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REPORT TO PHYSICIANS

OncoLog

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Getting Proactive about Prevention

by Rachel Williams

"We are actively debunking the myth of cancer as a deadly disease by offering the opportunity to detect cancer at its earliest, most treatable stage."

– Dr. Therese Bevers

News reports of American health habits often paint a bleak picture—not enough exercise, unhealthy eating habits, irregular cancer screening exams, and the list goes on.

But a different picture seems to be emerging at The University of Texas M. D. Anderson Cancer Center. Recently, M. D. Anderson relocated and substantially expanded its Cancer Prevention Center.

Since opening its doors earlier this year in the new Cancer Prevention Building—and doubling the number of treatment rooms—the Cancer Prevention Center has seen a substantial increase in patients.

(Continued on **next page***)*

THE UNIVERSITY OF TEXAS
MD ANDERSON
CANCER CENTER

Getting Proactive about Prevention

(Continued from **page 1***)*

Some patients want to know if their family's predisposition to cancer has a genetic component; others want to find out what toll smoking or sun damage may have taken; others may want an annual screening exam or advice on how to prevent cancer. Whatever their reasons, if the brisk pace of business at the Cancer Prevention Center is any indication, people are not just getting the message about cancer prevention, they are also taking action.

"We have already seen almost 15,000 people this year, a 22% increase over last year," said Therese B. Bevers, M.D., an associate professor in the Department of Clinical Cancer Prevention and the medical director of the Cancer Prevention Center. "The increased space allows us to accommodate more patients and expand our participation in clinical trials, including multinational prevention studies, as well as prevention research at M. D. Anderson."

According to Dr. Bevers, most people who come to the Center are concerned about their risk for cancer. They may have a family history of cancer or a personal medical condition that would put them at higher risk for cancer, be smokers, or have a precancerous condition such as lobular carcinoma *in situ* of the breast. "These patients are seeking specialty information about cancer risk that pertains specifically to themselves. They are asking for risk-reduction strategies that they can implement and want risk-based cancer screening recommendations," said Dr. Bevers.

> **These patients**
> **... are asking for risk-reduction strategies that they can implement and want risk-based cancer screening recommendations."**
> **– Dr. Therese Bevers**

Dr. Bevers chose the specialty of cancer prevention because she enjoys educating patients. "I like the process of risk assessment and being able to explain risks and risk reduction," she said. Dr. Bevers explained that there are three components of cancer prevention: risk assessment, risk reduction, and screening.

In addition to undergoing regular screening exams, [redacted] (r), shown here with research nurse **Valerie Sepeda**, *is participating in a breast cancer prevention trial at M. D. Anderson.*

Cancer risk assessment

Risk assessment takes a comprehensive look at risk factors, including an inherited predisposition to cancer. "We don't do genetic testing on every patient, but we assess them to see who should go through the genetic counseling process. Additionally, we conduct more formal evaluations to determine whether genetic testing is needed," said Dr. Bevers.

Prevention specialists also assess population-specific risk factors that may contribute to a person's cancer risk. Using that information, they make risk-based recommendations. For example, when they assess a 30-year-old woman whose mother had breast cancer at age 35, they determine whether she needs to be screened earlier or more often than the average woman, and they consider other risk-reduction options available to her on the basis of her level of risk.

Someone with an inherited risk might need to think about options, such as prophylactic surgery, that a person without an inherited risk would not consider. Depending on the patient and the situation, there may be a need for extra screening in the future, such as annual breast magnetic resonance imaging and mammography or follow-up exams at the Center every 6 months. A patient without an inherited risk for breast cancer but with, for example,

atypical hyperplasia shown on a biopsy might receive information about taking tamoxifen, which has been proven to reduce breast cancer incidence in women with an increased risk for the disease. "Our recommendations are very specific and individualized based on a patient's personal risk factors," explained Dr. Bevers.

Cancer risk reduction

Risk reduction focuses on three areas: (1) tobacco cessation, (2) healthy lifestyle (exercise, nutrition counseling), and (3) chemoprevention. With regard to chemoprevention, M. D. Anderson is one of more than 400 centers participating in the Study of Tamoxifen and Raloxifene (STAR) to determine the role of these drugs in breast cancer prevention. It is also participating in the Selenium and Vitamin E Cancer Prevention Trial (SELECT) for prostate cancer. Results from these studies will help determine what steps people can take to reduce their risk of cancer.

Cancer screening

The screening tests offered at the Center include mammographies, breast exams, prostate exams and prostate-specific antigen blood tests, and Pap smears. "In addition to offering the full spectrum of cancer screening, we have research going on in areas where there is no recognized screening as of yet," said Dr. Bevers. For example, researchers at M. D. Anderson are conducting a clinical trial in lung cancer screening, comparing spiral computed tomography to chest x-rays to see if it can detect cancer at an earlier stage, when it is more treatable. Similarly, there are no recognized screening tests available for ovarian cancer, but an ongoing study is evaluating how different blood tests may help identify ovarian cancer at an earlier, more treatable stage.

Dr. Bevers believes that it is advantageous that the Cancer Prevention Center provides a full spectrum of prevention services. "A woman may come in for her breast exam, mammogram, and pelvic exam, whereas at another place, she'd have to go to two separate centers to get the tests. Likewise, if we identify a woman who has an inherited predisposition to *BRCA1*, we're looking at increased susceptibility to both breast and ovarian cancer. Having combined services at the Prevention Center allows us to focus on the whole risk spectrum, and risk-reduction screening allows us to put together the best overall plan for the individual."

The Cancer Prevention Center provides a full spectrum of prevention services.

Diagnostic program

The Cancer Prevention Center also has some diagnostic programs, including an undiagnosed breast clinic for women who have found a lump or had an abnormal mammogram. Diagnostic services are also offered for abnormal uterine bleeding, abnormal Pap smears, and suspicious skin lesions.

If diagnostic tests indicate that the patient does not have cancer, specialists at the Center nevertheless advise him or her on how to reduce the risk of getting it later. Dr. Bevers explained the importance of these diagnostic programs, "We added on the diagnostic piece because it was a natural flow from our screening program."

Multidisciplinary approach

The Cancer Prevention Center has a multidisciplinary approach; its staff meets weekly with other specialists at M. D. Anderson to review patients' findings and histories. For example, if a patient has benign breast lesions, Dr. Bevers and her staff consult with radiologists, pathologists, and clinicians to determine whether the lesions suggest an increased risk of breast cancer or are completely benign.

The goal of the Cancer Prevention Center is to provide specialized cancer prevention and, in some cases, cancer diagnosis. Dr. Bevers said, "For the vast majority of patients, screening is done in primary care settings. It is unique to be able to provide an extension of primary care within a cancer hospital. In fact, all of the faculty in general prevention are family physicians who have focused their careers on cancer prevention. They are prevention specialists." ●

FOR MORE INFORMATION *on the Cancer Prevention Center call 713-745-8040 or 1-800-438-6434, or visit www.mdanderson.org/cancerpreventioncenter.*

New Techniques in
Tumor Ablation

by Sunni N. Hosemann

The idea is an appealing one: What if there were a reliable, nonsurgical way to eradicate cancerous tumors with the precision and immediacy of surgery? What if it were possible, say, to direct a highly targeted heat source at tumor cells from outside the body, causing those cells to vaporize or die? Or to insert a small probe directly into a tumor and destroy the cancer cells by freezing them?

In fact, such minimally invasive ablative techniques do exist; dermatologists use them to remove benign surface lesions, and thanks to refinements in ablative methods and advancements in imaging, ablation has found many uses *below* the surface as well.

Under imaging guidance, abnormal tissues can be eradicated without surgery. For example, ablative procedures may be done percutaneously or laparoscopically. Extracorporeal lithotripsy requires no entry at all but sends ultrasound shock waves from outside the body to destroy abnormal tissues. It is hard to imagine a medical specialty that would not have an interest in some form of nonsurgical ablative technology: cardiologists thread probes into the heart intravenously to eradicate abnormal cardiac cells that can cause cardiac arrhythmias, and gynecologists use ablation to destroy uterine fibroids, sparing some women from undergoing hysterectomies.

In oncology, radiofrequency ablation has become a standard way to treat metastatic tumors in the liver that result from the progression of colorectal and other cancers. Ablation is used as a palliative measure to treat metastatic lesions or some unresectable tumors; inoperable tumors of the liver and lung are among the candidates of interest. But beyond that, most nonsurgical ablative procedures are still investigational in oncology.

John Hazle, Ph.D., a professor and chair of the Department of Imaging Physics, points out some of the distinct advantages of ablation in the treatment of metastatic lesions: "Because the treated area has no 'thermal memory,' ablation can be repeated in the same area, unlike radiation therapy. Also, the results of ablation on metastases are immediate, whereas chemotherapy and radiation take more time to shrink symptom-causing tumors."

Despite the valuable role of ablation in palliation, ablation's usefulness in primary cancer treatment has been limited to date. This is due in large part to the burden of proof required when a cancer is potentially curable with existing therapies. When a breast tumor is surgically removed, a pathologist confirms that all the cancer, plus a margin of healthy tissue, has been removed. With ablation, the tumor is destroyed but left in place—making it hard to verify that all the malignant tissue has been treated.

"A breast cancer, which could potentially be cured by surgery, represents a very different set of considerations than a benign tumor or one that is considered inoperable or incurable," said Eric Strom, M.D., an associate professor in the Department of Radiation Oncology and medical director of M. D. Anderson's Nellie B. Connally Breast Center.

"Nonetheless, we still want to find better ways to do things," said Kelly Hunt, M.D., a professor in the Department of Surgical Oncology. She believes that surgery—at least for some cancers—could eventually be replaced by more refined, less invasive techniques.

In fact, in a recent pilot study of radiofrequency ablation in

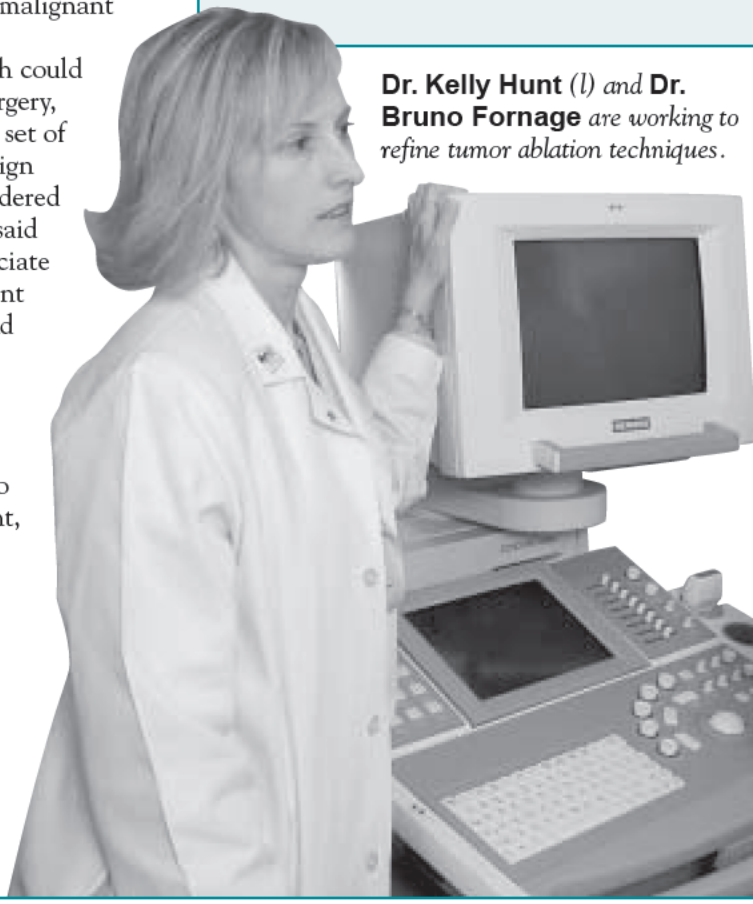
Types of Tumor Ablatio

Nonsurgical "tumor ablation" refers to the tumor by the direct, physical application o heat) or chemical agent.

The most common chemical agents used (alcohol) and acetic acid. Applied directly these agents cause cell death by coagula

Cryoablation, or the use of freezing to des involves placing a cryoprobe, which delive gas, liquid nitrogen, or nitrogen gas at sub tures, in or on the tumor. The freezing cau damage, and the thawing results in infarct A procedure may involve more than one f

Heat also causes irreversible cell death by microvasculature, and necrosis. The most use radiofrequency, microwave, laser, or u frequency ultrasonic hyperthermia and ma are two additional types of heat ablation th



Dr. Kelly Hunt *(l) and* **Dr. Bruno Fornage** *are working to refine tumor ablation techniques.*

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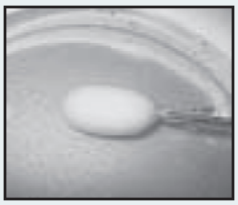
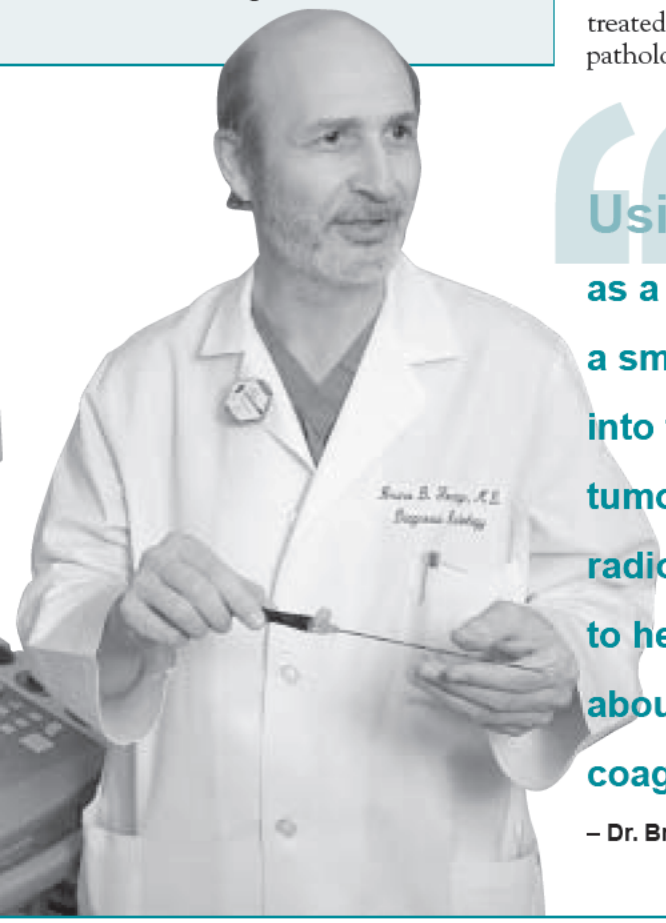


This photo shows the ice ball that develops at the tip of the cryoprobe when the probe is tested in vitro with a transparent gel.



breast cancer, researchers at M. D. Anderson showed ablation to be effective for treating small, confined tumors.

"Using ultrasound as a guide, we inserted a small needle-electrode into the center of a tumor, then used radiofrequency ablation to heat the tumor to about 200°F, basically coagulating it," said Bruno Fornage, M.D., the study's principal investigator and a professor in the Departments of Diagnostic Radiology and Surgical Oncology. The ablation was followed by standard surgical excision (either mastectomy or lumpectomy) and pathologic examination to confirm whether the cancer cells had indeed been ablated. They had.

"But if the method became standard practice, that postablation excision would not take place," said Dr. Fornage. "And that raises the question of how we will verify that the cancer is successfully treated in a clinical setting." Today, pathologic confirmation would require core needle biopsies after the procedure, and these would have to be extensive in order to sample an adequate area. This type of invasive procedure, which is not currently required after surgery, would also provide less definitive results than those obtained by examination of fully excised tissue.

"This study raised very interesting questions about how we evaluate cancer treatment," observed Nour Sneige, M.D., a professor in the Department of Pathology, who led the pathology arm of the study. "Furthermore, it is not known what pathologic examination would show over time."

Because of this, and the possibility of malignant-appearing calcifications left behind after ablation, patients treated by this method may require magnetic resonance imaging (MRI) or positron emission tomography scans instead of conventional mammography.

According to Dr. Strom, "The surveillance required by a treatment is a huge consideration. If it is more intense—perhaps more frequent, more specialized—or if it isn't practical or easy for the patient, then we haven't gained anything either medically or practically."

Another drawback was that the success rates achieved at M. D. Anderson were not reproduced in other centers, which means that the procedure may depend too much on highly specialized skills, particularly in interventional ultrasound, or require additional training for clinicians.

So what's the future for tumor ablation in breast cancer treatment?

"At this point, we can't offer ablation as a treatment for breast tumors, because we can't definitively say it is better than surgery," said Dr. Fornage. With a philosophical smile, he added, "This study was more interesting for the questions it raised than the ones it answered."

Dr. Strom agrees but feels that the study also highlights a need for a new level of technology that can more

(Continued on **page 6***)*

"Using ultrasound as a guide, we inserted a small needle-electrode into the center of a tumor, then used radiofrequency ablation to heat the tumor to about 200°F, basically coagulating it."

– Dr. Bruno Fornage

New Techniques in Tumor Ablation

(*Continued from* **page 5**)

precisely detect tumor cells, a capability that would impact cancer diagnosis and treatment in profound ways.

Forthcoming studies, then, will focus on addressing the questions raised. For instance, later this year, M. D. Anderson will participate in a multicenter, phase II trial of ultrasound-guided cryoablation of breast tumors sponsored by the U.S. National Cancer Institute. Cryoablation, which has been used successfully to treat benign fibroadenomas of the breast and is approved by the U.S. Food and Drug Administration, has potential advantages over radiofrequency ablation for breast tumors. One advantage is that during the procedure, a cryolesion (ice ball) forms that is visible with ultrasonography in real time, giving the operating surgeon and radiologist good visualization and control of the area to be ablated.

Another potential benefit is that cryoablation is not painful because it performs its own local anesthesia (freezing) and can therefore be done in an outpatient setting without a general anesthetic.

... a cryolesion (ice ball) forms that is visible with ultrasonography in real time, giving the operating surgeon and radiologist good visualization and control of the area to be ablated.

"This has been a very beneficial development for treating breast fibroadenomas," said Dr. Hunt, "and because those are tumors that tend to reoccur in young women, the ablative procedure saves them from multiple surgeries."

Women with small stage I invasive breast cancers and no preoperative chemotherapy are candidates for the phase II trial. Surgical removal by mastectomy or lumpectomy and pathologic analysis will follow the ablation. Both MRI and ultrasound imaging will be used before and after the procedure. MRIs will be compared with pathology findings, with a match confirming tumor and margin removal.

"If the MRI findings correlate with the pathologist's findings, we can feel more comfortable in the future using imaging as a basis for determining that a cancer has been removed," said Dr. Hunt. She believes that this will be a step toward more targeted surgery.

Dr. Hunt is excited about what might be learned from this trial. One of the more intriguing of these will be the immune response to cryoablation. "We know there is a local immune reaction, but some studies indicate that a systemic immune response may take place as well," said Dr. Hunt. "We need to clearly define that to see what role it might play in cancer treatment." ●

FOR MORE INFORMATION, *contact Dr. Bruno Fornage at (713) 794-1424, Dr. John Hazle at (713) 792-0612, Dr. Kelly Hunt at (713) 792-7216, Dr. Nour Sneige at (713) 794-5625, or Dr. Eric Strom at (713) 563-2300.*

Imaging Advances Fuel Progress

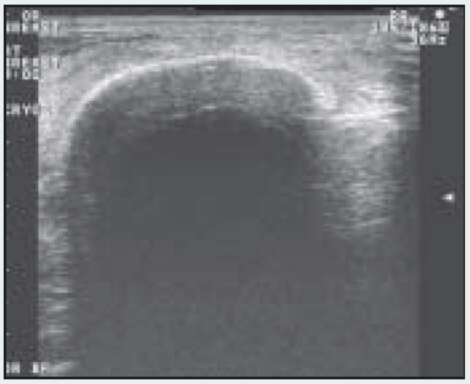
Nonsurgical tumor ablation depends heavily on imaging technologies for both guidance and evaluation. The technologies most commonly used with ablative procedures today are fluoroscopy, magnetic resonance imaging (MRI), computed tomography (CT), and ultrasonography.

Advances in imaging technologies will eventually answer the question, how do we verify that the cancer is no longer there? Dr. Hazle believes that perhaps the most important advance will be in molecular imaging, which targets unique biological receptors.

"Traditionally, evaluation of treatment has been anatomical: Has the tumor gotten smaller? Newer technologies will focus more on physiology, such as changes in tumor metabolism," said Dr. Hazle. To be sure, there are many potential tools, such as combinations of positron emission tomography and CT, that can detect metabolic and anatomical changes in tumors. There are also novel MRI techniques that can differentiate between tumors and treatment-related changes in tissue. Other evolving technologies use light at varying wavelengths to visualize both biochemical and structural features within the tissue.

The ability to peer so specifically into the human body in real time would be a significant advance for the evaluation of treatment response and for diagnosis. For example, these advances could make it possible to one day confirm the presence of a breast cancer and ablate all of it in one outpatient session.

For Dr. Strom, the real significance of improved imaging technology in breast cancer would be the ability to definitively identify women who need extensive treatment, while sparing others (perhaps the majority) from undergoing unnecessary investigative procedures and more treatment than they need. "When we have a way to detect living, functioning cells at the molecular level, we will be able to truly tailor treatment for individuals rather than populations," he said. "Patients would get only the treatment they need, and no more."



This sonogram taken during cryoablation of a fibroadenoma clearly shows the ice ball that has formed around the fibroadenoma.

HOUSE•CALL

Calling for Help: Cancer Helplines and What They Offer

Talking to a friendly, knowledgeable specialist on the phone is a user-friendly way to find out more about cancer. Here are a few of the agencies that sponsor cancer "helplines."

M. D. Anderson Cancer Center

1-800-345-6324
Monday to Friday, 8 a.m. to 5 p.m. (CST)

The Anderson Network, a service of M. D. Anderson, is a nationwide cancer support group with 1,300 trained volunteers speaking 10 to 12 languages. The volunteers—among them cancer patients, survivors, and caregivers—are matched to callers with a similar diagnosis and treatment. Although they cannot provide medical advice, these volunteers offer hope and support to those in similar situations.

For more information, visit www.mdanderson.org/departments/andersonnet/.

American Cancer Society

1-800-ACS-2345
1-866-228-4327 (TTY)
7 days a week, 24 hours a day

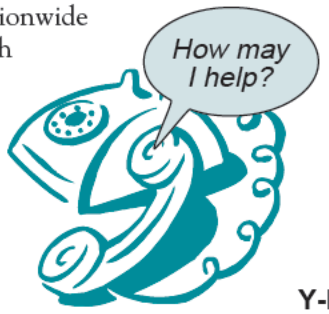
The ACS's National Cancer Information Center specialists answer questions about cancer, provide literature on treatment options, and link callers to support programs, events, and resources in the community. They also provide information on insurance matters, financial and legal issues, transportation, and the Look Good…Feel Better program.

Visit www.cancer.org to send a question, find clinical trials, and locate treatment centers. Communicate with other cancer patients and their family members in English, Spanish, and Chinese at the online Cancer Survivors Network.

National Cancer Institute

1-800-4-CANCER
1-800-332-8615 (TTY)
Monday to Friday, 9 a.m. to 4:30 p.m.

The NCI's free, government-funded Cancer Information Service provides information in English and Spanish on a broad variety of topics, including cancer prevention, risk factors, symptoms, diagnostic tests, treatments, social and emotional concerns, and clinical trials. The cancer information specialists can also direct callers to local treatment centers, mammography facilities, and other cancer organizations.



English-speaking specialists are also available for Internet chat through LiveHelp at www.cancer.gov (Monday to Friday, 9 a.m. to 11 p.m. EST).

Y-ME National Breast Cancer Organization

English, 1-800-221-2141
Spanish, 1-800-986-9505
7 days a week, 24 hours a day

Counselors who have survived breast cancer talk with callers about their feelings and concerns, provide straightforward information about breast cancer and breast health, and match callers with survivors who had a similar diagnosis. Y-ME provides wigs and breast prostheses free of charge to women with limited resources, has a Men's/Partner's Match Program that supports people who are helping someone through breast cancer, and has a ShareRing Network Teleconference with free monthly teleconferences featuring a breast cancer–related presentation by a medical professional. Counselors are available in English and Spanish, and there are interpreters in 150 languages.

Visit www.y-me.org to submit questions, find information on local affiliates, learn about treatment options, and access support programs.

American Institute for Cancer Research

1-800-843-8114
Monday to Friday, 8:30 a.m. to 9:30 p.m. (EST)

Registered dieticians at the AICR's Nutrition Hotline answer questions on cancer and nutrition, such as foods to eat during treatment and nutritional recommendations for cancer prevention. A customer service representative forwards calls to the dieticians, who call back within 48 hours. Callers can also ask for the booklets "Nutrition for the Cancer Patient" and "Nutrition for the Cancer Survivor."

The new online service at www.aicr.org/information/hotline/index.lasso provides answers within 3 days to dietary questions submitted by e-mail.

Cancer*Care*

1-800-813-HOPE
Monday to Thursday, 9 a.m. to 7 p.m.; Friday, 9 a.m. to 5 p.m. (EST)

Calls are answered and referred to an oncology social worker, who contacts callers within a couple of days. Social workers help people cope with the emotional, social, and financial burdens of cancer. They also provide information on financial grants for home care, child care, medication, and transportation. Social workers speak both English and Spanish.

Visit www.cancercare.org to join an online support group, e-mail a social worker, sign up for the Cancer*Care* e-newsletter, and learn about educational programs. ●

For more information, contact your physician or contact the M. D. Anderson Information Line:

(800) 392-1611, Option 3, *within the United States, or*

(713) 792-3245 *in Houston and outside the United States.*

July/August 2005

P. Lo, M. Morrison

OncoLog

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Sampling of Recent Prevention Publications of M. D. Anderson Faculty

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