DukeMed MAGAZINE

ADVANCES IN RESEARCH, EDUCATION, AND PATIENT CARE AT DUKE

VOLUME 10, ISSUE 1, SUMMER 2010

BREAST CANCER CARE GETS A custom fit

Lessons from Haiti

In February of this year I had the opportunity to travel to Haiti, where medical volunteers from Duke and many other concerned institutions had converged to help those affected by the devastating earthquake that struck the country on January 12. Over the weeks and months that followed the disaster, our entire university poured out its heartfelt support to the Haitian people in many ways, from raising funds to coordinating donations of medical supplies to organizing deployment of trained volunteers. In addition to our many faculty and staff who volunteered independently, Duke Medicine has sent five health care teams to date to work in coordination with Partners in Health—a respected organization with a long-standing presence in Haiti—to provide surgical services and medical treatment to people whose care was interrupted as a result of the necessary focus on acute medical demands of those injured in the earthquake. We are committed to continue sending health care teams for the foreseeable future.

As I visited with our team and with health officials and medical leaders in Haiti, I saw firsthand the indescribable conditions shown only in part on the nightly news: widespread destruction of infrastructure, including homes, hospitals, and clinics; patients being treated in tents, often with inadequate supplies; and families living in conditions that lack sanitation and clean water. Witnessing the incredible human spirit shown by the patients, families, and volunteers in the midst of a very difficult situation was truly inspiring, and there is no question that our teams have made a significant difference in the lives of many people.

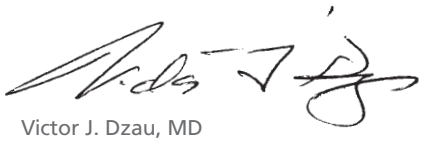
Although the news reports from Haiti have dwindled with the passage of time, I think it is very important to remember that the needs of the people there have not. In fact, while the earthquake exponentially worsened the situation, the truth is that the people of Haiti already had limited access to even basic health services—as do many others around the world and even here in the United States. Disparities in health care are a chronic problem on a global scale, one of the defining issues of our time.

I believe that Duke Medicine, as one of the world's leading medical institutions, has both the opportunity and the responsibility to lead the way in meeting these deep-rooted needs—not just when disaster strikes, but as a core part of our ongoing efforts. In fact, as I've often noted, caring for the underserved has been part of our mission since the beginning, when James B. Duke founded our medical school and hospital with the vision of improving care in the rural, underserved Carolinas.

Today we are extending that mission to maximize the difference we can make in the health and lives of people at home and abroad. Long one of the largest providers of charity care in North Carolina, we are also focusing our energies on addressing the root causes of health disparities in the region. Working closely with community agencies and partners, we are developing new models of care that improve the delivery of preventive care and access to regular chronic disease management—lessening the burden of advanced disease that results when people have difficulty obtaining timely treatment. While the recent passage of national health care reform legislation will expand insurance coverage to more people, we believe that these new approaches to delivering care will be crucial to ensuring that care is truly accessible and effective.

In 2006 we created the Duke Global Health Institute to formalize Duke's vision of applying our broad strengths in health care delivery, research, policy, and education to reduce health disparities at home and abroad. Today, this university-wide initiative is a hub for far-flung outreach efforts involving hundreds of faculty, staff, and students—from service-learning opportunities for our trainees to international research collaborations addressing global chronic and infectious disease burdens. We have productive partnerships in countries around the world—including Haiti, where Duke students, staff, and faculty have served for years through Family Health Ministries (FHM). Founded by Duke physician David Walmer, FHM has had a positive impact on the lives of thousands in Haiti, and played a key role in distributing medical supplies and assistance from Duke in the aftermath of the earthquake.

Duke may be best known as a leader in biomedical research and state-of-the-art care. But I am proud to be part of an institution that works just as hard to bring the benefits of modern medicine to those who might otherwise go without. As Haiti reminds us, there is much work to do—not only during a crisis, but as a matter of course. We are committed to keeping these global perspectives in mind as we carry out our day-to-day efforts in research, education, and care, so that we can make a difference for those who most need our help, and bring hope for a better future.



Victor J. Dzau, MD

Chancellor for Health Affairs, Duke University
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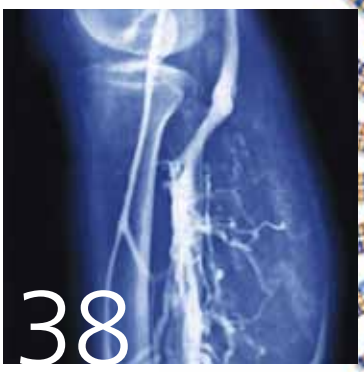

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DEPARTMENTS

LETTERS

A history lesson

On page 42 [of the Fall 2009 issue, in "New Angles on AFib"] you mention in 1968 a Duke team operated on a man with Wolff-Parkinson-White syndrome. Why was [Duke surgeon] Dr. Will Sealy not given credit, as he led the team that performed the procedure? Omission of Dr. Sealy is unacceptable.

Walter G. Wolfe, MD
Professor of Surgery
Duke Division of Cardiovascular and Thoracic Surgery

Editor's note: For more about Sealy, we turned to Duke Medicine Alumni Affairs, which provided this information:

> In 1968 Will C. Sealy, MD, in collaboration with Andrew Wallace, MD'59, and John Boineau, MD'59, became the first to use surgical ablation to treat Wolff-Parkinson-White syndrome, a debilitating and potentially life-threatening cardiac arrhythmia. Their first patient was a fisherman from the North Carolina coast. Sealy became famous as the "father of cardiac arrhythmia surgery" for his role in introducing the groundbreaking procedure, and his work led to Duke becoming an internationally recognized arrhythmia surgery center.
>
> Earlier, in 1959, Sealy and Ivan W. Brown Jr., MD'40, and W. Glenn Young Jr., MD'48, pioneered the use of hypothermia and extracorporeal circulation to improve patient outcomes in open-heart surgery. Sealy received his surgical training at Duke and was a faculty member for 35 years, including 27 years as chief of the Division of Thoracic Surgery. He died in 2001.

PHOTO COURTESY OF DUMC ARCHIVES

Dr. Sealy

To read an account of these efforts from Sealy's colleague Andrew Wallace, visit the online version of Duke Medicine's published collection of historical essays, The Magic of Medicine at Duke: A History in Our Own Words, *at* dukemedicine.org/magic.

Duke's hospital school (and other legacies of Dr. Dees)

Fifty years ago I was privileged to witness two remarkable beginnings at Duke University Medical Center, as I began a greatly desired fellowship in pediatric allergy under Dr. Susan Dees's tutelage. When Dr. Dees determined that a project or a person would make a difference in patient care or advance treatment, there was no stone left unturned.

The first was the School for Hospitalized Children [featured in the Fall 2009 issue, page 16]. During my fellowship, my bride of one year, Judith Rosenberg, would assist Dr. Dees in creating this enduring legacy at the hospital. Dr. Dees set in motion and fought to have the school financed in its infancy; I may be prejudiced, but I believe she found in Judith Rosenberg the right person at the right place with the right credentials to carry out that vision. The school is now part of the North Carolina School System and is staffed by eight teachers, many with master's degrees, and a principal with a PhD.

The second remarkable beginning was Dr. Rebecca Buckley's elective rotation with Dr. Dees. The evolution of that beginning into the vast impact Dr. Buckley has had on the field of immunology and its research is best told by Dr. Buckley. [*Editor's note:* You can read more about Buckley's pioneering work with primary immunodeficiency diseases in the Spring/Summer 2007 issue of *DukeMed Magazine*, available in our archives at **dukemedmag.duke.edu**.]

Continued on facing page

***DukeMed Magazine* welcomes comments** from our readers. Love something? Hate something? Have ideas or issues to share? Write to us via e-mail (dukemedmag@mc.duke.edu) or postal mail:

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The opinions expressed in letters from our readers are those of the authors and do not necessarily reflect those of Duke Medicine as a whole.

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Dr. Dees

Dr. Susan Dees was a phenomenal, caring physician and teacher. She made sure no one would ever forget that our patients were children with an illness, not just a disease that was being examined. She had an insatiable desire to understand and improve caring for patients. I'm sure there are others who studied with her or were her peers who would attest by narrative or observation as to the breadth of her impact.

It's time to pay tribute to the shoulders of yesteryear that Duke University Medical Center stands on today.

J. Loren Rosenberg, MD

Clarification

In our Fall 2009 issue, we stated that Duke orthopaedists had performed the region's first artificial cervical disk replacement surgery. In fact, this was not the first cervical disk replacement surgery performed, but the first such procedure performed using the FDA-approved Bryan cervical disk.

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Help for Haiti

SINCE THE JANUARY EARTHQUAKE that leveled much of Port-au-Prince and surrounding areas, the Duke community has mobilized in ways large and small to send relief to Haiti. In addition to ongoing donations of money and medical supplies, Duke has been sending teams of volunteer medical staff to Haiti to help meet the demand for surgical procedures, post-op care, specialized wound care, and physical rehabilitation; and to restore medical services for people with serious chronic infectious diseases such as tuberculosis and HIV/AIDS whose care was disrupted by the disaster.

The Duke Medicine teams are coordinating with Partners in Health (PIH), a global health organization led by Duke alumnus and university trustee Paul Farmer, MD, PhD, which has been providing medical care to the underserved in Haiti for more than 20 years. "I am proud of the commitment of our staff to make the personal sacrifices necessary to reach out to the people of Haiti," says Victor J. Dzau, MD, chancellor for health affairs and president and CEO of Duke University Health System, who accompanied the second volunteer team (see the chancellor's message in this issue). "It is a testament to the character of our physicians, nurses, physical therapists, and staff and their preeminent commitment to helping others."

To read more, see more photos, and watch videos from Haiti, visit ***duke.edu/haiti****.*


01


02

News from Duke Medicine

Integrating informatics

THE NEW DUKE CENTER FOR HEALTH INFORMATICS (DCHI), a collaboration among the Schools of Medicine, Nursing, Engineering, and the Fuqua School of Business, has been formed to promote the training of physicians, nurses, scientists, and health care managers and administrators in health informatics—the computer-driven science of obtaining, storing, and using information in the realms of health care and biomedical research. The center will integrate resources for a number of specialized certificate and degree programs within the participating schools, including a new Clinical Informatics Graduate Program that will enroll its first class in August 2010. W. Ed Hammond, PhD, one of the world's pioneers in health care information technology, has been named director. To learn more, visit *www.dchi.duke.edu*.

Anemia in older adults

DUKE HAS BEEN AWARDED $16 MILLION by the National Institute on Aging to form a consortium that will investigate why unexplained anemia is so common in older adults. Harvey J. Cohen, MD, director of the Center for the Study of Aging at Duke, is principal investigator of the consortium, known as Partnership for Anemia: Clinical and Translational Trials in the Elderly (PACTTE). Lynda Szczech, MD, who will coordinate the trial at the Duke Clinical Research Institute (DCRI), notes that anemia is associated with increased mortality, hospitalization, higher incidence of and more severe cardiovascular disease, cognitive impairment, decreased physical function, and an increased risk of falls and fractures. Anemia affects 20 percent of people over 85 who live independently, and approaches 50 percent for those who are hospitalized or institutionalized. A third of these cases of anemia cannot be explained.


03


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04


05

01 A church sanctuary in Cange, converted into use as a clinic in the aftermath of the earthquake

02 Duke physical therapist Daniel Dore, DPT (center), looks on as a young woman tries out her new prosthetic leg at the Partners in Health (PIH) hospital in Cange

03 A street scene in Port-au-Prince shows the extent of the devastation and remaining rubble weeks after the earthquake

04 A young patient at the PIH hospital in Cange

05 Members of Duke Medicine's second Haiti team meet in Cange with Chancellor Victor Dzau, MD (center); Michael Merson, MD, director of the Duke Global Health Institute (directly behind Dzau); and PIH founder and Duke alumnus Paul Farmer, MD, PhD (right)

06 A group photo of Duke Medicine's second Haiti team

Expanding clinical research facilities

DUKE OPENED ITS EXPANDED inpatient clinical research unit in February. The Duke Clinical Research Unit (DCRU) is one of only a handful of hospital-based, early-phase research units in the country, providing facilities for researchers and patients involved in clinical trials that require access to cutting-edge technologies, overnight stays, or other procedures to evaluate the biological effects of novel interventions in patients with or without disease. Located in Duke Clinic, the new unit has a 30-bed, 17,000-square-foot adult unit and an existing 13,000-square-foot pediatric unit that includes six confinement beds and two infant family rooms. The DCRU includes one of the world's only EchoMRI systems, which helps to measure the physiologic effects of medical interventions and the biological causes of diseases.

A new center for cell therapy

THE ROBERTSON FOUNDATION has made a $10.2-million commitment to build a state-of-the-art Translational Cell Therapy Center at Duke. The center will investigate the therapeutic use of umbilical cord-blood stem cells, a technique that has shown increasing potential to treat a wide range of problems in both children and adults—including cancer, cerebral palsy, stroke, and brain injury. Duke will build a 4,000-square-foot laboratory on the ninth floor of the North Pavilion to house the center. Read more on page 45.

Doing the dirty work

IN JANUARY, Duke received a $3.7-million contract from the Biomedical Advanced Research and Development Authority (BARDA) to develop a rapid genomic diagnostic test that can determine with great accuracy whether a person has been exposed to radiation from a dirty bomb or nuclear attack. John Chute, MD, principal investigator of the project, says the test will require only one drop of blood and can provide a result in about one hour. This test would make it possible to rapidly screen thousands of people to determine their level of radiation exposure in the event of a nuclear attack. The funding is part of a multi-year contract that could total $43.6 million in research support. Researchers hope to have a prototype ready for demonstration by 2012.

Talk matters

Why communication is good medicine

DUKE PHYSICIAN Neil S. Prose, MD, says that most doctors are "explainaholics—we like to offer information without taking the time to listen and to express understanding for the way that our patients are feeling." Since 2008, Prose has been leading seminars, workshops, and conferences to train residents and fellows in the art of empathic communication. More than 300 residents and fellows in pediatrics, medicine, obstetrics–gynecology, and surgery have participated in the program, which is funded by a Graduate Medical Education Innovation Grant.

"Half of our work as doctors," says Prose, "is building relationships with patients and their families. But very little of our graduate education curriculum is devoted to doctor-patient communication. The good news is that we all want to communicate well, and the specific skills that work in the most difficult situations are teachable and learnable."

The seminars help participants develop techniques for dealing with situations in which communication can be difficult, such as interacting with angry or disappointed patients or delivering bad news. Prose covers everything from body language—making eye contact and the importance of sitting instead of standing—to asking open-ended questions ("How are you feeling today?"), to reflective listening—saying back to the patient what you believe you have heard them say.

Other important techniques include naming the emotion the patient is probably feeling and explaining that those feelings are normal ("I can see that you're worried, and I can imagine why you're feeling that way,") and asking permission before explaining what's gone wrong or giving advice. Prose also suggests ending every medical visit with a simple question—"Is there anything else you want to tell me?"—and then waiting to hear the answer. The seminars also include role playing with actors as patients, so that residents and fellows have the opportunity to "try on" the words and phrases that they may not be accustomed to saying, and to experience the results.

"As physicians, we have an obligation to listen to a patient's story—the whole story—and empathize as much as we can. Our patients need to know that their feelings are understandable," says Prose. "The guiding principle behind the course is doing the right thing for our patients."

seven 7 phrases for difficult discussions

"It sounds like you've been through a lot"

"Please talk to me about it"

"Let me see if I have this right"

"I understand why you might be worried or frustrated"

"Is there anything else you would like to tell me?"

"Would it be okay if I try to explain what happened, what I think went wrong?"

"Here's what I think we can do to keep it from happening again"

INNOVATION GRANTS

Duke residency program directors are full of great ideas on how to improve patient care and physician training—or health care overall. But the resources needed to make those ideas a reality can be hard to come by. Neil Prose's program is one of many small-budget projects that have been funded by an Innovation Grant from the health system's Office of Graduate Medical Education. The GME Innovation Program, which began in 2008, was created by Victor J. Dzau, MD, chancellor for health affairs and president and CEO of Duke University Health System, with the specific goal of making small investments that can have a big impact on residency training by impacting patient care, curricula, or clinical research. "Most of these grants are small," says Kathryn Andolsek, MD, associate director of graduate medical education, "but they're supposed to be—and it's the kinds of funding that these physicians wouldn't be able to get any other way.

"Thanks to Dr. Dzau's commitment, we've been able to maintain this program even in tough economic times," says Andolsek. "We're grateful to be able to keep such a strong focus on enhancing education." In the spirit of "a little goes a long way," Andolsek reports that the average funding is $79,000, but some projects receive as little as $3,600—and the impact of those projects is worth far more.

Fall factors

Duke's efforts to curb a hidden threat—inside hospitals and out

TAKING A TUMBLE is usually a minor mishap for the young—but in older adults, including those hospitalized for other conditions, falls are insidious events that can set off a series of health consequences, from broken bones to bedsores and blood clots. "A patient who has been admitted into the hospital is already at a vulnerable state," says Kim Bailey, injury prevention coordinator at Duke University Hospital. "If you add a falls-related injury into the mix, the results can be catastrophic. And the older you get, the more serious falls become; some people never regain their mobility."

At Duke and other institutions nationwide, there's a growing movement to protect patients from falls, which can be surprisingly severe. In North Carolina, falls are the most common cause of fatal injuries in those age 65 and up. According to the CDC, this age group is hospitalized for falls-related injuries at five times the rate of injuries from other causes. The cost impact of falls is estimated to reach $54.9 billion by 2020.

The evidence team

"There are many risk factors that contribute to falls: advanced age, history of falls in the previous 12 months, incontinence, medications, cognitive impairment, or limited mobility," says Susan Avent, RN, MSN.

Avent, associate chief nursing officer for quality at Duke University Health System, chairs the Duke University Hospital Falls Advisory Board, which meets monthly to address risk factors and monitor falls data.

"We look at all of the factors leading up to a fall," says Avent. "How did it happen? When did it happen? We work to identify the causes so that we can create a safer environment."

All of the data is compiled in the health system's Safety Reporting System, a Web-based application available to Duke's clinical staff. The falls team looks for trends and determines an action plan to target emergent issues. In 2007, the first iteration of the board instituted evidence-based revisions to Duke University Hospital's falls policy and plan of care, and implemented patient safety checks (at two-hour intervals) and a revised falls assessment tool (to be used at every nursing shift).

More recently, the board has stressed a wider circle of involvement beyond just nurses—including all hospital employees and patients themselves—in falls awareness and prevention. Patients and families at Duke are encouraged to be mindful of their environment; falls alert posters have been placed throughout the hospital's patient rooms and bathrooms, with details specific to adult and pediatric units.

North Carolina's safety net

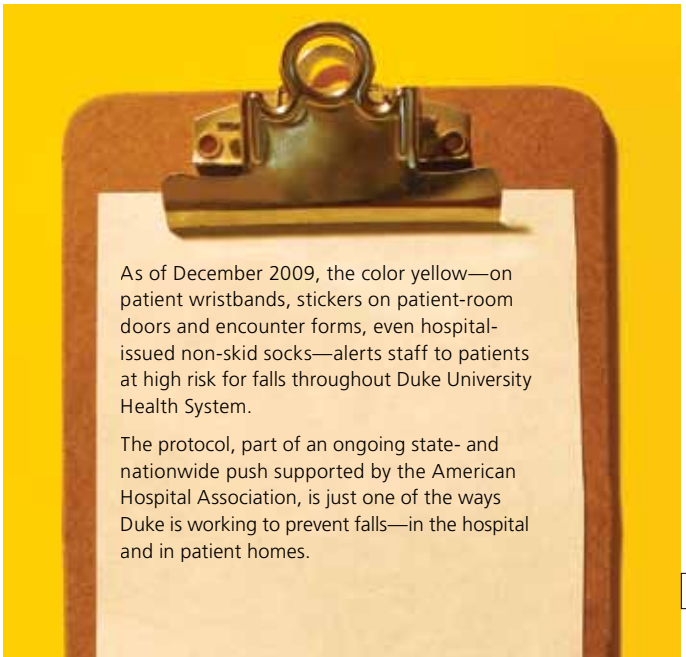
"Falls in the hospital setting is just a piece of the puzzle," says Bailey. "We want to prevent them from happening in the first place, and the home is actually where the majority of falls occur."

While the 65-and-up group does carry the highest risk, Bailey says, "There's a false perception that only older people fall or only kids are prone to falls. But it can happen to someone who has a physical condition affecting strength, someone taking balance-altering medications, or just tripping over pets or rugs."

Bailey serves as one of Duke's liaisons to the North Carolina Falls Prevention Coalition, a statewide network of hospitals, emergency medical services, public health groups, and even housing specialists promoting multidisciplinary strategies to prevent falls and falls-related injuries, such as risk assessment, behavior intervention, and community education.

"For older people, trying not to point fingers is important. We can tell them about falls, but we also provide practical information and resources to prevent falls," she says. "Simple adjustments can make a real difference in patient safety."

Download a free Duke HomeCare & Hospice brochure with tips on preventing falls at home at ***dukehealth.org/quality*** *(click on "Going Steady: Fall Prevention").*



As of December 2009, the color yellow—on patient wristbands, stickers on patient-room doors and encounter forms, even hospital-issued non-skid socks—alerts staff to patients at high risk for falls throughout Duke University Health System.

The protocol, part of an ongoing state- and nationwide push supported by the American Hospital Association, is just one of the ways Duke is working to prevent falls—in the hospital and in patient homes.

A closer look at GINA

The federal law against genetic discrimination in health insurance and employment is now in full effect. Duke's Lauren Dame discusses what the landmark legislation means.

Those undergoing genetic or genomic testing can now breathe a little sigh of relief. The Genetic Information Nondiscrimination Act (aka GINA), signed into law in 2008, went into full effect in December 2009. GINA prohibits group and individual health insurers from using genetic information to determine an individual's eligibility or premiums. It also prohibits employers from using genetic information in decisions about hirings, firings, job assignments, and promotions. In addition, GINA limits the kinds of genetic information that a health insurer or employer may collect.

GINA has been lauded as an essential ingredient for ushering in the new era of genomic medicine and the growing personal genomics industry. Lauren Dame, JD, MPH, associate director of the Duke Institute for Genome Sciences & Policy's Center for Genome Ethics, Law & Policy, talks about the new protections, the challenges they present to wellness programs, and their significance as genomic information becomes more widespread in the coming decade.

What is GINA meant to accomplish and what do you see as challenges under the new law?

GINA has a difficult task. It's trying to stop people from using genetic information to discriminate, but genetic information is getting broader and broader all the time. Almost every health issue has some kind of genetic element. In our current health care system, insurance companies try to set premiums based on the costs they anticipate, and they have been allowed to do that. GINA now says there is one slice of information they can't use. Under GINA, "genetic information" is broadly defined to include family medical history. This means that if I had a heart attack, that's not genetic information. But if my mom or grandmother had a heart attack, that is my genetic information even though there is no genetic test. That is an important part of the law. Many state laws protect against discrimination based on genetic information, but not family history, and that leaves an enormous loophole. If a health insurer is allowed to use family history, it really scoops up the entire medical record. GINA gets rid of that loophole.

GINA was passed into law back in 2008, but the interim regulations under the law only became available more recently. What are some of the key elements of those regulations?

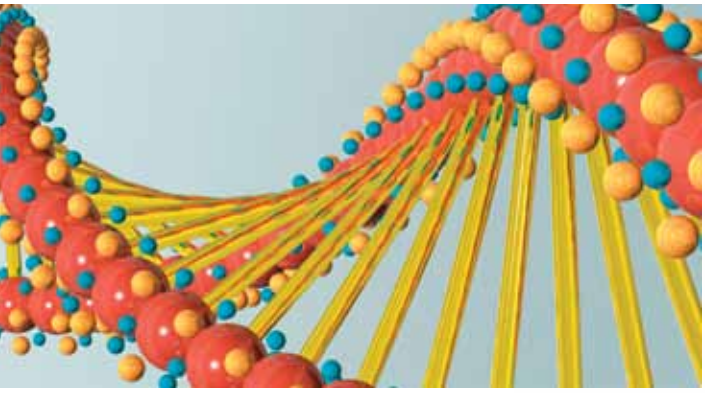
The regulations are important for explaining what key phrases in the law mean—for example, defining "genetic information" to include family medical history. This definition has led to heated discussions about the effect of GINA on wellness programs and health risk assessments (HRAs). The number of health plans or employers with wellness programs is increasing, and it's common to ask about family medical history as part of HRA enrollment. You also can't ask for genetic information at any time for underwriting purposes. Under GINA, the definition of "underwriting" is very broad, and can include a financial break or incentive—a common element of wellness programs to encourage individuals to participate. Because all of the final regulations have not been released yet, there is still a lot of uncertainty about how the details of GINA will affect workplace wellness programs.

As you bring up, there has been a lot of talk about the fact that some wellness programs, as currently run, might be in violation of GINA, and there are complaints from those affiliated with those programs that the new law will result in a decline in participation. What is your take on that?

I come from a civil rights and patient advocacy background and there is always tension in crafting anti-discrimination laws in such a way as to prevent use of the information in a bad way, but to allow use in a good way. It's rare, if not impossible, to craft a rule that draws the line at exactly the right spot. Members of the business and insurance communities who want to do wellness programs and say GINA hampers that effort are correct. It does make that more difficult, but it has to be acknowledged that if they collect genetic information for a good reason, it could also be used for a bad one. If you introduce an exception, then that becomes the loophole that eats up GINA. The fact that GINA now prohibits some wellness program strategies, however, doesn't mean wellness programs are doomed. The administrators will have to make changes in light of GINA, and after a period of some uncertainty, they will develop new strategies to promote the goals of wellness programs, without collecting sensitive genetic information.

Some have said that GINA is primarily important as a means of reassuring people that they can get genetic testing in a clinical or research setting without fear of discrimination. Do you agree?

The reassurance GINA provides is very important. There is ample evidence that people are concerned about genetic discrimination and that people worry about research participation. The law can't prevent all discrimination, but it certainly helps. For instance, there are people out there with a strong family history of breast cancer who have forgone genetic testing out of fear of discrimination, and that's really a shame. Now GINA is offering protection for those people. It is important to note, however, that GINA



only protects in the case of health insurance and employment—not disability insurance or long-term care insurance or use by any other entity. As more and more people get their genome sequenced and more entities get the idea that DNA can be used for something, GINA won't offer complete protection.

GINA has been called the "first civil rights bill of the new century." Given your civil rights background, how do you place GINA within this context?

To the extent that civil rights laws over time have been aimed at ensuring people are treated equally and as individuals evaluated on the basis of their qualities and abilities, not on stereotypes or generalizations—whether those are defined by skin color or a genetic mutation—GINA is a part of that effort. Because we don't have the same widespread background of genetic discrimination, it will not have as dramatic an impact. But GINA's impact may be to stop genetic discrimination before it really gets started; once discrimination is built in, it is hard to eradicate it.

This article was excerpted from a longer interview published in the February/March 2010 GenomeLIFE, *the magazine for the Duke Institute for Genome Sciences & Policy. To read the full article, visit genome.duke.edu.*

Pain management

A new way to negotiate narcotics

PRIMARY CARE PHYSICIANS often treat patients with chronic pain—and often find themselves caught between their discomfort with prescribing potentially addictive narcotics and the practical difficulties of finding timely access to a pain clinic. The Duke Pain Clinic has customized a new strategy for dealing with the complexities of narcotic-based pain management—which also creates a more open line of communication between the patient, the patient's doctor, and the pain specialist.

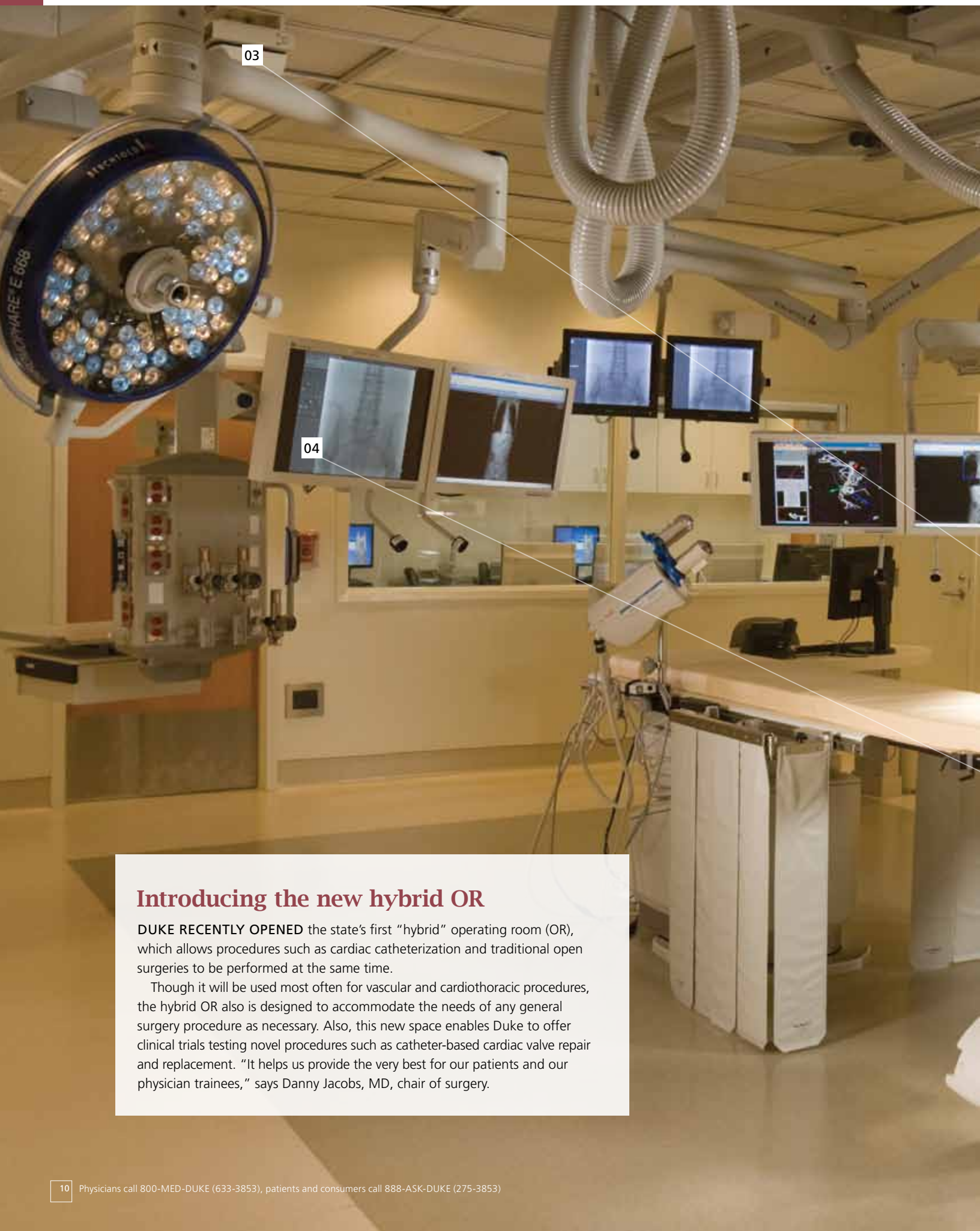
Most patients who visit the Duke Pain Clinic aren't prescribed narcotics, says Jennifer Asbell, nurse manager at the clinic. But for those who do need pain medication, a special system called a trilateral agreement has been established. In this agreement the patient, the pain physician, and the patient's primary care physician all agree on a care plan in which the Pain Clinic works with the patient to stabilize the pain, and then the primary care doctor takes over maintenance. This agreement is an actual document, which the patient gets from the Pain Clinic and must have signed within 90 days by his or her primary care physician. If the primary care doctor ever feels uncomfortable about the patient's progress (or lack thereof), he or she can send the patient back to the Duke Pain Clinic at any time for an evaluation and intervention if necessary.

So far the results have been heartening, says Asbell. "We've established trilateral agreements with more than 20 physicians since we began the practice in July 2009," and community physicians report that this more-formalized arrangement makes them feel better about prescribing these strong drugs to patients long-term, she says.

The trilateral agreement was initiated as part of an overall overhaul of the Pain Clinic's systems, which has cleared a path for easier patient access. "We now offer appointments within seven to 10 days," says Asbell. "It's made a huge difference in our being able to see new patients in a timely fashion."

DUKE PAIN CLINIC: NOW OFFERING APPOINTMENTS WITHIN SEVEN TO 10 DAYS

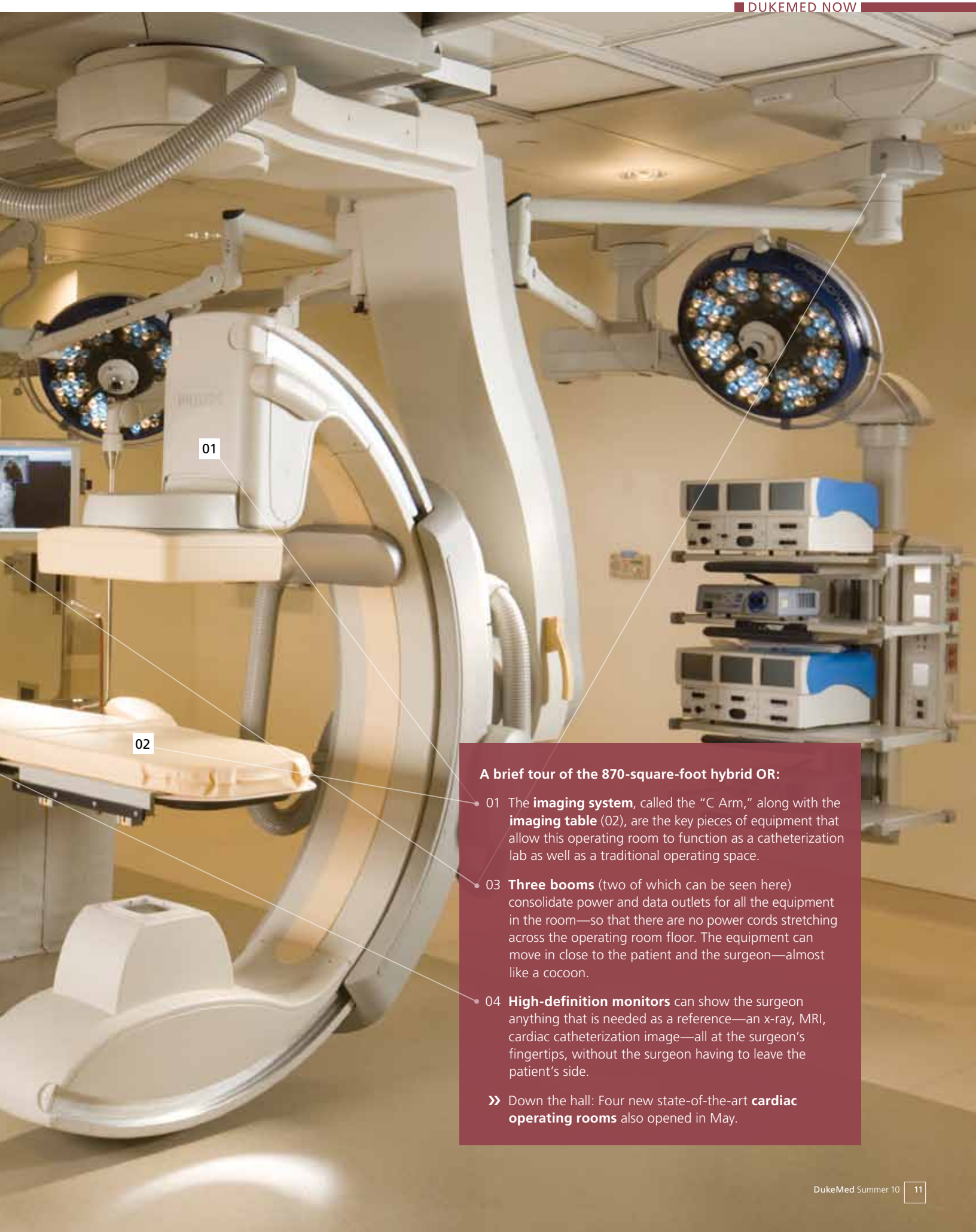
Physicians can call **919-684-PAIN (7246)** for more information about referring a patient for an initial consult.



Introducing the new hybrid OR

DUKE RECENTLY OPENED the state's first "hybrid" operating room (OR), which allows procedures such as cardiac catheterization and traditional open surgeries to be performed at the same time.

Though it will be used most often for vascular and cardiothoracic procedures, the hybrid OR also is designed to accommodate the needs of any general surgery procedure as necessary. Also, this new space enables Duke to offer clinical trials testing novel procedures such as catheter-based cardiac valve repair and replacement. "It helps us provide the very best for our patients and our physician trainees," says Danny Jacobs, MD, chair of surgery.



A brief tour of the 870-square-foot hybrid OR:

01 The **imaging system**, called the "C Arm," along with the **imaging table** (02), are the key pieces of equipment that allow this operating room to function as a catheterization lab as well as a traditional operating space.

03 **Three booms** (two of which can be seen here) consolidate power and data outlets for all the equipment in the room—so that there are no power cords stretching across the operating room floor. The equipment can move in close to the patient and the surgeon—almost like a cocoon.

04 **High-definition monitors** can show the surgeon anything that is needed as a reference—an x-ray, MRI, cardiac catheterization image—all at the surgeon's fingertips, without the surgeon having to leave the patient's side.

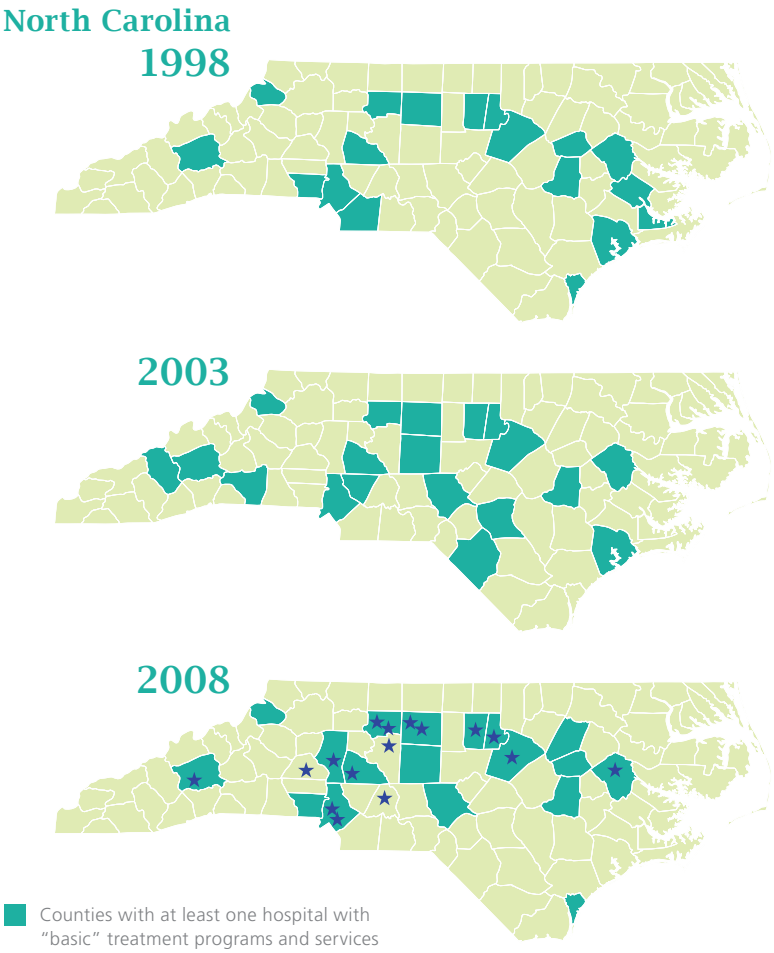
» Down the hall: Four new state-of-the-art **cardiac operating rooms** also opened in May.

North Carolina's stroke service stats

IN THE APRIL ISSUE of the American Heart Association journal *Stroke*, Duke researchers published 10 years of statewide data on stroke prevention and treatment services in North Carolina, which they say will provide a map for future care.

Larry B. Goldstein, MD, director of Duke's Stroke Center, led statewide surveys in 1998, 2003, and 2008 that asked every hospital in North Carolina to complete a questionnaire. The surveys show that some diagnostic tests became more widely available, but that basic organizational features for stroke care—the use of stroke care maps, protocols for intravenous administration of the drug tPA, and stroke teams—did not change at all between 1998 and 2003. Since 2003 there have been some improvements. Now about 40 percent of the population lives in a county with at least one Primary Stroke Center.

The information will help planning efforts to improve stroke care for all North Carolina residents. "The ultimate goal is to have health services organized so that no matter where a patient in North Carolina has a stroke, he or she will have ready access to state-of-the-art acute treatment," says Goldstein.



Supersized scanners

IN THE LAST YEAR, Duke has installed new CT and MR scanners with extra-wide openings and higher weight limits, so that Duke can provide imaging services to the growing number of very obese patients. Duke radiologist Erik Paulson, MD, says that in addition to these upfits, "We're also partnering with manufacturers to develop innovative methods to optimize image quality in obese patients." He says that size constraints are only part of the problem. "We have to be cognizant of radiation dose to patients as we develop these new approaches," because the larger the body, the more radiation that's required to obtain a clear image of internal structures.

CT scanners

Standard	Duke's new	
70 cm	78 to 80 cm	opening
450 pounds	500 pounds	weight limit

MR scanners

Standard	Duke's new	
64 cm	70 cm	opening
400 pounds	500 pounds	weight limit

Chest pain: Does the system work?

IT'S TIME TO RETHINK how patients are selected for cardiac catheterization. In a new study, Duke doctors showed that the invasive procedure found no significant coronary artery disease in nearly 60 percent of chest pain patients with no prior heart disease.

"We're spending a lot of energy and money to evaluate chest pain [with catheterization]," says lead author Manesh Patel, MD, a cardiologist with the Duke Heart Center. "But our research shows that our methods for identifying patients at risk for obstructive disease need significant improvement."

In the study of two million patients, about a fifth had stable chest pain without a previous diagnosis of heart disease. Most of them had undergone a noninvasive test before catheterization, but only 38 percent turned out to have significant obstructive disease.

What is needed, Patel stresses, is a re-evaluation of the entire decision-making process of caring for patients with chest pain—from how patients' histories are taken to how risk factors are assessed to the role of diagnostic testing. He and Duke colleagues are working on several fronts to address these issues, including developing national standards on appropriate use of technology, and conducting clinical trials to evaluate different noninvasive imaging technologies.

New England Journal of Medicine, *March 2010*

In 2006, 1,115,000 cardiac catheterizations were performed in the United States to diagnose and treat heart disease, at a mean cost of $31,000 each and an in-hospital death rate of 0.79 percent. Caths are the standard of care for people who experience heart attack or unstable chest pain.

Heart news

Prevention: Back to the drawing board

RESULTS FROM THE NAVIGATOR study brought disappointing news about two commonly prescribed preventive drugs. The anti-hypertensive drug valsartan (Diovan) led to a modest reduction in the development of type 2 diabetes but did not significantly reduce cardiovascular events in patients. The study also showed the blood-sugar-lowering drug nateglinide (Starlix), used to treat diabetes, proved ineffective at halting progression to diabetes, and had no significant impact on reducing cardiovascular events. "This is a sobering confirmation of the need to continue to focus on lifestyle improvements while also accelerating the efforts to develop new treatments for the exploding epidemics of diabetes and cardiovascular disease around the world," says Robert M. Califf, MD, director of the Duke Translational Medicine Institute, who led the study with researchers from Oxford University.

New England Journal of Medicine, *March 2010*

Basic research: The fishy frontier of heart regeneration

DUKE RESEARCHERS have found a new clue to the zebra fish's enviable ability to regenerate heart muscle—an ability that humans seem to lack. The new research reveals a previously undetected group of muscle cells that ultimately contribute to regenerating the heart muscle. These muscle cells are distinguished by their activation of the gene GATA4, which is required for heart formation in the developing embryo. "We don't yet know the instructions or the mechanisms that mobilize these cells or cause them to proliferate, but we now know that they are the cells that are participating in new muscle growth," says Duke cell biologist and Howard Hughes Medical Institute investigator Kenneth Poss, PhD. Finding a key origin of heart muscle will help scientists understand cardiac muscle regeneration, and suggests a target for disease therapies in humans.

Nature, *March 2010*

Heart failure: Diuretics found to be sound practice

THE FIRST TRIAL TO SCRUTINIZE use of diuretics in hospitalized heart failure patients has OKed current practices—finding that all current administration practices are equally effective, and that higher doses yield better results with minimal risk to renal function. "This study addresses a lot of questions about the best way to administer and dose intravenous loop diuretics," says Michael Felker, MD, a Duke cardiologist who presented the findings from the Diuretic Optimization Strategies Evaluation (DOSE) Study, the first trial completed by the NHLBI Heart Failure Clinical Research Network. "This study suggests that it doesn't matter whether loop diuretics are given intermittently or in continuous infusions. And, the study gives us more understanding about the trade-offs involved when choosing which dose to use."

Presented, American College of Cardiology meeting, March 2010

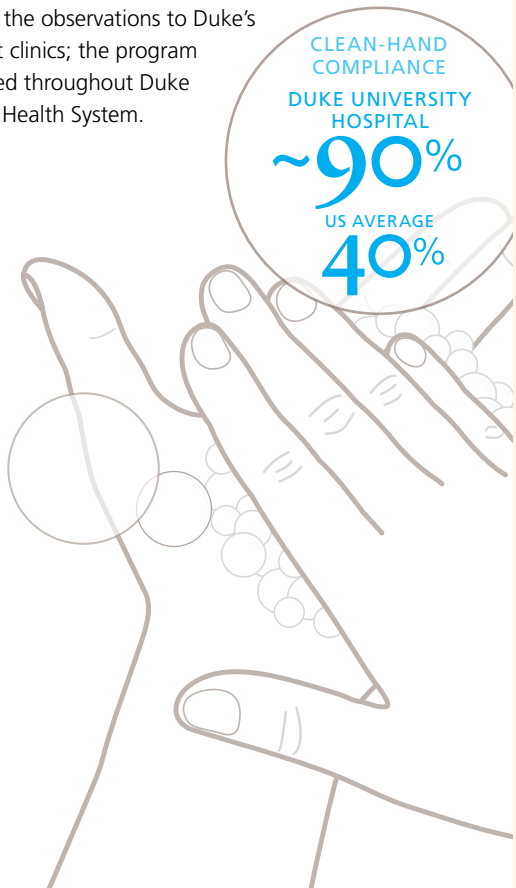
Duke: National champions of…hand hygiene

CLEAN HANDS: They are essential to preventing infections, but hand hygiene hasn't always been a high priority in health care, says Duke infectious diseases specialist Deverick Anderson, MD, MPH. "Everyone knows it's the right thing to do, but we have to make it a part of our culture and ensure that it happens every time a provider cares for a patient."

A year ago, Duke's Infection Control and Epidemiology Department collaborated with Performance Services to develop a better way to monitor hand hygiene in the hospital. The real-time monitoring process improved hand hygiene compliance at Duke University Hospital to more than 90 percent—far above the national average of 40 percent.

For the new program, nursing care assistants were hired to record hand hygiene compliance on an Enterprise Digital Assistant—a handheld wireless device that relays messages in real time to a Web site. The data are trended by month, unit, and the type of health care worker observed. Duke University Hospital's hand hygiene compliance increased to more than 97 percent after the program's rollout and remains in the 90 percent range.

"The unit-specific and worker-specific data help us target groups that need more training," says Lisa Cooper, RN, an infection control nurse at Duke University Hospital. The initiative's success led to the recruitment of six full-time auditors who expanded the observations to Duke's outpatient clinics; the program will be used throughout Duke University Health System.



Antibiotic management in your Palm

(or Blackberry, or iPhone…)

IT'S THE OLD KISS PRINCIPLE. In this case, Keep It Simple, Steward.

A team led by Duke's Martha B. Adams, MD, has developed a simple yet effective tool to help hospitals as they strive to be the best stewards of antibiotic management. The new Web-based, PDA-accessible tool, called CustomID, allows clinicians to quickly look up the proper antibiotic prescription and dose for their patients—it replaces the printed infectious diseases (ID) management guides that physicians used to carry in their pockets. "It's pretty low-tech, but smart and efficient," says Adams, who is vice chair for clinical affairs in the Department of Medicine.

Adams and colleagues put the ID database from the booklet into a searchable Web site that is accessible by desktop computer or handheld PDA (personal digital assistant). Institution-specific information is organized by disease, drug, and pathogen. CustomID saves paper, is easily accessible, and customizes antimicrobial therapy with local factors.

"Even among the hospitals in our own health system, drug resistance is different. And even within a hospital, in the ICU it will be different because the pathogens and the sensitivities are different. But once you have this electronic tool, it is easy to translate," says Adams. CustomID is edited and updated once a week by Richard Drew, PharmD, a member of the project team.

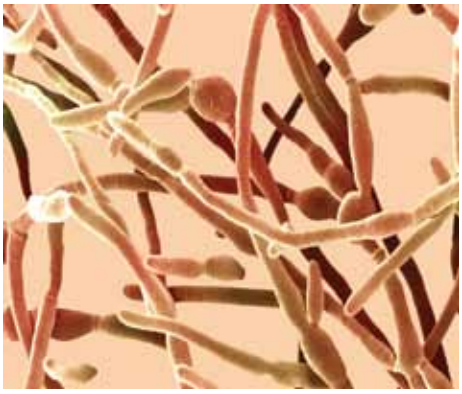
The tool has already caught the attention of health care providers in the Netherlands, where CustomID is now used in 24 hospitals and known by the acronym SWAB. "The Dutch are famous for their ID expertise and they've always been electronically advanced," says Adams, explaining the far-flung early adoption of the tool.

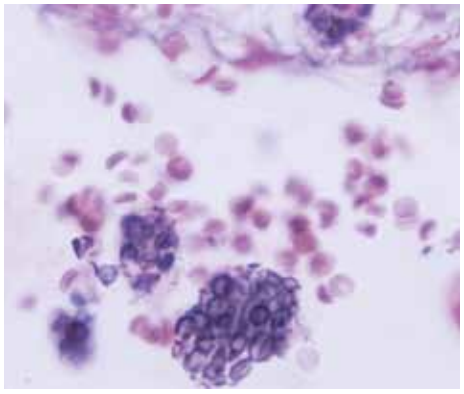
Perhaps the best indication that the new tool is catching on locally is what Adams says she hears in Duke's hospital hallways. "I'll overhear the residents saying, 'Did you look it up on CustomID?' That's neat."

*CustomID is available to community practices and hospitals. For more information, contact Martha Adams, MD, at **919-660-6746** or **martha.adams@duke.edu**.*

An infectious hit list

Protecting patients against life-threatening pathogens





CANDIDA: Researchers at Duke's Institute for Genome Sciences & Policy (IGSP) have devised an entirely new and more rapid way to test for the fungal pathogen *Candida*, which kills 10 to 15 percent of critically ill patients within the first 24 hours of infection. If the disease goes undetected for up to three days, the mortality rate rises to 30 percent. The new gene-based test worked well in mice, so Duke scientists are now developing a similar test to be used in people. Geoffrey Ginsburg, MD, PhD, director of the IGSP's Center for Genomic Medicine and senior author of the study, says that this research is part of a "portfolio of blood gene-expression-based tests we are developing to detect viral, bacterial, and fungal infections that will lead to more precise diagnosis and more appropriate therapies for infectious disease."

Science Translational Medicine *March 2010*

C. GATTII: The newly discovered strain of an airborne fungus called *C. gattii* has researchers nationwide on alert. "This novel fungus is worrisome because it appears to be a threat to otherwise healthy people," says Edmond Byrnes III, a graduate student in the Duke Department of Molecular Genetics and Microbiology. The fungus has caused several deaths in Oregon and seems poised to move into California and other adjacent areas. The mortality rate for recent *C. gattii* cases in Oregon is running at approximately 25 percent out of 21 cases. Byrnes and other co-authors in the lab of senior author Joseph Heitman, MD, PhD, collaborated with an international team of researchers on a study on the emergence and virulence of the new *C. gattii* strain. Some strains of the fungus are not as virulent as this new version, so doctors will need to know what type they are dealing with, Byrnes says.

PLoS Pathogens *April 2010*

C. DIFFICILE: Move over, MRSA—a new multi-drug-resistant superbug is on the rise. *C. difficile* is a bacterium that causes diarrhea and, in some cases, life-threatening inflammation of the colon. It is currently treated with one of two antibiotics, but relapses occur in one-quarter of treated patients. "This is not a nuisance disease," says Daniel Sexton, MD, director of the Duke Infection Control Outreach Network (DICON), a collaboration between Duke and 39 community hospitals in Georgia, North Carolina, South Carolina, and Virginia. "A small percentage of patients with *C. difficile* may die, despite treatment." A team led by Becky Miller, MD, evaluated data from 28 hospitals in DICON. During a 24-month period, there were 847 cases of *C. difficile* infections in the 28 hospitals and the rate of *C. difficile* infection was 25 percent higher than the rate of infection due to MRSA—which has been declining since 2005. Sexton says that it's likely that the routine use of alcohol-containing hand cleansers to prevent infections from MRSA does not prevent infections due to *C. difficile*.

Presented, International Conference on Healthcare-Associated Infections, March 2010

The Duke Infection Control Outreach Network (DICON) has helped member hospitals significantly reduce post-surgical, device-related, and bloodstream infections, as well as employees' risk of blood and body fluid exposures.

Learn more about DICON at **dicon.mc.duke.edu**, where you can find free educational resources as well as information on joining the network.

Photo credits: (above left) David M. Phillips / Photo Researchers Inc., (above right) Kari Lounatmaa / Photo Researchers Inc.

Concussion complexities

Even a mild traumatic brain injury is still a traumatic brain injury

FOOTBALL AND MILITARY COMBAT seem worlds apart in most ways, but they share a few commonalities. One is the devotion of players and soldiers to their teams—in play or in battle, a soldier doesn't want to let his team down.

Another link between these realms is a risk of significant, long-term brain damage from repeated mild brain injuries—otherwise known as concussions. As a medical officer for the U.S. Air Force and as a clinician here at Duke, neurosurgeon Gerald Grant, MD, has seen injuries from both fields, and although it's unusual for neurosurgeons to focus on nonsurgical brain injuries, Grant and his colleagues at Duke are determined to find a better way to detect and treat them.

"When a severe traumatic brain injury occurs in a patient, there are well-established treatment guidelines we follow to help manage these injuries," says Grant. "But right now, out of 100 grade-1 concussions, we can't tell who's at risk for significant injury if they return to the game. And we don't want to keep healthy players out of the game if we don't have to." For those who are at risk, though, the consequences can be grave. "Those are the kids who get hit again and get significantly worse, or may even die. And you see one of those…you just never want to see that again."

Most concussions—barring previous concussions—get better with time, usually within seven to 10 days. So it's not worth it to be too aggressive with treatment, says Grant—since with physical, mental, and emotional rest, most patients will get back to normal function.

The trick is to determine, sometimes in the heat of play, when a mild concussion has occurred. Many of these injuries don't have clinically detectable symptoms—at least not right away—and even a brain scan would be normal. But the injuries may still be there. Grant and Duke neurologist Danny Laskowitz, MD, are developing a blood test that could detect biomarkers that signal the presence or absence of a brain injury. "It's still in the investigational stage," Grant says. "There's still a lot to understand for this test, because it needs to be very sensitive so that we do not miss any injuries. It also might not be just one blood marker we're looking at; it might be a panel of five."

Current concussion testing for soldiers and athletes begins with the physical assessment on the field. Protocols have shifted since the days of sending players who are symptom-free back into the game, says Grant. In cases where the injured player shows no obvious symptoms, the current rules for re-engagement require that player to try exercise—off the field—to see if increases in heart rate and general exertion unmask symptoms. There are also neurocognitive tests available that can be given on the sidelines. These tests can be very useful, especially if baseline testing is available.

"There's a lot of pressure on coaches to keep athletes in play," says Grant. "And the players themselves often underreport symptoms. Combat soldiers are no different and often will downplay their symptoms since they don't want to leave their comrades. I believe that we can really make a difference by finding better tools to detect these injuries—to be proactive and keep these kids out of play until it's safe."

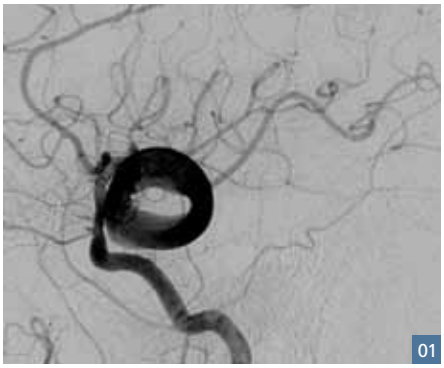
Mild injury, major consequences

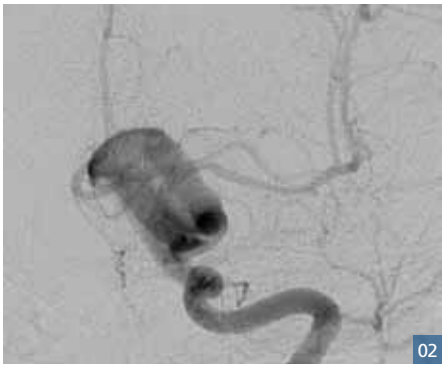
- **Repeated brain injury is cumulative in consequence** and now has been linked to dementia later in life. But because the individual assaults are mild, players, soldiers, coaches, and medics alike can easily miss their significance. "People—especially those who played sports in high school—will say, 'yeah, I've had two or three concussions; what difference does it make?'" says neurosurgeon Gerald Grant, MD. "But after five mild brain injuries, permanent brain damage may have already occurred."
- For young people, **brain injuries can lead to significant deficits in cognitive function**, which sometimes don't present themselves until well after the accident—a middle-school athlete might suffer a concussion, seem to recover, and two years later start failing classes in school.
- **Making sure that patients understand what "rest" means** is important, says Grant. In the aftermath of a concussion, the patient should avoid physical exertion but also mental exertion—that means no homework, no video games, no multitasking, no stress. That's a tall order in today's world, but critical to allow the brain to recover.
- **Return-to-play guidelines** have been established but are not well known among some physicians treating these patients. They can be found online through the American Academy of Neurology: *aan.com*.

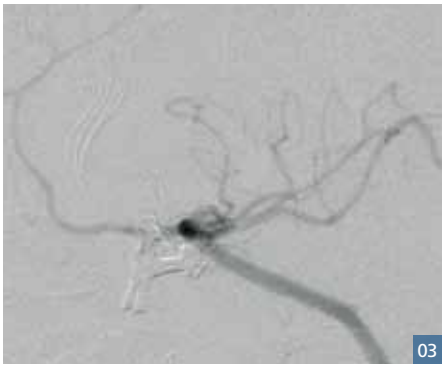
CASE STUDY

A delicate problem

What happens when a patient presents with the biggest aneurysm her radiologist has ever seen?







01, 02 Angiograms showing the large aneurysm prior to surgery. The aneurysm was located at the base of the patient's skull, making access difficult.

03 A postoperative angiogram showing that the aneurysm is no longer filling with blood. The patient now has a vein bypass that goes from the carotid artery in the neck to arteries in the brain.

KATHY CHAVIS, a 54-year-old UPS driver from Vass, North Carolina, had been experiencing recurrent headaches for about two years. "It felt very much like the sinus headaches you get on the side of your eye," she says. In late April 2008, the headaches became constant—and when the vision in her left eye grew blurry in June, she went to her eye doctor, who sent her to the local hospital for a CT scan. "I just assumed it was something I would do and then go home," she says, "but after the scan they told me they had to admit me to the emergency room."

What the radiologist found, Chavis later learned, was what he described as the biggest aneurysm he had ever seen. Unable to be treated locally, Chavis was referred to Duke neurosurgeon Gavin Britz, MD, among the country's most experienced surgeons in handling complex aneurysm repair and reconstructions.

And Chavis's case was indeed complex. "Kathy had a very difficult aneurysm in that it was large, had thrombus [blood clotting] inside it, and was located in the skull base," says Britz. One of the most common ways to treat an aneurysm is to clip the blood vessels that supply it, making it inert—unlikely to rupture. But in order to clip this large aneurysm, Britz would have to remove the bone around the affected vessels at the base of the skull. "It is dangerous and difficult to remove the bone around such a large aneurysm—it can rupture during the exposure, which could lead to a major stroke and possibly death."

Even if the aneurysm doesn't rupture, it can be hard to clip at this size, says Britz. "You often have to clip the carotid artery in the neck and even briefly stop the patient's heart to collapse the aneurysm enough to be able to clip it."

The surgery, initially scheduled to last three hours, took more than nine. "The aneurysm was so calcified and hard that we could not clip it, even after multiple attempts," says Britz. Instead, the team used vein from Chavis's leg to bypass it, cutting off its blood supply from the carotid artery. "Essentially we provided an alternative route for the blood to go from the carotid artery in the neck to the brain."

Although Chavis says she was prepared to spend several weeks in the hospital for rehabilitation, she was released within 10 days of her surgery—because her aneurysm never ruptured, her recovery was remarkably smooth. "My mom and dad call me a miracle child," she says. It took a month before she felt back her normal self, and she still has some lingering effects from the aneurysm and surgery. "I can't lift over 25 pounds. And sometimes I have headaches and difficulty remembering things, like how to spell words—just little stuff. I have to take more time with things I used to take for granted. But my life is good."

"This case emphasizes how aneurysm treatment has evolved over the years," says Britz. "Even patients with complex aneurysms can do well." He notes that in addition to advances in traditional surgical methods, such as clipping and bypass, there are also new, less-invasive procedures including endovascular coiling. "The important aspect of Kathy's care was that she had an experienced team looking after her."

"It matters, how confident and at ease people can make you feel," Chavis agrees. "I guess you can call it faith—if you can go into any surgery and feel in your mind and your soul that everything is good, because you really trust the people who are doing all this. Dr. Britz did stress how serious it was, that I might not make it, all that—but I just felt very comfortable and confident about the whole thing.

"Being able to wake up every day—I feel like I owe that to the good Lord and Dr. Britz."

The Duke Cerebrovascular Center is dedicated to treating vascular problems in the brain and spinal cord. Learn more at ***dukehealth.org/services/cerebrovascular_center****.*

BREAST CANCER GETS personal

photography by JARED LAZARUS

Advances in genomic and molecular medicine are helping physician-scientists crack the code on breast cancer—and deliver customized approaches to care, one woman at a time.

When Nixon declared war on cancer in the 1970s, we attacked it with our biggest weapons. "The medical mindset was to bomb the holy heck out of stuff, dosing chemo until people couldn't stand it anymore," says Duke breast oncologist Kimberly Blackwell, MD. "That's unlike every other disease we take care of—waging a war that hurts the patient."

The war has been hard fought, against a force we're still struggling to understand. But some key intelligence has come to light: this is not a war against one monolithic enemy, and it can't be fought on a single front. The outcome of each woman's fight against breast cancer hinges on an ever-changing, interdependent web of internal and external factors, says P. Kelly Marcom, MD, clinical director of Breast Medical Oncology and director of the Hereditary Cancer Clinic at Duke. "There is the individual—her inherited genetic traits, her environmental exposures, her other health characteristics. There is the biology of her particular cancer. There's how her body interacts with the treatment, how her tumor type responds to the drugs.

"Basically we are up against a different cancer in every person we treat."

As research reveals ever more about the particular causes and vulnerabilities of various types and subtypes of tumors, the war on cancer—or, more accurately, *cancers*—is experiencing its own revolution. In place of the broadly toxic, unreliably effective weapons of mass destruction used in the past, physician-scientists at Duke and elsewhere are creating new prevention and treatment strategies pinpointed to the particular characteristics of each woman and each woman's disease.

This new brand of care—known as personalized medicine—has no better testing ground than cancer, where the consequences of both the illness and the treatment can be so grave. "Our goal is to treat patients as individuals, to maximize the beneficial results of the treatments we give them while minimizing toxic side effects," says Marcom. Or, to put it more simply: "Find out exactly what someone needs, give them that and nothing more."

"I've had so many people close to me die of breast cancer. To know that I'm at risk…it can be traumatizing. Just to have that personal touch—especially from a doctor of Dr. Seewaldt's caliber—makes all the difference in the world. She is very aggressive in monitoring me, and when I e-mail she gets back to me immediately, sometimes within the hour, even late at night."

Monique McIver, 41, Wilson, NC
Registered nurse, mother of five,
High-Risk Breast Clinic patient
Shown with photo of her mother, who died of breast cancer at 57
Plans to have a bilateral prophylactic mastectomy within the next two years

Stopping cancer before it starts

Breast cancer, like all other cancers, is a process—a gradual accumulation of molecular changes that allow the disease to develop. Cells proliferate when they would normally die, replicating without control. The resultant tumor masses become able to grow blood vessels and eventually spread to other parts of the body. "All those things happen as the result of genetic mutations that accumulate in those cells," says Marcom. It's a slippery slope, along a fundamentally genetic course.

Scientists have been on the hunt for the genes that instigate, aid, and abet these processes. Some are inborn genetic mutations that stand out like red flags, such as in the breast cancer susceptibility genes BRCA1 and BRCA2, which can quintuple a woman's risk of developing breast cancer. Others are tangled in a soup of germline traits and environmental triggers.

Duke researchers contributed to the discoveries of BRCA1 and BRCA2 in the mid-1990s—a huge breakthrough that fueled new modes of detection and prevention. But although the BRCA mutations are the most common cause of hereditary breast cancer, they account for only around 5 percent of all breast cancers. Marcom says other inborn genetic traits have been identified that increase the risks of cancer in a less powerful way, but that are more common in the

population. "So a lot of our research now is focusing on both identifying these genetic risk indicators and learning how to use them in a clinical setting," in combination with clinical factors such as family history. "That's going to be an ongoing process over the next several decades—answering the question of who needs more intensive screening and who needs preventive interventions."

For women who are at increased risk, chemopreventive agents that inhibit tumor development, such as tamoxifen and raloxifene, have been shown to be very effective in some patients. But they aren't effective in every patient, says Marcom, and it's not yet clear exactly who will benefit. "Prevention is something we would all like to do more of," says Marcom. "But right now the studies we have of preventive drugs apply only to large populations. We don't really have the right risk models in place to clearly identify who should take those types of drugs."

Duke's High-Risk Breast Clinic is helping to develop these models as it cares for women known to be at high risk due to family history, positive tests for BRCA mutations, or prior abnormal biopsy. "Through a mix of high-tech detective work and the lower-tech stuff, like taking detailed family histories and offering counseling, we're able to figure out a personalized strategy for each patient," says the center's director, oncologist Victoria Seewaldt, MD.

These strategies are also often a mix of high- and low-tech. Patients can opt to take part in investigating potential preventive agents, such as statins or gel forms of tamoxifen. Diet and exercise are also emphasized as important aspects of cancer prevention—not to mention overall good health, says Seewaldt. "Our patients may be at high risk for breast cancer, but we focus on them as a whole person. They are not just their breasts."

One major initiative at the clinic is an ongoing trial that seeks to identify atypical, precancerous cells early on through a breast cell sampling technique called random periareolar fine needle aspiration. "Women who develop these cells are at an increased risk," says Seewaldt. "So when we discover them, we can prescribe a drug and see whether it affects the presence of these atypical cells."

The clinic has also begun testing cells from high-risk women for changes in protein expression in response to prevention agents. The data gathered from these investigations will help identify pathways that become abnormal at the very beginnings of familial breast cancer and track how they are changed by preventive therapy.

By refining prevention, such studies are slowly laying the path toward the ultimate goal of personalized medicine: to keep people who are predisposed to a certain disease from ever developing it.

Scanning for signatures

Until that grail is grasped, of course, the battle against breast cancer goes on—and for women who are diagnosed with the disease, many investigators believe that genomic analysis is the fast track to

P. KELLY MARCOM, MD

KIMBERLY BLACKWELL, MD

JEFFREY PEPPERCORN, MD

personalized treatment plans that are more effective and less toxic.

In the same way that it's now possible to generate a complete genomic profile of a person, which spells out all the gene expressions that person carries in her DNA, it's also possible to generate a genomic profile of a tumor. But these scans are still the equivalent of a wall of hieroglyphs—a code that is so far only partially deciphered.

Though they don't have the whole picture, scientists do have some clues. Already, there are a few commercially available tests that analyze selected genes within a patient's tumor cells to help oncologists assess prognosis and determine whether chemotherapy is likely to help. While these tests are so far limited to women with specific subtypes of breast cancer, investigators across many institutions are working to broaden the application of genomic profiling technology.

"Genomics will revolutionize cancer therapy," says cancer researcher Anil Potti, MD. "It allows us to identify a fingerprint that's unique to every individual patient's tumor. If you can match that fingerprint with the drug that's most likely to work for that patient, you can make cancer treatment more effective and less toxic. It brings us closer to a cure."

Potti and Joseph Nevins, PhD, of the Duke Institute for Genome Sciences & Policy, have led the effort to look at gene expression profiles from large groups of tumor samples and compare those profiles with treatment outcomes, searching for patterns (or genomic signatures) that indicate the "personality types" of tumors—those that are likely to metastasize or not; those with good prognosis and poor prognosis; a tumor that is resistant to a drug or one that is sensitive to a drug.

In the April 2, 2008, issue of the *Journal of the American Medical Association*, Nevins and Potti published a study of more than 1,000 breast tumor samples, showing that combining a tumor's genomic profile with the breast cancer patient's clinical characteristics allowed researchers to reliably determine an individual patient's risk of recurrence.

A new Duke study, published in March 2010 in *Proceedings of the National Academy of Sciences*, showed that these profiles could help develop a whole new classification system for breast cancer. Currently, oncologists group these tumors into five main molecular categories, but by combining the genomic profiles with studies of the cell-signaling activity in the tumors, the team identified 17 subsets—which could lead to new treatment protocols. Basal-type breast cancers, for example, are generally believed to be especially aggressive and hard to treat, and they're associated with lower survival rates. But in using this new classification system, the Duke researchers identified patients in one subtype who lived almost twice as long as the others.

Continued on page 24

Putting pharmacogenetic tests to the test

Tamoxifen is generally regarded as the gold-standard drug for preventing breast cancer recurrence in premenopausal women with a prior history of the disease, but there is much individual variation in response. Jeffrey Peppercorn, MD, Duke medical biologist, bioethicist, and breast cancer specialist, explains that patients differ in their ability to metabolize the drug, which is correlated in some studies with its effectiveness.

That ability to metabolize tamoxifen is linked to genetic differences in the CYP2D6 enzyme. The FDA recently approved a genetic test that may help identify which patients are likely to respond—but that hasn't been firmly established. Such uncertainty is not unusual given the rapid pace of pharmacogenetic research, says Peppercorn. "Pharmacogenetic tests can become available in the marketplace while the evidence on whether to use them or how best to use them in clinic is still evolving." Peppercorn and colleague Nicole Kuderer, MD, published a comprehensive review of the evidence in the December 2009 issue of *Oncology*, concluding that more definitive research about CYP2D6 testing is needed before it can be routinely recommended. Peppercorn is currently leading a study with colleagues at the University of North Carolina that explores the potential benefits of dosing based on genetic metabolism.

Peppercorn says that how doctors use this type of testing can be as important as the effectiveness of the test itself. He led a survey of oncologists around the country to understand how the CYP2D6 test is currently being used in practice, and found that use of the test remains rare—but that community-based oncologists are almost twice as likely to order the test as breast cancer specialists. "It's another example of why we need to keep oncologists up to date on what we do and don't yet know about a test's potential benefits," Peppercorn says. [At press time he was scheduled to present data at the June 2010 American Society of Clinical Oncology annual meeting on what factors oncologists consider most important when deciding to order a novel genetic test.]

On a broader scale, Duke recently launched a Genetic Testing Advisory Committee; it will provide recommendations to Duke physicians about which of the growing list of genetic tests approved by the FDA to guide drug prescribing should be routinely offered to Duke patients. The committee is among the first of its kind in the nation established by an academic health system.

Breast Cancer Screening: What's Next?

As the dust settles—or doesn't—following the new breast cancer screening recommendations released by the U.S. Preventive Services Task Force (USPSTF) last November (see box below), physicians may not be advising patients much differently than before. Thomas Koinis, MD, a Duke primary care physician who chairs the Commission on Health of the Public and Science for the American Academy of Family Physicians (AAFP), says what he's seeing is that most physicians are following the guidelines of the organization they feel most comfortable with—whether that's USPSTF, the American Cancer Society, or the World Health Organization. And so far there's no indication that the USPSTF recommendations are curbing insurance coverage or Medicare reimbursement of mammograms for women in their 40s.

But the task force revisions raise valid concerns about the current limitations of mammography. "When you strip away the patina of emotion, the issue is that we're still in the very early days of screening, not just for breast cancer but all cancers," says Duke oncologist P. Kelly Marcom, MD. "And if all the women in the United States actually did what was recommended for breast screening, there wouldn't be enough radiologists to do the mammograms and read them. So we need to figure out how to use our resources more effectively, so that we are screening the women who need it and not the women who don't."

Most agree the current debate over the most appropriate age to begin breast cancer screening will be resolved by better identifying which individuals are at high risk—and by advances in imaging technologies. What's most needed is a reduction in false-positive readings, which are more common among women ages 40 to 49 than in older women and are cited as a rationale for changing the USPSTF recommendations. (The breast tissue in younger women is often denser than that of older women, posing more difficulty in imaging.) "Nationally, about 80 percent of biopsies we conduct [based on mammogram results] are benign," says Jay Baker, MD, chief of breast imaging at Duke, where the rate is about 65 to 75 percent.

"We know we could be doing a whole lot better in reducing unnecessary biopsies," Baker says, "but radiologists are expected to pick up 100 percent of cancers, and the current culture dictates that we call back even the things we are certain aren't going to be cancer." He says preliminary Duke studies (not yet published) suggest that removing such an unspoken mandate could eliminate as much as 40 percent of the false-positive recalls, while missing virtually none of the cancers. Though there are many radiologists who call back as many as 10 to 15 percent of their cases for further investigation, Baker says that most research shows that "once you get past a recall rate of about 5 percent, you're not catching more cancers—you're just calling more people back."

While mammography remains the standard of care, researchers at Duke and other institutions are examining a variety of new and/or improved imaging technology, such as:

- **Tomosynthesis.** According to Baker, this technology is well on its way to complement and perhaps even replace mammography—because it is mammography, in a sense. It's a digital mammogram machine that has been modified to move in an arc over the breast to collect a series—say, 25—of low-radiation images. The result is like a mix of a mammogram and a CT, providing better-quality, multi-dimensional images without more radiation. Early testing of the technology has been promising, but not conclusive, and it's not yet approved by the FDA.
- **Breast ultrasound and breast MRI.** Both of these technologies are widely available, but not quite ready for widespread application as screening tools. The false-positive rates for ultrasound are 10 to 1, compared to 4 to 1 with mammogram. The high cost of MRI also makes it a poor choice for widespread use, though both MRI and ultrasound can help refine diagnosis in women at high risk or who have a lesion.
- **Breast SPECT-CT (single photon emission computed tomography combined with computed tomography).** Developed at Duke by Martin Tornai, PhD, this new machine is an ultra low-dose CT scanner that's been miniaturized and tailored specifically to image the breast. It provides high-resolution 3-D imaging that can even register biochemical changes—meaning that it could detect abnormalities much earlier than MRI. The SPECT component requires injection with radioactive dye, so it may only be appropriate for high-risk patients.
- **Decision integration tools, also known as CAD (computer-assisted diagnosis).** Because computers can store thousands of images of breast lesions, as well as information about whether those lesions turned out to be cancerous, this developing information technology could provide radiologists with a tool to refine their evaluation of breast images by comparing a new scan to a compendium of similar cases.

"My mother, grandmother, great-grandmother, and two aunts had all been diagnosed with an aggressive form of breast cancer. Multiple factors such as personal shame and a lack of education on their behalf contributed to my vague knowledge of my familial medical history. So after the birth of my daughter, I reached out to Duke in hopes of getting answers and figuring out if my daughter could avoid that same fate."

Kesha Dozier, 37, Raleigh, NC
Wife, mother of three, pharmaceutical rep
High-Risk Breast Clinic patient since 2008

On November 16, 2009, the U.S. Preventive Services Task Force (USPSTF) recommended new guidelines on screening for breast cancer, including mammography and breast self-exams. The controversial guidelines, in a reversal from previous recommendations (and the recommendations of several other groups), say the decision to start regular, biennial screening mammography before the age of 50 should be an individual one and take into account the patient's risk factors and family history. They recommend regular screening, every other year, for all women between the ages of 50 and 74.

To read more about the guidelines, visit ***dukemedmag.duke.edu*** *and click on "Who Needs a Mammogram?"*

Chemo matchmaking

A more refined prognosis is the first step toward a more refined treatment plan. Patients with a profile that signifies a low risk of recurrence, for example, may be able to forgo a harsh treatment regimen. But once it's established that a patient needs chemotherapy, the next question is whether she is sensitive to the chemotherapy that her oncologist may choose. "Large randomized trials done on thousands of patients [which is what most current standard protocols are based on] don't necessarily apply to the individual who is sitting in front of me," says Marcom. "What chemotherapy should we treat *this* person with?"

That's exactly the question Nevins and Potti's genomic profiling techniques are helping to answer. Already under way at Duke are clinical trials using the techniques to predict chemotherapy response in patients with lung, prostate, and breast cancers, with trials for other cancer types in the works. Marcom is leading the breast cancer trial, which uses tumor profiling to guide selection of pre-surgical chemotherapy for patients with early-stage, HER2-negative, invasive breast cancer.

In standard care, there's not a lot of information to help physicians decide whether such a patient would respond better to, for instance, docetaxel- or doxorubicin-based chemotherapy, so the therapy selection is often a coin toss. If the chosen chemo doesn't work, the physician might try another type—but in the meantime the patient will have lost time and experienced side effects from an ineffective treatment.

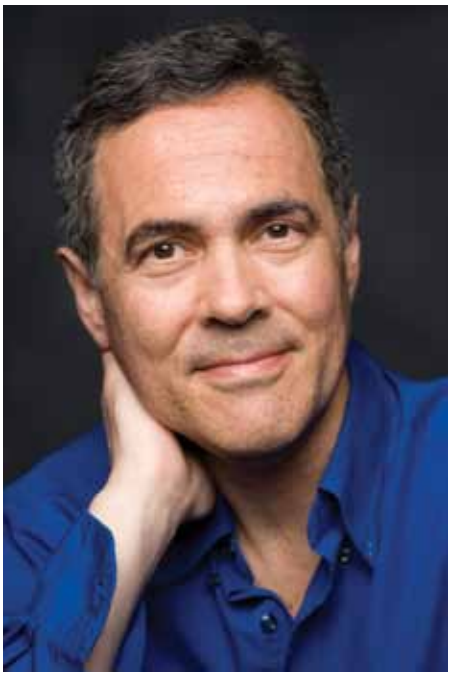
In Marcom's trial, researchers studied the genomic signatures from previously collected tumor samples, comparing the treatments applied to each sample and their outcomes, to generate a set of predictions about what kind of chemotherapy will work best for tumors with certain genomic signatures. They tested their theories using breast tumor cell lines grown in the lab, and now randomized participants in the trial are having their own tumors biopsied, profiled, and matched to the appropriate chemotherapy (based on these predictions). Trial outcomes will be used to judge the effectiveness of this approach.

"No other institution right now is capable of taking this type of genomic profiling on individual tumors and turning it around in seven to 10 days to incorporate it into clinical decision-making," says Marcom. "We had to set up a new methodology do this kind of work." But he anticipates that, over the next five years, clinicians will be able to incorporate this type of genomic assessment as routine practice. "We need to do it in the context of clinical studies to prove that it works, but I believe we are learning a lot about how to treat our patients."

Strategic strikes

Genomic tumor profiling is one of many technologies that are helping researchers understand a tumor's biology at the molecular level—learning exactly which cellular processes make each tumor tick.

VICTORIA SEEWALDT, MD



NEIL SPECTOR, MD

In addition to aiding the selection of chemotherapies, such biologic insights are driving the development and application of another frontier in cancer care: targeted therapies.

Sometimes referred to as the "chemo of the future," targeted therapies are different from chemotherapies in that they act on a specific function in the tumor cell, whereas chemotherapies generally wipe out any cells in the body that are rapidly dividing, tumor or otherwise. The targeted therapy lapatinib (Tykerb), for example, blocks the action of the HER2 gene, which mutates to become overactive in about a quarter of women with breast cancer—causing more aggressive cancer and worse outcomes. As the pharmaceutical equivalent of guided missiles, targeted therapies are more precise and less toxic than chemotherapy. They also provide new treatment options for patients whose tumors are resistant to chemo.

"I often describe a tumor as being like a room full of lights and light switches," says oncologist Neil Spector, MD, co-director of Duke's Experimental Therapeutics Program, who led the development of lapatinib. "With targeted therapies, we are working to figure out what circuit can be cut so that all the lights shut down."

The problem is that not all tumors have the same wiring—so, just like with chemotherapy, not all patients will respond to the same targeted therapies. But, says Spector, "The history of oncology has been that you give a drug to everybody and see who responds. And if 15 people out of 100 respond you jump up and down. If you told someone with heart disease 'hey, there's a one-in-10 chance you'll respond to this cholesterol drug'—you'd never get away with that."

That broad prescribing happens not only with chemotherapy but some of the newer targeted therapies, he points out—including trastuzumab (Herceptin), which was FDA-approved 15 years ago. "We're still not entirely clear about how that drug works," Spector says. As a result, sometimes the drug is given to people for whom it will have little benefit. And although

A path toward whole-person care

Personalized medicine extends beyond matching the gene expression to the correct therapy. "We know that people under stress release hormones that could counteract the benefits of any therapy," says oncologist Neil Spector, MD. "So taking a whole-person approach to care and helping patients manage the stress in their lives is just good medicine."

Duke has long offered support groups and counseling for cancer patients and their loved ones, and studies show such approaches can make a measurable difference. In 2006, Kim Lyerly, MD, director of Duke Comprehensive Cancer Center, invited Tina Staley to implement her personalized cancer support program, Pathfinders, at Duke. The goal was to study the program and determine whether it had a positive impact on patients.

The Duke research 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."

"This is a structured, personalized model of care that can be measured like any other treatment," says Staley. "That's why we spent the time we did to make it evidence-based; otherwise it's just a lot of classes with no curriculum. This is about social change, not just bringing humanity into the health care system, but proving it works."

"Some of it isn't the sexiest, high-science stuff," says Spector, but care that considers the emotional, mental, and spiritual aspects of a patient's experience with cancer is going to be an increasing part of the personalized approach. Duke is even building its new Duke Medicine Cancer Center with such considerations in mind; the facility will feature, among other things, a chemotherapy infusion suite that includes an outdoor terrace in addition to indoor and secluded spaces for receiving treatment. "You can count on one hand the number of institutions that include programs like Pathfinders and integrative medicine as part of their cancer care," Spector says. "How you treat the whole person is really where I think we've made a tremendous leap."

A documentary on the Pathfinders participants, filmed by Ted Bogosian, a faculty member at the Duke Center for Documentary Studies, is coming out this fall. Learn more at cancer.duke.edu/dccrp/pathfinders.

Learn more about all of the support services available for Duke cancer patients and their families at cancer.duke.edu.

targeted therapies are gentler than chemotherapies, there are still significant risks—trastuzumab, for example, can cause heart damage in some patients. "We don't want to needlessly expose women to that," Spector says.

To change the game, Spector, Marcom, and colleagues are analyzing the specific molecular processes on which targeted therapies act—and profiling individual tumors to match them to the drug that homes in on their particular vulnerable pathways. It's an intricate, iterative process, Spector says. "Tumors change, especially in advanced disease; they develop resistance to therapies that worked before. And we have to look at what drug A is doing to the cell circuitry, compared to what drug B is doing, and figure out how to combine drugs that don't recapitulate each other but enhance or complement the effect. So it involves going back and forth between the bench to the clinic and the clinic to the bench to look at what's happening. It's a great example of translational research, and Duke is a great environment for doing that."

For example, Spector recently showed that when some breast cancer cell lines were treated with lapatinib, which blocks HER2 receptors, the cells simply found an alternative way to support their growth—growing new estrogen receptors.

"I have participated in several clinical trials. I enrolled in these trials because I liked the idea of my treatment being scrutinized on such a detailed basis. It also gave me a sense of control over the uncontrollable diagnosis of cancer. Participating in research was a way of hitting the disease head-on—my way of contributing to its potential demise."

Claire Weinberg, 46, Oxford, NC
Practice manager, wife, mother of a five-year-old son
Diagnosed with invasive breast cancer in August 2008
Enrolled in genomic profiling trial led by Duke's Kelly Marcom, MD

"Breast cancer cells are designed to survive; they essentially seek out a new pathway for their survival," he says. But Spector found that he could prevent the new outgrowth of estrogen receptors in the cell lines by treating them with both lapatinib and a drug that blocks estrogen receptors (an aromatase inhibitor).

Last year, a multicenter clinical trial based on Spector's research found that a combination therapy of lapatinib plus the aromatase inhibitor letrozole resulted in better outcomes for women with HER2-positive breast cancer. "It was very exciting to find that these models could dictate what sort of treatment certain women with breast cancer should get," Spector says.

A similar Duke study led by Kimberly Blackwell yielded promising results for patients with HER2-positive metastatic breast cancer. Blackwell showed that combining lapatinib and trastuzumab appear to deliver what she calls a "double whammy," disabling the HER2 pathway in two places.

Blackwell's study, which began in 2005 and was published in December 2009 in *Journal of Clinical Oncology*, showed the combination worked significantly better than lapatinib alone, extending patients' lives more than four months. All participants had metastatic disease that had continued to spread even after multiple treatments that included trastuzumab plus chemotherapy.

"These patients had pretty much had all of the chemo we had to offer," says Blackwell. "Here we got chemo out of the picture and kept people alive longer. This study typified our current mantra of delivering the right drug to the right patient; there was a survival advantage because we thought about what drove the patient's tumor. That's what personalized medicine is all about." The next step is a worldwide study of the combination therapy in 9,000 HER2-positive breast cancer patients.

Fast forward

After 40 years with chemotherapy as our major weapon in the war on cancer, it's hard to shake the mentality that chemo carpet-bombing is a necessary evil—even with its extensive collateral damage to people who may get no therapeutic benefit to show for it. "We've been reluctant to let go of chemo because it takes a long time to develop and incorporate new treatments," Blackwell says. "But we're showing that when we understand the mechanisms behind a woman's tumor, we can give her the right drugs; we don't always have to have the toxicity."

Targeted agents may not replace chemotherapy outright—at least not in the near future—but they will make it possible to avoid "blasting" cancer patients, says Blackwell. "It's starting to get cancer more in line with other chronic conditions like lung, kidney, and heart disease, where we manage medications and lifestyle.

"I'm living for the day that I don't have to give chemotherapy to patients—that I know what drives their particular tumor forward, and I can say 'hey, this is what your tumor likes and what it doesn't like and here's your cocktail of drugs.' And that's where we're headed."

Learn more about breast cancer care at Duke at ***dukehealth.org/cancer*** *or by calling* ***888-ASK-DUKE*** *(patients) or* ***800-MED-DUKE*** *(physicians).*

JUNE SPENCE, KATHLEEN YOUNT, *and* MINNIE GLYMPH *contributed to this article.*

ANXIOUS TIMES

by June Spence photography by Jared Lazarus

In the same way that grim headlines seem to be today's media mainstay, anxiety disorders seem more and more like a defining impairment for this era. Managing these disorders—which are significantly more common than depression disorders—can be daunting, but Duke psychiatrists say that accurate diagnosis, circumspect prescribing, and strategic referral to behavioral therapy or specialty care can bring solace to sufferers in nerve-wracking times.

Even if you've thus far managed to avoid a personal crisis via economic downturn, domestic or foreign violence, or plain-out natural disaster, the cultural pulse of dread that dominates our times is inescapable. We're still slogging through the aftermath of the worst financial crisis since the Great Depression. Our landscapes—literal, financial, and emotional—have been shaken by earthquake and oil spill. Job losses and home foreclosures continue to ripple through the media headlines, with no clear end in sight. It seems that by the millions, Americans are facing agonizingly uncertain futures.

All patient names have been changed.

In times of trouble, heightened anxiety is an appropriate response, one that can spark positive action. A few sleepless nights of fretting over impending layoffs may well drive someone to more mindful spending, or even to develop a new set of skills to better compete in the marketplace. Anxiety keeps humans alert to dangers both physical and social, so at its best it's a powerful tool for survival.

But for those with anxiety disorders—which affect 40 million adults in the United States, according to the Anxiety Disorders Association of America—such sensations take on a life of their own, far removed from the events that triggered them. Instead of spurring self-protective action, fear and dread become overwhelming, even incapacitating.

PERSONALITY VS. PATHOLOGY

"Imagine you're sinking in quicksand while having a heart attack, and someone has stuck a loaded gun in your mouth," says Liam. That's how urgent and terrifying his panic attacks were when they struck. "There was an impending sense of doom. That's one of the worst things. You feel it will happen, that this is the end. My body isn't working; I'm going to die." Eventually Liam learned he had mitral valve prolapse, which is associated with panic attacks, but the severity of his anxiety had by then eclipsed its origins. "It was completely debilitating. I had no control of my nightmarish racing thoughts, and no control of my body's reaction to these thoughts."

Carrie is a cancer survivor with a long career in a volatile industry, but it wasn't until a confrontation with a supervisor four years ago that her struggle with anxiety began. "I'd wake up in the morning and have this sense of dread, and every day it got a little worse. No peace, no sleep; the thought of eating was horrible. It felt like that fight-or-flight adrenaline had kicked in and never turned off. I could feel it in my stomach, a constant fluttering. I felt like all the areas

I could feel it in my stomach, a constant fluttering.

of my life were out of control. I'd pace back and forth, praying for it to stop. You try to maintain this normalcy, but inside you're screaming."

To Liam and Carrie, it was clear that something physical had gone terribly awry. But the forms anxiety disorders take are not always so easily recognized. In some people, the line between personality and pathology can be difficult to discern—as with Tim, whose acute social anxiety was something he'd long taken for granted. He says he'd always been "introverted and shy. I thought, 'This is who I am, this is the hand that was dealt to me,' and for the most part I tried to accept it."

A former tennis pro, Tim had felt at home out on the court, but found the frequent board meetings and presentations the job required "extremely challenging. Any time I was the center of attention, I don't think I coped very well. I didn't have any growth through repetition. I probably knew early on that the anxiety was interfering with my life, but I didn't have the strength or the will to follow up—maybe it was not even knowing how to follow up." But four years ago, as the date of his daughter's wedding approached, he began to wonder whether something could be done to help. "I just wanted to enjoy the moment and be there as her dad."

"People often think it's a question of character," says Wei Zhang, MD, PhD, director of the Anxiety and Traumatic Stress Program at Duke, which conducts research on anxiety disorders and provides adult outpatient care. "They assume they're just stressed out. Perhaps there has been some stressful event, the stock market's down, there's a death in the family, and they think they just have to tough it out. Or they think it's natural because their mom was like that—and, of course, anxiety disorder does have a genetic component."

ROOTS OF THE CRISIS

Social anxiety has been linked with a functional variation in the human serotonin transporter gene, which appears as either a short or long allele. People who carry one or two short alleles are predisposed to a stronger emotional reaction to threat and fear, which sometimes manifests as anxiety. Among humans of European ancestry, 64 percent have at least one copy of the short allele.

But why should an allele that could bias individuals towards maladaptive emotional responses appear so frequently? "It's important to understand that the short allele is advantageous under most circumstances, largely through its positive effects on arousal and attention," says Duke neurobiologist Ahmad Hariri, PhD. Hariri is studying variations in the serotonin transporter gene that may account for up to 10 percent of the difference in the reactivity of the amygdala—the structure in the brain that is crucial to both the formation of emotional states and the encoding of memories that have an emotional component, such as those of a traumatic event. These genetic differences may help explain why one person

A CURE—VIA CANCER

Marie says she probably struggled with anxiety for most of her life, never being fully aware of it or knowing what to call it. Then she was diagnosed with cancer, and her anxiety went into overdrive. She felt frozen by fear one minute, overloaded on adrenaline the next. "I felt so traumatized and fearful," she says. "I couldn't find a place within myself to rest and draw from my own inner reserves. It was like I was holding a huge piece of kryptonite, and I couldn't move away from it."

While under the care of Duke oncologist Andrew Berchuck, MD, Marie discovered a class on mindfulness-based stress reduction at Duke Integrative Medicine. "That was one of the first doors to open," she says. Marie later began working with psychiatrist Margaret Maytan, MD, at the Duke Comprehensive Cancer Center. Medication helped her clear her mind and opened her up to other therapies. She began practicing yoga, qigong, and meditation. She discovered the therapeutic value of making huge, colorful drawings with oil crayons. After meeting with a nutritionist, Marie adopted a "vegan plus fish" diet and her energy soared. She began taking four-mile walks in the woods near her Hillsborough home.

Marie's anxiety abated, and remarkably, she feels less anxious than before she was diagnosed. "Now I know that I had generalized anxiety before. Cancer has transformed my ability to know what stress feels like and to be active about what I need to do to help curtail it."

Maytan says that anxiety is part of the journey for every cancer patient. However, its severity and the ability of the patient to cope vary widely. "Some people become extremely anxious even when their prognosis is excellent and their treatment not so demanding. Others facing a terminal diagnosis may cope well, without the need for professional assistance."

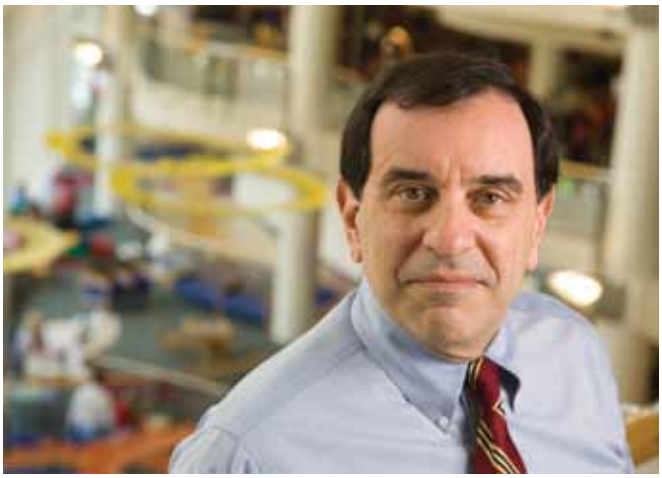
What are the clues to how well a patient is coping? "When a patient is not sleeping, having episodes of panic, feeling out of control, or having a hard time functioning because of anxiety, think about a referral to a psychiatrist," says Maytan. "There's no need for a cancer patient's days to be filled with disabling anxiety."

reacts to a stressful situation with a debilitating depression, anxiety, or post-traumatic stress, when another does not.

"Maybe evolution favors this genetic constitution in particular environments characterized by uncertainty or volatility," suggests Duke neurobiologist Michael Platt, PhD. Platt's research group studies the social behavior of rhesus macaque monkeys, who are the only other primates with similar variation in the same gene. "Being more easily aroused might promote more risk-taking behaviors outside of the social realm, like leaping farther between trees or traveling farther," he says—behaviors that contribute to the success and survival of individuals carrying the gene.

The variation could also offer protection in certain social situations. A recent study by Platt's group showed that macaques with the short/long allele combination, like humans, become averse to risk when experiencing social anxiety. This may aid them in avoiding dangerous interactions with others. "There's a heightened vigilance in social situations," explains Platt, which could benefit a low-status monkey, "although someone high in status who is risk-averse may not take advantage of opportunities or resources available."

Identifying and understanding genetic predispositions to anxiety disorders could one day pave the way for more tailored and effective therapies. "We may be able to get to who is most at risk for these disorders



Richard D'Alli, MD

Imagine you're sinking in quicksand while having a heart attack, and someone has stuck a loaded gun in your mouth.

and even to find the biological pathways where we could intervene to prevent the disorders from ever occurring," Hariri says. "To shift these trajectories before they even begin to manifest, that's the dream." However, genes are not destiny, Platt is quick to emphasize. "This is not deterministic. A lot depends on environment. A traumatic childhood experience, for example, an uncertain or deprived upbringing—that's when the short allele starts to have a bigger negative impact."

SHIFTING SYMPTOMS

If an anxiety disorder is triggered in childhood, it can present very differently than it does in adults, and its appearance shape-shifts with maturity. Duke child and adolescent psychiatrist Richard D'Alli, MD, chief of the Division of Child Development and Behavioral Health and medical director for Child and Adolescent Psychiatry Services, says identifying it is "really about adjusting your sights as a clinician to the developmental stage of the child. Anxiety might look like excessive fussiness in infancy. Toddlers may show anxiety by being inhibited or behaving in a way that is avoidant. When they get to pre-K or kindergarten, separation anxiety can be the issue, when they throw massive tantrums and may refuse to go to school or be away from their parents. In adolescents you may see the anxiety manifesting as social phobia [also called social anxiety disorder, or SAD]—isolation from friends, or not participating in the classroom out of fear so that it affects grades." Substance abuse may emerge at this stage as well, as an attempt at self-medicating.

What separates the difficulties almost all children experience from a true disorder that calls for intervention is impairment. "When we say someone is impaired, we really mean that they are in some way prevented from doing their developmentally appropriate job," observes D'Alli. "What's the job of a kindergartner? To go to school, to stay in circle time, to take naps, to eat with the other kids, to be a family member." Similarly, in adults, the threshold between distress and disorder is functional impairment, says Zhang. "It's when you could achieve more in your life without that fear and avoidance."

"The sooner any kind of medical or psychological disorder can be identified and treated, the better the long-term outcome," says D'Alli. "No one questions that about cancer. We ought not to question it in pediatric psychiatric disorders, of which anxiety is one of the most prevalent."

TRADING IN THE BENZ

The first-line drug treatment for a range of anxiety disorders is SSRIs or SNRIs (selective serotonin and norepinephrine reuptake inhibitors). While some physicians may be tempted to try benzodiazepines, lured by this older class of drug's promise of quick, short-term relief from panic symptoms or insomnia, "they carry a lot

of baggage," warns Zhang. Potentially addictive, benzodiazepines also have been shown to worsen depression, which commonly co-exists with anxiety. They are emphatically not recommended for post-traumatic stress disorder (PTSD), says Zhang, because they impair the ability for cognitive restructuring, which is important in recovery from PTSD. And according to D'Alli, they're not appropriate for children: "At present there are no data to support long-term treatment of child and adolescent anxiety with benzodiazepines."

Compared to benzodiazepines, efficacy and safety are much better established for SSRIs and SNRIs, Zhang says. Still, only 50 to 60 percent of adult patients experience some symptom relief from the medication. "The rate of complete remission is even lower—about 30 to 40 percent. And remission should be the ultimate goal of treatment."

The psychotherapy approach of cognitive behavioral therapy (CBT) has also proven to be beneficial for anxiety, especially PTSD, notes Zhang. "A lot of studies bear that out. However, alone it is not always sufficient, especially when symptoms are severe. A patient unable to concentrate, for example—how much is he going to be able to absorb in CBT?" Studies have shown greater efficacy with medication and CBT combined than with either alone.

Combined therapy has also been proven effective in children. Duke researchers led by principal investigator John March, MD, took part in the Child/Adolescent Anxiety Multimodal Study (or CAMS, published in October 2008 in the *New England Journal of Medicine*), which showed dramatic improvement in children with separation anxiety, generalized anxiety, or social anxiety disorders that were treated with both sertraline (Zoloft) and CBT. Medication and therapy taken separately showed efficacy as well.

The study's authors further noted no suicidality among the participants—a reassuring finding for physicians and parents disturbed by the black-box warning that remains on SSRIs specifically because of concerns about suicidal tendencies among young patients. Nonetheless, medication need not always be the first step in treating children's anxiety, says D'Alli. "Some very good news that we have from CAMS is that CBT has just as much a chance of being effective in the treatment of pediatric anxiety as any evidence-based medicine." To increase the probability of a more robust response to treatment, a combination of SSRI with CBT is indicated. But if there are concerns about medication, says D'Alli, it serves to start with the therapy: "There is no black-box warning on therapy!"

DIAGNOSIS DILEMMAS

Anxiety disorder is significantly more widespread than depression—one-third of the population will experience anxiety disorder in their lifetimes, as opposed to the one person in five who will suffer

I'd have nightmares, wake in a cold sweat, and in the morning the sense of dread was overwhelming.

major depression. However, anxiety hasn't achieved anything approaching the level of public—or professional—awareness that depression has.

This diagnosis disparity may exist because of how people with anxiety disorder commonly present. "Oftentimes patients will come in with vague somatic symptoms, such as headache, nightmares, fatigue, or irritability," notes Zhang. "Sleep disturbances are common: night waking, waking in a cold sweat or panic. Or they don't have the sense of being rested and refreshed—they may not even realize their sleep quality is not good."

Chest discomfort, muscle tension, or GI symptoms are also red flags, and even less likely to be linked to a psychiatric condition. "Anxiety disorder has a lot of overlapping symptoms with chronic fatigue, fibromyalgia, and irritable bowel syndrome. You can treat the symptoms, but if you don't treat the underlying cause, patients may still come back with those symptoms. More tests may be run, and doctor and patient are both left scratching their heads."

Anxiety and heart health—what's the connection?

Chronic anxiety doesn't just turn people's lives upside down; it also can erode their heart health over time. Anxiety—along with depressed mood—is one of two primary components of stress, a known contributor to cardiovascular disease.

The Duke Heart–Mind Center is the country's first dedicated program to study the link between emotional and cardiovascular health. Led by Duke psychiatrist Ranga Krishnan, MB ChB, dean of the Duke–NUS Graduate Medical School Singapore, Duke Heart Center director Christopher O'Connor, MD, and Duke professor of medical psychology James Blumenthal, PhD, the center is pursuing a variety of clinical trials, including:

- **REMIT**, which is assessing the impact of the drug escitalopram on stress-related myocardial ischemia.
- **COPE-HF**, which is comparing the impact of coping-skills training with standard medical care in outpatients treated for heart failure.
- **ENHANCED**, which is using the Duke-developed "mental stress test" to examine the effects of stress-management strategies and exercise on cardiovascular biomarkers. During the test, participants perform stress-evoking tasks while clinicians monitor their heart rate and blood pressure and use echocardiography to detect myocardial ischemia.
- **UPBEAT**, which is studying the benefits of exercise and anti-depressant medication in cardiac patients with symptoms of depression.
- **INSPIRE**, which is a telephone-based coping skills intervention for patients with COPD.

To learn more, call Jennifer Wilson at 919-681-4367.

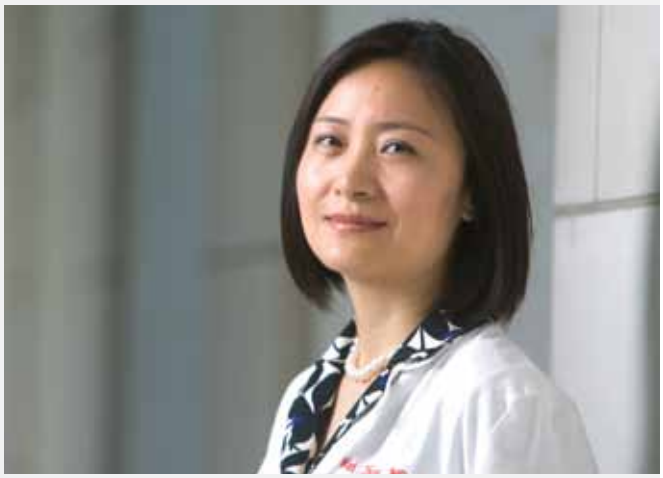
FEMININE MISTAKE?

Anxiety more prevalent in women

Betty Friedan famously wrote about a crippling malaise among 1950s housewives, dubbing it "the problem that has no name." In the 21st century, the malady gripping a disproportionate number of maniacally multitasking mothers/wives/professionals has been clearly identified: anxiety disorder. Women are more likely to be affected by generalized anxiety disorder, panic disorder, post-traumatic stress disorder (PTSD), and specific phobia than men—in some cases twice as likely, according to the Anxiety Disorders Association of America.

There's no single reason why women have an increased risk, according to Duke psychiatrist Wei Zhang, MD, PhD. Hormonal fluctuations put more women at risk for anxiety and depression during adolescence, pregnancy, the postpartum period, and menopause. Psychological studies suggest women engage in more cognitive avoidance—strategies to avoid threatening thoughts and emotions—than men. Social factors such as gender roles and discrimination seem to be in play as well. And there are more female victims of sexual assault and childhood sexual abuse, common triggers of PTSD.

Anxiety disorders not only affect the patient's well-being, but potentially that of her offspring. "There are studies suggesting that the children of moms with depression and anxiety have worse outcomes in their academic and social development," says Zhang, "so it's very important to recognize and treat."



Wei Zhang, MD, PhD

The Generalized Anxiety Disorder scale

Primary care physicians can use the Generalized Anxiety Disorder-7 (GAD-7) scale to quickly and effectively screen their patients for anxiety disorders. The subscale, which is the first two items of the GAD-7, can also be a good measure of core anxiety symptoms.

Over the past two weeks how often have you been bothered by the following problems?	not at all	several days	more than half the days	nearly every day
Feeling nervous, anxious, or on edge	☐ 0	☐ 1	☐ 2	☐ 3
Not being able to stop or control worrying	☐ 0	☐ 1	☐ 2	☐ 3
Worrying too much about different things	☐ 0	☐ 1	☐ 2	☐ 3
Having trouble relaxing	☐ 0	☐ 1	☐ 2	☐ 3
Being so restless that it is hard to sit still	☐ 0	☐ 1	☐ 2	☐ 3
Becoming easily annoyed or irritable	☐ 0	☐ 1	☐ 2	☐ 3
Feeling afraid, as if something awful might happen	☐ 0	☐ 1	☐ 2	☐ 3

total score _____ = add columns _____ + _____ + _____

Scores of 5, 10, and 15 reflect mild, moderate, and significant anxiety.

Careful, directed questioning can help primary care physicians to identify a potential anxiety disorder—and it's possible to do so within the time constraints of the average exam. A brief but effective screening tool is the Generalized Anxiety Disorder-7 (GAD-7) and its subscale, the Generalized Anxiety Disorder-2 (GAD-2). Both perform well in screening not only for GAD, but for panic disorder, SAD, and PTSD (see box above).

"Some very simple screening questions can help you narrow down the cause," adds Zhang. "The most important thing in recognizing PTSD, for example, is identifying a history of trauma—that's the center of the issue. It's very important to ask about whether there has been a very stressful event. PTSD is oftentimes missed even among the psychiatric community; it's treated as GAD or depression, and they've missed the elephant in the room."

You try to maintain this normalcy, but inside you're screaming.

Anxiety is also often a co-morbid condition. Patients frequently have multiple anxiety disorders or experience acute anxiety alongside depression, bipolar disorder, or addiction. In these cases, tailored treatments, optimally under a specialist's care, are needed. For Liam, who struggled for years to head off his brutal panic attacks without shutting off from the world, connecting with the right specialist was key. "He saw past the anxiety and zeroed in on what no one else had recognized, that it was a part of bipolar disorder."

THE GRADUAL RECOVERY

But even then change didn't happen overnight. As his specialist gradually fine-tuned his medications, Liam worked on getting regular exercise and eating more healthily, lifestyle changes he feels helped stabilize him as well. The difference, he says, is "night and day. Now, I can do most of the things I could do before. That doesn't mean I don't ever get anxious or fear a panic attack, but it's like having a second chance at a normal life." For Carrie, a six-week medical leave allowed for intense therapy and careful medication management, which helped stabilize her enough to return to work. Within four months she was feeling more like her old self, and "today couldn't be more different," she reports. "I am more at ease with myself."

Tim's first step toward recovery was volunteering for a Duke study on SAD. He later sought treatment through the Anxiety and Traumatic Stress Program. Drug therapy has provided dramatic relief of his symptoms, he reports. "The medication offers me an opportunity to be comfortable in situations where I wouldn't otherwise be." Now a sculptor by trade, he's still often the center of attention, attending gallery openings and delivering presentations and Q&As. But unlike in his tennis years, "there's no trepidation going forward, only positive anticipation and excitement. I am seeing a different side of myself—it's illuminating."

Helping patients find their way to normal lives is what drives Zhang and her colleagues, whether that means feeling like their "old selves" or tapping into new, unprecedented selves. "In the face of trauma or stress," she observes, "people can and do overcome their fear with help. Human beings have a lot of resilience."

The Anxiety and Traumatic Stress Program at Duke is a major referral center throughout the Southeast, providing services to more than 500 adult outpatients annually. For more information, visit ***psychiatry.mc.duke.edu*** *and click on "Clinical Services," or call* ***800-MED-DUKE*** *(physicians) or* ***888-ASK-DUKE*** *(patients).*

Duke Children's provides online continuing medical education for clinicians, including CME courses on pediatric psychiatric conditions. Learn more at ***pediatrics.duke.edu*** *(click on "Education").*

CLINICIAN Q & A:

Peripheral vascular disease

Duke experts discuss the latest thinking in diagnosis and treatment of this common—and commonly overlooked—condition.

If you have patients over the age of 70, or patients over age 50 who have diabetes or a history of smoking, you have patients who are at high risk for peripheral vascular disease (PVD)—but probably don't know it. Although more than eight million Americans have this condition, in which atherosclerotic plaque builds up in vessels outside the heart and brain—most commonly resulting in reduced blood flow to the legs and feet—many have no symptoms, or they mistake the signs for something else. Though the disease has long been recognized as an indicator of increased risk for cardiovascular and cerebrovascular disease, some of the recommendations for evaluation and treatment are shifting along with improvements in technology. *DukeMed Magazine* asked three specialists to discuss the current options for diagnosis and treatment of PVD:

Manesh Patel, MD, cardiologist and assistant professor of medicine at Duke

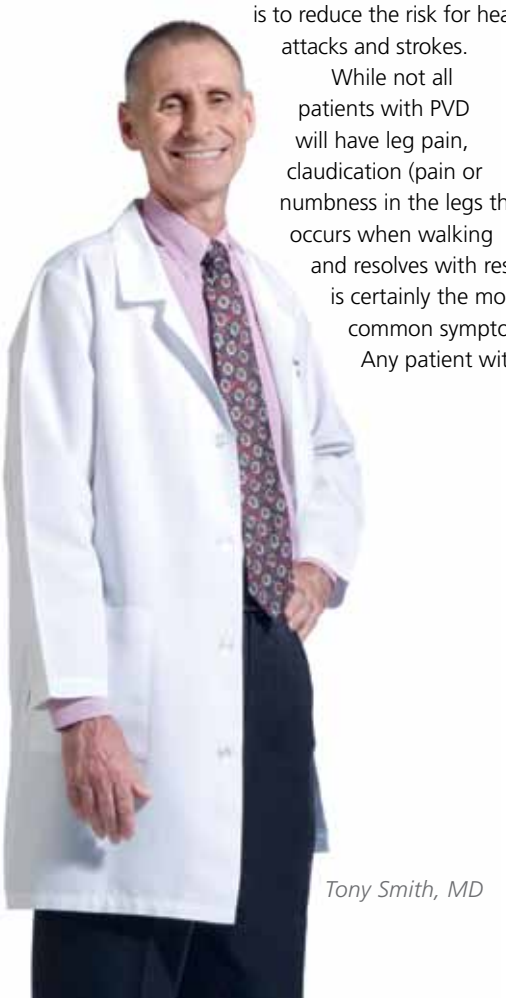
Cynthia Shortell, MD, professor of surgery, chief of vascular surgery, and director of Duke's Center for Vascular Disease

Tony Smith, MD, professor of radiology and division chief of vascular and interventional radiology

Why should patients with only mild or few symptoms be evaluated and treated for PVD?

PATEL: The risks associated with PVD are not solely related to the legs but to the heart and the brain. More than half of people who have PVD also have severe coronary disease. When we take care of patients, our first goal is to reduce the risk for heart attacks and strokes.

While not all patients with PVD will have leg pain, claudication (pain or numbness in the legs that occurs when walking and resolves with rest) is certainly the most common symptom. Any patient with claudication should be evaluated, even if they don't currently have heart disease, because PVD can be a precursor to heart disease.



Tony Smith, MD

Are there other indications besides claudication that my patient may need PVD evaluation?

SHORTELL: All patients with heart disease, cerebrovascular disease, smoking history, and diabetes are at high risk for having PVD, but the issue of whether or not they should all be screened is controversial. If a patient's distal pulses are absent on physical exam, they definitely should be evaluated.

My patient has diabetes and already clearly has problems in his small blood vessels. Why would he need further evaluation?

PATEL: Even these patients may still benefit from an evaluation of their large blood vessels. Otherwise, it's like saying your problem is due to blockages in exits off of Interstate 40 without looking at 40 itself. Opening up the big pipelines can still help these patients, and in many cases stave off amputation. Unfortunately, there are patients who go to amputation without anyone ever evaluating the blood flow to the large vessels in the leg.

When should my patient with PVD be referred for an interventional or surgical procedure?

SHORTELL: Patients should have failed conservative management before having a catheter-based or surgical procedure. That management is similar to treatment of atherosclerosis and would include aggressive control of blood sugar, lipid-lowering and antihypertensive treatment, antiplatelet therapy, and thorough foot care. Also, smoking cessation is very important. Smoking has been shown to increase the risk of PVD as much as seven times. A sustained exercise program to build new vessels and improve circulation works the vast majority of the time. But of course, it's harder to achieve than a procedure.

Sometimes medications can be useful, but we don't have any medications that are excellent. For example, we have cilostazol (Pletal), which improves blood flow in the vessels. Fifty percent of the patients who take that medication are able to walk 50 percent farther without symptoms. But many patients who take this drug experience side effects including GI upset, headache, and palpitations, and it's contraindicated with cardiac arrhythmias and patients who have a history of congestive heart failure.

If a patient is still experiencing symptoms after maximal medical therapy, then she should be referred for a possible surgical intervention.

What has changed in terms of the procedures available for patients who need surgical intervention?

SMITH: There are a lot of interventional therapies we can offer for patients who have chronic problems with PVD, including some patients who in the past would have actually gone to amputation. For instance, we can revascularize the entire lower extremity percutaneously, which means we can open up the superficial femoral artery through catheter-based procedures that use balloons and stents. Five years ago, we usually revascularized only very short areas of narrowing or occlusion. But today improvements in equipment and skill sets allow us to revascularize much longer segments.

The other option is of course to perform a bypass graft around occluded arteries. Or, sometimes hybrid procedures are appropriate. Hybrid procedures can be performed in the cardiac catheterization lab or in the operating room and involve a surgeon making a surgical incision to get into the vessel, then using catheters to open up the vessel without doing a full surgery.

SHORTELL: In many cases, physicians will want to delay such interventions, because their benefits are durable but not permanent. For example, in a young patient, a physician may not want to use up the patient's saphenous vein for a bypass in case the patient were going to need it for a heart or lower leg bypass down the road. We usually reserve bypass for severe cases of claudication, or cases of critical limb ischemia, which means if an intervention isn't performed, the patient is at risk of losing their leg.

Are there special interventions for these patients at risk for limb loss?

PATEL: Duke has formed a Limb Salvage Center for patients who have critical limb ischemia—which presents as resting leg pain or a non-healing ulcer. Physicians can contact Duke Vascular, either cardiology, surgery, or interventional radiology, and we'll see them in clinic and determine if there are ways to get more blood flow to their legs, and also make sure we're coordinating our efforts with wound care specialists.

As part of the work of that center, for patients who have no other options to get blood flow to their legs, Duke offers enrollment in a clinical trial that uses stem cells to try to generate growth of new vasculature. This trial uses a therapeutic known as Pluristem, which is made up of undifferentiated placental stem cells. These cells are injected into the legs in an attempt to promote growth of new blood vessels and reduce pain for these patients.

What is changing for patients who need interventions for PVD affecting the carotid artery?

SMITH: The gold standard of care for carotid artery disease is surgery (endarterectomy), in which an incision is made in the neck and the plaque is physically removed from the artery. A less invasive option is carotid stenting, which is performed by inserting a catheter into an artery in the groin that is then threaded to the carotid artery. Currently, carotid stenting is approved by Medicare and by third-party payers only for patients for whom surgery poses a high risk. For patients not at high surgical risk, the literature has been inconclusive as to whether stenting provides outcomes that are equal to those from surgery.

But the results of CREST, a major study announced in February 2010 at the American Stroke Association's International Stroke Conference, may change the playing field. CREST was an NIH-sponsored study with more than 100 centers involved, including Duke. This was the largest randomized clinical trial to date comparing the two approaches, and it required rigorous training and credentialing for the physicians who performed the surgeries and stenting, in order to get a true comparison between the procedures. The CREST results showed that carotid stenting essentially works just as well as surgery for patients who would normally undergo endarterectomy). In this trial, the overall stroke rates and long-term effects were similar for both procedures. These results were a milestone, but at this point, we don't know how Medicare and insurers will respond. Based on this study, they may in fact open it up and say a patient can choose whichever procedure they want. But we will have to wait a period of months to find out the decision.

PATEL: In the meantime, patients who aren't at high risk for surgical complications may be able to access carotid stenting through another clinical trial at Duke. I'm the principal investigator at Duke for ACT 1, which is comparing carotid stenting with endarterectomy in treating asymptomatic patients at standard surgical risk. We have enrolled more than 30 patients in this trial and are still recruiting.

How does a doctor know what type of specialist to refer a patient to?

SMITH: We have a great multidisciplinary effort between the Departments of Surgery, Medicine, and Radiology here. When patients come to the Duke vascular group, they get an opinion from all of us—non-invasive cardiovascular medicine as well as endovascular and open surgery.

PATEL: Sometimes, at other institutions, when you are referred to a surgeon you will most likely get a surgical procedure, or if you go to cardiology, you will get a catheter-based procedure. At Duke, we work together to figure out the best procedure for the patient, if a procedure is needed. But as a general guideline, patients who have both heart and vascular disease may benefit from seeing a cardiologist first. If a patient has had prior surgical procedures or is considering surgery elsewhere and is at risk for surgical complications related to vascular disease, especially if they have non-healing wounds, they may benefit from a referral to a surgeon.

Manesh Patel, MD (left)
Cynthia Shortell, MD

RESOURCES AND REFERENCES

The Pluristem trial is a phase I trial testing safety and efficacy and is the first time this technology is being tested in humans. To enroll a patient in that study, physicians can call 800-MED-DUKE.

For more information about the ACT 1 trial, visit act1trial.com.

Results of the first phase of CREST: *J Stroke Cerebrovasc Dis.* 2010 Mar;19(2):153-62. Duke physicians Richard McCann, MD (vascular surgery), Tony Smith, MD (interventional radiology), and Larry Goldstein, MD (neurology), are investigators in the CREST study.

To make an appointment with a Duke PVD specialist, call ***800-MED-DUKE*** *(physicians) or* ***888-ASK-DUKE*** *(patients).*

Direct-to-consumer genetic testing: Physician, inform thyself

What's the best way for clinicians to counsel patients who buy their own DNA scans?

BY GEOFFREY S. GINSBURG, MD, PhD

The appeals of the leading companies that sell direct-to-consumer (DTC) genome scans are hard to resist, especially in this age of the ever-more informed and increasingly "take charge" patient. With one small saliva sample and a fee, a buyer can learn whether he or she has genetic traits that are associated with the most common killers of our time, from heart disease to diabetes to cancers of all kinds.

It is fair to say that these firms provide accurate and scientifically valid genetic-testing results from the samples provided by their customers. But there is also evidence that the *interpretation* of the genetic results may differ from one firm to another. Moreover, although it might be useful to know one's possible genetic predispositions toward developing heart disease or other conditions, there is still much debate within the medical community and the scientific literature as to whether this information is ultimately beneficial. Just this May, plans to sell the first over-the-counter DNA testing kits at Walgreens were put on hold after the Food and Drug Administration questioned their legality; the agency is also examining online sales of similar tests, which continue to be available as of this writing.

One side of the debate argues that information gleaned from DTC tests may be motivating to patients—it may change their behavior and help them make more informed decisions about lifestyle and medications. In fact, the REVEAL study recently reported that children of patients with Alzheimer's disease were not only interested in having their ApoE4 (Alzheimer's susceptibility gene) genotype measured, but also had less stress for having done so. Many even made decisions about long-term care insurance based on the results.

The other side suggests that the data thus obtained provide only limited information about a patient's true risk profile—which makes them potentially misleading, possibly causing patients to make needless decisions or creating stress and anxiety. The tests also could create false security among patients who don't show genetic risk for some diseases that could still develop.

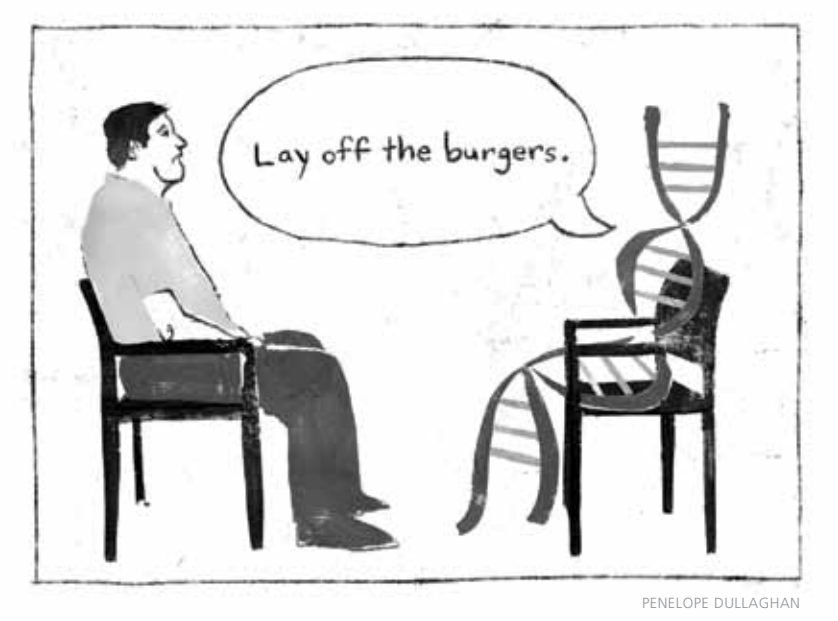
At this point in the evolution of the field of personalized medicine, it is clear that patients who wish to "take control" of their health should do so in collaboration with their health care provider. And because physicians and other medical professionals can play an important role in counseling individuals who are contemplating DTC tests or have already taken them, it behooves the physician community to become aware of the different DTC tests on the market, their nuances, and their potential value for the individual.

Putting genetic risk into context

One of the clinician's primary goals when discussing these tests should be to help the patient see these test results as just one risk indicator in the universe of data that doctors maintain on their patients. Genetic information is best placed in the context of other clinical information, with one of the most important being a thorough family history.

Patients should also know that most of the genetic data gained from current state-of-the-art DTC tests are incomplete. Many of the inheritable tendencies of consumer interest—one's likelihood of getting diabetes, for example—are based on numerous genes that work together in the development of, or in providing protection from, the condition in question. But current tests detect abnormalities in only a few of these genes. Tests do not yet exist for most of the others, nor does knowledge about how they all work together, or sometimes fail to.

This point may be confusing to patients who are familiar with the Mendelian-genetics tests that already exist, such as those for cystic fibrosis or Huntington's, diseases that are the result of a single gene. But given the genetics of complex diseases such as cancer, diabetes, and heart disease, the presence of one or even several abnormalities does not have a "no doubt about it" aspect and may actually be inconsequential. And if, for argument's sake, we did know all of the genes involved in a particular medical condition, and a test were available for each of them, and the telling mutations proved to be present, there would still be other factors, such as lifestyle and diet, that influence the outcome. "Genes load the gun," it has often been said, "but environment pulls the trigger."



PENELOPE DULLAGHAN

How best to interpret the results of genomic scans is also an area of significant uncertainty. A study in the October 8, 2009, issue of *Nature*, which compared two companies' results from the same individuals' samples, found little difference in the accuracy of the genetic analyses done by the DTC testing outfits, but several differences in the reporting of risk. This finding does not impugn the test providers so much as it illustrates that medicine is still as much an art as a science—a reality not unique to the field of genomic and personalized medicine. Uniform industry-wide standards obviously need to be developed. But even under the best of circumstances, genetic test results and the interpretations that go with them should not be taken as gospel.

By the end of the next decade or so, it's possible that personal genomic testing could move from a boutique business serving the few who are interested and can afford it to a technology that is fully integrated into health care. The benefits for both patients and providers could be enormous: imagine a health care system, for example, that could sequence virtually every person's genome—if possible, at birth—thereby giving each person a lifelong tool for prevention, diagnosis, and treatment of the diseases he or she is most likely to develop. Providers could work with their patients to formulate individually tailored health plans, be more strategic in their interventions, and use limited resources more effectively to improve people's health and reduce their risks. This is, in essence, what personalized medicine is all about.

At this point much work still needs to be done before we can fully explore such possibilities. In the meantime, it is important for physicians to educate themselves in this exciting and uncertain new world. To do so, we need not all become experts in the details of genetics or even know which genes are being analyzed in any given case. Clinicians should even consider simply having their own genomes scanned. This action would, more than any course or literature search, change the abstract concept of DTC genomic scans into a personal reality. It would also give clinicians a wider and richer perspective to bring to the patient-physician relationship, as physicians' and patients' understanding of genetic-testing innovations mature together.

Geoffrey S. Ginsburg, MD, PhD, is the founding director of the Center for Genomic Medicine in the Duke Institute for Genome Sciences & Policy. He is also a professor of medicine and in pathology at Duke University Medical Center.

Pharmacogenomic guidance

One type of test that has some immediate utility for the patient and physician alike entails the genetics of drug response (pharmacogenomics)—variation in a patient's genome that enables him or her to receive a drug's full benefit or, conversely, could cause that person to suffer its side effects but get no benefit. Such tests, currently available for a small number of drugs—such as warfarin (Coumadin) and clopidogrel (Plavix)—can potentially help physicians prescribe the most appropriate drugs in a timely fashion, avoid the problematic process of trial and error, and reduce costs. Results may even be extendable, as the genes responsible for metabolizing one drug may also be found to apply to other drugs.

Duke has established the Genetic Testing Advisory Committee (GTAC) to promote appropriate, evidence-based utilization of tests related to genomic medicine. The multidisciplinary group is working to evaluate the feasibility, appropriateness, and application of established and emerging tests in clinical practice, including testing for genetic risk evaluation, pharmacogenomics, and relevant biomarkers.

SAYING THANK YOU

Gifts from individuals and organizations are the largest source of non-government support for Duke Medicine's research, education, patient care, and service missions—and we are grateful to all who help us make a difference. To learn more about how you can partner with Duke Medicine, please call **919-667-2500** or visit **dukemedicine.org/giving**.

Employer of visually impaired funds Eye Center building plans

The country's largest employer of visually impaired people, Durham-based LC Industries, has accelerated planning for a new Duke Eye Center building with an extraordinary $12-million gift to Duke Medicine.

"This gift takes our company's commitment to people with visual impairments to a new level," says William Hudson, company president and a member of the Eye Center Advisory Board. "We want to play a meaningful role in the process that leads to cures for the common causes of blindness."

While the new clinical facility is ultimately subject to approval through the North Carolina Certificate of Need process, as well as Duke University and Duke University Health System governance approvals, it is possible that it could be built as early as 2013.

"I can't think of a better partnership than one between a company that has set the standard for employing visually impaired people and one of the nation's premier eye centers," says Victor J. Dzau, MD, chancellor for health affairs.

In addition to providing the highest quality of care for patients, Dzau says the new facility will facilitate the translation of research discoveries into breakthrough innovations in clinical care. Vision loss is quickly becoming a major health problem as the population ages and the rate of eye disease increases.

The gift has initiated an extensive planning process in hopes that a certificate of need can be filed in late 2010 or early 2011. A fund-raising campaign is currently under way to raise the additional money needed to fund construction of the new facility.

David Epstein, chair, Department of Ophthalmology; Chancellor Victor Dzau; Sally Foster, Duke Eye Center Advisory Board chair; William Hudson, chairman, LC Industries; and Bill Fulkerson, senior vice president for clinical affairs, Duke University Health System

Blue Tie/White Coat Dinner

More than 400 Duke medical students, members of the Medical Alumni Council, and guests turned out in style for the first Blue Tie/White Coat Dinner at the Angus Barn Pavilion in March. The students presented Dean Nancy C. Andrews with a check for $25,000 in support of the new Learning Center for the School of Medicine. Thanks to a $35-million gift from The Duke Endowment, planning has begun for the building and a campaign is under way to raise another $15 million. Pending approval of the Duke University Board of Trustees, a groundbreaking is planned for this fall.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01 Linda Austin and John "Jeb" Hallett with medical students

02 James Friedman, Ashley Watts, Barton Haynes, Matthew Kan

03 Nidhi Tripathi, James Yeh, Katie Yang, Ying Liu, Bryan Leppert, Manisha Bhattacharya, Tomas Moreno

04 Chancellor Victor Dzau, Philip Lehman, Dean Nancy Andrews

Cancer Center groundbreaking

North Carolina governor Bev Perdue and Duke University president Richard Brodhead joined chancellor for health affairs Victor J. Dzau, MD, and other special guests and philanthropic partners on November 6 to break ground on the new 267,000-square-foot Duke Medicine Cancer Center. A campaign is currently under way to raise $75 million in philanthropic support for this state-of-the-art, patient-centered facility, which is designed to accelerate the development of novel therapies for all forms of cancer. The new building is slated to open in 2012.

01 Mary D.B.T. Semans, Durham mayor Bill Bell, Chancellor Victor Dzau, Governor Bev Perdue, Duke University president Richard Brodhead, Durham County Commissioner Ellen Reckhow

02 Kim Lyerly, director, Duke Comprehensive Cancer Center; Myles Wittenstein, member, Duke Medicine Board of Visitors

03 Bill Fulkerson, senior vice president, clinical affairs, Duke University Health System; Bev Perdue; Victor Dzau

04 Jamie Valvano Howard

05 Kim Lyerly; Nikki Mercer, member, Cancer Center Board of Overseers; Josh Sommer and Simone Sommer, co-founders, The Chordoma Foundation

06 North Carolina State Senator Floyd McKissick Jr.; Kevin Sowers, president, Duke University Hospital; Victor Dzau

Going bald for children with cancer

Pediatric cancer physicians and members of the Duke rugby team came together in a show of solidarity for children fighting cancer this spring. The annual St. Baldrick's event is observed each year by people across the country who go bald to help raise money for children's cancer research. In the 10 years since the nonprofit organization was started, more than $50 million has been raised for pediatric cancer research.

07 Duke rugby team member Uki Deane is shorn by teammate David Houck as fellow players (from left, Manny Coker, Cameron Setzer, Calvin Hayes, Franco Signorini) look on.

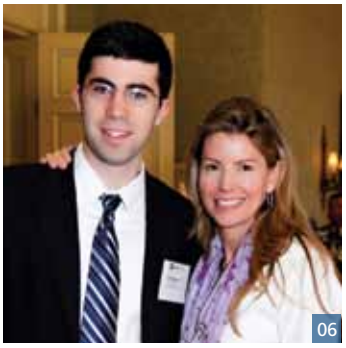
08 Henry Graham, Duke Men's Rugby coach Jay Wisse, physicians Dan Wechsler, Dan Landi, Danny Gebhart, Mas Hayashi, Michael Armstrong, David van Mater, and Ray Barfield

Teddy Bear Ball

Friends of Duke Children's celebrated the 20th anniversary of the Teddy Bear Ball in December 2009. The ball features music and dancing and a charity auction. In its 20-year history the ball has raised $2 million for research and patient care at Duke Children's Hospital & Health Center.

Duke Palm Beach Forum

Duke Medicine faculty joined friends and alumni at The Breakers in West Palm Beach, Florida, in March for the 16th annual Duke Palm Beach Forum. The theme of this year's forum was "Getting Personal About Your Health"—it featured talks on genomic medicine and personalized approaches to health and wellness, primary care, and cancer care.



01 Volunteer chairs of the Teddy Bear Ball, including Lars and Elisabeth von Kantzow, Russell and Mary Barringer, Dennis Clements and Martha Ann Keels, Wendy and Dan Cooper, Alisa and Malbert Smith, Jennifer and Jack Stenner, Rebecca and Eric Hinshaw, Don and Mary Tucker, Wendi and Bucky Oliver

02 The Casa Blanca Orchestra

03 Sam Katz and Mike Frank, past chairs of the Department of Pediatrics; Joe St. Geme, current chair

04 Jim Goodmon, president and CEO of Capitol Broadcasting, and member, Duke University Health System Board of Directors

05 Chancellor Victor Dzau; Patsy Johnson, member, Duke Children's National Advisory Board; Dick Johnson, member, Duke Medicine Board of Visitors

06 Josh Sommer and Kristen Johnson

07 Geoff Ginsburg, director, Duke Center for Genomic Medicine; Shep Zinovoy, member, Duke Medicine Board of Visitors; Reuven Porges; Roslyn and Milton Lachman, members, Duke Medicine Board of Visitors

08 Shelley Daren and Bill Fulkerson

Duke physician Joanne Kurtzberg has brought hope to thousands of children and families through umbilical cord blood transplantation.

Robertson Foundation gift accelerates regenerative medicine research

Countless children from all over the world are alive and well today thanks to the work of Duke's Joanne Kurtzberg, MD, and her team at the Duke Pediatric Blood and Marrow Transplantation Program.

Kurtzberg has spent decades investigating the therapeutic use of umbilical cord blood stem cells, a technique that has shown increasing potential to treat a wide range of problems in both children and adults—including cancer, cerebral palsy, stroke, and brain injury.

This pioneering work recently captured the attention of Julian Robertson and the Robertson Foundation, which has made a $10.2-million commitment to build a state-of-the-art Translational Cell Therapy Center at Duke.

"Dr. Kurtzberg's research reflects the kind of transformational science that has the potential to change the lives of thousands of people throughout the country and around the world," says Robertson, speaking on behalf of the Robertson Foundation.

Duke will build a 4,000-square-foot laboratory on the ninth floor of the North Pavilion, where therapeutic cells will be made and stored. It will operate under good manufacturing practices (GMP), meaning all work will follow strict safety and quality guidelines set forth by the Food and Drug Administration.

"This gift comes at such an important time," says Kurtzberg. "It will enable us to move forward with the first placebo-controlled, randomized clinical trial in children with cerebral palsy, which is specifically designed to answer key questions about the efficacy of cord blood treatments in this condition."

Anecdotal evidence from families indicates that cord blood treatments have been effective in relieving the symptoms of cerebral palsy. Now Kurtzberg hopes to prove the treatments work and to better understand how they work. Over time, she hopes support from the Robertson Foundation will also enable studies of cord blood stem cells to treat newborns with congenital heart disease, children with certain genetically acquired neurodegenerative diseases, and adults suffering from brain injury due to stroke or radiation to treat brain cancer.

"The emerging field of regenerative medicine has great promise, and this generous gift will accelerate the pace of Dr. Kurtzberg's, and other Duke scientists', world-renowned translational work in cell therapies," says Victor J. Dzau, MD, chancellor for health affairs.

In addition to directing Duke's Pediatric Blood and Marrow Transplant Program, Kurtzberg is director of the Carolinas Cord Blood Bank, which she established in 1996 with support from the National Institutes of Health and the National Heart, Lung, and Blood Institute. It processes, tests, and stores pediatric cord blood units donated by mothers delivering at 14 hospitals and health systems across the region and is one of the largest cord blood banks in the world.

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01 Allan Friedman, Darell Bigner, and Henry Friedman, leaders of Duke's Preston Robert Tisch Brain Tumor Center, receive a check for brain tumor research

02 Motivated walkers and runners came from across the country to participate

Angels Among Us

More than 4,500 people of all ages ran through Duke's campus or walked through Duke Gardens during the 16th annual Angels Among Us event in April. More than $1.6 million was raised for brain tumor research at the Preston Robert Tisch Brain Tumor Center at Duke.

Klotman is new chair of medicine

Mary E. Klotman, MD, became the chair of Duke's Department of Medicine in March. She previously held the position of chief of the Division of Infectious Diseases at Mount Sinai Medical Center in New York for 13 years, and more recently was named co-director of Mount Sinai's Global Health and Emerging Pathogens Institute.

This new post is a return to Duke for Klotman—she earned her undergraduate and medical degrees, completed her residency and a fellowship in infectious diseases, and then served as assistant professor of medicine here for five years before moving to the National Institutes of Health. She's also served on the Duke Medical Alumni Council for the past 10 years.

Klotman's research is focused on the molecular pathogenesis of HIV-1 infection. Among her contributions to this field has been to demonstrate that HIV resides in and evolves separately in kidney cells, a critical step in understanding HIV-associated kidney disease. Her research group has also determined the role of soluble host factors in innate immune responses to HIV.

The Department of Medicine is Duke's largest department, including more than 1,000 faculty, staff, residents, and fellows. Klotman is the only female chair of a department of medicine at a top-10 medical school in the United States.

3 Questions for Mary Klotman

You're now at the head of Duke's largest department. What do you see as your primary mission as chair?

The broad strokes are reorganizing the department's administration so that we are responsive to changes in health care. The current health care reforms are really exciting, and we need to be able to anticipate needed changes at Duke and implement those changes across the department and the health system. The other big challenge that is going to be fun is building translational research. It's already very strong at Duke, but that's where the growth will be. I'll be working a lot with Rob Califf [director of the Duke Translational Medicine Institute], and with School of Medicine dean Nancy Andrews to identify candidates to fill key translational research positions. It's like being a kid in a candy store—you have this incredible patient population, incredible clinical service, and great physicians and basic scientists, and my job is to look for opportunities to bring them together more.

How will you encourage those collaborations?

A lot of that historically has worked at the ground level, individuals finding each other. But as the institution and this department has gotten bigger and bigger, finding the right partners has gotten challenging. So my role is to be the point person to make those connections, particularly for some of the junior faculty, because nobody does it alone anymore.

Do you plan to continue your own research on the molecular pathogenesis of HIV-1 infection?

My first job, of course, will be being chair of the Department of Medicine. But I do plan to keep up my research. It's hard not to be interested in infectious diseases in general and HIV in particular. The first case of HIV that I saw was as a house staff here in 1983—a young man was dying of overwhelming tuberculosis, and HIV wasn't even identified yet. I feel like my generation really lived the epidemic, which is a tragic but amazing story. I like to think that my research is relevant, and obviously that piece was a big attraction of coming here too, because of CHAVI and Bart Haynes. [CHAVI, the Center for HIV/AIDS Vaccine Immunology, is an international consortium devoted to HIV vaccine research and development directed by renowned Duke immunologist Barton Haynes, MD.]

This Q&A has been excerpted from a longer piece published in The Abstract, *Duke Medicine's faculty newsletter. To read the full article, visit* ***dukemedmag.duke.edu****.*

Rubin named chair of radiology

Geoffrey Rubin, MD, a pioneer in the development and application of computed tomography angiography for diagnosis of cardiovascular diseases, has been named the next chair of the Department of Radiology. Rubin will assume his new role at Duke in August.

Rubin is currently chief of cardiovascular imaging and medical director of the 3D Laboratory at Stanford. In addition to his clinical leadership roles, Rubin serves as vice chief of staff at Stanford Hospitals and associate dean for clinical affairs for the Stanford University School of Medicine.

"I'm very pleased that Geoff will be joining our team here at Duke as his track record for effective leadership and vision for the department's three missions of clinical care, teaching, and research deeply impressed our search committee from the beginning," says Nancy Andrews, MD, PhD, dean of the Duke University School of Medicine.

"I'm thrilled and honored to be selected to lead a department that has an outstanding reputation for clinical and research excellence," says Rubin. "I have great respect for the faculty in this department, and am very pleased to become a part of a medical school and health system that is considered one of the very best in the country."

Expanded global role for Merson

Michael Merson, MD, Wolfgang Joklik Professor of Medicine and director of the Duke Global Health Institute, was named vice chancellor for Duke–National University of Singapore affairs. He was appointed by Victor J. Dzau, MD, chancellor for health affairs, in February.

Merson will work to increase collaboration between the Durham- and Singapore-based faculty, as well as strengthen what is currently Duke Medicine's most significant global partnership. With Dean Ranga Krishnan, MB ChB, overseeing the operation of the graduate medical school, Merson will also act as the liaison between Dzau and the Duke–NUS leadership.

"The next five years should see greater alignment between the two campuses and even more opportunities for faculty and students in both schools to maximize the benefits that could come from this collaboration," says Merson.

Duke Orthopaedics gains department status

On July 1, Duke University School of Medicine will create the Department of Orthopaedics, to be led by interim chair **James Nunley, MD**, current chief of the Division of Orthopaedic Surgery. This is the second such promotion given to a former clinical division in the past year.

Distinguished professors

On April 27, Duke University awarded distinguished professorships to the following Duke Medicine faculty members:

School of Medicine

Vadim Arshavsky, PhD
Helena Rubinstein Foundation Professor of Ophthalmology

A. Wesley Burks, MD
Kiser-Arena Professor of Pediatrics

Blanche Capel, PhD
James B. Duke Professor of Cell Biology

Nelson Chao, MD
Donald D. and Elizabeth G. Cooke Cancer Research Professor

David Goldstein, PhD
Richard and Pat Johnson University Professor of Cardiovascular Genomics

Robert A. Harrington, MD
Richard Sean Stack, MD/Guidant Foundation Professor of Cardiology

Nicholas Katsanis, PhD
Jean and George W. Brumley Jr., MD, Professor of Developmental Biology

Paul Noble, MD
Charles Johnson, MD, Professor of Medicine

Eric D. Peterson, MD
Fred Cobb, MD, Professor of Medicine

John H. Sampson, MD, PhD
Dr. Robert H. Wilkins and Gloria Wilkins Professor of Neurosurgery

School of Nursing

Ruth A. Anderson, PhD
Virginia Stone Professor of Nursing

Learn more about the honorees at insidedukemedicine.org.

HONORS & AWARDS

Bradley Collins, MD, associate professor of surgery, was among nine members of the Duke–Durham community selected as a winner of the 2010 Sammie Award, named for the distinguished Duke University political scientist, educator, and human rights activist Samuel DuBois Cook. Collins, whose clinical practice includes liver, kidney, and pancreas transplantation, encourages organ donation, particularly to underrepresented minorities.

Thomas A. D'Amico, MD, professor of surgery, program director of thoracic surgery, and director of clinical oncology, was elected chair of the National Comprehensive Cancer Network (NCCN) Board of Directors. D'Amico was previously vice chair of the board; the change in leadership was formalized at the board of directors meeting held in conjunction with the NCCN 15th Annual Conference in March.

David L. Epstein, MD, Joseph A.C. Wadsworth Research Professor of Ophthalmology and chair of the Department of Ophthalmology, was named president-elect of the Association of University Professors of Ophthalmology (AUPO) in February. AUPO is the national organization for chairs of ophthalmology programs as well as program and medical student directors.

Catherine Gilliss, DNSc, RN, FAAN, vice chancellor for nursing affairs and Helene Fuld Health Trust Professor of Nursing, was appointed to the North Carolina Institute of Medicine by Governor Bev Perdue in March. During her five-year term, Gilliss will participate in task forces to study health issues facing the state, with the goal of developing workable solutions to improve health, health care quality, and access for North Carolinians.

Gilliss also became president of the American Academy of Nursing (AAN) Board of Directors in November after two years as president-elect and board member.

Sue Jinks-Robertson, PhD, professor of molecular genetics and microbiology, was elected to fellowship in the American Academy of Microbiology in March. According to the academy, fellows "are elected annually through a highly selective, peer-review process, based on their records of scientific achievement and original contributions that have advanced microbiology."

Lee Jones, PhD, assistant professor of radiation oncology and scientific director of the Duke Center for Cancer Survivorship, was appointed to the International Advisory Board for *Lancet Oncology*.

Joanne Kurtzberg, MD, Susan Dees Professor of Pediatrics and chief of the Division of Pediatric Blood and Marrow Transplantation, received the Kristjan Ragnarsson Angel Award from the Sarah Jane Brain Foundation. The award, presented in November, recognizes a leading researcher who is advancing the field of pediatric acquired brain injury.

Paul P. Lee, MD, James Pitzer Gills III, MD, and Joy Gills Professor of Ophthalmology and vice chair of the Department of Ophthalmology, was appointed to the American Board of Ophthalmology in February. Lee was one of three new directors to join the board.

Robert J. Lefkowitz, MD, James B. Duke Professor of Medicine and Howard Hughes Medical Institute investigator, was awarded the BBVA Foundation Frontiers of Knowledge Award in Biomedicine for his discoveries of the seven transmembrane receptors (G protein-coupled receptors). The award, announced in January, includes a prize of €400,000.

H. Kim Lyerly, MD, George Barth Geller Professor of Surgery and director of the Duke Comprehensive Cancer Center, was reappointed as a member of the North Carolina Advisory Committee on Cancer Coordination and Control by Governor Bev Perdue in March.

Debby Nowack, RN, manager of Durham Regional Hospital's Outpatient Nutrition and Diabetes Center, received the 2010 American Diabetes Association's Patient Care Award in January. The award is given to providers who go above and beyond to educate patients and families about diabetes management.

Mark Onaitis, MD, assistant professor of surgery, received a $100,000 Young Investigator Research Grant from the N.C. chapter of the National Lung Cancer Partnership. His research seeks to better understand the complexity of lung cancer tumors by characterizing tumor-initiating cells and how they respond to certain molecular signals.

Mary Vinson, RN-BC, director of patient care services and associate chief nursing officer for Duke University Health System, was elected to the American Academy of Ambulatory Care Nursing (AAACN) Board of Directors for 2010-11. Vinson took her post at AAACN's 35th Conference in May.

Three Duke faculty members were elected as fellows of the American Association for the Advancement of Science in December:

Daniel J. Lew, PhD, professor of pharmacology & cancer biology, was recognized for distinguished contributions to microbiology, elucidating mechanisms of cell cycle control, polarity establishment, and cell cycle checkpoint enforcement in the model budding yeast.

Joseph W. St. Geme III, MD, professor of pediatrics and chair of the Department of Pediatrics, was recognized for distinguished contributions to the field of microbial pathogenesis, particularly for elucidating the structure and function of bacterial protein secretion systems and other virulence factors.

Xiao-Fan Wang, PhD, Donald and Elizabeth Cooke Professor of Cancer Research, was recognized for distinguished and long-term contributions to understanding the biology of cancer cells with respect to cell signaling, proliferation, and checkpoint control.

The American Institute of Architects honored Duda/Paine LLC of Durham with its 2010 Healthcare Design Award for the architecture of the Duke Integrative Medicine building. The 27,000-square-foot facility, located on Duke's Center for Living campus, opened in 2007. For more information, visit dukeintegrativemedicine.org.

Duke received three honors at the 2009 American Heart Association Scientific Sessions, held in November:

Duke Heart Center received the American College of Cardiology Foundation's NCDR ACTION Registry–GWTG Gold Performance Achievement Award—one of only 121 hospitals nationwide to do so. **Matthew Roe, MD**, associate professor of medicine and chair of the Research and Publications Subcommittee for ACTION Registry–GWTG, received the award on the hospital's behalf.

Rob Califf, MD, Donald F. Fortin, MD, Professor of Medicine, vice chancellor for clinical research, and director of the Duke Translational Medicine Institute, was named a Distinguished Scientist for 2009. The award cited his research that has advanced the understanding of cardiovascular disease and stroke.

Robert Lefkowitz, MD, James B. Duke Professor of Medicine and Howard Hughes Medical Institute investigator, received the prestigious Research Achievement Award "for transformative discoveries of cellular receptors, seminal findings that have created a cascade of biomedical innovation leading to more effective treatments for human disease."

The American Society of Clinical Oncology (ASCO) presented awards to two members of the Duke Comprehensive Cancer Center in March:

Harvey Jay Cohen, MD, Walter Kempner Professor of Medicine and director of the Center for the Study of Aging and Human Development, was awarded the 2010 B.J. Kennedy Award and Lecture for Scientific Excellence in Geriatric Oncology.

Gary Lyman, MD, professor of medicine, received a Statesman Award in recognition of his extraordinary volunteer service, dedication, and commitment to ASCO.

In December, the Durham–Orange County Medical Society presented the 2009 Jerry Nance Community Service Award to:

Robert Buchanan Jr., MD, cardiologist, Durham Regional Hospital

JoAnn Garofalo, RN, nurse clinician in the Division of Plastic and Reconstructive Surgery

David Walmer, MD, PhD, associate professor of obstetrics and gynecology and chief of the Division of Reproductive Endocrinology

The award seeks to recognize "unsung heroes" of Durham and Orange counties who have not had prior recognition for their volunteer work.

Two research scientists were selected by Duke internal committees to receive awards from the Hartwell Foundation. The foundation provides grants to early-stage biomedical research projects with the potential to benefit children's health.

Charles A. Gersbach, PhD, assistant professor in the Pratt School of Engineering's Department of Biomedical Engineering, received a Hartwell Foundation Individual Biomedical Research Award in April. He will receive $100,000 per year for three years for his work to correct faulty genes that cause Duchenne muscular dystrophy.

Carlos C. Goller, PhD, a postdoctoral associate in the Division of Pediatrics Infectious Diseases, was selected as the 2009 Hartwell Fellow in March. He will receive $100,000 over two years for his postdoctoral career development. He is pursuing research on drug-resistant urinary tract infections.

In April, two Duke University researchers were elected to the National Academy of Sciences, one of the highest national honors given to a scientist or engineer.

Philip Benfey, PhD, Paul Kramer Professor of Biology and director of the Center for Systems Biology in the Duke Institute for Genome Sciences & Policy (IGSP), was recognized for his work on cellular signaling and cell fate in plants.

Vann Bennett, MD, PhD, James B. Duke Professor of Cell Biology and Howard Hughes Medical Institute investigator, was recognized for his discovery of and work on the structural proteins called ankyrins.

The *Triangle Business Journal* presented the 2010 Health Care Heroes Awards in March. Duke was represented by 10 of the 28 total honorees:

Cindy Atkins, volunteer, Duke Cancer Patient Support Program

Rosemary Brown, MSN, CNRN, chief nursing officer, Duke Raleigh Hospital

John Chute, MD, associate professor of medicine

Andrea Layton, RN-BC, Duke Raleigh Hospital

Yvette Meggs, RN, Duke Raleigh Hospital

Margie Muir, RN, MSN, Durham Regional Hospital

Ashley Neville, RN, Durham Regional Hospital

Ron Olson, MD, associate professor in community and family medicine

Bruce Sullenger, PhD, Joseph and Dorothy Beard Professor of Experimental Surgery and director of the Duke Translational Research Institute

Dennis Thiele, PhD, George Barth Geller Professor of Pharmacology & Cancer Biology

DUKE WELCOMES NEW PHYSICIANS

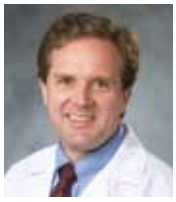
ANESTHESIOLOGY

Wendy L. Pabich, MD
Cardiothoracic Anesthesiology
Particular Clinical Interests and Skills: Cardiothoracic anesthesiology, transesophageal echocardiography
MD Degree: University of Washington School of Medicine, 2004
Residency: Transitional Medicine, Virginia Mason Medical Center (Washington), 2005; Anesthesiology, Virginia Mason Medical Center (Washington), 2008
Fellowship: Cardiothoracic Anesthesiology, Duke University Medical Center, 2009

DUKE PRIMARY CARE

Asma Afzal, MD
Triangle Family Practice
Particular Clinical Interests and Skills: Preventive care, treating chronic disease states commonly encountered in family practice such as diabetes, hyperlipidemia, and hypertension, promoting women's health and wellness
MD Degree: MBBS, Punjab Medical College (Pakistan), 1992
Residency: Family Medicine, SUNY Buffalo, 1997-2000
Other: Diplomat, American Board of Family Medicine

Tammy L. Boyd, MD
Duke Primary Care
Knightdale
Particular Clinical Interests and Skills: Wellness (preventive medicine), women's health, integrative medicine, chronic disease management
MD Degree: Brody School of Medicine at East Carolina University (North Carolina), 2001
Residency: Family Medicine, Carolinas Medical Center/Union Regional Medical Center (North Carolina), 2004

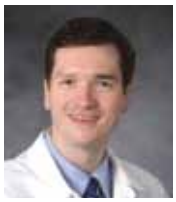


Edward W. Cooner, MD
Sutton Station Internal Medicine
Particular Clinical Interests and Skills: Type 2 diabetes and hypertension
MD Degree: University of Medicine and Dentistry of New Jersey–New Jersey Medical School, 1994
Residency: Internal Medicine, Thomas Jefferson University Hospital (Pennsylvania), 1994-1997

Pearline Grant, MD
Henderson Family Medicine Clinic
Particular Clinical Interests and Skills: All aspects of family medicine, focus on social and psychological components of the patient
MD Degree: American International School of Medicine (Guyana), 2004
Residency: Family Medicine, Meharry Medical College (Tennessee), 2006-2009

Esther E. Seo, MD
Duke Primary Care
Harps Mill
Particular Clinical Interests and Skills: General internal medicine
MD Degree: University of Illinois College of Medicine, 2000
Residency: Internal Medicine, University of Illinois at Chicago Medical Center/Westside Veterans Administration Hospital (Illinois), 2000-2003

Rushad D. Shroff, MD
Duke Primary Care
Harps Mill
Particular Clinical Interests and Skills: General internal medicine, geriatric medicine, comprehensive assessment and care of adults age 18 and older including the elderly, preventive medicine and health maintenance, management of acute and chronic disease
MD Degree: MBBS, T.N. Medical College (India), 1996
Residency: Internal Medicine, Sir J.J. Group of Hospitals (India), 1996-1997; Internal Medicine, Mercy Catholic Center (Pennsylvania), 1997-2000
Fellowship: Geriatrics, Duke University Medical Center, 2000-2001



John P. Tanner, MD
Duke Primary Care
Knightdale
Particular Clinical Interests and Skills: General primary care, diabetes, hypertension, musculoskeletal disease
MD Degree: Brody School of Medicine at East Carolina University (North Carolina), 2004
Residency: Family Medicine, University of Virginia, 2007

Raymond Edward Wase Jr., MD
Duke Urgent Care
Particular Clinical Interests and Skills: Urgent care
MD Degree: University of Florida College of Medicine, 1974
Residency: Rotating Surgery, Charlotte Memorial Hospital (North Carolina), 1974-1975; Orthopaedic Surgery, Charlotte Memorial Hospital (North Carolina), 1975; Emergency Medicine, Charlotte Memorial Hospital (North Carolina), 1976-1977
Other: Fellow, American College of Emergency Physicians

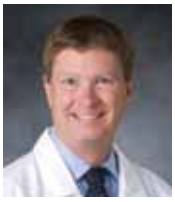
HOSPITAL MEDICINE

Brian K. Britt, MD
Duke Raleigh Hospital Medicine Program
Particular Clinical Interests and Skills: Acute inpatient medicine; prevention of chronic medical problems and readmissions; quality of care, efficiency, and clinical decision-making; medical education; community-level factors affecting health; financial and political issues affecting health care policy
MD Degree: University of Texas School of Medicine at San Antonio, 1997
Residency: Internal Medicine, University of New Mexico, 1997-2000
Fellowship: Faculty Developmental and Clinical Research, General Internal Medicine, Columbia University (New York), 2000-2002
Other: MPH, Columbia University of Public Health (New York), 2002

Joanna R. Kipnes, MD
Duke Hospital Medicine Program
Particular Clinical Interests and Skills: Care of the hospitalized patient, perioperative management, hospital-wide quality improvement
MD Degree: Jefferson Medical College of Thomas Jefferson University (Pennsylvania), 2004
Residency: Internal Medicine, Thomas Jefferson University (Pennsylvania), 2004-2008
Other: MS, Clinical Pharmacology, Thomas Jefferson University (Pennsylvania), 2000

MEDICINE

Philip A. Davenport, MD
Neurology
Particular Clinical Interests and Skills: General neurology, including neuromuscular disorders, movement disorders, headache, epilepsy, cardiovascular disease, and dementia; clinical neurophysiology, including EMG/nerve conduction studies, clinical research
MD Degree: Virginia Commonwealth University School of Medicine, 1985
Residency: Neurology, Mayo Clinic and Hospitals (Minnesota), 1992
Fellowship: Clinical Investigator, Pharmacology and Neurology, Mayo Clinic and Hospitals (Minnesota), 1993
Other: MSc, Biology (Neurobiology), University of Virginia, 1981
Graduate Studies, Institute for Neurological Sciences, University of Pennsylvania, 1985-1988



Robert G. Everhart, MD
Cardiology
Particular Clinical Interests and Skills: General adult cardiology, coronary artery disease, acute MI management, cardiac catheterization, coronary interventions including coronary angioplasty, stent implantation, coronary atherectomy, IVUS, stress testing, echocardiography
MD Degree: Drexel University College of Medicine (Pennsylvania), 1981
Residency: General Internal Medicine, Monmouth Medical Center (New Jersey), 1981-1984; Chief Resident, General Internal Medicine, Monmouth Medical Center (New Jersey), 1984-1985
Fellowship: Cardiology, University of California, Davis, 1985-1987
Other: Fellow, American College of Cardiology

ON THE SPOT

With your previous experience in the Midwest, what are your observations about the "Stroke Belt" and stroke patients in the South?

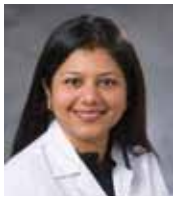
It is well known that we live in the "Stroke Belt," where the incidence of stroke is higher than in the Midwest. This reflects differences in lifestyle, such as diet and smoking, as well as the higher incidence of both diabetes and hypertension. I have also noted what appears to be a greater percentage of small vessel disease in this area as compared to the Midwest, which I suspect reflects the greater prevalence of diabetes and hypertension in this area.

—Philip A. Davenport, MD

John T. Geneczko, MD
Gastroenterology
Particular Clinical Interests and Skills: Patient-centered general gastroenterology
MD Degree: University of Michigan Medical School, 1978
Residency: Internal Medicine, University of Wisconsin, 1981
Fellowship: Digestive Diseases, University of Cincinnati (Ohio), 1984

Kathleen A. Havlin, MD
Medical Oncology
Particular Clinical Interests and Skills: Breast cancer; adjuvant, metastatic, and preventive treatment; general oncology
MD Degree: Northwestern University Feinberg School of Medicine (Illinois), 1982
Residency: General Internal Medicine, Northwestern Memorial Hospital (Illinois), 1982-1985
Fellowship: Medical Oncology, University of Wisconsin, 1985-1987; Hematology–Oncology, University of Texas Health Science Center at San Antonio, 1987-1988

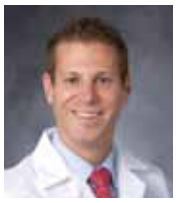
Hili M. Metjian, MD
Pulmonary, Allergy, and Critical Care Medicine
Particular Clinical Interests and Skills: Bronchiectasis (including Kartagener's syndrome), asthma, COPD, interstitial lung diseases, lung cancer, critical care medicine including sepsis and ARDS
MD Degree: University of Florida College of Medicine, 2003
Residency: Internal Medicine, UNC Hospitals, 2006
Fellowship: Pulmonary and Critical Care Medicine, UNC Hospitals, 2009



Zainab Samad, MD
Cardiology
Particular Clinical Interests and Skills: Clinical echocardiography, cardiac MRI, myocardial perfusion imaging, valvular heart disease, outcomes of different diagnostic strategies
MD Degree: Aga Khan University Medical College (Pakistan), 2000
Residency: Internal Medicine, Duke University Medical Center, 2005
Fellowship: Cardiology, Duke University Medical Center, 2009
Other: MHS, Clinical Research, Duke University School of Medicine, 2009

OPHTHALMOLOGY

Alice A. Lin, MD
Comprehensive Ophthalmology and Pediatric Ophthalmology and Strabismus
Particular Clinical Interests and Skills: Medical and surgical management of pediatric eye disorders and adult strabismus, pediatric and adult cataracts, amblyopia, diagnosis and management of common ocular disease through medical and surgical interventions
MD Degree: University of Michigan Medical School, 2003
Residency: Ophthalmology, Case Western Reserve/ University Hospitals of Cleveland (Ohio), 2004-2007
Fellowship: Pediatric Ophthalmology and Strabismus, Duke University Medical Center, 2007-2009



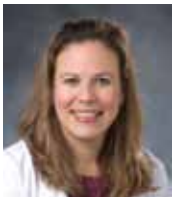
Jason Liss, MD
Oculoplastic and Reconstructive Surgery
Particular Clinical Interests and Skills: Oculoplastics and reconstructive surgery
MD Degree: Columbia University College of Physicians and Surgeons (New York), 2003
Residency: Ophthalmology, NewYork-Presbyterian Hospital/ Weill Cornell Medical College, 2004-2008
Fellowship: Oculoplastics, University of Pittsburgh Medical Center (Pennsylvania), 2008-2009

Stefanie G. Schuman, MD
Vitreoretinal Diseases and Surgery
Particular Clinical Interests and Skills: Medical vitreoretinal disease, diabetic retinopathy, age-related macular degeneration, macular disease, retinal vascular disease
MD Degree: University of Tennessee College of Medicine, 2002
Residency: Ophthalmology, Tufts New England Eye Center (Massachusetts), 2006
Fellowship: Retina, Duke University Medical Center, 2007

PEDIATRICS

Alexandra D. Bentley, MD
Neonatology
Particular Clinical Interests and Skills: General pediatrics, especially the care of high-risk infants recently discharged from the hospital
MD Degree: University of Maryland School of Medicine, 2005
Residency: Pediatrics, Duke University Medical Center, 2006-2009

Kenneth W. Jordan, MD
Primary Care Pediatrics
Particular Clinical Interests and Skills: All aspects of general pediatrics
MD Degree: Southern Illinois University School of Medicine, 1986
Residency: Pediatrics, Moses H. Cone Memorial Hospital (North Carolina), 1986-1988; Pediatrics, Duke University Medical Center, 1988-1989

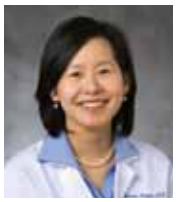


Caroline P. Ozment, MD
Critical Care Medicine
Particular Clinical Interests and Skills: Extracorporeal membrane oxygenation, alternate modes of mechanical ventilation (high frequency, JET), transfusion medicine
MD Degree: University of South Alabama College of Medicine, 2003
Residency: Pediatrics, Oregon Health & Science University, 2006
Fellowship: Critical Care, Duke University Medical Center, 2009

Leon J. Reinstein, MD
Gastroenterology, Hepatology, and Nutrition
Particular Clinical Interests and Skills: General pediatric gastroenterology; cystic fibrosis, IBD, and nutritional deficiencies in complex cases requiring aggressive intervention including peg placements; GI procedures
MD Degree: National University of San Marcos Faculty of Medicine (Peru), 1986
Residency: Pediatrics, Moses H. Cone Memorial Hospital (North Carolina), 1988-1989; Pediatrics, UNC Hospitals, 1989-1990
Fellowship: Pediatric Gastroenterology, UNC Hospitals, 1990-1993

Heather A. Van Mater, MD
Rheumatology
Particular Clinical Interests and Skills: Juvenile arthritis, access to care and cost-effective treatments in pediatric rheumatology
MD Degree: University of Rochester School of Medicine and Dentistry (New York), 2001
Residency: Pediatrics, University of Michigan, 2001-2004
Fellowship: Pediatric Rheumatology, University of Michigan, 2006-2009
Other: MSc, Health and Health Care Research, University of Michigan, 2009

RADIATION ONCOLOGY



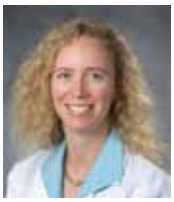
Catherine L. Chang, MD
Radiation Oncology
Particular Clinical Interests and Skills: Radiation oncology
MD Degree: University of North Carolina at Chapel Hill School of Medicine, 2000
Residency: Radiation Oncology, University of Texas MD Anderson Cancer Center, 2005

RADIOLOGY

Jared D. Christensen, MD
Cardiac and Thoracic Imaging
Particular Clinical Interests and Skills: Minimally invasive thoracic interventions including CT-guided lung biopsy and pulmonary radiofrequency ablation for the diagnosis and treatment of lung cancer, imaging of acquired cardiovascular disease by functional cardiac MRI and coronary CT angiography, medical education
MD Degree: University of Vermont College of Medicine, 2003
Residency: Surgery, University of Virginia Medical Center, 2004; Diagnostic Radiology, University of Rochester Medical Center (New York), 2008
Fellowship: Cardiothoracic Radiology, Duke University Medical Center, 2009

Kelly W. McAlarney, MD
Community Radiology/ Nuclear Medicine
Particular Clinical Interests and Skills: Nuclear medicine and PET, thyroid disease therapies
MD Degree: University of South Carolina School of Medicine, 2001
Residency: Combined Radiology and Nuclear Medicine, Oregon Health & Science University, 2009

SURGERY



Heatherlee Bailey, MD
Emergency Medicine
Particular Clinical Interests and Skills: Emergency medicine, trauma and critical care, acute resuscitation
MD Degree: University of Medicine and Dentistry of New Jersey–New Jersey Medical School, 1994
Residency: Emergency Medicine, Medical College of Pennsylvania, 1997

Todd V. Brennan, MD
General Surgery
Particular Clinical Interests and Skills: Liver, kidney, and pancreas transplantation, laparoscopic nephrectomy for living donor kidney donation, general surgery on transplant recipients, hemodialysis access procedures
MD Degree: Harvard Medical School (Massachusetts), 1999
Residency: General Surgery, University of California, San Francisco, 2007
Fellowship: Abdominal Transplantation, University of California, San Francisco, 2009
Other: MS, Biochemistry, University of California, Los Angeles

Albert S. Y. Chang, MD
Cardiovascular and Thoracic Surgery
Particular Clinical Interests and Skills: Lung and esophageal cancer; esophageal, pulmonary, mediastinal chest wall, and diaphragm surgery; minimally invasive thoracoscopic and laparoscopic surgery; airway surgery; gastroesophageal reflux disease; hyperhidrosis; achalasia
MD Degree: Duke University School of Medicine, 1996
Residency: General Surgery, Baylor College of Medicine (Texas), 2003
Fellowship: Cardiovascular and Thoracic Surgery, Cleveland Clinic (Ohio), 2006

W. Tucker Cline, MD
General Surgery
Particular Clinical Interests and Skills: All aspects of general surgery with particular interest in oncology, GI, and breast
MD Degree: Duke University School of Medicine, 1978
Residency: Surgery, NewYork Hospital–Cornell Medical Center, 1978-1983

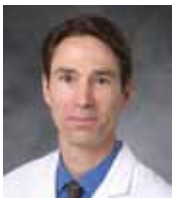
Abigail E. Martin, MD
General Surgery and Pediatric General Surgery
Particular Clinical Interests and Skills: All aspects of general pediatric surgery and transplant surgery for adults and children; special interest in pediatric transplantation, intestinal failure, and intestinal transplantation
MD Degree: University of Texas Medical Branch School of Medicine, 1998
Residency: General Surgery, University of Medicine and Dentistry of New Jersey, 1998-2001, 2003-2005; Trauma Research, Nationwide Children's Hospital (Ohio), 2001-2003
Fellowship: Transplant Surgery, University of Pittsburgh Medical Center (Pennsylvania), 2005-2007; Pediatric Surgery, Brown University (Rhode Island), 2007-2009

Eric W. Ossmann, MD
Emergency Medicine
Particular Clinical Interests and Skills: All aspects of out-of-hospital care and disaster medicine with a focus on the integration of emergency medical services into a community-based health care delivery system
MD Degree: Southern Illinois University School of Medicine, 1994
Residency: Emergency Medicine, Methodist Hospital, Indiana University, 1997
Fellowship: Emergency Medical Services, Carolinas Medical Center (North Carolina), 1998

Heather N. Paddock, MD
Pediatric General Surgery
Particular Clinical Interests and Skills: All aspects of the general surgical care of children and neonates, including minimally invasive surgery; thoracic surgery; special interest in the care of patients with congenital diaphragmatic hernia and chest wall abnormalities; pediatric trauma and critical care; childhood solid tumors
MD Degree: Wake Forest University School of Medicine (North Carolina), 1998
Residency: General Surgery, University of Florida, 2005
Fellowship: Pediatric Surgical Critical Care, Nationwide Children's Hospital (Ohio), 2006; Pediatric Surgery, University of Florida, 2009

Kadiyala V. Ravindra, MD
General Surgery
Particular Clinical Interests and Skills: Hepatobiliary and pancreatic surgery, laparoscopic liver resections, cholangiocarcinoma, surgery for chronic pancreatitis, abdominal organ transplantation: liver, kidney, pancreas
MD Degree: MBBS, Jawaharlal Institute of Postgraduate Medical Education & Research (India), 1987
Residency: General Surgery, Jawaharlal Institute of Postgraduate Medical Education & Research (India), 1988-1992; Surgical Gastroenterology, Sanjay Gandhi Postgraduate Institute of Medical Sciences (India), 1992-1994
Fellowship: Hepatobiliary and Pancreatic Surgery, St. James's University (United Kingdom), 2000-2003; Transplant Surgery, University of Nebraska, 2003-2005

Donna E. Sharpe, MD
Otolaryngology–Head and Neck Surgery
Particular Clinical Interests and Skills: Surgical and medical management of pediatric and adult ear, nose, and throat disorders; treatment of nasal and sinus chronic infection and chronic allergy; balloon sinuplasty; nasal allergy testing and immunotherapy; endoscopic procedures; ear infections; hearing loss; hoarseness and neck masses, including thyroid and salivary gland tumors
MD Degree: Mount Sinai School of Medicine of New York University, 1993
Residency: General Surgery, Medical College of Georgia, 1993-1994; Otolaryngology–Head and Neck Surgery, Medical College of Georgia, 1994-1998



Mark C. Sturdivant, MD
General Surgery
Particular Clinical Interests and Skills: Minimally invasive/ advanced laparoscopic surgery (upper and lower GI, spleen, hernia repair), GERD, outpatient general surgery, oncology
MD Degree: University of North Carolina at Chapel Hill School of Medicine, 1988
Residency: General Surgery, University of Virginia, 1988-1992; General Surgery, Carolinas Medical Center (North Carolina), 1990-1994

ON THE SPOT

Which patient populations can benefit from composite-tissue allotransplantation (CTA)?

CTA is an emerging field that deals with patients with complex defects—patients with functionally (and cosmetically) impairing defects that cannot be repaired with established plastic surgical procedures. CTA aims to replace "like with like," such as hand transplantation in amputees, partial/complete face transplantation for those with severe disfigurements, or abdominal wall transplantation for those with massive hernia. More than 50 hand and 11 face transplantation procedures have been performed worldwide, and the excellent results thus far have encouraged us to increase our efforts at Duke.

—Kadiyala V. Ravindra, MD

2010 **Duke CME Calendar**

CONTINUING MEDICAL EDUCATION AT DUKE For more information on the courses listed below, please contact the Duke Office of Continuing Medical Education at 919-401-1200 or visit cme.mc.duke.edu.

On-site courses

	DATE	LOCATION	CREDITS
ANESTHESIOLOGY			
Ultrasound-Guided Regional Anesthesia Preceptorship	July 12–14, August 9–11, September 13–15, October 4–6, November 8–10, December 13–15	Durham, NC	20
Anesthesia Camp Laguna Beach 2010	September 30–October 2	Laguna Beach, CA	17
Anesthesia Camp Puerto Vallarta	December 1–4	Punta Mita, Mexico	20
CARDIOLOGY			
Essentials of Transradial Angiography and Intervention	July 15–16	Durham, NC	8.25
Duke Clinical Medicine Series: Cardiology Conference	July 22–24	Asheville, NC	13.5
INTERDISCIPLINARY			
13th Annual Duke Cardiothoracic Update & TEE Review Course	August 5–8	Hilton Head Island, SC	28.25
ONCOLOGY			
Highlights from ASCO 2010: The Era of Personalized Cancer Treatment	July 23	Cary, NC	6.75
16th Annual Perspectives in Breast Cancer: Surveying and Debating Prominent Issues in Breast Cancer	August 27–28	New York, NY	6
RADIOLOGY			
2010 Duke Radiology Summer Postgraduate Course	July 26–30	Myrtle Beach, SC	23
Comprehensive Review of Musculoskeletal MRI	September 18–21	Washington, DC	18
Abdominal Imaging & Musculoskeletal MRI Update 2010	October 16–19	Asheville, NC	20
Comprehensive Review of Musculoskeletal MRI	November 7–10	Maui, HI	18
Neuroradiology & Cardiopulmonary Imaging	November 7–10	Orlando, FL	20

Online courses

	DATE	CREDITS
Disruptive Clinician Behavior	Through July 16	1
Signposts and Pathways: Multidimensional Care for Patients with Type 2 Diabetes (Monograph)	Through July 30	3
The Council on Menopause Management: Clinical Challenges and Quality-of-Life Issues	Through August 2	1
TeamSTEPPS e-Essentials	Through August 10	1
PROACTIVE: Peer-to-Peer Podcast #1	Through September 9	0.5
PROACTIVE: Setting a Course Toward Prostate Cancer Prevention	Through September 9	0.75
Managing Adolescent Depression in Primary Care: Assessing the Benefits and Risks	Through September 23	1
PROACTIVE: Peer-to-Peer Podcast #2	Through October 9	0.25
Council on Menopause Management: 2009 Menopause Management Highlights	Through October 14	1
Council on Menopause Management: Case Simulation #827	Through October 14	1
Council on Menopause Management: Case Simulation #828	Through October 22	1
Setting a Course Toward Prostate Cancer Prevention: Communicating the Evidence to Our Patients, E-Primer	Through November 3	1.75
PROACTIVE: Peer-to-Peer Podcast #3	Through November 18	0.25
Delivering Systemic Therapies to the Brain: Breaching the Blood-Brain Barrier	Through November 29	1.5
Pneumococcal Disease in Adults: Identifying Risk & Preventive Approaches in Changing Epidemiology	Through December 1	1
Pneumococcal Disease in Adults: Testing and Treatment	Through December 21	1
Thrombosis: Describing the Clinical Link Between the Coagulation Cascade and Platelet Function	Through December 21	0.75
PROACTIVE: Patient Risk Factors and Screening Tests for Prostate Cancer	Through December 30	0.75
PROACTIVE: Toolkit	Through December 30	2
Setting a Course Toward Prostate Cancer Prevention: Communicating the Evidence to Our Patients	Through December 31	0.75
Neuro-Oncology Portfolio: Current and Emerging Therapies, Video Lecture	Through January 4, 2011	1
PROACTIVE: Prostate Cancer Prevention Strategies	Through January 4, 2011	0.75
Management of Diabetic Neuropathy and Glycemic Control in Long-Term Care Facilities	Through January 14, 2011	1.75
Glioblastoma Multiforme: Current Approaches and Treatment Challenges	Through January 18, 2011	1.75
Thromboprophylaxis in Atrial Fibrillation and Acute Coronary Syndromes: Can We Do Better?	Through February 1, 2011	1.25
Creating a Patient Safety Culture	Through February 2, 2011	1
Pneumococcal Disease in Adults: Rationale Behind Updated Practice Recommendations	Through February 9, 2011	1.25

Duke's "big dig"

IN EARLY MARCH, CONSTRUCTION CREWS BEGAN digging the foundations of the new Duke Medicine Cancer Center and Duke Medicine Pavilion—construction projects that will expand the Duke University Medical Center campus by some 800,000 square feet.

The excavation removed about 50,000 cubic yards of earth—an amount equal to about 12 Olympic-sized swimming pools. Now that the excavation work is complete, tower cranes have been erected on the site to lift the steel, concrete, large tools, and other building materials that will be needed during construction.

*Visit **dukemedicine.org/construction** to see live Webcam images of the work in progress, to learn more about each construction project, and to see animated renderings of the finished buildings.*

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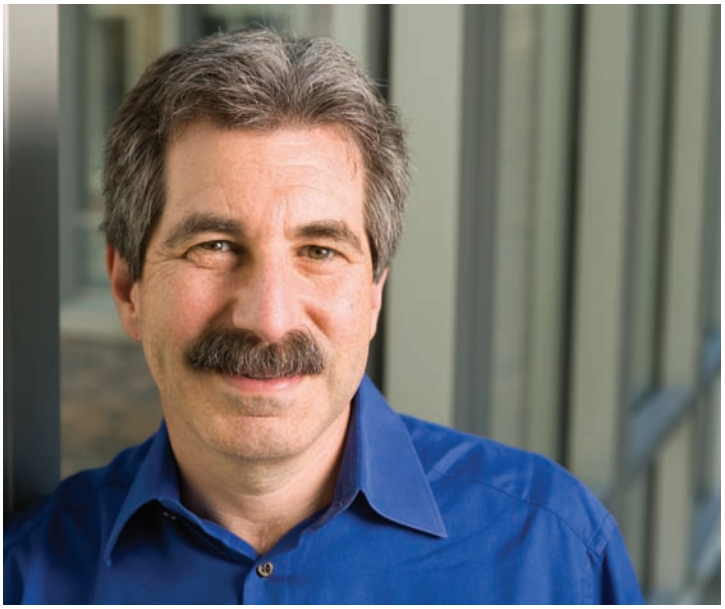
BRINGING THE GENOME HOME

With a few quick clicks you can now buy your own DNA scan online—resulting in a personalized readout of risk for diseases from Alzheimer's to heart attack to leukemia. But are these tests the crystal balls they're cracked up to be? "It's said that genetics loads the gun, but environment pulls the trigger," says Geoffrey S. Ginsburg, MD, PhD, director of Duke's Center for Genomic Medicine. "DNA tests can provide clues about a person's susceptibility to disease, but it's critical to consider the results in a broader context." Read more about the pros and cons of DNA testing in this issue—and learn how Duke researchers are working to transform genetic information from a mass of "maybes" into powerful predictors of disease risk and response to therapy (pages 18 and 40).



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