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ISSUE 1
WINTER 2008

DukeMed MAGAZINE

When sleep isn't easy

CARE FOR A CONSTELLATION OF SLEEP DISORDERS

ADVANCES IN RESEARCH, EDUCATION, AND PATIENT CARE AT DUKE

On a mission

Eighteen months ago, as we developed our grand vision and strategy for the future of Duke Medicine, we adopted a new mission statement that defines our goals. Crafted with the participation of many people throughout our institution, it reads:

"As a world-class academic and health care system, Duke Medicine strives to transform medicine and health locally and globally through innovative scientific research, rapid translation of breakthrough discoveries, educating future clinical and scientific leaders, advocating and practicing evidence-based medicine to improve community health, and leading efforts to eliminate health inequalities."

Elements of this statement will be familiar to many of our readers, as it is built on the historic mission of excellence in education, research, and patient care that has driven and defined this institution since its founding. Over the years, however, our achievements in these areas and our growing influence nationally and internationally have catapulted Duke to a position in which we can do even more. By strategically focusing our efforts, we seek to lead a transformation of medicine that will vastly improve the quality, effectiveness, and equitable delivery of health care both here and worldwide.

It's an ambitious mission, certainly. But I am pleased to report that we are already making great strides to achieve our goals. In fact, just in the past year, Duke Medicine marked the achievement of historic milestones and the start of bold initiatives that will propel us towards our vision.

Among them were two historic events on the global stage—including the September signing of a seven-year agreement with Peking University Health Science Center to help improve health care delivery in China, and the August matriculation of the first class of the Duke-NUS (National University of Singapore) Graduate Medical School Singapore (GMS)—marking the true beginning of this ambitious endeavor we have been working toward for several years. Both efforts will further our goal of advancing global health, working closely with talented colleagues abroad.

We also initiated important changes at home to nourish the great science, strong educational programs, and groundbreaking clinical care that fuel our ambitions. Importantly, we restructured our academic leadership team, promoting former medical school dean Sandy Williams, MD, to the new post of senior vice chancellor for academic affairs, recruiting Nancy Andrews, MD, PhD, of Harvard as the new dean—the first female ever to hold that position—and appointing Ranga Krishnan, MB, ChB, chair of Duke's Department of Psychiatry, as the executive vice dean of the GMS. With these historic appointments, we are poised to lead the unprecedented growth of our research and educational endeavors and to orient them for even greater success.

Furthermore, we are planning for the Duke "Medical Center of the Future," with state-of-the-art facilities for patient care, education, and research that will transform our campus into an ideal setting for the world's best health care, education, and research. Indeed, we recently filed a Certificate of Need with the State of North Carolina for a major expansion of Duke University Hospital.

In 2006 we established the Duke Translational Medicine Institute to facilitate the "bench to bedside to population" translation of novel discoveries to clinical care. This fall we made a major leap forward towards this goal when we received the largest gift in the history of Duke's School of Medicine—$35 million from philanthropist David H. Murdock—to conduct a landmark study that could dramatically change the future of medicine. The Kannapolis, N.C.-based M.U.R.D.O.C.K. study promises to vastly increase our knowledge of genetic influences on disease risk and outcomes, enabling unprecedented understanding of how to prevent and treat disease.

Importantly, we will be able to realize great synergies between this work and many signature initiatives already under way at Duke, including our efforts in global health, genomics, and translational medicine. Through these exciting and historic advances, we are making major strides towards our mission of transforming medicine both in North Carolina and worldwide.

As you read about many of these achievements in *DukeMed Magazine*, I hope you will be as proud as I am of our progress to date—and of how we will be building on these successes to further our mission in the year ahead.

VICTOR J. DZAU, MD
CHANCELLOR FOR HEALTH AFFAIRS,
DUKE UNIVERSITY
PRESIDENT AND CEO,
DUKE UNIVERSITY HEALTH SYSTEM
JAMES B. DUKE PROFESSOR OF MEDICINE

DukeMed MAGAZINE
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Meet the dean

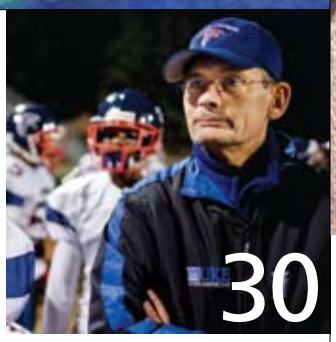
Nancy C. Andrews, MD, PhD, on what drew her to Duke—and her priorities now that she's arrived.

Sleep chasers

Meet the caretakers of that forgotten third of our lives—the portion we spend asleep.

Mending hearts

Today's care for congenital heart disease helps patients of any age not just survive, but thrive.



The sports team

Duke's squad of sports medicine professionals tackle the problems that limit activity.

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Off to a flying start in Singapore

by R. Sanders Williams, MD
Senior Vice Chancellor for Academic Affairs

ON THE MORNING OF AUGUST 1, 2007 I stood at the front of a classroom half a world away from North Carolina and watched with pride as the members of the inaugural class of medical students of the Duke-NUS Graduate Medical School in Singapore walked down the center aisle towards me. Faculty members of the new school and some distinguished visitors, including present and former Duke trustees, were gathered around the periphery of the room, applauding.

Then from behind me I heard a roar of spirited applause and cheers building to a crescendo that drowned out the enthusiastic but more decorous clapping of the assembled faculty. On a large flat-screen TV I could see and hear a hundred or more current Duke medical students who had gathered to welcome, most joyously, their counterparts in Singapore via a simulcast in real time from the medical school amphitheatre in Durham. This was an unforgettable and historic experience indeed!

I spoke to the class about a similar day 76 years previously, when Dean Wilburt C. Davison had greeted the inaugural class to Duke's new medical school in North Carolina, and I told them of the remarkable lives and careers that some of those initial Duke students, like Jay Arena, Cal Callaway, and Talmadge Peele, had lived. I asked them to look to their left, then to their right, and then inside themselves, and to know they were gazing upon future leaders and notable scholars of medicine, just as has proven the case with every other class of Duke medical students for three-quarters of a century.

The 26 new Duke students in Singapore are citizens of seven different nations, including the USA, and they are graduates of leading universities from Asia, Europe, Australia, and the United States. They were selected from among almost 400 applicants, and both their entering academic credentials and their pioneering spirit should make all Duke Med alumni proud.

Likewise, the quality of the faculty that is forming under the Duke banner in Singapore blends an interesting diversity of international backgrounds with a distinctly Duke flavor. We are demanding a level of academic excellence that Dukies will find quite familiar. Here I can mention only few of the recent additions to our faculty, but these are decidedly noteworthy. Ranga Krishnan, our highly successful chair of psychiatry at Duke, has taken a position in Singapore as executive vice dean of the GMS. He is joined in the neuroscience arena by one of Britain's most distinguished biomedical scientists and leaders, Sir Colin Blakemore from Oxford University, who until recently chaired the British Biomedical Research Council (similar to our NIH). Pediatric oncologist David Virshup left a chaired professorship at the Huntsman Cancer Center in Utah to lead the cancer research program of the Duke-NUS GMS, and Duane Gubler, a noted expert in West Nile virus and dengue virus research, is departing Hawaii for Singapore to develop our program in emerging infectious diseases.

Duke Med is in Singapore to extend the special quality of the Duke experience to that important part of the world, and to provide our faculty and students in North Carolina with the benefits of trustworthy global partners. So far, so good!

To read a Fall 2007 DukeMed Alumni News *cover story on the opening of the GMS, visit dukemedmag.duke.edu and click on the link under "Web Extras."*

"A Framingham study for the molecular age"

M.U.R.D.O.C.K. study researchers will apply the latest biotechnology to conduct broad, population-based studies linking genetic data to disease risk and outcomes.

PHILANTHROPIST DAVID H. MURDOCK has given Duke a $35-million gift to support a massive biomedical research project at the North Carolina Research Campus (NCRC) in Kannapolis, North Carolina, Duke University President Richard H. Brodhead, PhD, and Chancellor for Health Affairs Victor J. Dzau, MD, announced in September.

The gift—the largest in the history of Duke University School of Medicine—will fund an ambitious study to link genetic data to disease risk and treatment outcomes among thousands of patients and their families over time. It will establish an understanding of how disease occurs at the molecular level and how it varies from one person to the next, rewriting medical textbooks.

Supporters are calling the M.U.R.D.O.C.K. study (Measurement to Understand the Reclassification of Disease of Cabarrus and Kannapolis) "a Framingham study for the molecular age," in reference to the landmark Framingham, Massachusetts heart study that has tracked entire families since 1948, contributing much of what we know about heart disease today.

M.U.R.D.O.C.K. will focus on several high-impact diseases, including cancer, heart disease, high blood pressure, obesity, diabetes, hepatitis, osteoarthritis, and mental illness.

"We are most grateful for this gift, and David Murdock's vision, because it will bring together scientists from Duke and other North Carolina institutions to address a pressing social need," Brodhead said. "The M.U.R.D.O.C.K. study has the potential to revolutionize health care by finding ways to match treatments to a patient's genetic profile. This research could lead to improved medicine around the world, but I am especially pleased that we will first be able to share our advances with citizens of North Carolina."

"In this life, we have only a few opportunities to make a lasting difference in the world," says David H. Murdock, whose historic gift of $35 million will fund the M.U.R.D.O.C.K. study. "I am proud to join with the great researchers at Duke University to seize this opportunity and transform the world's approach to the prevention and treatment of disease."

The 311,000-square-foot David H. Murdock Core Laboratory Building at the North Carolina Research Campus—a developing 350-acre life sciences campus in Kannapolis—will feature an 80,000-square-foot core laboratory containing a strategic array of state-of-the-art scientific equipment.

State-of-the-art biotechnology housed in the 311,000-square-foot David H. Murdock Core Laboratory at NCRC will be used by physicians and scientists from Duke, the University of North Carolina system, and the North Carolina Community College System.

"For the first time, we will be able to generate a global database of human health and disease that will provide us the opportunity to clearly transform medicine," Dzau said. "We are honored and tremendously pleased with this gift from Mr. Murdock and share his commitment to advancing the treatment of disease in patients here and around the world."

Murdock, owner and chairman of Dole Food Company Inc. and real estate development company Castle & Cooke Inc., has pledged to invest up to $1 billion in Kannapolis for buildings and research at the NCRC. He is an outspoken advocate of improving global health through disease prevention, better nutrition, and innovation in crop science.

"In this life, we have only a few opportunities to make a lasting difference in the world," Murdock said. "I am proud to join with the great researchers at Duke University to seize this opportunity and transform the world's approach to the prevention and treatment of disease. Ever since losing my wife to cancer at a young age, human health has been my driving passion. With my gift to Duke and the

work that will be done at the North Carolina Research Campus, this passion becomes the point of departure for a scientific adventure that will save countless lives."

The lead investigator of the M.U.R.D.O.C.K. study is Robert Califf, MD, director of the Duke Translational Medicine Institute.

"We aspire to be able to give advice to individuals about how to stay healthy and optimally treat illness when it occurs," Califf said. "Combining this information across entire counties using electronic health records, we believe we can provide much better prevention programs for the diseases that are causing death and disability in our society and beyond."

M.U.R.D.O.C.K. investigators will begin their work with Duke's collection of clinical databases and biospecimen repositories, among the largest such collections in the world. Simultaneously, they will begin laying the groundwork for enrolling study volunteers from in and around Kannapolis and surrounding Cabarrus County, working in collaboration with community physicians. Patients enrolled in the study can expect to donate blood samples and other clinical data.

"Thanks to Mr. Murdock, our collective research will enable unprecedented understanding of human disease, and how genetics, geography, and environment contribute to health and wellness," Dzau said. "Mr. Murdock's gift is truly a gift to us all."

Listen to M.U.R.D.O.C.K. researchers discuss the study in a podcast and video available at development.mc.duke.edu.

For more information about NCRC, please visit ncresearchcampus.net.

Duke, FDA collaborate to improve clinical trials

THE U.S. FOOD AND DRUG ADMINISTRATION (FDA) and Duke have begun a collaboration to modernize the way clinical trials are conducted.

Under an agreement between the organizations, Duke will host a public-private partnership to include representation from government, industry, patient advocacy groups, professional societies, and academia. The participants will work together to develop new standards and identify new methods and technologies that improve safety, boost the quality of information derived from clinical trials, and make the research process more efficient.

"To ensure the safety of clinical trial participants and to improve the health of the public, the clinical research enterprise needs to evolve," says Janet Woodcock, MD, FDA deputy commissioner and chief medical officer. "It needs to be much more streamlined and efficient, and at the same time it needs to be better equipped to answer the pressing questions that confront both patients and health care professionals."

"Society is appropriately demanding more evidence about medical practice. Indeed, there is concern that our research system is falling behind the needs of society to determine the balance of benefit and risk from drugs, devices, and surgical procedures. We aim to provide a forum in which experts can put forward ideas about how to improve the system—and then do research to inform policymakers about whether suggested changes are likely to have beneficial effects."

—ROBERT CALIFF, MD

Woodcock leads the FDA's Critical Path Initiative, a national effort to modernize the process through which a potential human drug, biological product, or medical device is transformed from a discovery into a medical product. The agency has entered into a number of partnerships to address key priority areas of the initiative. This partnership will be chaired by Robert M. Califf, MD, Duke's vice chancellor for clinical research, and co-chaired by Rachel Behrman, MD, director of the FDA's Office of Critical Path Programs.

Among the ideas that the initiative will explore:

- Establishing national standards to streamline the current approaches for initiating and conducting clinical trials.
- Exploring alternative models for Institutional Review Boards to minimize duplication of effort in multi-site clinical trials and enhance the process of obtaining informed consent from clinical trial participants.
- Establishing accreditation programs for both clinical investigators and research sites.
- Improving data management through technology.

The initiative will begin by identifying simple measures in areas where there is strong consensus across the clinical research community that better procedures can be established. The complete set of recommendations will take several years to develop.

From gathering dust to saving lives

Surplus goes around the globe

JANE PLEASANTS THREW HER HANDS UP and said, "What on earth are we doing?" Duke's top purchasing officer had added up the cost of storing surplus medical equipment—equipment that, though still of good quality, is not as high-tech as much of the equipment used by hospitals in the United States—and found that the university was spending $1.5 million a year just to move the stuff around. Duke was using three warehouses and dozens of semi trucks to store a couple of football fields' worth of used medical equipment, and it was decided that the policy of storing it should be abandoned.

Happily, around the same time, neurosurgeon Michael Haglund, MD, PhD, stuck his head in Pleasants's door. A veteran of medical relief efforts in Ecuador, Haglund was turning his attention to the 1,500-bed New Mulago Hospital in Kampala, Uganda, whose surgical units had to share one ventilator, no monitoring equipment, and inadequate supplies for tasks such as plating and suturing.

Michael Haglund, MD, PhD, with some of the $1.3 million in medical equipment destined for service in Uganda.

And just like that, a new program was born: the Global Health PLUS program (Placement of Life-Changing Usable Surplus), administered by the Duke Global Health Institute. The program collects and organizes Duke's surplus medical equipment, which is cleaned, rehabilitated when needed, and shipped to hospitals in developing nations.

In August, Haglund and a 27-person team from Duke flew with $1.3 million in equipment—including $800,000 in surplus equipment—to Kampala, where they set up five modern operating rooms and an eight-bed surgical intensive care unit and performed 30 brain and spinal surgeries. During their week-long stay, they trained the staff at New Mulago Hospital to keep the new equipment safe and running properly. Educational grants also made it possible for a local clinical engineer to be able to attend an eight-week training session in surgical equipment maintenance.

"The program is designed to be a self-sustaining effort," Haglund says. "With these supplies and training, we've been able to change how neurosurgery is performed in East Africa."

The Global Health PLUS program is open to Duke faculty, staff, students, and Duke-affiliated physicians in the community who wish to apply for equipment, supplies, and support for projects that further Duke's research, education, and service efforts to improve health in developing countries.

For information about the program, visit *globalhealth.duke.edu*. To read a blog from the August trip to Uganda, visit *dukeinuganda.blogspot.com*.

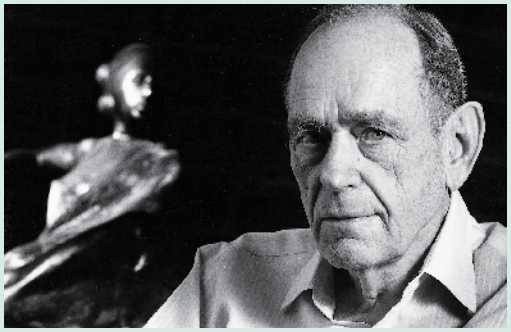
14 ventilators including **9** anesthesia machines, **7** complete anesthesia monitors, **1,000** plating systems for bone flaps, **16** portable combination oxygen saturation and automatic blood pressure monitors, **2** electrosurgical units, **1** bipolar cautery machine, and **31** patient transport heart monitors made their way from Duke surplus storage units to lifesaving operating rooms in Kampala, Uganda. Also included were **2** operating microscopes purchased from ProMedical Inc. in Winston-Salem with grants from Duke Global Surgery, Duke Global Health Institute, Synthes Spine, and Integra, as well as **100** specialty surgical packs from Cardinal Health Care and **100** digital intravenous pumps from Presbyterian Hospital in Charlotte.

A Duke original: Physician Assistant profession turns 40

IN 1964, EUGENE A. STEAD JR., MD, had been chair of Duke's Department of Medicine for going on two decades, and he was noticing a problem: the community-based physicians were too busy to attend continuing education classes. But one rural physician, Amos Johnson, had overcome the time constraints of his busy practice—by training his office assistant, Buddy Treadwell, to assist in his clinical duties.

Stead began to experiment with this idea. He was already using former military corpsmen to help run specialty units at Duke, and by 1965 he had devised a two-year curriculum to expand the education and experience of these corpsmen, turning them from medics into physician assistants. From there, Duke became the birthplace of a brand-new field in health care: that of the physician assistant. Now, at the 40th anniversary of the first graduating class—which numbered three—the profession is one of the fastest-growing in the country, with a practicing corps of more than 70,000.

"We now have 10 applications per available slot in our program, and our graduates must decide among multiple job offers," says Patricia Dieter, MPA, PA-C, current director of Duke's PA program. "The future looks very bright for physician assistants."



Eugene A. Stead Jr., MD, founder of the PA profession

1965
Duke approves Stead's proposed physician assistant (PA) curriculum, and the first four PA students, all former Navy hospital corpsmen, begin training at Duke.

1967
The first class of three PAs graduate from Duke on October 6—later established by the American Academy of Physician Assistants (AAPA) as National PA Day.

1968
The AAPA is incorporated in North Carolina.

1973
The National Board of Medical Examiners administers the first certifying PA examination to 880 candidates.

Today
According to the AAPA census, about 56 percent of responding PAs work in physician offices and clinics; 23 percent in hospitals; and the rest in public-health clinics, nursing homes, schools, prisons, home-health care agencies, and the Department of Veterans Affairs. About 9 percent of PAs provide health care in small communities with few (if any) physicians.

School of Nursing to offer a new doctoral program

DUKE UNIVERSITY will launch a new doctoral program in nursing that focuses on putting research and scientific findings into practice to improve health care systems.

The three-year Doctor of Nursing Practice (DNP) program was approved in December by the university's Board of Trustees. The program plans to enroll 20 students next fall. A full contingent of 65 students is expected to be enrolled by the fifth year.

"We anticipate that upon fully implementing the DNP program, Duke will be known as the center for preparing nurses to become leaders who will inform, develop, evaluate, and transform disease management within complex health systems and diverse communities," says Catherine Gilliss, DNSc, RN, dean of the Duke University School of Nursing (DUSON) and vice chancellor for nursing affairs.

Nationally, 59 nursing schools have DNP programs, including several of DUSON's top-15 national peers. No nursing school in North Carolina currently offers the DNP degree.

The Duke approach differs from those of the traditional doctoral degrees in nursing, the Doctor of Philosophy in Nursing and the Doctor of Nursing Science, which prepare nurse scientists for careers in research and academia. DUSON launched a PhD program in 2006.

Duke's DNP program also will address a national need for clinical nurse leaders who will work with people from related professions to move research into clinical practice to promote innovative, high-quality, and safe patient care, Gilliss says.

In addition, Duke's DNP program will help ease the nation's nursing shortage, which stems in part from a shortage of nursing faculty. DNP graduates are expected to be qualified to fill the gap and prepare the next generation of nurses, Gilliss says.

For more information, visit *nursing.duke.edu*.

Health care for a healthy planet

Making Duke Medicine environmentally friendly

IT'S NOT EASY BEING GREEN.

For health care institutions, balancing quality treatment with environmental friendliness has long been a tough task. The heavy energy use, disinfectant chemicals, and streams of waste so intrinsic to modern patient care can also harm the environment.

But in recent years, Duke has found ways to "green" its operations—from large-scale construction projects to everyday housekeeping services—without sacrificing quality or cost-efficiency. The results: less negative impact on the environment, lower energy and waste disposal costs, and safer facilities for patients.

The environmental sustainability movement at Duke Medicine gained momentum when Duke University Hospital partnered with Hospitals for a Healthy Environment (H2E) several years ago. H2E is leading a national push for best environmental practices in health care, requiring partner hospitals to commit to goals such as waste reduction and mercury elimination.

Among Duke's efforts have been reprocessing medical instruments rather than relying on disposable products, purchasing environmentally preferable medical products, and phasing out products with mercury. Although the element was long used in thermometers, blood pressure cuffs, feeding tubes, and other devices, mercury produces a noxious discharge that hurts water quality and poisons fish and other animals, and accidental spills can be hazardous to humans. Since 2003, Duke's elimination program has recycled mercury-containing instruments and swapped them out for safer devices, replacing some 4,000 thermometers and reducing mercury waste by 95 percent.

Housekeeping has gone green too. In several buildings, Duke replaced conventional wet mops with microfiber mops that use less water and fewer corrosive chemicals—and are more sanitary in the bargain. Some groups have also switched to non-toxic cleaners. "Historically, we have fought the perception that green chemicals and products would not perform as well," says Katherine Jordan, assistant director for campus design and sustainability. "What we are seeing, though, in the buildings where we have implemented green housekeeping, is that not only is the air cleaner and the downstream negative impact removed, but the staff like it better—and the products work just as well."

As an added plus, such sustainability efforts often save money—by reducing water and energy consumption, encouraging recycling that saves on waste disposal fees, and mitigating the negative impact of toxic products on employee and patient health.

Duke officials are building on these green efforts with several construction projects in the pipeline. Across the university, all new buildings will be certified through the U.S. Green Building Council's Leadership in Energy and Environmental Design (LEED) program, which rates the design, construction, and operation of green buildings. Several recently completed facilities are already LEED-certified, including the Duke Integrative Medicine building and Medical Science Research Building II.

Future construction plans will emphasize high-performance building design, such as "green" roofs—vegetated structures that combine durability with environmental benefits. Officials are also looking at ways to reduce the waste stream and energy use of operating rooms. This means researching green-friendly options for lighting, curtains, flooring, paint, and other products.

"More and more, we are viewing our facilities not just as medical delivery systems, but as active participants in public and environmental health," says Gregory Warwick, campus architect for Duke Medicine. "Sustainability and environmental quality are at the beginning of every discussion we have."

Learn more at duke.edu/sustainability.

A stunning example of environmentally sustainable construction, the Duke Integrative Medicine facility was built using 25 percent recycled materials and low volatile organic compound (VOC)-emitting carpets, adhesives, paints, and sealers, as well as indoor chemical and pollutant source controls that yield better air quality. "Stewardship of the environment was a major consideration in building design, and is integral to the daily operations of this program," says Duke Medicine campus architect Gregory Warwick.

Chancellor's scholarships to support biomedical grad students

VICTOR J. DZAU, MD, chancellor for health affairs at Duke, has announced a new Chancellor's Scholarship program that will provide $1.6 million in funding for biomedical graduate students who are not eligible for support on National Institutes of Health (NIH) training grants, including outstanding international applicants.

The Chancellor's Scholarship will also award a limited number of one-time merit supplements to especially talented domestic graduate students to augment their NIH-funded stipends.

"Until now, there has been very limited financial support available for outstanding graduate students applying from outside of the U.S.," says Dzau. "Increasingly, international students are becoming an important pipeline of outstanding young scientists at Duke and in the U.S. This new scholarship program will allow Duke to tap this vital resource and to attract and reward our most distinguished domestic applicants, too."

> "Increasingly, international students are becoming an important pipeline of outstanding young scientists at Duke and in the U.S. This new scholarship program will allow Duke to tap this vital resource and to attract and reward our most distinguished domestic applicants, too." —VICTOR J. DZAU, MD

The new program is the result of a recommendation from the Science Advisory Council, which Dzau formed in December 2006 to generate ideas for strengthening Duke Medicine's science and research efforts. The scholarship initiative also supports Duke Medicine's vision of globalization.

"An overwhelming priority [for the Council] was to find a way to improve graduate programs' access to the best applicants, and in particular to international applicants," says Sally Kornbluth, PhD, vice dean for basic science and a professor of pharmacology and cancer biology. "We've all seen applications or inquiries from great students whom we couldn't accept because we couldn't support them."

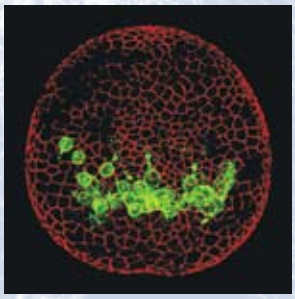
"[This program] will provide a refreshing solution to problems of graduate student support and make Duke more competitive for the best graduate students, both domestic and foreign," adds Paul Modrich, PhD, James B. Duke professor of biochemistry and a Howard Hughes Medical Institute Investigator.

The Chancellor's Scholarship will begin as a pilot program, to run in the 2008-2009 and 2009-2010 academic years. It will enable the School of Medicine to admit 20 additional biomedical graduate students over three years.

Ready for your close-up?

THESE BEAUTIFUL BEINGS WERE captured by Duke researchers at the new Light Microscopy Core Facility. Opened last summer, the shared facility has expanded access to state-of-the-art microscopes and image analysis resources to researchers across the university and medical center.

To learn more (and see more fascinating images), visit microscopy.duke.edu.



Sea urchin embryo
SIMON WU / DAVID MCCLAY

Background image:
Mouse embryonic fibroblast
YASHENG GAO / PANG YAO

Start! Walking

MORE THAN A THOUSAND Duke Medicine employees laced up their walking shoes to participate in the 2007 Start! Triangle Heart Walk, joining some 10,000 walkers from across the Triangle to raise $840,000 for the American Heart Association (AHA). Duke Medicine sponsored this year's walk, which promotes physical activity and heart-healthy living while raising critical dollars for lifesaving research. Victor J. Dzau, MD, Duke chancellor for health affairs, served as chair.

Since 1970, the AHA has funded cardiovascular research at Duke University and other local institutions totaling more than $41 million. This year, Duke received more than $6.5 million in grants to support heart disease and stroke research, and was also one of three institutions nationwide to receive the $2.5-million American Stroke Association-Bugher Foundation Centers for Stroke Prevention Research Grant to improve stroke prevention.

A student-decorated bench on Duke's West Campus pays homage to Edvard Munch's *The Scream*.

The health costs of college

Duke Student Health takes a creative approach to the common complaints of stress and sleep deprivation.

IN A WORLD OF ENERGY DRINKS and high-tech gadgets, Duke students are discovering the joys of herb tea and a good game of Scrabble.

Serenity reigns at the Oasis, which opened last year in Bell Tower Dorm. It is a place for students to go—*sans* cell phone—to relax, play board games, and have face-to-face conversations. And it is just one weapon in an arsenal of strategies Duke Student Health has put in place to help keep students healthier and happier.

"We know that students are struggling with stress issues," says Franca Alphin, director of health promotion at Duke Student Health, which is part of the Department of Pediatrics and also includes many faculty from the Department of Community and Family Medicine. According to the 2006 National College Health Assessment (NCHA), college students nationwide report that stress impacts their academic performance—including 29 percent of Duke undergrads.

"Effortless perfection." Perhaps more so at Duke than many other universities, students feel the pressure. "There's a phrase, 'effortless perfection,'" says Devdutta Sangvai, MD, medical director at Duke Student Health. "That is, I should be perfect without putting forth much effort. If I can't achieve this, maybe I am not doing something right. [The pressure] can manifest itself in different ways—stress, sleep disorders, eating disorders, all of which can affect your immunity and lead to illness."

Data from the NCHA show that in terms of stress, Duke students mirror their counterparts at Ivy League institutions. "These are bigger issues where there are higher expectations," says Alphin.

Be a bedhead. Sleep, it seems, can help resolve a lot of issues for students, including how they handle stress.

"From academic stress issues to true anxiety disorder, sleep hygiene factors into everything," says Sangvai. "We tell students, if you can just get eight hours, things might feel a little better."

But for many students, sleep remains elusive. According to the NCHA, 20.4 percent of Duke students reported sleep difficulties that impacted their academic performance.

Lack of sleep can also be at the root of seemingly unrelated problems, says Alphin. "I see students for nutritional and weight issues, and discover that their lack of sleep impacts their eating."

Student Health offers a peer education group called MINDS (Mental Issues and Needs of Duke Students), in which undergraduate volunteers reach out to their classmates with information and events like Sleep Awareness and Stress Management Week. Students are recognizing the importance of sleep as well, and in Brown (the "wellness dorm") and other residence halls students have established "quiet hours" guidelines.

Good gadget, bad gadget. While such efforts help, the technological age has made it even harder for students to turn in for the night. "A lot of students stay up late, in chat rooms, gaming on the Internet. The availability of nonstop stimulation keeps people awake," says Sangvai. "That's the negative side of technology—but the positive side is easier communication with students."

An online appointment service has been available for about two years. Student Health Center caregivers also use a secure message server to keep in touch with students. "We can e-mail, 'Is your ankle better?' and they will reply, 'Yes, it's better, thank you,'" says Sangvai. "We do whatever we can do, to be proactive, to make their Duke experience better."

Fighting the sedentary sickness

"Sedentary living is a disease state." William Kraus, MD

JUST WHEN IT SEEMS LIFE can't get any more automated, your neighborhood Starbucks opens a drive-thru. And then the local drugstore. And then the dry-cleaner. With all these modern conveniences, the most exercise some people get on any given day is rummaging through their sofa cushions in search of the remote control. Now a Duke-led study has finally generated the evidence to confirm what researchers have long suspected: Sedentary living is so dangerous that it is simply not an option for long-term health.

The STRRIDE study measured important health markers in the blood of people who were inactive, moderately active, and vigorously active. "What really surprised us," says Duke exercise physiologist Cris Slentz, PhD, "is just how much worse the health measures got in the inactive group. Anything bad that could happen to a cholesterol molecule happened." The inactive group showed an array of worsening risk factors for heart disease, from weight gain to rising bad cholesterol and blood sugar levels.

The good news is that it really doesn't take much to undo this sedentary sickness—simply following the current American College of Sports Medicine/American Heart Association recommendations of a half-hour of moderately intense exercise on most days, or 20 minutes of vigorous exercise three times a week, will do. And according to STRRIDE, even less will still have a positive effect. "Just walking four to seven miles a week can stabilize many of these risk factors," says Duke cardiologist William Kraus, MD. "It takes remarkably little."

In some measures of health, those in the moderate intensity exercise group actually did better than the vigorous intensity group. "Our studies show that a modest amount of moderately intense exercise is the best way to significantly lower triglyceride levels," Slentz says. "More intense exercise doesn't seem to do that."

A possible explanation for this surprising finding comes from how our bodies burn fuel during different types of exercise, says Slentz. "It's been well established that, if you walk three miles versus jog three miles, the person jogging will use a lot of glucose for energy.

William Kraus, MD

The person walking will get more of their energy from fat." That means that triglycerides—the particles of fat that the body uses for energy—are used more during low-intensity exercise than during high-intensity exercise.

"The triglyceride levels in the low-intensity group stayed low even two weeks after the study's workouts ended," says Kraus, whereas longer, more intense workouts didn't have nearly the same impact. "And a proper exercise program can lower a person's insulin resistance in a matter of days." These findings appeared in the August 2007 *Journal of Applied Physiology*.

"There are some experts who think vigorous exercise is necessary—and it may be," says Slentz. "But the point is not to get too caught up in worrying about what to do or when to do it. The important thing is to help people understand how important it is to get out there and move."

Reducing fatal post-fracture frailty

A HIP FRACTURE IS OFTEN a harbinger of more ills to come. Not only does a broken hip significantly increase a person's risk of permanent walking impairment, the need to spend time in a long-term care facility, and further fractures in both hips, approximately 15 to 25 percent of patients will die within a year of their fracture.

A new Duke-led study has shown that the osteoporosis drug zoledronic acid, given intravenously once a year, significantly reduces not only the occurrence of new fractures but also the incidence of death in patients who have had a hip fracture. A study of 2,127 patients found that those who received zoledronic acid (U.S. trade name Reclast) within 90 days of surgery for a hip fracture showed a 28 percent reduction in death and 35 percent lower chance of suffering another fracture.

"Very few patients [currently] get treatment for osteoporosis after fracturing a hip," says study leader Kenneth W. Lyles, MD, a Duke geriatrician and endocrinologist, so "we believe that using a drug like zoledronic acid can be instrumental in reducing the frailty so common in the elderly."

Though the link between this treatment and the reduction in mortality warrants further study, he says, "These data show that we can go beyond cutting the risks of future fractures to reducing the death rate after these disabling fractures." The results of the international clinical trial appear in the November 1, 2007 *New England Journal of Medicine*.

New findings on teens and antidepressant use

A MAJOR DUKE-LED STUDY has shed new light on the best way to help the estimated 2 million American teenagers suffering from depression—and more such guidance is on the way. The findings of the Treatment for Adolescents with Depression Study (TADS), published in the October 2007 *Archives of General Psychiatry*, show that the combination of medication management with fluoxetine (Prozac) and cognitive behavioral therapy (CBT) improved depressive symptoms and reduced the level of suicidal thinking and behavior in adolescents better than medication or CBT alone.

"Depression among teenagers is a significant public health problem and there has been a tremendous need to identify treatments that work and are also safe," says lead investigator John March, MD, chief of child and adolescent psychiatry at Duke. "While medication is very helpful, we found that combining medication with CBT produced the quickest improvement and, especially for suicidal thinking and behavior, a much improved outcome compared to medication alone."

March is also the principal investigator for the Child and Adolescent Psychiatry Trials Network (CAPTN), which is funded by the National Institute of Mental Health to conduct large, simple trials addressing questions of importance to doctors and patients. The network has recently launched two new studies to help doctors identify which patients are good candidates for medication management and which patients might be most vulnerable to adverse events. With this information, which is currently unavailable, doctors can steer specific patients toward drugs that will be helpful and away from those that might be harmful.

In the Antidepressant Safety in Kids (ASK) study the CAPTN team will follow 2,420 children and adolescents with a depressive disorder, anxiety disorder, obsessive-compulsive disorder, or eating disorder who are starting treatment with one of several commonly used antidepressants. CAPTN investigators will gather information about the safety, tolerability, acceptability, and benefits of these medications along with a variety of patient, family, and environmental characteristics that may influence response to medication. In a substudy entitled Pharmacogenomics of Antidepressant Response in Children and Adolescents (PARCA), the CAPTN team will examine selected gene variants that may be associated with an increase in benefits or in side effects, including drug-related suicidal events.

"My hope," says March, "is to repeat the success of networks established for other common illnesses, such as heart disease and cancer, so that we can help doctors and patients make informed choices about the use of psychotropic medications in younger patients."

To learn more about CAPTN or about the ASK and PARCA studies, visit the CAPTN Web site at captn.org.

Drug boosts platelets in hepatitis C patients

IT'S NOT A CURE, BUT this may be some of the best news patients infected with the hepatitis C virus (HCV) have heard in a long time: A new drug, eltrombopag, appears to be effective in boosting low platelet counts, one of the major reasons why patients can't initiate or endure antiviral therapy.

John McHutchison, MD

Other drugs that can restore normal platelet levels are infusions of platelets or injections; eltrombopag is a pill taken just once a day.

Researchers at Duke and other centers worldwide studied eltrombopag (U.S. trade name Promacta) in 74 patients with low platelet counts and cirrhosis of the liver due to HCV infection. They found that it boosted platelet counts in a majority of patients at each of three dosage levels, enabling most of them to continue or start conventional antiviral treatment.

"We feel this is an important development for many people infected with the hepatitis C virus worldwide," says John McHutchison, MD, professor of medicine and associate director of the Duke Clinical Research Institute. "A significant number of patients with HCV infection will at some point develop platelet problems that will compromise their being able to receive or complete the best treatments we have. Anything we can do to prevent that from happening would improve their care."

The findings appear in the November 29, 2007 *New England Journal of Medicine*.

New exercise lab puts kids to the test

Peter Michelson, MD

Michael Carboni, MD

JUST TWO MINUTES INTO A RACE with his high school cross-country team, Quentin collapsed. A spell of dizziness had struck without warning, and suddenly the 14-year-old fell to the grass, unconscious. Though he woke up minutes later, he and his parents were desperate for an explanation: was this an isolated incident or a sign of serious health problems?

That question prompted Stephen Miller, MD, a cardiologist at Duke Children's Cardiology of Fayetteville, to recommend that Quentin visit the new pediatric cardiopulmonary exercise lab at Duke Children's Hospital and Health Center.

One of the only facilities of its kind in the Southeast, this state-of-the-art exercise lab tests for chest pain, asthma associated with exercise, exercise intolerance, cardiac rhythm disturbances, and a host of other activity-related concerns, all with a pediatric focus.

"It's very difficult for children to describe what they're feeling when they're having difficulty with sports," says Peter Michelson, MD, the pulmonologist who started the facility with cardiologist Michael Carboni, MD, in August. "There are so many different explanations for why they may be having exercise intolerance; the best way for us to determine the cause of their symptoms is simply to get them on a treadmill or bike and exercise them under supervision."

The idea is to re-create the conditions that triggered the problem so that doctors can determine its cause—whether cardiac, pulmonary, or otherwise. Some labs specialize in one or the other, but rarely do they offer both sets of diagnostic tools, specifically catered to children.

Pediatric patients at Duke used to visit the adult lab, Michelson says. "Now, with our own lab and pediatric-focused staff, they're coming into a much more nurturing environment, where we'll get more useful information from any test that we administer, because it'll be pediatric-specific."

In Quentin's case, the results of his cardiopulmonary exercise test showed no heart irregularities, and Carboni confirmed that his asthma symptoms were being properly managed—giving him the thumbs-up to start running again. For chronically ill patients, doctors may use the results to determine an appropriate level of physical activity. For most patients, though, results either raise red flags about medical conditions or rule out particular diagnoses.

Says Michelson: "In that regard, it is a great asset to be able to reassure families that their children are not at risk when they exercise."

The pediatric exercise lab is accepting new patients through physician referrals. Physicians can call 919-668-3190 to set up an appointment.

What's wrong with banked blood?

TWO DUKE STUDIES have shown that almost immediately after it is donated, human blood begins to lose nitric oxide, a key gas that opens up blood vessels and facilitates the transfer of oxygen from red blood cells to oxygen-starved tissues. However, adding this gas back to stored blood before transfusion appears to restore red blood cells' ability to transfer oxygen to tissues. These studies, published in the *Proceedings of the National Academy of Sciences*, may go a long way toward explaining why patients who receive blood transfusions have higher incidences of heart attack, heart failure, stroke, and even death.

Because blood transfusions are an essential part of medical care—about 5 million Americans receive blood each year—study author Jonathan Stamler, MD, suggests that the potential harm of transfused blood is one of the bigger problems facing American medicine—and one that is not widely appreciated. "Banked blood is truly a national treasure that needs to be protected," Stamler says. He notes that clinical trials are needed to test the effectiveness of replacing nitric oxide, but says that "In principle, we now have a solution to the nitric oxide problem—we can put it back."

Attacking heart attacks—fast

A TEAM OF NORTH CAROLINA doctors, nurses, hospitals, and emergency medical service workers has come up with a way to provide faster, more effective treatment for heart attack patients. Working as partners, rather than as rivals, caregivers at 65 hospitals and associated emergency medical teams were able to dramatically slash the time from diagnosis to treatment with potentially lifesaving therapies. In fact, the project was recognized by the American Heart Association as one of the top 10 research advances of 2007.

Design of the RACE (Reperfusion of Acute Myocardial Infarction in North Carolina Emergency departments) project was based on a trauma treatment system. Everyone focused on a single goal—to provide the fastest, most beneficial care to the greatest number of heart attack patients eligible for reperfusion, or artery-opening therapy. To do so, all caregivers worked to "move care forward"—that is, enabling first responders to do as much of the work as possible, including diagnosing a heart attack. Paramedics were trained to do the work of ER physicians, and ER physicians were trained to do the work of cardiologists. A single phone call from the field was enough to bring an angioplasty team to the catheterization lab; hospitals had to admit heart attack patients, even if they didn't have any beds. "Cardiologists had to give up some of the control we were used to having," says James Jollis, MD, a Duke cardiologist and senior author of the study. "It was a hard habit to break. But once we saw the results, we knew we could trust the process."

Over two years, physicians collected information on 2,000 patients, measuring pre- and post-intervention times between key processes, such as arrival at the hospital door to angioplasty or clot-busting therapy, and transfer times between hospitals. Times improved between 17 and 41 percent in all areas.

Studies show that heart attack patients treated with reperfusion therapies within 90 minutes do best. "But many people who are eligible to get these treatments don't get them in time, or don't get them at all," says Jollis. "Now, we know how to change that."

"This strategy is the first to demonstrate substantial, system-wide improvement on a statewide scale," says Duke's Christopher Granger, MD, a lead investigator of the project, which was presented at the 2007 annual meeting of the American Heart Association. "We are pleased that the RACE experience has created a model for change throughout the rest of the country."

Is heart failure treatment unfair?

A PAIR OF DUKE STUDIES has shown that many Americans hospitalized for heart failure still aren't getting the therapy they need—especially women and minorities. Both studies focused on patterns of implantable cardioverter defibrillator (ICD) use, and both found that only a fraction of those who appeared to be eligible for ICD therapy actually had one of the devices in place or had plans for the therapy when they left the hospital.

The percentages differed in each study, but in both studies white men were the most likely to get ICD therapy, which uses electrical shocks to help control erratic rhythms that could cause the heart to stop beating. Black men were less likely than white men, and women the least likely, to receive an ICD. Both papers appeared in the October 3, 2007 *JAMA*.

Duke health policy expert Kevin Schulman, MD, says it is discouraging to find such stark differences. "There is definitely an unconscious bias and there are definitely issues of access, but at the end of the day, I think it is about complexity. Our most vulnerable patients—those who need care the most—don't know how to navigate the system."

"Clinical trials show that ICDs save lives, so the sex difference in treatment rates is worrisome," says Duke health services researcher Lesley Curtis, lead author of one study. "We found that the use of ICDs overall increased significantly over our study period, but in each year, the use among women lagged way behind that in men."

"Survival among women with heart failure has not improved substantially over the past 10 to 20 years," says cardiologist Adrian Hernandez, MD, lead author of the companion study. "Increasing ICD use among eligible women with heart failure is one potential way that we could improve these outcomes."

Customized cancer care

Genomic analysis enables physicians to provide tumor-specific chemotherapy


Jennifer Garst, MD


P. Kelly Marcom, MD

PHYSICIANS HISTORICALLY HAVE had little patient-specific disease information to guide their treatment decisions, and many patients have suffered through ineffective treatments—and their side effects—in an effort to discover what works for them.

But thanks to information gleaned from sophisticated genomic analyses, Duke Medicine is now delivering disease-specific treatments to patients enrolled in clinical trials currently under way here.

For example, patients with advanced non-small-cell lung cancer are taking part in a first-of-its-kind study led by Duke oncologist Jennifer Garst, MD. The study—based upon the research of Joseph Nevins, PhD, and Anil Potti, MD, both of Duke's Institute for Genome Sciences & Policy (IGSP)—uses genomic analysis to guide the choice of the initial chemotherapy drug patients receive, when an effective treatment is particularly critical.

Because every person's genetic composition is unique—and that composition influences both normal and abnormal cells—diseases are as individual as the people who have them. Herein lies the key to the pioneering field of genomic medicine.

For patient Artis Perry, 64—who was diagnosed with Stage 4 non-small-cell lung cancer in Spring 2007 and chose to participate in Garst's study—the genomic-guided approach couldn't have worked better.

After a genomic analysis found Perry's tumor to be resistant to cisplatin, a commonly used front-line chemotherapy drug, he was assigned to a treatment group using a combination of the non-platinum drugs pemetrexed and gemcitabine. At the end of Perry's six-cycle treatment, his tumor was more than 50 percent smaller.

Because Perry received the initial treatment that his tumor was genetically wired to respond to, he didn't have to waste precious treatment on fruitless therapies or endure side effects of drugs biologically destined to be ineffective. Had he been prescribed the "standard" drug for his condition with no consideration of his genetic makeup, his post-chemo outcome likely would have been much different.

In early 2008, the trial will be expanded to the Duke Cancer Center Raleigh based at Duke Raleigh Hospital. A range of other novel genomics-guided clinical trials—all carried out by the Duke IGSP's newly formed Clinical Genomics Studies Unit under the leadership of Geoffrey Ginsburg, MD, PhD—will soon begin at Duke and several Duke-affiliated hospitals, giving patients with other types of cancer the opportunity to benefit from similar targeted therapies.

For example, Duke oncologist P. Kelly Marcom, MD, will soon launch a large clinical trial to investigate genomic-guided therapies in early-stage breast cancer patients. Supported by a $7-million grant from the U.S. Department of Defense, the trial will seek to confirm that genomic profiles can be used to successfully predict which patients will benefit from which existing chemotherapy drugs.

Similar studies involving patients with other types of cancer will begin at Duke in the near future. To learn more visit www.genomestohealth.org.

How to keep cancer patients clot-free

CANCER PATIENTS ARE at increased risk for venous thromboembolism (VTE)—the formation of a potentially deadly blood clot that may travel through the veins. VTE affects an estimated 4 to 20 percent of cancer patients, and is considered one of the leading causes of death in this population. Now, an international panel of researchers led by Duke oncologist Gary H. Lyman, MD, has put together a set of evidence-based guidelines for the prevention and treatment of VTEs in cancer patients for the American Society of Clinical Oncology (ASCO). The guidelines were published in the December 1, 2007 *Journal of Clinical Oncology*, and are also available on ASCO's People Living With Cancer Web site, plwc.org, along with a corresponding patient guide.

Potential blood test for lung cancer

A TEST FOR FOUR BLOOD PROTEINS may provide a less-invasive follow-up for patients who have suspicious lesions on chest radiographs or computerized tomography (CT) scans, according to a new Duke study published in the December 10, 2007 *Journal of Clinical Oncology*.

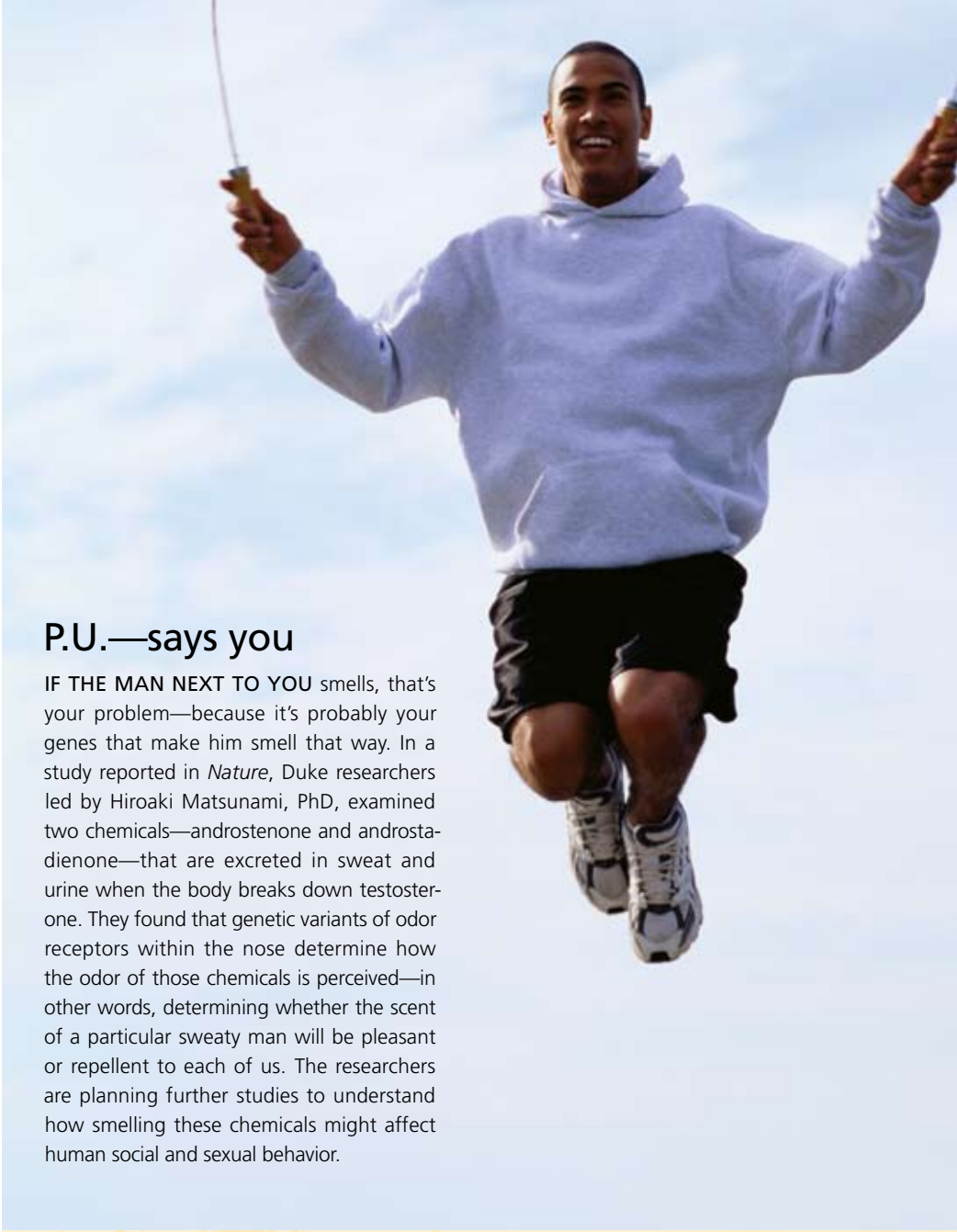
"CT scans have a very high false positive rate when trying to discover lung cancer," says lead investigator Edward Patz Jr., MD, a Duke radiologist, so patients often must undergo invasive procedures like biopsy to confirm the results. "This study is the first step in developing a test that would allow us to sample a patient's blood and determine whether more invasive testing and treatment are necessary."

Using the four blood protein markers, known as CEA, RBP, SCC, and AAT, researchers were able to distinguish which patients had cancer with over 80 percent accuracy, Patz says. They will next perform a larger study, with the ultimate goal of developing a screening system by which patients could have the blood test before imaging. Those found to be at high risk would have a CT scan for further evaluation.

Embyros for research? What infertility patients say

CURRENT FEDERAL POLICIES do not reflect the preferences of most infertility patients who have faced the personal moral challenge of deciding what to do with their frozen embryos, asserts a recent study. In a survey answered by more than 1,000 patients who have created and frozen embryos as part of fertility treatment, 60 percent say they would be likely to donate unused embryos for stem-cell research, according to a study led by researchers at Duke and Johns Hopkins University. The researchers published their findings in the July 6, 2007 *Science*.

Among those patients surveyed, research proved to be the most desirable option for disposition of excess embryos; other options, including donation to another infertile couple or destruction of the embryos, were far less desirable. These findings suggest that the number of embryos potentially available for stem-cell research may be 10 times higher than previous estimates, resulting in a potential 100-fold increase in the number of stem cell lines—groups of stem cells derived from a single source—available for federally funded research.



P.U.—says you

IF THE MAN NEXT TO YOU smells, that's your problem—because it's probably your genes that make him smell that way. In a study reported in *Nature*, Duke researchers led by Hiroaki Matsunami, PhD, examined two chemicals—androstenone and androstadienone—that are excreted in sweat and urine when the body breaks down testosterone. They found that genetic variants of odor receptors within the nose determine how the odor of those chemicals is perceived—in other words, determining whether the scent of a particular sweaty man will be pleasant or repellent to each of us. The researchers are planning further studies to understand how smelling these chemicals might affect human social and sexual behavior.

Why we have an appendix

LONG VIEWED AS SUPERFLUOUS, the appendix now appears to have a reason to be: Duke researchers say it's a "safe house" for the beneficial bacteria living in our guts. Drawing upon a series of observations and experiments, Duke investigators postulate that, should a person experience a bout of diarrhea that completely evacuates the intestines, the beneficial bacteria in the appendix that aid digestion would be protected and could emerge afterwards to repopulate the gut. "In industrialized societies with modern medical care and sanitation practices, the maintenance of a reserve of beneficial bacteria may not be necessary," says researcher William Parker, PhD, which is why removing the appendix in such societies seems to have no negative effects. The theory appears in the *Journal of Theoretical Biology*.

A genetic breakthrough in multiple sclerosis

IN THE FIRST MAJOR ADVANCE in understanding the genetics of multiple sclerosis in three decades, researchers have identified a gene that increases an individual's risk of developing MS by 30 percent. Until now, only genes within a region of chromosome 6 have been implicated in the disease. The current finding, reported in July in *Nature Genetics*, demonstrated that a functional gene variant on chromosome 5 was associated with an increased susceptibility to the disease. "Our finding is very important, because the genetic factors that are already known to be associated with multiple sclerosis explain less than half of the total genetic basis for the disease," says Duke molecular geneticist Simon Gregory, PhD.

Your baby is what you eat

EXPERIMENTS IN ANIMALS have provided new evidence that what a pregnant mother eats can make her offspring more susceptible to disease later in life. Duke researchers studied how exposing pregnant mice to the common plastics chemical BPA caused noticeable changes in the offspring, but did not alter any of the offspring's genes. This and similar research is broadening the new field of epigenetics—the study of changes that happen in the expression of a gene sequence without altering its code.

How exposure to BPA affects humans is still not known, but study leader Randy Jirtle, PhD, notes that giving the mice folic acid or genistein, an active ingredient in soy, protected their offspring from the effects of BPA. This finding shows promise of future nutritional approaches to counteract exposure to toxins.

Obesity blurs prostate cancer checkpoints

A NEW STUDY led by Duke Prostate Center researchers warns that doctors may be missing early prostate cancers in obese men. "Obese men have more blood circulating throughout their bodies than normal-weight men," says Duke urologist Stephen Freedland, MD. "As a result, the concentration of prostate-specific antigen, or PSA, in the blood—the gold standard for detecting prostate cancer—can become diluted."

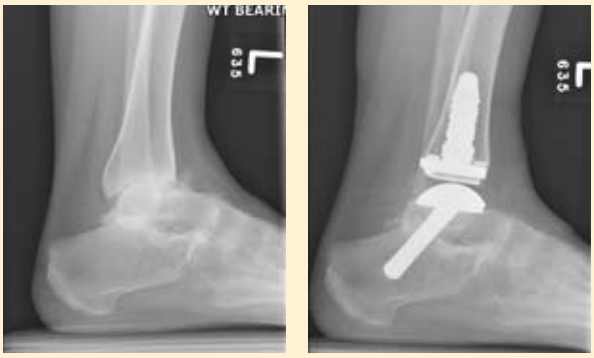
In a study published in the November 21, 2007 *JAMA*, researchers compared the medical records of almost 14,000 patients who had undergone radical prostatectomy surgery for the treatment of prostate cancer between 1988 and 2006 at Johns Hopkins, Duke, or at one of five Veterans Affairs hospitals making up the Shared Equal Access Regional Cancer Hospital (SEARCH) cohort. They analyzed the relationship between body mass index and PSA concentration levels, while also examining the blood volume in the patients' bodies and the total amount of PSA protein found in the blood, known as PSA mass.

"We found that a higher body mass index directly correlated with higher blood volume and lower PSA concentrations," says lead author Lionel Bañez, MD, a researcher in the Duke Prostate Center. "Men in the most obese group had PSA concentrations that were 11 to 21 percent lower than those of normal-weight men." Previous studies have linked obesity to more aggressive prostate cancers, and Freedland says that this study may in part explain why: their prostate cancers are being detected later because of the dilution of PSA.

Of obsessive-compulsive mice (and men)

INVESTIGATORS STUDYING HOW individual brain cells communicate with each other made a serendipitous discovery: mice born without a key brain protein exhibit obsessive-compulsive behavior. These mice compulsively groom their faces until they bleed and are afraid to venture out of the corner of their cages. But when given a replacement dose of the protein in a specific region of the brain—or the drugs used to treat humans suffering from obsessive-compulsive disorder (OCD)—many of these mice seem to get better. The finding, reported in *Nature* by an international team of researchers led by Duke's Guoping Feng, PhD, may have uncovered important clues about a possible mechanism for OCD—a debilitating psychiatric condition that affects up to 2 percent of people worldwide.

New angles in ankle replacement



COURTESY MARK EASLEY, MD

Severe ankle arthritis with deformity before ankle replacement (left) and after surgery (right)

ALISON WHITTAKER, who has suffered from rheumatoid arthritis since childhood, likes to spend Labor Day weekend at the coast. But in 2007, Alison was able to do something she hadn't been able to do in years without severe pain—walk barefoot in the sand. Thanks to a total ankle replacement, known as total ankle arthroplasty (TAA), Alison now has no pain in her left ankle. Simple daily activities, such as a trip to the grocery store, are no longer filled with discomfort and exhaustion.

Alison is one of hundreds of people with debilitating ankle arthritis who are experiencing significant pain relief and improved quality of life after TAA at Duke. Duke orthopaedists, including Whittaker's surgeon, Mark Easley, MD, and division chief James Nunley, MD, have long been at the forefront of advancements in ankle replacement. With the recent addition of James DeOrio, MD, ankle replacement specialist and former chair of Mayo Clinic Orthopaedics in Florida, Duke has expanded its TAA orthopaedic services to Durham Regional Hospital as well as Duke University Hospital—and, Nunley says, Duke may now be performing more ankle replacements than any other institution in the country.

"It's like building a ship in a bottle,"

says James DeOrio, MD, of the precision involved in total ankle replacement.

When first performed 30 years ago, TAA proved less successful than anticipated. Advancements in ankle replacement lagged behind hip and knee replacement because replacing an ankle is far more difficult, DeOrio says. Hips and knees have large amounts of bone and can be partially or fully dislocated, giving the surgeon more visualization of the surgical area. The ankle, however, must be replaced where it lies. "It's like building a ship in a bottle," says DeOrio. Adding to the delicacy of the procedure is the critical need for proper alignment. He notes, "Unlike hip or knee replacement, the ankle is much less forgiving because of the smaller surfaces and more compact environment."

However, the past decade has seen a surge in new prosthetic designs that more accurately mimic the human ankle and improved surgical techniques that allow for more precise alignment. The Duke team has experience with all three ankle prostheses currently approved for use in the United States (Agility, INBONE, and SaltoTalaris) and all three surgeons recently completed clinical trials of the Scandinavian Total Ankle Replacement (STAR), expected to be approved by the FDA in early 2008.

The orthopaedists describe the ideal candidate for TAA as a patient with severe, debilitating ankle pain from arthritis or cartilage injury. Patients tend to be over age 50, weigh less than 250 pounds, and have a good blood supply to the leg. Patients with skin problems, severe misalignment, ankle deformities that cannot be corrected, large areas of dead bone, or current infection are generally not good candidates for the procedure. However, DeOrio notes that newer prostheses allow for greater flexibility in choosing candidates.

While mid-term data for TAA are promising, Easley cautions that the newest prostheses have not been in use long enough to determine whether they can successfully carry the strain of higher activity levels over the long term (10 years or more). Consequently, ankle fusion is still generally the most common choice for younger, more active patients. Unfortunately, ankle fusion restricts ankle movement and leads to arthritis of the surrounding joints. TAA, on the other hand, allows patients to maintain the range of motion they start out with before surgery. Time and clinical data will tell whether TAA supersedes ankle fusion for all patients with severe ankle pain.

To refer a patient or make an appointment to discuss total ankle replacement with DeOrio, Easley, or Nunley, call 800-MED-DUKE (physicians) or 888-ASK-DUKE (patients).

New targets for an HIV vaccine

AN INTERNATIONAL TEAM of researchers has identified three gene variants that may help people's immune systems fight the proliferation of HIV—thereby delaying the onset of AIDS. The findings may advance the search for an HIV vaccine that would work by boosting the protective effects of one or more of these genes.

The study, published in *Science*, was carried out within the Center for HIV/AIDS Vaccine Immunology, an international consortium of scientists led by Duke's Barton Haynes, MD, that focuses on basic research related to HIV/AIDS vaccine development. "These results not only approximately double our understanding of the factors that influence variation amongst individuals in how they control HIV-1, but also point toward new mechanisms of control," says study director David Goldstein, PhD, a Duke genetics researcher. The study is only the first in a series of planned genome-wide studies to pinpoint additional targets for HIV vaccines.

Read more about AIDS vaccine research at Duke at dukemedmag.duke.edu.

Not in it for the money

PAYING HOSPITALS EXTRA MONEY does not appear to significantly improve the way they treat heart attack patients or how well those patients do. But giving hospitals the information they need to improve heart attack care does help. A team of researchers led by Seth Glickman, MD, MBA, at the Duke Clinical Research Institute looked at whether financial incentives to hospitals for adhering to specific treatment guidelines would improve patient outcomes. They found no evidence that such incentives improved outcomes, nor that hospitals had shifted their focus from other areas in order to concentrate on the areas being evaluated for possible increased payments.

On the other hand, "Because of better care processes, heart attack mortality declined significantly over time in pay-for-performance and non-pay-for-performance hospitals," says cardiologist Eric Peterson, MD, senior member of the research team. "The bottom line is that patients win when health care providers are committed to improvement, no matter what the incentive is." Study findings appeared in the June 6, 2007 *JAMA*.

Beauty may be skin deep, but wrinkles go to the bone

GRAVITY IS GETTING A BUM RAP, according to a new Duke study. When it comes to aging of the face, the main force at work may be your shifting bone structure. The study shows that as we age, the face's underlying bony structure changes—and those changes appear to occur more dramatically in women than in men.

Using CT scans of 100 men and women, the researchers discovered that the bones in the human skull continue to grow as people age. The forehead moves forward while the cheekbones move backward. As the bones move, the overlying muscle and skin moves as well, and that subtly changes the shape of the face. "The facial bones also appear to tilt forward as we get older," explains Michael Richard, MD, an oculoplastic surgeon at the Duke Eye Center, who led the study with oculoplastics service chief Julie Woodward, MD. "This causes them to lose support for the overlying soft tissues, which results in more sagging and drooping." Drooping tissues around the eyelids can lead to vision problems, dry eyes, and excessive tearing.

"This paradigm shift may have big implications for cosmetic eye and facial surgery," says Richard. "Our focus has always been on tightening and lifting the soft tissues, skin, and muscle. Based on this information, it might actually be better to restore the underlying bony framework of the face to its youthful proportions."

The research may also make cosmetic surgery safer. "One of the big risks of facial surgery is the potential for hitting the facial nerve," says Richard, "which could cause paralysis." Such a complication is rare, but "if we can move the focus to the bone surface, away from that nerve, we may create an even safer, less extensive surgical procedure than the ones we perform today," Richard says.

Meet the Dean

Nancy C. Andrews, MD, PhD

FROM THE LEGENDARY WILBURT C. DAVISON to the recently promoted R. Sanders Williams, the six former deans of Duke University School of Medicine have, to a man, been exceptionally talented physician-scientists, educators, and leaders—passionate advocates for the advancement of medicine in general and Duke medicine in particular.

Dean No. 7 is no exception. Called "a leader who is able to take programs, organizations, and people to new heights" by her mentor David Nathan, MD, president emeritus of Dana-Farber Cancer Institute, "one of the nation's most accomplished physician-scientists," by Williams, now senior vice chancellor for academic affairs at Duke, and "the best candidate in the country for this position," by Chancellor Victor J. Dzau, MD, Nancy C. Andrews brings to her new post a record of experience and accomplishment that clearly establishes her place in the pantheon of Duke Med deans.

There is, of course, one notable difference between this dean and her predecessors: she's a woman. As the first female dean not only of Duke's medical school, but at any top-10 medical school in the United States, her appointment created a buzz that expanded beyond academic circles to over 200 media outlets nationwide, from the *Wall Street Journal* to NPR.

DukeMed Magazine recently talked with Andrews about all the attention—and where she'll be focusing *her* attention as Duke's next dean.

After two decades at Harvard and inquiries about deanships at other institutions, why did you decide to accept the position at Duke?

"From my first visit, it was clear that Duke has a very special character—a real spirit of innovation and entrepreneurialism. I had the feeling that this was a place where big things could happen—where somebody could have a great idea and if it was compelling, something would come of it. Some of the large New England schools are so big and there's so much process around everything that it can be hard to start new initiatives. It's like trying to change the direction of the Titanic. Here, doing new things seems to be part of the culture."

Were you surprised at the level of media attention your appointment received?

"Kind of—initially, I don't think any of us had really thought about my being 'the first.' I think it's another wake-up call for academic medicine. Women and members of underrepresented minority groups are still not on equal footing at the highest levels, even though medical school classes are more representative. I hope that it will help to have more women leaders who not only understand what the issues are for young female faculty, but are also in a position to do something about them."*

You've gotten to know Duke better since becoming dean in October. What do you see as this institution's differentiating strengths—and its major challenges?

"Duke has a great tradition of collaboration, especially across traditional academic boundaries. Duke has remarkably strong clinical research and basic science engines, and is ready to take full advantage of where they intersect to do translational work. Duke also has a strong core value of being of service to society, which I think is really important. I like the fact that Duke is aggressively thinking about its global role, and reaching out to establish collaborations with academic and industry partners and other countries and governments.

"It is always a challenge when there are more great ideas than there are resources to support them in terms of building space and money. So we're not in a position to do all the things that we'd like to. It's unfortunately a fact of academic life right now, especially while the NIH budget is in so much trouble."

What are your main priorities as dean?

"Education always has to be a top priority for our medical school. I want to put a lot of my attention early on into strengthening the MD/PhD program. We have very fine students and committed faculty, but we need to continue to increase the size and quality of our applicant pool, diversify the kinds of research experiences students choose, and bring more visibility to the physician-scientists who are role models for those students. We also want to be continuously rethinking education for all of our students, because the needs change over time.

"Another priority is to find better mechanisms and incentives for interdisciplinary work. The traditional departmental structure can pose logistical barriers for interdepartmental collaborations, and if we can fine-tune ways to manage these intersecting enterprises, that will be important not only to Duke but on a national scale.

"We'll also be working on the goals identified in the [2006] strategic plan, exploring possibilities for a new student learning center, research building, and imaging facility and contributing to Duke's initiatives in global health, genomics, translational medicine, brain sciences, and others. We want to make sure Duke is well-positioned not only for what's hot today but also for the next waves in medicine." ■

Read more about Andrews's appointment on page 47.

*For more perspectives, see Dean Andrews's editorials "The other physician-scientist problem: where have all the young girls gone?" (*Nature Medicine*, May 2002) and "Climbing through Medicine's Glass Ceiling" (*New England Journal of Medicine*, November 8, 2007).

"From the first, I had the feeling that Duke was a place where big things could happen."

Education
BS and MS, Yale University
PhD, Massachusetts Institute of Technology
MD, Harvard Medical School

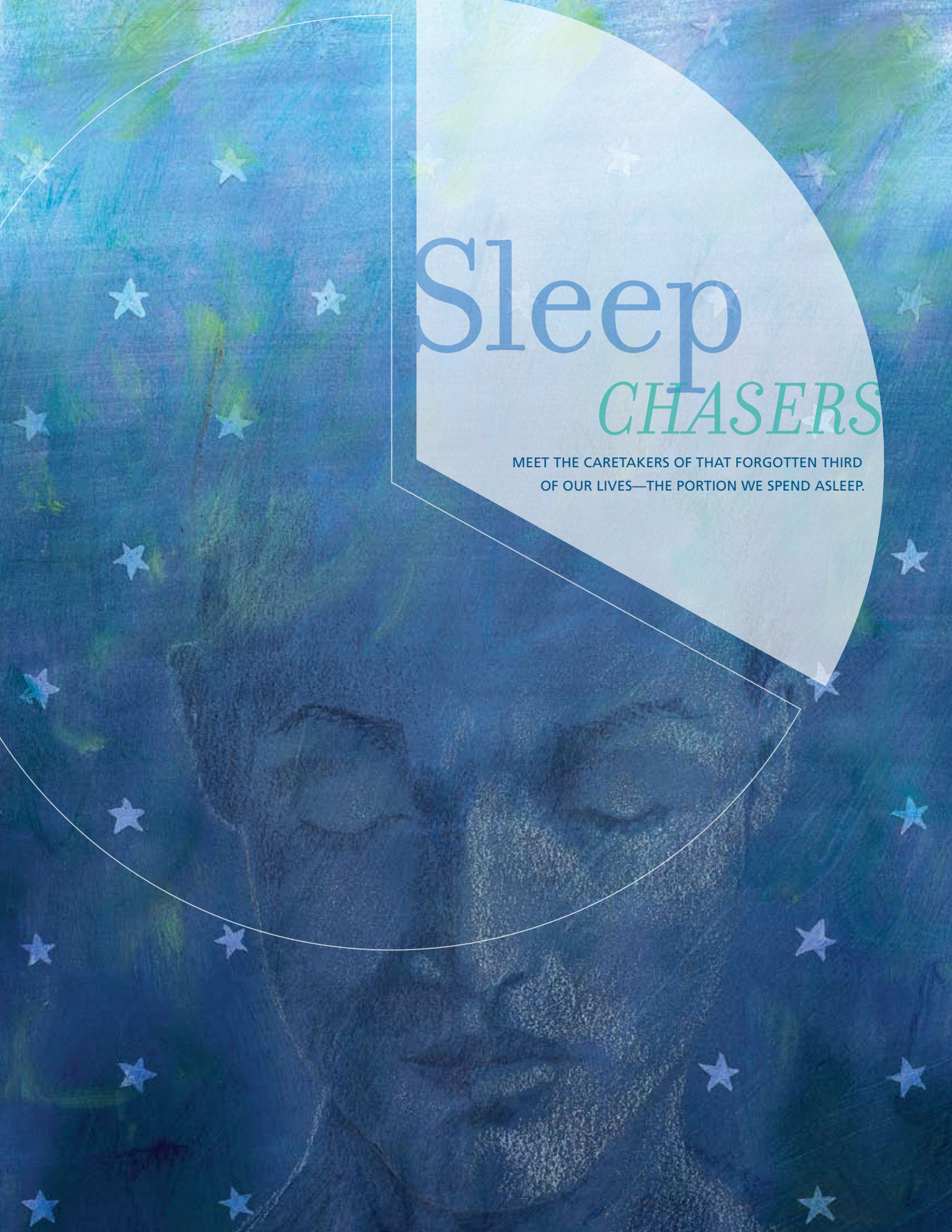
Career highlights
Most recent positions held: Dean for Basic Sciences and Graduate Studies, George Richards Minot Professor of Pediatrics, Harvard Medical School; Distinguished Physician in Pediatric Oncology, Dana-Farber Cancer Institute

Other posts held: Director, Harvard-MIT MD-PhD Program (1999–2003); Attending Physician, Children's Hospital Boston (1991–2003)

Honors: Member, Institute of Medicine of the National Academy of Sciences, American Academy of Arts and Sciences; Howard Hughes Medical Institute Investigator (1993–2006); President-Elect, American Society for Clinical Investigation

Research focus: Understanding iron diseases and laying the foundation for new treatments. "Just recently our lab identified a gene related to an inherited disorder we first discovered in a family I followed in hematology clinic 12 years ago—we call it iron-resistant iron deficiency anemia. That has been very exciting."

Personal
Hometown: Syracuse, New York
Family: Husband Bernard Mathey-Prevot, PhD, a research scientist; children Camille, 15, and Nicolas, 12
Hobbies: Cooking. "I don't use recipes very much; I like working with food and playing around, thinking of new things."
What she's reading: *The Doctor's Doctor: A Biography of Eugene A. Stead Jr., MD* and novels. "I usually have more than one going at a time."



Sleep *CHASERS*

MEET THE CARETAKERS OF THAT FORGOTTEN THIRD OF OUR LIVES—THE PORTION WE SPEND ASLEEP.

BY KATHLEEN YOUNT

MOVE OVER, MANHATTAN. IT USED TO BE THAT, OUTSIDE OF THE WORLD'S MOST URBAN AREAS, THE NIGHT BELONGED ONLY TO STOICS LIKE DOCTORS ON CALL, COPS, AND TRUCK DRIVERS. BUT NOW THAT SO MUCH OF MODERN CULTURE AND COMMERCE ASPIRES TO 24/7/365, THE SLEEPLESS MOST ANYWHERE IN AMERICA CAN PASS THE NIGHT FROM THE 24-HOUR WAL-MART TO THE 24-HOUR KINKO'S TO THEIR 300-CHANNEL CABLE TV AND THE WORLD WIDE WEB, WHERE IT'S ALWAYS DAYLIGHT SOMEWHERE. WANT TO WAKE UP IN THE CITY THAT NEVER SLEEPS? YOU PROBABLY ALREADY DO.

Perhaps that's why sleep medicine, once something of a backwater specialty, is now experiencing an unprecedented heyday. In a clear sign that the specialty has arrived, the American Board of Medical Specialties began offering physicians board certification in sleep medicine just last year. "I think sleep is in the public consciousness," says psychiatrist Andrew Krystal, MD, who directs the sleep research program at Duke. "It's hard for me to believe that people are sleeping worse now than they were a few decades ago, but it seems that people are talking about it more. Ambien is a household word now, like Prozac."

In the Triangle, while growing ranks of insomniacs fill clinicians' offices, sleep labs are running ever-more recordings of the squiggles and lines that describe the landscape of nightly repose—or the fitful lack thereof. The Duke Sleep Disorders Center—one of the country's oldest, and one of the few in the nation that offer faculty expertise in neurology, pulmonology, psychology, and psychiatry—moved its clinical sleep laboratory to Durham's Millennium Hotel in November 2005. The new setting not only provided patients with a less hospitalized and more amenitized way to undergo a sleep study, but also upped the number of beds, in order to accommodate increasing referrals from physicians and patients themselves. It seems that the long-sung refrain of sleep medicine experts is finally catching on: How can we ignore any chronic disruption in something that all of us are wired to spend a third of our lives doing?

A STRATEGY FOR THE BED BATTLEFIELD

By far, the number-one disorder of sleep is its painful absence. We live in a sleep-deprived culture, but beyond our self-imposed sleep debt, on any given night at least a fifth of our populace is watching the alarm clock in waking misery. There is good news for those with chronic insomnia: there's a well-proven, drug-free treatment that works well for the majority of patients. The bad news? Only about 100 psychologists in the country are trained and board-certified to provide it.

One of them—Duke sleep psychologist Jack Edinger, PhD—pulls a dust-covered briefcase from the corner of his office in the Durham VA Medical Center, opening it to display a tool from the early days of this now-proven prescription for insomnia, cognitive behavioral therapy (CBT). "It's a timer with an alarm on it, and a tape recorder," Edinger says of the circa-70s machine. "It was set up to beep, very softly, several times throughout the night; when it beeped it would turn on the tape recorder, and the patient had 10 seconds to say 'I'm awake.' Then in the morning you could reconstruct the night of sleep or wakefulness." The device was among the tools used by a small group of researchers, including Edinger, to develop and prove the effectiveness of CBT for insomnia.

"It's not rocket science," says Edinger of his craft, but it is one that was painstakingly designed to target and disengage the behaviors and anxieties that can perpetuate sleeplessness. Most people with chronic insomnia are stuck in a self-perpetuating loop: their anxiety about not getting enough sleep keeps them hyper-aroused at night, both mentally and physically. Meanwhile, they've altered

Improving the tools: *Psychiatrist Andrew Krystal, MD, and psychologist Jack Edinger, PhD, are among those working to refine cognitive behavioral therapy for insomnia patients with depression and other confounding conditions.*

their sleeping habits—napping, fiddling with their bedtimes, and so forth—in an effort to coax more sleep out of their days. This sort of sleep-chasing ultimately interrupts the homeostatic drive of the body's sleep system.

"CBT helps them right the ship again," Edinger says. "And once they are in treatment, it's easy for the patients to see what they need to change. Conceptually, it's not a tough disorder to treat." [For more about the nuts and bolts of CBT, see page 26.] A recent study at the Durham VA Medical Center showed that people with primary insomnia who undergo cognitive behavioral therapy have excellent success rates—75 percent experience remission.

The caveat is that sleep research to date—and this goes for both CBT and pharmacologic research, notes Edinger—has focused almost exclusively on primary insomnia, meaning insomnia that occurs in the absence of other illnesses, chronic pain, and substance abuse. While people with this type of insomnia number large, they comprise only about 20 percent of all insomnia sufferers.

Edinger and other sleep psychologists at Duke are working to tweak the CBT model for patients whose insomnia is confounded by other conditions. According to current research, including three studies at Duke, the management of one hinges on the other. "If you look at people with depression, those with prominent comorbid insomnia problems are generally more difficult to manage and treat," Edinger says. "They also have a greater propensity toward suicide, and if you treat the depression effectively but there is residual insomnia, they're more likely to relapse." Conversely, treating insomnia along with depression seems to vault a patient's progress forward. Research shows that both anxiety disorders and chronic pain are also linked with insomnia in this way: to treat any of the conditions effectively, you must treat them all.

TANGLES IN THE BEDSHEETS

But there are times, says Duke neurologist Aatif Husain, MD, when a patient complaining of insomnia may actually have an entirely different sleep disorder. Husain is one of the physicians who read sleep studies at Duke's lab at the Millennium Hotel—one of the few in the area staffed entirely by physicians who are board-certified in sleep medicine. In many cases, he says, the real culprit is another of the wide range of sleep-disrupting problems patients present with. Some suffer from REM behavior disorders, in which sleepers act out fearful, violent dreams at great peril to themselves and their bed partners (and which has now been linked to a subsequent onset of Parkinson's disease).

Others have narcolepsy, which often plagues patients for 10 years before they get a proper diagnosis. That's because most of the time its main symptoms—fatigue and daytime sleepiness—start in the teenage years, when fatigue and sleepiness are likely to be glossed over as the throes of adolescence or treated as symptoms of depression. "Unless a diagnosis is made early on, it can have long-lasting consequences for these patients' lives," says Husain, "since they may underachieve during important academic years in high school and college." He says that a physician can spot signs of narcolepsy in the patient history: if someone says she doesn't sleep well at night and reports having dreams during short naps (15 to 30 minutes), she may need further evaluation.

A more common cause of sleep disruption is restless leg syndrome (RLS). Hallmarked by nighttime movement of

the legs and a creepy-crawly sensation that can torment patients trying to sleep, RLS may be a disorder of dopamine levels in the brain—much like Parkinson's disease. In fact, Husain notes that many Parkinson's disease patients have restless leg syndrome—though the converse is far from true. Husain participated in the international testing of the two medications currently approved for the treatment of restless leg syndrome, both of which are also prescribed for many Parkinson's disease patients, although at a much higher strength. In some cases, the treatment can be as simple as an iron supplement, because there is a high incidence of low iron levels among patients with RLS. "Patients really see a significant day-to-day benefit from these treatments," says Husain.

BREATHLESS NIGHTS

Even more common than RLS in patients visiting sleep labs is obstructive sleep apnea, says neurologist Rodney Radtke, MD, medical director of the Duke Sleep Disorders Center. Sleep apnea affects about one out of every 10 people, and because obesity often triggers the condition, that number could be on the rise. But Radtke emphasizes that it is not strictly a disorder of obesity: "One 300-pound man may have it while another doesn't. And a 170-pound man may have it while a 300-pound person doesn't."

The toll obstructive sleep apnea takes on a sufferer of any weight can be extreme, and sleep-study footage of the condition is almost painful to watch: Over and over, the sleeping patient stops breathing; then, as the oxygen levels in his blood drop, he rouses from sleep with a jarring gasp, his heart rate leaping high as he hyperventilates. The same episode repeats and repeats, eerie quiet followed by frantic gasping.

What's unseen on film, says Duke pulmonologist Ambrose Chiang, MD, is how this grim cycle triggers the body's sympathetic system and increases oxidative stress, leading to endothelial cell dysfunction and systemic inflammation. This is why sleep apnea not only strains the heart but also can play a role in atherosclerosis, insulin resistance, and glucose intolerance, as well as a host of cardiovascular complications from refractory hypertension to atrial fibrillation. "It's such an important disease, and it affects so many organ systems," Chiang says, noting that it's also among the most common causes of motor vehicle accidents

Spot check

Meds that may spur sleep problems

Paul Peterson, MD, of Duke Neurology of Raleigh, says there's now a great body of evidence that routine medications we've been using for years may have effects on sleep. Drugs that seem sleep-benign, such as prednisone, can cause insomnia in some patients. Moreover, many patients can unwittingly trigger a sleep disruption when they take matters—or, more specifically, medications—in their own hands. A patient with restless leg syndrome, for example, may start taking her medication in the afternoon, and then have trouble sleeping at night without realizing why.

Even antidepressants can interfere with the body's sleep system. "When some patients are given an SSRI, we may actually give them a sleep disorder," says Peterson. In these cases, a balancing act is in order: while not withholding important medications such as antidepressants, a physician must prescribe wisely to avoid a sleep-disrupting domino effect.

Whether the patient complaint is insomnia, restless legs, or another sleep disorder, combing through the tangles of medications and health conditions that may be disrupting a patient's sleep begins with a good history, according to Peterson. "A good history can obviate an expensive sleep study, in many cases," he says, noting that the results of a sleep study can be confounded by the medications that the patient is on. "When I see a patient for the first time, it's important for me to know exactly what that patient is taking, and exactly when they take it."

Neurologist Paul Peterson, MD

Bringing faith to the faithless

Cognitive behavioral therapy (CBT) addresses one of the most critical aspects of chronic insomnia: the patient's own fear and anxiety about sleeplessness. It usually requires four one-hour sessions spaced every other week. The main thrust of the therapy, says Duke psychologist Jack Edinger, PhD—one of the early founders of the technique—is given in the first session, and following sessions troubleshoot and help patients problem-solve.

The therapy includes education on "sleep hygiene"—a well-known list of environmental and behavioral recommendations to promote restful sleep. These tactics, such as avoiding alcohol, nicotine, and strenuous exercise near bedtime and keeping the bedroom a cool, quiet, TV-free place, are easy to teach, and, says Duke psychiatrist Andrew Krystal, MD, often already well-known to patients who struggle with chronic insomnia.

The core of CBT, though, is behavioral tactics and mental strategies that help patients rewire their poor sleeping tactics. Cognitive therapy helps patients understand their sleep needs and how the body's sleep system works, and it defuses the dysfunctional thinking that generates anxiety and fuels insomnia. "It's thoughts like, 'tomorrow is ruined,' or the expectation that every time you get in bed, it will be a struggle to sleep," says Krystal. These thought patterns can become so entrenched that, after a while, the mere idea of going to bed generates mental and physical anxiety in the patient.

"Once you do the cognitive and educational parts, the behavioral do's and don'ts make more sense," Edinger says, and they retrain the body into its natural sleep rhythms. These strategies include sleep restriction, which means limiting the time a patient spends in bed to the actual time he or she reports sleeping (measured as the average over several nights); keeping a consistent waking time seven days a week; protecting the sleep period from intrusions, be they external or internal; and cutting out daytime sleeping of any kind. "I learned long ago that people with insomnia have as many words for naps as Eskimos have for snow," Edinger says. "I'll ask, 'Do you nap?' And they say no, but then they'll admit to 'resting their eyes.'"

CBT can also help patients who've become dependent on sleep medications. A recent NIH-funded study showed that these drugs, though perennially popular, hasten and lengthen sleep by only a handful of minutes. But for some patients, these effects are not only compelling—they are also addictive. Edinger says that these are the patients who have "lost faith in themselves as sleepers. They're concerned about the long-term effects of medicine, but they're frightened of coming off sleep meds." Researchers are still sorting out how best to taper off medication, but Edinger says that CBT can help these people regain their confidence in one of their most basic and natural abilities: to rest.

Turn-down service with extra expertise: *Aatif Husain, MD, Rodney Radtke, MD, and Ambrose Chiang, MD (left to right) are board-certified sleep medicine specialists who staff Duke's patient-friendly sleep lab at the Millennium Hotel.*

in which drivers fall asleep at the wheel.

The condition also brings with it a buffet of unpleasant complications that can raze the sufferer's quality of life, from headaches and acid reflux to erectile dysfunction and nocturia (frequent nighttime urination), which is triggered by the heart's chemical release when the body strains to breathe against a closed airway. But because it is usually these accompanying complaints that drive patients to the practitioner, most of the time, Chiang says, the sleep apnea is not picked up. "Nocturia in particular is often misattributed to fluid intake, diuretics, or bladder or prostate problems," he says. "Many physicians don't know that it can be a sign of sleep apnea."

TEST OF THE EVIL TONGUES

In many cases, people who seek treatment specifically for sleep apnea are those whose bed partners have lain awake beside them, listening for their absent breathing. Chiang believes that certain patients should be screened for sleep apnea as a routine. "Though we don't have the studies to support this yet, it's my opinion that every cardiac inpatient should be evaluated for sleep apnea before they are discharged," he says. "When folks come in for an acute cardiac event and we send them home without catching their sleep apnea, they may wind up coming back." Likewise, he says, every hypertensive patient, every obese patient, and every insomnia patient should be screened. "It makes good clinical sense to assess the possibility of sleep apnea in these patients—because there are a lot of patients that we could be treating that we're not."

But all of these patients can't just grab a sleep study on their way home, so Chiang hopes to improve in-office diagnostic tactics. He is working to devise an easy-to-use scoring system that could flag possible obstructive sleep apnea patients, based on the patient's history, symptoms, craniofacial profile, and a good physical exam of the upper airway. "If we do it right, a user-friendly scoring system could make it possible for a sleep apnea screening to be done by a physician's staff, or nurses in a hospital," says Chiang. "And if we can achieve this, then we'll be able to pick up these sleep apnea patients early instead of 10 years down the line."

Chiang shows a slide to illustrate how clearly some of the physical characteristics of sleep apnea can be identified. The slide, which he titled "The Evil Tongues," shows six pinkish tongues displayed dragon-style, whose edges look nearly the shape of a piecrust. This kind of noticeable tongue scalloping suggests that the tongue may be too big for the mandible, and therefore likely to shut off the airway when that person sleeps. Similar physical signs of apnea can be seen in the narrowness of a patient's posterior pharynx or the size of his uvula or tonsils. Even facial features such as a small, receding chin or a pronounced overjet (overbite) can signal a potential obstructive apnea. "The upper airway examination has traditionally been ignored," says Chiang. "A brief, focused upper-airway examination can be very enlightening, and it takes no more than two minutes to do."

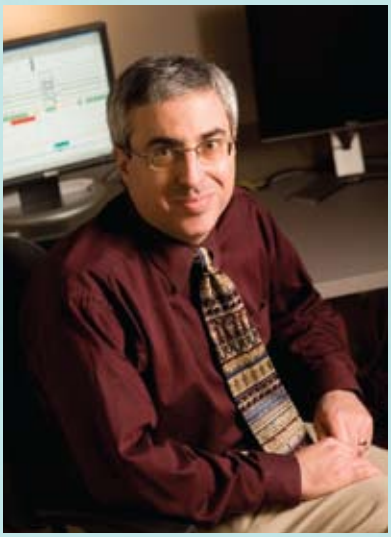
PATIENTS UNMASKED

While weight is a significant contributor to obstructive sleep apnea, it usually takes major weight loss to have a significant impact, Radtke says. But like insomnia, obstructive sleep apnea already has an interventional therapy that works for most people: nasal CPAP (continuous positive airway pressure) delivered via a soft plastic

Kids have sleep problems, too

Pediatric sleep specialist Richard Kravitz, MD, remembers the days when the television turned to static at 2 a.m. "It used to be that people went to bed after the sun went down," he says. Now, like the adults who are raising them, many kids are chronically sleep-deprived. But this condition in children can look much different than the shuffling, bleary-eyed yawning seen in overtired adults. Some kids, when they're too tired, actually become hyperactive.

Kravitz says that inadequate sleep is as big an issue as disturbed sleep among his young patients. "I'm getting more and more referrals for kids who are having serious problems in school or elsewhere, and it turns out that they are simply chronically tired," he says. "Many parents don't understand how much sleep their children need. Teenagers need nine or more hours a night, and young children need even more. If a child is sleeping six or seven hours a night, that's just not enough."



Richard Kravitz, MD

Kravitz also gets a lot of referrals at the end of summer break—because after a season of family vacations and shared hotel rooms, some parents discover that their kids are not the restful sleepers they may previously have seemed. "About 7 to 10 percent of children snore," Kravitz says. While snoring on its own was once considered a benign condition in children, it's now a flag for further investigation. "If they snore, you gotta ask more," he says.

This is because snoring can be a signal of obstructive sleep apnea, which affects 2 to 4 percent of all children. Kravitz notes that the number-one cause of apnea in children is not obesity, but rather structural problems in the airway. "It's mostly big tonsils and adenoids," he says, "though obesity has shot up as a cause."

Since children with sleep apnea generally don't suffer from problems such as hypertension and heart disease, the effect of sleep apnea on these illnesses isn't as great a concern as it is in adults. What is often an immediate complication is attention deficit disorder (ADD), a diagnosis that many children with sleep apnea also carry. "In my opinion, before a child is put on Ritalin, that child should also be evaluated for sleep apnea," says Kravitz. "Treating the apnea may obviate the need for medication."

Above all, it's important to remember that children with sleeping problems are not miniature adults with sleeping problems, Kravitz says. "Kids can present in ways that are a lot more subtle, so you need to cast a wider net."

The pediatric sleep lab at Duke conducts sleep studies seven days a week. For more information, call 919-684-3364.

mask that fits over the nose. "If you wear it, it works," says Radtke. "CPAP became commercially available in 1985, and we have people who have been on it for 22 years. They'll jokingly say things like, 'You can have my wife, but you can't have my machine.' It really brings a marked benefit to their lives."

In fact, the only patients who don't benefit from CPAP are those who don't wear the mask. "People who have severe apnea are remarkably compliant, because of the change in their ability to stay awake and energetic during the day," says Radtke. "They get the immediate reinforcement of feeling great. But in the mild apnea patients, who get only a modest benefit in terms of how they feel, it can be hard to put up with the aggravation of CPAP over the long haul." Radtke says that in these mild cases compliance is only 70 percent at best, and sometimes as low at 30 percent. "Most 40-year-olds don't like the vision of themselves going to bed every night with a mask on."

Husain says that the more a patient understands about the health implications of stopping breathing 50 times an hour, the better his CPAP compliance becomes. Duke's year-old sleep apnea/CPAP clinic was developed in part to make sure that these patients understand the importance of what the perhaps ungainly equipment is doing for them. "Our sleep technologist works with patients to make

"There are effective methods out there to help people with sleep problems—we just need more people who are trained to provide them." —ANDREW KRYSTAL, MD

sure they have the best-fitting mask and to solve any issues of discomfort, as well as to provide education," Husain says. The clinic also streamlines the CPAP process for both patient and referring physician. "We arrange for the CPAP equipment to be sent to the patient's home, and we conduct follow-up appointments and further testing when needed," he says—which serves the patient and saves the primary care physician potential logistical nightmares.

"When I order CPAP I have to send a prescription to a home health company, and they get the machine to the patient. But different insurance companies deal with different home health care companies, and most physicians don't have any cause to know which works with which. It can take a lot of navigation to sort it all out."

EDUCATING MORE BEDFELLOWS

For both apnea and insomnia, the greatest challenges aren't in discovering treatment, but in getting the treatments to more patients. "Most patients who seek treatment for insomnia do so in a primary care setting," says Edinger, "where the most they are likely to get is a sleep medication. Ultimately we want a model of CBT that would be practical for primary care physicians to use." He says there are now studies under way to look at different ways of providing CBT through nurse providers, physician assistants, or even Internet delivery systems. "In Holland they did behavioral interventions via TV," he says. "That kind of delivery isn't as effective as one-on-one CBT in a clinic setting, but for what it was they actually did fairly well—and they reached thousands of people."

Krystal is trying another tactic: educating physicians online. "We know that physicians can improve how they manage their patients in general when they improve how they manage their patients' sleep," he says, but clinicians in the field currently don't get much in the way of training to do so.

To remedy that, Krystal and two colleagues, Thomas Roth, PhD, at Detroit's Henry Ford Hospital and Daniel Buysse, MD, at the University of Pittsburgh, formed the Sleep Medicine Education Institute, a non-profit organization that disseminates sleep medicine research findings and provides continuing medical education credit on insomnia, restless leg syndrome, and sleep apnea. The organization is funded in part by pharmaceutical companies, but the content of the information is not influenced by industry. "It's a means of education in which the educator is in no way compromised by commercial interests," he says. "It allows physicians to hear from the people who are actually doing the research."

Krystal hopes that this and similar education venues will help improve care for the hordes of patients still awaiting a consistent night's rest. "Sleep medicine is still an area where we're not getting any better at making the problems go away," he says. "But we are getting better at treating it. There are effective methods out there to help people with sleep problems—we just need more people who are trained to provide them." □

RESOURCES

For more information about the Duke Sleep Disorders Center, its sleep lab, and the sleep apnea/CPAP clinic, call **919-684-2057**.

The Sleep Medicine Education Institute's Web site offers information about upcoming Web conferences and talks, as well as educational materials that qualify for CME credit: **sleepmeded.org**.

Concerned about physician fatigue? Visit **lifecurriculum.info** for education, strategies to help clinicians fight fatigue, and CME credit.

THE SPORTS TEAM

FROM CONDUCTING RESEARCH TO ENHANCING ATHLETIC PERFORMANCE TO HELPING WEEKEND WARRIORS RECOVER

FROM INJURY, DUKE'S SQUAD OF SPORTS MEDICINE PROFESSIONALS TACKLE THE PROBLEMS THAT LIMIT ACTIVITY.

BY S.D. WILLIAMS

One youth chases another at furious speed, and when he catches his quarry grabs him by the shoulders and flings him mercilessly to the hard earth. The contact between boy and ground creates a sound so clear you can envision it in large, bright letters: THUNK! MMMMPH!

The tackled boy, being an adolescent and thus immortal, rolls, jumps up, and trots back to his team's huddle, probably with a smile hidden inside his football helmet that says, "Hit me as hard as you want. That was 30 yards, and I'm about to get 30 more." And so the running, hitting, falling, twisting, and blocking—the continuous, jarring impact—rolls on into a cold autumn night as boys from Charles E. Jordan High School in Durham and Garner High School battle for glory in the state's high-school football playoffs.

On the sidelines pace a number people who understand the possible consequences of that impact, have helped the boys prepare for it, and are ready to respond if a boy can't jump up from a blow.

Claude T. Moorman, MD—who goes by his middle initial—is the director of the Duke Sports Medicine Center and an associate professor in the Division of Orthopaedic Surgery. Just before half-time, he squats before a boy on the bench who had come out of the game with a neck "stinger" several minutes earlier. He supports the boy's wrists lightly and has the boy raise his arms to shoulder level, with his elbows at horizontal 90-degree angles. The boy doesn't wince, but he looks tired and disappointed. Moorman gives him the OK, and the boy trots to the locker room with his teammates.

Seven years ago, Moorman helped create Duke's outreach into area high school athletic teams. Duke supplies them with orthopaedic physicians, primary care physicians, and certified athletic trainers or physical therapists, for free. Depending on the needs of the school, they might consult with coaches and school-based certified athletic trainers during the week, but at the least every Friday night in autumn they're at football games, either at home or away, and they often attend the home games of a school's other sports. The program now reaches nine high schools in Durham County and one each in Orange and Wake, and Duke certified athletic trainers are at Durham middle school football games every Wednesday during the fall. Duke also supplies physicians for North Carolina Central University games—and, of course, for the Blue Devils.

Usually orthopaedic residents also attend the high school games, but on this night the residents are studying for their training exam the next day. It's a rare night off—they must serve at 20 sporting events during their residency year, whether or not they intend to practice sports medicine as a subspecialty. Why? It's simultaneously a service to the community, a living lab of bone-jarring impact, and way to form connections between Duke and the world beyond its walls. It's also good preparation for the sports-related injuries the residents will likely see in their future practices.

"Hit 'em again, harder," chant the cheerleaders to a cold crowd, as if to remind the absent doctors that they will have no shortage of patients.

Left: Duke Sports Medicine director Claude T. Moorman, MD, at the Jordan vs. Garner high school football game


Robin Queen, PhD

The Duke Sports Medicine Center is built around four pillars: a sports medicine clinic, physical therapy services, a sports performance program, and research in the Michael Krzyzewski Human Performance Lab—the K-Lab. The center, in various forms, dates back 70 years and has pushed the boundaries of orthopaedic medicine through its focus on people placing maximum stress on their musculoskeletal systems. In recent years it has greatly expanded its efforts along a continuum that ranges from research through clinical treatment to sports performance training.

Among its newer components is the 10-year-old K-Lab, directed by Robin Queen, PhD. On this particular day, participants in a K-Lab study are preparing to perform simple exercises, such as climbing a step. Small reflective markers are attached to the outsides of their knees, ankles, and hips. Eight cameras around the room capture the movement from the markers and feed computers that create digital representations of the motion of their joints.

Queen, with a doctorate in biomechanics, and researchers from Duke University Medical Center are studying several orthopaedic issues in the K-Lab. For example, three Duke specialists in hip replacement surgery utilize three different surgical approaches for reaching the hip: posterior, direct lateral, and modified anterior lateral. Each involves cutting different muscles. Outcome studies to date—by various researchers around the country—have been based on patient satisfaction surveys. In this study, for which Queen serves as the principal investigator, patients who have undergone hip surgery will be examined to determine whether they have returned to walking normally. Their movement will be compared to that of a control group measured in the K-Lab. Members of the control group have been chosen to match the age, weight, gender, and other characteristics of the group that has undergone surgery.

Initially, Queen's group is looking at patients post-surgery, but eventually the gait and movement of patients will be examined before surgery in order to compare movement before and at several milestones after the operations.

The logic is as clear as the sound of high-school athletes hitting hard ground. Patients will be compared to healthy, normal controls in order to evaluate the success of their operation in returning them to normal movement. "We're looking at what the numbers say in addition to what the patients say," Queen says.

Few if any similar studies have been undertaken anywhere—likely, as Queen notes, because scientific disciplines often operate independently. "It's a novel concept to combine biomechanics with clinical outcomes," she says.

The same idea drives studies of hip resurfacing. Patients who have undergone either hip replacement or hip resurfacing will be compared to healthy controls, with researchers examining such indicators as hip flexion angle, range of hip flexibility, and degree of hip hike.

A similar study is evaluating ankle replacements. And as the K-Lab builds databases of movement of various aspects of the musculoskeletal system, they could be applied to future studies.

The K-Lab also plays a vital role in collecting kinematic and kinetic movement data on patients who have knee osteoarthritis in an attempt to understand how the disease alters movement patterns. "We're looking at gait mechanics as a functional outcome following a clinical intervention of weight loss and pain management," says Queen. This work is part of a larger NIH-funded Program Project Grant directed by Farshid Guilak, PhD, who heads Duke's Orthopaedic Bioengineering Lab.

The knowledge generated by these studies is published in scientific journals and makes its way into the practice community through traditional routes. But the K-Lab itself also is used for immediate clinical applications, such as assessing athletes to help them improve sports performance (see p. 33).

The science of sports performance

BRYAN MANGES IS AN AMATEUR—BUT SERIOUS—MARATHON RUNNER. LIKE MANY OTHER ATHLETES, HE CAME TO DUKE SPORTS MEDICINE NOT BECAUSE OF AN INJURY BUT TO IMPROVE HIS PERFORMANCE. ON A RECENT MORNING HE WAS UNDERGOING TESTS IN THE K-LAB WITH GREG MCELVEEN, WHO COORDINATES THE DUKE SPORTS PERFORMANCE PROGRAM.

Greg McElveen oversees Bryan Manges's performance test.

"When someone comes to us, we typically take them to the K-Lab to evaluate them," says McElveen. "We had Bryan on the ParvoMedics Metabolic System to evaluate his aerobic and anaerobic performance and in the Bod Pod to assess his body composition. Testing is an important part of what we do, because it enables us to tailor a training program to our client's needs and goals."

Marathon running is an endurance sport and requires an entirely different training regimen from, for example, shot-putting, which is a power sport. In between those two extremes are sports like soccer, basketball, and lacrosse, whose players need both endurance and power and therefore need more multifaceted training. An athlete's training is geared toward improving those abilities specifically needed to perform in his or her sport and at his or her position. The program provides tests not only of endurance, power, and body composition but also of strength, speed, agility, stamina, and flexibility—all sport-specific, position-specific, and goal-specific. McElveen and his staff also offer programs focused on the particular interests of "master" athletes—40 years of age or older—as well as professional and elite athletes.

While testing is useful, some clients "just aren't data people," says McElveen. If they're interested in training "by feel," McElveen and his staff can also help them set up effective regimens, then teach and guide them as they close the gap between their current performance and their potential.

In addition to training advice from exercise physiologists, clients of the performance program have access to sports medicine physicians, physical therapists, a sports psychologist, and a sports nutritionist.

Having a training facility as part of a clinical and therapeutic center is unusual, but it allows clinicians to make referrals to the performance program when appropriate, allows the performance staff members to refer clients to clinical and therapeutic services, and provides athletes with access to the testing facilities in the K-Lab.

As with the rest of Duke Sports Medicine's efforts, improving athletic performance is clearly a team sport.

For more information or appointments, call 919-681-4184.

Alison Toth, MD, directs the Duke Women's Sports Medicine Program—one of the first of its kind in the nation.

With the attention paid to athleticism at Duke Sports Medicine—and its location in the heart of the Duke athletics complex, right next to Wallace Wade Stadium—it is almost a surprise to walk through the clinic, with its standard-looking examining rooms, nurses' station, and x-ray rooms. But while the Center has an obvious focus on sports-related medicine, it is not just for competitive athletes—the team here can help anyone with musculoskeletal injury or pain who seeks to be more active than his or her medical condition currently allows. In addition to straightforward sports-related orthopaedic services, the medical and therapeutic staff provide services specifically focused on women's sports medicine, pediatric sports medicine, sports psychology, primary care, and rheumatoid arthritis treatment, plus an extensive on-site physical therapy program that enables seamless post-surgical care and rehabilitation.

In fact, the majority of the patients seen here aren't professional athletes, or even necessarily serious amateurs. Most patients are self-referred, many of them simply active people who have injured themselves or people looking for help with medical problems such as osteoarthritis. On a recent day an older man with a leg brace was leaving his appointment while a young father with his elementary-school age boy were checking in.

"We're somewhat like a 'space program' for orthopaedics," says Moorman from his office overlooking the football stadium. "Athletes are always looking to break barriers that you and I don't generally approach, and in sports medicine you get to work with problems and treatments at the edge of the scientific field. One of the results is that sports medicine has driven the development of treatments that have eventually become the gold standard for the rest of us, like minimally invasive surgical techniques and early motion, minimal stress recovery therapies."

For example, recovery from ACL repair once took a year but now takes three to four months, thanks in many ways

> “We’re somewhat like a ‘space program’ for orthopaedics .... Sports medicine has driven the development of treatments that have eventually become the gold standard for the rest of us.”
>
> —Claude T. Moorman, MD

to practices developed for athletes. Sports medicine has also supported advances in soft-tissue healing, such as contributing to findings that the body overshoots the mark in healing and causes overinflammation, which can be mediated by anti-inflammatory agents.

Some sports medicine research even makes its way into the commercial arena. The K-Lab, for example, has provided data to help Nike improve the safety and performance of cleats and other athletic footwear. And recently Duke Sports Medicine has been involved in testing a new way to deliver electrolytes—via an oral strip against the gums.

"When you’re active, your blood goes to your extremities, away from your GI tract, which cuts down on your body’s efficiency in absorbing electrolytes delivered through drinks—which, of course, is the way they’ve traditionally been delivered," explains Moorman. "People have wondered if there was a more efficient way of delivering them so that they would spread to your muscles more effectively. This strip appears to do that and decreases cramping significantly."

The need for better delivery systems for professional athletes, who spend hours in intense activity, seems self-apparent, but the same need may exist among boys and girls who are physically active, especially those in warm climates. The number of school-age athletes has doubled over the past 10 to 15 years, says Moorman, due in large part to the influx of young women into sports.

That growing population of young female athletes has resulted in the need for more sports-medicine research and treatment focused on women. Just down the hall from Moorman’s office is the office of Alison Toth, MD, who launched Duke’s Women’s Sports Medicine Program in August 2001. The program quickly became a national hub for the growing movement to teach women and clinicians to recognize and prevent problems that plague active females—whether they’re young Olympic hopefuls or senior citizens who want to resume a walking program after a fracture. The Duke program was one of the first three in the country to focus specifically on women in sports and has the capability to diagnose and treat injuries that are unique to women, that manifest themselves differently in women than they do in men, or that require interventions specific to women.

Like the rest of Duke Sports Medicine, the Women’s Program isn’t just for jocks. "Our practice is for anyone who has musculoskeletal problems and wants to stay active, whether through sports, walking for exercise, or simply being able to reach overhead and comb her hair," says Toth. "We can help people maximize their ability to stay active and remain injury-free."

That’s the common thread among people who come to Duke Sports Medicine, it seems, whether they’re pro athletes, active seniors, or soccer-crazy kids. All seek to improve their physical capabilities in an atmosphere that helps them push their limits.

At the game, intent on the players: Pictured clockwise from bottom are Duke Sports Medicine physical therapist and certified athletic trainer Alanna Cooley; her frequent teammate in care Gail McMurry, a certified athletic trainer at Jordan High; and Ron Olson, MD, of Duke's Department of Community and Family Medicine.

On the football field, boys are pushing their limits in order to keep their season alive, one game at a time. Ron Olson, MD, walks the sidelines of the field on that cold Friday night. Olson, the Duke primary care physician working the game this evening, has a long history in sports and sports medicine and describes himself as a semi-serious athlete. In addition to helping with the outreach program and the Duke primary care sports medicine fellowship, he looks after a few other teams and travels with the U.S. Ski Team to Europe for a week each year. As Moorman attends to a player on the bench, Olson jokes, "We let the orthopaedics people be the first responders at these games."

Not far away is Alanna Cooley, a Duke physical therapist and certified athletic trainer assigned to the Jordan teams. In the mornings she sees physical therapy patients at the Duke Sports Medicine Center, but afternoons are often spent at the large Durham high school, working with Jordan's athletic trainer, Gail McMurry. At the game, both she and McMurry carry packs containing bandages, tape, scissors, gloves, and other tools to take care of small injuries.

There's a common thread among people who come to Duke Sports Medicine, whether they're pro athletes, active seniors, or sports-crazy kids: all seek to improve their physical capabilities in an atmosphere that helps them push their limits.

This evening all the injuries are minor. The staff get to enjoy the game. Jordan loses, however, and so its season—and the Duke staff's attendance at its Friday night games—are over for the year.

But basketball season is starting. And wrestling.

"We may even see some of these kids at the Saturday clinic tomorrow," says Moorman as the game winds down.

Then his own team packs up and heads home for the weekend. □

How to reach the Duke Sports Medicine Center

More information and patient referral forms are available on the Duke Sports Medicine Web site: dukesportsmedicine.org

Duke Sports Medicine Center—
Duke Campus
317 Finch-Yeager Building
Frank Bassett Drive

Main Number: 919-684-5888

Clinic Appointments:
1-888-401-7266 or 919-684-4502

Physical Therapy Appointments:
919-681-1656

Sports Performance Appointments:
919-681-4184

Fax: 919-684-8598

Duke Sports Medicine Clinic
at Southpoint
Duke Health Center at Southpoint
6301 Herndon Road, Durham

Clinic Appointments:
1-888-401-7266 or 919-684-4502

Physical Therapy Appointments:
919-681-1656

Fax: 919-572-6121

Walk-in Saturday Injury Clinics are held August through November at the Southpoint facility.


Mending
Hearts
BY ANGELA SPIVEY

Every year in the United States some 40,000 babies are born with congenital heart defects. Today, advances in care are helping patients of any age to not just survive—but thrive.

For years, Deloris Gibson had felt tired—exhausted, really. Her doctors thought it might be allergies. Then, four years ago, when Gibson was 64, her problem worsened. "To get the dishes done, I'd do one pan and stop for an hour and rest, then do another one," she says.

She went to a pulmonary specialist, and bought a home oxygen saturation monitor. She found that her oxygen level was at times dropping to a dangerously low 70 percent (a level greater than or equal to 90-94 percent is considered normal). She had a diagnostic catheterization, but it revealed nothing definitive. Her doctors put her on home oxygen.

In 2006, Gibson was at her sister's house, making the Thanksgiving dressing, when she felt especially tired. "I measured my oxygen, and it was 68," she says. She slept through Thanksgiving and two days beyond, waking only to eat. Her family wanted to hospitalize her, but she waited until she returned home to North Carolina and went back to a pulmonary specialist, then to a cardiologist, and had another diagnostic catheterization.

Gibson's cardiologist referred her to Duke because he suspected her problem was caused by a heart defect called a patent foramen ovale (PFO). "The best way to think about it is as a trap door in the wall in the heart," says John F. Rhodes Jr., MD, chief of clinical cardiology in Duke's Department of Pediatrics. The opening should close sometime after birth, but in 25 to 30 percent of people it remains open. PFOs often go unrepaired because they are considered normal. "Unfortunately, in some people, PFOs can become pathologic," Rhodes says. "In people with hypoxemia [low levels of oxygen in the blood] we think the hole opens up, and all the blue blood goes across, causing the pink blood to be unoxygenated."

For Gibson, Rhodes performed a catheterization to close the PFO with a Dacron-and-metal patch about the size of a quarter. Today, for the first time in years, she doesn't depend on supplemental oxygen. "Dr. Rhodes thought I might be on oxygen part-time, but I don't need it," she says. In addition, she's been able to have knee surgery that her doctors previously considered too dangerous because of her low oxygen levels.

Gibson gets tears in her eyes when she talks about all the things she can do now—paint her kitchen, mow her one-and-a-half-acre lawn with a riding mower, and travel. "I thank the doctors and everyone at Duke with all my heart—including the patch over it," she says.

♥♥♥

Fortunately, most patients with congenital heart defects don't have to wait as long as Gibson did to reap the rewards of detection and treatment. In fact, the average age at which treatment begins has steadily dropped over the years—and many heart abnormalities are now being identified before babies are even born.

Even better news for the estimated 40,000 infants born with heart defects each year in the United States is that improved diagnostic and repair techniques have enabled defects previously associated with high mortality to be successfully treated. From 1993 to 2003, death rates for congenital cardiovascular defects declined 31 percent, according to the American Heart Association.

"A number of heart defects that were previously considered fatal can now be treated surgically with good results," says James Jaggers, MD, associate professor of surgery. For example, for children with single ventricle defects, in which one of the heart's pumping chambers is underdeveloped, the survival rate 10 to 15 years ago was less than 50 percent. Today, the survival rate has risen to 85 to 90 percent.

Now that mere survival isn't a luxury, many patients grow up with their cardiac team. Today, care focuses on helping patients of any age to thrive. At Duke, patients benefit from physicians' experience in the most complex cases, access to a steady stream of new treatments and devices available only through clinical trials, and a team that follows a patient for as long as it takes—often into adulthood.

DIAGNOSING DEFECTS BEFORE BIRTH

At Duke, physicians use ultrasound routinely to detect birth defects before babies are born. "If defects are identified early, then the baby's delivery can be coordinated at a tertiary care center, where ICUs and neonatal and cardiology support are available," says Jennifer Li, MD, chief of cardiovascular research in the Department of Pediatrics and an associate professor of pediatrics. "It's also easier on the family because they learn earlier what is going on with their child and can have a consultation to find out if there are other abnormalities."

John F. Rhodes Jr., MD, chief of clinical cardiology in Duke's Department of Pediatrics

Angelo Milazzo, MD, of Duke Children's Cardiology of Raleigh, uses telemedicine to provide answers for expectant mothers and other patients as soon as possible. While an ultrasound or echocardiogram is performed in the Raleigh office, colleagues at Duke can see the images in real time and discuss them with Milazzo and the sonographer. Milazzo also uses telemedicine to consult live with doctors whose patients are having these tests performed at outlying community hospitals.

"Fetal ultrasounds are very complicated, technically difficult studies to do because you're at the mercy of the position of the baby and several other factors," Milazzo says. This is especially true when a baby is suspected to have a complex condition such as hypoplastic left heart syndrome, which represents a spectrum of different but related kinds of heart disease. "No two of these patients are alike, and it can be very difficult prenatally to determine exactly what variant the baby may have," Milazzo says.

"We're a full-service pediatric cardiology office, and we're able to do the test and give the results that day. But if we have a very complicated case or a clinical question that we feel needs multiple opinions, by using telemedicine, we can do that at the time of the visit. We don't have to say, 'I want to discuss this with my colleagues, so I'll bring you back in a month.' That's very helpful because these women are often scared to begin with because they've been told there may be something wrong with their baby's heart. It's important to give them information because they may have to make difficult decisions," Milazzo says.

IMPROVING OUTCOMES

After a defect is detected, often it is repaired through either cardiac catheterization or surgery. Duke has become a leader in both methods. Duke's pediatric interventional catheterization lab is the busiest in North Carolina, performing 600 procedures in 2006. The pediatric surgical program has the highest volumes in the state, performing 380 surgeries in 2006.

And though Duke often handles complex cases, outcomes are superb. Out of dozens of U.S. programs involved in the Society of Thoracic Surgeons congenital heart national surgical database, Duke has one of the most complex patient populations but still has one of the lowest mortality rates, Rhodes says: "Our outcomes are as good as anywhere." Adds Jaggers, "We specialize in taking care of the most

THE QUEEN OF HEARTS: Charlotte Smith could be a poster child for progress in congenital heart defect care. As little as five years ago, Charlotte would have needed open-heart surgery to repair her atrial septal defect. But in 2005, when Smith was five, John F. Rhodes Jr., MD, and Piers Barker, MD, fixed the problem using cardiac catheterization. Charlotte, who came to Duke from Florida for the procedure, was able to leave the hospital after only two days—although she did have time for a pre-procedure dress-up session. "The only scars when she got home were two little Band-Aids on her leg," says Charlotte's mother, Katherine Snow-Smith.

With the largest and busiest pediatric cardiology program in North Carolina, Duke often handles complex cases—but with superb outcomes, says John F. Rhodes Jr., MD. Out of dozens of U.S. programs involved in the Society of Thoracic Surgeons congenital heart national surgical database, Duke has one of the most complex patient populations but still has one of the lowest mortality rates. "We specialize in taking care of the most complicated cases with excellent results that rival anyone in the country," says surgeon James Jaggers, MD.

complicated cases with excellent results that rival anyone in the country."

One factor in that success is the ability to perform more complete repairs when patients are babies. "We do a significant number of operations on premature infants—children as small as three-and-a-half pounds with very complex heart defects," Jaggers says. In the past, doctors would perform smaller, temporary repairs early in life, then bring the patient back later for a bigger surgery. "Now, we tend to do a definitive repair at an earlier age," Jaggers says.

In addition, Rhodes and Jaggers point to improved management in both the operating and recovery rooms. Developing best practices that are uniformly used has meant that patients spend less time on the breathing machine and suffer fewer side effects from surgery, such as strokes or neurological injury. "We're interested in not only getting kids through surgery, but getting them through functional and whole," Jaggers says.

Jon Meliones, MD, director of the pediatric ICU at Duke, has led these efforts, including a formalized procedure for transferring patients from the operating room to the ICU. First the surgeon conveys the results of the procedure, then the anesthesiologist gives a report, then the nurse repeats the information back, and the ICU physician clarifies with questions. "Before, people would begin talking without having a plan of what they were going to say," Meliones says. "Now, the team comes in, and we do the handoff using very scripted, stylized communication, and it happens the same way every single time." The procedure is modeled on those used in the aviation industry to reduce crashes. Duke has won several awards for quality for this procedure, including a scientific award from the Society for Critical Care Medicine. Articles on these procedures have been accepted for publication by the Agency for Healthcare Research and Quality.

Though repair of defects is the mainstay of treatment, care does not end there. Duke's team of nurses, genetic counselors, doctors, and others work to treat the whole patient. "We're looking more comprehensively at patients and thinking about the genetic causes of their heart disease, their neurodevelopmental outcomes, and how we can help maximize their developmental potential," says Stephanie Wechsler, MD, who runs Duke's specialized cardiovascular genetics clinic. "We are moving well beyond just survival to look at what we need to do to help these kids have as full a life as possible."

Wechsler sees patients with congenital heart disease that accompanies other birth defects, patients with cardiomyopathies that may have a genetic basis, and patients who may have a connective tissue disorder such as Marfan syndrome. Children with congenital heart disease as well as other congenital anomalies can often benefit from finding out if they have a named genetic syndrome or chromosomal abnormality. "That can be helpful both for planning care for the child and for letting the family and pediatrician know about other health problems that might come up in the future," Wechsler says. In addition, Wechsler and clinic coordinator Elizabeth Melvin, a certified genetic counselor, counsel families about the possibility that current or subsequent siblings may also have congenital heart disease.

Additional support comes from nurses, social workers, and even parents of other patients. Robin Wilson, a pediatric cardiology nurse at Duke, helped start a Triangle-area chapter of Mended Little Hearts, a support program for families

"We're looking more comprehensively at patients… [to] help maximize their developmental potential," says Stephanie Wechsler, MD, director of Duke's specialized cardiovascular genetics clinic.

Angelo Milazzo, MD, of Duke Children's Cardiology of Raleigh, uses telemedicine to provide answers for expectant mothers and other patients as soon as possible. While an ultrasound or echocardiogram is performed in the Raleigh office, colleagues at Duke can see the images in real time and discuss them with Milazzo and the sonographer. Milazzo also uses telemedicine to consult live with doctors whose patients are having these tests performed at outlying community hospitals.

For more information about Duke Children's Cardiology of Raleigh and other locations throughout the region, visit dukehealth.org.

Angelo Milazzo, MD

of children with congenital heart disease. At weekly meetings held at Duke, parents receive support from each other as well as information from a guest, such as a dentist who provided heart-healthy dental care tips.

WATCHING PATIENTS GROW

As treatment has improved, more and more patients with congenital heart disease are growing into adulthood. Ronald J. Kanter, MD, who specializes in treating heart rhythm problems, has followed some patients for as long as 20 years. For one patient, who first came to Duke when he was 15, Kanter has implanted three pacemakers over 15 years. "He's now married and has a kid," Kanter says.

For such patients, Duke offers one of the nation's few specialty clinics providing comprehensive treatment for adult congenital heart disease. The clinic includes pediatric cardiologists such as Kanter and Rhodes, adult cardiologists, cardiovascular surgeons, and other specialists in adult congenital heart disease. Patients include a few who, like Gibson, have heart defects that were not repaired in early life. But many have had complex defects repaired during childhood and still need ongoing care. Such patients may have recurring or new problems that can require additional surgeries or procedures to repair valves, blood vessels, or holes in the heart using new non-surgical techniques in the cardiac catheterization laboratory. They can also develop heart rhythm problems related to scars from prior surgeries, which may also be treated with catheter-based procedures, Kanter says. And, adds cardiologist Thomas Bashore, MD, "As patients get older, they may develop heart problems that affect everyone, such as hypertension, coronary artery disease, or diabetes. These issues can further complicate their overall care."

The clinic offers services such as genetic counseling, referrals for vocational counseling, management of issues that might arise during pregnancy, clearance to participate in sports, and comprehensive imaging techniques, such as echocardiography, cardiac CT, and cardiac MRI, to diagnose and follow these patients. Specialized services also include the newest treatments for pulmonary hypertension offered in collaboration with Duke pulmonologists.

Kanter remembers having to tell a high-school senior that he had to stop playing on his school's basketball team. "When I met with him, I realized he had a valve disease that made it unsafe for him to continue to compete at high-level sports until we dealt with it either with a catheter-based procedure or surgery," Kanter says. But the teenager desperately wanted to play in his homecoming game. Kanter, despite his reservations, trekked down to the gym with a portable defibrillator to supervise while the teen played in one last game. "I felt we could take whatever minimal risk there was, and let him play, and I could be there in case he had a life-threatening heart rhythm episode," Kanter says. Fortunately, Kanter didn't need to use the defibrillator—and the boy's team won.

"I realized that like many things, in medicine there is opportunity for compromise," Kanter says. "We have to take into account more about the patient than just their physical problem; we have to take into account their developmental level and emotional status as well." □

For more information on congenital heart disease treatment at Duke, call 919-681-2916 (general information) or 919-668-4000 (appointments and referrals).

Trials of the Heart

Children who enroll in a clinical trial at Duke can help improve care nationwide. Duke is a member of the NIH Pediatric Heart Network, in which eight North American academic medical centers enroll patients (with their permission of course) in clinical studies and follow the outcome of their care. The results are then reported to a central repository.

Jennifer Li, MD

"We want to improve therapies and outcomes for babies and children for congenital heart disease, and only through looking at some of these newer therapies systematically can we find out how to treat children in the best way," says Duke's Jennifer Li, MD, who is co-principal investigator of the network. Page Anderson, MD, also of Duke, has been a principal investigator.

Duke reports its results as well as those of patients at cooperating sites at East Carolina University and Wake Forest University.

Among the trials currently open at Duke:

REPAIRING PFOS. John F. Rhodes Jr., MD, is involved in several trials to find out whether repairing patent foramen ovale (PFO) can help alleviate problems such as low blood oxygen levels, migraines, and stroke.

In patients with migraines, for instance, Rhodes and other physicians think that the PFO, an opening in a flap of skin that separates the two upper chambers of the heart, may allow headache-causing substances to get into the bloodstream. "Because of this hole, every time the heart beats, the blood that should be filtered by the lungs pools and goes to the other side. So unfiltered substances can go across," Rhodes says.

Rhodes became aware of the connection between migraines and PFOs in 2001. "I was closing these holes in people with strokes, and they were coming back and telling me that their migraine headaches were gone," he says. "I had no idea they even had migraine headaches."

In early 2008, Rhodes will begin a clinical trial to find out if using a bioabsorbable device called BioSTAR to close PFOs helps patients with low blood oxygen levels. The device is also being used in a clinical trial for patients with migraine headache, the MIST II trial. The benefit of the device, which has been approved for use in Europe and Canada, is that as the body absorbs the patch material, the patient's own tissue grows to cover the heart defect.

More information: Contact study coordinator Summer Roberts at 919-668-4745.

A PROMISING TREATMENT FOR MARFAN SYNDROME. As part of a multicenter trial, Stephanie Wechsler, MD, is helping to examine the safety and efficacy of using a drug called Losartan in children with Marfan syndrome to slow the growth of the aortic root. The drug, approved for treating hypertension in adults, has been shown to work dramatically well in early studies in mice.

"In children with Marfan syndrome, the aortic root blows up like a balloon and grows out of proportion to the rest of the body," Wechsler says. "For adults it can continue to grow, and if the aorta gets big enough, the walls can become relatively thin and stretched and more prone to tear or rupture—which could be catastrophic." Current treatment options are beta blockers or major surgery. "It's still early, but this is one of the first new therapies for Marfan syndrome that's been contemplated in a long time," Wechsler says.

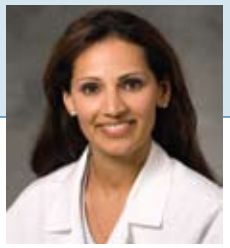
More information: Contact study nurse Mingfen Xu at 919-668-6352 or visit pediatricheartnetwork.org/marfanforparents.asp.

REPAIR OF A COMPLEX DEFECT. A multicenter trial enrolling patients at Duke compares two different methods of reconstruction for hypoplastic left heart syndrome, a specific single-ventricle defect that requires treatment with a series of operations. Children with this defect who will have a Norwood procedure, which involves placing a shunt to carry blood from the heart to the lungs, are eligible for this trial.

More information: Contact James Jaggers, MD, at 919-681-2343 or visit pediatricheartnetwork.org/svrforparents.asp.

clinicianQ+A

Management of uterine fibroids



by Millie Behera, MD and Phyllis Leppert, MD, PhD
Duke Department of Obstetrics and Gynecology

UTERINE FIBROIDS, also known as leiomyomas or myomas, are the most common gynecologic tumor in women of reproductive age, affecting approximately 30 to 40 percent of premenopausal females. The prevalence increases with age, with an estimated 70 to 80 percent of women developing fibroids by age 50.[1]

While typically classified as benign, uterine fibroids can cause troublesome symptoms to approximately 30 percent of affected women, including heavy vaginal bleeding, pelvic pressure, pain, obstructive urinary and bowel symptoms, as well as reproductive difficulties.[1,2] Fibroids are one of the most common indications for hysterectomy in the U.S., accounting for approximately 200,000 cases per year. Fibroid-related morbidity has a significant economic impact on health care: the cost of health care for women with fibroids is more than double that of women without this condition, and annual costs related to the diagnosis of fibroids are over $2 billion.[3]

Fortunately, new approaches to managing uterine fibroids are improving the outlook. Minimally invasive and non-invasive treatments such as MRgFUS (MRI-guided focused ultrasound)—a novel therapy recently introduced at Duke—are providing effective treatment for fibroids while offering faster recovery and fewer complications than hysterectomy.[4] At the same time, new studies have increased our understanding of the biology of uterine fibroids and created inroads for developing more effective medical therapies.

WHAT CAUSES UTERINE FIBROIDS, AND WHO IS AT RISK?

While the exact etiology of fibroids is still unclear, physician-scientists at the Duke Center for Uterine Fibroid Biology and Therapy have co-authored several of the most recent studies examining the underlying disease process that leads to the formation of uterine fibroids.[5,6,7] These studies indicate that fibroids grow by accumulation of collagen and components of the extracellular matrix. This fibrosis is similar to that observed in the formation of keloid scars. The center, which includes physician-investigators, basic scientists, and epidemiologists, is currently involved in several studies to elucidate the molecular biology of uterine fibroid growth and etiology for associated bleeding and subfertility.

Factors implicated in the development of fibroids include genetic, hormonal, and growth factors, especially transforming growth factor beta (TGFb)-related cellular changes.[8,9] Clinical risk factors associated with fibroids include obesity, hypertension, nulliparity (never having given birth), family history, and race. Up to 70 percent of African American women have uterine fibroids, and these generally tend to be larger, more numerous, and produce more severe symptoms.[1]

HOW ARE UTERINE FIBROIDS BEST DIAGNOSED?

Given the fact that uterine fibroids are highly prevalent in women of childbearing age and are associated with decreased fertility, prompt and accurate diagnosis is important. Uterine fibroids are most often diagnosed by ultrasound as part of the evaluation for associated symptoms or when an enlarged uterus is found on physical examination. However, other imaging modalities such as saline infusion sonograpy (3-D) and MRI may provide more accurate diagnosis and better delineation of fibroid size and location.

Fibroids are classified based on location within the uterine wall: subserosal, intramural, and submucosal. These definitions are often used to determine appropriate interventions and/or surgical approach.

WHAT ARE CURRENT TREATMENT APPROACHES—AND WHAT THERAPIES ARE ON THE HORIZON?

Current treatment options for uterine fibroids run the gamut from medical intervention to non-invasive and minimally invasive therapies to hysterectomy. Several factors must be addressed in determining the appropriate treatment for each individual, including size and location of fibroids, severity of symptoms, and desire to retain fertility or uterine preservation.

Medical options. Current medical options for fibroid management are limited. Of the established interventions, GnRh agonists are the most effective. GnRh agonists have been used to control bleeding and pressure-related symptoms by reducing fibroid size and decreasing bleeding. Within three to six months, fibroid size is reduced by approximately 30 to 50 percent. However, these effects are short-lived; fibroids grow and symptoms recur soon after treatment is discontinued. Furthermore, due to hypoestrogenic effects, treatment time is limited to six months, after which bone density can be affected. Add-back hormone therapy can be used to combat this effect, but some studies have found that this regimen may decrease the treatment efficacy. Hence GnRh agonists have been found to be most useful as an adjunct to surgical treatment of fibroids, since preoperative use results in improvement in hematocrit levels and less

Table 1. Medical therapy for fibroids [10–16]

DRUG CLASS	MECHANISM	EFFECTS	CONSIDERATIONS
GnRH agonists	Suppression of ovarian steroidogenesis production—delayed pituitary downregulation	Fibroid size and symptom reduction up to 50% within 3-6 months	Hypoestrogenic side effects: hot flashes, vaginal dryness, headaches. Prolonged use associated with reduced bone mineral density
GnRh antagonists	Suppression of ovarian steroidogenesis production—immediate pituitary downregulation	Reduction in fibroid size 25-40% and symptom improvement within 3 weeks	Hypoestrogenic side effects: hot flashes, vaginal dryness, headaches. Prolonged use associated with reduced bone mineral density
Oral contraceptives	Endometrial stabilization, variable effects on leiomyomas	May improve uterine bleeding, but no significant decrease in fibroid size	Use judiciously—both estrogen and progesterone may promote fibroid growth (increased mitotic activity)
Progestin only	Endometrial stabilization/atrophy, variable effects on leiomyomas	Mixed results—both fibroid shrinkage and enlargement have been shown; may induce amenorrhea	Use judiciously—progesterone may promote fibroid growth (increased mitotic activity)
Androgens	Combination hormonal and vascular effects (androgenic, progestogenic, antiprogestogenic, and antiestrogenic actions)	24% fibroid size reduction in 4 months, may improve bleeding symptoms	Side effects: weight gain, edema, acne, oily skin, hirsutism, voice changes, headaches, hot flashes, altered libido, decreased breast size, and muscle cramps
Aromatase inhibitors*	Reduces estrogen synthesis and effects	Fibroid size reduced 60-70% within 1-2 months in case report	Hypoestrogenic side effects; further studies needed
Antiprogestins*	Anti-progesterone effect—reduces action and number of progesterone receptors in fibroids and myometrium	Improved symptoms in 60-75%, may induce amenorrhea, reduction in fibroid volume 25-50% within 3 months	Side effects include hot flashes, elevated hepatic enzymes, and endometrial hyperplasia
Mixed progesterone receptor antagonist/agonists*	Local progesterone-mediated effects on leiomyomas and endometrium	Decreased menstrual bleeding (up to 80%) and fibroid size reduction up to 36% within 12 weeks, may induce amenorrhea	Maintains follicular phase estrogen levels, no adverse endometrial effects—causes nonphysiologic secretory changes (clinical relevance unknown)
Mixed estrogen receptor antagonist/agonists*	Estrogen antagonist effects on fibroid and endometrium	Inconsistent results—trend to decreased fibroid size in small heterogeneous studies	Side effects: leg cramps, hot flashes. Increased risk of thromboembolic events
Antifibrotics*	Interfere with growth factors, leiomyoma cell proliferation, and extracellular matrix/collagen production	Interfere with fibroid growth	Long-term effects not known, further studies needed

*Investigational medical therapies

blood loss during surgery.[10]

Several other hormone-related medical treatments have been used to treat uterine fibroids; however, most of these medications are still being evaluated in clinical trials and are considered investigational.[11] Some of these proposed interventions are aimed at controlling fibroid growth and related symptoms by targeting ovarian steroid production. These include combined birth control pills, progestin-only preparations, androgens, both estrogen and progesterone receptor antagonists, and mixed receptor antagonist/agonists. Other medications, such as antifibrotic agents, target growth factors and affect extracellular matrix production and angiogenesis within the fibroid. These medical treatments are summarized in Table 1. The Duke Center for Uterine Fibroid Biology and Therapy is actively investigating new drug therapies to treat uterine fibroids, and we expect this to be an area of significant advancement and progress over the next several years.

Non-medical options. Since most medical options are investigational and not recommended as first-line, long-term treatment for symptomatic fibroids at this time, the most common treatments remain either conservative surgical intervention or definitive surgery. Until now, the most prevalent treatments have been hysterectomy (surgical removal of the uterus) and myomectomy (surgical removal of individual fibroids). However, more women are looking for options that provide minimal intervention and shorter recovery time.

Minimally invasive surgical treatments can provide excellent results when patient and fibroid characteristics are appropriate. In general, such treatments are best suited for women with a few, discrete symptomatic fibroids, while extensive fibroids are best treated with more definitive approaches. Minimally invasive approaches include laparoscopic and hysteroscopic myomectomy, as well as uterine artery embolization, a radiologic procedure that has also become more popular over the last several years.

continued

Table 2. Non-medical treatment interventions—conservative and definitive [4, 17–19]

TREATMENT	MECHANISM	EFFECTS	CONSIDERATIONS
Uterine artery embolization	Ischemic necrosis	Fibroid size reduction 40-60% within 4 months, menorrhagia improvement up to 85%	Post-procedure pain, risk of major adverse events (such as serious infectious complications) 1-2%, may be associated with adverse pregnancy outcomes, ovarian failure in 1-2%
MRI-guided focused ultrasound	Localized thermal necrosis	Symptomatic improvement up to 71% within 3 months, fibroid size reduction up to 30%—increased in proportion to treated fibroid volume, treatment effects sustained up to 24 months with low rates of secondary or repeat procedures	Patient selection criteria and fibroid characteristics important—post-treatment volume determines efficiency/duration of clinical results; minimal risk of adverse events (skin burn, nerve injury)
Myolysis (Laparoscopic)	Thermal necrosis	Fibroid shrinkage up to 70% by 12 months	Surgical risks, significant postoperative adhesions
Laparoscopic myomectomy	Excision	Removal of large fibroids, high patient satisfaction with symptomatic improvement	Surgical risks; often requires cesarean delivery with future pregnancy—labor is not advised, due to small risk of uterine rupture
Abdominal myomectomy	Excision	Removal of all palpable fibroids, high patient satisfaction with symptomatic improvement	Surgical risks; often requires cesarean delivery with future pregnancy—labor is not advised, due to small risk of uterine rupture
Hysterectomy	Excision	Definitive treatment—high patient satisfaction rate with symptomatic improvement	Surgical risks

A recent addition to the treatment toolkit is MRI-guided focused ultrasound (MRgFUS), in which precisely pinpointed, high-intensity ultrasound waves are used to "burn away" fibroids without harming normal surrounding tissues. This cutting-edge technology, which offers women the option of same-day, non-surgical treatment, is available at Duke through the Duke MRI-Guided Focused Ultrasound Treatment Program. With increasing availability of conservative treatment choices, both patients and their physicians have the opportunity to individualize therapy based on the goals of each patient. More details on the pros and cons of various non-medical therapies are in Table 2.

For more information about uterine fibroid treatment at Duke or to refer a patient, call 919-572-8851, e-mail fibroidcenter@mc.duke.edu, or visit dukehealth.org/uterinefibroids.

Phyllis C. Leppert, MD, PhD, is a professor and vice chair for research in the Duke Department of Obstetrics and Gynecology, and also director of the new Duke Center for Uterine Fibroid Biology and Therapy. Millie Behera, MD, is an assistant professor in the Department of Obstetrics and Gynecology, clinical director of the Duke Center for Uterine Fibroid Biology and Therapy, and director of the Duke MRI-Guided Focused Ultrasound Treatment Program.

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Andrews at the medical school helm

Nancy C. Andrews, MD, PhD, an internationally renowned researcher and former dean for basic sciences and graduate studies at Harvard Medical School, began her duties as dean of the Duke University School of Medicine in October. Andrews is the first woman to be appointed dean of Duke's School of Medicine and becomes the only woman to lead one of the nation's top 10 medical schools.

A pediatric hematologist/oncologist by training, Andrews oversaw research in Harvard Medical School's pre-clinical sciences departments, as well as physician-scientist and graduate education. She previously served as director of the Harvard-MIT MD/PhD Program.

"My goal, and that of [Duke University] President [Richard] Brodhead, was to identify and recruit the best candidate in the country for this position, and it was clear to us early on that Dr. Andrews was that person," said Chancellor Victor J. Dzau, MD, in announcing the appointment. "She is one of the most distinguished faculty leaders and physician-scientists at Harvard, and her recent service as dean of basic sciences and graduate studies has proven her to be an effective and decisive leader. I look forward to working with Dr. Andrews to further Duke's academic excellence and to advance my commitment to ongoing efforts to increase diversity within Duke Medicine leadership and faculty."

Andrews succeeds R. Sanders Williams, MD, who was recently promoted to the position of senior vice chancellor for academic affairs after serving as dean of the Duke School of Medicine since 2001. "Dr. Andrews is one of the nation's most accomplished physician-scientists and she is very well prepared to take up the challenges and maximize the opportunities of the dean's role at Duke," Williams said. "She has grasped immediately how we expect to derive the greatest benefit from our new organizational structure. It's difficult to imagine a better addition to our senior management team."

Meet the new dean, p. 20.

New appointments at the School of Medicine

Eugene Oddone, MD, has been named vice dean for research at the Duke University School of Medicine. Oddone will oversee all functions of the central administration that support and monitor the conduct of research within the school. He will continue to direct the Center for Health Services Research in Primary Care at the Durham VA Medical Center, and is stepping down from his 10-year role as chief of Duke's Division of General Internal Medicine.

Augustus "Gus" Grant, MD, PhD, has been appointed to the newly created position of vice dean for faculty enrichment. He will lead, define, and implement the faculty enrichment goals and objectives that are outlined in the school's strategic plan. Grant also will be overseeing the Multicultural Resource Center led by Del Wigfall, MD, and the faculty development initiatives currently administered by Ann Brown, MD.

Wesley Byerly, PharmD, has been appointed to the newly created position of associate dean for research support services. He will report to Oddone and be the dean's office liaison for key administrative areas, including the Institutional Review Board, International Animal Care and Use Committee, Division of Laboratory Animal Resources, the Office of Animal Welfare Assurance, and the Office of Research Misconduct. He also will have administrative responsibility for renovation and construction of school facilities.

Oddone

Grant

A new role in Duke heart care

Marti Taylor, RN, MSN, was named to the newly created position of associate vice president of cardiovascular services for Duke University Health System (DUHS). In her new role, Taylor will provide operational and strategic leadership for cardiovascular services throughout Duke Medicine in collaboration with hospital, physician, and ambulatory leaders.

Taylor holds 18 years of service to Duke Medicine, including serving as the associate operating officer for Duke Heart Center. Taylor also served for three years as president of the Heart and Vascular Institute for Saint Joseph's Hospital in Atlanta. Most recently, she was assistant vice president for DUHS Acute Care Services Division, with a focus that included system-wide strategy development.

Duke Comprehensive Cancer Center leadership appointments

Tony Means, PhD, Nanaline H. Duke professor and chair of the Department of Pharmacology and Cancer Biology, has been appointed as deputy director of the Duke Comprehensive Cancer Center (DCCC). Means is an internationally renowned basic research scientist and experienced administrator. In his new role, he will be responsible for all administrative and operational elements of the DCCC. He will work with Kim Lyerly, MD, DCCC director, to develop new strategic initiatives and operational directives to support its expanding group of investigators.

Chris Willett, MD, Leonard R. Prosnitz professor and chair of the Department of Radiation Oncology, has assumed the newly created dual role of associate director of clinical research for the DCCC and medical director of Oncology Site-Based Research—a program that will be a key component of the overall DCCC administrative structure and program development. Willett and his team of research administrators will work with leadership throughout Duke Medicine to create an improved infrastructure and programs for clinical research.

Donald McDonnell, PhD, Glaxo Wellcome professor of molecular cancer biology in the Department of Pharmacology and Cancer Biology, has assumed the role of associate director of basic research. McDonnell is internationally recognized for his contributions to the pharmacology of nuclear receptors and will provide leadership for the DCCC's strategic research plan.


Means


Willett


McDonnell

Leading nursing research

Dianne Holditch-Davis, PhD, RN, FAAN, has been named associate dean for research affairs at the Duke University School of Nursing. She will be responsible for the development and conduct of research activities within the school, and succeeds the late Elizabeth C. "Jody" Clipp, PhD, RN. Holditch-Davis is an internationally recognized scholar in the field of premature infant behaviors. A Duke Nursing alumna, she joined the School of Nursing faculty in 2006 and this year was named the Marcus Hobbs distinguished university professor of nursing.

DTRI COO

Victoria Christian has been appointed chief operating offer of the Duke Translational Research Institute (DTRI). Christian has extensive experience in clinical and translational research in both industry and academia, most recently assisting in the development of the DTRI and playing a leadership role in the conceptualization and design of the M.U.R.D.O.C.K. study (see page 4). In her new role, Christian will work with DTRI director Bruce Sullenger, MD, to oversee the operations and strategic direction of the DTRI as an institutional resource for translational researchers.

New oncology chief in Raleigh

Duke Raleigh Hospital and Duke Cancer Center Raleigh have announced that **Michael Spiritos, MD**, has been named chief of medical oncology. Spiritos came to Duke from a hospital-based oncology practice outside of Philadelphia, where he helped build and develop a large community cancer program competitive with regional cancer centers. In his new role, Spiritos will see patients with both hematology and oncology needs. He will also continue to strengthen Duke Raleigh's cancer program with multidisciplinary clinics in prostate, lung, and breast cancers.

A head for the Institute for Brain, Mind, Genes, and Behavior

David Fitzpatrick, PhD, Duke professor of neurobiology, has been named the first director of the new interdisciplinary Institute for Brain, Mind, Genes, and Behavior. The institute, an outgrowth of the university's latest strategic plan, is being created "to build on our existing strengths in a variety of disciplines that are critical for understanding brain function," explains Fitzpatrick. "I'm looking forward to working together with the faculty and administration in Arts and Sciences and in the medical center to marshal our talents in a way that elevates the neurosciences at Duke to a new level of excellence."

MaryAnn Black will receive the Cook Society's Distinguished Service Award.

Joshua Broder, MD, was awarded the National Faculty Teaching Award.

Thomas D'Amico, MD, was elected vice-chair of the board of the National Comprehensive Cancer Network.

Eric D. Peterson, MD, MPH, was named a recipient of the Duke Med Scholar award.

Nancy C. Andrews, MD, PhD, dean of the Duke University School of Medicine, and **Barton Haynes, MD**, Frederic M. Hanes professor of medicine and immunology and director of the Duke Human Vaccine Institute, joined 201 other scholars, scientists, artists, and civic, corporate, and philanthropic leaders as part of the 2007 class of fellows elected into the American Academy of Arts and Sciences.

The academy comprises scholars and practitioners from mathematics, physics, biological sciences, social sciences, humanities and the arts, public affairs, and business to promote and conduct a wide range of interdisciplinary studies and public policy research.

MaryAnn Black, associate vice president for community relations for Duke University Health System, will receive the Distinguished Service Award at the 11th annual Samuel DuBois Cook Society awards dinner in February 2008. The Society was founded in 1997 to honor the first African American faculty member hired and tenured at Duke University, and to recognize his contributions as a member of the Duke University Board of Trustees. Its awards honor those who have reflected in their work or their academic pursuits the objectives to which Cook dedicated his professional life: to "translate the promise and potential of African Americans into fulfillment and actuality, and to seek to improve relations among persons of all backgrounds."

Joshua Broder, MD, associate residency program director in Emergency Medicine, has been awarded the National Faculty Teaching Award by the American College of Emergency Physicians for his dedication and innovation in teaching. Currently developing a national curriculum in diagnostic imaging for emergency medicine residents, Broder also began a case-based Web site for emergency medicine education and has formed an independent non-profit organization, allowing national collaboration for emergency medical education.

Rosemary Brown, MSN, CNRN, chief nursing officer at Duke Raleigh Hospital, was selected to join a group of nursing executives from around the world in the Johnson & Johnson–Wharton Fellows Program in Management for Nurse Executives. The Wharton Fellows Program is considered the leading program of its kind; only 40 senior nursing executives from around the nation and world are selected to attend annually.

R. Edward Coleman, MD, director of nuclear medicine and professor and vice chair in the Department of Radiology, was awarded the 2007 Georg Charles de Hevesy Nuclear Pioneer Award for his contributions to the nuclear medicine profession. He was recognized for his efforts in advancing molecular imaging and clinical applications of positron emission tomography (PET), PET/computed tomography (CT), and radionuclide therapy.

Thomas A. D'Amico, MD, has been elected vice-chair of the board of the National Comprehensive Cancer Network. The not-for-profit alliance of 21 of the world's leading cancer centers is dedicated to improving the quality and effectiveness of care provided to patients with cancer. D'Amico is director of clinical oncology, program director of thoracic surgery, and associate professor of surgery at Duke.

Victor J. Dzau, MD, chancellor for health affairs, was honored recently when Harvard Medical School (HMS) established a $2.75-million professorship of medicine in his name. The endowed professorship was created in recognition of Dzau's significant contributions to Harvard and Brigham and Women's Hospital (BWH). The incumbent must be an outstanding physician-scientist and leader in cardiovascular medicine.

The first recipient of the professorship, Marc Pfeffer, MD, professor of medicine at HMS in the cardiovascular division of BWH, was officially named at a reception at Harvard on June 28.

Dzau is the former Hersey professor and chair of medicine at BWH in Boston. Dzau and Pfeffer are international leaders in cardiovascular disease research. Dzau's study of the biology of the renin angiotensin system—a system of hormones that assist in regulating blood pressure and volume—helped lead to the development of angiotensin-converting enzyme (ACE) inhibitors, a now-common therapy used in the treatment of high blood pressure. Pfeffer has done a considerable amount of work related to ACE inhibitors, particularly when used in patients who have had heart attacks.

Michael Ehlers, MD, PhD, associate professor of neurobiology and a Howard Hughes Medical Institute Investigator at Duke, has received the annual Young Investigator Award from the Society of Neuroscience. Ehlers's studies focus on understanding how nerve cells are able to maintain two seemingly contradictory functions—being plastic enough to change with new input or stimuli, yet permanent enough to retain this input in the form of memory or learning.

David Fitzpatrick, PhD, **Eric D. Peterson, MD, MPH**, and **Geoffrey Pitt, MD, PhD**, have been named recipients of the Duke Med Scholar awards, established last year as part of the School of Medicine's strategic plan to attract and support junior faculty whose work shows great potential for advancing science and medicine.

Fitzpatrick, a professor of neurobiology, leads a lab investigating the functional organization and development of neural circuits within the primary visual cortex, gaining new insight into how the brain processes visual information. "Our goal is to establish how patterns of neural activity driven by experience shape the development of cortical circuit properties," says Fitzpatrick. "This information is critical for understanding normal

Geoffrey Pitt, MD, PhD, was named a recipient of the Duke Med Scholar award.

Randy Jirtle, PhD, was nominated as *TIME* magazine's 2007 Person of the Year.

Michael Merson, MD, will serve as chair of the MIDAS Steering Committee.

Sheldon R. Pinnell, MD, was feted at Duke Dermatology's 70th anniversary celebration in October.

mechanisms of cerebral cortical development and their alteration in developmental disorders."

Peterson, a professor of medicine in cardiovascular medicine, uses national cardiovascular data registries to develop medical evidence and improve the quality of clinical care. With the Duke Med Scholar funds, Peterson hopes to augment these registries with genetic and blood markers as well as long-term follow-up information in order to identify why certain treatments work in some people but not others. He also hopes to set up a collaboration between Duke's medical and business schools and the Duke Clinical Research Institute to help identify the business, cultural, and care practices that lead one hospital to get better results than its peers, with the goal of developing a curriculum to teach providers how to improve care quality.

Pitt, formerly of Columbia University, joined Duke's cardiovascular medicine faculty in August. He is particularly interested in inherited cardiovascular diseases and arrhythmias. Pitt studies the structure and function of ion channels in the heart and brain and the role that changes in the amount of intercellular calcium play in turning these channels on and off. Determining how channel abnormalities disturb this vital calcium-feedback loop could shed light on inherited arrhythmias and epilepsies.

Randy Jirtle, PhD, professor of radiation oncology and director of the Duke Genomic Imprinting Lab, was nominated as *TIME* magazine's 2007 Person of the Year for his study of epigenetics, defined as changes in gene function independent of changes in DNA sequence.

"[His] pioneering work in epigenetics and genomic imprinting has uncovered a vast territory in which a gene represents less of an inexorable sentence and more of an access point for the environment to modify the genome. The trailblazing discoveries of Dr. Randy Jirtle have produced a far more complete and useful understanding of human development and diseases," said Nora Volkow, MD, director of the National Institute on Drug Abuse, in nominating Jirtle. Epigenetics received national attention last summer when Jirtle and his lab were featured in the PBS *NOVA* program "Ghost in Your Genes." "It looks like the importance of epigenetics and genomic imprinting in human health and disease is really beginning to be more appreciated," says Jirtle.

Robert J. Lefkowitz, MD, Howard Hughes Medical Institute Investigator at Duke, has received the Shaw Prize in Life Science and Medicine for 2007 for his research into understanding the receptor system that controls the body's response to drugs and hormones. Lefkowitz received the award, which includes a $1-million prize, during a ceremony in Hong Kong in September. Earlier this year, Lefkowitz received the Albany Medical Center Prize in Medicine and Biomedical Research. He shared the $500,000 prize with two other researchers.

Three Duke Eye Center faculty members received awards from Research to Prevent Blindness, the world's leading voluntary organization supporting eye research for more effective treatments, preventions, and cures for eye diseases.

Stuart J. McKinnon, MD, PhD, associate professor of ophthalmology, has been selected as the recipient of a $60,000 Research to Prevent Blindness Lew R. Wasserman Merit Award. Established in 1995, the award provides unrestricted support to mid-career MD/PhD scientists who hold primary positions within departments of ophthalmology and who are actively engaged in eye research at medical institutions in the United States.

Catherine Bowes Rickman, PhD, assistant professor of ophthalmology, has received the Research to Prevent Blindness William and Mary Greve Special Scholars Award in the amount of $60,000. The award recognizes outstanding young ophthalmic scientists conducting research of exceptional merit and promise.

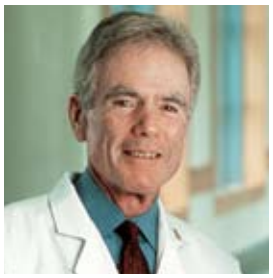
David K. Wallace, MD, associate professor of ophthalmology, received the Research to Prevent Blindness Walt and Lilly Disney Award for Amblyopic Research in the amount of $100,000. This award provides funds to respected ophthalmic scientists for research into improved detection, treatment, or cures for amblyopia, which develops in 2 to 3 percent of all children—usually before they can speak—and is particularly difficult to detect.

Michael Merson, MD, director of the Duke Global Health Institute, will serve as chair of the MIDAS Steering Committee, starting in May 2008. MIDAS (Models of Infectious Disease Agent Study) is sponsored by the National Institute of General Medical Sciences as a collaboration of research and informatics groups to develop computational models of the interactions between infectious agents and their hosts, disease spread, prediction systems, and response strategies.

Merson has also been named an ambassador in Research!America's Paul G. Rogers Society for Global Health Research. He is one of 51 of the nation's foremost global health experts who are increasing awareness about the critical need for greater U.S. public and private research investment to improve global health.

Sheldon R. Pinnell, MD, J. Lamar Callaway professor emeritus and chief of the Division of Dermatology from 1982 to 1997, was honored at the Duke Dermatology 70th Anniversary Celebration and Scientific Program in October. More than 130 colleagues, former Duke dermatology residents, friends, and family attended the event. The division honored Pinnell with the planting of a Japanese cherry tree in the Sarah P. Duke Gardens. Photos from the event are at dukederm.duke.edu.

Peter K. Smith, MD, received the Distinguished Service Award of the Society of Thoracic Surgeons.



Ralph Snyderman, MD, received the 2007 Leadership in Personalized Medicine Award.

Rebekah White, MD, and **Jonathan Stiber, MD**, received grants from the Howard Hughes Medical Institute to launch their careers as physician-scientists.

John Sampson, MD, PhD, associate professor of surgery in the Division of Neurosurgery and associate deputy director of the Preston Robert Tisch Brain Tumor Center at Duke, became the second recipient of the Tug McGraw Researcher of the Year Award, which recognizes outstanding achievements in brain tumor research.

Sampson was recognized for developing vaccines that work by enlisting the assistance of the immune system in fighting off brain cancer cell growth.

Peter K. Smith, MD, professor and chief of thoracic surgery, was presented the Distinguished Service Award of the Society of Thoracic Surgeons. The award, presented only 20 times in the 38-year history of the organization, recognizes significant and far-reaching contributions to the society and the specialty.

Smith is the society's representative on the American Medical Association's Relative Value Update Committee, which is the primary physician advisory committee to the U.S. Centers for Medicare and Medicaid Services for the physician fee schedule. The award in large part recognizes his work in the most recent five-year refinement of the fee schedule, as mandated by the enacting legislation. Smith was also recently appointed as the lead physician for organized medicine regarding Medicare payment for professional liability insurance.

Ralph Snyderman, MD, Duke University chancellor emeritus, received the 2007 Leadership in Personalized Medicine Award from the Personalized Medicine Coalition for his efforts in advancing predictive and targeted therapies on a national scale. The award recognizes the contributions of a visionary individual whose actions in science, business, or policy have advanced the frontier of personalized medicine.

As the chancellor for health affairs at Duke from 1989 to 2004, Snyderman drew on his experience in biotechnology and health care delivery to conceive, pioneer, and implement a comprehensive health care approach based on the concept of "Prospective Health Care." The foundation of this health care approach is strategic, personalized, and predictive health planning, rather than reactive treatment. After stepping down as chancellor, he founded the Center for Research on Prospective Health Care as well as Proventys Inc.

Justine Strand, MPH, PA-C, chief of the Physician Assistant (PA) Division of Duke's Department of Community and Family Medicine, was named president-elect of the Physician Assistant Education Association. A past president of the NC Medical Society Foundation and recipient of the 2005 American Academy of Physician Assistants' Outstanding PA of the Year award, among other honors, Strand has seved as division chief since 1999.

Fan Wang, PhD, assistant professor of cell biology, received a McKnight Foundation Scholar Award. The awards, granted to young scientists with a demonstrated commitment to neuroscience, support innovative research designed to bring science closer to the day when diseases of the brain and behavior can be accurately diagnosed, prevented, and treated. Wang will receive $75,000 per year for three years for her research examining molecular and genetic analyses of mammalian touch sensation.

Two young Duke University School of Medicine faculty members have received grants from the Howard Hughes Medical Institute (HHMI) to launch their careers as physician-scientists. Each will receive $375,000 over a five-year period to fund their individual research programs.

Rebekah White, MD, participated in the HHMI Medical Fellows Program while a medical student at Duke and had a three-year postdoctoral fellowship, also funded by the institute, during her surgical residency. White, who joined the Duke faculty in July, is studying a novel drug that could be used to treat pancreatic cancer.

Jonathan Stiber, MD, was an HHMI–National Institutes of Health Research Scholar during his medical school studies at New York University. Stiber, a cardiologist, joined the Duke faculty in 2004 after completing an internal medical residency and a cardiology fellowship at Duke. His research interests focus on a particular protein known as Homer, which plays a key role in muscle function.

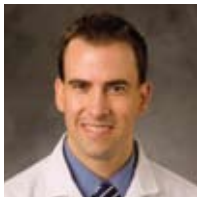
William S. Yancy Jr., MD, assistant professor of medicine, and **Michelle P. Winn, MD**, assistant professor in nephrology at the Duke Center for Human Genetics, were honored at the White House in November 2007 as recipients of the 2006 Presidential Early Career Awards for Scientists and Engineers, the nation's highest honor for professionals at the outset of their independent scientific research careers. Yancy's current work focuses on the health effects of low-carbohydrate diets versus medication and the relationship between obesity and access to preventive health services. Winn, an inaugural Duke Med Scholar, is investigating the genetic causes of kidney disease.

Michael R. Zalutsky, PhD, professor of radiology and biomedical engineering, received the 2007 SNM Paul C. Aebersold Award for outstanding achievement in basic nuclear medicine science. Zalutsky, also the director of the Duke Radiolabeling Facility Shared Resource and member of the cancer immunobiology, neuro-oncology, and radiation oncology programs in the Duke Comprehensive Cancer Center, was recognized for his outstanding contributions to the understanding and implementation of molecularly targeted cancer therapy.

ANESTHESIOLOGY

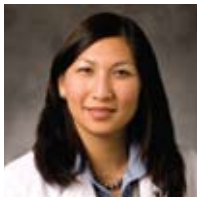
James G. Benonis, MD
Anesthesiology
Particular Clinical Interests and Skills: Regional anesthesia, including ultrasound-guided regional anesthesia and continuous anesthesia, ambulatory anesthesia, acute pain management, and education
Faculty Rank: Assistant Professor
MD Degree: Temple University, Pennsylvania, 2002
Residency: Transitional Internship, The Reading Hospital and Medical Center, Pennsylvania, 2002-2003
Anesthesiology, Duke University Medical Center, 2003-2006
Fellowship: Regional and Ambulatory Anesthesiology, Duke University Medical Center, 2006-2007

Richard J. Ing, MB BCh
Anesthesiology
Particular Clinical Interests and Skills: Pediatric cardiac and general pediatric anesthesiology
Faculty Rank: Assistant Clinical Professor
MB BCh Degree: University of the Witwatersrand, South Africa, 1988
Residency: FCA (SA), College of Medicine, South Africa, 1995



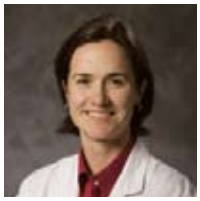
Steve Melton, MD
Anesthesiology
Particular Clinical Interests and Skills: Ambulatory anesthesia
Faculty Rank: Assistant Professor
MD Degree: University of Chicago Loyola, Stritch School of Medicine, Illinois, 2002
Residency: Anesthesiology, Loyola University Medical Center, Illinois, 2006
Fellowship: Regional Anesthesiology, Hospital for Special Surgery, New York, 2007

COMMUNITY AND FAMILY MEDICINE

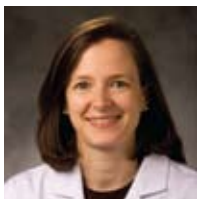


Harriet N. Hansell, MD
Family Medicine
Particular Clinical Interests and Skills: Chronic disease management (diabetes, hypertension, asthma), preventive medicine, women's health, and medical acupuncture
Faculty Rank: Medical Instructor
MD Degree: UNC-Chapel Hill School of Medicine, 2003
Residency: Family Medicine, Duke University Medical Center, 2003-2006
UCLA Medical Acupuncture for Physicians Certification, 2005

Deborah Bade Horn, DO
Obesity Treatment
Particular Clinical Interests and Skills: Treatment of obesity and related co-morbidities, medical care of patients in a residential lifestyle and behavioral change program, physical activity and chronic disease including obesity, hypertension, dyslipidemia, diabetes, and musculoskeletal issues
Faculty Rank: Clinical Associate
DO Degree: Kirksville College of Osteopathic Medicine, Missouri, 2001
Residency: General Preventive Medicine, University of South Carolina, 2004
Family Medicine, The Methodist Hospital, Houston, Texas, 2006
Other: MPH



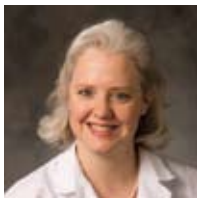
Lorraine S. Sease, MD
Family Medicine
Particular Clinical Interests and Skills: Family medicine for all ages with special interest in geriatrics and palliative care
Faculty Rank: Medical Instructor
MD Degree: UNC-Chapel Hill School of Medicine, 2002
Residency: Family Medicine, UNC-Chapel Hill, 2005
Fellowship: Geriatrics, Duke University Medical Center, 2006
Palliative Medicine, Duke University Medical Center, 2007
Other: MSPH, Maternal and Child Health, UNC-Chapel Hill School of Public Health, 2001



Nancy J. Weigle, MD
Family Medicine
Particular Clinical Interests and Skills: Full spectrum of family medicine including prenatal care, chronic disease management, care for underserved populations
Faculty Rank: Medical Instructor
MD Degree: George Washington University School of Medicine, Washington, D.C., 2000
Residency: Family Medicine, Lawrence Family Practice, Greater Lawrence Family Health Center, Massachusetts, 2003

DUKE UNIVERSITY AFFILIATED PHYSICIANS

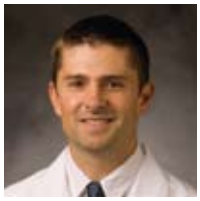
Elizabeth O. Aderoju, MD
Durham Medical Center
Particular Clinical Interests and Skills: Preventive health and screenings, general internal medicine management of chronic medical issues including hypertension, diabetes, high cholesterol, osteoporosis
Faculty Rank: Consulting Associate
MD Degree: Meharry Medical College, Tennessee, 2001
Residency: Internal Medicine, University of Tennessee Health Science Center, 2001-2004



Laura M. Bowen, MD
Triangle Family Practice
Particular Clinical Interests and Skills: Family medicine with interest in adolescent medicine, international adoption medicine, and preventive medicine
Faculty Rank: Consulting Associate
MD Degree: Medical College of Georgia, 2003
Residency: Family Medicine, East Tennessee State University, 2006

Michael O. Citron, MD
Duke Urgent Care
Particular Clinical Interests and Skills: Wellness and natural health improvement
Faculty Rank: Consulting Associate
MD Degree: University of Cincinnati College of Medicine, Ohio, 1984
Residency: Emergency Medicine, St. Vincent's Hospital, Ohio
Other: MS, Microbiology/Immunology, University of Cincinnati Division of Graduate Education and Research, Ohio, 1979

Amy S. Erickson, DO
Duke Medicine at Brier Creek
Particular Clinical Interests and Skills: Family medicine with a concentration on adult and adolescent medicine
Faculty Rank: Consulting Associate
DO Degree: The University of New England College of Osteopathic Medicine, 2000
Residency: Family Medicine, Albany Medical Center, New York, 2000-2003



Robert W. Gardner, MD
Wake Forest Family Physicians
Particular Clinical Interests and Skills: Family medicine
Faculty Rank: Consulting Associate
MD Degree: Wake Forest University School of Medicine, North Carolina, 2000
Residency: Family Medicine, Wake Forest University Baptist Medical Center, North Carolina, 2003

To make an appointment with a Duke physician, call 1-888-ASK-DUKE (275-3853). Physicians call 1-800-MED-DUKE (633-3853)

MEDICINE

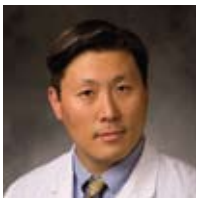
Hilary N. Hawkins, MD
Triangle Family Practice
Particular Clinical Interests and Skills: Adolescent and women's health as well as preventive medicine with special focus on nutrition and lifestyle choices; illness and chronic disease management
Faculty Rank: Consulting Associate
MD Degree: UNC-Chapel Hill School of Medicine, 2003
Residency: UNC-Chapel Hill, 2006

Alounthith Phichith, MD
Harps Mill Internal Medicine
Particular Clinical Interests and Skills: Women's health, preventive medicine
Faculty Rank: Consulting Associate
MD Degree: Morehouse School of Medicine, Georgia, 2004
Residency: Internal Medicine, UNC-Chapel Hill, 2007

Ivy Altomare, MD
Medical Oncology
Particular Clinical Interests and Skills: Increasing the awareness and availability of clinical trials in the community setting, with a focus on GI malignancy treatment and prevention
Faculty Rank: Assistant Professor
MD Degree: UMDNJ New Jersey Medical School, 2001
Residency: Internal Medicine, Mount Sinai Medical Center, New York, 2001-2004
Fellowship: Hematology-Oncology, Mount Sinai Medical Center, New York, 2004-2007

Anne W. Beaven, MD
Medical Oncology
Particular Clinical Interests and Skills: Treatment of hematologic malignancies with a particular interest in clinical trials in lymphoma
Faculty Rank: Medical Instructor
MD Degree: UNC-Chapel Hill School of Medicine, 2000
Residency: Internal Medicine, UNC-Chapel Hill, 2000-2003
Fellowship: Hematology/Oncology, UNC-Chapel Hill, 2004-2007

Internal Medicine, St. John's Episcopal Hospital/State University of New York at Brooklyn, 1997-2000
Fellowship: Gastroenterology, Virginia Commonwealth University, 2000-2003



Steve S. Choi, MD
Gastroenterology
Particular Clinical Interests and Skills: Acute and chronic liver diseases, general gastroenterology
Faculty Rank: Medical Instructor
MD Degree: Flinders University of South Australia, 1999
Residency: Internal Medicine, Duke University Medical Center, 2001-2004
Fellowship: Gastroenterology, Duke University Medical Center, 2004-2007

Michael W. Klinkner, MD
Duke Urgent Care
Particular Clinical Interests and Skills: Urgent care, family medicine, care of minor emergencies, health maintenance, travel medicine, sports medicine
Faculty Rank: Assistant Clinical Professor
MD Degree: University of Michigan Medical School, 1980
Residency: Family Medicine, Michigan State University, Kalamazoo Center for Medical Studies, 1983
Fellowship: Office of Medical Education, Research and Development, Michigan State University School of Human Medicine, 1982-1983

James M. Troutman, MD
Durham Pediatrics
Particular Clinical Interests and Skills: Well child and adolescent care up to age 21
Faculty Rank: Consulting Associate
MD Degree: The Ohio State University College of Medicine, 1994
Residency: Pediatrics, Columbus Children's Hospital, Ohio, 1998

Bryan C. Batch, MD
Endocrinology, Metabolism, and Nutrition
Particular Clinical Interests and Skills: General endocrinology, diabetes, insulin resistance, nutrition
Faculty Rank: Medical Instructor
MD Degree: UNC-Chapel Hill School of Medicine, 2000
Residency: General Internal Medicine, Boston Medical Center, Massachusetts, 2000-2004
Fellowship: Endocrinology, Duke University Medical Center, 2004-2007

Iliana S. Bouneva, MD
Gastroenterology
Particular Clinical Interests and Skills: Viral hepatitis, non-alcoholic fatty liver disease, end-stage liver disease, liver transplantation, recurrent viral hepatitis following transplantation
Faculty Rank: Assistant Professor
MD Degree: Medical University, Sofia, Bulgaria, 1990
Residency: Internal Medicine, University Alexandrovska Hospital, Medical University, Sofia, Bulgaria, 1993-1996

Francis A. Castiller, MD
Pulmonary, Allergy, and Critical Care
Particular Clinical Interests and Skills: Critical care, ARDS, septic shock, pulmonary diseases including asthma, COPD, interstitial lung diseases, lung cancer, sleep-related disorders
Faculty Rank: Consulting Associate
MD Degree: University of Santo Tomes, 1999
Residency: Internal Medicine, Winthrop University Hospital, 2004
Fellowship: Pulmonary and Critical Care, Winthrop University Hospital, 2007

Regina D. Crawford, MD
Hematology
Particular Clinical Interests and Skills: Sickle hemoglobinopathies with particular interest in neurologic sequelae; platelet disorders and anemias
Faculty Rank: Medical Instructor
MD Degree: University of Cincinnati College of Medicine, Ohio, 2000
Residency: Internal Medicine, University of Texas Medical Branch, 2000-2003
Fellowship: Hematology-Oncology, The Ohio State University, 2004-2007

ON THE SPOT

Q. In your opinion, what's behind the growing popularity of urgent care services?

A. I think people have generally gotten more used to the idea. You know, it used to be just a little "doc-in-the-box" kind of place, and the physicians weren't well-known within the community. Now, personal physicians will actually refer their patients to urgent care after hours and on weekends, and patients find out that they can get fine care by highly qualified personnel. It is a consumer-driven type of practice. If you're ill on a Monday morning and attempt to call your physician, it may be hard to get an appointment within a day or two. That opens up a huge opportunity for urgent care centers that are set up to deal with those types of problems. I think urgent care is coming into its own. **—Michael W. Klinkner, MD**

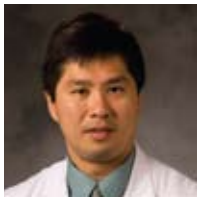
MEDICINE *continued*

Sandeep S. Dave, MD
Medical Oncology
Particular Clinical Interests and Skills: Targeted therapies in lymphoma
Faculty Rank: Assistant Professor
MD Degree: Northwestern University, Illinois, 1999
Residency: Internal Medicine, 2001
Fellowship: Hematology-Oncology, National Institutes of Health, 2006
Other: MS, Biomedical Engineering, Northwestern University, Illinois, 1993
MBA, Northwestern University Kellogg Graduate School of Management, Illinois, 2000

Melissa M. Garrett, MD
Gastroenterology
Particular Clinical Interests and Skills: General gastroenterology, diagnostic and therapeutic endoscopy, colon cancer screening and surveillance
Faculty Rank: Medical Instructor
MD Degree: University of Virginia, 2000
Residency: Internal Medicine, Vanderbilt University Medical Center, Tennessee, 2000-2003
Fellowship: Gastroenterology, Duke University Medical Center, 2004-2007

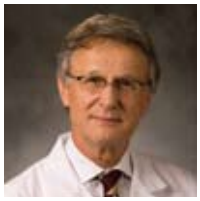
Donald D. Hegland, MD
Cardiovascular Medicine
Particular Clinical Interests and Skills: Use of cardiac MRI to define arrhythmogenic substrate, assess cardiovascular risk, and guide electrophysiologic therapy; clinical electrophysiology including pacemaker and defibrillator implantation, electrophysiologic studies and ablation procedures
Faculty Rank: Medical Instructor
MD Degree: University of Florida, 1999
Residency: Internal Medicine, Duke University Medical Center, 1999-2003
Fellowship: Cardiology, Duke University Medical Center, 2003-2007

Lisa D. Hobson-Webb, MD
Neurology
Particular Clinical Interests and Skills: Diagnosis and treatment of neuromuscular disorders, including neuropathies, myasthenia gravis, myopathies, motor neuron disease and muscular dystrophies, EMG, ongoing clinical research in peripheral nerve and muscle ultrasound
Faculty Rank: Assistant Professor
MD Degree: University of Kentucky, 2001
Residency: Neurology, Wake Forest University Medical Center, North Carolina, 2001-2005
Fellowship: Neuromuscular Medicine, Duke University Medical Center, 2005-2006
Advanced Fellowship in Neuromuscular Medicine, Duke University Medical Center, 2006-2007



S. David Hsu, MD, PhD
Medical Oncology
Particular Clinical Interests and Skills: Gastrointestinal malignancies
Faculty Rank: Medical Instructor
MD Degree: UNC-Chapel Hill School of Medicine, 2001
Residency: Internal Medicine, University of Texas Southwestern Medical Center (Parkland Hospital), 2004
Fellowship: Hematology and Oncology, Duke University Medical Center, 2007
Other: PhD, UNC-Chapel Hill, 1997

Kevin P. Jackson, MD
Cardiovascular Medicine
Particular Clinical Interests and Skills: Pacemakers, implantable defibrillators, cardiac resynchronization therapy, supraventricular and ventricular arrhythmias, congestive heart failure, cardiac imaging
MD Degree: Columbia College of Physicians and Surgeons, New York, 2000
Residency: Internal Medicine, University of California San Francisco, 2000-2003
Fellowship: General Cardiology, Duke University Medical Center, 2003-2006
Electrophysiology, Duke University Medical Center, 2006-2007



James R. Kelly, MD
General Internal Medicine
Particular Clinical Interests and Skills: General internal medicine, primary care for adults
Faculty Rank: Medical Instructor
MD Degree: Duke University School of Medicine, 1970
Residency: Internal Medicine, Duke University Medical Center, 1970-1971; 1974-1976
Other: MBA, Health Services Management, Duke University, 1997

Igor Klem, MD
Cardiovascular Medicine
Particular Clinical Interests and Skills: Cardiovascular magnetic resonance imaging
Faculty Rank: Medical Instructor
MD Degree: University of Vienna, Austria, 1997
Residency: Internal Medicine, Robert-Bosch-Hospital, Stuttgart, Germany, 2006
Fellowship: University Hospital, Muenster, Germany, 2007

Brad J. Kolls, MD, PhD
Neurology
Particular Clinical Interests and Skills: Provide neurologic critical care and develop multimodal monitoring; research interests include development of mouse-based models of post-traumatic epilepsy and brain monitoring in the ICU
Faculty Rank: Medical Instructor
MD Degree: University of California, Irvine, 2001
Residency: Neurology, Duke University Medical Center, 2001-2005
Fellowship: Neurocritical Care and Stroke, Duke University Medical Center, 2005-2007
Other: PhD, University of California, Irvine, 1999

Vinod M. Krishnan, MD
Neurology
Particular Clinical Interests and Skills: Peripheral nerve and muscle disease, EMG, EEG
Faculty Rank: Consulting Associate
MD Degree: Northeastern Ohio Universities College of Medicine, 2002
Residency: Internal Medicine, University Hospital of Cincinnati, Ohio, 2003
Neurology, University Hospital of Cincinnati, Ohio, 2006
Fellowship: Clinical Neurophysiology, Cleveland Clinic Foundation, Ohio, 2007

Patricia L. Lugar, MD
Pulmonary, Allergy, and Critical Care
Particular Clinical Interests and Skills: All conditions related to allergy and immunology with particular interest in chronic urticaria, common variable immunodeficiency (CVID), and the immunologic mechanism of immunoglobulin therapy (IVIG) and allergen immunotherapy
Faculty Rank: Medical Instructor
MD Degree: State University of New York at Buffalo, 1999
Residency: Internal Medicine, McGaw-Northwestern University, 2001
Fellowship: Allergy and Immunology, National Institute of Health, 2007
Other: MS, Molecular Medicine and Immunology, Roswell Park Cancer Institute, New York, 1998

Njira Lucia Lugogo, MD
Pulmonary, Allergy, and Critical Care
Particular Clinical Interests and Skills: General pulmonary medicine with a specific focus on asthma, allergic airway disease, sarcoidosis, bronchiectasis, and COPD; diagnosis and management of obesity related lung disease; research focus on the mechanisms by which obesity affects asthma severity and quality of life; clinical research in asthma
Faculty Rank: Medical Instructor
MD Degree: Medical College of Virginia, VCU School of Medicine, 2001
Residency: Internal Medicine, Wake Forest University, Baptist Medical Center, North Carolina, 2001-2004
Fellowship: Pulmonary and Critical Care Medicine, Duke University Medical Center, 2004-2007

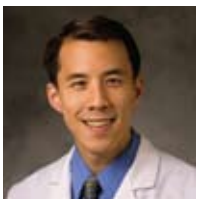
Gary H. Lyman, MD
Medical Oncology
Particular Clinical Interests and Skills: Clinical investigation, experimental therapeutics, breast cancer, care of patients with breast cancer with a focus on the management of early-stage patients for staging prognostic evaluation and treatment decision making; extensive experience in providing optimal supportive care to patients receiving systemic chemotherapy
Faculty Rank: Professor
MD Degree: State University of New York at Buffalo, 1972
Residency: Internal Medicine, UNC-Chapel Hill, 1972-1974
Fellowship: Hematology/Oncology, Roswell Park Memorial Institute, New York, 1975-1977
Other: MPH, Biostatistics, Harvard University, Massachusetts, 1982

Lake D. Morrison, MD
Pulmonary, Allergy, and Critical Care
Particular Clinical Interests and Skills: Interstitial lung diseases, lung diseases associated with collagen-vascular disease, lung diseases associated with immunosuppression, evaluation for lung transplantation
Faculty Rank: Medical Instructor
MD Degree: University of Pennsylvania, 1998
Residency: Internal Medicine, University of Pennsylvania, 2001
Fellowship: Pulmonary and Critical Care Medicine, University of Pennsylvania, 2004

Paul C. Peterson, MD
Neurology
Particular Clinical Interests and Skills: Sleep medicine (hypersomnolence, narcolepsy, sleep disordered breathing); epilepsy; central and peripheral neurodiagnostic evaluations including electromyography, nerve conduction studies, evoked potentials, and electroencephalography; cerebrovascular disease (stroke); and general neurology including dementia
Faculty Rank: Consulting Associate
MD Degree: The University of Texas Medical Branch at Galveston, 1995
Residency: Emergency Medicine, San Antonio Uniformed Services Health Education Consortium, Texas, 1999
Neurology, Duke University Medical Center, 2006
Fellowship: Sleep Medicine and Electroencephalography, Duke University Medical Center, 2007

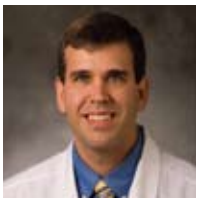
Clare A. Pipkin, MD
Dermatology
Particular Clinical Interests and Skills: Medical dermatology with an interest in systemic disorders with cutaneous findings
Faculty Rank: Assistant Professor
MD Degree: Washington University, Missouri, 2000
Residency: Dermatology, Harvard Combined Residency, Massachusetts, 2005

Geoffrey Pitt, MD, PhD
Cardiovascular Medicine
Particular Clinical Interests and Skills: General cardiology with a special interest in inherited cardiovascular diseases and arrhythmias
MD Degree: Johns Hopkins University, Maryland, 1993
Residency: Internal Medicine, Stanford University Hospital, California, 1995
Fellowship: Cardiovascular Disease, Stanford University Hospital, California, 1999
Other: PhD, Biochemistry, Cellular, and Molecular Biology, Johns Hopkins University, Maryland, 1993



Patrick H. Pun, MD
Nephrology
Particular Clinical Interests and Skills: Improving delivery of care to pre-dialysis chronic kidney disease patients, cardiovascular outcomes in CKD patients, and disorders of bone mineral metabolism in CKD
Faculty Rank: Clinical Associate
MD Degree: Vanderbilt University School of Medicine, Tennessee, 2001
Residency: Internal Medicine, Duke University Medical Center, 2001-2004
Fellowship: Nephrology, Duke University Medical Center, 2004-2007

Gordon R. Reeves, MD
General Internal Medicine/ Duke Hospital Medicine Program
Particular Clinical Interests and Skills: Hospital medicine with a focus on cardiovascular disease, medical education, patient safety and outcomes
Faculty Rank: Medical Instructor
MD Degree: UNC-Chapel Hill School of Medicine, 2004
Residency: Internal Medicine, Duke University Medical Center, 2004-2007
Other: MPT, UNC-Chapel Hill, 1998



Richard F. Riedel, MD
Medical Oncology
Particular Clinical Interests and Skills: Treatment and management of patients with soft-tissue and bone sarcoma, thoracic malignancies
Faculty Rank: Assistant Professor
MD Degree: Jefferson Medical College, Pennsylvania, 2000
Residency: Internal Medicine, Duke University Medical Center, 2000-2003
Internal Medicine, Chief Resident, Duke University Medical Center/Durham VA, North Carolina, 2004-2005
Fellowship: Hematology-Medical Oncology, Duke University Medical Center, 2003-2004, 2005-2007

Jacqueline L. Rookwood, MD
General Internal Medicine
Particular Clinical Interests and Skills: General internal medicine
Faculty Rank: Assistant Professor
MD Degree: New York Medical College, 1992
Residency: Internal Medicine, Saint Vincent's Hospital and Medical Center, New York, 1995

ON THE SPOT

Q. What do you view as the most promising developments in breast cancer treatment over the past few years?

A. Based on molecular markers and genetic profiling, we're learning that there are not just one, two, or a few kinds of breast cancer, but complex patterns of the disease. As we better define the biologic, molecular, and genetic differences in breast cancer from one patient to another, we should be able to further identify critical points for more targeted therapies. While increasingly complex, such improved understanding of breast cancer and its heterogeneity is increasingly exciting as we develop more targets for novel therapies that could dramatically improve survival or cure rates in patients. In terms of defining that heterogeneity and the molecular genetic basis for it, Duke is right in the center of an enormous global effort—and has been a leader in translating discoveries in our basic understanding of the disease into improvements in patient care. That's really Duke's strength—the strong, clear linkages between basic science such as genomic research and clinical care as illustrated by the comprehensive breast program. **—Gary H. Lyman, MD**

MEDICINE *continued*

Rahul A. Shimpi, MD
Gastroenterology
Particular Clinical Interests and Skills: Esophageal diseases, including esophageal motility disorders and Barrett's esophagus
Faculty Rank: Medical Instructor
MD Degree: UNC-Chapel Hill School of Medicine, 2001
Residency: Internal Medicine, Duke University Medical Center, 2004
Fellowship: Gastroenterology, Duke University Medical Center, 2007

Scott L. Shofer, MD, PhD
Pulmonary, Allergy, and Critical Care
Particular Clinical Interests and Skills: Lung cancer, airway obstruction and interventional pulmonary medicine, diagnosis and management of pleural effusions
Faculty Rank: Medical Instructor
MD Degree: Boston University School of Medicine, Massachusetts, 2001
Residency: Internal Medicine, Stanford University, California, 2004
Fellowship: Pulmonary and Critical Care, Duke University Medical Center, 2007
Other: PhD, Biology, UC Santa Cruz, California, 1997

Michael D. Spiritos, MD
Medical Oncology
Particular Clinical Interests and Skills: General hematology-oncology with specific interests in breast cancer and thrombotic disorders
MD Degree: Cornell University, New York, 1983
Residency: Internal Medicine, The New York Hospital, 1986
Fellowship: Hematology-Oncology, The University of Pennsylvania, 1990

Kevin L. Thomas, MD
Cardiovascular Medicine
Particular Clinical Interests and Skills: Heart rhythm disorders, implantation of pacemakers and defibrillators as well as cardiac ablation procedures, research interest in health care disparities among minority populations and the relationship between heart failure and sudden cardiac death
Faculty Rank: Medical Instructor
MD Degree: UNC-Chapel Hill School of Medicine, 1999
Residency: Internal Medicine, Duke University Medical Center, 2002-2004
Fellowship: Cardiology, Duke University Medical Center, 2006
Electrophysiology, Duke University Medical Center, 2007

Hope E. Uronis, MD
Medical Oncology
Particular Clinical Interests and Skills: Gastrointestinal oncology
Faculty Rank: Medical Instructor
MD Degree: State University of New York at Buffalo School of Medicine and Biomedical Sciences, 2000
Residency: Internal Medicine, Duke University Medical Center, 2000-2003
Internal Medicine, Chief Resident, Duke University Medical Center, 2004-2005
Fellowship: Hematology and Medical Oncology, Duke University Medical Center, 2003-2004
Hematology and Medical Oncology, Duke University Medical Center, 2005-2007
Other: MHS, Clinical Research, Duke University, North Carolina, 2007

Victoria A. Walker, MD
Geriatrics
Particular Clinical Interests and Skills: Geriatrics, acute care of the elderly
Faculty Rank: Medical Instructor
MD Degree: University of Texas–Houston Medical School, 2002
Residency: Internal Medicine, St. Vincent Hospital, Indiana, 2002-2005
Fellowship: Geriatric Medicine, Duke University Medical Center, 2005-2007

Robert W. Walters, MD, PhD
Dermatology
Particular Clinical Interests and Skills: General dermatology with a focus on acute care dermatology including the evaluation and management of new growths, lesions, or rashes
Faculty Rank: Medical Instructor
MD Degree: University of Iowa, 2003
Residency: Medicine, University of Iowa, 2004
Dermatology, Duke University Medical Center, 2007
Other: PhD, Physiology, University of Iowa, 2003

Cary C. Ward, MD
Cardiovascular Medicine
Particular Clinical Interests and Skills: Valvular heart disease, adult congenital heart disease, cardiac catheterization
Faculty Rank: Assistant Professor
MD Degree: University of Virginia, 1999
Residency: Internal Medicine, University of Texas Southwestern, 2002
Fellowship: Cardiology, Duke University Medical Center, 2007

Matthew J. Wolf, MD, PhD
Cardiovascular Medicine
Particular Clinical Interests and Skills: General cardiology, heart failure
Faculty Rank: Assistant Professor
MD Degree: Washington University, St. Louis, Missouri, 2000
Residency: Internal Medicine, Duke University Medical Center, 2000-2003
Fellowship: Cardiology, Duke University Medical Center, 2003-2007
Other: PhD, Washington University, St. Louis, Missouri, 2000

Aaron L. Woofter, MD
Gastroenterology
Particular Clinical Interests and Skills: General gastroenterology and hepatology; trained in therapeutic and biliary endoscopy, including ERCP and endoscopic ultrasound
Faculty Rank: Assistant Professor
MD Degree: The Ohio State University, 2000
Residency: Internal Medicine, Baylor College of Medicine, Texas, 2000-2003
Fellowship: Gastroenterology, Baylor College of Medicine, Texas, 2004-2007

Daniella A. Zipkin, MD
General Internal Medicine
Particular Clinical Interests and Skills: Patient-centered, evidence-based primary care internal medicine
Faculty Rank: Assistant Professor
MD Degree: University of California, San Francisco, 1999
Residency: Internal Medicine, NYU Primary Care, New York, 1999-2002
Fellowship: General Internal Medicine, Clinician-Educator Fellowship, University of California, San Francisco, 2002-2003

OBSTETRICS AND GYNECOLOGY

Millie A. Behera, MD
Reproductive Endocrinology and Fertility
Particular Clinical Interests and Skills: General infertility, assisted reproduction technologies, uterine fibroids, polycystic ovary syndrome, reproductive tract anomalies, minimally invasive surgery, premature ovarian failure, pubertal disorders, MRI-guided focused ultrasound
Faculty Rank: Assistant Professor
MD Degree: University of Saskatchewan, Canada, 1999
Residency: Obstetrics and Gynecology, University of Western Ontario, London, ON, Canada, 2004
Fellowship: Reproductive Endocrinology and Infertility, Duke University Medical Center, 2007

Susannah D. Copland, MD
Reproductive Endocrinology and Fertility
Particular Clinical Interests and Skills: Assisted reproductive techniques, female and male infertility, disorders of ovulation, premature ovarian failure, reproductive tract anomalies, recurrent pregnancy loss
Faculty Rank: Medical Instructor
MD Degree: Mayo Medical School, 1999
Residency: Obstetrics and Gynecology, Magee-Women's Hospital, Pennsylvania, 2003
Fellowship: Reproductive Endocrinology and Infertility, Emory University, Georgia, 2006
Other: MS, Clinical Research, Emory University, Georgia, 2007

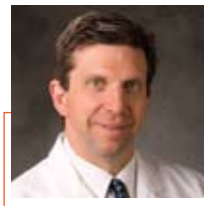
Aimee L. Ferrandino, MD
Gynecologic Specialties
Particular Clinical Interests and Skills: Gynecologic specialties
Faculty Rank: Assistant Professor
MD Degree: New York University School of Medicine, 2001
Residency: North Shore University Hospital, 2005

Serina E. Floyd, MD
General Obstetrics and Gynecology
Particular Clinical Interests and Skills: Family planning, contraceptive management, international women's health, domestic violence
Faculty Rank: Medical Instructor
MD Degree: UNC-Chapel Hill School of Medicine, 2001
Residency: Obstetrics and Gynecology, Duke University Medical Center, 2005
Other: MS, Public Health-Maternal and Child Health, UNC-Chapel Hill School of Public Health, 2000

Jennifer M. Rubatt, MD
Gynecologic Specialties
Particular Clinical Interests and Skills: Resident education, laparoscopic surgery, contraception, STD management and prevention
Faculty Rank: Clinical Associate
MD Degree: Medical College of Wisconsin, 2002
Residency: Obstetrics and Gynecology, Medical College of Virginia, 2002-2006

Jennifer M. Wu, MD
Urogynecology
Particular Clinical Interests and Skills: Urinary incontinence, pelvic organ prolapse, fecal incontinence, rectovaginal and vesicovaginal fistulas, minimally invasive surgery
Faculty Rank: Assistant Professor
MD Degree: University of California, San Francisco, 1999
Residency: Brigham and Women's Hospital/Massachusetts General Hospital, 2003
Fellowship: Urogynecology and Reconstructive Pelvic Surgery, UNC-Chapel Hill, 2007
Other: MPH, Epidemiology, UNC-Chapel Hill, 2007

OPHTHALMOLOGY



Karl G. Csaky, MD, PhD
Vitreoretinal Diseases and Surgery Service
Particular Clinical Interests and Skills: Vitreoretinal diseases and surgery
Faculty Rank: Associate Professor
MD Degree: University of Louisville, Kentucky, 1983
Residency: Duke University Medical Center, 1983-1985
Ophthalmology, Washington University, 1987-1990
Fellowship: Medical Retina, Johns Hopkins University, Maryland, 1990-1991
Biotechnology, National Cancer Institute, Maryland, 1991-1993

Kelly W. Muir, MD
Glaucoma Service
Particular Clinical Interests and Skills: Medical and surgical management of glaucoma as well as general eye disease, including cataracts
Faculty Rank: Assistant Professor
MD Degree: Duke University School of Medicine, 2001
Residency: Ophthalmology, Duke University Medical Center, 2005
Chief Residency, Duke University Medical Center, 2007
Fellowship: Glaucoma, Duke University Medical Center, 2006

Tina K. Singh, MD
Comprehensive Ophthalmology Service
Particular Clinical Interests and Skills: Management of common ocular diseases including cataracts, glaucoma, diabetes, and macular degeneration; surgical expertise in cataract surgery and corneal and ocular surface procedures
Faculty Rank: Assistant Professor
MD Degree: Brody School of Medicine, East Carolina University, North Carolina, 1997
Residency: Ophthalmology, Wake Forest University Eye Center, North Carolina, 2001
Fellowship: Cornea and Anterior Segment Disease, Wake Forest University Eye Center, North Carolina, 2002

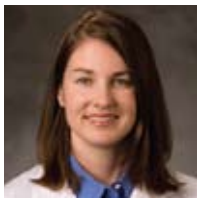
ON THE SPOT

Q. We understand you're working on a replacement for eye drops. How will this improve treatment of eye diseases?

A. New drug delivery technologies are the future for ophthalmology. Eye drops work really well, but if you're anything like me, only about one out of every 10 drops actually gets in your eyes, and nobody really likes to put drops in their eyes. It creates a compliance problem, especially in glaucoma sufferers or people who need to take drugs prophylactically—patients forget to take them, they can't take them, or after awhile they don't want to take them, especially if it's to prevent a problem they don't yet have. At Duke, we're developing drug delivery technologies that would allow us to put a very small drug-releasing device on the surface of the eye, where the patient can't feel it or see it. That would help ensure that patients are receiving the medication they need. Also, compared to eye drops, sustained drug delivery dramatically improves the distribution of drugs within the eye, so treatment is more effective. **—Karl G. Csaky, MD, PhD**

PATHOLOGY

Tammy L. Yanovitch, MD
Pediatric Ophthalmology and Strabismus Service
Particular Clinical Interests and Skills: Diagnosis and medical and surgical management of pediatric eye disorders and adult/childhood strabismus, screening and treatment of retinopathy of prematurity, special interest in children with Down syndrome and accompanying eye issues
Faculty Rank: Assistant Professor
MD Degree: University of Oklahoma, 2002
Residency: Internal Medicine, University of Oklahoma, 2002-2003 Ophthalmology, University of Oklahoma, 2003-2006
Fellowship: Pediatric Ophthalmology, Duke University Medical Center, 2006-2007



Amy L. Lark, MD
Pathology
Particular Clinical Interests and Skills: Surgical pathology, cytology, fine needle aspiration
Faculty Rank: Assistant Professor
MD Degree: UNC-Chapel Hill School of Medicine, 2001
Residency: Anatomic and Clinical Pathology, UNC-Chapel Hill, 2002-2006
Fellowship: Surgical Pathology, UNC-Chapel Hill, 2006-2007

Michael S. Waugh, MD
Pathology
Particular Clinical Interests and Skills: Surgical pathology and cytopathology; ENT pathology and gastrointestinal pathology
Faculty Rank: Assistant Professor
MD Degree: Duke University School of Medicine, 2001
Residency: Internal Medicine, Duke University Medical Center, 2001-2002 Pathology, Duke University Medical Center, 2002-2006
Fellowship: Cytopathology, Duke University Medical Center, 2006-2007

PEDIATRICS

Michael B. Armstrong, MD, PhD
Hematology-Oncology
Particular Clinical Interests and Skills: Hemoglobin disorders, sickle cell anemia, management of pediatric solid tumors
Faculty Rank: Medical Instructor
MD Degree: University of Minnesota, 2001
Residency: Pediatrics, University of Michigan, 2001-2003
Fellowship: Pediatric Hematology/Oncology, University of Michigan, 2003-2006
Other: PhD, Biochemistry, Biophysics, and Molecular Biology, 1999

Adrianne W. Bagley, MD
Neonatal-Perinatal Medicine
Particular Clinical Interests and Skills: Neonatal-perinatal medicine
Faculty Rank: Medical Instructor
MD Degree: Johns Hopkins School of Medicine, Maryland, 2001
Residency: Pediatrics, Johns Hopkins Hospital, Maryland, 2004

Joseph A. Jackson, MD
Primary Care Pediatrics
Particular Clinical Interests and Skills: Primary care pediatrics
Faculty Rank: Medical Instructor
MD Degree: University of Virginia School of Medicine, 2004
Residency: Pediatrics, Duke University Medical Center, 2007

Cassandra Moran, DO
Hematology-Oncology
Particular Clinical Interests and Skills: Pediatric oncology, experimental therapeutics/early drug development, pharmacokinetics of drugs used in children
Faculty Rank: Medical Instructor
DO Degree: Philadelphia College of Osteopathic Medicine, Pennsylvania, 1999
Residency: Pediatrics, Geisinger Medical Center, Pennsylvania, 1999-2002
Fellowship: UNC-Chapel Hill, 2002-2005 Post-Doctoral Research Fellowship, UNC-Chapel Hill, 2004-2006 Pediatric Pharmacology Research Unit Fellowship, Duke University Medical Center/UNC-Chapel Hill, 2003-Present
Other: PharmBS, Philadelphia College of Pharmacy and Science, Pennsylvania, 1991-1994

Laura E. Saldivar, MD
Primary Care Pediatrics
Particular Clinical Interests and Skills: General pediatrics, adolescent medicine, care of premature infants, Latino health issues
Faculty Rank: Assistant Professor
MD Degree: Stanford University School of Medicine, California, 1991
Residency: Pediatrics, Lucile Packard Children's Hospital at Stanford, California, 1991-1994

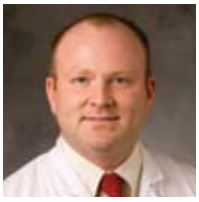
May K. Slowik, MD
Primary Care Pediatrics
Particular Clinical Interests and Skills: General pediatrics, quality improvement
Faculty Rank: Clinical Associate
MD Degree: University of California, San Francisco, 2003
Residency: Pediatrics, Duke University Medical Center, 2006

Edward C. Smith, MD
Neurology
Particular Clinical Interests and Skills: General child neurology with special interest in neuromuscular disorders
Faculty Rank: Medical Instructor
MD Degree: University of Mississippi Medical Center, 2002
Residency: Pediatrics, University of Mississippi Medical Center, 2002-2004 Pediatric Neurology, Duke University Medical Center, 2004-2007
Fellowship: Neuromuscular Medicine, Duke University Medical Center, 2007-present

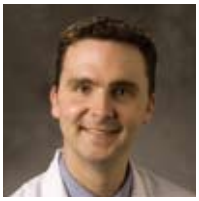
P. Brian Smith, MD
Neonatal-Perinatal Medicine
Particular Clinical Interests and Skills: Nosocomial infections in preterm neonates, drug safety and efficacy in neonates
Faculty Rank: Assistant Professor
MD Degree: Mercer University School of Medicine, Georgia, 2001
Residency: Pediatrics, Duke University Medical Center, 2001-2004
Fellowship: Neonatology, Duke University School of Medicine, North Carolina, 2004-2007
Other: MS, Clinical Research, Duke University, North Carolina, 2006

Kim P. Talikoff, MD
Hospital and Emergency Medicine
Particular Clinical Interests and Skills: Pain management and the cultivation of resilience in children who experience either acute or chronic illness
Faculty Rank: Medical Instructor
MD Degree: Brown University, Rhode Island, 1994
Residency: Family Medicine, Tufts University, Massachusetts, 1994-1995 Pediatrics, Montefiore Medical Center/AECOM, New York, 1995-1998
Other: MPS, Digital Media, NYU Tisch School of the Arts, New York

PSYCHIATRY AND BEHAVIORAL SCIENCES

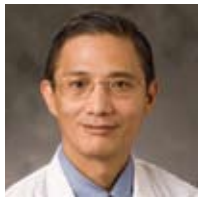


Eric J. Christopher, MD
Outpatient Psychiatry
Particular Clinical Interests and Skills: Treatment of disorders on the interface of medicine and psychiatry, administration
Faculty Rank: Assistant Professor
MD Degree: Medical College of Wisconsin, 1996
Residency: Internal Medicine and Psychiatry, Duke University Medical Center, 2001



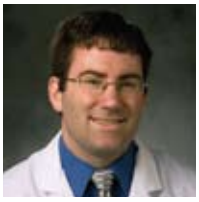
Tyler J. Story, PhD
Medical Psychology
Particular Clinical Interests and Skills: Neuropsychological assessment of adults with known or suspected central nervous system injury or illness; particular interests in traumatic brain injury, multiple sclerosis, and dementias
Faculty Rank: Assistant Professor
PhD Degree: University of California, Los Angeles, 2005
Residency: Geriatric Neuropsychology Internship, Resnick Neuropsychiatric Hospital, Geffen School of Medicine at UCLA, California, 2004-2005
Fellowship: Adult Clinical Neuropsychology Fellowship, Duke University Medical Center, 2005-2007

Jennifer Strauss, PhD
Medical Psychology
Particular Clinical Interests and Skills: Dialectical behavioral therapy, cognitive-behavioral and self-management interventions for anxiety, mood and Axis II disorders; specific expertise in post-traumatic stress disorder, sexual trauma, and adult sexual dysfunction
Faculty Rank: Assistant Professor
PhD Degree: Adult Clinical Psychology, University of Miami, 2001
Duke University Medical Center, 2001
Duke University and Durham VA Medical Centers, North Carolina, 2001-2003



Chunsheng Joseph Wang, MD, PhD
Outpatient Psychiatry
Particular Clinical Interests and Skills: Adult ADHD, anxiety, OCD, PTSD, mood disorders, late-life depression, pharmacotherapy and cognitive-behavioral therapy for healthy mental function
Faculty Rank: Clinical Associate
MD Degree: Peking Union Medical College, China, 1987
Residency: Psychiatry, Duke University Medical Center, 2002-2006
Fellowship: Psychopharmacology, Duke-GSK Joint Training Program, North Carolina, 2006-2007
Other: PhD, Neuroscience, University of Illinois at Chicago, 1997

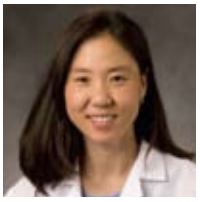
RADIATION ONCOLOGY



Christopher R. Kelsey, MD
Radiation Oncology
Particular Clinical Interests and Skills: Lung cancer, Hodgkin's and non-Hodgkin's lymphoma, central nervous system malignancies
Faculty Rank: Assistant Professor
MD Degree: University of Colorado, 2002
Residency: Radiation Oncology, Duke University Medical Center, 2007

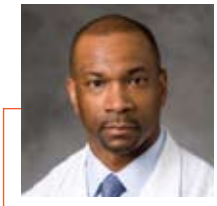
Bridget F. Koontz, MD
Radiation Oncology
Particular Clinical Interests and Skills: Prostate cancer, clinical trials, combination therapy
Faculty Rank: Assistant Professor
MD Degree: Harvard Medical School, Massachusetts, 2002
Residency: Internal Medicine Internship, UNC-Chapel Hill, 2002-2003
Radiation Oncology, Duke University Medical Center, 2003-2007

RADIOLOGY



Connie Kim, MD
Breast Imaging
Particular Clinical Interests and Skills: Breast imaging
Faculty Rank: Clinical Associate
MD Degree: University of Pittsburgh, Pennsylvania, 2001
Residency: Diagnostic Radiology, Western Pennsylvania Hospital, 2006
Fellowship: Breast Imaging, Duke University Medical Center, 2007

SURGERY



Carlos A. Bagley, MD
Neurosurgery
Particular Clinical Interests and Skills: Spine neurosurgery, spinal oncology, spinal reconstructive surgery
Faculty Rank: Assistant Professor
MD Degree: Duke University School of Medicine, 2000
Residency: Internship, General Surgery, Johns Hopkins Hospital, Maryland, 2000-2001
Neurological Surgery, Johns Hopkins Hospital, Maryland, 2001-2004
Fellowship: Spinal Surgery, Johns Hopkins Hospital, Maryland, 2004-2007

Mikal N. Bennett, MD
Emergency Medicine
Particular Clinical Interests and Skills: Shock, community dynamics and the ED
Faculty Rank: Assistant Professor
MD Degree: University of Medicine and Dentistry of New Jersey–New Jersey Medical School, 2004
Residency: Emergency Medicine, Duke University Medical Center, 2007

ON THE SPOT

Q. As a Duke medical school alumnus, what drew you back to join the faculty?

A. It's amazing how much Duke has grown since I was a student here, but the essence of what makes Duke unique is still the same. The institution as a whole has a tremendous sense of camaraderie and teamwork. Within the spine surgery program, we have people with a lot of neat ideas approaching problems from multiple angles—and all trying to achieve the same goals. That allows us to be more creative and innovative in the ways we treat patients. Having physicians who are fellowship-trained and experienced in techniques such as minimally invasive spine surgery and complex tumor resections allows us to draw on wide array of skill sets to address various spinal disease processes, from the most straightforward to the most complex. In addition, the close relationships between orthopaedics and neurosurgery enable us to draw on the strengths of everyone's individual disciplines, creating the optimal plan for each patient.

—Carlos A. Bagley, MD

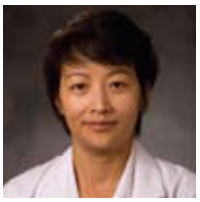
SURGERY *continued*

Gavin Britz, MD
Neurosurgery
Particular Clinical Interests and Skills: Treatment of cerebrovascular disorders (brain aneurysms, arteriovenous malformations, dural fistulas, arterial dissections, atherosclerotic diseases) and diseases affecting the skull base (meningiomas, chordomas, pituitary tumors, and craniopharyngiomas)
Faculty Rank: Assistant Professor
MB BCh Degree: University of Witwatersrand, South Africa, 1982-1987
Residency: University of Witwatersrand, South Africa, 1988-1990
Surgical Internship, Johns Hopkins Hospital, Maryland, 1992-1993
Atkinson Morley's Hospital, St. George's Medical School, University of London, Neurosurgery, 1998-1999
Resident, University of Washington, 1993-2002
Chief Resident, University of Washington, 1999-2000
Fellowship: Cerebrovascular Fellowship, University of Washington, 2000
Neuroradiology Fellowship, University of Washington, 2001-2002
Interventional Neuroradiology Fellowship, University of Washington, 2002-2003
Other: MPH, Epidemiology, University of Washington, 2003

Christopher K. Cicci, MD
Cardiovascular and Thoracic Surgery
Particular Clinical Interests and Skills: General cardiothoracic surgery, vascular/endovascular surgery, minimally invasive surgery
Faculty Rank: Clinical Associate
MD Degree: SUNY Health Science Center, New York, 1995
Residency: General Surgery, Carolinas Medical Center, North Carolina, 1995-2000
Cardiothoracic Surgery, Ochsner Foundation Hospital, Louisiana, 2000-02
Vascular/Endovascular Surgery, University of Tennessee, 2006-2007

James K. DeOrio, MD
Orthopaedic Surgery
Particular Clinical Interests and Skills: Lower extremity reconstruction, especially total ankle replacements and all other procedures involving the hind foot, midfoot, and forefoot deformities
Faculty Rank: Associate Professor
MD Degree: George Washington University Medical School, Washington, D.C.
Residency: Surgery, Wilford Hall Medical Center, Texas, 1978
Fellowship: Orthopaedics, Mayo Clinic, Minnesota, 1982

Harrison N. Jones, PhD
Speech Pathology and Audiology
Particular Clinical Interests and Skills: Neurogenic communication and swallowing disorders in adults, particularly speech abnormalities in individuals with movement disorders
Faculty Rank: Assistant Professor
PhD Degree: University of Florida, 2007
Residency: Clinical Fellow, Speech and Pathology Audiology Services, Lumberton, North Carolina, 1998-1999
Clinical Research Assistant, University of Florida, 2004-2007
Speech Pathology Pre-Doctoral Trainee, Brain Rehabilitation Research Center, Malcolm Randall VAMC, Florida, 2005-2007
Other: MA, Appalachian State University, North Carolina, 1998

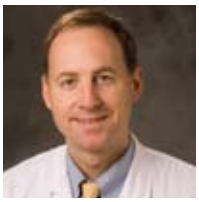


Gloria G. Liu, MD
Orthopaedic Surgery
Particular Clinical Interests and Skills: Non-operative management of spine problems; lumbar rehabilitation for musculoskeletal problems
Faculty Rank: Assistant Professor
MD Degree: Xian Medical University, P.R. China, 1983
Residency: Physical Medicine and Rehabilitation, University of Cincinnati, Ohio, 1995-1999
Other: MS, Pathology, Ohio University, 1991

Fernando A. Lopez, MD
Emergency Medicine
Particular Clinical Interests and Skills: Emergency medicine, ultrasound, internal medicine
Faculty Rank: Assistant Professor
MD Degree: University of Maryland Medical School, 2000
Residency: Internal Medicine, University of Maryland, 2000-2003
Emergency Medicine, Morristown Memorial Hospital, New Jersey, 2003-2006
Fellowship: Emergency Medicine Ultrasound Fellowship, Morristown Memorial Hospital, New Jersey, 2006-2007

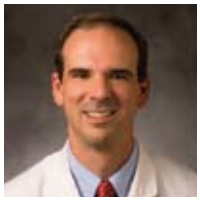
James A. McShane, MD
Emergency Medicine
Particular Clinical Interests and Skills: State of the art emergency care, resident education
Faculty Rank: Assistant Professor
MD Degree: UNC-Chapel Hill School of Medicine, 2003
Residency: Emergency Medicine, University of Pittsburgh, Pennsylvania, 2003-2006

Leila Mureebe, MD
General Surgery
Particular Clinical Interests and Skills: Vascular and endovascular surgery; diagnosis and management of the full spectrum of arterial and venous diseases; minimally invasive procedures for vascular disease including endograft repair of aortic aneurysms, angioplasty and stenting of the carotid, renal, and mesenteric arteries, and angioplasty and stenting of the arteries to treat peripheral vascular disease
Faculty Rank: Assistant Professor
MD Degree: Medical College of Pennsylvania, 1992
Residency: General Surgery, Medical College of Pennsylvania, 1999
Fellowship: Vascular Research, Harvard Longwood Fellowship, Massachusetts, 1995-1997
Vascular Surgery, Yale-New Haven Hospital, Connecticut, 1999-2001



Mark W. Onaitis, MD
Cardiovascular and Thoracic Surgery
Particular Clinical Interests and Skills: Thoracic oncology, general thoracic surgery, benign and malignant disease of the lung, esophagus, mediastinum and chest wall
Faculty Rank: Assistant Professor
MD Degree: Duke University School of Medicine, 1997
Residency: General Surgery, Duke University Medical Center, 1998-1999; 2001-2004
Thoracic Surgery, Duke University Medical Center, 2004-2007
Fellowship: Surgery Research, Duke University Medical Center, 1999-2001

Marc J. Richard, MD
Orthopaedic Surgery
Particular Clinical Interests and Skills: Upper extremity fractures, peripheral nerve injuries, wrist and elbow arthroscopy, arthritis surgery
Faculty Rank: Assistant Professor
MD Degree: University of Vermont, 2001
Residency: Orthopaedic Surgery, Boston University Medical Center, Massachusetts, 2001-2006
Fellowship: Hand, Upper Extremity, and Microvascular Surgery, Duke University Medical Center, 2006-2007



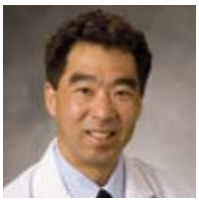
Randall P. Scheri, MD
General Surgery
Particular Clinical Interests and Skills: Endocrine surgery including disorders of the thyroid, parathyroid glands, and adrenal glands; specialized skills in minimally invasive techniques including radioguided parathyroidectomy (MIPS); thyroidectomy with recurrent laryngeal nerve monitoring, and laparoscopic adrenalectomy; surgical oncology including malignant diseases of the breast and melanoma; specialized skills and interest include clinical trials, sentinel lymph node biopsy, neoadjuvant endocrine therapy, and neoadjuvant chemotherapy for breast conservation
Faculty Rank: Assistant Professor
MD Degree: University of Virginia, 1996
Residency: General Surgery, Barnes Hospital/Washington University, Missouri, 1996-2003
Fellowship: Surgical Oncology, John Wayne Cancer Institute, California, 2004-2007

Sarah A. Stahmer, MD
Emergency Medicine
Particular Clinical Interests and Skills: Cardiac arrhythmics, ultrasound, graduate medical education
Faculty Rank: Associate Professor
MD Degree: Cornell University Medical College, New York, 1984
Residency: Internal Medicine, The New York Hospital, 1984-1987
Fellowship: Cardiology, Hahnemann University Hospital, Pennsylvania, 1987-1988

Rebekah R. White, MD
General Surgery
Particular Clinical Interests and Skills: Surgical oncology with special interest in hepatobiliary, pancreatic, and upper gastrointestinal tumors
Faculty Rank: Assistant Professor
MD Degree: Duke University School of Medicine, 1997
Residency: General Surgery, Duke University Medical Center, 1997-2005
Fellowship: Surgical Oncology, Memorial Sloan-Kettering Cancer Center, New York, 2005-2007

John E. Scarborough, MD
General Surgery
Particular Clinical Interests and Skills: General surgery, trauma surgery and surgical critical care, abdominal organ transplantation
Faculty Rank: Assistant Professor
MD Degree: Duke University School of Medicine, 1998
Residency: General Surgery, Duke University Medical Center, 1998-2005
Fellowship: Surgical Critical Care, Duke University Medical Center, 2005-2006
Abdominal Organ Transplantation, Duke University Medical Center, 2006-2007

Alfonso Torquati, MD
General Surgery
Particular Clinical Interests and Skills: Minimally invasive surgery with focus on foregut and bariatric surgery
MD Degree: University of Rome Tor Vergata, School of Medicine, Italy, 1988
Residency: General Surgery, University of Rome Tor Vergata, Italy, 1988-1993
General Surgery, Oregon Health Sciences University, 1996-2000
Fellowship: Post-Doctoral Research Fellow, Department of Surgery, Oregon Health Sciences University, 1995-1996
Laparoscopic Surgery, Vanderbilt University, Tennessee, 2001-2004
Other: MSCI, Vanderbilt University School of Medicine, Tennessee, 2003



Linton L. Yee, MD
Emergency Medicine
(also Pediatrics/Hospital and Emergency Medicine)
Particular Clinical Interests and Skills: Resident and medical student education as well as sports injuries, head trauma, cardiac emergencies
Faculty Rank: Associate Professor
MD Degree: John A. Burns School of Medicine, University of Hawaii, 1988
Residency: Pediatrics, Baylor College of Medicine, Texas, 1989
Pediatrics, Harbor-UCLA Medical Center, California, 1991
Fellowship: Pediatric Emergency Medicine, Children's Hospital Los Angeles, California, 1994

Search Duke's comprehensive Physician Referral Directory online at dukehealth.org/physician_search

Gifts from individuals and organizations are the largest source of non-government support for Duke's research, education, patient care, and service missions. Here are some recent examples of philanthropic partnerships that will make a difference to human health for generations to come. **To learn more about how you can become a partner with Duke Medicine, please call 919-667-2500 or visit development.mc.duke.edu.**

Williams family honors son Sandy with scholarships for scientists

Since the day their son enrolled in Duke University School of Medicine in 1970, **Charlotte L. and Claude Williams Jr.** have continually been impressed with the thoroughness, flexibility, and opportunities that a Duke education and training afforded him.

"It has opened avenues so he could do anything in the world he wanted to," says Charlotte. "That says a lot for Duke Medicine: that you are able to follow your dreams."

It is the marriage of extreme pride for their son, Senior Vice Chancellor for Academic Affairs **R. Sanders "Sandy" Williams, MD'74, HS'77-'79**, and their deep desire to help young scientists that led the Williamses to donate 20,000 shares of Wachovia Bank stock valued at just over $1 million to fund The R. Sanders (Sandy) Williams Medical Scientist Scholarship Fund through a charitable gift annuity.

The scholarship endowment will benefit MD/PhD and Medical Scientist Training Program (MSTP) students in the School of Medicine.

Preparing Duke medical students for the future is something that Sandy Williams is especially passionate about.

Charlotte L. and Claude Williams Jr.

"Duke has long been a pioneering institution in encouraging physicians to complement their clinical training with extended periods of rigorous laboratory science," he says. "I believe the best biomedical science and the best medicine occur in an environment where fundamental biology and clinical medicine come closer together."

The MD/PhD program's purpose is to add a significant research component to medical education, training physician-scientists (MD/PhDs) for high-level research careers in the medical sciences and in academic medicine.

Graduates of Duke's more than 40-year-old program go on to significant roles in biomedical research and academic medicine. They populate biomedical research institutions and academic institutions throughout the United States.

The Duke MSTP is a partnership program with the National Institutes of Health. The Duke program is one of the most diverse in the country, with an underrepresented minority enrollment of 13 percent and a current female enrollment of 42 percent.

"From the early days Sandy's interest has been in research. He always wanted to be in academic and not private practice medicine," Claude says. "We talked to him about this (gift) and he said he'd like it to support young medical scientists."

"This major gift from my wonderful and loving parents will offer opportunities to future medical students," says Sandy. "Without such philanthropic support, our ability to provide such an experience to students is quite limited."

Sandy Williams, MD, and his wife, Jennifer, at medical school graduation, 1974.

Claude, 85, is a former small-town media entrepreneur who owned part of a community radio station and community newspaper and later was principal owner of an outdoor advertising business. He says with a laugh that there came a time when "I borrowed so much money from banks that I wanted to see what it looked like from the other side."

So he started a community bank—Georgia National—that was eventually bought by South Trust, which was later bought by Wachovia Bank.

He is a graduate of the University of Georgia-Athens (UGA) ROTC Program and spent 36 months in active duty during World War II.

Charlotte earned her PhD at UGA and was on faculty there for 17 years as a professor of education in the Division of Exceptional Children before retiring in the early 1980s.

"As parents we really owe something to Duke," Charlotte says. "We strongly believe in supporting students in training. It's a long, hard road."

One thing they have learned over the years, they say, is that government funding for scientific research can be fickle.

"This gift will provide dollars that can be counted on," Claude says.

For more information about Duke Medicine's charitable gift annuity program, please see the ad on page 64.

Personalizing cancer treatment


Anil Potti, MD

When his wife Emilene was fighting lung cancer, **Sumner Brown** of Phoenix, Arizona, developed a close relationship with Duke assistant professor of medical oncology **Anil Potti, MD**. Potti, who has a joint appointment in Duke's Institute for Genome Sciences & Policy (IGSP), was conducting promising research to help physicians treat lung and other cancers with greater precision. Potti used genomic profiling to characterize individual tumor cells and then tracked their response to different chemotherapy drugs. He found that certain molecular characteristics determine which cancer cells will respond to one chemotherapy drug over another.

Although Mrs. Brown lost her battle with cancer in December 2006, her husband hopes his gift of $600,000 will benefit others fighting cancer. The Emilene Brown Genomic Cancer Research Fund will fund Potti's research, now in human clinical trials for lung, breast, and ovarian cancer, as well as the work of young investigators in his lab who are studying the mechanisms of cancer initiation and progression.

"I am very appreciative of my friendship with Mr. Brown and the continued relationship between him and the IGSP," says Potti. "This funding will help advance our understanding of genomics related to cancer and should help us save many lives each year."

Hope at the crossroads for Carolina kids

Longtime lumber industry leader **George Ragsdale** says children and the hospitals that care for them "touched a special place in my heart." Since the mid-1980s Ragsdale, who also co-founded the Carolina Crossroads mega-music and entertainment venue in Roanoke Rapids, North Carolina, has been a regular and generous contributor to Duke Children's and the Children's Miracle Network through the N.C. Log-a-Load for Kids program. Now Carolina Crossroads has donated $1 million in profits from last year's outdoor concerts to provide unrestricted support through the Children's Miracle Network—$500,000 for Duke Children's and $500,000 to University Health Systems of Eastern North Carolina's Children's Hospital.

Nursing scholarship honors alumna

Thomas and Myrtle Jones of Stamford, Connecticut, have given $100,000 to endow a scholarship in memory of their daughter, the late **Debbie Jones Mordaunt, N'75,** right, with her former Duke roommate, **Susan T. Miner, N'75**. Mr. Jones's employer, General Electric Corporation, contributed $50,000 in matching funds, and additional matching by Duke University's Financial Aid Initiative brought the total endowment to $300,000.

Renowned alumnus creates urology lectureship

Victor A. Politano, MD'43, HS'44-'45, '50-'53, and his wife, Aida, of North Miami, Florida, have given $100,000 to establish the Politano Lecture in the Division of Urologic Surgery. A graduate of the School of Medicine and a former resident in urology at Duke, Politano served on Duke's urology faculty before moving to the University of Miami School of Medicine in 1962, where he was chairman of the Department of Urology from 1971-1991. An internationally renowned urologist, Politano is known for his many contributions to pediatric and adult urology.

Duke Hospice celebrates groundbreaking

More than 60 friends and supporters of Duke Hospice celebrated the groundbreaking for a 12-bed, 15,100-square-foot hospice house in November. **John W. Mallard Jr.**, president & CEO of Cardinal State Bank and a long time Durham resident, will serve as chair of the development committee, spearheading a community initiative to raise a total of $2.5 million in capital funding over the next three years. Two lead gifts—$1 million from Durham developer **Gary Hock** and $100,000 from **Robert Machemer, MD**, Duke chair emeritus of ophthalmology, and wife, **Christine Machemer, MD**—along with gifts from others in the community have brought the total raised to date to more than $1.2 million. Construction on the new facility, located beside Duke's Teer House community education center on Roxboro Road, is scheduled to begin in January, with opening targeted for January 2009.


From left: Paul Newman, vice president for ambulatory care, Duke University Health System; MaryAnn Black, associate vice president, community relations; Gary Hock, owner, Hock Development Corporation; Ellen Reckhow, chair, Durham County Board of County Commissioners; and Starr Browning, executive director, Duke HomeCare & Hospice

When you establish a charitable gift annuity with Duke Medicine, you become a partner in research that saves lives—in our community and around the world.

SAMPLE DUKE ANNUITY RATES

SINGLE PERSON

Age	*Rate*
65	6.0%
70	6.5%
75	7.1%
80	8.0%

MARRIED COUPLE

Age	*Rate*
65/65	5.6%
70/70	5.9%
75/75	6.3%
80/80	6.9%

With your gift of cash or stocks, Duke will establish a charitable gift annuity in your name and pay you a lifetime annuity. Upon your passing, the remaining funds can support Duke's groundbreaking medical research, education for tomorrow's best doctors and nurses, or any area of Duke Medicine you choose. You qualify for a charitable tax deduction and avoid capital gains taxes.

For more information about how you can make a difference with a Duke Medicine charitable gift annuity, please contact Joseph W. Tynan, JD, director of gift and endowment planning for Duke Medicine, at tynan002@mc.duke.edu or 919-667-2506. Visit us on the Web at development.mc.duke.edu.

DukeMedicine

A charitable gift annuity was the perfect vehicle for Charlotte L. and Claude Williams Jr. to honor their son, Sandy, Duke's senior vice chancellor for academic affairs (above left). Their gift will establish a scholarship fund for promising young medical scientists. (See page 62 of *DukeMed Magazine*.)

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.

DUKE CME CALENDAR

ON SITE

COURSE	DATE	LOCATION	CREDIT	REGISTRATION
ANESTHESIOLOGY				
Duke Winter Anesthesia & Critical Care Review	March 9, 2008	Breckenridge, CO	20 credits	919-681-6437
The First Great American Fluid Debate	March 27, 2008	Sonoma, CA	13.75 credits	919-681-9660
Emerging Technologies in the OR	May 8, 2008	Orlando, FL	17 credits	919-681-6437
11th Annual Cardiothoracic Regional Update	July 6-10, 2008	Hilton Head Island, SC	32 credits	919-681-6752
CARDIOLOGY				
10th Annual Duke Medicine Spring Cardiovascular Symposium: Acute Cardiac Emergencies	April 18, 2008	Brier Creek Country Club Raleigh, NC	8.5 credits	919-401-1201
11th Annual Cardiothoracic Regional Update	July 6-10, 2008	Hilton Head Island, SC	32 credits	919-681-6752
INFECTIOUS DISEASES				
African American Women & HIV: A Community Forum	March 7, 2008	Durham, NC	5.5 credits	919-401-1208
INTERDISCIPLINARY				
1st Annual Meeting of the Society for Spirituality, Theology, and Health: Spirituality, Health, and Human Flourishing: Meaning, Measurement, Implications	June 25-27, 2008	Duke University Fuqua School of Business, Durham, NC	9 credits	919-660-7556
Duke Medicine Community CME Series	Monthly through October 2008	Various sites throughout NC	1 credit	919-419-5046
NEUROLOGY				
6th Annual Advanced EMG Chemodenervation Workshop	March 7-9, 2008	Durham, NC	19.5 credits	919-668-2222
ONCOLOGY				
Perspectives in Colorectal Cancer	February 8, 2008	Charleston, SC	8.5 credits	919-419-5506
Focal Therapy and Imaging of Prostate Cancer	February 21, 2008	Washington Duke Inn Durham, NC	14 credits	919-684-4056
Duke Debates: Controversies in Management of Patients with Hematologic Malignancies	March 7, 2008	Asheville, NC	11 credits	919-419-5506
PEDIATRICS				
Katz-Wilfert Update in Pediatric Infectious Diseases	April 19, 2008	Durham, NC	7.5 credits	919-684-6335
RADIOLOGY				
Musculoskeletal Magnetic Resonance Imaging–Visiting Fellowship	February 4, 2008 and April 7, 2008	Durham, NC	28 credits	919-684-7272
A Practical Approach to Musculoskeletal MRI	February 16, 2008	Las Vegas, NV	20 credits	919-684-7228
UROLOGY				
Duke Urologic Assembly	April 6, 2008	Aventura, FL	19.5 credits	919-684-6106

ONLINE

COURSE	DATE	CREDIT	REGISTRATION
PEDIATRICS			
Evidence-Based Management of Pediatric Mental Illness: Advanced Teletraining for Primary Care Providers	Recurring	1 credit	pediatrics.duke.edu/modules/dept_peds_educ_cme/index.php?id=3
RESEARCH ETHICS			
Conflicts of Interest in Research with Human Participants	Recurring	Up to 1 credit	researchethics.duhs.duke.edu
Social Sciences Research in Medical Settings			
Protecting the Confidentiality and Privacy of Patients			
Protecting Research Subjects			
What Counts as Research with Human Subjects?			
Children Involved as Subjects in Research			
Ethical and Regulatory Considerations When Bringing a Medication to Market			
Informed Consent for Research			
Research in Emergency Settings			
Using Databases in Research			

These activities have been approved for *AMA PRA Category 1 Credits*.

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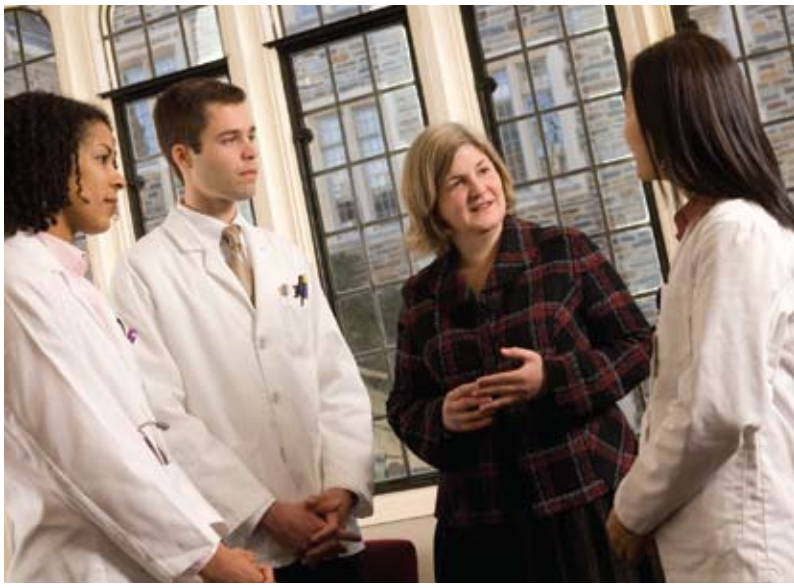
VOLUME 8, ISSUE 1, WINTER 2008

BECOMING TRUE BLUE

On October 1, 2007, Duke University School of Medicine welcomed a new dean: Nancy Andrews, MD, PhD. A New Englander most of her life, Andrews first visited Duke last spring—but she's quickly made up for lost time. "Since I was first approached about this position I've done everything I can to learn about Duke and the people who make it so great," she says. "Duke has a great tradition but it's also a very forward-looking and outward-looking institution—I'm honored to become a part of it." In fact, her blood is already running Duke blue, if her glee at the start of basketball season is any measure. "During my career I've been at Yale, Harvard, and MIT, but this will be first time I've been at a school with a decent basketball team."

Learn more about the new dean, pp. 20-21.



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