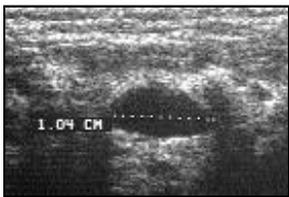


. . . a breast ultrasound instrument that could examine breast abnormalities not readily apparent with x-ray mammography.

SONIC CT™ IS UNDERGOING LIMITED TRIALS AT THE HILLCREST CENTER FOR WOMEN'S HEALTH IN SAN DIEGO, CALIFORNIA.



■ Ultrasound can help confirm the presence of a malignant lesion, as pictured above.

Courtesy of New South Wales Breast Cancer Institute.

BREAST ULTRASOUND MAY SAVE WOMEN'S LIVES

An important addition to mammographic screening in recent years, breast ultrasound helps doctors decide whether a suspicious area on a mammogram is a benign cyst or a malignant tumor. Investigators found new ways to use hand-held ultrasound wands for this task. Manufacturers of ultrasound equipment also responded to the needs of clinicians, developing specialized units for breast ultrasound.

Demonstrating its proactive corporate strategy of continual innovations in breast imaging, ThermoTrex Corporation (San Diego, CA) transferred some of its BMDO-funded advanced imaging technology into the growing field of breast ultrasound. ThermoTrex is also developing digital mammography techniques.

In its unique approach, ThermoTrex incorporated computed tomography (CT) techniques into breast imaging with ultrasound. Sonic CT™ images the breast in a slice-like fashion using high-frequency sound waves. This method yields an image relatively free from overlying tissue interference, helping doctors to see features not always apparent with x-ray mammography. Radiation exposure is not a concern with this method, because Sonic CT uses ultrasound instead of x-rays to form a breast image. Also, this technology does not require painful compression of the breast.

Sonic CT can spot breast abnormalities not associated with microcalcifications. Thus, it could assess such conditions as fibrocystic breast disease (also called "lumpy" breast disease). It also could help reduce the number of breast biopsies, 80 percent of which turn out negative. Currently, Sonic CT is undergoing limited trials at the Hillcrest Center for Women's Health in San Diego, California.

ThermoTrex is developing Doppler CT, an imaging technology related to Sonic CT. This device uses ultrasound to assess blood vessels for blockages. Specifically, it will detect blood flow speed and image vessels in three dimensions, providing useful information for examining coronary and carotid arteries to assess the risk of heart attack and stroke, respectively. Doppler CT also can image the peripheral blood vessels of the legs, an important capability for detecting blood clots in elderly patients after surgery and during prolonged periods of bed rest.

ABOUT THE TECHNOLOGY

Both Sonic and Doppler CT devices convert ultrasound signals into digital images of anatomical features and electronically process and store them, just as x-ray images are manipulated in "conventional" CT. Sonic CT uses low-frequency ultrasound to produce cross-sectional slices of the breast, acquiring images in near-real time. Doppler CT will measure the velocity of blood coursing through vessels. Blood flows at a higher speed through a passage narrowed by plaque or scar tissue than through an unobstructed blood vessel with a wider diameter. Therefore, comparing the speed of blood flow in adjoining areas of an artery allows detection of blockages in that artery.