributed to the dramatic and steady decline in the number of breast-cancer related deaths over the last 20 years, yet Professor Boone also appreciates that we may well be nearing the time when a new technology makes the mammogram, an imaging technology that relies on x-rays and is uncomfortable for the patient, obsolete.

The x-ray reliably detects breast tumors when they have reached 11 mm in diameter. Prof. Boone understood that newer imaging technologies, like the CT scan, could detect significantly smaller growths—tumors that would not have shown up on a mammogram for 12 to 18 months.
Practical considerations, however, argued that the increased radiation exposure of computed tomography made it unsafe for the routine screening of breast tissue. Prof. Boone, compelled by the fact that the CT scan could detect tumors months if not years before a mammogram, revisited the question of how CT could be advanced specifically for breast screening in a way that minimizes radiation exposure.

With the support of the California Breast Cancer Research Program, the National Cancer Institute, the National Institute for Biomedical Imaging and Bioengineering, and UC Davis, Prof. Boone and his fellow researchers have developed a prototype CT scanner, now being tested, that minimizes exposure to radiation while accurately detecting tumors as small as 3- to 5-millimeters, a stage that adds significant hope for successful outcomes. Initial clinical trials for the CT breast scanner will commence in early 2004, and, pending favorable results, a commercial version could be in use by the end of the decade.

**Progress, innovation, and improved outcomes**
Progress, innovation, and improved outcomes have been the marks of success in the treatment of breast cancer, but much remains to be done to diminish the effects of this disease.

An endowed chair for the study of breast cancer will aid the UC Davis Comprehensive Cancer Center in attracting and supporting a noted physician-researcher who will:

- Provide exceptional patient care and clinical leadership,
- Lead and conduct clinical and translational research and attract outside research funding,
- Attract other promising researchers, and
- Work collaboratively to help leverage the university's considerable research capacities
  - To better understand the origins of the disease,
  - To develop preventative strategies for the disease,
  - To improve existing therapies and outcomes.