ABOUT US

The Angeles Clinic and Research Institute was established by a group of physicians who came from academic backgrounds who sought to establish an environment where world-class patient care was the top priority. The Clinic's physicians include widely recognized oncologists and leaders in cancer medicine who, together with expert radiology services, radiation oncology, specialized oncologic nurses, and a dedicated support staff, have created a state-of-the-art center for oncology in the Los Angeles area. In addition to superb clinical care, our physicians are known for their world-class clinical research. The Institute has earned an international reputation for developing new cancer therapies, providing the best in traditional and experimental treatments, and expertly guiding and training the next generation of clinicians and researchers.

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INTRODUCING CALYPSO™ TECHNOLOGY: THE SAFEST CARDIAC-SPARING RADIATION THERAPY FOR BREAST CANCER PATIENTS

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In order to provide the safest and most advanced radiation therapy to our patients, The Angeles Clinic and Research Institute has become the first center in Southern California to use the Calypso™ GPS for the Body technology in the treatment of our patients with breast cancer. By using this cutting-edge technique, we are able to dramatically reduce radiation exposure to a woman’s heart during her course of radiation therapy compared with other modern radiation techniques. To best understand the value of this new technology, it is useful to review the tremendous benefits of breast irradiation in the treatment of breast cancer as well as the potential risks of this important and widely utilized treatment.

Radiation therapy is a critical component of the treatment of many patients with breast cancer. In patients who are treated with breast conservation therapy, which consists of a lumpectomy accompanied by surgical removal of axillary lymph nodes, a moderate dose of radiation therapy directed to the breast reduces the risk of cancer recurrence from approximately 25-40% down to approximately 10-15%. Breast cancer patients with certain high-risk features who undergo mastectomy have a similar reduction in their risk of recurrence with post-mastectomy radiation therapy. By reducing the risk of recurrence in these scenarios, radiation therapy has also been shown to improve a woman’s likelihood of long-term survival related to her breast cancer.1

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Although these benefits of radiation therapy are well-established, several studies have suggested that breast irradiation may increase the risk of heart disease. This risk appears to be most relevant to patients with cancers of the left breast due to the anatomic location of the heart and coronary arteries. As oncologists, we have become very sensitive to heart disease in women due to the common use of chemotherapies that also have the potential to harm the heart as well as the overall rise in heart disease in women in the U.S. that is unrelated to cancer therapy. A recent study published in the New England Journal of Medicine demonstrated that even very low doses of radiation given incidentally to the heart during the administration of radiation therapy for the treatment of breast cancer results in a small but significant increase in the risk of major cardiac events, such as a heart attack, death from heart disease, or the need for procedures, such as coronary artery bypass surgery or coronary artery stenting. Specifically, these researchers found that with each additional Gray (our unit of measure) of radiation dose to the heart, the risk of a woman experiencing one of these cardiac events rose by approximately 7% — even with doses as low as 1 Gray. The average dose to a woman’s heart in this study was approximately 5 Gray. The baseline risk of a 50-year-old woman dying of heart disease by age 80, according to this study, is quite low (1.9%). Radiation therapy appears to raise this risk to between 2.4% and 3.4%, depending on the amount of radiation exposure to the heart. The risk of these cardiac events was further elevated in patients who had pre-existing risk factors, such as high blood pressure or diabetes.

The results of this study were also published in The New York Times and were widely disseminated through the mass media. These findings were particularly noteworthy within the oncology community because this study was among the first that actually quantified the risks of exposing the heart to radiation during breast cancer treatment. This study was also alarming in that it showed that even the lowest doses of radiation to the heart can have serious long-term consequences — in other words, there is no completely safe dose of radiation to the heart. The implications of this research indicate that radiation oncologists must do everything that they can, including through the implementation of new technologies, to minimize radiation dose to women’s hearts during the course of radiation therapy — and the lower the dose to the heart, the better.

At The Angeles Clinic and Research Institute, we strive to provide high-quality and technically excellent radiation therapy to our patients in the safest possible way. We are the first center in Southern California to implement the revolutionary Calypso™ GPS for the Body technology to provide the safest cardiac-sparing radiation therapy in the treatment of breast cancer. This non-invasive technology enables our radiation oncologists to treat women with breast cancer using a carefully calibrated breath-hold technique to permit the delivery of the full dose of radiation therapy to the breast while maximally sparing the underlying heart. The Calypso™ beacon is placed onto a woman’s chest during the course of her radiation treatment. Using sophisticated radiofrequency

![Calypso™ beacon](image)

Figure 1. Calypso™ beacon (a) that is placed non-invasively onto a woman’s chest during the course of her radiation treatment for breast cancer (b).
and electromagnetic signaling, the Calypso™ system ensures that the patient is being treated during the proper phase of breathing, when the lungs are comfortably expanded and the heart rests closer to the center of the chest and safely away from the chest wall. At this phase of inspiration, the radiation oncologist can direct the radiation beam to treat the breast while avoiding the underlying heart. Studies of this type of breath-hold technique have shown >80% reduction in cardiac radiation dose compared with other modern techniques for breast irradiation. In fact, these studies have shown that breast radiation therapy – even to patients with cancers of the left breast – can be delivered without any exposure to the heart at all in approximately 40-50% of women.4,5

We feel that avoiding radiation dose to the heart is essential, especially in women with cancers of the left breast, in women who have received prior chemotherapy which may have already harmed the heart, and in women who have pre-existing conditions that may predispose them to cardiac disease, such as high blood pressure or diabetes. For these reasons, The Angeles Clinic and Research Institute is proud to offer Calypso™ technology to provide the safest radiation therapy to our patients with breast cancer. For a consultation or to learn more about our breast cancer radiation therapy program, please contact Dr. Daniel Schiffner, Chairman of our Department of Radiation Oncology, at (310) 828-0061.

References:

Figure 2. Comparison between treating a patient with cancer of the left breast (BR) using the standard free breathing technique (a) versus the inspiration breath hold technique using Calypso™ technology (b). With the commonly-used free breathing technique (a), the lungs (L) are not fully expanded, and the heart (H) is compressed against the chest wall. In this anatomic configuration, a portion of the heart is included in the radiation beam (yellow) during breast cancer treatment, which increases cardiac radiation dose and has the potential to increase the risk of heart disease in the patient. Using the Calypso™ inspiration breath hold technique (b), the lungs (L) are comfortably expanded, and the heart (H) rests closer to the center of the chest and safely away from the chest wall. At this phase of inspiration, the radiation beam (yellow) can be directed to cover the breast (BR) completely while maximally avoiding the underlying heart. For this reason, the Calypso™ inspiration breath hold technique minimizes (and in many cases eliminates) potentially harmful radiation dose to the heart.
CONGRATULATIONS

Nanaz Amini, Research Pharmacist at The Angeles Clinic and Research Institute (TACRI) was recently recognized nationally as one of the finalists for the 2013 T.O.P. Pharmacist Award. Few programs can boast a pharmacist of such depth, intelligence, and compassion. Dr. Amini holds both PharmD and a Master’s Regulatory Science degrees from the University of Southern California (USC). She boasts a background in laboratory work and clinical training at the U.S. Food and Drug Administration. During her tenure at TACRI she has been instrumental in the transformation of our research program into a nationally and internationally recognized translational program involved in paradigm-shifting immunotherapeutic and targeted therapy trials. She is responsible for all of our therapeutics and overseeing the infusion service at both TACRI sites. Dr. Amini heads our oral pharmacy program. Her deep level of knowledge on drug products is an invaluable resource for all of our patients. Constantly a source of education, problem solving and kindness to all our patients; we are grateful for her service and proud of her accomplishments.

IN THE NEWS

The recent announcement by the renowned actress Angelina Jolie regarding her decision to undergo bilateral mastectomy and the anticipation of her future salpingo-oophorectomy procedure has caused considerable emotions in women who either have had breast cancer or who have a fear of developing breast cancer in the future. The motivation for Miss Jolie to consider these preventive surgeries is based on the fact that she was found to have a genetic mutation that placed her at high risk for both breast and ovarian cancer. In the midst of heightened emotions on this issue, it is an opportune time to review the characteristics of women for whom genetic testing should be considered, keeping in mind that the majority of women who develop breast cancer do not carry BRCA1 and BRCA2 mutations.

The probability that a person (both men and women) carries a mutation in the BRCA1 and BRCA2 genes increases with certain familial patterns of cancer and include:

- Breast cancer at a young age either in a patient or a family member
- Bilateral breast cancer in a patient or a family member
- Two or more first degree relatives with breast cancer
- Breast cancer in several generations in a family line
- Ovarian cancer in a family member/both breast and ovarian cancer in a family
- Male relatives with breast cancer
- Ashkenazi Jewish descent
- Patients who have triple-negative breast cancer are also more likely to have a genetic mutation and may be considered for testing