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University of Tennessee Graduate School of Medicine

2005

Frontiers (4th Quarter 2005) - Working Together: Multidisciplinary Approach; Cancer Research; Becoming a Doctor

University of Tennessee Medical Center

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FRON'TIERS

FEATURES:

Working Together: Multidisciplinary Approach

> Cancer Research Becoming a Doctor

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Frontiers

The University of Tennessee Medical Center and the University of Tennessee Graduate School of Medicine Frontiers

4th Quarter 2005

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THE UNIVERSITY of TENNESSEE



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November 2005

Dear Friends:

The term "frontier" has many definitions, among them is this entry in Webster's New Collegiate Dictionary: "The farthermost limits of knowledge or achievement in a particular subject."

Whichever meaning is used, it describes a place on the leading edge of exploration and capability, populated by pioneers, leaders and visionaries. I believe that applies directly to the goals and achievements of the University of Tennessee Medical Center. This is why we have adopted the phrase "Expanding the Frontiers of Medicine" and named this publication *Frontiers*.

In this issue, we will be exploring one of the most critical frontiers in all of medicine: cancer. As a disease, cancer presents many challenges in patient care, education, and research. Some cancers, too, are especially prevalent in our region and are thus of particular concern to East Tennessee patients, physicians, and communities. The Medical Center commits a tremendous amount of our resources to the detection and treatment of this important disease.

In fact, this entire issue is focused on some of the people and programs at the University of Tennessee Medical Center Cancer Institute, who search the frontiers of medicine every day, seeking ways to fight the disease that touches the lives of so many of our friends and neighbors.

I hope you find the information here both interesting and informative.

Sincerely,

Joseph R. Landsman, Jr. President & CEO University Health System, Inc.



Dear Alumni and Friends:

Frontiers is an excellent way to keep in touch with the Graduate School of Medicine and its role with the University of Tennessee Medical Center. As we share our stories about medical education, research endeavors, and of course advances in patient care, you will understand why we are a highly regarded graduate regional medical center.

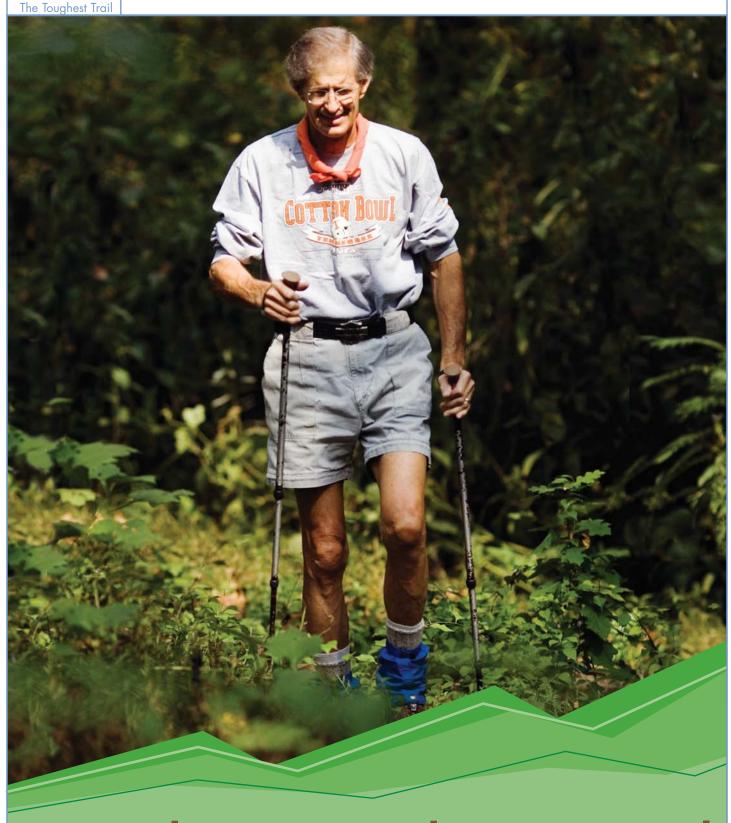
What we do each day impacts the well-being of Tennesseans, whether it be through the training of excellent physicians—two-thirds of whom remain in Tennessee after completing residencies—or our cutting-edge research leading to new medical opportunities.

This edition highlights the world of the medical student and shows how our cancer imaging research efforts are being applied to patient care. We invite you to read *Frontiers* every quarter and welcome your comments and suggestions for future articles.

Share *Frontiers* with a friend or colleague, and if they would like to be on our mailing list, we would be honored to include them in our group of alumni and friends.

Sincerely,

James J. Neutens, Ph.D. Interim Dean UT Graduate School of Medicine



The Toughest Trail

One Man's Drive to Conquer Pancreatic Cancer

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Tom Cronan is interviewed by Robin Roberts on ABC's Good Morning America



Tom Cronan is a happy man. To him, "down" is only the decline of a hiking trail. Yet he faces a sobering disease that, as he says, "respects no one."

In March 2004, Tom Cronan, a exercise physiologist who's now 63, was training for a master's decathlon and readying himself for a second career. Then a professor at Carson-Newman College in Jefferson City, Tennessee, he intended to spend the next part of his life promoting wellness programs to underserved adults. Several weeks after telling Carson-Newman of his retirement plans, he caught a stomach virus, and when the other symptoms had faded, a pain remained in his stomach. "I'd never had pain like this—a sharp pain in the middle of my gut," says Cronan. The following week he got a diagnosis from the Cancer Institute at UT Medical Center: pancreatic cancer.

Pancreatic cancer plays dirty. Initially it hides, and no screening test as of today can detect it early. If it blocks the bile duct, the skin may become jaundiced—a symptom Cronan's wife, Joan, noticed—and the urine may darken, a sign he noted. Stool might turn chalky, a backache might develop, or vomiting might occur after each meal.

The location of the pancreas, buried behind the stomach, makes it a tough target for surgery. Cronan's tumor sat in the head of his pancreas—the most common place, although doctors don't know why. "There may be molecular differences between the tissue there and elsewhere in the pancreas," says John L. Bell, MD, director of the Cancer Institute and professor of surgery. If the cancer has grown into the portal vein (which runs through the pancreas and drains blood from the intestines) or has spread to other organs, the treatment options are radiation and chemotherapy. Cronan was fortunate: his tumor had not visibly spread or invaded the portal vein.

The surgery involved a procedure called a Whipple. Bell and Paul S. Dudrick, MD, associate professor of surgery, removed half of Cronan's pancreas, his gall bladder, a portion of his stomach, and a six-inch stretch of the small intestine. After removing the tumor, the surgeons connected the pancreas, bile duct, and stomach. Cronan now takes enzymes to supplement those his pancreas cannot supply, although enough of the organ remains to supply him with insulin and other digestive enzymes.

He faced the difficult climb with dogged but upbeat practicality—the same attitude he'd applied while hiking the Appalachian Trail from Georgia to Maine. When a fever forced him back into the hospital shortly after surgery, he walked the halls four times a day, a quartermile at a time. "I told the nurses, 'I can't stay in bed,'" he says. And when Bell suggested he join the community advisory committee at the Cancer Institute, Cronan was delighted: "It's UT's effort to get patients' perspectives, and that kind of activity is critical for accelerated health care."

A month after surgery, Cronan started six weeks of radiation, combined with chemotherapy. "Pancreatic cancer tends to come back locally if you approach it only with surgery," says Robert J. Bertoli, MD, clinical associate professor of radiation oncology. "So we routinely use radiation and chemotherapy. But Tom's advantage was having surgeons experienced with pancreatic cancer. The Whipple surgery procedure is one of the most extensive in oncology."

When Cronan finished his treatments in June 2004, he asked medical oncologist and associate professor of medicine Stephen S. Miller, MD, if there was anything more he could or should do. Several options for chemotherapy remained. Cronan's response: Bring it on. He endured another round of chemotherapy for six more months. In February 2005, after a CT scan of his pancreas showed no signs of cancer, Bell cleared him to do anything he wanted.

Cronan definitely had something in mind. During treatments, he had begun attending weekly meetings at the Knoxville chapter of the Wellness Community, a worldwide nonprofit organization that provides support, education, and hope to those with cancer. "At the meetings you leave your cancer at the door," Cronan says. "You go in, and for two hours you can cuss and cry, lean and learn. Anything goes. You see the trauma that each person is living. You indeed can relate."

His experience with the Wellness Community allowed a dormant ambition to percolate: for years he had wanted to bicycle across America. He wasted no time in planning the trip. When his doctor suggested that his knees might not hold up, Cronan opted for a motorcycle journey to each of the 24 Wellness Communities in the U.S. In 42 days he rode 7,300 miles—with an appearance on ABC-TV's Good Morning America thrown in—promoting the centers and cancer awareness. "What I hope to do is make a difference for myself and for others," he says. "I want to help eliminate the guesswork of cancer."

He also wants to help ease the hopelessness many cancer patients feel. "No one at the Cancer Institute ever shared the stage of my cancer with me," he says. "It may be a valuable part of the medical record, but unless it's of value to the patient, it only removes hope. The timetable is God's shot to call."

It's that optimistic attitude, says Miller, that makes Cronan one of the most admirable patients he's ever seen. "And he does what we ask all our patients to do: keep fit and active." Cronan rides a stationary bike for 25 minutes most evenings, and plans to build back shrunken muscle—he lost 30 pounds following surgery—with strength training. He's scheduled to hike Mount Le Conte in October and is contemplating a return to the Appalachian Trail next spring. Every month or two he sees Miller for blood work and a periodic CT scan. If he remains cancer-free for five years after surgery, Miller will consider him cured. "I pretty much work around his schedule," the doctor says. "He's a busy man."

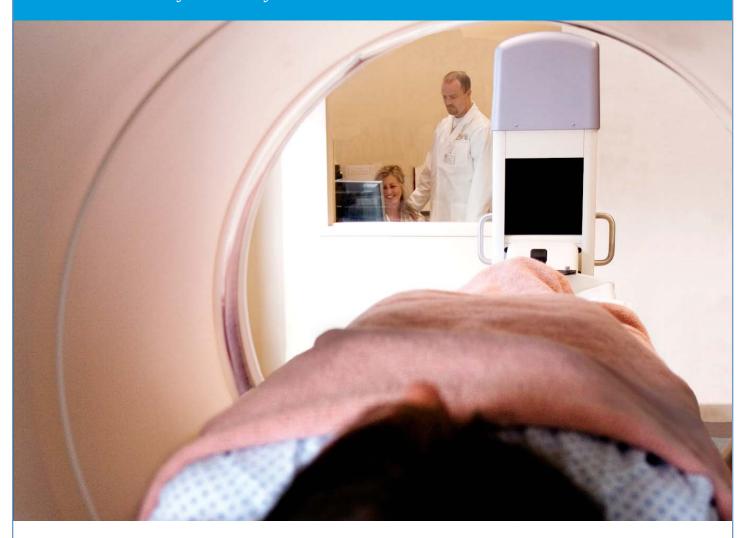
Dorothy Foltz-Gray



"What I hope to do is make a difference for myself and for others," Cronan says. "I want to help eliminate the guesswork of cancer."

Tom and Joan Cronan

FROM RESEARCH TO APPLICATION: The Clinical Use of PET/CT for Patients with Oral/Head and Neck Cancer



Early detection of malignant disease still offers the best chance of a

FAVORABLE PROGNOSIS. Functional, or molecular, imaging potentially offers an earlier detection of cancer than with anatomical imaging such as Computed Tomography (CT) or Magnetic Resonance Imaging (MRI). Molecular imaging with Positron Emission Tomography (PET) and a glucose biomarker 18Ffluoro-deoxyglucose (FDG) has become increasingly widely used to diagnose and stage malignant disease. The ability of PET to accurately stage malignant disease depends on the tumor size, the physical specifications of the PET scanner, and the avidity of the cancer cells to take up FDG. Recently, fusion devices that image both anatomy (CT) and function (PET) have been developed, offering the best of both worlds: functional abnormalities can be accurately localized and the functional status of anatomical abnormalities can be immediately assessed.

Combined PET/CT scanners have been commercially available only for the past four years. During this period, multi-slice CT detectors have been introduced and PET/CT scanners now incorporate up to 64-slice CT. The PET components comprise fast LSO detectors with an intrinsic spatial resolution around 4 mm. The first 16-slice spiral CT scanner in combination with the new fast, high-resolution PET detectors, developed by CPS Innovations, Knoxville (now Siemens Medical Solutions Molecular Imaging) was installed at UT Medical Center in October 2003. Since that date, over 2000 cancer patients have been successfully scanned on the PET/CT at the Medical Center.

One region of the body where full advantage can be taken of the high spatial resolution of the new PET/CT scanner is in the head and neck. The ability to resolve small structures, both normal and abnormal, is essential for accurate staging of oral/head and neck cancer.

PET/CT to Stage Oral/Head and Neck Cancer

The American Cancer Society estimates that approximately 29,370 patients will be diagnosed with cancer of the oral cavity and oropharynx during 2005. Treatment failures of oral/head and neck cancer seem to be related to the development of recurrent disease in the head and neck region, new primary cancers in this area, and distant metastatic disease. To this end, the ability to more effectively identify subclinical disease in a timely fashion should enhance the survival rates of these patients. In essence, early detection could be lifesaving.

The evaluation of patients with oral/head and neck cancer frequently involves first obtaining conventional CT scans. These studies allow for better preoperative visualization of lymph nodes in the neck and other structures planned for removal during surgery. In so doing, CT scans provide an anatomic evaluation of structures in a given region, rather than a physiologic evaluation. CT scans are not able to ascertain the exact character of mildly enlarged lymph nodes in the neck in oral/head and neck cancer patients, as often occurs after a biopsy of the primary cancer. With this problem in mind, our experience with PET/CT has proved to be beneficial in the management of these patients. In the oral/head and neck oncology patient, PET/CT has frequently been shown to be more accurate than conventional CT in depicting unexpected foci of neck metastases that were not seen or difficult to observe on conventional CT scans, or whose character was uncertain. In addition, abnormal incidental foci of hypermetabolism may be identified that may or may not be related to the neoplasm for which the patient is being scanned. In practical terms, we have identified three specific advantages of obtaining PET/CT in the initial evaluation of patients with oral/head and neck cancer:

- 1. Assessment of subclinical disease in the lymph nodes in the neck that might alter the neck surgery treatment plan
- 2. Early assessment of synchronous second primary cancers
- 3. Assessment of distant metastatic disease that might require refinement of treatment recommendations

These advantages will be illustrated with three specific oral/head and neck cases where PET/CT scanning played an important role.

Eric R. Carlson, DMD, MD, FACS and David W. Townsend, PhD

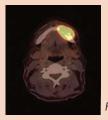


Dr. Townsend (left) and Dr. Carlson review the PET/CT images of a patient with cancer of the neck.

4th Quarter 2005

Case Study 1

A 69-year old gentleman was referred for treatment of a biopsy proven cancer of the left lower jaw (figure 1). A complete history and physical examination identified stage IV squamous cell carcinoma of this area, without clinical evidence of spread of the cancer to the lymph nodes in the neck. The patient underwent a staging PET/CT scan that identified hypermetabolic activity in the known site of cancer in the left mandible (figure 2a-c), as well as a mass associated with the left kidney (figure 3). Surgery consisted of removal of the left mandible and upper lymph nodes in the neck, as well as exploration and partial removal of the left kidney. The kidney demonstrated renal cell carcinoma. The PET/CT study permitted early diagnosis of the second cancer in the kidney. This diagnosis would not have been made had the patient undergone conventional CT imaging only of the head and neck region in preparation for the removal of the cancer in this area.





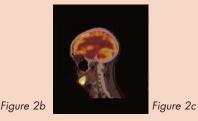


Figure 2a-c: PET/CT fused images identify the known cancer in the left lower jaw.

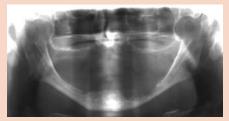


Figure 1: A radiograph of the jaws of this patient showing destruction of bone in the lower jaw.



Figure 3: Additional images showed a hypermetabolic focus associated with the left kidney, suggestive of a second cancer in this area.

Case Study 2

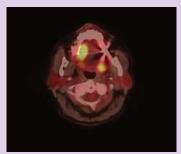


Figure 4a

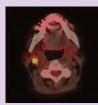


Figure 4b



Figure 4c

An 82-year old woman was referred for evaluation and management of a cancer of the right tongue. A complete history and physical examination revealed a 3 cm cancer of the tongue without clinical evidence of neck disease. The patient underwent a staging PET/CT that identified hypermetabolic activity within the tongue (figure 4a) the lymph nodes of the neck (figure 4b) as well as a focus of hypermetabolic activity within the right thyroid gland (figure 4c). The patient underwent surgery consisting of removal of the right tongue, the lymph nodes of the right neck and exploration and removal of the right half of the thyroid gland. The pathologic examination of the specimens disclosed the expected cancer in the right tongue, as well as two lymph nodes containing cancer in the neck dissection specimen. The pathologic examination of the thyroid gland revealed a second primary cancer. The value of the PET/CT study in this case is that the cancer of the right thyroid gland would otherwise have not been diagnosed in a timely fashion had only isolated conventional CT scans been performed.

Figure 4: PET/CT fused images identify the known cancer in the right tongue (*figure 4a*), as well as a hypermetabolic lymph node in the right neck (*figure 4b*) that was not able to be palpated on clinical examination of the neck. Additional images disclosed a hypermetabolic focus within the right thyroid gland (*figure 4c*), highly suggestive of a second cancer in this area.

Case Study 3



Figure 5: PET/CT fused images showed several hypermetabolic lymph nodes in the left neck.



Figure 6b: The additional PET/CT images also identified hypermetabolic foci in the thoracic spine.

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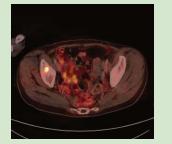


Figure 6a: Additional PET/CT images identified hypermetabolic foci in the right hip.



An 80-year woman was referred for evaluation and management of a biopsy proven cancer of the left jaw and surrounding soft tissues. Her main complaint at the time of evaluation was severe pain. Complete clinical evaluation was significant for stage IV squamous cell carcinoma of this area without spread of the cancer to the lymph nodes in the neck. The patient underwent a staging PET/CT that identified increased metabolic activity in the left jaw as well as a large number of hypermetabolic lymph nodes in the left neck (figure 5). Moreover, multiple foci of distant hypermetabolic activity were noted in the bilateral lungs, thoracic spine, and ilium (figure 6a-c). The distant metastatic disease would not have been identified had an isolated CT scan of the neck been routinely performed. As such, the PET/CT scan provided essential information to share with the patient and to plan appropriate treatment for a patient previously not known to have a very poor prognosis.

Figure 6c: A whole body PET image shows these disseminated metastatic foci in one image.

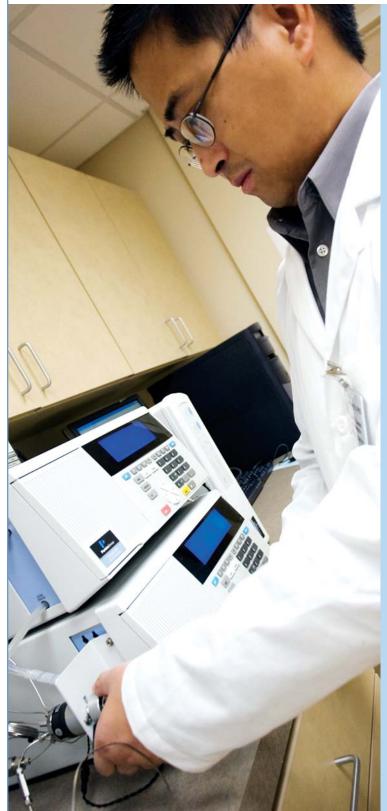
The Seven Warning Signs of Cancer

If you or a loved one notice any of the following seven warning signs of cancer, report them to your doctor immediately!

- Change in bowel or bladder habits
- A sore that does not heal
- Unusual bleeding or discharge
- Thickening or lump in breast or other part of body
- Indigestion or difficulty in swallowing
- Obvious change in wart or mole
 - Nagging cough or hoarseness

Every type of cancer has its own unique characteristics - such as its location, type, growth and how quickly it spreads to other tissues and organs. That's why an early diagnosis of cancer allows your doctor time to treat the cancer for your individual case and to develop the best treatment plan for you. It is important to know and recognize the early symptoms and signs of cancer.

Cancer Imaging and Tracer Development Research Program



Meixiang Yu, PhD, at work in the lab.

THE CANCER IMAGING AND TRACER Development Research Program (CITDRP) was established at the University of Tennessee Medical Center in Knoxville, Tennessee in February 2003 under the direction of David Townsend, PhD. Complementing Positron Emission Tomography (PET) initiatives at UT Medical Center since the early nineties and benefiting from the support of nearby CTI Molecular Imaging, the recognized world leader in PET technology and innovation based in Knoxville, the mission of the CITDRP is to create a world-class center for translational research using molecular imaging. The establishment of the CITDRP at the University of Tennessee was the inspiration of Ron Nutt, PhD, formerly President and CEO of CTI Molecular Imaging in Knoxville. This program involves the development of new molecular biomarkers, evaluation of such biomarkers in appropriate animal models, and their subsequent introduction into the clinical arena for patient imaging. The CITDRP is based within the UT Graduate School of Medicine with faculty members holding appointments in the Departments of Medicine and Radiology.

The program is organized into three principal components: Physics and Methodology, Radiopharmaceutical Development, and Applications for both animals and humans. The Physics and Methodology component is directed by Dr. Townsend in association with Bjoern Jakoby, MS who is responsible for a number of PET instrumentation and methodology projects.

Meixiang Yu, PhD was recently recruited from Harvard University to lead the radiotracer and biomarker development program with the participation of organic chemist Fang Gao, PhD. This recently-established PET radiochemistry program shares the operation of a cyclotron with PETNET radiopharmaceutical production and a research hot cell with Department of Radiology faculty.

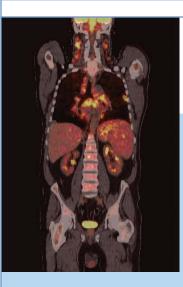


Figure 1: A 31 year-old male with lymphoma staged on the Sensation 16 PET/CT scanner in the UT Cancer Institute prior to commencing chemotherapy. The PET/CT scan reveals the extent of malignant disease.

Claude Nahmias, PhD recently joined the program to head both the animal and human research applications component with the close participation of Karl Hubner, MD. The new, \$600,000 animal imaging

facility will be managed by Xukui Wang, MD, also recruited recently from Harvard. The facility has four scanning suites with PET and SPECT/CT imaging capability, animal holding rooms and laboratory workspace. Veterinary technologist James Avenell, BVSc LVMT directs the operation of these imaging devices. The animal imaging program involves close collaboration with the UT College of Veterinary Medicine and with the amyloid imaging program of Alan Solomon, MD and Jon Wall, PhD, who will also be responsible for operation of the animal imaging equipment, in particular the SPECT/CT. Establishing a strong animal imaging initiative for translational research is an essential part of the CITDRP mission. Collaboration with radiologist Greg Daniel, DVM and oncologist Amy LeBlanc, DVM from the UT College of Veterinary Medicine plays an instrumental role in meeting this goal by bridging the gap in translational research between micro imaging of small animal models and the imaging of clinical patients and can only be undertaken in an academic environment that includes a high-level veterinary college such as the one at UT.

In addition to these animal imaging facilities, a state-ofthe-art high resolution 16-slice PET/CT scanner has been installed in the Cancer Institute at the Medical Center. The scanner is used for both routine clinical and clinical research studies. Operational aspects of the PET/CT research program are the responsibility of technologist Misty Long, RT(N)(R) and Chris Carr, RT(R), CNMT as the lead technologist responsible for operation of the scanner for clinical PET/CT studies. All administrative aspects are managed by Linda

Xukui Wang, MD, explains how the animal imaging PET operates.

Paschal, BS. The primary focus of the CITDRP is the imaging of cancer (Figure 1), with a current workload of 5-7 clinical PET/CT scans per day and 1-2 research studies. However, the importance of PET imaging in other areas of clinical research is demonstrated by ongoing projects in both cardiology with the collaboration of Woody Besozzi, MD, and in neuroscience with John Dougherty, MD, Kent Hutson, MD and Yongxia Zhou, PhD. Current research projects in cancer imaging include monitoring response to chemotherapy with medical oncologist Wahid Hanna, MD, and staging head and neck cancer prior to surgery in collaboration with surgeon Eric Carlson, DMD, MD, FACS (see article in this issue). Radiation oncologist Khanh Nguyen, MD has recently joined the University of Tennessee in Knoxville to focus on both his clinical practice and on research with image-guided radiation therapy planning. In early 2006, the CITDRP will acquire a second, state-of-the-art PET/CT scanner as part of an NIH-funded collaborative initiative with Siemens Molecular Imaging. The new scanner will be an advanced design offering improved sensitivity for PET imaging.

After more than two years at UT, the Cancer Imaging and Tracer Development Program is now wellestablished and is expanding to contribute to other areas of research in which PET and PET/CT can play a significant role, and also offer potential for peerreviewed NIH funding.

David Townsend, PhD



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Preston Medical Library Consumer Health Information Service

Answers with a Personal Touch



You've just learned that you have diabetes. What now?

Your physician recommends a medical procedure. How is it done and what information will it provide?

You're not comfortable looking up medical information on the Internet. Where can you turn?

If you find yourself faced with similar questions, the Preston Medical Library at the University of Tennessee Graduate School of Medicine may have the answers you need.

At the Preston Medical Library and Learning Resource Center, both patients and community members can make use of the Consumer and Patient Health Information Service, a free information resource as close as your telephone or computer. If you have health-related questions, call the service at 865-544-9525 or e-mail your questions to library@mc.utmck.edu. A medical librarian will search for answers on any health topic, and the new knowledge will help you feel more confident as you and your doctor talk and make decisions about your health.

"That's a true benefit of the service," says Sandy Oelschlegel, the library's director. "Consumers can gather information about health concerns and have more productive relationships with their physicians." But the information is just that, she adds—information, not medical advice.



The Preston Medical Library Consumer and Patient Health Information Service at the UT Graduate School of Medicine is funded in part by charitable gifts from grateful patients and members of the community. One couple with good reason to feel gratitude is the Fordhams. For 20 years, the library has provided Joellen and J. Lynn Fordham with critical health information.

"I owe my life to the library staff," says J. Lynn Fordham. "During four medical crises, I received information and help from the library. In each case, the input provided a sound basis for my decision on treatment that was lifesaving. The library staff did more than supply helpful medical literature. They taught my good wife how to find and survey health information."

The Fordhams have shown their appreciation for the library and its staff in many ways, including a charitable gift to fund the transformation of the library conference room into an integrated multimedia learning center.

"We are indebted to the library, the hospital, and the Graduate School of Medicine," Mr. Fordham says. "They understand human suffering. And they're ready to help before the need arises."

Amanda Johnson

Contact Preston Medical Library Consumer and Patient Health Information Service

Hours of Operation: Monday - Friday, 9:00 am - 5:00 pm

Phone: 865-544-9525

E-mail: library@mc.utmck.edu

Website: www.tennessee.edu/healthinfo



J. Lynn and Joellen Fordham

Collective WISDOM

CATHLEEN HUDSON HD



Weekly Input From Multiple Disciplines Improves Cancer Care.

IN 1978, a group of doctors in the radiation and medical oncology divisions at the University of Tennessee Medical Center began meeting every Wednesday to discuss cases. "Four or five of us met in a little hole and reviewed xrays with radiologists, and that was it," says Wahid T. Hanna, MD, professor of medicine and chief of the Hematology/Oncology Division. "Then we expanded to involve pathologists. We began to say to other doctors, 'By the way, we're presenting your case. Would you like to be there?""

Twenty-seven years later, the Medical Center's Cancer Institute holds a number of multidisciplinary meetings, formally called multidisciplinary tumor conferences, every week. It was the first medical facility in the region to hold these dedicated conferences. The meetings include a general conference on Wednesdays at which attendees discuss any type of malignancy, a lung and esophageal conference on Thursdays, a breast conference on Fridays, and a head and neck conference held twice monthly.

"The main purpose of the conferences is to bring together a group of doctors who focus their efforts on treating cancer patients," says John L. Bell, MD, director of the Cancer Institute and professor of surgery. "You can't always open a textbook and implement a cancer plan. It benefits the patient to have specialists look at the case and develop an individualized tailored plan: the surgeons, the radiologists, the pathologists, the radiation oncologists and medical oncologists. The patient gets optimum care through the collective wisdom of a multidisciplinary team involving numerous physicians and healthcare professionals."

UT Medical Center Tumor Conferences

Breast *Friday*

Pulmonary

Thursday

General

Wednesday

Head & Neck Every other Monday

The meetings, often attended by more than 40 people, may also include a patient's primary doctor, as well as geneticists, social workers, nutritionists, nurses, chaplains, clinical-trials staff, residents, and medical students. Bell notes, "There's a whole spectrum of people at these meetings that represent the medical and patient communities." Multiple scientific studies, he says, indicate that the multidisciplinary approach improves patient outcomes. For example, according to a nine-year melanoma survival study completed in 2002 at the Cancer Institute, five-year survival rates at UT Medical Center were 10 percent higher than the national average.

When a physician wishes to present a case, he or she works with a conference coordinator who ensures that all necessary materials—slides, scans, X-rays are available at the meeting. After

"The patient gets optimum care through collective wisdom of a multidisciplinary team involving numerous physicians and health care professionals."

the doctor lays out the case, everyone participates in the discussion. "Sometimes there is a controversy about the management, and different views, even arguments," says Hanna. "But eventually we end up with a plan that's usually the right one—because, after all, a patient is in our hands and we want to do what's best for them."

The meetings also offer an opportunity to learn about new research findings and treatment options. "It's very refreshing to discuss cases and exchange ideas," Hanna says. "And you keep up-to-date, because you discuss the latest published information. Each week is like an update for all of us of where we stand in state-of-the-art cancer care."



18 Frontiers

Robert J. Bertoli, MD, clinical associate professor of radiation oncology, has particular praise for the breast conferences. Every kind of case is presented, from the routine to the most complex. Bertoli says: "Those conferences are the best I've ever been to. They're a combination of a very academic and workoriented conference. And the surgeons have been the driving force for that."

The economy of the multidisciplinary approach is impressive too, says Bertoli, who trained at Hahnemann Hospital in Philadelphia, Pennsylvania and has been at the Medical Center since 1994. At Hahnemann, he had to trek from doctor to doctor to confer about cases of breast cancer, because the hospital didn't have breast conferences at the time. "You got the work done," he says, "but it wasn't as efficient. If you have everyone involved in one room, then you learn what people need to know, what's important to each specialty. And that really streamlines care." In fact, data show that the majority of patients at the Cancer Institute receive a care plan within five working days. And most of the time, they know that many specialists have reviewed their case.

For Bertoli, the conferences also enhance communication between specialties. "Sometimes just the inflections in someone's voice are important," he says. "A radiologist may look at an X-ray and say, 'The calcifications are probably benign, but we ought to follow up.' To have them say that in the conference gives you a sense that you really need to take a look, so you do an extra-careful follow-up. That's different from just reading a report."

Hanna agrees. "Let's say there's a patient with a liver lesion. It's nice to hear from the surgeon if it can be removed surgically. If it can't, can the interventional radiologist do a radio-frequency ablation [a procedure that kills tissue with heat generated by electrical energy]? Or can it be treated with chemoembolization [a procedure in which chemotherapy drugs are fed through a catheter directly into the tumor's blood supply]? All these things are discussed as options, and every specialty speaks, and so in the end we come up with the best approach for the patient—hopefully giving the patient the best chance for cure, which is what we strive for." Dorothy Foltz-Grav



A Message from Dr. John L. Bell

Cancer care in the United States continues to improve as evidenced by the ever increasing number of survivors. Advances in cancer diagnostic technologies, treatment modalities and new methodologies for prevention and early detection of cancer have

been realized through years of research. Basic laboratory research at the cellular and subcellular level continues the search for keys to unlock the "cancer questions." These basic research findings are constantly translated to the bedside resulting in improved cancer care. Much progress has been made, but much additional work lies ahead to win the battle against cancer.

This is where you come in! Funding is needed to continue our search for answers. Few industries run on margins as narrow as healthcare. Translated into reality, this means fewer discretionary dollars are left in health care to fund critical research projects. It is only through philanthropy that such dollars will be available to expand current research efforts.

The Cancer Institute has several established gift funds to support education, research, and clinical care initiatives (see page 29). Additional gifts are needed to continue our research efforts toward finding a cure. Donors may give to one of our existing funds or may consider establishing special purpose funds in honor of or memory of loved ones or friends. For more information about how you can make a difference, please contact the UT Medical Center Development Office at 865-544-6611.

Your serious consideration of our needs is greatly appreciated.



MEDICAL SCHOOL The First Big Step to Becoming a Doctor

AFTER EARNING THEIR UNDERGRADUATE DEGREES, students accepted to the University of Tennessee Health Science Center College of Medicine do their first two years of study in Memphis. The medical students complete necessary coursework and participate in the Longitudinal Community Program, which provides early longitudinal exposure to the realworld aspects of medicine. During these initial two years, the program emphasizes continuity of care, interpersonal skills, and physician roles and relationships, as well as clinical decision-making.

The third and fourth years of medical school are dedicated mostly to clinical rotations, called clerkships in the third year. While some rotations are offered only in Memphis, most can also be completed in Knoxville or Chattanooga, a factor that makes the program truly statewide. All clinical rotations are conducted under the watchful eyes of attending physicians, or faculty physicians who supervise the students' work.

Medical students are required to take three board examinations. Successful completion of all four years of medical school and satisfactory scores on the board exams earn students the doctor of medicine degree. The newly minted physicians must then complete residency programs in their selected specialties—for instance, internal medicine, family medicine, surgery, anesthesiology, or obstetrics/gynecology. These residencies are collectively known as graduate medical education, and every year, doctors choose the UTGSM in Knoxville for their residency training.

The UT Graduate School of Medicine's program emphasizes a team approach to patient care. Close collegial relationships among attending physicians, residents, and medical students allow licensed residents to work with the faculty physicians, nurses, and other medical professionals in determining treatment strategies. The team reviews each patient's case and decides on the most effective plan of care.

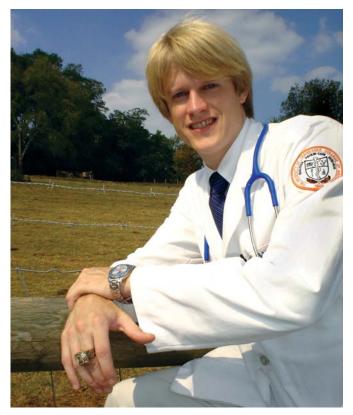
"Patients at UT Medical Center get the best of both worlds," says Eli Jones, a fourth-year medical student. "The medical team approach combines the knowledge of the faculty and attending physician with that of the residents and students. The patient benefits from the wisdom of the attending physician and the detailoriented considerations of the residents and students."

IN THE NEXT ISSUE, FOCUS ON RESIDENCY.

Athlete to Physician The Story of Eli Jones

Raised on a farm in Columbia, Tennessee, Eli Jones learned hard lessons at an early age. By the time he turned 10, he knew the rigors of keeping a working farm productive. He had also discovered how it felt to lose his mother, a vibrant, athletic school teacher who died four months after learning that her flulike symptoms were signs of aggressive leukemia.

Jones, a versatile athlete, was a member of the basketball, football, baseball, and track teams, and he was valedictorian of his 1997 Salem High School class. He received numerous scholarship offers from universities and colleges all over the country. But tradition ruled his heart. His parents had graduated from UT, and he was determined to follow in their footsteps. After a satisfying



"I have always wanted to use my hands to help people, and I have always tried to show people compassion. As an anesthesiologist, I can do both."

Eli Jones

look at the biochemistry department and encouragement from football coach Phillip Fulmer, he became a full-fledged Volunteer.

"I was a red-shirt freshman that first year, which meant I didn't dress out for the games—but I practiced every practice," says Jones, smacking his fist into his hand. "I was on the squad that played against the first string. Boy, did I take some hits!"

By the end of the 2001 season, he'd earned a letter, received his second Academic All-SEC honor, and graduated magna cum laude in cellular and molecular biology. Then he embarked on what he calls "the hardest job of my life." He entered medical school at the University of Tennessee, Memphis.

"The studying was relentless," he says. "I went to class from eight in the morning to four in the afternoon, then studied until eleven at night. Finally reality set in. I had always been at the top of my class. At med school, I was struggling just to be in the middle. A lot of brilliant people go to medical school. They're the best of the best."

Jones, now a fourth-year medical student, did his thirdyear clerkships in pediatrics, neurology, and psychiatry in Memphis. After that he moved to Knoxville to tackle rotations in internal medicine, obstetrics and gynecology, surgery, and family practice at the UT Graduate School of Medicine. He's also completing electives and weighing the question of which medical specialty to choose. "I'm very interested in anesthesiology," he says. "I've always wanted to use my hands to help people, and I've always tried to show people compassion. As an anesthesiologist, I can do both."

Jones leans forward, extending his open palms. "To be able to use my knowledge and hands to heal others is the ultimate job on the planet."

Lea Anne Law

In Search of Cures



Clinical Trials Push Toward New Treatments

APPROXIMATELY 400 MEDICINES FOR CANCERS are in development worldwide—and the Cancer Institute at the University of Tennessee Medical Center is helping to push that process forward. At any one time, the Institute is involved in 35 to 45 clinical trials—research studies that determine the safety and effectiveness of new therapies. Most trials are funded through the National Cancer Institute (NCI) or sponsored by pharmaceutical companies.

A clinical trial begins with a NCI-approved protocol, or trial plan created by a sponsor and offered to clinical research institutions like the Cancer Institute at UT Medical Center. A five-person clinical trials staff keeps doctors informed about trial options. The Cancer Institute's Scientific Peer Review Committee evaluates each study and decides whether or not to participate in it. Then the protocol is submitted to the UT Graduate School of Medicine Institutional Review Board for approval of the study. The Review Board oversees every trial and oversees participant safety. The dedicated oncology trials staff coordinates trial conduct, including the screening and enrollment of research participants as well as follow-up and data collection.

The trials range in focus from prevention to treatment, from patients with advanced cancer to those who are at high risk or who have just been diagnosed. "Not only do clinical trials provide Cancer Institute patients with the newest treatments, they also allow physicians to contribute to improvements in medicine," says Renee Hawk, MPH, administrative director of the Cancer Institute.

Some trials are particularly innovative, like one investigating a personalized vaccine for kidney cancer. Following surgery, a tumor tissue sample from the patient is sent to a specialty lab, where scientists create a unique vaccine within weeks. A therapy for colon cancer involves Avastin (generic name: beviacizumab), one of a new class of drugs called monoclonal antibodies that attack the blood vessels surrounding a tumor, cutting off



its blood supply. A third trial for non-small-cell lung cancer uses Tarceva (erlotinib), a drug that targets a protein necessary to cancer cell growth.

"These trials lead to scientific advances that increase our understanding of cancer," says Barbara Munsey, clinical trials manager at UT Medical Center. "And every doctor at the Cancer Institute is involved. It's part of our mission."

For more information on our clinical trials, please call 865-544-9773.

Dorothy Foltz-Gray

Three Phases of Clinical Trials



Efficacy Trials The focus is learning if the new treatment is effective. Does this treatment cause a response?

Π

Randomized Trials

These compare the new treatment with the standard treatment. Which treatment is better?

Patient Testimony

Sharon Lackey was busy taking care of her husband, Gene, who was receiving treatments for end-stage renal cancer, when she received the news that she had two types of breast cancer one a slow growing type and the other, a very aggressive, fast-spreading form that returns in 80 percent of patients. Instead of taking a stance of self-pity, Sharon and her husband teamed up for the fight of their lives. That was November 2003; today they are still a dynamic team.

Sharon had surgery to remove the tumors in her breast and lymph nodes, then chose to see Dr. Wahid Hanna, her husband's medical oncologist. Dr. Hanna discussed options with her...she could receive one of the standard therapies or enroll in a clinical trial that may prevent the return of her aggressive cancer by building antibodies and blocking tumor cell growth. After reviewing the information on the clinical trial and searching the Internet, Sharon felt she could make an informed decision about her care. Sharon remembered someone telling her, "Better to lose hair now and have gray hair later." She couldn't agree more, and decided the clinical trial was right for her.



More than a year after enrolling in the clinical trial and enjoying life as a cancer survivor, Sharon now volunteers in the chemotherapy room encouraging others in their fight against cancer. When asked if she would recommend a clinical trial to others, Sharon says, "Most definitely, but it is up to each person to look at their own situation. Prayer has a lot to do with it. There were lots of people praying for us and I think that tipped the scales."

Heather Grieve

the Wheels of Women's Health

Statewide Grant Yields New Mobile Mammography Unit—and More

When Kathy Cook, 49, climbed into the University of Tennessee Medical Center's new mobile mammography unit last summer, she hadn't had a mammogram in four years, despite her family history of breast cancer. The reason: An off-site medical appointment would take too much time from her work at the Melaleuca Company factory in Knoxville. But with the mobile unit parked outside the factory's door, Cook could be back on the job in 15 minutes.

Women's Health

She's one of many women who are benefiting from the \$1,122,834 Tennessee Women's Health Initiative (TWHI) grant awarded by Tennessee Attorney General Paul Summers in January 2004. The three-year grant provided \$292,500 toward the purchase of the mammography unit that cost almost \$500,000. The grant initiative began in July 2003, when the National Consortium of Breast Centers, Inc. in Warsaw, Indiana informed Linda B. Cruze, RN, BSN, CMC, coordinator of the Breast Care Service at UT Medical Center. that the attorney general had funding to offer. Would the center help develop a statewide grant aimed at improving women's breast health?

Cruze began combing the state for medical professionals who could represent each of four regions—East and Northeast Tennessee, Mid-Tennessee East, Mid-Tennessee West, and West Tennessee. She also contacted county health department representatives that offer the Tennessee Breast and Cervical Early Detection Program, funded by the Centers for Disease Control and Prevention in Atlanta. Six to eight core group members met in Nashville every six weeks or so, sorting out breast-care needs in each region.

The new unit hit the road in June of this year, bringing mammograms to numerous women in its first two months.

It didn't take long for East Tennessee representatives to agree on the need for a new mobile unit. UT Medical Center has had a mobile mammography program since 1988, but for several years, the old unit had experienced increased maintenance problems that sometimes disrupted the program. The new unit hit

the road in June of this year, bringing on-site mammograms to numerous women in its first two months.

The program screens many women throughout East Tennessee annually and visits local businesses, churches, health departments, and senior centers, sometimes multiple times per year. The unit staffed by a driver/receptionist and radiology technologist logs thousands of miles, providing services 10 to 12 hours a day four to five days

each week.

The Cancer Institute also operates the Breast Health Outreach Program (BHOP), designed to enhance the breast health education of underserved women in East Tennessee. Paige Huggler, the program coordinator of BHOP, works with businesses and other organizations in the region to provide on-site education sessions





"Our goal was to set a standard for clinical breast exams and to measure competency," says Cruze.

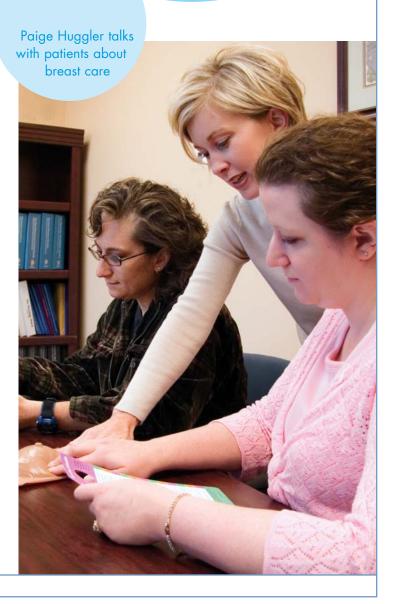
where women have the option of signing up for mammograms once they have completed the education portion of the program.

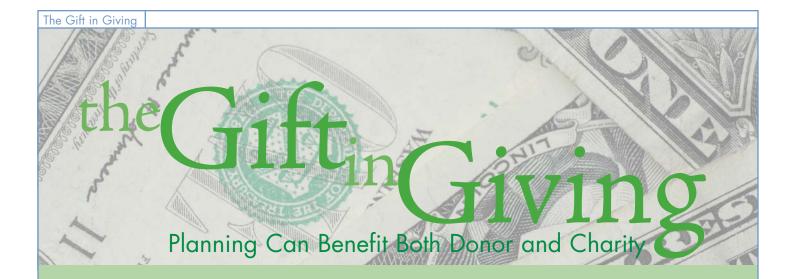
"Sometimes a company will be hesitant about the outreach program," says Huggler. "But once they see how seamless the process is, they're very open to it."

In addition to the mobile-unit funding, UT Medical Center received a \$70,000 grant to be used for the development of an eight-hour clinical breast examination and instructor certification pilot program for healthcare providers, "the first-ever comprehensive clinical breast exam certification course," Cruze says. The pilot program, completed in October of this year, was offered free to physicians, nurses, and nurse practitioners in each of the four state regions. "Our goal was to set a standard for clinical breast exams and to measure competency," says Cruze. The National Consortium of Breast Centers will launch a nationwide version of the program at its March 2006 meeting in Las Vegas.

Another portion of the Tennessee Women's Health Initiative grant, \$13,500, went to raise awareness of screening and diagnostic services among African-American and Hispanic residents of the state. So far Cordell Simpson, the faith-based program's coordinator, has reached more than 4,000 parishioners and 300 African-American clergy members in East and Northeast Tennessee and in Chattanooga.

Dorothy Foltz-Gray





OVER THE YEARS the University of Tennessee Medical Center has benefited from many charitable gifts made by grateful patients and their families, by physicians who trained or practice at the Medical Center or refer patients there, and by employees and other friends. The Tom and Katherine Black Neonatal Intensive Care Unit, the Heart Lung Vascular Institute, the Pastoral Care program, the Cancer Institute, the Preston Medical Library, and the UT Graduate School of Medicine are just a few of the numerous facilities and programs that excel as a result of generous private gifts.

As the calendar year closes, many individuals consider how best to give to charitable entities like UT Medical Center. Here are some suggestions to help you with the process. Because certain charitable gifts are not subject to federal income tax, itemizing deductions on your tax return may allow you to donate more than you thought possible. The type of gift you choose is important. Cash, for example, may reduce your income tax by as much as 50%; a gift of stock, bonds, or other appreciated assets may lower your capital-gains tax. Or by giving a life insurance policy, retirement account, bequest, or other financial instrument related to your estate, you may be able to increase the size of your gift.

Timing is also crucial. Reviewing your individual circumstances with a financial adviser, attorney, or accountant as the calendar year closes may help you feel more comfortable about making a gift. The University of Tennessee Medical Center Office of Development would welcome the opportunity to discuss specific gift options with you or your advisers.

For your convenience, we've provided an envelope you can use if you're ready to make a gift. If you would like to discuss other gift opportunities, please contact the UT Medical Center Development Office.

John J. Sheridan

Property Donated	Income Tax Savings	Capital Gains Tax Savings	Estate Tax Savings
Cash	~		
Appreciated Property	v	 Image: A start of the start of	
Retirement Assets	~		~
Life Insurance	~		~
Gift by Will	~		~

Remember time spent deciding what, when, and how to best make your gifts can result in maximum tax savings and financial benefits.

University of Tennessee Medical Center

Office of Development

1520 Cherokee Trail Suite 110 Knoxville, TN 37920

865-544-6611

New Tax Law New Opportunities

Events in 2005 have generated an unprecedented response and Americans have responded with record levels of charitable giving to assist those in need.

Congress has also acted to encourage additional charitable giving by changing tax laws to help Americans fund relief efforts while continuing support for their traditional charitable interests.

The Katrina Emergency Tax Relief Act of 2005 includes a number of important charitable giving provisions. The Act provides special tax treatment for individuals who volunteer their time or otherwise provide assistance to affected individuals and includes special incentives for those who make charitable gifts of cash before the end of 2005.

Expanded tax incentives

Our nation's tax system has long encouraged charitable giving. Gifts to qualified charities may be deducted from income otherwise subject to tax.

The amount one can deduct for income tax purposes in a given year may be limited. Contributions of cash are generally deductible in amounts up to 50% of a donor's "contribution base." For most individuals, the contribution base is the same as adjusted gross income (AGI).

For gifts of securities and certain other properties that have increased in value, the limit is normally 30% of AGI. Any gifts of cash or other property in excess of these limits may be carried over for use as a deduction in up to five additional years.

A window of opportunity

Because many individuals may wish to make additional gifts this year, they could encounter charitable deduction limitations. Congress has temporarily suspended limits on deductions for gifts of cash to qualified charities made during the period beginning on August 28, 2005 and ending on December 31, 2005. Thus, donors may deduct qualified charitable gifts in amount up to 100% of their AGI, if so desired.

Other limits that can reduce the value of itemized deductions by 3% for some higher income taxpayers have also been suspended for qualified contributions made before the end of this year.

As always, consult your tax advisor but be aware of these changes that might help you make an additional gift to the University of Tennessee Medical Center or use this window to make pledge payments that might otherwise be due in the next few years.

Thanks to the Sharpe Group for assistance with this article.

Thanks to the generosity and thoughtful estate planning of Dr. Lee A. Absher and his wife Reba Q. Absher, \$900,000 of a total of \$1.3 million bequest in their will was designated to help

Thank You

support the Pastoral Care Program. The Pastoral Care Residency initiative

was greatly enhanced by this generous bequest. UT Medical Center patients, their families, and staff have the support of specially trained chaplains available to help them through stress caused by trauma and illness.



Members of chaplain program in front of the Absher Chapel.



Cancer Institute *Gift and Education Funds*

Larry and Dorothy Stephens Cancer Care Gift Fund

Supports cancer patients with medicine and transportation

Breast Cancer Education/Outreach Gift Fund Breast cancer research and education

The Reverend Vertrue Sharp Gift Fund Supporting scientific or medical research in cancer and other prevalent diseases with supporting innovative cancer education

Tinque Blakely Cancer Gift Fund Cancer research and appreciation for cancer education Cancer Institute Education and Research Gift Fund, Paul T. and Dorothy B. Gillenwater Cancer Gift Fund and Buford N. Irwin Cancer Research Gift Fund *All support general cancer research and education*

Anne A. Wallen Lung Cancer Gift Fund Lung cancer research

Prostate Cancer Research Gift Fund Prostate cancer research, provides research grants for promising clinical and basic research initiatives

Oscar Roe Bragg Cancer Gift Fund Supports cancer with an emphasis on lung and esophageal cancer

If you are a physician or allied healthcare professional, researcher, or faculty member seeking continuing education, you may be interested in this sampling of upcoming activities offered through the UT Graduate School of Medicine Office of Continuing Medical and Dental Education.

CME Course Calendar

	2nd Annual Hematology Review	January 21, 2006 UT Conference Center Knoxville, TN	This annual review serves as a follow-up and briefing to the American Society of Hematology (ASH) international conference held each year in December. Prominent physicians from across the country will discuss new findings and updates to information presented at the ASH meeting.
5000	Health Literacy Conference: Soul Speak: Plain Talk about Health Literacy in the Physician-Patient Partnership	February 8-11, 2006 Jackson Hole, WY	This conference will allow physicians to learn how to better assess language needs, conduct motivational interviews with patients, break communication and motivation barriers, and maintain the focus of a medical provider. Attendees will participate in plenary sessions, discussions, and the AMA's Train-the-Trainer workshops on health literacy.
C	The "D" Team 2nd Annual Diabetes Update	March 11, 2006 University Club Knoxville, TN	This conference is focused on the latest techniques and medicines in the treatment of diabetes. It is a conference designed for the whole office as a team approach for battling this disease. From the front desk staff to the physician, everyone is included in this learning experience.
	Gastroenterology Practice & Endoscopic ASCs – Creating Success 2006	April 4–9, 2006 Knoxville Marriott Knoxville, TN	Lectures and workshops are designed to provide gastroenterologists, nurses, and practice managers with information on planning and operations, managing electronic medical records, and proven systems to improve practice efficiencies in endoscopic ambulatory surgery centers.
	29th Annual Family Medicine Update	April 27–29, 2006 Park Vista Resort Gatlinburg, TN	The format of this year's update will follow the human life cycle. The conference will cover the time periods of childhood, adolescence, adult, and senior adult. Each time period will feature experts in the appropriate specialties. The final day talks will be on the inevitability of death and taxes featuring a tax attorney and the nationally known forensic anthropologist Dr. Bill Bass.
	The 2006 Patterson Lecture: Long-Term Health Effects of Childhood Sexual Abuse	May 19, 2006 UT Medical Center Wood Auditorium Knoxville, TN	Understanding that while the immediate and short-term effects of childhood sexual abuse are generally known, physicians seeing adult patients need information regarding the long-term effects of such a history.
	LifeInside & Out First Annual Perinatal and Neonatal Care Symposium	May 24–26, 2006 Grove Park Inn Asheville, NC	This perinatal conference will focus on the specialties of obstetrics, neonatology and pediatrics. Invited participants will include physicians, physician assistants, nurse practitioners and others. The faculty will be composed of the top specialists in the region.

To register or for more information call 865-544-9190 or visit our website www.tennessee.edu/cme



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The University of Tennessee Cancer Institute focuses on two things: cancer and the patient. The institute provides advanced treatments, fast answers, expert health professionals and the best personalized care, so patients never feel like they are going through cancer alone. A team of specialists meet throughout the week to discuss a definitive diagnosis and treatment for the best care plan for the patient so he does not have to make multiple physician appointments. This individualized and coordinated cancer care makes the Cancer Institute a leader in the region.

For more information about the Cancer Institute, please call toll-free 1-877-UT-CARES or visit our website at www.utmedicalcenter.org

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