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MRI vs Mammogram:

What's a Woman to Think?

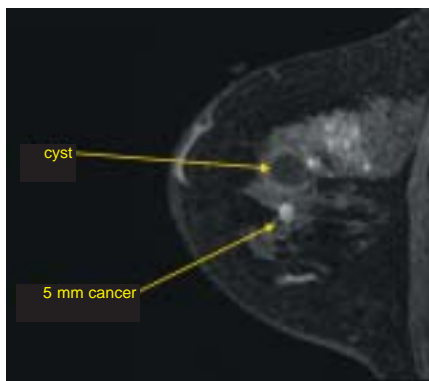
Recent research showing the value of an MRI scan for women at high risk of developing breast cancer, while good news, is also fueling confusion about when an MRI is appropriate. There's no doubt that when MRI is used with high-risk patients, its ability to locate small or hard-to-find cancers outweighs its risks. But mammography and ultrasound are not obsolete technologies that now can be tossed aside. In some cases MRI may miss cancers that mammography would detect. And MRI can be too sensitive for its own good—it makes mistakes.

Why Not an Annual MRI?

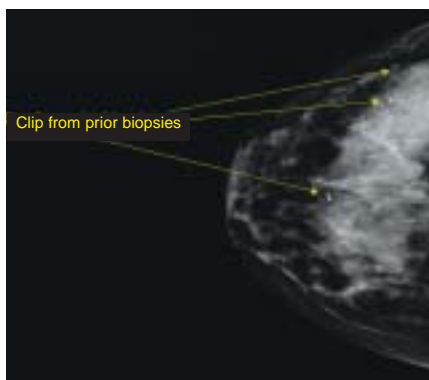
MRI (magnetic resonance imaging) uses radio waves and a powerful magnet to create three-dimensional pictures of the body. During a breast MRI, the patient lies face down on a cushioned table with her breasts between padded openings. The table slides in and out of a cylinder as the machine creates images of the breast. The procedure is painless and, unlike mammography, does not use radiation.

While MRI is more sensitive than a mammogram at detecting cancer, mammography remains the most reliable and affordable screening tool for women who are not experiencing symptoms. It is the only imaging method proven to decrease breast cancer deaths. The American Cancer Society continues to recommend an annual mammogram for healthy women 40 and older who have an average risk of getting breast cancer.

But if an MRI is more sensitive than a mammogram, why not recommend an annual MRI? While an MRI is good at finding cancer, more things look like cancer to an MRI than to a



MRI scan of the right breast in a patient at high risk of developing breast cancer



Mammogram of the same patient showing how her dense breast tissue obscures the small cancer

mammogram. MRI has a high rate of false positives (detecting something as cancerous that is non-cancerous). Norris Cotton

Cancer Center radiologist Petra Lewis, MB, MS, estimates that the call-back rate for follow-up visits after a breast MRI is 20%, while for a screening mammogram it's closer to 10%. For a woman at high risk, an unnecessary biopsy might be worth it. But if MRI were to replace mammogram as a general screening tool, the high false positive rate would trigger a large number of women being called back for unneeded additional imaging and biopsies, besides causing a great deal of unnecessary anxiety.

There is also the expense. The cost of an MRI is ten times that of a mammogram. Most major insurance companies will pay for an MRI if a woman is at high risk, but they may not if she is at lower risk. And even if someone is willing to pay out-of-pocket, there are a limited number of MRI facilities in the country. DHMC currently has three MRI machines, which are in constant demand to evaluate coronary artery disease, brain tumors, spinal cord trauma, and many other conditions.

Best Use of MRI

"MRI is a great tool for high risk patients," says Lewis. "In women who are at markedly higher risk of developing breast cancer, such as those with genetic mutations (BRCA1 or BRCA2 positive), MRI picks up about twice as many cancers. We also use it for some women who have a moderately increased lifetime risk of breast cancer and have dense breasts, with patients where there is a

Living with - and Beyond - Breast Cancer

Breast Cancer Symposium
October 15, 2007

concern about the recurrence of a tumor at a lumpectomy site, and in patients with a new diagnosis of breast cancer to screen both breasts for additional disease.”

One method used by health care providers to initially gauge whether someone is an appropriate candidate for a breast MRI is a computerized risk assessment tool called a “Gail Model.” It asks a simple series of questions about personal and family history to estimate a woman’s chance of breast cancer. The National Cancer Institute breast cancer risk assessment tool is available online at www.cancer.gov/bcrisktool. It calculates a 5-year and lifetime risk of developing invasive breast cancer. “If a woman has a Gail Model of greater than 20-25% and she has dense breasts, we may use MRI screening,” explains Lewis.

While MRI may be perceived as the current gold standard for breast cancer detection, no imaging technique is the sole solution for finding and preventing cancer. Skilled radiologists like Lewis use the evidence gleaned from each technology, at different points in the diagnosis, to build a detailed understanding of each woman’s condition.

Norris Cotton Cancer Center radiologist Petra Lewis, MB, BS, will talk about the pros and cons of breast cancer screening with MRI at the Breast Cancer Symposium, sponsored by the Cancer Center and the Comprehensive Breast Program at DHMC,

on October 15. The evening forum will cover important topics in breast cancer, from screening to survivorship. Opening remarks by the director of the Comprehensive Breast Program, E. Dale Collins, MD, will be followed by a keynote speech by nationally recognized palliative

care expert, Ira Byock, MD, DHMC’s Director of Palliative Medicine and the Cancer Center’s Associate Director for Cancer Survivorship and Palliative Care. Because of new treatment options, more women with cancer are surviving and living longer. Byock will talk about the challenges of living with and beyond cancer.

Norris Cotton Cancer Center is one of the preeminent cancer research institutions in the country. The Breast Cancer Symposium is a way for Cancer Center clinicians and researchers to provide breast cancer patients, caregivers, and community members with up-to-date information on cancer prevention and treatment. Symposium participants can attend seminars on diet and cancer, sexuality and cancer, breast cancer treatment options, MRI screening, the effects of chemotherapy on brain function, and lymphedema.

The symposium starts at 4:15 p.m. and is free and open to the community. Online registration is available on the Cancer Center website at www.cancer.dartmouth.edu/bcs or by calling (603) 653-9000. Registrants are provided with a box supper.





Starting Early is Key to a Healthy Lifestyle

Obesity not only puts a person at risk for heart disease, stroke, and diabetes, it's also a leading cause of some cancers. Currently, 67% of U.S. adults are either overweight or obese. This puts



an estimated 97 million people at higher risk for breast, endometrial, esophageal, kidney, prostate, and colon cancer. Studies have shown that even moder-

ate weight loss can decrease cancer risk. Clinical researchers Susanne Tanski, MD, Auden McClure, MD, and Selvi Senthinathan, MD, want to start early, by addressing childhood risk factors.

Childhood obesity is two to three times more prevalent now than in 1970. Researchers are testing a unique way to intervene by addressing two behaviors that can lead to obesity: watching television and consuming sweet beverages, including soda, fruit drinks, and even 100% juice. They will be working with primary care physicians to educate parents with young children about these risk factors. Parents will receive three personalized letters over six months from their physician describing guidelines for limiting television watching and sweet beverage consumption.

The researchers believe that early intervention can establish healthy lifestyles, and result in reducing the adult risk of cancer. Their clinical trial is part of a larger program to address prevention as well as treatment.

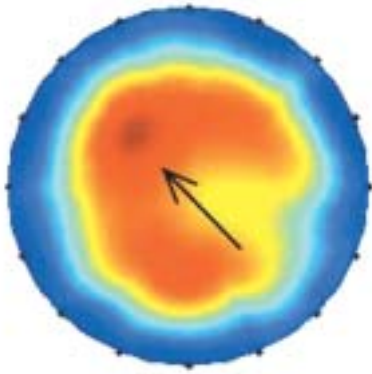
"Prevention is essential, but addressing the epidemic at hand is unfortunately an equally important priority," says McClure.

Vital Support of New Cancer Research

Getting new research off the ground can be a chicken and egg proposition. Major funding often depends on having significant research data, but collecting data requires funding.

Money raised from the annual Prouty Century Bike Ride & Challenge Walk is helping to overcome that conundrum. Every year the directors of the cancer research programs at Norris Cotton Cancer Center select promising new research proposals for Prouty Pilot Project funding. These projects explore innovative ideas and develop the initial data that is critical for continued support.

Descriptions of all Prouty Pilot Projects from 2006 and 2007 are available online at the Cancer Center website. A handful of the 2007 projects are profiled here.



New Way to View Prostate Cancer

Screening methods for prostate cancer are far from perfect. Even MRI and ultrasound do not reliably detect tumors—75% of prostate cancer biopsies are negative. A more reliable method could spare a significant number of men the anxiety of undergoing a biopsy, and relieve the health care system of a major financial burden.

A unique collaboration of researchers from Norris Cotton Cancer Center, Dartmouth-Hitchcock Medical Center, Dartmouth Medical School, and Thayer School of Engineering is investigating a new type of imaging technology for prostate cancer detection—electrical impedance spectroscopy (EIS). Because conductivity is significantly lower for prostate cancer cells than for healthy tissue, passing a painless, low-voltage electrical current through the tissue can be used to distinguish between benign and malignant tissue structures. Similar results had been found using EIS for breast cancer detection.

Researchers Ryan Halter, PhD, and Alex Hartov, PhD, have developed preliminary data to support the use of EIS as a diagnostic tool for prostate cancer, especially when used in conjunction with current imaging methods. Based on these findings, they are testing a larger group of patients to determine the magnitude of difference in electrical properties between

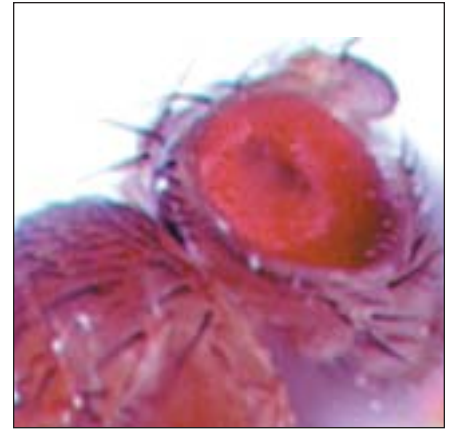
benign and malignant tissue. This fall they will begin the design and construction of a new prototype diagnostic probe.

Anti-cancer Effects of CLA

A fatty acid, called conjugated linoleic acid (CLA), in common use for decades as a weight loss supplement, may be effective in controlling breast cancer, according to William Kinlaw, MD. His research into the gene S-14, a switch that controls fat production in breast cancer, led to investigation of CLA's ability to suppress fat synthesis, and inhibit tumor growth.

CLA is produced naturally in the rumen of cows during the digestion of grass, where fermentation converts a normal fatty acid into conjugated linoleic acid. Milk and the meat of ruminants—including goats, buffalo, sheep, as well as cows—contain CLA, but in smaller quantities than the dietary supplement. Supplements, however, are a mixed bag of compounds. "There are various CLAs. It's not a single molecular species," explains Kinlaw. "What's being sold commercially is usually a fifty-fifty mixture of two different types of CLA that have different biological activities."

Studying the effects and metabolism of pure CLAs is crucial to developing dependable scientific data. Kinlaw is collaborating with Cancer Center researchers Lionel Lewis, MD, and Raymond Perez, MD, on a pharmacological study of each type of CLA, to measure how much is absorbed into the blood from the gastrointestinal tract, and its resulting effect. This information could guide the use of CLA as a tumor-inhibiting drug.



Fruit Flies and Colon Cancer

The gene APC (adenomatous polyposis coli) has been called the "gatekeeper" of the colon. "Loss of the APC gene is the first step in the development of colon cancer," explains Yashi Ahmed, MD, PhD, a genetics researcher investigating the molecular events that cause cancer to grow in the colon. In order to understand how the APC gene operates, Ahmed is using a laboratory organism whose APC gene functions in similar ways in humans—the fruit fly.

"Remarkably, our studies have shown that the APC gene in flies and in humans has identical functions," she says.

Ahmed notes that people with an APC gene mutation not only develop colon cancer, they also experience retinal nerve damage. Loss of the APC gene caused some cells to grow (colon cancer cells) and others to die (eye nerve cells). "Why is it that some cells respond to the loss of APC by proliferating, while others respond by dying?" she asks. Prouty Pilot Project funds are helping her answer that question. Developing a way to control the process could lead to a therapy for stopping the growth of cancerous colon cells.

The Best Year Yet!

You did it! The 2007 Prouty Century Bike Ride & Challenge Walk beat its goal of \$1.5 million, and exceeded last year's record total by almost \$500,000—raising \$1.7 million for research and patient services at Norris Cotton Cancer Center.

More than 3,500 people participated in the July 14 event, including Governor John Lynch and First Lady Dr. Susan Lynch. Many bikers and walkers were on one of 283 teams that formed to honor a family member or friend who is battling cancer or has recently died from the disease. More than 125 businesses and 400 volunteers also contributed to the day's success.

"We are thrilled by this overwhelming show of support by our community," said Cancer Center director Mark A. Israel, MD. "The Prouty provides vital support for two important areas of focus for us: research funding for bright, young scientists who are developing innovative approaches in cancer, and supportive services for cancer patients that truly can make a difference in their well-being and healing."

Spotlight on Volunteers

Margo Titus

When Margo and Rob Titus ran a bed and breakfast in Norwich, a guest offered Margo a Reiki treatment for her sore elbow. Reiki, which in Japanese means "universal life energy," is a gentle, hands-on healing art that can create a sense of well-

being and relaxation. "The guest gave me a Reiki treatment and the pain was gone," says Margo.

She began to study Reiki, and

now patients and nurses ask for her gentle touch and calm manner every Monday morning in the Hematology/Oncology Infusion Suite. "I just had to jump in with both feet and explain what Reiki was," she says.

In May 2005, when Margo first became a volunteer, she thought she might feel depressed or sad after working with cancer patients. "That is not the case," she states. "I go home feeling energized and happy. The extraordinary courage and positive attitudes of so many patients and caregivers is just amazing and inspiring."



Donna Cornelius

Donna Cornelius began volunteering in 1979 at the hospital's previous site in Hanover as an escort and coffee cart assistant. Since then she has devoted many hours to volunteering wherever she was needed. Because Donna lost both her parents to cancer, she was drawn to the needs of cancer patients undergoing treatments, and to family caregivers.

In the late 1990s, Donna became a regular volunteer in the Radiation Oncology waiting room. She also sells daffodils for the American Cancer Society Daffodil Days fundraiser, helps with the Cancer Survivor Day celebration, and pitches in as a Prouty volunteer. To round out her week, she is the bingo host for cancer in-patients.

"Over the years I have personally gained strength from the patients," says Donna. She recommends volunteering to anyone who wants the personal satisfaction of offering services and a listening ear to someone having a hard day.



An open letter of appreciation...

This summer, the 26th Annual Prouty Century Bike Ride & Challenge Walk raised more than \$1.7 million for cancer research and patient services at Norris Cotton Cancer Center. And *U.S. News & World Report* ranked Norris Cotton Cancer Center at Dartmouth-Hitchcock Medical Center among the top 50 hospitals in the nation for cancer care for the sixth year in a row.

For 35 years, the National Cancer Institute (NCI) also has acknowledged our excellence. Norris Cotton Cancer Center is one of only 39 centers in the country to have achieved Comprehensive Cancer Center designation by the NCI. It requires that we excel in several important areas—laboratory, clinical, and population-based research, innovative patient care and clinical trials, and outreach and education for health care professionals and the public.

As Director of Norris Cotton Cancer Center, I feel privileged to represent an institution that so consistently achieves such exceptional recognition and support. I offer my deepest appreciation to the people who are responsible for our achievements—the staff, clinicians, and scientists at Norris Cotton Cancer Center.

Close to 1,000 people employed at Dartmouth Medical School and Dartmouth-Hitchcock Medical Center touch the lives of cancer patients and their families in the work that they do every day. Nurses, doctors, scientists, post-docs, administrators, clerks, housekeepers, support staff, technicians, care coordinators, dietitians, physical therapists—the list goes on and on. There cannot be a more dedicated, competent, and compassionate group of people anywhere. Our patients and families tell us so. Our research contributions and national prominence reflect that excellence.

I thank each and every one of you for all you do to make Norris Cotton Cancer Center a place of excellence and service, a place that makes a crucial difference in the lives of so many.

With heartfelt congratulations,

Mark A. Israel, MD
Director, Norris Cotton Cancer Center
Dartmouth-Hitchcock Medical Center
Dartmouth Medical School



Finding Your Way Around:

Cancer Center Unveils a Redesigned Website

www.cancer.dartmouth.edu



More and more patients and clinicians are using the Internet to search for information about cancer. We want you to know more about the clinical services available at Norris Cotton Cancer Center, and the important cancer research taking place here, so we've redesigned our website to help you find everything from clinical trials to driving directions.

We encourage you to try it out, and let us know what you think. Email feedback to cancerhelp@dartmouth.edu. We welcome your observations and suggestions about the website and how it meets your needs.



Norris Cotton Cancer Center combines advanced cancer research at Dartmouth Medical School with patient-centered cancer care at Dartmouth-Hitchcock Medical Center in Lebanon, NH and regional locations in St. Johnsbury, VT, and Manchester and Nashua, NH. It is one of 39 Comprehensive Cancer Centers designated by the National Cancer Institute (NCI).

Learn more about Norris Cotton Cancer Center research, programs, and clinical trials online at www.cancer.dartmouth.edu

Please address all inquiries and comments regarding this newsletter to Mary Hawkins, Norris Cotton Cancer Center, One Medical Center Drive, Lebanon, NH 03756, or by email Mary.S.Hawkins@Dartmouth.edu

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