This is the Duke Cancer Institute

OPTIONS. COMPASSION. HOPE.

2011 Report

The Duke Cancer Institute: Welcome to everything cancer care should be

ON THE COVER

When cancer invades, it can disrupt more than our tissues and organs—it can disrupt life as we know it. Surrounded by family and friends… by knowledge and compassion… by options and hope…we fight back and celebrate every victory, small and large.

CONTENTS

Options. Compassion. Hope.

To say that it's a pivotal moment in cancer at Duke is almost an understatement. When I arrived here in August 2011, the cancer enterprise's identity as the Duke Cancer Institute was still fresh, and construction was progressing on an amazing new cancer treatment facility due to open in several months. The excitement on campus was palpable.

The changes at Duke coincide with an extraordinarily exciting time in cancer research and care. We've made many advances in the past 40 years since the "war on cancer" was declared. At that time, we didn't have the technology or the knowledge base necessary to win a war, but we've come a very long way since then. Today, we are designing drugs to treat cancer in a very targeted way. We will continue to develop drugs over the next decade that will hit the Achilles' heels of tumors without harming healthy tissue.

The Duke Cancer Institute is poised to quicken the pace by being a national model for the way cancer programs should be structured—bringing together education, research, and patient care for the good of our patients and patients all over the world.

There were two primary reasons I wanted to come to the Duke Cancer Institute. First, Duke has incredible intellectual capital to apply to cancer—not only within the Institute but across campus in the schools of environment and engineering, the department of community and family medicine, the institutes of global health and of genome sciences and policy, and more. I am also excited to partner with local community agencies and neighboring universities.

I was also attracted by the vision of the DCI. There is no question that great patient care is tightly linked to great research. The DCI merges everything from basic research to patient care into a seamless continuum.

Perhaps the most visible representation of Duke's commitment to cancer care and research is the new Duke Cancer Center facility. We are very excited to open the doors in February 2012 to our patients, who, in the midst of what is likely the worst time in their lives, will receive multidisciplinary care and optimal support in a warm, healing environment.

We've come so far and made so many advances in recent decades. Today, whether you are a researcher, provider, or patient, I truly believe there is no better place to continue the fight than at the Duke Cancer Institute.

Sincerely,

Michael B. Kastan, MD, PhD
Executive Director
Duke Cancer Institute

Ushering in a new era of cancer research and care at one of the world's leading academic health systems, Duke Medicine has created the Duke Cancer Institute (DCI).

The DCI promises to become a national model for the way cancer programs will be structured in the future. "It's exactly what cancer medicine should be. It's the merging and strategic oversight of a seamless structure, including everything from basic research to patient care, all part of a continuum," says Michael Kastan, MD, PhD, a renowned cancer physician-scientist, former director of the comprehensive cancer center at St. Jude Children's Research Hospital, and the new executive director of the DCI.

Kastan arrived at Duke in August 2011—soon after the announcement of the DCI and just before the opening of the Duke Cancer Center facility. Together, these events are creating excitement nationally and locally, among patients, the community, and Duke researchers and caregivers.

The DCI is a single entity—the first of its kind at Duke—which promotes collaborations between individuals involved in cancer care, research, and education. It was created to do nothing less than transform cancer care.

Specifically, the Duke Cancer Institute provides:

- **A single leader** who is responsible for both clinical and research activities
- **Enhanced collaboration** between research and clinical enterprises, facilitating translational research
- **An integrated organization** that advances and empowers multidisciplinary disease-site clinical care teams
- **Disease groups**, each with a team of leaders representing clinical care, clinical research, and basic research, who work together to promote and advance the diagnosis, treatment, and continuing care of cancer patients
- **NCI-designated programs** that address specific areas including genomics, prevention, radiation oncology, and more, which are closely aligned with the disease-site programs and designed to take advantage of research opportunities impacting cancer care
- **New resources** to construct first-class clinical and research facilities, recruit the best faculty and staff, and ensure the newest technologies for the most advanced care

"The Duke Cancer Institute represents Duke's highest commitment to the transformation of cancer care and research."

VICTOR J. DZAU, MD, DUKE UNIVERSITY CHANCELLOR FOR HEALTH AFFAIRS

At a Glance: Duke Cancer Institute

Who we are

- The Duke Cancer Institute integrates patient care and research with the goals of improving patient outcomes, decreasing the burden of cancer, and accelerating scientific progress. First established in 1973 as one of the original eight comprehensive cancer centers designated by the National Cancer Institute, the DCI today remains one of only 40 in the country.
- Duke University Medical Center is ranked among the **top hospitals in the nation** 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, including the National Institutes of Health, the National Cancer Institute, the American Cancer Society, and other organizations.

What we do

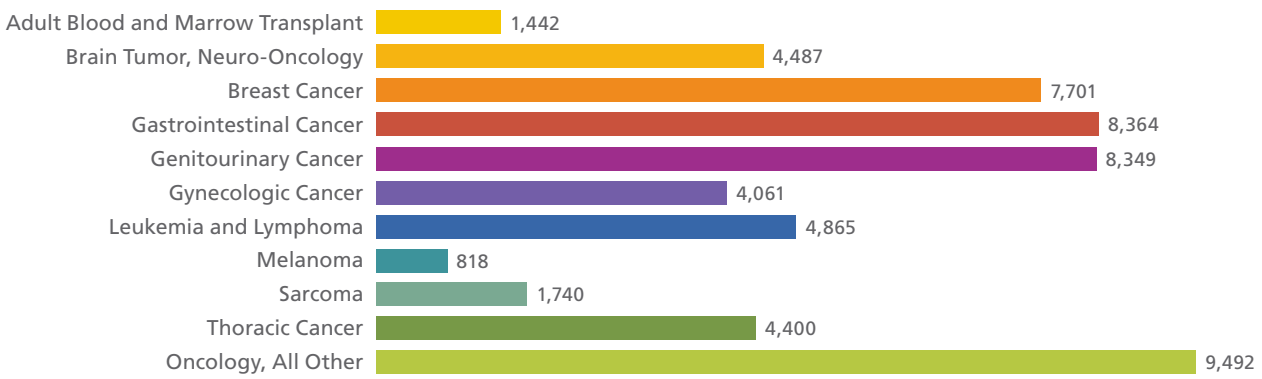
- The Duke Cancer Institute provides specialized care to patients, **treating every cancer type, with more than 100 oncology-dedicated, board-certified physicians and 500 clinical staff**—nurses, physician assistants, social workers, nutritionists, and others—dedicated to cancer.
- Duke advances the world's knowledge of cancer. Last year alone, members of the Duke Cancer Institute published **622 papers in peer-reviewed journals**. More than **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

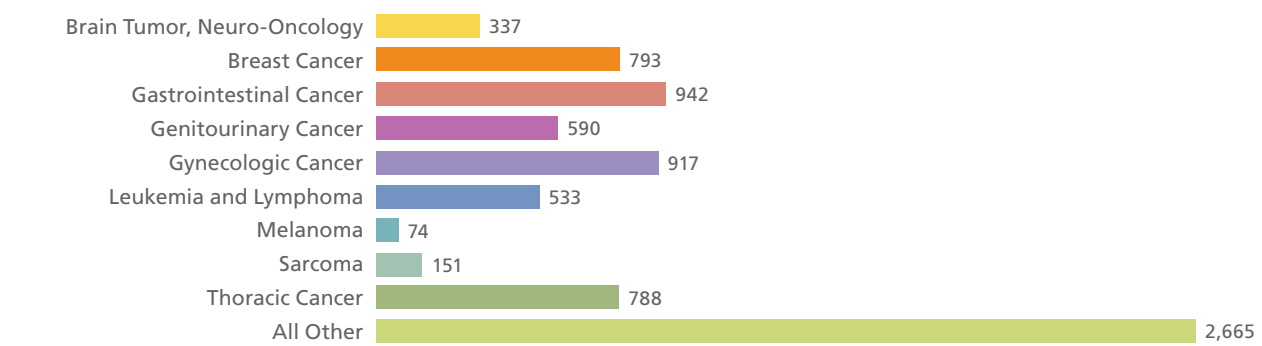
- Patients come to Duke Cancer Institute from **every state in the nation** and every county in North Carolina.
- Nearly **50,000 individuals with a cancer diagnosis** were seen at Duke University Hospital and clinics in fiscal year 2010, including more than 6,000 new patients.

In calendar year 2010, Duke had 869 oncology clinical trials open with 5,979 patients enrolled.

PATIENTS SEEN BY DUKE CANCER INSTITUTE SPECIALISTS AT **DUKE UNIVERSITY HOSPITAL AND CLINICS** IN FY 2011



PATIENTS SEEN BY DUKE CANCER INSTITUTE SPECIALISTS AT **DUKE RALEIGH HOSPITAL** IN FY 2011



A new, leading-edge facility, the Duke Cancer Center, opens February 2012

With the 2010 launch of the Duke Cancer Institute and the opening of the new Cancer Center facility in February 2012, Duke Medicine is making an unparalleled commitment to patient-focused, research-driven cancer care.

The new Cancer Center building will optimize the very essence of the Duke Cancer Institute model—providing an environment designed to integrate care and research. The synergy fostered by the cancer facility and the DCI will accelerate the translation of research discoveries into the most advanced clinical care for patients.

"This is the beginning of a new era for cancer research and care at Duke that will transform the way patients are treated and that will unite every aspect of our clinical and research mission," says Michael B. Kastan, MD, PhD, executive director of the Duke Cancer Institute.

Putting our heads together

In the new building, caregivers will work as multidisciplinary teams organized to ensure communication among providers and convenience for the patient. Patients will benefit from having physicians, advanced practice providers, nurses, clinical trials team members, pharmacists, counselors, social workers, and dieticians working side by side to provide comprehensive care.

Almost all clinical cancer services offered at Duke's main campus will be located in the new facility, including pathology, imaging, radiation oncology, and infusion, supporting multidisciplinary care and improving accessibility for patients.

Greater synergy between cancer treatment and clinical trial opportunities will be achieved through the co-location of all the different cancer care services. The building will house dedicated space where clinical research nurses can speak privately with patients about clinical trial opportunities. Clinical trials—one of the significant advantages of receiving care at Duke—are an important care option for many patients, and the clinical trial enrollment process will improve in the new building.

Joseph Moore, MD, a medical oncologist with the DCI, says his group is going to benefit from having pathology services nearby. "Looking at actual pathologic material and being able to make a decision in real time while the patient is still in the clinic helps ease patient anxiety, since answers and next steps may be identified before they leave the building rather than their having to wait anxiously for critical information and decisions," Moore says.

Taking care

In addition to convenience and collaboration, the building was designed with comfort and healing in mind. "Delivering care to our patients in a healing environment that meets their clinical, spiritual, emotional, and psychosocial needs has become an increasingly vital part of our cancer care," says Kevin Sowers, MSN, RN, FAAN, president of Duke University Hospital.

Some of the unique, patient-centered features of the building include a quiet room for personal reflection, a patient resource library, a nutritional café, a boutique, and a rooftop garden.

"We are committed to creating an environment in which all of our cancer researchers, physicians, educators, and staff come together as one team focused on the needs of the patient," says Victor J. Dzau, MD, Duke chancellor for health affairs and CEO of Duke University Health System.

Part of a new landscape

The new building is answering the growing demand and need for Duke Medicine-quality cancer services. It is one of the many strategic building projects taking place on campus that will shape the future of Duke Medicine for decades to come. The DCI also serves patients at the Duke Raleigh Cancer Center, which has also undergone new renovations and expansions.

Learn more at dukehealth.org/cancer.

Faculty and Staff Honors

Recent National Awards and Leadership Positions of DCI Faculty

Seven Duke cancer researchers have been awarded the distinction of **AAAS Fellow** by the American Association for the Advancement of Science: **Blanche Capel, PhD**[1]; **Maria E. Cardenas-Corona, PhD**; **Mark W. Dewhirst, DVM, PhD**[2]; **Sally Kornbluth, PhD**[3]; **Ann Marie Pendergast, PhD**[4]; and **John D. York, PhD**[5].

Robert Lee, MD[6], has been selected by the American Brachytherapy Society (ABS) as the recipient of the 2011 ABS Ulrich Henschke Award. This award was first given in 1981 and represents the highest honor bestowed by the ABS.

A 2009 *New England Journal of Medicine* article by researchers at the Duke Cancer Institute and the Preston Robert Tisch Brain Tumor Center was recently deemed one of the most important cancer papers in the last two years, according to leaders in the field surveyed by the journal *Nature Medicine*. The scientists discovered mutations in two genes that could become immediate diagnostic markers and potential therapeutic targets in malignant glioma, a dangerous class of brain tumors. Duke authors on the paper are **Hai Yan, MD, PhD**[7]; **Genglin Jin, PhD**; **Roger McLendon, MD**[8]; **B. Ahmed Rasheed, PhD**; **Ivan Kos, PhD**; **Ines Batinic-Haberle, PhD**; **Henry Friedman, MD**[9]; **Allan Friedman, MD**[10]; **David Reardon, MD**[11]; **James Herndon, PhD**; and **Darell D. Bigner, MD, PhD**[12].

Christopher Willett, MD[13], received an ASCO Statesman Award at the ASCO Annual Meeting in June 2011. The ASCO Statesman Award recognizes ASCO members for their extraordinary volunteer service, dedication, and commitment to ASCO.

Robert J. Lefkowitz, MD[14], Howard Hughes Medical Institute investigator, has been awarded the highest honor of the Association of American Physicians, the George M. Kober Medal.

J. Brice Weinberg, MD, has received the ***William S. Middleton Award*** by the U.S. Department of Veterans Affairs. The William S. Middleton Award, given for outstanding achievement in biomedical or behavioral research, is Biomedical Laboratory Research and Development Service's highest honor for scientific achievement.

H. Kim Lyerly, MD[15], was appointed to the Council of Councils at the National Institutes of Health (NIH). Additionally, he serves on the Office of AIDS Research Advisory Council, an NIH advisory council.

Andrew Berchuck, MD[16], who received the Barbara Thomason Ovarian Cancer Professorship from the American Cancer Society (ACS) in 2005, received a renewal of this award for another five years.

Jen-Tsan Ashley Chi, MD, PhD, has been elected to the American Society of Clinical Investigation (ASCI), an honor society of physician-scientists.

Mariano Garcia-Blanco, MD, PhD[17], was elected as a fellow in the Association of American Physicians.

Nancy C. Andrews, MD, PhD[18], vice chancellor for academic affairs and dean of the School of Medicine, accepted the 2010 Vanderbilt Prize in Biomedical Science in March. The prize, awarded by the Vanderbilt University School of Medicine, honors prominent women in science who have "a stellar record of research accomplishments" and who have contributed significantly to the mentorship of other women in science.

Cristina Hendrix, DNS, FNP[19], associate professor in the School of Nursing, was named president-elect of the Philippine Nurses Association of North Carolina for 2011–2013.

Marva Price, DrPH, FNP[20], associate clinical professor in the School of Nursing, has been re-elected to the board of directors of the National Organization of Nurse Practitioner Faculties.

Linda Sutton, MD[21], associate professor in medical oncology and medical director of the Duke Oncology Network, has been selected to be the next president-elect for the North Carolina Oncology Association.

Bryan Clary, MD[22], associate professor of surgery, has been elected to the American Surgical Association.

Stephen Freedland, MD[23], associate professor of surgery, was appointed as the new editor of *Prostate Cancer and Prostatic Diseases*.

Kim Blackwell, MD[24]; **Gerard Blobe, MD, PhD**[25]; **H. Kim Lyerly, MD**; and **Neil Spector, MD**[26], were named Komen Scholars. The Komen Scholars are an advisory group of 68 distinguished scholars and leaders in breast cancer research and advocacy who have made significant contributions to advancing the field or who demonstrate significant promise of leading the field with important advances in the future and are committed to furthering Susan G. Komen for the Cure's mission.

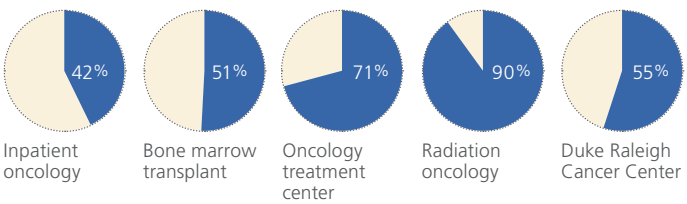
Nursing Awards and Leadership

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 fewer than 7 percent of hospitals in the nation, this honor recognizes the highest level of nursing care.

Certification and education

Duke nurses certified in oncology



Over 70 percent of oncology nurses (RNs) at Duke University Hospital hold a BSN or higher degree.

Ten abstracts submitted by oncology nurses at Duke were accepted for poster presentations at Oncology Nursing Society Congress in 2009 and 2010.

Oncology nursing awards and leadership

Donald Bailey, RN, PhD[27], received State of the Science Lectureship Award (competitive), 11th National Conference on Cancer Nursing Research

Susan Bruce, RN, MSN, OCN[28], was named vice president, Oncology Nursing Society Certification Corporation Board

Ellen Parks, RN, OCN[29], received the American Cancer Society Lane Adams Award

Susan M. Schneider, PhD, RN, AOCN, FAAN[30], was named director at large, Oncology Nursing Society (ONS) Board of Directors

Nursing innovation

A new system called disease-site nursing is giving patients a single point of contact for all of their medical care at the Duke Cancer Center—from the initial consultation, throughout the education and treatment process, and beyond. The goal is to provide a consistently high level of care for patients, and to develop the nurse-patient relationship. This system has already proven successful in radiation oncology for more than a decade. Over the past year, it has been implemented in Duke's thoracic, breast, and gastrointestinal cancer clinics and ultimately will be in place in all oncology groups.

Patient Support and Survivorship

Duke offers a multitude of support services and resources, many of them provided through the Duke Center for Cancer Survivorship.

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 therapy
- Support groups
- Self-image resources
- Volunteer companionship and peer support

All support services are provided at no charge to patients and their families.

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.

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 including art therapy and therapy using humor.

Clinical social work services

Clinical social workers are available to all patients and families to provide help with emotional and psychological distress, difficult family or social situations, and medical crisis and adjustment to illness.

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 of breast cancer 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.

Support for brain cancer patients

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.

Blood and marrow transplant patient support programs

The Adult Blood and Marrow Transplant Program offers numerous patient education opportunities including a patient notebook, transplant DVDs, twice-weekly new patient classes, and discharge classes to help patients and their caregivers understand the many phases of the transplant process. The program also offers a weekly caregiver support group for caregivers of patients in the active transplant period, a multiple myeloma support group, and education sessions open to all patients with multiple myeloma and their loved ones.

Reaching out

The Duke Cancer Institute offers free cancer screenings in its home communities of Durham and Raleigh regularly, both at the medical center and at Lincoln Community Health Center, which provides primary care to low-income patients. The screenings are promoted through advertising and extensive grassroots efforts.

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. The program was born through the efforts of PBMT staff and the families who experienced transplant at Duke. The program seeks to embrace families and fully address their needs during the arduous transplant process.

Each pediatric oncology patient and their family is followed by a clinical social worker who, from diagnosis forward, provides emotional support and counseling and links patients and families to appropriate resources. Additionally, they serve as liaisons with schools, arranging homebound school services and assisting with the transition back to the school setting. They work to meet the needs of the entire family.

Duke offers support groups for adolescents and young adults with cancer as well as a separate group for parents and caregivers of pediatric patients. A quality of life program provides palliative care and support services from the time of diagnosis onward. A hospital school, operated by Durham Public Schools, helps patients maintain their academic progress. Child and adolescent life specialists provide further support.

Adult patients and their children

KidsCan!, a program of the Duke Cancer Patient Support Program, is designed to support children ages six to 18 who have a parent or significant caregiver with a 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 Cancer Center.

Integrative medicine

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 nausea, pain, tissue inflammation, fatigue, and anxiety. **Learn 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.

Pet therapy

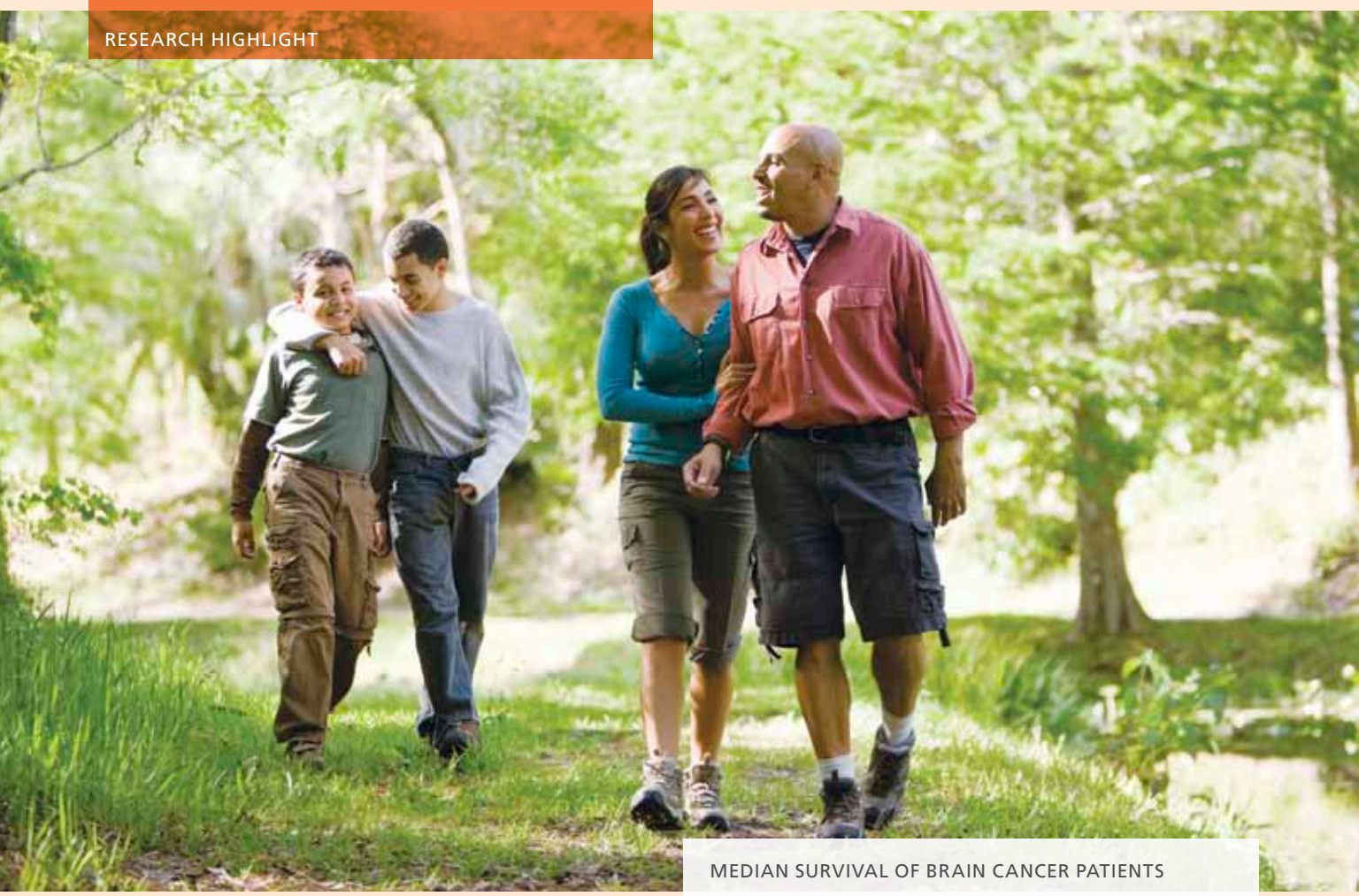
The therapy program Pets at Duke offers patients companionship and affection. Research shows animal-assisted therapy can reduce stress, improve mood and energy levels, decrease perceived pain, lower anxiety, and lower blood pressure. Participating dogs are therapy-certified and have completed animal-assisted therapy training sessions. Twice a week, dogs visit pediatric oncology inpatient units, adult hematology-oncology inpatient units, radiation oncology, and other units.

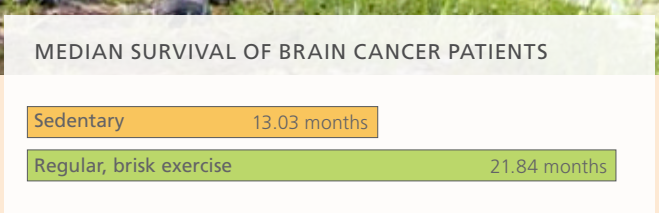
And more

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.

Survivorship research: The benefits of exercise

RESEARCH HIGHLIGHT





Research has shown that exercise improves how cancer patients feel during and after treatments. A recent research study by Duke Cancer Institute investigators shows it may also extend their lives. The study, published July 20, 2011, in the *Journal of Clinical Oncology*, showed that brain cancer patients who exercise live longer than sedentary patients.

"This provides some initial evidence that we need to look at the effects of exercise interventions not only to ease symptoms but also to impact progression and survival," says Lee W. Jones, PhD, senior author of the study and scientific director of the Duke Center for Cancer Survivorship.

Although the study was not designed to test whether regular exercise actually extends survival among brain cancer patients, it established a strong correlation that could give doctors and patients a more accurate prognosis of long-term survival.

The study enrolled 243 patients at the Preston Robert Tisch Brain Tumor Center.

The patients who reported participating in regular, brisk exercise had significantly prolonged survival, living a median 21.84 months vs. 13.03 months for the most sedentary patients.

Jose Cortes, a Duke patient who has battled inoperable anaplastic astrocytoma since 2009, has been an avid proponent of the power of exercise during his treatment. "I wanted to be able to exercise because it makes me feel alive again," Cortes said. "Exercise is a very good way to overcome the side effects of your disease. You can feel more positive about your life even if you are in a terminal state."

The Duke study demonstrates that if doctors know about their patients' exercise regimens, they will have a better way to assess long-term outcomes.

Cancer Clinical Services at Duke

Adult Blood and Marrow Transplants

Duke's Adult Blood and Marrow Transplant Program is internationally recognized for its novel approaches to treating leukemia, lymphoma, and myeloma through bone marrow, cord blood, and peripheral blood progenitor cell transplantation. Novel indications such as autoimmune disease and hemoglobinopathies are also treated. Our board-certified physicians include intensivists in stem cell transplantation, hematology-oncology, medical oncology, and related specialties. Duke's leadership in stem cell transplantation research enables patients to receive treatment with the very latest approaches, of special importance to patients with refractory or recurrent malignancies. 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, vaccine therapy, and the latest drug therapies.

HIGHLIGHTS

Partially matched donors

Duke is able to successfully transplant stem cells from mismatched family members and unrelated donors. To date, 356 such transplants have been performed at Duke.

Post-transplant vaccine protocol

Innovations under way at Duke include novel approaches to improve immune-system function after transplant, including vaccine therapies and selected lymphocyte boosts from donors.

Reduced-intensity chemotherapy

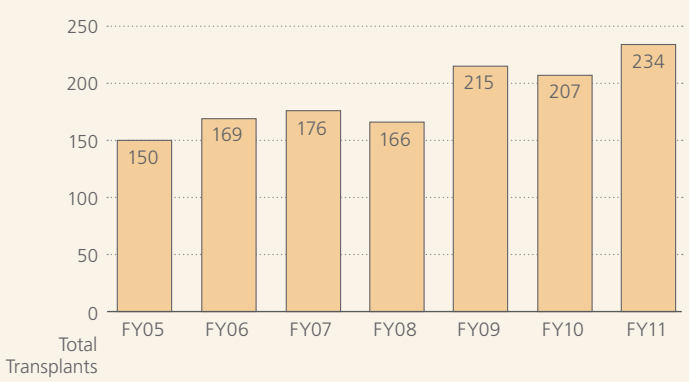
Duke researchers conducted the first large study demonstrating success in transplanting stem cells from donors who are not fully matched, while using chemotherapy that is less aggressive than standard practice. Today, reduced-intensity chemotherapy regimens make transplant an option for patients once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

ADULT BONE MARROW AND STEM CELL TRANSPLANT VOLUMES



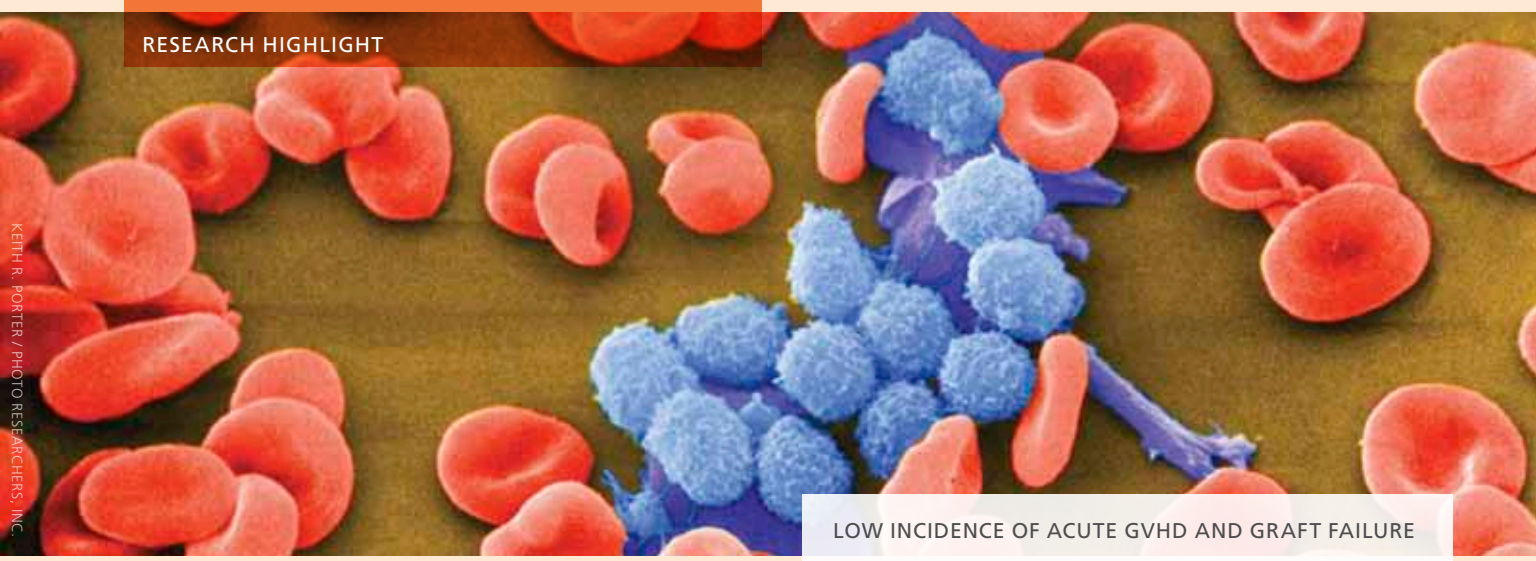
Over 4,000 adult patients from all over the world have received stem cell transplants at Duke. The program's comprehensive team designs individualized treatment plans for each patient.

Services such as nutritional counseling, physical therapy, social work, and in-home care assist the ABMT patient through every step of treatment.

Missing the match, but not the cure

PARTIALLY MATCHED, RELATED DONORS FOR LEUKEMIA PATIENTS

RESEARCH HIGHLIGHT



KEITH R. PORTER / PHOTO RESEARCHERS, INC.

There was a time when the only treatment available to adult leukemia patients was chemotherapy. Hematopoietic stem cell therapy brought patients new hope, but was only for the lucky few (less than 30 percent of patients) who had an HLA-identical sibling who could provide the donor cells. An HLA-matched unrelated donor is a good alternative, but not only is there an increased risk of graft failure and graft-versus-host disease (GVHD), there also is a limited number of volunteers in donor registries. The promise of cord blood is growing for children, yet its use among adult patients is not common, due in part to the small unit size. (Nonetheless, Duke pioneered this procedure in 1999, and it is becoming more and more viable.)

Today, Duke researchers led by Nelson Chao, MD, are offering hope for a cure to more patients by pushing forward the safety and effectiveness of transplants with nonmyeloablative therapy using haploidentical related donors.

"Really, it's a remarkable thing that we're doing," says Chao. "Nearly all patients can have a stem cell donor." In addition to potential sibling haplotype matches, parents and children of patients share one HLA haplotype. (*Curr Oncol Rep*. July 3, 2010)

Joseph Foley, a registered nurse, was 63 when he developed abdominal pain that would not let up. The diagnosis was acute myeloid leukemia (AML). He became a patient of Duke's Louis Diehl, MD, who knew the challenge in treating older adults with AML because of the toxicity of chemotherapy. He was referred to John Chute, MD, a member of Chao's team.

Foley

"Dr. Chao runs a very tight ship," says Foley. "Every Thursday there is a team meeting and all the present patients are discussed. I got input from seven doctors. I was astounded by that."

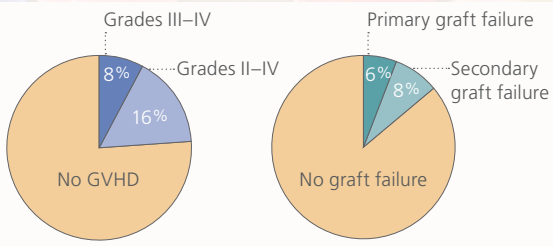
After an extensive search, Foley's son was chosen as the partially matched, related donor. The transplant was preceded by nonmyeloablative chemotherapy.

The gentler conditioning regimen makes the therapy a good alternative for older or infirm patients. These lower-intensity regimens have broadened the potential of haploidentical transplants. Risk of GVHD and graft rejection is still very real, but manageable, says Chao.

In a Duke study written by Duke's David Rizzieri, MD, 75 percent of patients attained complete remission using the less toxic preparatory regimen and partially matched, related donor cells. (*J Clin Oncol*. Feb 2007)

Fortunately, Foley, now 68, was among this group of patients, reaching his five-year remission milestone in August 2011.

LOW INCIDENCE OF ACUTE GVHD AND GRAFT FAILURE



Outcomes of reduced-intensity haploidentical transplants for 49 patients after conditioning with fludarabine, cyclophosphamide, and alemtuzumab.

Mycophenolate mofetil with or without cyclosporine was used as GVHD prophylaxis.

J Clin Oncol. Feb 2007

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. Dedicated entirely to the treatment and cure of brain and spinal tumors in children and adults, the Center combines the resources of a leading research program with a commitment to the best in patient care. 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.

Duke vaccine extends survival

A Duke 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 receive the vaccine. (*J Clin Oncol.* Oct 4. 2010)

A "most important paper"

A 2009 *New England Journal of Medicine* article by researchers at the Duke Cancer Institute and the Preston Robert Tisch Brain Tumor Center was recently deemed one of the most important cancer papers in the last two years, according to leaders in the field surveyed by the journal *Nature Medicine*. The scientists discovered mutations in two genes that could become immediate diagnostic markers and potential therapeutic targets in malignant glioma. (*NEJM.* Feb. 19, 2009)

Exercise prolongs life

Brain cancer patients who are able to exercise live significantly longer than sedentary patients, according to a study by Duke scientists. The study enrolled 243 patients at the Preston Robert Tisch Brain Tumor Center at Duke with advanced recurrent gliomas, lethal brain malignancies that typically result in a median life expectancy of less than six months. The patients who reported participating in regular, brisk exercise had significantly prolonged survival, living a median 21.84 months vs. 13.03 months for the most sedentary patients. (*J Clin Oncol.* July 20, 2011) More on page 10.

Gene mutations as biomarkers

Scientists at the Preston Robert Tisch Brain Tumor Center at Duke have discovered that genetic mutations found in brain tumors can alter tumor metabolism. This work could help lead to new designs for anti-cancer drugs based on the unique properties of these tumors. The study showed that some malignant gliomas involve mutation in the IDH1 and IDH2 genes, and some don't. The IDH mutation can serve as a biomarker to help single out individuals who are likely to have better outcomes and who might then receive a particular type of treatment based on their tumor IDH mutation status. (*PNAS.* Feb. 2, 2011)

THE BRAIN TRUST left to right: Henry S. Friedman, MD; John H. Sampson, MD, PhD; Darell D. Bigner, MD, PhD; James J. Vredenburgh, MD; and Allan H. Friedman, MD

Education, prevention: Patients receive education about being at increased risk for developing breast cancer, the importance of early detection, and available screening resources in the community.

Breast Cancer

One of the world's leading breast cancer programs, the Duke Cancer Institute's Breast 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. Duke offers clinical trials for all stages of breast cancer. 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 plus lapatinib for breast cancer patients with the overexpressed HER2 gene.

Treating advanced disease

Duke is leading an international trial comparing the efficacy and tolerability of Abraxane (nanoparticle albumin-bound paclitaxel) to standard paclitaxel for the treatment of metastatic breast cancer. **For information:** 919-660-1278 or renee.welch@duke.edu.

Real-time tracking of tumor response

Duke leads multiple trials 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.

Breast specialty clinics

In March 2012, Duke will open the first of three specialized breast cancer clinics designed to improve clinical services and facilitate whole-person care for unique-need patients. The first clinic is for women with inflammatory breast cancer (IBC). The second specialized breast cancer clinic, scheduled to open later in 2012, focuses on women under 45 with breast cancer. The third will be for women over the age of 70 and will include geriatricians as well as support specialists who have knowledge and expertise in geriatric issues.

Improving anesthesia

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

Advanced imaging

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.

Preventing cancer in 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. 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 aims 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** 919-668-3051, 919-668-2234, or 919-681-9852.

Vaccine trials

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

Gastrointestinal Cancer

Duke is a major referral center for patients with cancers of the esophagus, stomach, pancreas, liver, biliary system, small intestine, colon, and rectum, including uncommon tumors such as anal, neuroendocrine, and gastrointestinal stromal tumors.

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.

Particular areas of expertise among Duke's radiation oncologists, surgical oncologists, and medical oncologists include intra-operative radiation therapy, neoadjuvant therapy of rectal cancer, and phase 1 and 2 clinical trials in these malignancies.

The Duke Cancer Institute's Esophageal Program sees up to 200 patients with esophageal cancer each year—significantly more than other hospitals.

Patients from around the world choose the individualized care, state-of-the-art treatments, and surgical experience that Duke offers. Novel treatments are often available through a robust clinical trials program.

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. Duke is a leading center for the testing of novel chemotherapies for many cancers, including esophageal, pancreatic, hepatobilliary, neuroendocrine, and colorectal cancers. Duke investigators have led many of these trials.

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. Duke's surgeons performed 76 esophageal resections in FY2011; 20 such procedures per year is considered high volume.

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.

Patients play an integral role in creating the treatment plan and deciding which options feel right for them and their families.

Harnessing the power of the immune system to fight metastasized colorectal cancer

RESEARCH HIGHLIGHT

> "It took a team of coordinators, nurses, physicians, technicians, laboratory scientists, biostatisticians, database and informatics specialists, and of course the patients to make this study successful."
>
> MICHAEL MORSE, MD

It is well established that the human immune system interacts with cancer. Yet it was only last year that the Food and Drug Administration approved the very first cancer treatment vaccine, sipuleucel-T (Provenge), for the treatment of metastatic prostate cancer after trials in which Duke was a leader showed a survival benefit.

"Our understanding of how cancer vaccines might work is evolving," says Duke medical oncologist Michael Morse, MD. "It has been common to think of them as if they were cancer drugs, expecting to see the cancer shrink in people who receive the immunotherapy. We now suspect that cancer vaccines may lengthen survival for some without causing an immediate slowing of tumor growth; rather, the benefits may be delayed, demonstrable only well after a person actually received the vaccine."

In June 2011, at the annual meeting of the American Society of Clinical Oncology, Morse and colleagues presented results of a phase 2 study of vaccination for people who had undergone surgery to have their lung or liver metastases of colorectal cancer removed, but who had a very high risk of cancer recurrence. "We studied a vaccine based on dendritic cells and one based on engineered viruses, and we compared the outcome of the people who were vaccinated with those who did not receive a vaccine," says Morse. "We found that more people who had been vaccinated were alive after three years of follow-up. We also found that people who experienced the best activation of their immune system from the vaccine had the lowest likelihood of having the cancer grow back."

The study showed a trend for recurrence-free survival among patients with CEA-specific T-cell responses. At a median follow-up of 40 months, 35 of 37 patients treated with vaccine and dendritic cells survived, and 32 of 37 treated with vaccine alone survived, with a combined survival rate exceeding that of the unvaccinated control patients.

Burnham

Margaret Burnham, an attorney from Greensboro, North Carolina, participated in the trial, receiving the vaccine and dendritic cells. Diagnosed with metastatic colon cancer in 2006, she was referred to Duke surgeon Bryan Clary, MD, who introduced her to Morse. "There was a lot of buzz about this trial and I wanted very much to qualify for it," says Burnham. "Dr. Morse was willing to spend all the time necessary to explain this trial to someone who had never even taken college-level biology, as if he had nothing else to do."

Burham has a new circle of friends—those newly diagnosed with her cancer. "When someone has just been diagnosed they need to know that there is hope. The best way to give someone hope is to say, 'I had what you have and I'm still here.'"

Gynecologic Cancer

The Duke Cancer Institute's 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, which emphasizes emotional support for patients and families. Duke physicians are leaders in the areas of hereditary gynecologic cancers and 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.

HIGHLIGHTS

Genetic susceptibility to ovarian cancer

Most ovarian cancer presents at an advanced stage, and there is no approved screening test. Duke is among the leaders of an international consortium of investigators that is seeking to identify common genetic variants that increase ovarian cancer risk. In the past two years, this work has led to the discovery of six genes that have been definitively associated with the disease. This has the potential to allow early detection and prevention approaches to be directed to those at the highest risk, an important step toward reducing ovarian cancer mortality in the future. (*Nat Genet.* Oct 2010)

Leaders in minimally invasive surgery

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

Leading a national study of African American women

Duke is leading the African American Cancer Epidemiology Study, the first study of ovarian cancer exclusively in African American women. **For information:** cancer.duke.edu/aaces.

Providing the newest therapies

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 supported by pharmaceutical groups or grants. GOG is studying anti-angiogenic drugs such as bevacizumab, AMG386, and other novel agents. 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.

Andrew Berchuck, MD, is director of the Duke Division of Gynecologic Oncology.

Duke head and neck cancer specialists include: from left, Neal E. Ready, MD, PhD; Frank R. Dunphy, MD; David S. Yoo, MD; David M. Brizel, MD; and Walter T. Lee, MD

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 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 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 has developed 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, and operations that result in better function and less disfigurement.

HIGHLIGHTS

Individualizing treatment

Duke investigators are leading the effort to use functional metabolic imaging to better determine prognosis and to predict the outcome of a planned course of treatment. They are conducting clinical trials that use both a specialized type of MRI scan called dynamic contrast enhanced (DCE) MRI to measure tumor blood flow and blood vessel function and PET scanning to measure tumor glucose metabolism. The scans are performed before and during treatment to determine the effects of therapy on these functions and their relationships to the success of treatment. This information will help to personalize treatment for individuals. **For more information**, contact the Radiation Oncology Clinical Research Office at 919-668-3726.

Targeted therapies

The epidermal growth factor receptor (EGFR) 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 EGFR-targeted therapy panitumumab. Panitumumab will be added to standard radiation treatment after surgery, and gene expression analysis will seek to identify a pattern for panitumumab effectiveness. **For information**, please call 919-681-4768.

Improved surgical outcomes

Duke head and neck surgeons now use transoral robotic surgery for the treatment of select tonsil, tongue, and larynx cancers. This technique allows resection of these cancers without the need for large deforming surgical procedures and with a greater chance of preserving speech, swallowing, and breathing functions. **For more information** contact Richard Scher, MD, at 919-681-8069.

Noninvasive analysis of head and neck lesions

Researchers are 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. **For more information**, contact Erika Juhlin at 919-681-2137.

Immune alterations 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-positive head and neck cancer on the immune system. These tumors have a favorable prognosis compared with HPV-negative tumors, and this research aims to understand the relationship between HPV status and immune system function. **For more information**, contact Erika Juhlin at 919-681-2137.

Hematologic Malignancies

The Duke Cancer Institute's 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 care 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. 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 of physicians, nurses, nurse practitioners, physician assistants, and pharmacists discussing patients on a daily basis.

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.

HIGHLIGHTS

Planning for easier chemo

Duke researchers are leading efforts to evaluate leukemia patients prior to starting chemotherapy to better predict who will experience excess toxicity, allowing for the development of early intervention strategies to improve outcomes.

Duke Center for Chronic Lymphocytic Leukemia (CLL)

The Duke Center for CLL provides dedicated and specialized clinical care for chronic lymphocytic leukemia and small lymphocytic lymphoma, 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.

Integrated care for myeloma patients

Duke researchers are among the leaders in integrating the care of myeloma patients. The chemotherapy team, bone marrow transplant team, and clinical research teams are co-localized and directed as a single interdisciplinary program, offering the best and most promising therapeutic options at each stage of the process.

Stem cell research

Duke researchers are using 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.

TREATMENT PROGRAM HIGHLIGHT

Kesha Dozier's mother, grandmother, great-grandmother, and aunts had been diagnosed with breast cancer. She reached out to Duke for answers for her daughter.

Hereditary Cancer Clinic

Duke's Hereditary Cancer Clinic offers 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 rarer 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 Cancer Center. 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 teams 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 (see page 33). 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, call 919-684-3181.

Lung cancer robotic surgery is growing in volume at both Duke University Hospital and Duke Raleigh Hospital.

Lung Cancer

At the Duke Cancer Institute, thoracic specialists 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 Cancer Center. 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 body 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.

HIGHLIGHTS

CT screening for high-risk patients

Duke has launched a lung cancer screening program to give people at high risk for lung cancer access to screening via spiral computed tomography (CT) scans. It is the most advanced screening for lung cancer available. Results from the National Lung Screening Trial, published in August 2011, show that among people at high risk for lung cancer, those who were screened with low-dose spiral CT scans showed a 20 percent reduction in lung-cancer-related mortality compared to those who were screened with standard chest x-rays. **For information:** 800-MED-DUKE.

Radiation oncology trial

Duke is conducting a dose-escalation research study of intensity-modulated radiation therapy (IMRT) to treat lung cancer. IMRT is used to spare the esophagus. **For information:** Christopher Kelsey, MD, 919-668-5213.

Robotic surgery

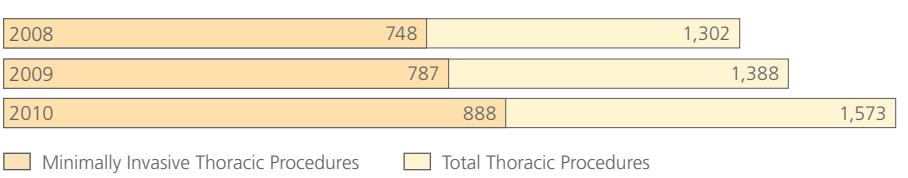
Duke is home to a highly experienced thoracic surgery team: six thoracic surgeons who focus exclusively on lung cancer and general thoracic oncology surgery. Duke offers surgical alternatives that offer patients faster and less painful recoveries, including robotic surgery, which is rapidly growing in volume. In the first six months of 2011, 58 thoracic procedures were performed robotically—a 94 percent increase over 2010.

More options for patients

Duke's dedicated thoracic medical oncologists have a long history of multidisciplinary clinical trial development across all stages of lung cancer and mesothelioma, including pivotal trials integrating targeted therapy, novel therapeutic approaches, and supportive care to maximize treatment options. **To learn more:** dukecancerinstitute.org.

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

GENERAL THORACIC SURGERY VOLUMES



Melanoma

The Duke Cancer Institute's Melanoma Program is a comprehensive melanoma treatment and research program, 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 investigational agents available only through 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.

Duke brings together experts in the full range of medical and surgical specialties to diagnose and treat patients with basal cell and squamous cell carcinomas, melanomas, and other skin cancers.

HIGHLIGHTS

Large regional therapy program

Duke offers one of the largest regional therapy programs 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.

Extensive experience in Mohs surgery

Duke offers patients Mohs micrographic surgery for selected melanomas. This treatment appears to have similar local control rates to traditional methods of excision and frequently creates a smaller wound, allowing an improved cosmetic result. To date, Duke surgeon Jonathan Cook, MD, has treated over 1,000 melanomas using Mohs surgery.

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.

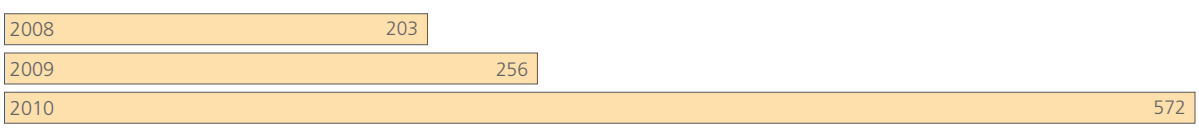
Laser evaluation technology

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.

Novel treatments for metastatic melanoma

New treatments have been approved in the last couple of years, which markedly increase the therapeutic options for patients with metastatic melanoma. Duke is one of the few medical centers in the country that has a medical oncologist whose practice focuses solely on patients with metastatic melanoma. This has allowed Duke's melanoma clinic to markedly expand the treatments and trials available to patients with advanced disease.

EXPANDING PROGRAM: TOTAL MELANOMA PROCEDURES



TREATMENT PROGRAM HIGHLIGHT

Joanne Kurtzberg, MD, (right)
in the Carolinas Cord Blood Bank

Pediatric Blood and Marrow Transplants

The largest of its kind in the world, Duke's Pediatric Blood and Marrow Transplant Program (PBMT) now transplants some 100 children annually. PBMT has provided outstanding care and support to more than 1,800 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. Blood and marrow 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 cord blood 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.

One of the largest cord blood banks

Duke is one of only a few US medical centers 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 trials for brain injury and cerebral palsy

A Duke pilot study is testing feasibility of collecting, preparing, and infusing 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. Duke is also conducting a randomized, placebo-controlled trial of autologous cord blood in children ages one to six with spastic cerebral palsy. To be eligible for the study, children must have access to their own cord blood, banked at the time of their birth. **For information**, contact jessica.sun@duke.edu.

Pediatric Cancers

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

HIGHLIGHTS

Children's Oncology Group

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

Pediatric neuroblastoma

Duke offers treatment options for neuroblastoma not found at many other institutions, such as our experienced bone marrow transplant program and a new treatment program using MIBG, a compound that concentrates in neuroblastoma tumor cells to selectively deliver tumor-killing radioactive iodine. Duke is one of only 14 sites nationwide that participates in the NANT (New Approaches to Neuroblastoma Therapy) Consortium. **For enrollment information**, call 919-684-3401.

Novel trials for brain tumors

Duke participates in a number of clinical trials for children with recurrent malignant glioma, brainstem glioma, medulloblastoma, ependymoma, and low-grade gliomas, managed through the NCI's Pediatric Brain Tumor Consortium. On the basic research front, the laboratory of Oren Becher, MD, is actively investigating pathways that may lead to novel approaches for the treatment of brainstem gliomas. **For information** visit cancer.duke.edu/ctrials.

Leukemia research models

Duke physician-scientists are continuing to develop mouse models of acute myeloid leukemia (AML) to investigate novel mechanisms by which AML develops in infants. Interfering with protein localization in the cell may lead to new approaches for this difficult-to-treat pediatric cancer.

Pediatric rhabdomyosarcoma

Duke pediatric oncology researchers have identified new pathways that lead to the formation of pediatric muscle tumors (rhabdomyosarcomas). In collaboration with other investigators at Duke and around the country, they are targeting these pathways in an effort to develop new treatment interventions.

Duke pediatric oncologists Michael Armstrong, MD, PhD; Susan Kreissman, MD; Dan Wechsler, MD, PhD; Timothy Driscoll, MD; and Raymond Barfield, MD, PhD at Duke Children's Hospital and Health Center.

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 support staff seek to improve the quality of life and survival of men living with prostate cancer. Together, these multidisciplinary teams provide state-of-the-art treatment options in urology, radiation oncology, and medical oncology, as well as emerging investigative treatments, based on basic, translational, and clinical research.

Prostate cancer patients frequently access 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 to improve drug development for prostate cancer.

More than 600 radical prostatectomies were performed at Duke in FY11. Both a minimally invasive open, nerve-sparing technique and a robotically assisted technique are offered for prostatectomy. Duke University Medical Center is ranked #7 in the nation in urology by *U.S.News & World Report*.

HIGHLIGHTS

Obesity and prostate cancer

A Duke study shows that obesity, which affects one in three men in the United States, is significantly associated with progression to metastases and prostate cancer death among men starting hormonal therapy for recurrences after surgery. Previous studies from Duke have shown that obese men are more likely to have cancer recur after surgery, but this is the first study to show obesity is associated with worse outcomes after hormonal therapy. (American Urological Association National Meeting, May 2011)

Study of smoking and kidney cancer

A study led by Duke researchers showed that smokers are more likely to develop kidney cancer than nonsmokers. In the study, smoking was consistently associated with advanced renal cell carcinoma, and cessation reversed the risk. Current and former smokers had 1.5- and 1.6-fold increased odds of advanced disease, respectively. Heavier smoking (longer duration and exposure) was associated with increased risk of advanced disease, whereas durable cessation reduced the odds of advanced disease. (*J Clin Oncol.* May 20, 2011)

Free screenings

Members of the Duke Cancer Institute come together to offer local men free screenings for prostate cancer, both on campus and in the community.

New PI3 kinase inhibitor for chemotherapy-refractory prostate cancer

PI3 kinase is a critical growth signal pathway enzyme for many tumors and a subset of prostate cancers. A Duke-led multicenter trial will determine the clinical effects of a novel P13 kinase inhibitor in men with lethal prostate cancer. **Contact** Peggy Lyons at peggy.lyons@duke.edu.

Novel chemotherapy study

For patients with metastatic castration-resistant prostate cancer, docetaxel chemotherapy remains the first-line standard of care. Adding a novel agent targeting angiogenic growth factors (pazopanib), Duke is leading a national phase 1 trial of docetaxel/prednisone and pazopanib, particularly for patients with poor risk features. **Contact** Carolyn Winters at carolyn.winters@duke.edu.

Novel radiation protocol

Duke has opened the SMART trial (Stereotactic Motion-Adjusted Radio Therapy) 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.

Renal cell carcinoma clinical trial

Duke is leading two large kidney cancer registries to better understand the outcomes of patients treated with standard therapies. In addition, a Duke investigator-initiated multicenter trial is studying the anti-tumor activity of two drugs in patients with metastatic non-clear-cell renal cell carcinoma. **Contact** Karla Morris at karla.morris@duke.edu.

New faculty strengthening team care

In the past year, two new faculty recruits have strengthened the multidisciplinary care provided by the Duke Prostate Center: Michael Harrison, MD, a medical oncologist, and Andrew Peterson, MD, a urologist who is a national leader in improving incontinence in men with prostate cancer.

Statins and prostate cancer

RESEARCH HIGHLIGHT

When a Duke study showed that healthy men who started taking statins saw a drop in their prostate specific antigen (PSA) level, Duke researchers asked another question: could statins be used to treat prostate cancer?

In 2010 a Duke team led by Robert Hamilton, MD, Lionel Bañez, MD, and Stephen Freedland, MD, set out to answer this question by examining whether men taking statins at the time of radical prostatectomy had lower PSA recurrence rates.

The study included over 1,300 patients who had undergone radical prostatectomy, 236 of whom were taking statins at the time of surgery. After taking into consideration factors such as age, race, body mass index, and other clinical variables, investigators found that statin use was associated with a significantly lower risk of PSA recurrence.

Another Duke study by the same team examined the same group of men but looked only at the men who were not on a statin at the time of surgery. Of these men, more than one in four started a statin after surgery. They had a nearly 40 percent lower risk of PSA recurrence than their peers who never took a statin, suggesting that not only taking statins before surgery, but also starting statins after surgery may have a benefit.

More recently, Duke researchers were interested in learning more about the mechanisms by which the drugs impact recurrence risk. One idea was that the statins reduced intratumoral inflammation, believed to contribute to cancer recurrence after surgery. "We found that preoperative statin use was associated with a 69 percent lower risk of intratumoral inflammation," says Bañez. In addition, the team discovered a trend suggesting greater risk reduction with higher doses of the drug.

"Increasing evidence suggests that statins may reduce risk of prostate cancer progression, and some studies have even suggested that widespread statin use over the past 15 years has contributed to a decline in prostate cancer mortality," says Bañez.

When Charles Jackson, 70, of Roxboro, North Carolina, was diagnosed with prostate cancer, he began taking statins before his prostatectomy. Four years later, his PSA level has stabilized, and he says he hopes the drugs can be developed as prevention against cancer. "I saw results in a very short period of time," he says.

So should all prostate cancer patients be on a statin?

"No—or at least not yet," says Freedland. "More studies have to be done before such a recommendation can be made. However, men taking statins for heart health may already be enjoying a beneficial side effect against prostate cancer." (*JNCI*, 2008. *Cancer Epi Bio Prev*, 2010. AUA Annual Meeting, 2010. *Cancer*, July 15, 2010.)

Rich Riedel, MD, with patient

Sarcoma

The Duke Cancer Institute's Sarcoma Program serves sarcoma patients of all ages, with tumors in all locations, to provide the most advanced care available for this rare disease. 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 300 new patients with sarcomas per year, many who travel from across the country to benefit from Duke's unique multidisciplinary approach.

Duke is leading the way in research on sarcoma, studying the cancer in children as well as adults. Areas of focus include investigation of new agents for rhabdomyosarcoma and other sarcoma subtypes. 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. Researchers use 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.

HIGHLIGHTS

National leadership

Duke faculty participate in setting national guidelines, developing educational initiatives, and designing national trials through leadership positions in the National Comprehensive Cancer Network (NCCN), Sarcoma Alliance Through Research and Collaboration (SARC), Radiation Therapy Oncology Group (RTOG), Children's Oncology Group, the American Society of Clinical Oncology (ASCO), and other groups.

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 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.

High-volume center

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

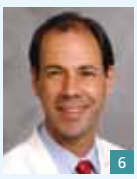
Rotationplasty, an alternative to traditional amputation that provides greater range of motion with a prosthesis

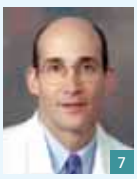
Vascularized fibular reconstruction, a procedure offered in cooperation with plastic surgeons in which the fibula is transplanted to replace large areas of resected bone

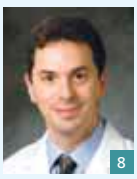
Duke's latest series of vascularized fibular reconstructions is among the largest reported in the literature to date. (*Clin Orthop Relat Res.* Aug 2009)

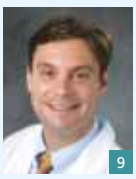
For more information about the sarcoma program, please call toll-free 877-SARC-DUKE (877-727-2385), or 919-613-5550 (local).

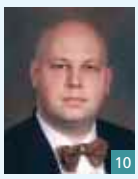
Cancer Clinical and Research Leadership











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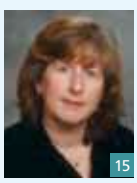

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- **Gastrointestinal Oncology**
  919-668-6688
- **Gynecologic Oncology**
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- **Hematology Oncology (Lymphoma and Leukemia)**
  919-684-8964
- **Melanoma (Skin Cancer)**
  919-668-6688
- **The Preston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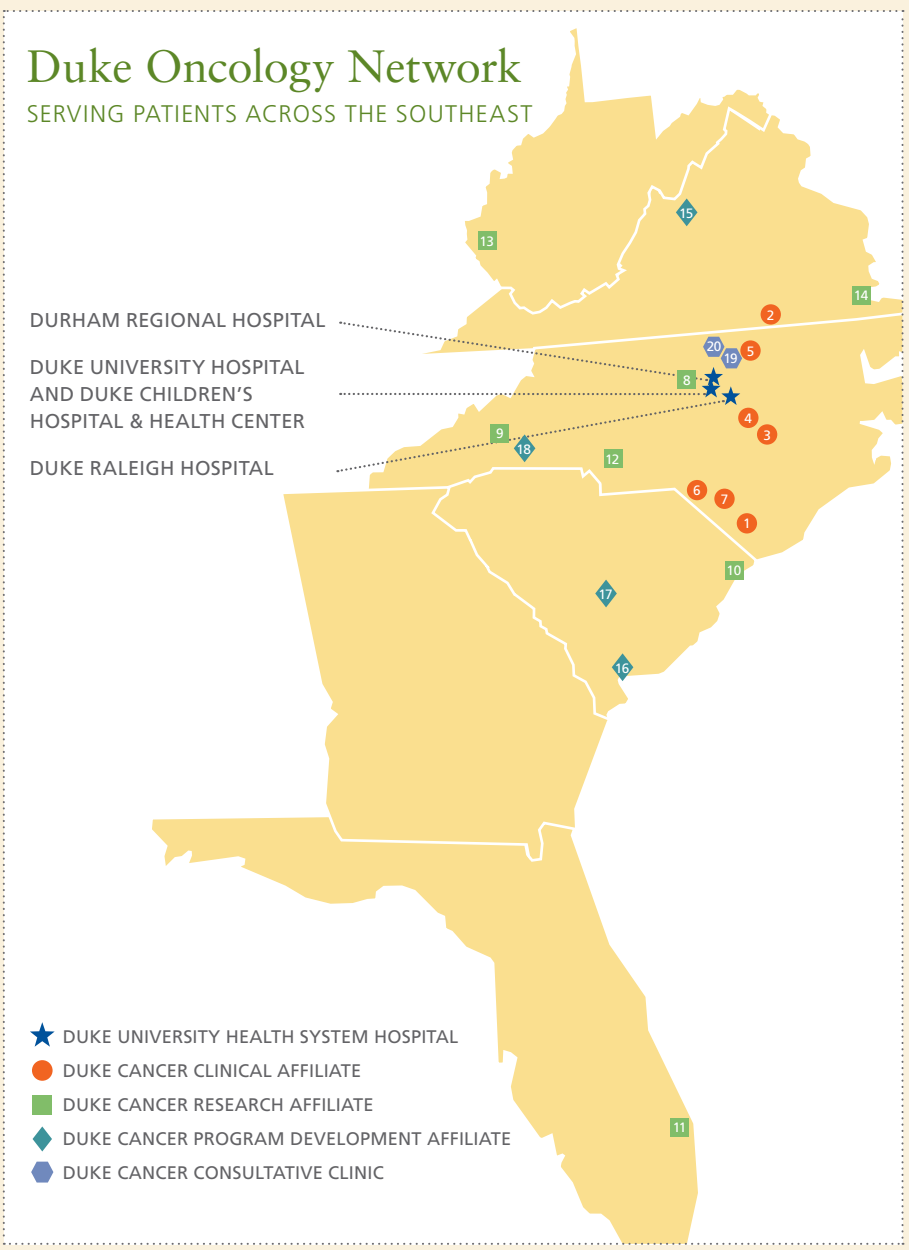


The Duke Oncology Network

The Duke Oncology Network 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.

Clinical affiliates

Duke and community hospitals 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.

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

1 **Columbus Regional Healthcare System, Donayre Cancer Care Center**
711 North Franklin Street
Whiteville, NC 28472
910-641-8220

2 **Community Memorial Healthcenter CMH Cancer and Specialty Care Center**
750 Lombardy Street
South Hill, VA 23970
434-774-2417

3 **Johnston Hematology Oncology–Smithfield**
514 North Brightleaf Boulevard,
Suite 1100
Smithfield, NC 27577
919-989-2192 or 989-5891

4 **Johnston Hematology Oncology–Clayton**
Johnston Professional Plaza
2076 NC Highway 42, Suite 130
Clayton, NC 27520
919-585-8835

5 **Maria Parham Medical Center Maria Parham Oncology Center**
566 Ruin Creek Road
Henderson, NC 27536
252-436-1880

6 **Scotland Memorial Hospital Scotland Cancer Treatment Center**
500 Lauchwood Drive
Laurinburg, NC 28352
910-291-7630; 877-762-2735 (toll-free)

7 **Southeastern Regional Medical Center, Gibson Cancer Center**
1200 Pine Run Drive
Lumberton, NC 28359
910-671-5730

Research affiliates

A research affiliation with Duke 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 research studies, pharmaceutical industry studies, and collaborative research.

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

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

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

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

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

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

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

Program development affiliates

A program development 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 relationship is extensively customized depending on the needs and interests of each affiliate. Programmatic development can be comprehensive or focused on a specific subspecialty.

15 **Augusta Health**
78 Medical Center Drive
Fishersville, VA 22939
540-932-4800

16 **Beaufort Memorial Hospital Keyserling Cancer Center**
1680 Ribaut Road
Port Royal, SC 29935
843-522-7925

17 **Lexington Medical Center**
2720 Sunset Boulevard
West Columbia, SC 29169
803-791-2000

18 **Rutherford Regional Health System**
288 South Ridgecrest Avenue
Rutherfordton, NC 28139
828-286-5000

Consultative clinics

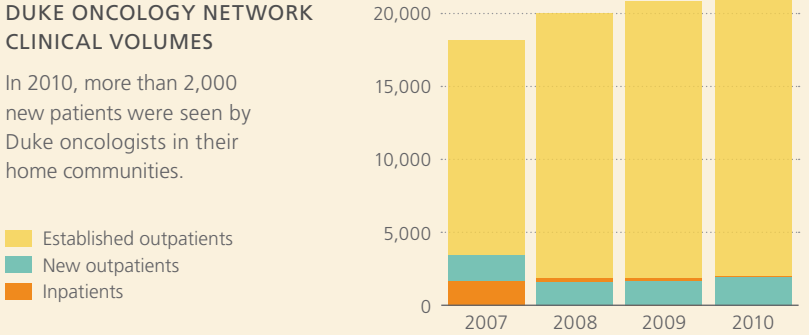
Duke faculty and Duke fellows see patients and recommend treatments at these consultative clinics.

19 **Granville Specialty Clinic**
103–C Professional Park Drive
Oxford, NC 27565
919-690-3210

20 **Person Memorial Hospital Specialty Clinics**
615 Ridge Road
Roxboro, NC 27573
336-503-5776

DUKE ONCOLOGY NETWORK CLINICAL VOLUMES

In 2010, more than 2,000 new patients were seen by Duke oncologists in their home communities.



DukeMedicine

Duke Cancer Institute
DUMC 3687 Durham, NC 27710
888-ASK-DUKE
dukecancerinstitute.org

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Resources

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)

Patient Coordinators

Many of our disease groups use a patient coordinator to support access. Coordinators serve as the main contact for new patients and referring offices and support all tasks related to new patient access, including scheduling appointments, collecting outside records and forms, coordinating multidisciplinary care options, and providing initial medical review. Each coordinator works with a specific disease group to make sure all new patients are prepared for their outpatient visit. Our Oncology Scheduling Hub can direct calls to these individuals: **919-668-6688**.

Learn more online

For clinicians and patients we recommend: **dukecancerinstitute.org**

Clinical trials now enrolling patients: **dukecancerinstitute.org**

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

Other educational opportunities for health professionals: **dcri.duke.edu/education-training**

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

DUKE CANCER INSTITUTE

A National Cancer Institute-designated Comprehensive Cancer Center