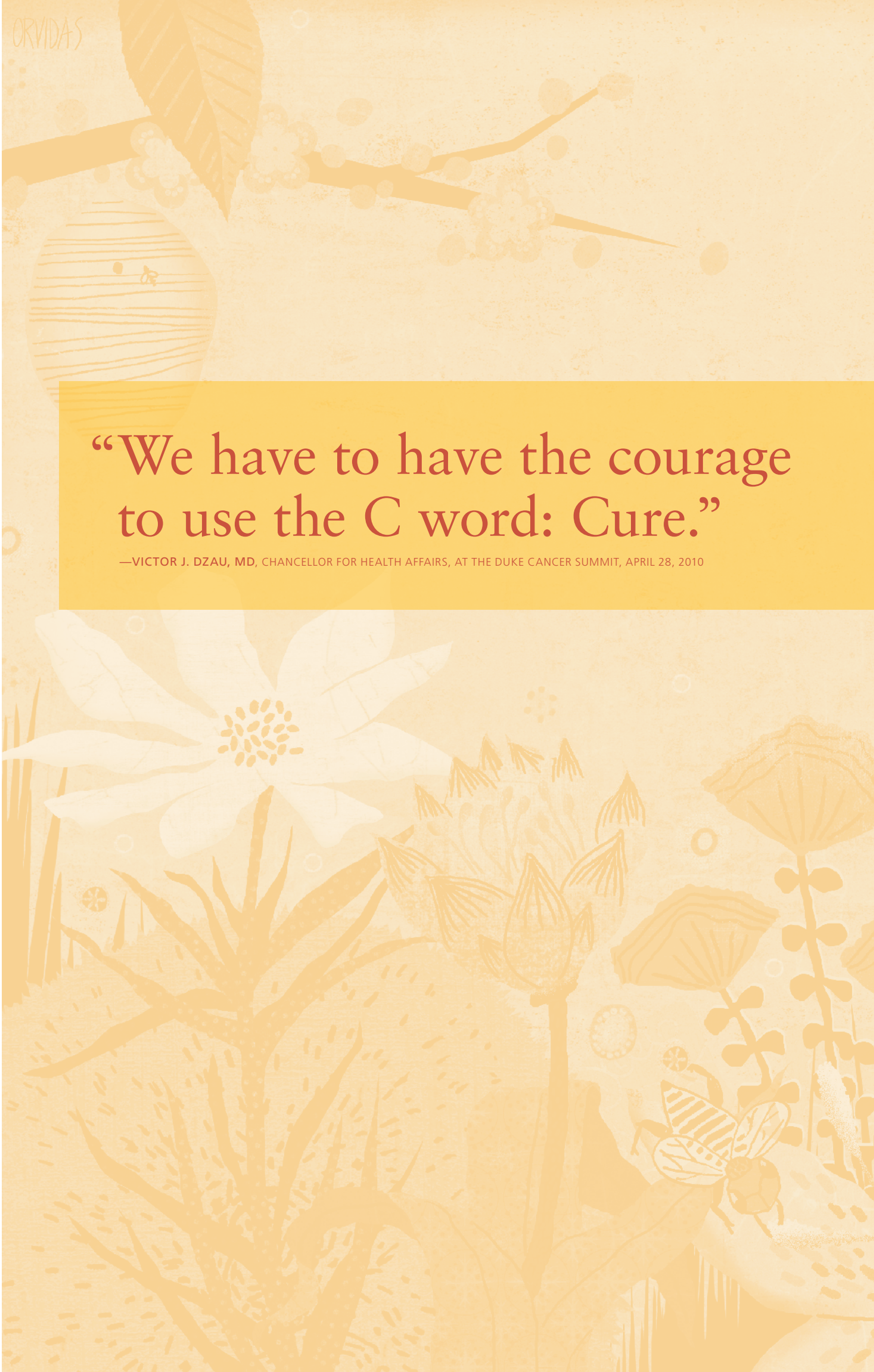
Duke Cancer Report 2010

INSIGHT, COURAGE, PROGRESS



"We have to have the courage to use the C word: Cure."

—**VICTOR J. DZAU, MD**, CHANCELLOR FOR HEALTH AFFAIRS, AT THE DUKE CANCER SUMMIT, APRIL 28, 2010

INSIGHT, COURAGE, PROGRESS

At Duke we want nothing less than to transform the way cancer is treated. Our mission is not only to deliver the most advanced, compassionate treatment to patients today, but to continually advance the field so that the outlook will be even brighter for cancer patients tomorrow.

As one of the original eight comprehensive cancer centers supported by the National Cancer Institute, Duke's cancer enterprise has developed over the past 38 years into one of the largest and most active in the world.

Every day, we leverage our institution's **robust biomedical research infrastructure with a unique focus on translational and clinical research excellence** enabled by one of the nation's top-ranked clinical oncology operations. This collaboration between research and clinical care is facilitated through hundreds of clinical trials offered to thousands of patients each year.

At Duke, our commitment to cancer has never been stronger, as evidenced by several historic milestones. In fall 2009, we began construction of a state-of-the-art cancer center dedicated solely to the care of patients with cancer. This new facility, scheduled to open in 2012, will enable us to reach and care for more patients than ever before.

The construction of this facility comes as part of **the historic creation of the new Duke Cancer Institute.** This entity represents a fundamental restructuring of our cancer enterprise to even more closely align our research, clinical, and education missions in order to accelerate scientific and clinical progress. We believe the Duke Cancer Institute will offer unprecedented opportunities for collaboration among Duke scientists and clinicians, enhancing and encouraging translational research so that patients benefit from groundbreaking discoveries in the most expeditious manner possible. I look forward to sharing with our patients and partners more details about the establishment of the Duke Cancer Institute in the coming months.

It has been almost 40 years since the passage of the National Cancer Act launched the War on Cancer. Duke is proud to be at the forefront of this effort, more prepared than ever before to win this war and **find the cure.**

Sincerely,

Victor J. Dzau, MD

Chancellor for Health Affairs, Duke University
President and CEO, Duke University Health System

Clinical Trials

ACCESS TO THE MOST CUTTING-EDGE TREATMENTS

Survivorship

SERVICES AND RESOURCES FROM DAY ONE

Cancer Vaccines

ARMING THE IMMUNE SYSTEM

Cell Therapy

UNLEASHING THE POTENTIAL

Places, Resources

ACCESSIBILITY FOR PATIENTS AND PHYSICIANS

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Who we are

- The Duke Comprehensive Cancer Center, created in 1972, was **one of the original eight** National Cancer Institute-designated cancer centers
- Duke University Medical Center is ranked the **top hospital in the Southeast** for cancer services according to *U.S.News & World Report*
- Duke currently receives nearly **$300 million annually in cancer research funding** from a variety of sources

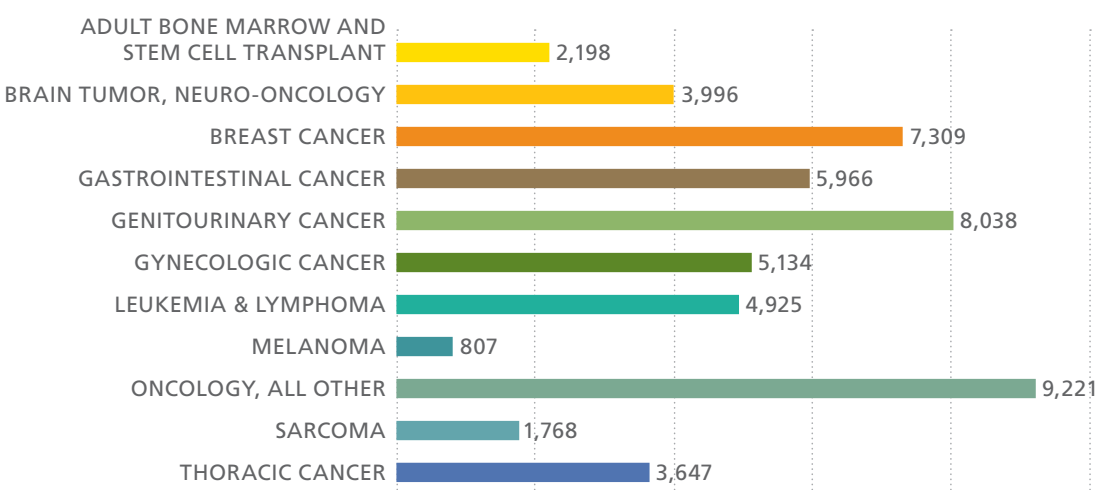
What we do

- Duke provides specialized care to patients, **treating every cancer type, with more than 100 oncology-dedicated, board-certified physicians and 500 clinical staff**—nurses, social workers, nutritionists, and others—dedicated to cancer
- Duke advances the world's knowledge of cancer. Between 2004 and 2008, 291 members of the Duke Comprehensive Cancer Center published **6,941 papers in peer-reviewed journals**. Over 200 faculty researchers are devoted to cancer
- Duke **residency and fellowship training programs** provide comprehensive training in gynecologic oncology, hematology/medical oncology, neuro-oncology, pediatric hematology/medical oncology, radiation oncology, and surgical oncology to develop the next generation of clinical and science leaders

The patients we serve

- Patients come to Duke from **every state in the nation** and every county in North Carolina
- More than **50,000 individuals with cancer** were seen at Duke University Hospital in fiscal year 2010 (FY10)
- More than 60 percent of new Duke cancer patients were **referred to Duke** for their initial treatment

DUKE UNIVERSITY HOSPITAL TOTAL CANCER PATIENTS BY PROGRAM 2010



Duke's extensive offering of trials gives patients access to treatment opportunities that are on the frontier of medicine—to possibly extend their survival and improve their quality of life.

Duke has over **700 clinical trials open**
in cancer patient populations

5,886 patients
enrolled in cancer-related clinical trials at Duke last year

In fall 2009, Daniel George, MD, who specializes in prostate and kidney cancer, was named medical director of Duke's Oncology Clinical Trials Shared Resource, which provides oversight and support for cancer clinical trials management, infrastructure, and regulatory and compliance issues. Here he shares his thoughts regarding clinical trials at Duke.

Daniel George, MD

How is Duke distinguished by its cancer clinical trials?

At Duke, we have the opportunity to do something that others cannot. While some phase 3 and a few phase 2 trials can be conducted at community hospitals, large medical centers like Duke are the only appropriate places for many phase 1 trials, where we do the first trials in humans. The comprehensive research infrastructure—from pathologists to pharmacists to laboratories—needed to run these trials is rarely available at smaller locations. In addition, Duke's tissue databanks are an enormous resource that help us understand the natural history and heterogeneity of cancer. The opportunity to apply new technologies to these tissue repositories is one we have at Duke that many other centers do not. By bringing together our expertise, our personnel, and our resources, we have the opportunity to hypothesize and test critical biologic questions in patients.

According to the National Cancer Institute, nationally less than 5 percent of adult cancer patients are enrolled in clinical trials. Why do you think this is true?

There are multiple obstacles that limit patients participating in clinical trials. Some obstacles are difficult to change, including the general health of the patient and their personal resources to access health care, while other factors can be addressed. Through the Duke Comprehensive Cancer Center we have initiated efforts to better educate patients on the purpose of clinical research, navigate the health care system to identify trials available for patients, and simplify, when possible, the eligibility and requirements of clinical trials to allow greater numbers of patients to qualify for trials. Fortunately, at Duke, we are well above the national average for cancer patient participation in clinical trials.

What are some of the current trials at Duke that you personally find most exciting?

It is difficult to choose between early studies of truly new therapies that hold tremendous potential and advanced studies that are comparing an investigational strategy to a standard of care. Personally, I find the studies involving my own patients in our genitourinary oncology portfolio extremely rewarding because of the immediate impact I see in our patients as well as the opportunity to contribute to the knowledge in our field. To me, the studies that benefit our patients and teach us about the disease and how these strategies work or don't work are the most exciting. These studies not only benefit our patients today, but can improve the health of future generations.

cancer.duke.edu/ctrials

"There is a quality and sophistication of cancer care that can only be provided by specialists and subspecialists who have received specific training and focus all of their time—24/7, every day—on continually refining clinical practice based on the latest in clinical research."

—VICTOR J. DZAU, MD, CHANCELLOR FOR HEALTH AFFAIRS

Recent faculty awards and honors

In April 2010, **Thomas D'Amico, MD**[1], was elected chair of the National Comprehensive Cancer Network board of directors.

Two Duke Comprehensive Cancer Center (DCCC) members were elected to the National Academy of Sciences in 2010, one of the highest honors given to a scientist in the United States. **Philip Benfey, PhD**[2], was recognized for his work on cellular signaling and cell fate in plants. **Vann Bennett, MD, PhD**, was recognized for his discovery and work on structural proteins called ankyrins.

The BBVA Foundation Frontiers of Knowledge Award in the Biomedicine category was presented to **Robert Lefkowitz, MD**[3], James B. Duke Professor of Medicine and Biochemistry and a Howard Hughes Medical Institute investigator.

Two members of the DCCC were elected fellows of the American Association for the Advancement of Science: **Daniel J. Lew, PhD**, for contributions to microbiology, elucidating mechanisms of cell cycle control, polarity establishment, and cell cycle checkpoint enforcement in the model budding yeast; **Xiao-Fan Wang, PhD**[4], for contributions to understanding the biology of cancer cells with respect to cell signaling, proliferation, and checkpoint control.

William Robert Lee, MD[5], was named inaugural editor in chief of *Practical Radiation Oncology* and received the American Brachytherapy Society Presidential Award 2010.

David Kirsch, MD, PhD[6], received the 2010 Michael Fry Award from the Radiation Research Society, given to one junior scientist for extraordinary contributions to the field of radiation research, and the 2010 Advanced Clinical Research Award in Sarcoma from the American Society of Clinical Oncology.

Mark Dewhirst, DVM, PhD[7], received the 2009 BSD Award from the European Society for Hyperthermic Oncology.

Lee Jones, PhD, was appointed to the international advisory board for *Lancet Oncology*.

Joanne Kurtzberg, MD, received the Kristjan Ragnarsson Angel Award from the Sarah Jane Brain Foundation, in recognition of advancement in the field of pediatric-acquired brain injury.

H. Kim Lyerly, MD[8], was reappointed to both the NC Advisory Committee on Cancer Coordination and Control and the scientific advisory board for Susan G. Komen for the Cure.

Mark Onaitis, MD[9], received a Young Investigator Research Grant from the NC chapter of the National Lung Cancer Partnership.

Harvey J. Cohen, MD[10], was awarded the 2010 B.J. Kennedy Award and Lecture for Scientific Excellence in Geriatric Oncology.

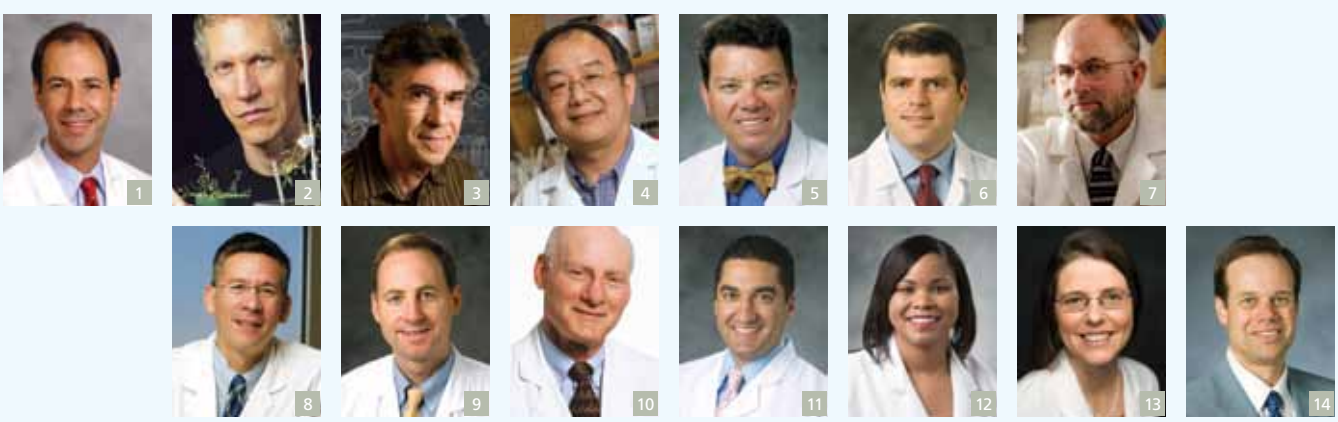
Gary Lyman, MD, received a Statesman Award in recognition of extraordinary volunteer service, dedication, and commitment to the American Society of Clinical Oncology.

Paiman Ghafoori, MD[11], and **Nicole Kuderer, MD**, were recipients of ASCO's Young Investigator awards. Kuderer is involved in developing a genomic signature linked to thrombosis. Ghafoori is studying how tumors in mice respond to radiation.

Kristin Higgins, MD, **Yannis Bellil, MD**, and **Marvaretta Stevenson, MD**[12], received merit awards from ASCO: Higgins for authoring an abstract which detailed newly identified cellular changes involved in metastasis; Bellil and Stevenson for their presentations related to molecular markers linked to the spread of lung cancer.

Victoria Seewaldt, MD[13], was appointed to the Parent Committee of the National Cancer Institute, which is responsible for scientific peer review and final merit scoring of cancer center applications.

David Harpole, MD[14], is co-chair of the NCI Thoracic Cancer Steering Committee, which approves and oversees all large phase 2 and randomized phase 3 clinical trials in North America.



Magnet, across the board

All three Duke hospitals (Duke University Hospital, Duke Raleigh Hospital, and Durham Regional Hospital) have achieved Magnet designation by the American Nurses Association. Earned by only 5 percent of hospitals in this country, this honor recognizes the highest level of nursing care.

Nurses certified in oncology

At Duke University Medical Center, 100 percent of nurses in radiation oncology, 95 percent of nurses in the oncology treatment center, and 45 percent of inpatient oncology nurses are certified in oncology. In comparison, about 43 percent of oncology nurses in the United States are certified in oncology.

16 Number of RNs who have received national recognition or American Cancer Society scholarships in the past three years.


1


2


3

Oncology nursing awards and leadership

Jane Fellows, RN, MSN, 2010 Excellence in Surgical Oncology Award from the Oncology Nursing Society (ONS)

Camille Lambe, RN, PhD[1], 2010 Pat McCue/New Orleans Chapter End-of-Life Nursing Career Development Award from the ONS

Brenda Nevidjon, RN, MSN[2], immediate past president, ONS board of directors, member of nomination committee

Susan Schneider, RN, PhD[3], director-at-large, ONS board of directors

Susan Bruce, RN, MSN, OCN, member, ONS Certification Corporation Board

Personalized care and clinical research at the heart of Duke's new cancer center

In March 2010, workers began digging the foundation of what will be a major expansion of cancer facilities at Duke. The 267,000-square-foot, patient-centered, Duke Cancer Center is scheduled to open in 2012.

The new Duke Cancer Center promises to transform the cancer patient experience at Duke with a focus on convenience and comfort. In addition, it will facilitate synergy among some of the most talented cancer researchers and clinicians in the country.

Patients and their families will enjoy more space, accessibility, convenience, and attention to their special needs. The new center will unite Duke's outpatient clinical services, eliminating the need for patients to navigate from one clinic to another. It will feature plenty of sunlight, a rooftop garden terrace where patients can receive chemotherapy, and quiet healing spaces for rest and reflection.

The cancer center will be connected via a new pedestrian concourse to the Duke Medicine Pavilion at Duke University Hospital. That nearby facility, also currently under construction, has been designed in such a way as to allow easy and seamless transport of patients requiring surgical and inpatient care services. The Pavilion is scheduled to open in 2013.

Learn more at **dukemedicine.org/construction**.

THE NEW DUKE CANCER CENTER

7 Floors

Square footage: **267,000**

140 Exam rooms

Infusion (chemotherapy) stations: **73**

A rooftop terrace, patient resource center, a café, and a climate-controlled walkway to Duke University Hospital and Duke Medicine Pavilion (to open 2013)

Estimated project cost: **$219 MILLION**

PATIENT SUPPORT AND SURVIVORSHIP

Duke offers a multitude of support services and resources proven through clinical research. Many of Duke's support programs are offered through the Duke Center for Cancer Survivorship.

Duke Cancer Patient Support Program

The Duke Cancer Patient Support Program provides services from diagnosis through treatment, recovery, survival, and the circumstances surrounding end of life. Services include:

- Individual, couple, and family counseling
- Support groups
- Self-image resources
- Volunteer companionship and peer support

All support services are provided at no charge to patients and their families. **For more information:** dukehealth.org/cancersupport.

Patient Education Program and Resource Center

The Duke Cancer Patient Education program offers the Patient and Family Resource Center, the Cancer Education Closed Circuit TV Channel, the Patient Education Notebook, and other educational offerings to assist patients and families in understanding their options, making decisions, managing the effects of cancer and its treatment, and finding meaning in the experience. **For more information:** dukehealth.org/cancereducation.

Oncology Recreation Therapy

This program assists inpatient adults with cancer and their families in adjusting to illness, treatment, and hospitalization. Recreational therapy treatment intervention and general recreational activities and resources are offered. **For more information:** dukehealth.org/oncologyrecreationtherapy.

Breast Cancer Survivorship Clinic

This specialized clinic for survivors combines group and individual support, assessment, and education within a single visit. The clinic features a multidisciplinary team of health care providers who address long-term and late effects that may include and/or impact bone health, post-mastectomy lymphedema, sexuality, coping, healthy eating, exercise, and more. The primary goal is to empower patients to make healthy lifestyle choices that contribute to improved quality of life and minimize the risks of secondary cancers and other illnesses.

Research Shows Positive Effects of Patient Support Program

In 2006, the cancer support program called Pathfinders was implemented at Duke, and a research team went about studying its effects on patients.

The team, led by Amy Abernethy, MD, enrolled 50 patients with metastasized breast cancer. The women met at least monthly and communicated via telephone and e-mail with a "Pathfinder," a Duke social worker specially trained in the program's tenets, who helped them identify inner strengths and develop positive coping skills.

The results of the study, presented at the 2009 American Society of Clinical Oncology meeting and recently accepted for publication in *Supportive Care in Cancer*, showed that the program helped improve distress, despair, and emotional well-being during the initial three months and up to six months after diagnosis.

"Even though the women were getting sicker and experiencing more symptoms related to their cancer," says Abernethy, "they reported that they felt less emotional distress as a result of being able to better cope with the cancer."

"You can count on one hand the number of institutions that include programs like Pathfinders and integrative medicine as part of their cancer care," says oncologist Neil Spector, MD. "How you treat the whole person is really where I think we've made a tremendous leap."

Amy Abernethy, MD

Survivorship research

The Duke Cancer Care Research Program collects data about trends in well-being for cancer patients over time and systematically develops new models of care to enhance patients' quality of life and better manage commonly experienced symptoms. In late 2009, the Duke Center for Cancer Survivorship appointed its first scientific director, who will facilitate survivorship research activities at Duke by developing a closer relationship between clinical practice and survivorship researchers.

Surviving brain cancer

Clinicians and patients at The Preston Robert Tisch Brain Tumor Center at Duke begin creating a survivorship plan from the start of treatment. Both medical and psychosocial resources are offered throughout treatment to help patients adapt to memory loss or other cognitive deficits, vision and hearing problems, changes in relationships, earning status, or independence. Patients can use hands-on learning tools for all ages at the nationally acclaimed Brain Tumor Learning Center to help understand diagnosis, treatment, and related issues.

Especially for children and young adults

Duke's Long-Term Cancer Survivor Clinic is a multidisciplinary clinic serving patients under the age of 25 who have been off treatment for five years or more.

The Duke Pediatric Blood and Marrow Transplant (PBMT) Family Support Program provides resources and services to patients and families during their time at Duke. It was born through the efforts of families who experienced transplant at Duke and the PBMT staff. The program seeks to embrace families and fully address their needs during the arduous transplant process.

Duke also offers fertility preserving strategies for children, a support group for adolescents with cancer and their families, and a Quality of Life program that provides palliative care and support services from the time of diagnosis onward.

KidsCan! is a program designed to support children ages six to 18 who have a parent or significant caregiver with the diagnosis of cancer.

Patient navigators

Patient navigators provide a vital connection to the resources available to patients and their families. While their primary role is to coordinate the many tests, appointments, and procedures needed for cancer care, patient navigators also provide educational and emotional support and encouragement. Patient navigators serve cancer patients at Duke Raleigh Hospital, patients enrolled in clinical trials, and patients in other specific programs at Duke University Medical Center.

Complementary care

Duke Integrative Medicine offers a wide array of therapies and services based on the latest research to complement cancer treatment. Physicians, clinicians, and therapists help patients with stress reduction techniques that can reduce pain and anxiety and enhance the effects of treatment. Acupuncture and massage are also used to alleviate side effects of cancer treatment or the cancer itself, including nausea, pain, tissue inflammation, fatigue, and anxiety. **More at** dukeintegrativemedicine.org.

Preserving fertility

The Duke Fertility Center offers fertility-preserving services such as sperm and embryo banking for cancer patients undergoing treatment that may affect their reproductive abilities.

And more

Duke also helps coordinate travel and lodging assistance, nutritional counseling, financial counseling, pharmacy counseling, stress and pain management, physical and occupational therapy, and in-home care.

"For me, courage is being willing to step into the unknown..."

—**NEIL SPECTOR, MD,** DIRECTOR, DUKE TRANSLATIONAL ONCOLOGY RESEARCH
CO-DIRECTOR, EXPERIMENTAL THERAPEUTICS PROGRAM
HEART TRANSPLANT RECIPIENT, JULY 2009

"We have an instinctive nature to do whatever we can to stay alive, and Duke offers patients the opportunity to keep doing that even though we haven't figured out all the puzzle pieces of this incredibly humbling disease."

—ONCOLOGIST **DANIEL GEORGE, MD,**
AT THE DUKE CANCER SUMMIT, APRIL 2010

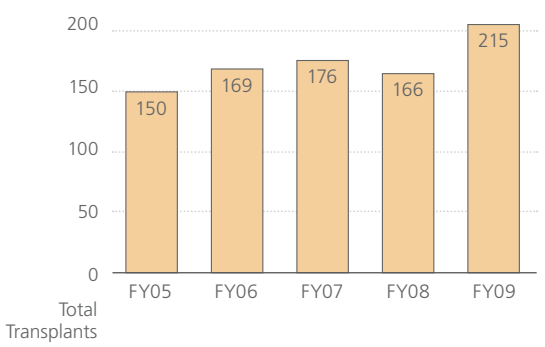
Adult Bone Marrow and Stem Cell Transplants

Duke's Adult Bone Marrow and Stem Cell Transplantation Program is internationally recognized for its novel approaches to treating leukemia, lymphoma, and myeloma through bone marrow and peripheral blood progenitor cell transplantation. Novel indications such as autoimmune disease and hemoglobinopathies are also treated.

Our board-certified physicians include intensivists in bone marrow transplantation, hematology-oncology, medical oncology, and related specialties. A support team that includes physical therapists, clinical social workers, dieticians, financial counselors, and pharmacists helps guide each patient to recovery.

Duke's leadership in bone marrow and stem cell transplantation research enables patients to receive treatment with the very latest approaches, of special importance to patients with refractory or recurrent malignancies. Studies with partially matched cord blood or haploidentical related donors make transplantation an option for patients without a sibling with a matching immune system. Duke also works to improve transplantation outcomes and reduce complications such as graft-versus-host disease. Duke researchers have received acclaim for their extensive studies of combining transplantation with other therapies including immunotherapy, anti-angiogenesis therapy, and the latest drug therapies.

ADULT BONE MARROW AND STEM CELL TRANSPLANT VOLUMES



More than 3,000 adult patients from all over the world have received bone marrow and stem cell transplants at Duke. The program's comprehensive team designs individualized treatment plans for each patient.

HIGHLIGHTS

Unmatched donors

Duke is able to successfully transplant stem cells from mismatched family members and unrelated donors.

Reduced-intensity chemotherapy

Duke researchers conducted the first large successful study of transplanting stem cells from donors who are not fully matched while using chemotherapy that is less aggressive than standard practice. Today, reduced-intensity chemotherapy regimens make transplant an option for patients once deemed too sick or too old.

Reducing complications

Duke provides long-term follow-up and surveillance for chronic graft-versus-host disease (GVHD) in allogeneic transplant patients. Duke research in this area includes: understanding murine reconstitution following transplantation; use of a peptide polymer to block MHC class II recognition of minor histocompatibility antigens; and use of T cell engineering to prevent GVHD while preserving a graft-versus-malignancy effect.

For more information about this program, call 919-668-1000. Find clinical trials at cancer.duke.edu/ctrials.

Bone and Soft Tissue Cancers

The Duke Multidisciplinary Sarcoma Program serves sarcoma patients of all ages, with tumors in all locations, to give them the best chance at a cure. The team works together to create the most effective treatment plan for the individual, using both standard procedures and the latest innovative techniques, many developed at Duke. Our physicians see approximately 200 new patients with sarcomas per year, many of whom travel from across the country to benefit from Duke's unique multidisciplinary approach.

Only 10,000 or so patients are diagnosed each year with sarcoma. Duke is leading the way in research on this rare cancer. Duke is a participant in the Sarcoma Alliance for Research through Collaboration (SARC), which provides the infrastructure for collaboration among medical institutions around the world for the development of new standards for sarcoma treatment, education, and prevention.

Duke researchers study sarcomas in children as well as adults. Areas of focus include investigation of new agents for rhabdomyosarcoma patients who have the lowest chance of long-term survival. Other Duke researchers are using novel approaches to understand how sarcomas develop and metastasize. Duke scientists genetically engineered a mouse model of sarcoma with mutations in the same genes that cause sarcomas in humans. Duke uses the model to identify mechanisms associated with metastases and resistance to chemotherapy, to learn how current therapies work, and to develop new ones. Sarcoma mechanisms identified in the mouse model are then analyzed in samples from Duke's sarcoma tissue repository, which contains tumor tissue donated by patients for genomic analysis. As tumor characteristics associated with clinical outcomes are identified, this knowledge can be used to develop personalized therapies specific to a patient's individual tumor.

Duke is one of only a handful of hospitals where patients can see in one visit a surgeon, medical oncologist, and radiation oncologist who make sarcomas their clinical and clinical research focus.

HIGHLIGHTS

High-volume center

Duke surgeons perform a high volume of resections for sarcomas and offer options to increase function such as:

- **Rotationplasty**, an alternative to traditional amputation that provides greater range of motion with a prosthesis
- **Vascularized fibular reconstruction**, a procedure offered in cooperation with plastic surgeons in which the fibula is transplanted to replace large areas of bone resection. Duke's latest series of vascularized fibular reconstructions is among the largest reported in the literature to date. (Clin Orthop Relat Res. Aug 2009)

A leader in using heat to treat cancers including soft tissue sarcomas

Duke participated in a multinational clinical trial demonstrating that noninvasive hyperthermia treatment can be safely combined with chemotherapy, surgery, and radiation therapy to treat soft tissue sarcomas. This randomized phase 3 trial showed that hyperthermia can improve the local control for some patients with sarcoma. Researchers at Duke are using MRI to develop new ways to measure heat to try to improve the effectiveness of hyperthermia therapy. **For information:** cancer.duke.edu/ctrials.

Image-guided radiation therapy

Specialized radiation therapy that delivers radiation with image guidance can allow radiation to be focused on the tumor and may cause less damage to normal tissue. Duke is participating in a phase 2 trial studying the side effects and how well image-guided radiation therapy works in treating patients with primary soft tissue sarcoma of the shoulder, arm, hip, or leg. **For information:** cancer.duke.edu/ctrials.

New type of genetic change identified in inherited chordoma

Duke and National Cancer Institute scientists have discovered that a novel genetic alteration—a second copy of an entire gene—is a cause of familial chordoma. Using a technique called array comparative genomic hybridization, researchers were able to pinpoint the defect. They identified it as the T (Brachyury) gene on chromosome 6. (Nat Genet. Nov 2009)

For more information about the sarcoma program, please call toll-free 877-SARC-DUKE (7272-3853), or 919-613-5550 (local).

THE BRAIN TRUST left to right: Henry S. Friedman, MD, John H. Sampson, MD, PhD, Darell D. Bigner, MD, PhD, David A. Reardon, MD, and Allan H. Friedman, MD

Brain Tumors

The Preston Robert Tisch Brain Tumor Center at Duke, established in 1937, is one of the longest-standing and largest brain tumor research and clinical programs in the United States. At Duke, more than 200 neurosurgeons, neuro-oncologists, radiation oncologists, scientists, nurses, social workers, and other staff are dedicated solely to investigating and treating brain tumors. Duke currently follows more than 2,200 adult and pediatric patients with brain tumors from all over the world and is committed to improving and extending their survival.

HIGHLIGHTS

Leading research

Duke offers patients dozens of clinical trials targeting both newly diagnosed and recurrent primary brain tumors. **For details**, visit cancer.duke.edu/ctrials.

Pioneering work leads to FDA approval

Duke-led research studies with bevacizumab (Avastin) resulted in accelerated approval by the Food and Drug Administration of the drug for patients with glioblastoma multiforme in May 2009.

Grant renewed for 25th consecutive year

The Preston Robert Tisch Brain Tumor Center at Duke has once again received the P50 research grant from the National Institutes of Health. Only two such multi-million dollar grants are awarded by the National Institute of Neurological Disorders and Stroke (NINDS) every five years, earmarked exclusively for brain tumor research. Duke has received one of the two awards consecutively for 25 years. The grant supports multiple projects that entail both laboratory and clinical research.

Discovery makes tumors more responsive to radiation

Duke researchers have figured out how stem cells in the malignant brain cancer glioma may be better able to resist radiation therapy. Using a drug to block a particular signaling pathway in these cancer stem cells, they were able to kill many more glioma cells with radiation in a laboratory experiment. (Stem Cells Nov 2009)

Duke vaccine extends survival

A study published in late 2010 showed that the vaccine known as CDX-110 added to standard therapy appears to extend survival for patients with glioblastoma multiforme (GBM). The vaccine targets a mutation in a very aggressive cancer gene known as EGFRvIII. In the controlled study, adding the vaccine to standard therapy extended median survival from an expected 15 months to 26 months. Patients in the vaccine group also experienced a much longer progression-free survival time, 14.2 months, compared to 6.3 months for those who did not received the vaccine. (J Clin Oncol. Oct 4. 2010)

Cancer Vaccines

ARMING THE IMMUNE SYSTEM TO FIGHT CANCER

In 2005, David Schmidt was diagnosed with glioblastoma multiforme (GBM), one of the most aggressive of brain tumors. After surgery, radiation, and chemotherapy, his tumor had not yet recurred, but his doctors told him there was only a 3 to 5 percent chance that things would stay that way. Today, five years after his symptoms first began, Schmidt is still recurrence-free. He credits that in large part to his enrolling in a clinical trial of a vaccine developed at Duke.

"Enrolling in the trial was one of the few options available. It was either that or just kind of take my chances and hope that the cancer didn't come back," Schmidt says. "The vaccine trial was attractive because the side effects were minimal. I'm doing really well."

This vaccine "trains" immune-system cells to attack EGFRvIII, a protein that is present in 25 to 40 percent of GBMs. In the phase 2 trial in which Schmidt was involved, patients whose tumors expressed EGFRvIII showed overall improved survival times compared to historical controls, and those better outcomes were combined with tumor-specific immune responses, says Duke neurosurgeon John H. Sampson, MD, PhD. The results of that trial and others led to Duke licensing the vaccine to pharmaceutical company Pfizer.

Sampson and colleagues are now honing a different type of weapon against GBM—vaccines that aid the immune system's fight against cytomegalovirus, which is normally latent in the body but that researchers at Duke and elsewhere have discovered is activated in some patients with GBM. "Because the immune system is especially developed to attack viruses, this provides an unparalleled opportunity for us to exercise immune therapy against these tumors," Sampson says. Duke is leading single-center phase 1 and phase 2 trials of glioblastoma vaccines that target cytomegalovirus.

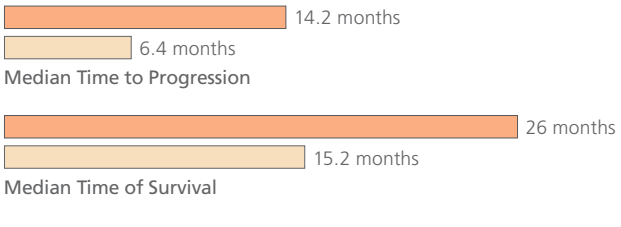
Duke's extensive work in developing and testing cancer vaccines means that patients can participate in trials of vaccines for many types of cancers—brain, breast, colon, ovarian, and prostate. Duke was an enrolling center for the trial that led to approval of the prostate cancer vaccine Provenge, which in May 2010 became the first cancer vaccine approved by the Food and Drug Administration.

New trials available only at Duke include a study of a vaccine called dHER2 to fight breast cancer that overexpresses the HER2 protein, which is one of the more aggressive forms of the disease. The trial was developed because of findings in mice that Duke oncologist Michael Morse, MD, and colleagues published March 1, 2010, in *Clinical Cancer Research*. "We showed that if you use a cancer vaccine in conjunction with a targeted therapy [lapatinib], you get additional efficacy. The vaccine activates T cells and also multiple antibody responses against HER2 that synergize with the HER2 tyrosine kinase inhibitor lapatinib," Morse says. If that proves true in humans, the vaccine could improve upon standard treatments for this type of breast cancer, which include chemotherapy plus the monoclonal antibody trastuzumab (Herceptin). "Unlike trastuzumab, which binds to just one part of HER2, the vaccine induces polyclonal antibody responses, targeting different parts of the molecule," Morse says.

Other work from Duke has also demonstrated the additive effect from combining traditional treatments with vaccines. "We've demonstrated in animals and humans that there is a potent synergy between chemotherapy and vaccines; the chemotherapy actually dramatically enhances the effects of the vaccine," Sampson says. For now, even after surgery, radiation, chemotherapy, and immunotherapy, recurrences are still all too frequent. But Sampson, Morse, and other Duke investigators work to develop the right combination of treatments that will make survival stories such as Schmidt's more commonplace.

Enrollment information for the trials mentioned here and other trials: cancer.duke.edu/ctrials.

A PHASE 2 CLINICAL TRIAL of a cancer vaccine developed at Duke showed that vaccination in combination with standard-of-care temozolomide chemotherapy may reduce time to progression in glioblastoma multiforme.



Expert Opinion on Biological Therapy. 2009 August; 9(8): 1087–1098.

After **David Schmidt** of Nashville, Tenn., was diagnosed with an aggressive brain tumor, he participated in a clinical trial of a cancer vaccine developed at Duke. Five years later, he is still enjoying fly fishing, hiking, skiing, and time with family.


NASHVILLE
ORVIDAS

Breast Cancer

One of the world's leading breast cancer programs, Duke's Breast Oncology Program offers women a complete range of services from diagnostics to genetic and prevention counseling to state-of-the-art treatments for early and advanced-stage disease. Radiologists with specialized training in breast imaging use the most advanced techniques to detect and diagnose breast cancer and are skilled in all forms of minimally invasive biopsy techniques, including needle core biopsies using stereotactic and ultrasound guidance, and pre-surgical wire localizations. Duke offers clinical trials for all stages of breast cancer. Duke also offers breast cancer patients fertility-preserving services such as embryo banking before chemotherapy. Physical therapists and self-image resources are available as well. The multidisciplinary breast cancer team meets weekly to discuss individual patient cases and to formulate and review individual treatment plans.

HIGHLIGHTS

A landmark trial

Duke investigators were leaders in the development and clinical testing of trastuzumab and lapatinib, a targeted therapy approved by the Food and Drug Administration in 2007 for breast cancer patients with the overexpressed HER2 gene. The development of lapatinib and trastuzumab was lauded as one of the "Top 10 Medical Advances of the Decade," as reported by ABC News in December 2009.

Complete tumor removal

Duke is developing an optical assay device that may be used in the operating room to assess tumor margins and ensure complete removal. Trials of this device are ongoing.

Real-time tracking of tumor response

Duke leads a multisite trial of dasatinib for patients with advanced-stage breast cancer in which tumor response is measured mid-trial and results are used to adjust dose. It is one of the first trials using tissue sampling and pharmacodynamics to modify drug dosing.

Endocrine therapy

Duke is defining the role of endocrine therapy (non-toxic regimens to shrink tumors) to facilitate breast-conserving surgery. Duke co-leads a national phase 3 trial of three agents.

Vaccine trials

Duke offers clinical trials of vaccines to fight both early-stage and metastatic breast cancer as well as triple-negative breast cancer, which does not respond to receptor-targeted treatments.

Profiling aggressive cancers

Through a large-scale genomic analysis (784 cases) Duke scientists demonstrated that breast cancer arising in young women is a unique subset driven by particular oncogenic signaling pathways and characterized by less hormone sensitivity and higher expression of the HER2/EGFR genes. (J Clin Oncol. July 10 2008)

Improving anesthesia

Duke offers anesthesia for breast surgery via paravertebral block, which results in less nausea and improved pain control.

Kimberly Blackwell, MD, is the principal investigator of a multisite trial of dasatinib for women with advanced breast cancer.

Screening high-risk women

At Duke's High-Risk Breast Clinic, women with a familial history of breast cancer or other risk factors receive breast cancer screening and individualized prevention plans. Patients can enroll in trials in which the success of these prevention methods is tracked through breast MRI or a novel breast cell sampling technique.

This technique—random periareolar fine-needle aspiration—allows scientists to obtain breast cells to test for atypical, precancerous changes. In a clinical trial, Duke scientists showed the reproducibility of this technique for obtaining cells to assess short-term breast cancer risk. (Cancer Epidemiol Biomarkers Prev. May 2009)

The clinic also conducts breast cancer education and outreach to surrounding communities, targeting African American women at high risk, who are typically underrepresented in breast cancer prevention trials.

Duke has also begun testing cells from high-risk women for changes in protein expression in response to prevention agents. This work is funded by a $7.5-million Promise Grant from Susan G. Komen for the Cure. It will begin to identify pathways that become abnormal at the very beginning of familial breast cancer and will track exactly how preventive therapy changes those pathways.

For trial information, visit cancer.duke.edu/ctrials.
For High-Risk Breast Clinic scheduling, call 919-684-2471.

Brian Czito, MD, radiation oncologist, reviews an in-room patient setup for a respiratory-gated radiation therapy treatment.

Esophageal Cancer

Duke is one of the few medical institutions in which surgical, medical, and radiation oncologists who specialize in esophageal cancer offer coordinated, multidisciplinary care. With one appointment, at one site, patients can see experienced cancer specialists from the full range of disciplines needed to provide expert diagnosis and treatment. The Duke Esophageal Cancer Clinic sees up to 200 patients with esophageal cancer each year—significantly more than other hospitals. Duke physicians lead the way in defining the role of chemotherapy and radiation treatment to treat tumors of the esophagus. Novel treatments are often available through our robust clinical trials program.

HIGHLIGHTS

Three-drug combo

A Duke trial is investigating the efficacy of capecitabine and oxaliplatin in combination with bevacizumab as first-line treatment for metastatic esophagogastric cancers. **Contact** Sherri Haley, RN, 919-668-1861, GIClinicalTrials@duke.edu.

Novel treatment trial

A phase 2 trial of a combination of the drugs capecitabine, oxaliplatin, and panitumumab along with radiation therapy is available only at Duke to patients with esophageal cancer. The combination, which has never been used before to treat this disease, may be given as primary treatment or administered before evaluation for surgery. **For enrollment information**: Brian Czito, MD, 919-668-7336, czito001@mc.duke.edu.

Experienced surgeons

Duke's thoracic surgeons performed 63 esophageal resections in FY2010; 20 such procedures per year is considered high volume. Outcomes for this procedure are directly associated with the experience of the surgeon and the medical center.

Image-guided radiation therapy

Duke's radiation oncology specialists use state-of-the-art methods such as PET-based treatment planning, respiratory gating techniques, and intensity-modulated radiation therapy to deliver a radiation plan tailored to each patient.

Gastrointestinal Cancer

The Duke Gastrointestinal Oncology Program offers patients the expertise of subspecialists in medical oncology, surgery, and radiation oncology combined with exciting research advances. Duke is a major referral center for patients with cancers of the esophagus (see previous chapter), stomach, pancreas, liver, biliary system, small intestine, colon, anus, and rectum, including uncommon tumors such as carcinoids and neuroendocrine tumors, and gastrointestinal stromal tumors. Patients from around the world choose the individualized care, state-of-the-art treatments, surgical experience, and access to cutting-edge clinical trials that Duke offers. The program's surgeons are fellowship-trained and offer expertise in a variety of complex hepatopancreaticobiliary procedures.

Duke physicians have been leaders in developing procedures such as laparoscopic surgery for colon cancer, radiofrequency ablation, cryotherapy, embolization of liver masses, radiosurgery of liver tumors, and radiolabeled MIBG for neuroendocrine and carcinoid tumors. An array of phase 1 and phase 2 studies across treatment modalities provide patients with access to cutting-edge treatments.

HIGHLIGHTS

Novel therapies

Duke is a national leader in preoperative chemotherapy and radiation therapy to shrink gastrointestinal tumors prior to surgery to improve outcomes. Novel radiation therapies include intra-operative radiation targeted directly at the tumor during surgery, hyperthermic radiation, and transrectal ultrasound.

Promising research in pancreatic cancer

Duke researchers have made a novel connection between bone morphogenetic proteins (BMPs) and pancreatic cancer. This discovery could lead to therapies that target BMP, inhibiting the activity of this pathway and treating patients with pancreatic cancer more effectively. (Feb 2009 Carcinogenesis)

Skilled surgeons

Duke's skilled hepatopancreaticobiliary surgeons have the experience that leads to better outcomes. Duke has expanded its minimally invasive cancer resections to include pancreatic, gastric, and liver tumors.

Resources for colorectal cancer

Duke has five board-certified colorectal surgeons—far more than any other program in the region—who specialize in laparoscopic colon and rectal surgery as well as sphincter-preserving operations for low rectal cancers. In addition, a team of experienced radiation oncologists and medical oncologists specialize in the care of patients with colorectal and anal cancer. Unique areas of expertise include intra-operative radiation therapy, neoadjuvant therapy of rectal cancer, and phase 1 and 2 clinical trials in these malignancies.

Angeles Secord, MD, with patient

Gynecologic Cancer

The Duke Gynecologic Oncology Program is one of the most comprehensive cancer treatment and research programs of its kind in the country. Its mission is to accelerate progress in the management of gynecologic cancers and improve survival for women with ovarian, endometrial, and cervical cancers. A multidisciplinary team provides the latest approaches in surgery, chemotherapy, radiation, brachytherapy, and supportive care in a patient-centered environment that emphasizes emotional support for patients and families. Duke physicians are leaders in adapting laparoscopic and robotic surgical approaches to the treatment of gynecologic cancers, offering these services at Duke University Medical Center and at Duke Raleigh Hospital.

Duke University Medical Center is ranked #7 in the nation in gynecology by *U.S.News & World Report*.

HIGHLIGHTS

Dozens of clinical trials

Duke has been a member of the Gynecologic Oncology Group (GOG), a large cooperative group devoted to improving care for women with reproductive cancers, since its inception in 1970. In addition to GOG studies, Duke has active trials that are supported by pharmaceutical groups or grants. Duke physician-scientists also work closely with the phase 1 team to provide the newest therapies to patients. **To learn more**, visit cancer.duke.edu/ctrials.

Leaders in minimally invasive surgery

About two-thirds of our major surgeries, including surgeries for cervical cancers and endometrial cancers, are performed laparoscopically or robotically. Single-incision laparoscopic surgery is also available for select patients. Our services, including laparoscopy and robotics, are offered both at Duke University Medical Center and at Duke Raleigh Hospital.

Early detection study

A Duke-led research study showed that ovarian cancers currently detected at an early stage have gene expression profiles that correlate with favorable outcomes. The researchers looked at gene expression patterns in 166 ovarian cancer tissue samples—of advanced cancers from patients who had experienced long-term survival and patients who had died within three years of diagnosis—and identified genes that were most predictive of survival. Cancers that were detected at an early stage almost always shared gene expression characteristics with advanced-stage cases of long-term survivors, suggesting a shared favorable biology. (Clin Cancer Research, March 24, 2009)

Andrew Berchuck, MD

"I hope to live up to the standard of courage and dignity that many of my patients have demonstrated." —ANDREW BERCHUCK, MD

Cancer-Associated Cell Signaling

BASIC FINDINGS ON THE FAST TRACK TO THE CLINIC

At Duke, leading basic scientists often walk the same halls as renowned clinicians, creating an environment in which insights are easily shared, and basic research discoveries can reach patients faster.

For instance, a new finding from a cellular signaling lab could result in a clinical trial for patients with pancreatic cancer. More than 95 percent of pancreatic cancers have a mutation in a gene called KRas. "It's an initiation oncogene—it's what gets the cancer going," says Christopher Counter, PhD, an associate professor of pharmacology and cancer biology at Duke. But stopping KRas has proven difficult. "There's been failure after failure after failure," Counter says. "So our approach has been, if you can't go after KRas, go after something KRas uses to promote cancer. If you can't go in through the front door, find a window."

That window turned out to be a protein called eNOS. As Counter's group published in *Nature* in 2008, they found that inhibiting eNOS blunted the tumor growth of human pancreatic cell lines. That was good news, but even better was that several drugs had already been developed to inhibit NOS enzymes, because the protein had been exhaustively studied for its role in septic shock. "We're able to capitalize on decades of research to very quickly go from a novel discovery to a drug," Counter says.

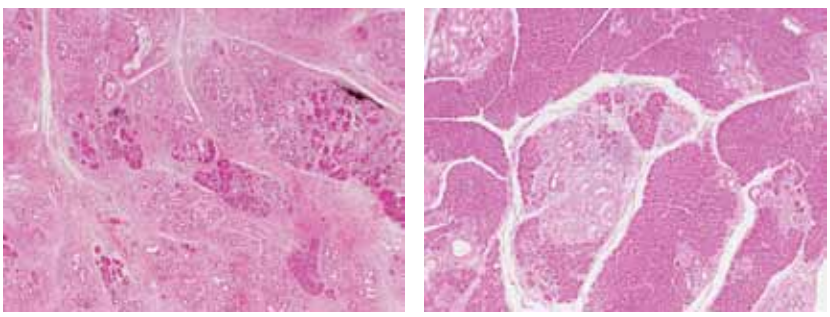
When Counter tested some of these NOS inhibitors in animal models of pancreatic cancer, he found that the drugs, which are already known to be well tolerated in animals and people, have antitumor activity. That work is not yet published, but it's already on track to the clinic. It was natural for Counter to share these findings with Chris Willett, MD, chair of Duke's Department of Radiation Oncology, where Counter has a secondary appointment. Willett and medical oncologist Hope Uronis, MD, are leveraging the findings in the hopes of developing a phase 1 human clinical trial to test a NOS inhibitor in patients with pancreatic cancer.

Another collaboration between a Duke physician and a cell-signaling scientist is already helping patients with melanoma. Todd Sullivan was diagnosed with melanoma on his right thumb in 2005. Then he learned it had spread to lymph nodes in that arm. In 2008 he enrolled in a multi-center clinical trial led by Duke that combined isolated infusion of chemotherapy to his arm with a drug called ADH-1, which scientists believe disrupts nearby blood vessels so that more of the chemotherapy is funneled to the tumor. The tumor in Sullivan's arm shrunk noticeably, and surgeons removed the remainder. It's been more than two years, and the melanoma in his arm has not recurred. "I'm going to have to take it as it comes, but right now I'm doing well," he says.

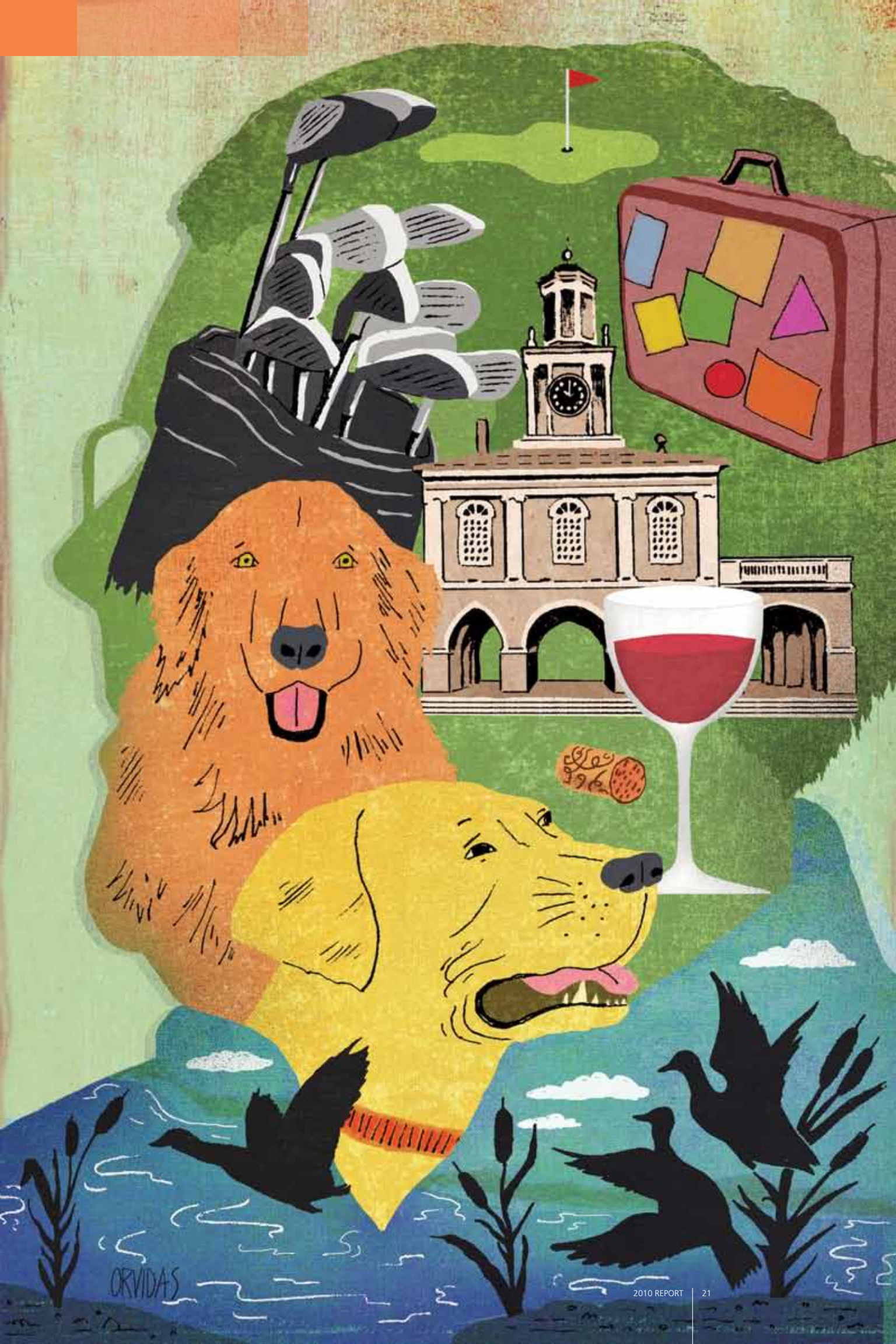
The research that led to that trial resulted from a partnership between Doug Tyler, MD, professor of surgery, who was principal investigator of the trial, and Ann Marie Pendergast, PhD, professor of pharmacology and cancer biology. When Tyler first came to Duke, he worked in Pendergast's lab before he set up his own. When Tyler began studying ADH-1, Pendergast collaborated. They co-authored the 2008 paper in *Cancer Research* that showed that ADH-1 increased the effectiveness of chemotherapy in mice, and that led to the trial that helped Sullivan.

PROMISING RESEARCH

In a model of early pancreatic cancer, untreated mice exhibit many lesions and activated stoma (left), while those treated with a NOS inhibitor retain more of the normal pancreatic architecture (right). (unpublished observations)



Todd Sullivan of Fayetteville, NC, continues to enjoy golf and duck hunting five years after being diagnosed with melanoma. A collaboration between a Duke physician and cell-signaling scientist offered him a novel therapy that shrunk the tumor before surgery.


ORVIDAS

Head and Neck Cancer

Duke is a high-volume major referral center for treatment of cancers of the mouth, salivary and thyroid glands, nasal cavity, paranasal sinuses, pharynx, larynx, and lymph nodes. The Duke Head and Neck Cancer Clinic's team of specialists in head and neck oncologic surgery, plastic and reconstructive surgery, radiation oncology, medical oncology, radiology, and pathology ensures that each patient receives state-of-the-art treatment—supported by the most advanced technology available anywhere—while maintaining the highest quality of life throughout treatment and recovery. Duke's head and neck physicians are internationally recognized experts in the field who make head and neck cancer care their primary career focus. Duke physician-researchers were at the forefront of developing innovations that are now the standard of care for treatment of head and neck cancer, such as:

- A combination of intensive radiation therapy and simultaneous chemotherapy for advanced-stage head and neck cancer
- Operations that result in better function and less disfigurement

Duke continues to advance the field, most recently developing a research program in tumor immunology—an emerging research area with potential applications in the development of vaccines for head and neck cancer.

HIGHLIGHTS

Noninvasive analysis of head and neck lesions

Researchers are currently investigating a light-based optical probe to rapidly and noninvasively analyze tumor characteristics and identify biomarkers before and during treatment. This probe, developed by Duke University biomedical engineers, may improve the ability to detect cancer and monitor the effectiveness of treatment, thus facilitating more personalized treatment recommendations.

Head and neck tissue biorepository

The Duke Comprehensive Cancer Center's Tissue and Blood Biorepository Core provides an opportunity for head and neck cancer patients to donate blood samples and excess tumor that would normally be discarded. The biorepository is a vital resource for current and future head and neck cancer research that helps to identify new biomarkers.

Immune alternations in head and neck cancer

Human papillomavirus (HPV) has been identified as a major cause of cancer in people who have never used tobacco. A clinical study is under way to examine the impact of HPV+ head and neck cancer on the immune system. These tumors have a favorable prognosis compared with HPV- tumors, and this research aims to understand the relationship between HPV status and immune system function.

Functional imaging for patients with locally advanced cancer

Duke conducted the first United States trial exploring the benefits of adding two molecularly targeted drugs to simultaneous radiation and chemotherapy in the treatment of head and neck cancer. This trial used functional metabolic imaging to evaluate the effects of treatment. A specialized type of MRI scanning—dynamic contrast enhanced MRI (DCE-MRI)—measured changes in blood flow and blood vessel function inside the tumor at multiple times during treatment. A new trial using both serial DCE-MRI and PET/CT scans is now enrolling patients.

Targeted therapies

The epidermal growth factor receptor (EGRF) is an important molecular target on the surface of most head and neck cancer cells. Duke physicians are leading a trial for head and neck cancer that uses the EGRF-targeted therapy panitumumab. Panitumumab will be added to standard radiation treatment, and gene expression analysis will seek to identify a pattern for panitumumab effectiveness.

For information about any of the clinical trials listed on this page, please contact the Clinical Trials Office at 919-668-3726.

Hematologic Malignancies

The Duke Hematologic Malignancies Program is a leading national center for hematologic cancers, improving outcomes for patients battling lymphoma, leukemia, myeloma, myelodysplasias, myeloproliferative disorders, aplasia, or other neoplastic diseases of the marrow or blood system. Nearly 1,000 new patients each year receive individualized attention from Duke's team of nationally recognized experts at Duke University Medical Center and Duke Raleigh Cancer Center.

Many of the therapies offered for leukemias and lymphomas have been developed and refined at Duke, and patients can access novel treatments through an extensive array of clinical trials. Duke hematopathologists can go beyond standard diagnostics to monitor leukemia and lymphoma patients at the molecular level using fluorescent in situ hybridization (FISH), polymerase chain reaction (PCR), and genomic techniques.

Patients benefit from a multidisciplinary approach to their care at each stage of their therapy while at Duke. Specialists in medicine, surgery, radiation therapy, and stem cell and marrow transplantation meet at least weekly to review difficult cases, debate new therapy plans, and formulate treatment algorithms. Patients are treated within a matrix of support with the care team involving physicians, nurses, nurse practitioners, physician assistants, and pharmacists discussing patients on a daily basis.

HIGHLIGHTS

CLL/SLL clinical trial

A Duke-led phase 2 trial is investigating the use of perifosine as an effective treatment for relapsed or refractory chronic lymphocytic leukemia (CLL) or small lymphocytic lymphoma (SLL). Perifosine inhibits a pathway felt to be important in the development of several types of cancers, including CLL or SLL. **For enrollment information**: davis043@mc.duke.edu or cancer.duke.edu/ctrials.

Jon Gockerman, MD, discusses treatment options with a patient in the Duke Center for Chronic Lymphocytic Leukemia.

Duke Center for Chronic Lymphocytic Leukemia

The Duke Center for CLL provides dedicated and specialized CLL/SLL clinical care, offers clinical research trials for cutting-edge therapy, and performs laboratory-based research. Duke is a member of the Genetic Epidemiology of CLL Consortium, a national collaboration that is gathering data from families with high incidence of CLL to determine which groups of genes cause the cancer and how the disease changes genetically over time.

Stem cell research

Duke researchers will use a recent $2.5-million award from the National Institutes of Health to study stem cells and the environments in which they live. This research may provide new ways to manipulate stem cell growth for patients who need new blood cells, and lead to approaches to stopping leukemias.

Targeted therapies

Duke physician-scientists are developing clinical trials to test a targeted treatment for diffuse large B cell lymphoma, using a compound that targets a pathway in the cell known as NF-KB. Targeted treatments focus on the specific pathway of the disease and spare the healthy surrounding tissue, thus potentially resulting in better treatment of the tumor with fewer side effects.

CLL breakthrough

Duke researchers have identified a protein called Musashi, which prevents cells from maturing, creating a population of immature cells—one of the hallmarks of CLL. This same molecular pathway may be related to other aggressive leukemias. (Nature online. July 18, 2010)

Hereditary Cancer Clinic

The Hereditary Cancer Clinic offers cancer risk assessment and education to cancer patients and people with a family history of cancer or other cancer risk factors. Board-certified genetic counselors work closely with medical oncologists to provide each patient with information about their personal risk of inherited cancers, ways to reduce the chance of developing cancer, and ways to increase the chance of early detection. Most frequently, the Hereditary Cancer Clinic tests for predisposition to breast, colon, and ovarian cancer, although testing related to more rare forms of cancer is also performed. Duke can test for any cancers for which a test has been developed. The clinic monitors new developments in cancer genetics and continuously evaluates new testing procedures. These services are offered at Duke University Medical Center and Duke Raleigh Hospital. Services are extended to patients in rural areas via teleconferencing with genetic counselors. Federal law prevents health insurance companies from denying coverage or raising rates due to the results of genetic tests.

HIGHLIGHTS

BRCA breakthroughs

Duke scientists were members of the team that discovered the BRCA1 and BRCA2 genes, mutations in which are a leading cause of inherited breast and ovarian cancers.

The Cancer Genetics Network

Duke is a member of The National Cancer Institute's Cancer Genetics Network (CGN). Researchers at the eight sites in the CGN have created a registry of individuals at increased risk for cancer and are looking at clinical implications of inherited cancer syndromes.

Counseling throughout NC

Duke provides genetic counseling and testing to patients in several hospitals throughout North Carolina that are affiliated with the Duke Oncology Network. Many of these hospitals are located in rural communities where this type of service was not previously available.

Clinical research

Through the Hereditary Cancer Clinic, individuals may be able to participate in research projects aimed at understanding and identifying the inherited genes that are important in cancer.

For information about the Hereditary Cancer Clinic: 919-684-3181.

Lung Cancer

At Duke, thoracic oncologists offer a multidisciplinary approach to ensure that each patient benefits from the combined expertise of our caregivers in medical oncology, thoracic surgery, radiation oncology, pulmonary medicine, and genetics. Specialists work together to deliver state-of-the-art treatment plans to patients at Duke University Medical Center and Duke Raleigh Hospital.

Duke thoracic oncology surgeons are national leaders in minimally invasive surgical procedures such as thoracoscopic lobectomy. The program's radiation oncologists focus on lung cancer and have access to specialized techniques such as stereotactic radiation therapy for early-stage lung cancer as well as radiation treatment planning aided by 4D CT technology, which tracks tumor motion caused by breathing. Duke's nationally renowned medical oncologists have developed a portfolio of targeted therapies, novel agents, and immune approaches that are integrated in multidisciplinary protocols with surgery and radiation.

Thomas D'Amico, MD, and other Duke surgeons perform over 1,000 thoracic procedures each year, including minimally invasive procedures.

HIGHLIGHTS

CALGB member

Duke is a member site of the national clinical research group Cancer and Leukemia Group B, and has consistently been one of the top institutions in terms of overall patient accrual for lung cancer trials.

National adjuvant trial

Duke is leading a national multicenter CALGB trial evaluating the role of adjuvant chemotherapy in early-stage non-small-cell lung cancer patients who are not currently receiving chemotherapy. Surgical tissue will be obtained to develop biomarkers to predict outcome and treatment benefits. **For more information** about the trial: David Harpole, MD, 919-668-8413.

Higher volume means lower mortality

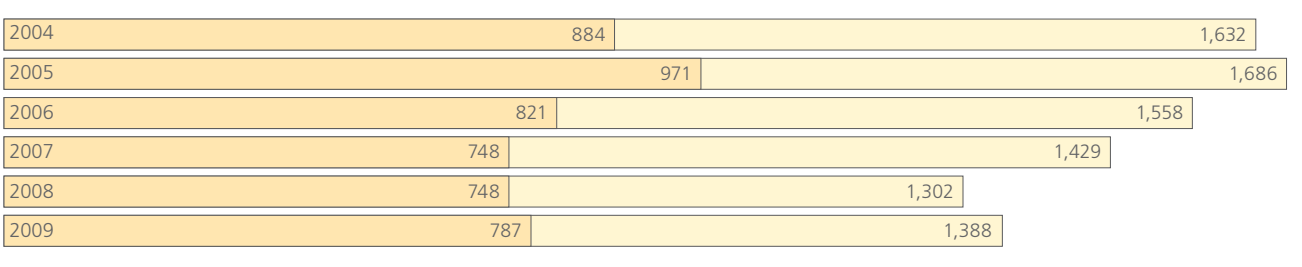
A Duke study showed that patients operated on by surgeons who do not routinely remove cancer from the lungs may be at a higher risk for complications. The study also found that mortality in teaching hospitals is slightly lower than in non-teaching institutions. (Cancer Therapy Dec 2008)

NCCN leadership

In April 2010 Duke's Thomas D'Amico, MD, was named chairman of the National Comprehensive Cancer Network's board of directors. D'Amico is medical director of Duke's oncology clinical services and professor of thoracic surgery.

Duke performs **one of the world's highest volumes** of thoracoscopic lobectomies.

GENERAL THORACIC SURGERY VOLUMES



The Promise of Cord Blood for Young Cancer Patients

When an emergency physician told Pat Bingham of Flint, Michigan, that her five-year-old son Isaiah likely had leukemia, her hands went numb. As the diagnosis was confirmed, her numbness went away, and she went into action. While Isaiah was undergoing chemotherapy to treat Philadelphia-positive acute lymphocytic leukemia, Pat was organizing a statewide bone marrow typing drive.

Two years later, as Pat and friends were adding their 750th name to the National Marrow Donor Program registry (which now included Michigan's then governor and lieutenant governor), Isaiah had a central nervous system relapse. Despite their hope and their hard work, there still was not a bone marrow match for him.

During her son's chemotherapy protocol, Pat saw several news stories on Joanne Kurtzberg's pioneering work with umbilical cord blood (UCB) transplants at Duke. A cyber friend on an online support group told Pat she was taking her daughter from California to North Carolina to see Kurtzberg.

Joanne Kurtzberg, MD, director of Duke's Pediatric Blood and Marrow Transplant Program, had performed the world's first UCB transplant from an unrelated donor in 1993. Since that time, unrelated UCB transplant has become a lifeline for children with cancer as well as metabolic and genetic diseases and disorders. An unrelated cord blood transplant, even from a mismatched donor, can be used to treat children who cannot find a bone marrow match.

Recently, in an article marking the 20th anniversary of the first use of UCB as a source of donor cells for hematopoietic stem cell transplantation, Kurtzberg noted the early skeptism of the therapy.

"Doubts were raised about whether UCB, containing 10-20 times fewer cells than bone marrow, had sufficient cells to durably engraft a myeloablated patient," she says. "And after demonstration that engraftment occurred with less graft-versus-host disease, there were doubts about whether it would confer graft-versus-leukemia activity." (Curr Opin Pediatr. Feb 2009)

Today, cord blood transplantation is an established field, and Kurtzberg is internationally recognized as a trailblazer.

Kurtzberg also is the director of the Carolinas Cord Blood Bank (CCBB), which she established in 1996. The public bank's importance grows in tandem with advances in cellular therapy. Kurtzberg recently launched a program to supply cord blood collection kits for mothers who want to donate their baby's cord blood to a public bank. The kits are available at no cost to expectant mothers and contain everything necessary to harvest the precious stem cells in the delivery room.

A New Translational Cell Therapy Center

Extending applications for cell therapy

A $10.2-million grant from the Robertson Foundation in 2010 to create the Translational Cell Therapy Center will advance Duke Medicine's trailblazing cell therapy research. The gift coincides with the first placebo-controlled, randomized clinical trial that has been specifically designed to answer key questions about the efficacy of cord blood treatments in children with cerebral palsy.

In coming years, the gift will also allow Kurtzberg and colleagues to conduct:

- Studies of cord blood stem cell transplants in certain newborns with congenital heart disease
- Studies of cord blood-derived oligodendrocyte-like cells (cells that produce myelin and insulating factors coating nerves in the brain) in certain children with genetically acquired neurodegenerative diseases
- Studies to determine the value of using cord blood or bone marrow cells in adults with stroke or brain injury resulting from radiation to treat brain cancer

Public cord blood banks have helped save thousands of leukemia patients…like Isaiah. In November 2002, Kurtzberg performed his transplant with cord blood from an unrelated donor that matched four out of six tissue types. He is now 14 years old and doing well. Typical of many cord blood transplant recipients, graft-versus-host disease was not an issue for him.

Kurtzberg looks forward to advances in cell therapy that will allow more and more kids to put childhood diseases behind them. A recent grant from the Robertson Foundation (see above) to support the research of Kurtzberg and colleagues will help make that possible. The gift will initially fund several different studies, including the use of cell therapy for patients with glioblastoma multiforme who have lost brain cells to radiation therapy.

"I think cord blood as a field will continue to expand. With partially matched cord blood, patients needing a transplant have increased access to care. In addition, there are emerging new applications I think we'll see really kicking off in five to 10 years, such as tissue repair and tissue regeneration to treat victims of drowning, falling, stroke, and low oxygen at birth, to name a few. We are only beginning to know the potential." —JOANNE KURTZBERG, MD

Isaiah Bingham, 14, of Michigan, kept up with schoolwork at Duke Hospital School when he came to North Carolina for a cord blood transplant. Today, eight years post-transplant, he and his mother make yearly trips to Durham. "Dr. K just wants to see her kids," he says.


ORVIDAS

Joanne Kurtzberg, MD, nurse practitioner Gilbert Ciocci, and patient Crystal Overcash, who received a cord blood transplant from an unrelated donor when she was three years old

Pediatric Blood and Marrow Transplants

The largest of its kind in the world, Duke's Pediatric Blood and Marrow Transplant (PBMT) Program now transplants some 100 children annually. PBMT has provided outstanding care and support to more than 1,600 children and their families since 1990. Today, over half of all the children treated at Duke since the program was established are surviving long-term and are considered cured of their underlying disease.

Children from almost every state in the United States and from around the world have had transplants at Duke. Transplantation is used to treat infants and children with refractory malignancies, immunodeficiency diseases, bone marrow failure syndromes, hemoglobinopathies, and inherited metabolic diseases.

Patients are usually seen within one to two weeks of their referral, despite a lengthy wait list, if it is determined that such speed is necessary. If transplantation is determined to be the patient's best option, donors can be identified within a week or two in most cases. Patients are hospitalized in an inpatient special care unit for approximately 55 days and receive subsequent outpatient treatment in the PBMT Clinic and Valvano Day Hospital, continuing follow-up for an additional four to six months.

Because 75 percent of children lack a traditional matched bone marrow donor, umbilical cord blood transplants are becoming the best way to treat patients with life-threatening genetic diseases and cancers.

HIGHLIGHTS

First unrelated-donor transplant

As the first medical center to use cord blood from unrelated donors to treat life-threatening cancer and other diseases, Duke leads in this field. The first unrelated cord blood transplant was performed by Duke physician Joanne Kurtzberg, MD, in 1993, for a patient with leukemia.

Transplants for sickle cell disease

Duke is translating its expertise in cord blood transplants to other diseases such as sickle cell disease. In a new Duke clinical study, children with sickle cell receive cord blood transplants, and young adults receive a half-matched bone marrow or blood transplant, reducing the intensity of chemotherapy required. This procedure is offered only by Duke and its research collaborator, the University of Louisville. **For information**: 919-668-6536 or baker133@mc.duke.edu.

Harvesting and banking

Duke is one of only a few US medical centers also equipped to harvest and bank cord blood, through the Carolinas Cord Blood Bank (CCBB) at Duke. The CCBB is one of the largest public cord blood banks in the world, currently storing approximately 27,000 units.

Autologous cord blood for brain injury

A Duke pilot study is testing feasibility of collection, preparation, and infusion of a baby's own umbilical cord blood in the first 14 days after birth if the baby is born with signs of brain injury. **For information**: 919-681-4913 or kimberley.fisher@duke.edu.

"This program is a godsend."

—**SUSAN ROBERTS**, MOTHER OF A LEUKEMIA PATIENT

Pediatric Cancers

The Duke Pediatric Oncology Program offers children, adolescents, and young adults individualized therapeutic plans, many of which were developed through the National Cancer Institute-supported Children's Oncology Group. The program sees over 100 newly diagnosed patients per year.

Physicians in the Pediatric Oncology Program have special expertise in neuroblastoma, rhabdomyosarcoma, leukemia, and brain tumors. Specific cancers treated include acute lymphoblastic leukemia (ALL) and acute myeloid leukemia (AML), Hodgkin and non-Hodgkin lymphoma, neuroblastoma, Wilms tumor, retinoblastoma, Ewing sarcoma, osteosarcoma, other soft tissue sarcomas, hepatoblastoma, brain and spinal cord tumors, Langerhans cell histiocytosis, and germ cell tumors.

Duke's Long-Term Cancer Survivor Clinic serves patients under the age of 25 who have been off treatment for five years or more, and is a truly multidisciplinary clinic for long-term survivors of cancer. Duke also offers fertility-preserving strategies for children, a support group for adolescents with cancer and their families, and a Quality of Life program that provides palliative care and support services from the time of diagnosis onward.

Drake Hardee, center, of Grifton, NC, is receiving treatment for neuroblastoma at Duke Children's Hospital & Health Center.

HIGHLIGHTS

Children's Oncology Group

Through its membership in the National Cancer Institute-supported Children's Oncology Group (COG), Duke offers enrollment in trials of novel therapeutic protocols for pediatric cancer. **For enrollment information**, call 919-684-3401.

Novel trials for brain tumors

Duke leads a large phase 2 study of bevacizumab plus irinotecan in children with recurrent malignant glioma, diffuse brain stem glioma, medulloblastoma, ependymoma, and low-grade gliomas, managed through the National Cancer Institute's Pediatric Brain Tumor Consortium. **For information** visit cancer.duke.edu/ctrials.

Mouse models of AML

Duke physician-scientists are developing mouse models of acute myeloid leukemia (AML) to investigate novel mechanisms by which AML develops in infants. Interfering with endocytosis, one mechanism by which growth factor signaling is turned off, may lead to new approaches for this difficult-to-treat pediatric cancer.

Pediatric neuroblastoma

Duke offers treatment options for neuroblastoma not found at many other institutions, including our experienced bone marrow transplant program and a new treatment program using MIBG, a compound that selectively concentrates in neuroblastoma tumor cells, to selectively deliver tumor-killing radioactive iodine.

Prostate/Genitourinary Cancer

Duke offers one of the country's premier comprehensive treatment, training, and research programs for prostate cancer and other genitourinary cancers, including bladder, renal, and testicular cancers.

The Duke Prostate Center is a multidisciplinary clinic where physicians, research scientists, and health care providers seek to prevent prostate cancer and improve the care of men living with prostate cancer.

Duke employs a team approach to the prevention and treatment of prostate and other genitourinary cancers. Together, caregivers provide information and consultation at the time of diagnosis, providing state-of-the-art treatment options in urology, radiation oncology, and medical oncology, and new treatments based on basic, translational, and clinical research.

Prostate cancer patients can also access the latest novel therapies through enrollment in clinical trials. Duke is one of only 13 institutions nationwide selected to participate in the Department of Defense Prostate Cancer Clinical Trials Consortium, which facilitates enrollment in phase 1 and phase 2 clinical trials and improves drug development for prostate cancer.

Both a minimally invasive, open, nerve-sparing technique and a robotically assisted technique are offered for prostatectomy. The program's surgical volume for radical prostatectomy is in the top 10 nationwide.

Duke University Medical Center is **ranked #7** in the nation in urology by *U.S.News & World Report*.

620
radical prostatectomies were performed at Duke in FY10

HIGHLIGHTS

Renal cell carcinoma clinical trial

A Duke investigator-initiated trial is studying the anti-tumor activity of two drugs in patients with metastatic non-clear cell renal cell carcinoma. **Contact** Andrew Armstrong, MD, at andrew.armstrong@duke.edu.

Coping in African American men

A Duke study sponsored by the Department of Defense seeks to learn more about improving quality of life and enhancing recovery in African American men with prostate cancer. The study uses an 8-week group intervention. **Contact** Lisa Campbell, PhD, at campb069@mc.duke.edu.

Dietary changes

Duke researchers are studying the effects of a low-carbohydrate diet in improving blood sugar control for men starting hormonal therapies. **Contact** Loretta Taylor, at loretta.taylor@duke.edu.

Statins and prostate cancer

A Duke study shows that statins—used to lower cholesterol—also significantly lower the degree of inflammation within prostate tumors. The response may, in part, explain why men on statins have a lower risk of disease progression. Previous studies have shown that statins reduce systemic inflammation, but the Duke researchers were interested in finding out if the drugs reduced inflammation inside tumors, so-called intra-tumoral inflammation, which is believed to contribute to cancer recurrence after surgery. (Cancer Epidemiol Biomarkers Prev. March 2010)

Exercise and ED

The effects of aerobic exercise training on erectile dysfunction among 50 sedentary men undergoing radical prostatectomy for clinically localized prostate cancer are being studied at Duke. **Contact** Lee Jones, PhD, at lee.w.jones@duke.edu.

Novel radiation protocol

Duke has opened the SMART trial (Stereotactic Motion-Adjusted RadioTherapy) for men with newly diagnosed prostate cancer. The trial uses the latest technologies to deliver five doses of radiotherapy over two weeks, reducing the duration of treatment, limiting the volume of normal tissue radiated, and potentially decreasing rectal and bladder toxicity. **Contact** Paula Kennedy-Newton at 919-668-3726.

EXPANDING PROGRAM

203
surgical procedures for melanoma in 2008

256 surgical procedures for 2009

500
projected total melanoma procedures for 2010, including regional therapies and Mohs surgery

Kelly Nelson, MD, uses the confocal microscope—one of only about 30 in the world.

Skin Cancer (Melanoma)

Duke's Melanoma Program is one of the most comprehensive melanoma treatment and research programs in the world, offering the full spectrum of care from screening and surveillance, through management of primary disease, to treatment for recurrent and metastatic disease. Duke offers systemic treatment for people with advanced or progressing melanoma, including high-dose interleukin-2 (IL-2), multi-agent chemotherapy, novel treatments, and clinical trials. Duke is one of a limited number of cancer centers in the Southeast that has the expertise to offer patients treatment with high-dose interferon alpha, a therapy used to prevent recurrences in patients with stage 2 or stage 3 melanoma. Duke also conducts clinical trials testing new ways to use interferon-based therapies, as well as vaccine therapies, to prevent recurrences in patients with stage 2 and stage 3 melanoma. Mole-mapping technology, pioneered by Duke researchers and now used around the world, allows physicians to detect the earliest signs of melanoma by maintaining and monitoring photographic records of the skin. Duke also has dermatopathologists who review every tumor.

HIGHLIGHTS

Primary referral center

Approximately 500 new melanoma patients from across the country come to Duke for treatment each year.

Largest regional therapy program in the US

Duke offers the largest regional therapy program in the country for advanced extremity melanoma. Duke surgeons are among the national leaders in developing novel techniques that allow regional delivery of new therapeutic agents to an extremity affected by melanoma. These regional treatments allow high doses of chemotherapy to be given without affecting the rest of the patient's body.

One of the world's largest melanoma databases

Duke has prospectively maintained a database of melanoma patients for over three decades—one of the largest melanoma registries in the world. The database contains over 14,000 patients. This resource is managed by a multidisciplinary board and enables researchers to perform retrospective analyses of recurrence patterns and other outcomes.

Mohs surgery

Duke offers patients Mohs micrographic surgery for selected melanomas. This treatment not only has a higher cure rate than any other treatment method, but also creates the smallest possible wound, permitting the best cosmetic result.

Advancing vaccine therapy

With a long history of pioneering vaccine development in melanoma, Duke is working to develop a new generation of tumor vaccines. The new vaccines are designed to augment the function of the body's main immune-fighting cell, the dendritic cell. A phase 1 study, open to subjects with metastatic melanoma, is assessing vaccination with melanoma tumor-associated antigen-encoding RNA-transfected mature dendritic cells. **For information**: Scott Pruitt, MD, PhD, scott.pruitt@duke.edu.

Laser evaluation technology

Duke is one of only a handful of centers using a reflectance confocal microscope to diagnose and study melanoma. The laser microscope lets clinicians and researchers look into the skin to a depth of about 0.4 mm, with near histologic-level resolution, to help determine if an area is skin cancer before a biopsy. The tool also allows one to see the blood moving through blood vessels and to study vascular morphology in tumors in real-time. There are approximately 30 confocal microscopes in use in the world.

LOCATIONS

Outpatient clinics

Duke University Medical Center North Pavilion
2400 Pratt Street
Durham, NC 277705

- Bone Marrow and Stem Cell Transplantation Programs
  919-668-1000 (adult)

Duke University Medical Center Morris Cancer Clinic
200 Trent Drive
Durham, NC 27705

- Breast Oncology
  919-668-6688
- Gastrointestinal Oncology
  919-668-6688
- Gynecologic Oncology
  919-684-3765
- Hematology Oncology (Lymphoma and Leukemia)
  919-681-7648
- Melanoma (Skin Cancer)
  919-668-8964
- The Preston Robert Tisch Brain Tumor Center at Duke
  919-684-5301
- The Duke Prostate Center (Genitourinary)
  919-668-8108
- Radiation Oncology
  919-660-2100
- Sarcoma
  877-SARC-DUKE
- Thoracic Oncology (Lung, Esophageal)
  919-668-6688

Duke Raleigh Cancer Center
3400 Wake Forest Road
Raleigh, NC 27609
919-862-5400
dukeraleighhospital.org

- Radiation Oncology
  919-862-5400
- Hematology Oncology (Lymphoma and Leukemia)
  919-862-5400

Duke Children's Hospital and Health Center
2301 Erwin Road
Durham, NC 27710
919-668-4000
dukechildrens.org

- Hematology Oncology (Lymphoma and Leukemia)
  919-684-3401
- The Preston Robert Tisch Brain Tumor Center at Duke
  919-684-5301

Inpatient locations

Duke University Hospital
2301 Erwin Road
Durham, NC 27710
919-684-8111
dukehealth.org

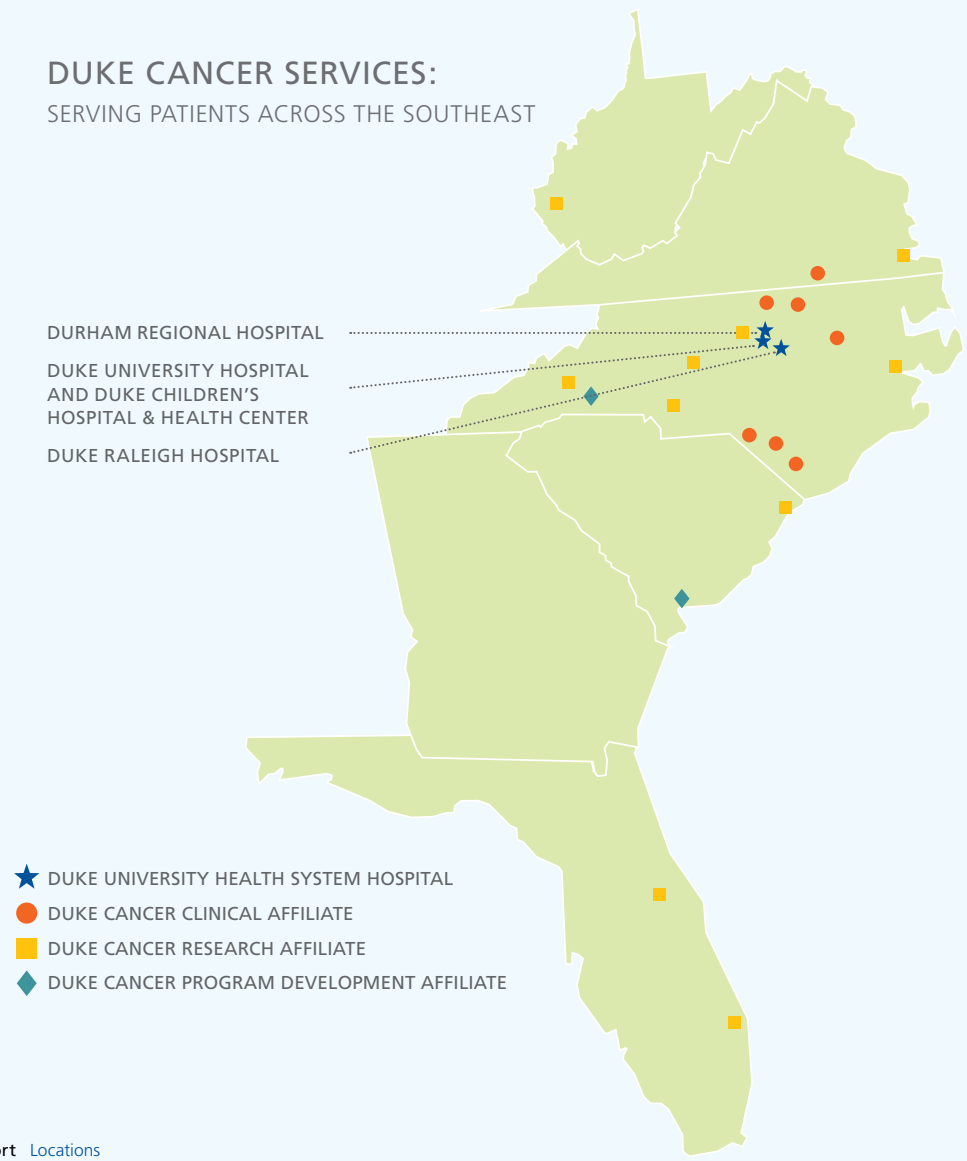
Duke Children's Hospital and Health Center
2301 Erwin Road
Durham, NC 27710
919-668-4000
dukechildrens.org

Duke Raleigh Hospital
3400 Wake Forest Road
Raleigh, NC 27609
919-954-3000
dukeraleighhospital.org

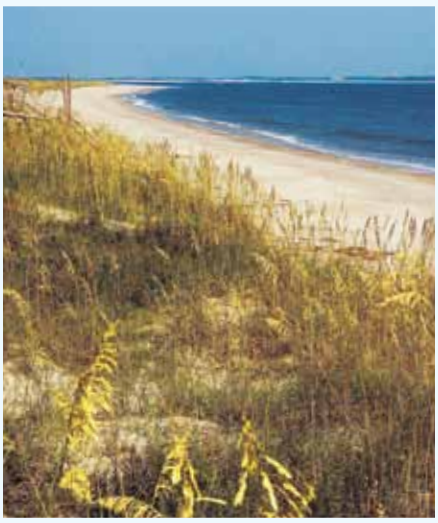
Durham Regional Hospital
3643 Roxboro Road
Durham, NC 27704
919-470-4000
durhamregional.org

DUKE CANCER SERVICES:

SERVING PATIENTS ACROSS THE SOUTHEAST



AFFILIATIONS



The Duke Oncology Network (DON) brings Duke's strengths in oncology to community practices across the Southeast. Duke provides an array of services to a regional network of community cancer programs sharing a commitment toward excellence in cancer care. In addition to eight clinical affiliates, the network includes ten research affiliates and program development affiliates (see pages 34–35).

Clinical affiliates

The DON and various hospitals within close geographic proximity to Duke University Medical Center partner to develop and manage clinical oncology programs, whether medical oncology, radiation oncology, or both. Clinical affiliates are staffed by Duke medical oncologists, radiation oncologists, physician extenders, and fellows.

Research affiliates

A research affiliation with the DON offers expertise in the development and management of a quality oncology research program. Affiliation includes access to Duke investigator-initiated clinical trials, national cooperative group trials such as CALGB (Cancer and Leukemia Group B) studies, pharmaceutical industry studies, and collaborative research.

Program development affiliates

In response to development, growth, and expansion needs of hospitals over a diverse geographical area, the DON offers a Program Development Affiliation. This affiliation generally offers consultative management and administrative functions, clinical relationships between community-based providers and Duke faculty/staff, and clinical trials development and management.

The program-development relationship is extensively customized depending on the capabilities, needs, and interests of each affiliate organization. Programmatic development can be comprehensive or focused on a specific subspecialty program, such as bone marrow transplantation.

For more information on the Duke Oncology Network, please contact us.

Duke Oncology Network
3100 Tower Blvd., Suite 600, Box 80
Durham, NC 27707
Phone: 919-419-5500
Fax: 919-493-3234
renee.muellenbach@duke.edu
linda.sutton@duke.edu

AFFILIATIONS

Clinical affiliates

Duke hematology and oncology physicians evaluate, offer treatment, and manage patients at each of these locations. All of our affiliates offer chemotherapy, infusions, and other supportive treatment services on a Monday through Friday schedule. All patients also have access to a variety of clinical trials.

Columbus Regional Healthcare System
Donayre Cancer Care Center

711 North Franklin Street
Whiteville, NC 28472
910-641-8220

This outpatient cancer clinic offers diagnostic and treatment resources in a convenient setting. Services include chemotherapy, an in-clinic pharmacy, access to clinical trials, and a nurse navigator to support social service and supportive care needs of their patients.

Community Memorial Healthcenter
CMH Cancer and Specialty Care Center

750 Lombardy Street
South Hill, VA 23970
434-774-2417

Comprehensive cancer services include advanced cancer treatments such as chemotherapy, clinical trials, laboratory, pharmacy, diagnostic x-ray, nutritional support, counseling, social services, and supportive services. A fitness center and physical therapy services are also conveniently located within the same facility.

Granville Medical Center

1010 College Street, Suite 1030
Oxford, NC 27565
919-690-3000

Hematology and medical oncology consultation services are offered by Duke physicians at this center. Chemotherapy is also available on-site.

Johnston Health–Smithfield
Johnston Cancer Center

514 North Brightleaf Boulevard, Suite 1100
Smithfield, NC 27577
919-989-2192 or 989-5891

The cancer center offers quality cancer care and management of oncology and hematologic problems, including anemia and coagulation disorders. All services are coordinated by a Duke medical oncologist. Full infusion services are available in addition to an in-clinic pharmacy, access to Duke clinical trials, a dedicated social worker, and a coordinated home health and hospice programs. Currently a genetic counseling study is open at this site.

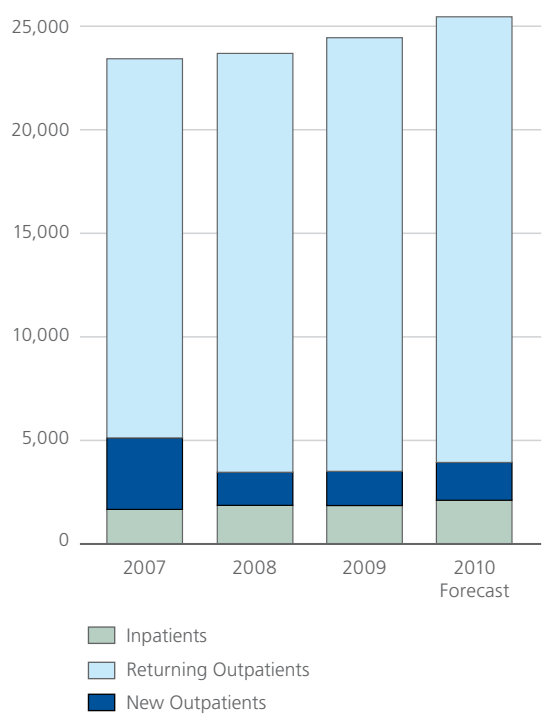
Maria Parham Medical Center
Maria Parham Oncology Center

566 Ruin Creek Road
Henderson, NC 27536
252-436-1880

Duke oncologists deliver multidisciplinary evaluation and treatments to patients for both medical and radiation oncology. Specialized radiation oncology services such as IGRT and IMRT are available on-site. The center staffs certified oncology nurses to deliver chemotherapy and Duke credentialed radiation technologists to deliver radiation therapy. Patients also have access to a wide array of Duke clinical trials. Currently patients may enroll in a genetic counseling study. Patients have access to a social worker, nutritionist, support groups, and an on-site cancer resource center. Maria Parham also offers frequent "Lunch and Learn" programs for patients and family. A newly renovated treatment space with access to gardens opened in fall 2010.

DUKE ONCOLOGY NETWORK CLINICAL VOLUMES

In 2009, more than 2,250 new patients were seen by Duke oncologists in their home communities.



Person Memorial Hospital
615 Ridge Road
Roxboro, NC 27573
336-503-5776
This clinic offers on-site consultation with Duke physicians for medical oncology services in addition to chemotherapy and supportive services.

Scotland Memorial Hospital
Scotland Cancer Treatment Center
500 Lauchwood Drive
Laurinburg, NC 28352
910-291-7630; 877-762-2735 (toll-free)
The Treatment Center offers quality cancer care and management of oncology and hematologic problems by Duke physicians. The center includes an aesthetically pleasing chemotherapy suite, and a new radiation therapy linear accelerator and simulator. A breast cancer multidisciplinary clinic is available, and a full-time social worker assists patients and families with their financial and support needs. An in-clinic pharmacy is available as are access to Duke clinical trials.

Southeastern Regional Medical Center
Gibson Cancer Center
1200 Pine Run Drive
Lumberton, NC 28359
910-671-5730
Gibson Cancer Center is the largest of the DON clinics and provides medical oncology and hematology services. The nurses delivering chemotherapy are oncology nursing certified. Patients have access to Duke clinical research studies that currently include a genetic counseling study. The center also provides radiation therapy and hosts an on-site laboratory and pharmacy. A pharmacist is available to provide counseling and education to patients about their medications. Support services are on-site and include an information resource library, a full-time oncology therapist, and an on-site dietitian. Numerous support groups and educational programs are offered in cooperation with the American Cancer Society. This program is accredited by the American College of Surgeons.

Research affiliates

Alamance Regional Medical Center
1240 Huffman Mill Road
Burlington, NC 27215
336-538-7000

Carolinas Medical Center NorthEast
George A. Batte Jr. Cancer Center
100 Medical Park Drive
Concord, NC 28025
704-403-1370

Charles George VA Medical Center
1100 Tunnel Road
Asheville, NC 28805
828-298-7911

Coastal Cancer Center
8121 Rourk Street
Myrtle Beach, SC 29572
843-692-5000

Comprehensive Cancer Care–
Marion L. Shepard Cancer Center
1209 Brown Street
Washington, NC 27889
252-975-4308

Florida Hospital
2501 North Orange Avenue
Orlando, FL 32803
407-303-2000

Palm Beach Cancer Institute
1309 North Flagler Drive
West Palm Beach, FL 33401
561-366-4100

Presbyterian Hospital
200 Hawthorne Lane
Charlotte, NC 28204
704-384-4000

St. Mary's Medical Center
Regional Cancer Center
2900 1st Avenue
Huntington, WV 25702
304-526-1234

Virginia Oncology Associates
5900 Lake Wright Drive
Norfolk, VA 23502
757-466-8683

Program development affiliate

Beaufort Memorial Hospital
Keyserling Cancer Center
1680 Ribaut Road
Port Royal, SC 29935
843-522-7925
Two full-time medical oncologists provide a full array of cancer services. Chemotherapy, infusions, and access to Duke clinical research studies are offered, as well as image-guided radiation therapy (IGRT) and intensity modulated radiation therapy (IMRT). Numerous support groups, a patient library and exercise programs are available to patients with cancer.

Rutherford Hospital
288 South Ridgecrest Avenue
Rutherfordton, NC 28139
828-286-5000

CANCER CLINICAL AND RESEARCH **LEADERSHIP**

Disease-Site Program Directors

BRAIN TUMORS

« **Allan Friedman, MD**, Director
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Darell Bigner, MD, PhD, Associate Director for Basic Science

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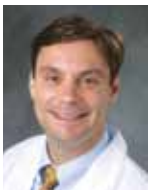
David Rizzieri, MD, Associate Director for Clinical Research

John Chute, MD, Associate Director for Basic Science



PROSTATE/GENITOURINARY CANCER

« **Daniel George, MD**, Director
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Donald McDonnell, PhD, Associate Director for Basic Science

MELANOMA

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Douglas Tyler, MD, Associate Director for Clinical Research

David Kirsch, MD, PhD, Associate Director for Basic Science

SARCOMA

« **Brian Brigman, MD, PhD**, Director
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Richard Riedel, MD, Associate Director for Clinical Research

David Kirsch, MD, PhD, Associate Director for Basic Science

Approach-Based Program Directors

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Daniel Sullivan, MD

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Huntington Willard, PhD

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Yiping Yang, MD, PhD

CANCER BIOLOGY AND REGULATION

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Ann Marie Pendergast, PhD

CHEMICAL GENOMICS AND STRUCTURAL BIOLOGY

« **Donald McDonnell, PhD**
donald.mcdonnell@duke.edu

Neil Spector, MD

Eric Toone, PhD

NUCLEIC ACID BIOLOGY

« **Bruce Sullenger, PhD**
bruce.sullenger@duke.edu

Mariano Garcia-Blanco, MD, PhD

Learn more about our faculty, their clinical and research interests, and representative publications at **dukehealth.org**.

"Patients come away feeling liberated because they know they've been very, very carefully evaluated and given multiple options."

—CARY ROBERTSON, MD

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RESOURCES FOR CLINICIANS

Consultations and Referrals

Referring physicians who would like to make an appointment, refer a patient, or find out more information about cancer services at Duke may call the Duke Consultation and Referral Center.

Physicians call: **800-MED-DUKE** (toll-free) or **919-416-DUKE** (local)

Patients call: **888-ASK-DUKE** (888-275-3853)

Many of our programs (breast, thoracic, gastrointestinal, sarcoma, prostate) use a patient coordinator to facilitate new patient scheduling and record collection. Our Oncology Scheduling Hub can direct calls to these individuals: **919-668-6688**.

Learn more online

For clinicians, we recommend: **cancer.duke.edu**

For patients, we recommend: **dukehealth.org/cancer**

Clinical trials now enrolling patients: **cancer.duke.edu/ctrials**

Continuing medical education opportunities: **cme.mc.duke.edu**

Other educational opportunities for health professionals: **www.dcri.duke.edu**

A PDF of this publication: **dukemedicine.org/cancerreport**

DukeMedicine

This report is printed on Utopia Two, 100-lb. text stock. Environmental savings realized by using this paper are summarized below: Lbs of Paper used **XXX** | Wood Saved in Lbs **XXX** | Water Saved in Gallons **XXX** | Landfill Waste Reduced in Lbs **XX** | Net Greenhouse Emissions Saved in Lbs **XXX** | Energy Consumption Reduced in BTU **XXX**

While care was taken to ensure the accuracy of data and information reported in this publication, any necessary updates or corrections will be available at dukemedicine.org/cancerreport.