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SURVIVING THE **30-HOUR DAY**

Current shift rules are no walk in the park

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The art of healing

Internist Ruth Parker sees a void in pre-med education. Chemistry and biology are good prep courses, but what about the art of healing? Do students know how they would define compassion? Every summer Parker leads a course that pushes students to contemplate the depths of their own compassion. Read more on page 7.

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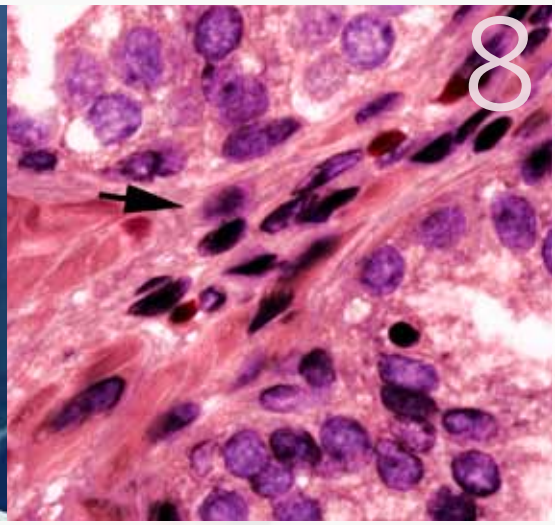

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At left: Students of Emory's Italian Studies Program observe a sculpture of a charioteer from the fifth century B.C. on Motya, off the coast of Sicily. Read about one of the program's courses, medicine and compassion, on page 7. This photo and one on page 7 by Jess Bowling.

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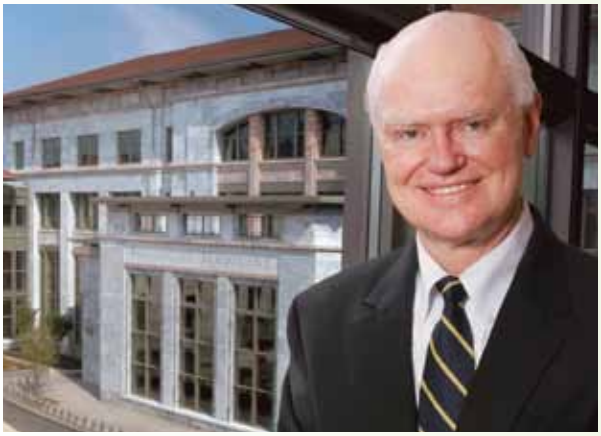
Dean's Message

A doctor's new year

This year is a special year for me. I am serving a one-year term as chair of the board of directors of the Association of American Medical Colleges (AAMC). The AAMC represents all 133 accredited U.S. and 17 accredited Canadian medical schools and 400 major teaching hospitals. That translates to 125,000 faculty members, 75,000 medical students, and 106,000 residents.



The AAMC is working on many important issues that affect you as a practicing physician and as a patient yourself. Three high profile areas are health care reform, increasing the number of doctors in the United States, and refining medical education.

How health care reform plays out is yet to be seen. Implementation of one of the biggest measures—the proposal to cover at least 20 million uninsured Americans through Medicaid in 2014—is uncertain. There are many players in this debate, and certainly no solution will satisfy everyone, but what is at stake is people's access to health care. The AAMC has lent its expertise to inform the White House and Congress and will continue to advocate for health care coverage for all Americans.

No matter what version of health care reform is enacted, the shortage of doctors will grow. This country faces a short fall of more than 90,000 physicians by 2020 and only produces 27,000 new doctors each year. As many as one third of all practicing physicians may retire in the next 10 years. The AAMC continues to work with medical schools to increase access as one way to combat the shortage. Like many other medical schools, Emory has increased our enrollment about 15% over the past four years and will consider further expansion.

Medical school curriculums are being modified throughout the nation. While still appropriately emphasizing the basic sciences, there is increasing emphasis placed on patient experiences very early in medical school. Quality of care, patient safety, access to care, and empowerment of patients are all key elements of curriculum changes in many medical schools. I am proud to say that Emory embraced these issues and many more when we introduced our new curriculum four years ago.

Together we can continue to help steer the nation's health care agenda and the dialogue on the issues affecting our future.

Sincerely,

Thomas J. Lawley
Dean

In Brief

The whale shark is brought to you by the letters **A, C, T, and G**

At the Georgia Aquarium, the whale shark is king of the sea. Scientists there know that whale sharks can grow up to 40 feet long—they are the world's largest fish—but they don't know why they grow so big. Nor do they know how are they related to other fish, or if they are members of one family or of dozens of smaller ones. The person who may be able to fish out those answers is Tim Read.

Read, head of Emory's GRA Genomics Center, is working with Georgia Aquarium scientists to produce the world's first genome of the whale shark. In cataloging the fish's DNA, they hope to unlock the mysteries of the whale shark.

"Mapping the genome is like an encyclopedia of life—it gives scientists the ability to ask questions," Read says. "In the architecture of the genome, it's a bit like archeology. We can see the history of the whale shark in its tissue."

How did Read find himself in this role. He was looking for a large complex project to test a lab machine and contacted the aquarium. The machine, which reads genetic sequences, or letters, is the size of a small copier and is relatively new in the field of genetics. Just 10 years ago, an entire lab would be needed to map a genome. One run of the machine can produce 100 billion letters. The human body, for example, has 3 billion. Read estimates that the whale shark may have 6 billion letters. All living organisms have the same four letters, A, C, T, and G (adenine, cytosine, thiamine, and guanine) in different combinations on each DNA molecule.

Sequencing the whale shark will take months, he says. In the meantime, the aquarium's gift shop is selling aquatic-themed Silly Bandz to support the whale shark DNA project.

The Genome Center has mapped smaller projects, including butterflies, dirt, and Lake Lanier. Read sees great potential for the center in cancer research. "Cancer is primarily a genetic disease," he says. "If we found specific mutations within certain cancers, we could potentially use genomics to tell us which drugs to use to treat them."

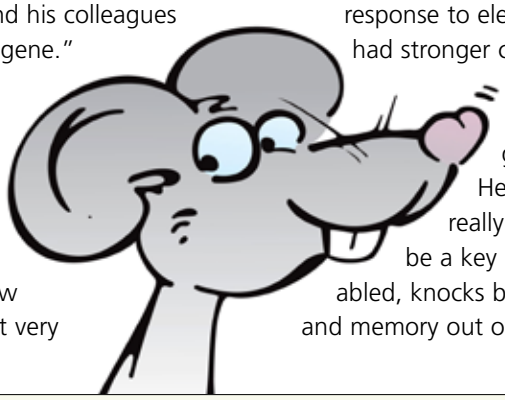
In Brief

'Homer' gene **limits mouse memory**

Deleting a certain gene in mice can make them smarter by unlocking a mysterious region of the brain.

Mice with a disabled RGS14 gene are able to remember objects they had previously explored and learn to navigate mazes better than regular mice, suggesting that the gene's presence limits some forms of learning and memory. Since RGS14 appears to hold mice back mentally, Emory pharmacologist John Hepler and his colleagues have dubbed it the "Homer Simpson gene."

RGS14 regulates several molecules that process brain signals known to be important for learning and memory. RGS14 is primarily turned on in one particular part—the CA2—of the hippocampus, a region of the brain known to consolidate new learning and form new memories. But very little is known about the CA2 region, says Hepler.



Neurons in the hippocampus will strengthen their connection after a new memory forms, but CA2 neurons do not. The loss of certain CA2 neurons is known to play a role in schizophrenia.

Hepler and his team were surprised to find that, in mice with a disabled RGS14 gene, the CA2 region was capable of robust long-term potentiation. In response to electrical stimulation, neurons there had stronger connections.

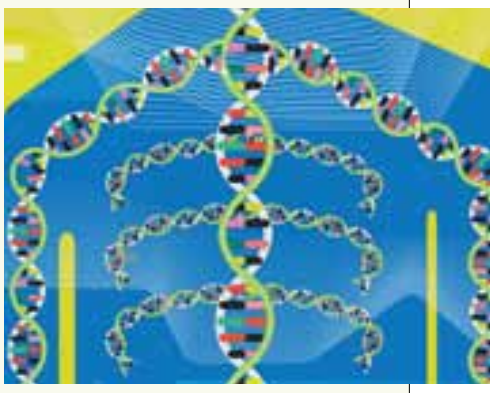
"A big question this research raises is why would we have a gene that makes us less smart?" Hepler says. "I believe that we are not really seeing the full picture. RGS14 may be a key gene that, when missing or disabled, knocks brain signals important for learning and memory out of balance."—*Quinn Eastman*

The American Medical Student Association gave the School of Medicine an "A" on its conflict-of-interest policy. Just 19, out of 152 U.S. medical schools, received such a high mark.

A safer way to regenerate blood vessels

A patient's own blood cells may regenerate blood vessels damaged by heart attack or peripheral artery disease, and the method may be safer and less arduous than using rare stem cells.

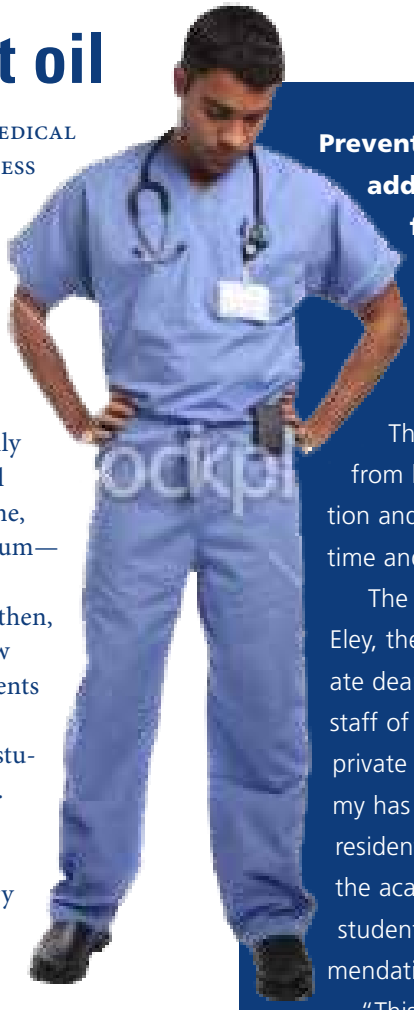
Recent trials have shown that a patient's bone marrow cells support the growth of nearby blood vessels. "Based on this idea, we wanted to identify a population of cells enriched with the capacity to regenerate blood vessels," says Emory cardiologist Young-sup Yoon.



Yoon and his team focused on the molecule CD31, found on the surface of some endothelial cells lining the inside of blood vessels. Using donated blood from volunteers or mouse bone marrow cells, the researchers showed that cells with CD31 secrete hormones that support the growth of blood vessels. In the lab, cells with CD31 formed tubular structures that mimicked the growth of blood vessels.

Harvesting cells with CD31 may have several advantages over stem cells, Yoon says. The cells can be prepared without the need to grow them in a dish for several days, and large volumes of patient's blood or bone marrow may not be necessary.

Burning the **midnight oil**



Remember those all-nighters in medical school and those seemingly endless shifts as a resident? At times, you felt emotionally exhausted and disconnected. For some, those feelings were anything but temporary. Studies have confirmed that many residents experience burnout. But new research is pointing to the conclusion that burnout may begin in medical school.

Emory emergency medicine physician Sally Santen surveyed 249 medical students several years ago at Vanderbilt University. At that time, Vanderbilt had a traditional medical curriculum—classroom lectures first and second years and clinical work beginning in year three. (Since then, Vanderbilt and Emory have implemented new curriculums that get students in front of patients their first year.)

She found that 21% of first-year medical students experienced moderate or high burnout. But burnout peaked in the second and third years of medical school.

More recently, Santen surveyed 105 Emory medical students during their second year, and while data are preliminary, overall she found fewer Emory students experienced burnout than their previous Vanderbilt counterparts. For example, 26% of Emory medical students experienced depersonalization, compared with 57% at Vanderbilt in the old curriculum.

Preventing burnout is about maintaining balance, Santen says. Students should have solid support systems to act as a base to balance what she calls "life's seesaw."

Preventing burnout was one topic addressed in a new guide for first-year medical students.

Emory's medical school gave each first-year student a copy of *A Guide to Medical School Success*, written by Emory faculty.

The booklet offers advice ranging from how to study to building concentration and memorization skills to managing time and priorities.

The idea for the booklet came from Bill Eley, the medical school's executive associate dean for medical education, and the staff of the Benjamin Franklin Academy, a private high school in Atlanta. The academy has been assisting medical students and residents with learning problems. Eley and the academy's staff thought all first-year students could benefit from the recommendations.

"This is everything I wish I had known in medical school," says Eley. "Students nowadays think they can multi-task. One student recently told me that he's gone back to taking notes on paper, rather than on a laptop, since using the laptop proved to be such a distraction."

Are Depressed People **Too Clean?**

Rates of depression have steadily grown, and researchers think it may be because of the loss of healthy bacteria. Emory neuroscientist Charles Raison has identified data that suggests that the modern world has become so clean that we are deprived of the bacteria our immune systems came to rely on to keep inflammation at bay. **"We have known for a long time that people with depression, even those who are not sick, have higher levels of inflammation,"** says Raison.

In Brief

New phase I trials unit

Emory's Winship Cancer Institute has opened a phase I trials unit. Dedicated space was needed because patients often spend extensive time at the unit for precisely timed blood draws and monitoring of potential side effects, says the unit's director, Donald Harvey. The unit is the largest in Georgia, and Winship will apply for a U01 grant from the National Cancer Institute, which would give it unfettered access to the NCI portfolio of novel compounds. Thirty-five of the 66 NCI-designated cancer centers have phase I trial units, and only 13 of them are U01-designated.

Three students who caught our eye

Every August, the School of Medicine receives its latest crop of great students. From the Class of 2014, *Emory Medicine* chose three to highlight.

Hawkins Gay was an investment banker and started the nonprofit Malaria NetWorks with two other bankers to provide mosquito nets to Ghana. **Chun Li** was a champion fencer at MIT. After school, she worked in a hospital lab and competed in more than 100 ballroom dancing competitions. **Gretchen Snoeyenbos** co-captained a rugby team in college before heading off to Mali as a Peace Corps volunteer. There she worked with a hospital on sewage and wastewater projects.

School of Medicine student **Gretchen Snoeyenbos** worked with a women's group to restart a garden and dug a well to provide year-round access to water in Mali.

Unseen **Risk**

The wonders of space travel captivate many astronauts. They see the stars, the moon, and the Earth, but what they don't see is the radiation they are exposed to in space.

Radiation exposure in space can occur from high energy charged particles (HZE), which damage DNA, but no epidemiological data for human exposure to HZE particles exist. Now Emory and Medical College of Georgia (MCG) researchers are teaming up to study how this radiation type may induce lung cancer in astronauts.

The National Aeronautics and Space Administration recently awarded the researchers a $7.6 million grant to establish a NASA Specialized Center of Research (NScOR).

Emory's NScOR will study how the body's stress response to HZE particles increases the risk of cancer. While there is no data on HZE exposure to people, some estimates have been made from studies of uranium miners and Japanese atomic bomb survivors, says Ya Wang, director of the NScOR at Emory. Animal experiments show that HZE particles induce more tumors than other forms of radiation. Since lung cancer is a leading form of cancer, astronauts are expected to be at greater risk than the general public.

Finding the **roots of compassion**

Carlo Levi was a doctor, but he was hardly a willing participant in the practice of medicine. In the mid-1930s, Levi was sentenced for participating in anti-fascist political activism in Italy. Instead of serving time in prison, Levi was forced to doctor to the peasants who lived in and around the caves in Matera, a small town in the arch of the Italian boot. In time, Levi's resentment eased, and he came to share in their joys and sorrows of everyday life.

What lessons does Levi's experience have for today's aspiring doctors? Sitting in a cave in Matera this past June, twenty-some Emory undergraduate students were discussing how Levi's experiences changed him. Levi's book, *Christ Stopped at Eboli*, about his experiences in Matera, is just one of a handful of readings about medicine and compassion that the students read in this course. The Medicine and Compassion course, part of Emory's Italian studies abroad program, was started seven years ago by Emory internist Ruth Parker, who felt that many pre-med students were so focused on their science studies that they neglected to consider the art of healing.

Emory students (above) in Matera, Italy, the small town where one doctor's life changed. Internist Ruth Parker (left) developed a course on medicine and compassion.

"The goal is that we want students to define compassion for themselves as it relates to healing," Parker says. "In the course, we spend a lot of time talking about the practice of medicine without compassion. We are so drawn to the science and technology, but we have to couple that with values that can guide ethical decision-making, which will help us figure out what to do in unexpected situations, like in rising floodwaters in a post-Katrina hospital. What do you do when the technology can't be supportive?"

Readings and discussions go from ancient to modern times: the medieval plague, Nazi doctors, the Tuskegee experiments, capital punishment, pediatric oncology, and malaria. In addition to class discussions, students journal and visit places that relate to the readings, such as a museum on medieval torture and one of the first anatomical theaters in western Europe.

CDC epidemiologist Paul Cantey 98M 01MR 03MPH helps teach the course, which is open to all undergraduates, regardless of their major. "A lot of students see things as black and white—there's a right answer, there's a wrong answer," he says. "On a biochemistry test that's true, but when you are dealing with human beings, there's a lot of gray. This is the course where we look at the gray."

Arian Hatefi 05C 11M says the course helped him appreciate the important distinction between physician and scientist. "That distinction is being blurred, and this course helped me understand that even when the limits of science have been reached, it is the physician who can still do more by sharing in the experience of suffering," he says.

Parker hopes that prospective doctors will think back to the course as they practice in the years to come.

"Unfortunately I don't think that many of us who are health care providers would say that the practice of medicine is characterized by habitual compassion," she says. "I think it's wonderful to say, 'But what if it were?'"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A VIRUS of INTEREST

| By Martha Nolan McKenzie

XMRV may be a *wanted suspect* in cases of prostate cancer

In early September, a group of scientists, physicians, and epidemiologists gathered at the National Institutes of Health headquarters for the 1st International Workshop on XMRV—a recently discovered retrovirus that has generated considerable controversy due to conflicting findings regarding its possible link with prostate cancer.

While the conference did little to dispel the disparities between the scientific camps finding evidence of XMRV in prostate cancer samples and those finding none, it did establish who a leader in the search for answers would be, Emory. "One thing that became very clear at the conference is that Emory is at the epicenter of XMRV issues," says Raymond Schinazi, professor of pediatrics and chemistry at Emory's Center for AIDS Research and a conference attendee.

This cunning retrovirus may well need such a powerhouse to wrest its secrets. XMRV—or xenotropic murine leukemia virus-related virus—was first identified in prostate tumors in 2006 by researchers at the Cleveland Clinic and University of California at San Francisco. Their study found XMRV present in 40% of prostate tumor samples of one phenotype and in 1.5% of samples of two other phenotypes. However, subsequent studies by other labs, including a study of 800 prostate cancer cases by researchers at Johns Hopkins, found no evidence of the retrovirus. XMRV also has been linked with chronic fatigue syndrome, with similarly conflicting results. A group of CDC researchers couldn't find XMRV or related viruses in patients with chronic fatigue syndrome (CFS) or healthy controls, but an FDA and NIH team did.

*On opposite page, clockwise from top, Jerry Blackwell, John Petros, Ross Molinaro, Francois Villinger, Raymond Schinazi (center)

In 2008, in an attempt to get to the bottom of the divergent findings, the CDC enlisted multiple academic centers to study the retrovirus, supplying many with prostate cancer samples from the vast archives of John Petros, an Emory urologist. "I've been doing prostate cancer research for 17 years, and I've accumulated thousands of specimens from hundreds of patients," says Petros. "I had never heard of XMRV when the CDC approached me about using some of my samples for its study. But it made me wonder whether I should start looking into it, so I turned to my a colleague who knows everything about retroviruses for advice."

That colleague was Emory scientist Dennis Liotta, who along with Schinazi in 2005 developed a major new AIDS drug, Emvitra, earning the university the largest licensing fee awarded at the time. Liotta not only convinced Petros to pick up the study of XMRV, he funded his lab and four others. "That was huge," says Petros. "You couldn't get grant support for it at that time because it was too novel for the NIH. Only one grant had been funded, for the University of Utah. Even Robert Silverman [the Cleveland Clinic researcher who originally identified XMRV] had not gotten his grant funded yet."

At the same time, but independent of the Liotta-funded labs, Schinazi began collaborating with Ila Singh, the University of Utah pathologist who had garnered the only NIH grant. In addition, Abbott Diagnostics contacted Francois Villinger, a pathologist at Emory's Yerkes National Primate Research Center, to develop a nonhuman primate model of the retrovirus. In all, seven labs at Emory are studying XMRV.

Developing a reliable, repeatable test

The first order of business for Emory researchers was to develop an effective diagnostic test to identify XMRV. "We cannot as a scientific community begin to answer the basic questions of XMRV transmission, frequency in the population, association with disease, etc., until we can effectively test for infection," says Petros. "If this virus, in fact, promotes prostate cancer and CFS, we need to be able to screen the blood pool and organ donors for it to prevent transmission."

A test to identify XMRV had to be extremely sensitive since the retrovirus is very hard to detect. "The thinking is that it's probably sexually transmitted, and people probably get it in their 20s or 30s," says Petros. "But they don't develop prostate cancer until their 50s, 60s, or 70s. So by the time you are looking at a man with prostate cancer, the virus is present in very low numbers, making it very hard to find."

Petros had the good fortune to have on his team a scientist who had expertise in using a neutralizing antibody assay for HIV/AIDS. Jerry Blackwell, a vaccinologist with the Emory Vaccine Center, was able to quickly adapt the HIV/AIDS assay to XMRV.

The immune system produces neutralizing antibodies in response to a virus. Detection of these antibodies indicates that the person is either currently infected with the virus or has been at some point. Though this assay proved very effective at identifying HIV antibodies, Blackwell was not certain it would work for XMRV.

"They are both retroviruses, and they are distantly related, but we didn't know if the tools that we had for detecting HIV neutralizing antibodies would work for XMRV," says Blackwell. "It turns out, they did. And since we had most of the expertise and tools that were needed already in place, we were able to develop the XMRV assay very quickly."

Blackwell initially screened the serum of 40 prostate cancer patients and detected XMRV in 11 of them, or 27%.

To confirm these findings, Petros took prostate tissue samples from a subset and handed them over to Emory clinical chemist Ross Molinaro. Molinaro had worked at the Cleveland Clinic as graduate student with Silverman when he discovered XMRV, and Molinaro himself developed the initial FISH assay for the virus.

FISH (fluorescent in situ hybridization) works like a lock and key system to identify cells infected with XMRV. "If you think of XMRV as a lock in the tissue, the key we use is a cocktail of fluorescently labeled nucleic acids that match the lock," says Molinaro. "After the keys find the locks in the tissue, we can then specifically identify the XMRV-infected cells when looking under a microscope."

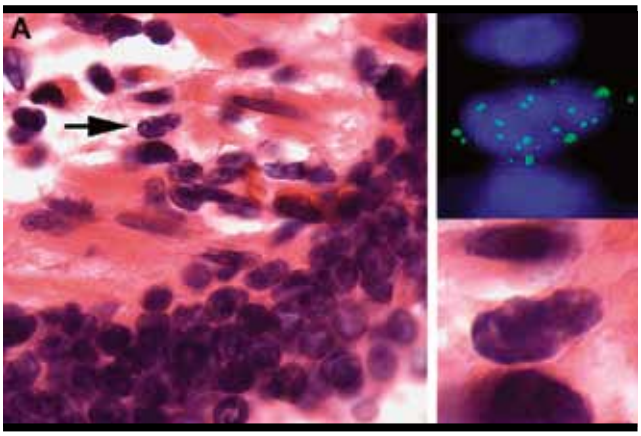
Molinaro did find evidence of XMRV in all the serum antibody-positive patients, but detection was difficult. "In XMRV-infected patients, we found that only 1% to 8% of cells within the prostate harbor XMRV nucleic acids," says Molinaro. "Therefore it may be easy to miss XMRV amongst the large background of other nucleic acids when the viral load is very low."

Finally, Petros used additional tissue samples from the same subset, extracting their DNA. He performed a PCR (polymerase chain reaction) amplification and was able to detect the viral RNA sequence of XMRV. "We ran three separate blinded tests—albeit on a small number of specimens—in three separate labs on serum and tissue from the same patients, and we got concordant results," says Petros.

Using monkey serum to develop tests for early detection

While Petros and his colleagues were working to develop a human diagnostic test for XMRV, researchers at Yerkes

were taking a page from early AIDS investigations, trying to use monkey serum to develop blood tests to detect virus antibodies. "Patients with prostate cancer may be seen many, many years after the XMRV infection takes place," says Francois Villinger, a pathologist at Yerkes. "If you want to prevent transmission, it's not very practical to wait until that late stage. You need early detection."



FISH (fluorescent in situ hybridization) works like a lock and key system to identify cells infected with XMRV.

Toward that aim, Villinger injected three rhesus monkeys with XMRV and followed them for about nine months. He found that all the monkeys developed antibodies to XMRV during the second week of infection, and he identified three proteins that had the greatest response. Villinger then developed three assays to detect the XMRV-specific antibodies. "These assays demonstrated good sensitivity and specificity, so they will facilitate large-scale epidemiologic studies of XMRV infection in humans," says Villinger.

Villinger, along with Silverman, further found that viral replication peaked on day seven, and he could detect the virus in the blood of the infected animals for only a month. During the early acute infection phase, Villinger found extensive viral replication in epithelial cells of the prostate. However, when he looked at prostate cells nine months later, he could not see any viral replication. He then looked for viral nucleic acids with FISH and found some infected cells. "The virus was still there but not replicating," says Villinger. "So we know the virus made it to the prostate, but it was controlled there."

Villinger also found the virus in a number of other organs, including the testes of the male monkeys and the cervix and vagina of the female one. "That's important because it could indicate that XMRV is sexually transmitted," says Villinger.

Using AIDS drugs to treat XMRV

Unaware of the XMRV research his colleagues were conducting, Schinazi teamed up with the University of Utah's Singh to test 45 anti-HIV compounds against XMRV in cell cultures.

They identified four drugs that are effective against XMRV, three of which have already been approved by the FDA to treat AIDS and one of which has been shown to be effective in monkeys with simian immunodeficiency virus, a close cousin to HIV.

The most potent drug against XMRV turned out to be raltegravir, produced by Merck and sold under the commercial name Isentress. The FDA initially approved raltegravir in 2007 only for persons whose HIV infection was resistant to other drugs, but in 2009 its approval was expanded to all HIV cases.

Raltegravir represents a new class of antiretroviral drugs because it inhibits the integrase enzyme, preventing the virus from invading a cell's DNA. Other drugs against HIV inhibit either the reverse transcriptase enzyme, which copies the virus' genetic information, or the protease enzyme, which carves up newly produced viral proteins so that viruses can be assembled. However, none of the protease inhibitors inhibited XMRV in culture.

The other three drugs that were effective against XMRV were AZT and tenofovir DF—both reverse transcriptase inhibitors—and another integrase inhibitor.

"We tested the drugs singly and in combination," says Schinazi. "We believe XMRV will probably mutate and some drug resistance will develop. So it will be very important to use a combination of drugs, in much the same way AIDS is treated.

"My interest now is to understand why some drugs that work against HIV work against XMRV and others don't," continues Schinazi. "I'm also interested in discovering the method of transmission. And what happens in the brains of patients who are infected. There is a lot of interesting work yet to be done."

Indeed, the amount of work that lies ahead was evident at the September NIH conference. "One of the most surprising things at the conference was that not only is there disagreement about whether XMRV is associated with prostate cancer or CFS, but both sides are getting better and better data supporting their positions," says Petros. "That tells me we still have a long way to go." **EM**

By Lilli Kim Ivansco

The 30-hour day

Older docs may scoff, but one Emory resident's experience shows that the present shift rules are no walk in the park

December is a rough time of year to be on the wards at a teaching hospital. The interns are tired of working all the time; the residents are tired of the interns whining all the time; the attending physicians are wondering why they had to get stuck with a tired, whiny team during the holidays. Nobody wants to be there. Even the malingerers ask when they're going to be discharged.

As an intern on the wards in December 2008, I was plenty tired and whiny. The patients were sicker than usual, which meant their care was more involved, which meant my pager went off more frequently. On overnight calls that month I rarely slept more than an hour. Even at home, in my own bed, the hospital public address system invaded my dreams, waking me with imagined code alarms in the still of the night.

So during a lunchtime conference, when the speaker mentioned a proposal to mandate naps for residents, my ears naturally perked up. That is, after the intern sitting next to me elbowed me in the ribs and hissed, "Wake up. You got to hear this."

The proposal was that residents working 30-hour shifts be provided with a five-hour "protected sleep period" sometime between 10 p.m. and 8 a.m. It was one of a series of recommendations issued that month by the Institute of Medicine in the interest of lessening sleep deprivation among residents and ultimately reducing fatigue-related medical errors.

As an esteemed nongovernmental organization best known to the general public for sounding the alarm on medical errors in the United States, the IOM carries weight among legislators and health policy makers. Hence, residency programs across every state and specialty were scurrying to dissect the new recommendations and their potential ramifications, holding meetings like the noon conference I was trying not to sleep through.

As heartily as I would have applauded some officially sanctioned shut-eye at that moment, I found it difficult to embrace stricter limits on resident work hours without reservation, mainly because it seemed like we were still struggling to cope with the existing rules. Yes, our call shifts were limited to a maximum of 30 hours, but this meant the last six hours of call consisted of a frantic scramble to round on patients, scribble progress notes, drop orders, call consulting services, and sign out to a fellow intern, all before turning into a pumpkin at the stroke of 1 p.m. True, we were blessed with an 80-hour workweek—how sweet, only twice as long as the standard for most American employees and probably six times that of the French—but at the cost of being constantly hounded to log our duty hours in 15-minute increments and getting called on the carpet to explain violations, no matter how minor, should they occur.

But the most significant issue, as I saw it, was that resident work hour restrictions as yet had failed to effect a sea change in the culture of the teaching hospital, where dedication is measured by the zeal of one's self-sacrifice and working past the point of exhaustion is regarded as a virtue. While residency programs by and large have risen to meet the enormous logistical and bureaucratic challenges of the new era, old attitudes die hard, as driven home by every physician who feels compelled to distinguish his or her training experience from mine. It's not necessarily out of arrogance; sometimes the comments just slip out; that's how ingrained the mind-set is.

"This was before duty hour rules," they say. Or my personal favorite, "That was when we still worked all the time," because 80 hours per week is basically the next thing to semi-retirement.

One morning on rounds after another sleepless night on call, I yawned broadly enough for the attending to admire my back teeth fillings.

"Tired, are we?" he said in a kindly tone.

I nodded.

"I remember rounding after call, wishing my attending would stop talking so much and just hurry up," he chuckled. I squirmed and looked away. "I can't tell you how many times I dozed off while leaning on the chart cart and woke up when it started to roll out from under me. Oh, those were the days..."

Here it comes, I told myself. Wait for it...

"Of course," he mused, "that was before the 80-hour rule."

Of course it was. And doctors also used to taste their patients' urine to check for diabetes. Progress is good, right?

Nonetheless, I guarantee that at least two-thirds of the doctors reading this who trained before the advent of duty hour restrictions have referenced how much harder they worked than we do now. Come on, you know who you are: fess up. I swear if I were to win the Nobel Prize 40 years from now there probably would be an asterisk next to my name: *Worked no more than 80 hours per week during residency.

In all fairness, part of the issue may be that limiting resident work hours remains a relatively novel concept; when I started internship, duty hour restrictions had been in effect at the national level for only five years.

THE OLD "NEW" RULES

Prior to 2003, some interns worked more than 100 hours per week. It was standard practice for medical trainees to put in 36-hour stints every three or four days, and not uncommonly residents remained on duty in the hospital, or "in-house"—hence the term resident—for even longer.

Every teaching hospital in the nation has a legend about a resident, usually a neurosurgeon but sometimes an orthopedist, who abandoned the effort to maintain an outside life and simply moved full-time into a hospital call room, thereby not only saving on rent and laundry but also eliminating that pesky commute. Every resident claims to know someone who was so exhausted after call, he crashed his car/couldn't find his apartment/mistook his wife for a hat stand. The stories might be apocryphal, but they illustrate the undisputed truth: residents were working far in excess of the legal and sensible limits for any government-regulated industry, let alone one in which others' lives are at stake.

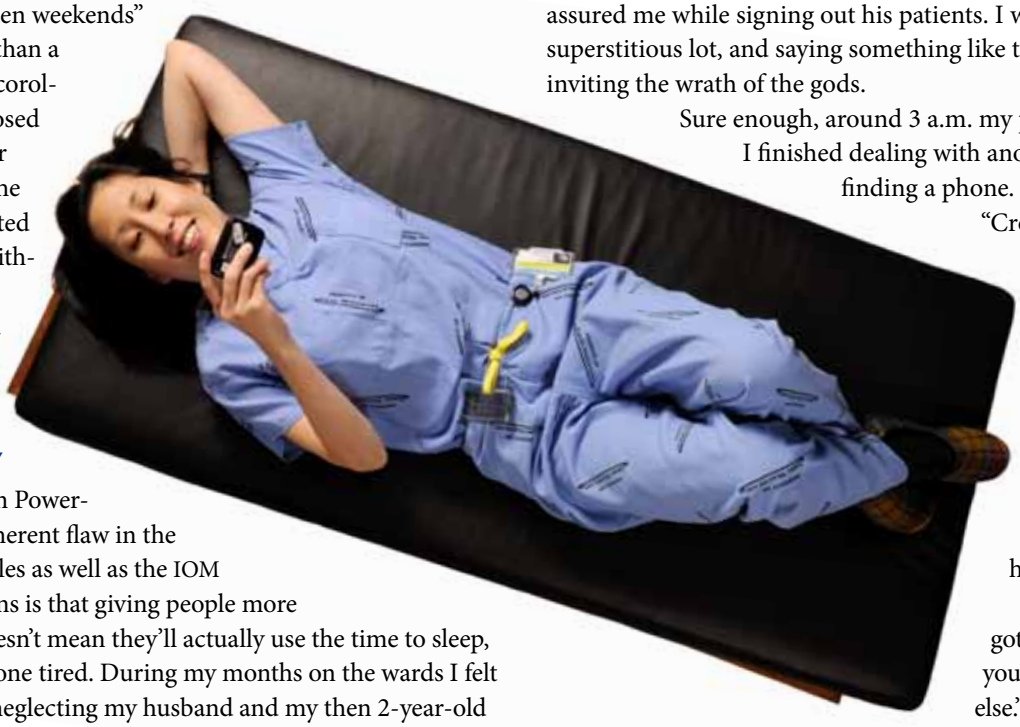
This last point became the crux of legal and media firestorms ignited by an outraged Sidney Zion after his daughter Libby died at a New York teaching hospital. A college freshman, Libby Zion suffered a fatal cardiac arrest while under the care of an intern and a second-year resident on call. Whether Zion's 1984 death was attributable to the exhausted state of the trainees remains a matter of debate, even today; it is generally agreed, however, that her unfortunate case was the seminal event that ultimately led to the development of formal rules limiting resident work hours.

These restrictions, developed by a commission led by and named for Bertrand Bell, were put into practice within the state of New York in 1989. It took another 14 years and the added threat of federal legislation and regulation for the

rules to be implemented nationally by the Accreditation Council for Graduate Medical Education (ACGME), which governs medical residency programs throughout the United States.

In broad terms, the 2003 ACGME restrictions stipulated that residents could work up to 30 hours per shift and an average of 80 hours per week, with in-house call limited to every third night. The rules also required that residents have a minimum of 10 hours off between shifts and a total of four days off per month.

The IOM recommended increasing the latter to five days off per month, including one 48-hour period. Under the existing rules, such "golden weekends" are a gift rather than a birthright. As a corollary to the proposed five-hour nap for 30-hour shifts, the IOM also suggested limiting shifts without a protected sleep period to a maximum of 16 hours.



IN REALITY

It looked good in PowerPoint. But an inherent flaw in the 2003 ACGME rules as well as the IOM recommendations is that giving people more time to sleep doesn't mean they'll actually use the time to sleep, even if they're bone tired. During my months on the wards I felt so guilty about neglecting my husband and my then 2-year-old son, any so-called free time went toward trying to make it up to them. Okay, so I ended up falling asleep on date night and while reading *Green Eggs and Ham*, but at least I tried.

Ironically, I couldn't sleep well after overnight call, between hearing phantom code alarms and agonizing over whether I'd handled certain situations correctly. Typically I found myself awake after a few fitful hours. Sleep scientists undoubtedly have an elegant explanation for this phenomenon, but my personal theory is that my body gets confused. Usually I just got up and pretended to be refreshed.

Another conundrum stems from the unalterable fact that a hospital is a 24-hour operation whose patients require around-the-clock care. To bring resident work hours into compliance with the 2003 ACGME rules, many institutions moved toward nighttime "cross-cover" systems in which interns and residents on overnight call cover patients on several other teams besides their own. The advantage is that fewer trainees have to work overnight; the disadvantage is that those on call barely know most of the patients for whom they are responsible. Shorter shifts translate into more frequent transfers of care, which in turn have been shown to be a source of delays in medical diagnosis and management as well as errors.

Furthermore, cross-cover is based on the erroneous theory that covering several dozen patients should be manageable because most of them sleep quietly all night. The reality is that the complicated patients go right on having complications, while even the straightforward patients find ways to wreck.

"My patients won't give you any trouble," an intern once assured me while signing out his patients. I winced. We are a superstitious lot, and saying something like that aloud is just inviting the wrath of the gods.

Sure enough, around 3 a.m. my pager went off. I finished dealing with another patient before finding a phone.

"Cross-cover, returning a page," I said when someone picked up.

"This patient has lice!" hissed an angry voice without preamble.

"I'm sorry?"

"This patient has li—"

"Lice, okay, I got it. I was just hoping you said something else."

I still haven't quite forgiven that intern for jinxing me.

A third and utterly serious issue is the question of adequate training. If I sound a touch defensive about my luxurious 80-hour workweek, it's because I'm acutely aware that reduced work hours perforce means fewer learning opportunities. I may chafe at having to work nights and weekends, but I want to be ready for the real world when I finally enter it.

The question is not whether today's medical trainees receive the same amount of experience as their predecessors—we don't, end of story—but whether we receive enough training to prepare us for independent practice upon graduating from residency. This is especially a concern for surgical specialties in which skill level often directly corresponds to the number of procedures performed, but all areas of medicine will have to pay close attention to the quality of training in the years ahead.

It seems attention to the quality, not just the quantity, of the time residents spend at work will become even more critical in the near future. In September 2010, after months of information-gathering and review, the ACGME approved revisions to the

How much is that resident in the window?

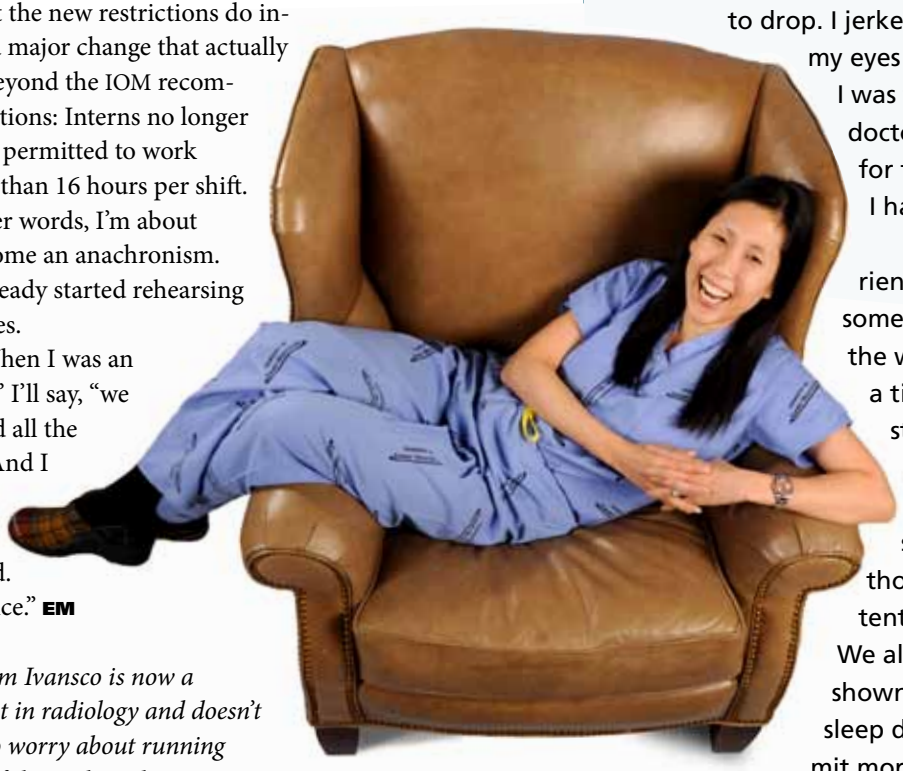
Now you can fund a resident's scholarship through the School of Medicine's Adopt-a-Resident Program. The funds enable a resident to attend a national conference and pay for textbooks. Your commitment of $10,000 over four or five years is awarded to one resident and follows the resident throughout training. Contact Rachel Donnelly at 404-727-3127 or rachel.donnelly@emory.edu.

work hour restrictions, to take effect in July 2011 at the start of the academic year.

The new rules make no mention of a fifth day off per month or a guaranteed golden weekend. The overall 80-hour rule remains more or less intact, based on the determination that the 80-hour limit achieves a reasonable balance between "service, education, and rest." And the ACGME stopped well short of mandating five-hour naps on call, although "strategic napping…is strongly suggested."

But the new restrictions do include a major change that actually goes beyond the IOM recommendations: Interns no longer will be permitted to work longer than 16 hours per shift. In other words, I'm about to become an anachronism. I've already started rehearsing my lines.

"When I was an intern," I'll say, "we worked all the time. And I never complained. Not once." **EM**



Lilli Kim Ivansco is now a resident in radiology and doesn't have to worry about running afoul of the 80-hour limit.

Time served

It's high time to change the structure of residencies

By Michael M.E. Johns

When I was a junior surgical resident some years ago, I was assisting my attending surgeon on an abdominal surgery. I had been on duty for hours, up all night, and my only job that morning was to hold the retractor. No big deal, I thought, I had been working the long-long shifts all year.

But I soon felt my eyes close, and my head started to drop. I jerked my head up and blinked my eyes several times, realizing that I was falling asleep. I wasn't the doctor ultimately responsible for this patient, but what if I had been?

Most residents have experienced sleep deprivation to some degree. We have all heard the war stories—the one where a tired resident accidentally stuck her stethoscope in the refrigerator or the resident who couldn't remember his spouse's name—but behind those humorous tales are potentially serious consequences. We all know, and studies have shown, that residents who are sleep deprived and fatigued commit more medical errors, are more

likely to incur needle stick injuries, and have a higher incidence of automobile accidents. As I look back, I should not have been in the operating room that day after a long shift without sleep for more than 24 hours, so I'm pleased to see the ACGME enact a 16-hour shift limit for first-year residents. (The ACGME does allow those in their second year of residency and beyond to work up to 24-hour shifts.)

The most common argument I hear against the new ACGME rules relates to the educational experience—longer shifts allow residents to follow patients for an extended time and experience continuity of care. Experience with continuity of care can be learned in daylight as well as in the middle of the night. The best way for interns and residents to learn medicine is to use their time wisely. I applaud the ACGME's recommendations about duty hours, but the ACGME also promulgated many other requirements that go beyond duty hours and will not only assure the safety of residents and their patients but also will enhance the educational experience.

Michael M.E. Johns *is chancellor of Emory University after leading the university's health sciences for more than 10 years. He was dean of the Johns Hopkins School of Medicine and vice president of the medical faculty. He is an otolaryngologist-head and neck surgeon.*

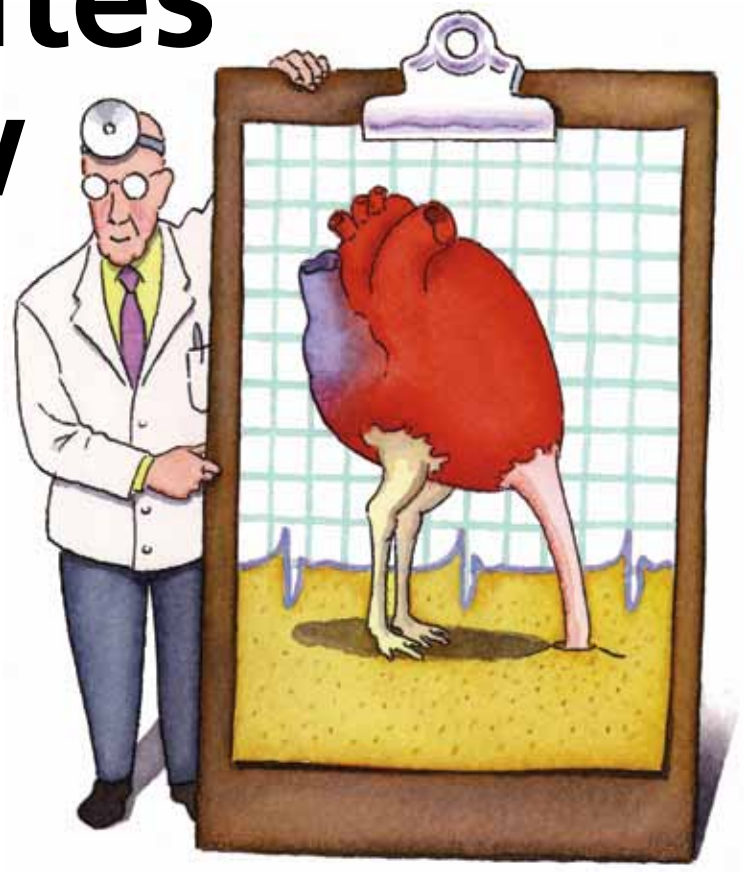
Now is the time to shift our attention to what I believe is the real issue at hand: what matters in residency training is not the hours worked but what residents do during those hours. Medicine has changed tremendously in the past decade, so an evaluation of how residencies are structured is long overdue. Residency education needs to focus on outcomes and competencies, not just time served. Residents should have time for meaningful clinical encounters, critical thinking, study, and reflection.

Over the years, we have successfully shortened patients' length of hospital stays, but at the same time, our residents seem to be functioning as clinical service machines. They are admitting and managing the care of more and more patients, all the while keeping the clinical service covered and enhancing hospital "throughput." A lone resident covering a couple dozen or so patients on the night shift is not what is best for patients or residents. More important, residents require adequate supervision based on their level of training.

One of the most significant changes to graduate medical education in the past several decades is the extensive proliferation of new subspecialties and with that, longer training time in almost every discipline. While this is a logical and justified response to the enormous and beneficial expansion of our medical knowledge and the development of new technologies, we must consider revising and shortening the time to complete that subspecialty training, not just pile years on. One approach is to shorten the time in core specialty training and track the resident into their subspecialty training sooner. This is already being done in several surgical disciplines and could be done across the board. We might start by asking what will the resident *really* be doing when they are in practice and develop the curriculum around that. Given the projected physician shortage and to say nothing of the large debt burden that so many of our medical students graduate with, we would be doing good for both society and the residents.

Most U.S. medical schools, like Emory, have done a good job of revising their curriculums using modern learning theory and technologies. New curriculums are more patient-centered and more nimble to address the ever-changing field of medicine. The naysayers are gone, and the new approaches are embraced by students and faculty. Medical educators now must turn their attention to the changes needed in graduate medical education. **EM**

Five minutes from now



Concealed in the lines of data parading across bedside monitors are clues of immediate threats to ICU patients

By Sylvia Wrobel

Tuesday, 10 p.m. More than 150 patients are receiving intensive care in one of Emory Healthcare's critical care units. Teams of critical care professionals—nurses, physicians, respiratory therapists, pharmacists—stand guard. Streams of data flash across the bedside monitors.

Five minutes from right now, one of those patients will require urgent intervention, possibly from an abnormal heart rhythm, a seizure, or a sudden drop in blood pressure. One of the teams will swing into action, working to reverse the process and save a life. But what if the team knew a few minutes in advance that the patient in bed 11 would face a serious life threat? With that information, could the team prevent the problem instead of treat it?

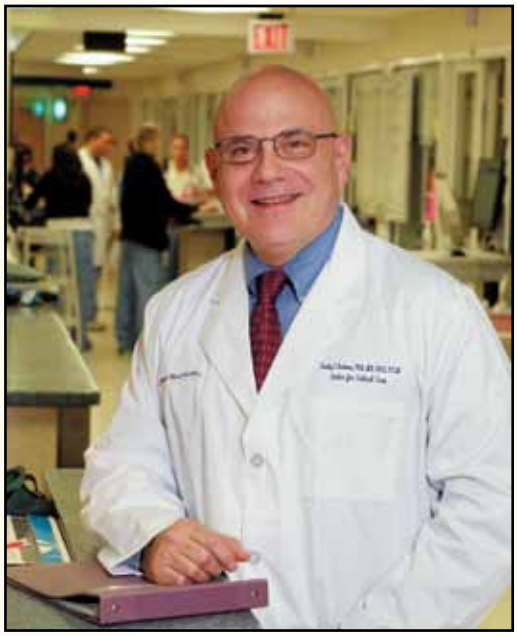
Tim Buchman, founding director of Emory's Center for Critical Care, expects to do just that.

Buchman, who came to Emory in 2009 and describes himself as a "recovering trauma surgeon," is taking predictive health to the bedside of Emory's most vulnerable patients. "Most of predictive medicine is focused on a long time line, typically using genetics to manage risks for chronic illnesses such as heart disease and cancer," Buchman says. His focus is on ferreting out immediate threats to life—before those threats become obvious.

The clues are in plain sight, says Buchman, concealed in the lines of data parading across the bedside monitors. "We look, but because of the way the data are conventionally displayed, we see patterns as we expect them to be."

Take regularity. Generations of physicians and nurses were taught that health is fundamentally regular, and that regularity should be encouraged if not enforced. Three square meals. Twenty-eight day menstrual periods. Even the cryptic abbreviations scattered through the medical chart reinforced the thinking: a normal heart exam was coded "RRR," regular rate and rhythm.

Wrong on all counts, says Buchman. "Feel your own pulse," he says. "Take a deep breath in and hold it for a few seconds. Then exhale completely and hold it for a few seconds. Feel your pulse slow and speed up? That's adaptive variability."



Tim Buchman is founding director of Emory's Center for Critical Care.

That capacity for moment-to-moment adaptation in response to changing physiologic demand is the true signature of health, says Buchman. The loss of adaptive capacity—increasing regularity in the face of everyday changes in our immediate environment—signals that something is wrong and the patient is at risk for sudden deterioration.

"We challenge patients as part of routine care, with fluids, drugs, and machines like respirators," Buchman says. "They ought to respond by varying their physiology. When they fail to respond, we need to pay attention."

Detecting those responses involves more than glancing at the bedside monitors. Those familiar displays, unchanged over four decades, present only a few seconds worth of data before the tracing runs off the end of the screen.

"A few seconds is surely the right time scale to see how patients are responding to treatment of a life-threatening event, but the loss of variability leading up to the event occurs over minutes, or even hours," he says.

The displays need to be redesigned to present clinicians with new and more meaningful information. Clinicians are reluctant to embrace variability as a vital sign, says Buchman. In fact, many traditional treatments in the ICU, such as ventilators, force regularity onto patients.

But Buchman invites a simple experiment. "Find a watch with a sweep second hand, and try to take a breath of the same volume every five seconds. We call this metronomic breathing, because it is in perfect time. After about a minute, you'll find you can't keep time."

While many ICUs force just such regularity into patient physiology, Buchman and his teams favor the opposite. At Emory University Hospital, for example, the most common ventilator mode is ASV or adaptive support ventilation. "We use the most advanced ventilators available. They can vary the size of the breaths and the interval between those breaths while minimizing the work of breathing—just as our natural physiology expects."

Reconstituting and sustaining that natural variability might be important in other physiologic systems. Ten days into a critical illness, patients have typically lost most of their normal variation in hormone levels such as cortisol, the growth hormone, and prolactin. "We're not sure if those losses are the result of the critical illness or the treatments. But patients have to recover at least some variability in order to get out of the ICU," says Buchman.

"Today, we're studying the waveforms of patients who go on to have a life-threatening event, teasing out the regularity and testing new metrics of variability—seeing how frequently patterns of heart rate and blood pressure repeat themselves—to see whether the repetition has predictive value in other patients.

"We are prototyping new ways of displaying the data that we routinely collect. We have to be able to compare a patient's current trajectory with her path an hour ago, and moreover to compare both of those with similar patients.

"With the right metrics, and better displays, we might be able to peer a few minutes into the future." Just far enough to prevent disaster and guide the patient back on course. **EM**

The Emerging Role of Fenestrated and Branched Aortic Endografts in the Treatment of Complex Aortic Aneurysms

Endovascular repair of abdominal and thoracic aneurysms has become widely accepted, especially for elderly and high-risk patients, due to decreased blood loss, shorter recovery, and decreased morbidity and mortality associated with these procedures. However, approximately half of patients with abdominal aortic aneurysms are not suitable candidates for endovascular repair using commercially available stent grafts as a result of unfavorable anatomy, including juxtarenal, paravisceral, hypogastric and thoracoabdominal involvement and short or angulated aortic necks.

Conventional open-surgical repair may be appropriate for healthy patients contraindicated for endovascular procedures, but those with large aneurysms or concomitant conditions that affect cardiac, pulmonary or renal performance have a high risk of operative complications. For these patients, fenestrated and branched stent grafts may offer a viable option.

Fenestrated and branched stent grafts were designed to extend the proximal sealing zone so that patients with short or absent aortic necks can be considered for total endovascular repair.

These devices are similar to other stent grafts, but with the addition of reinforced fenestrations or cuffed branches to allow the incorporation of renal and visceral arteries without compromising sealing requirements. First used in 1996, their design, as well as implantation techniques, have since been refined considerably, and they are now used in select high-risk patients with complex aneurysmal presentations throughout the entire length of the aorta.

A surgeon-modified fenestrated stent graft immediately prior to implantation. Image courtesy of Joseph J. Ricotta II, MD

Unfortunately, these devices are not yet commercially available in the United States. In countries where they are available, the grafts must be customized for each patient, a process that can take up to 12 weeks, during which time some patients will experience a rupture of their aneurysm. As an alternative, a few vascular surgeons throughout the country have been custom-making fenestrated and branched stent grafts since 2007 using currently available components.

The new fenestrated and branched aortic stent graft program established at Emory University Hospital is part of a broader effort led by veteran Emory vascular surgeons Thomas F. Dodson, MD, Karthikeshwar Kasirajan, MD, and Ravi K. Veeraswamy, MD, to provide comprehensive surgical and endovascular treatment options for a full range of aortic aneurysm presentations. Joseph J. Ricotta II, MD, recently joined the Emory Division of Vascular Surgery & Endovascular Therapy to help establish the new program. Before coming to Emory, Dr. Ricotta performed more than 100 fenestrated and branched endografts at the Mayo Clinic. Emory is currently one of only a few institutions in the country and the only one in the Southeast that offers these investigational procedures.

Three-dimensional CTA of a type II thoracoabdominal aortic aneurysm before and after endovascular repair using a surgeon-modified fenestrated-branched stent graft with branch stenting to the celiac, superior mesenteric and bilateral renal arteries. Image courtesy of Joseph J. Ricotta II, MD.

Fenestrated and branched endografts appear destined to play a key role in the management of complex aortic aneurysms. Short- and mid-term data have shown that these devices are both safe and effective in treating carefully selected patients, with low incidence of complications. Additional data are needed to substantiate these results, and Emory is poised to participate as a primary site in upcoming trials of these innovative devices.

Vascular Surgery & Endovascular Therapy Team

- Matthew A. Corriere, MD
- Thomas F. Dodson, MD
- Karthikeshwar Kasirajan, MD
- Joseph J. Ricotta II, MD
- Atef A. Salam, MD, RVT
- Ravi K. Veeraswamy, MD

You can learn more about Emory's fenestrated and branched aortic stent graft program at **www.emoryhealthcare.org/vascular**. If you have a patient you think may be a suitable candidate for this program, please call **404-778-3712.**

Class Notes

alumni news

1940s

William Orr 44C 47M, of Macon, Ga., received the Physician of the

Year Award from the Bibb County Medical Society in April. He was a pediatrician for 50 years.

1950s

C. Charlton Mabry 54M, of Lexington, K.Y., received the Distinguished Service Award from his alma mater, Maryville College. He is a pediatrician at the University of Kentucky.

Jerald Watts 59M 60MR 64MR, of Peachtree City, Ga., recently was nominated for Georgia Author of the Year Award by the Georgia Writers Association. He published *Promises Kept* on his reflections on Grady Hospital and Emory's medical school during the early 1960s.

1960s

Joseph Miller 62C 65M 74MR joined the Piedmont Heart Institute in Atlanta as chief of thoracic surgery and thoracic oncologic surgery. He also has served as an examiner on the board of cardiothoracic surgery for the past 19 years.

1980s

Ramon Parrish 75Ox 77C 81M 82MR 08MPH, of Augusta, Ga., received an outstanding teaching award from the Medical College of Georgia for the 2009-2010 school year. He teaches family medicine. He married Lisa Marks in January 2009.

1990s

Ethan Gundeck 98M, of Lagrangeville, N.Y., has been named president of the Poughkeepsie board of directors of the American Heart Association for 2010-2011.

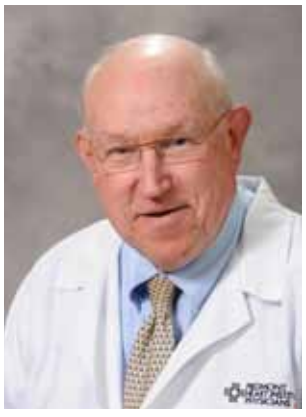
BORN: Aleksandr Rhys on March 26, 2010, to **Tina Rizack 91C 93MPH 98M** and her husband, Christopher Langlois. Aleksandr joins brother Holden. The family lives in Providence, R.I., where Rizack is a hematologist/oncologist at Women and Infants Hospital of Brown University.

AMA President Cecil Wilson 57C 61M (5th from right) stands behind President Barack Obama in December as he signs a one-year delay of the Medicare physician payment cut.

Cecil Wilson 57C 61M, a retired internist in Winter Park, Fla. and president of the American Medical Association, recently stood behind President Barack Obama as he signed into law a one-year delay of the Medicare physician payment cut. The AMA had strongly advocated for the delay. The provision would have mandated a 25% cut in reimbursements to physicians. "It's clear that 2011 is the year to finally fix this problem, as the baby booms began relying on Medicare in January for their health care coverage," Wilson says.

Wilson is the 165th president of the AMA. He has served on the board of trustees of the AMA since 2002 and been a member of the AMA House of Delegates since 1992.

C. Charlton Mabry 54M (left)



Joseph Miller 62C 65M 74MR

Ramon Parrish 750x 77C 81M 82MR 08MPH

Class Notes | alumni news

Jeffrey Brewster 00M

Aarti Kakkar 00C 05M married Jeffrey Evans

Lola Hannah, daughter of Benjamin Barden 02C 08M

Christopher Griggs 02Ox 04C 10M/MPH married Cecilia Miranda Pierangeli 02Ox 04C

Kristen Burgess 04C 11M married Paul Hudson 02Ox 04C 12MBA

Lakshmi Elin, daughter of Eric Almi (emergency medicine)

2000s

Jeffrey Brewster 00M received his MBA from Auburn University in May 2010. He is a pediatric intermediate care specialist in Columbus, Ga.

MARRIED: Aarti Kakkar 00C 05M to Jeffrey Evans on July 17, 2010. She is a gastroenterology fellow in Boston.

BORN: Lola Hannah to **Benjamin Barden 02C 08M** and his wife, Lauren 02C, on March 6, 2010. The family lives in Greenville, S.C.

MARRIED: Ian Campbell 09M to Natalie Reese 05G 11B on May 22, 2010. He is a radiology resident at Emory.

MARRIED: Christopher Griggs 02Ox 04C 10M/MPH to Cecilia Miranda Pierangeli 02Ox 04C on May 30, 2010. Griggs is an emergency medicine resident at Boston Medical Center.

MARRIED: Kristen Burgess 04C 11M to Paul Hudson 02Ox 04C 12MBA in Laguna Niguel, Calif., on Sept. 5, 2010.

Residency Notes

BORN: Lakshmi Elin to **Eric Almli** (emergency medicine) and his wife, Arathi 01L, on Feb. 10, 2010.

Jyoti Manekar (family medicine) has joined the practice of Northeast Georgia Physicians Group, Flowery Branch.

Deaths

1930s

Nathan Rifkinson 36M, of San Juan, Puerto Rico, on March 21, 2010. He was born in Lithuania in 1912, and after his town was bombed in 1914, Rifkinson's mother tied her 2-year-old son to her back and escaped with the retreating Russian army. Their trek across Siberia and China and then across the Pacific by ship to the United States, where they rejoined Rifkinson's father,

Farewell, but not goodbye

Claudia Adkison "retires," and a scholarship in her name is established

Claudia Adkison

Claudia Adkison, executive associate dean of the medical school, stepped down from her position this past summer. She will be on sabbatical for a year and then will retire but will continue working on special projects for the medical school as a consultant.

She served in administration for 15 years and before that as a faculty member. She began as a researcher in cell biology and also was recognized as an excellent teacher with numerous teaching awards.

One of her students, Bill Eley, is now Emory's executive associate dean of medical education and student affairs. "When I attended medical school, Claudia was a shining example of a teacher committed to our learning," he says. "She put extraordinary effort into her lectures. What made her our most cherished first-year professor, however, was her willingness to spend hours with the class outside of normal hours to review our histology and cell biology material. Her dedication was emblematic of her ethos in her leadership roles to come."

She continued her research and teaching full-time while she pursued a law degree. She then entered private practice as an intellectual property lawyer before she was convinced to return to Emory in 1995.

She has worked tirelessly on the school's behalf. To name a few of her accomplishments: serving as course director for the medical school's Cell Biology and Histology course for 17 years, serving as president of the University Senate for two terms and chair of the University Research Committee for many years, establishing the nine-year tenure clock, creating the faculty development policy and an office for faculty development, establishing "chair school" for new department heads, writing the first conflict of interest policies for the university and medical school, facilitating some of the medical school's international activities such as the vaccine center in New Delhi, and most recently, leading the school in updating its policies on industry relationships.

"She's a problem solver, never one to push things away," says neurology chair Allan Levey. "When I called her, she would ask me, 'What are you trying to accomplish?' And then she always helped navigate us to a solution. She's always been there for us."

Dean Thomas Lawley has established the Claudia Adkison Scholarship Fund in her honor. The fund will provide scholarships for Emory medical students, and Adkison and her husband, John Shullo, have bequeathed their entire estate to the fund.

"I would like to build this fund to support as many students as possible," Adkison says. "I had and continue to have many wonderful close friendships with my 2,500 medical students. When they entered the door, I already knew every name and tried hard to form a personal relationship with as many of them as I could, and I have followed their careers with much joy and pride."

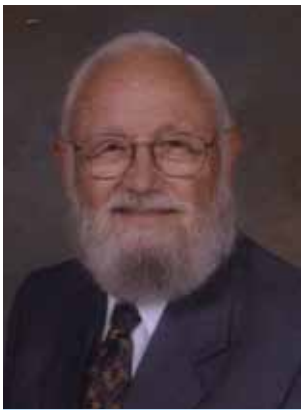
For more information on the Adkison fund, please call the office of gift planning at 404-727-8875 or access emory.edu/giftplanning.

Deaths | alumni news

Quentin Pirkle 37Ox 42M

Frank Gibson 42C 44M 50MR

Jack Worth 41C 44M 55MR



Lloyd Burns 49C 52M

took three years.

Rifkinson began his career in the U.S. Virgin Islands. Contacted by Margaret Sanger, he was persuaded to establish birth control clinics on three of the islands. In 1942, he studied pathology in San Juan at the School of Tropical Medicine and then completed a neurosurgery residency in St. Louis, Mo. He returned to San Juan in 1948 as Puerto Rico's lone neurosurgeon.

In 1972, he was appointed to the post of Secretary of Health and served as director of the University of Puerto Rico's new neurosurgical residency program for 30 years. In 2000, the university named him a distinguished professor. He was preceded in death by his wife and is survived by a son and a daughter.

William Grimes Jr. 37M 38MR 40MR, of Atlanta, on May 5, 2010. He was an obstetrician and gynecologist for 46 years. He is survived by his wife, two sons, and two daughters.

Jack Tepper 39M of Overland Park, Kan., on Aug. 12, 2010. He practiced pediatrics in Chattanooga, Tenn. Unhappy about the local public hospital's pediatric department, Tepper built the Tepper Hospital and Clinic, which grew into a 67-bed pediatric hospital accredited by the American Hospital Association. He is survived by a daughter, six grandchildren, and nine great-grandchildren. He was preceded in death by his wife, son, and two grandchildren.

1940s

Quentin Pirkle 37Ox 42M, of Atlanta, on July 7, 2010. He retired from his general practice at age 89. He is survived by his wife, five children, and 15 grandchildren.

James Anderson 43M, of Greenville, S.C., on June 10, 2010. He is survived by his wife, three sons, and three grandchildren.

Darnell L. Brawner 44M 51MR, of Brooklet, Ga., on Nov. 8, 2010. He practiced obstetrics and gynecology in Savannah, Ga., from 1951 until 1995. After his retirement, he farmed his 50 acres of flowers. He is survived by his wife, six children, 11 grandchildren, and five great-grandchildren.

G. Thomas Cowart 41C 44M, of Atlanta, Ga., on July 13, 2010. He declined a full scholarship to the University of Virginia to remain in Atlanta so he could continue going to Georgia Tech football games. He later served as chief of urology at the Atlanta VA Medical Center from 1951 to 1954. He is survived by his wife, two children, and two grandchildren.

Frank Gibson 42C 44M 50MR, of Bainbridge, Ga., on Aug. 12, 2010. He was in the Navy for seven years and remained in the reserves for 45 years. He worked at two hospitals in Bainbridge. He is survived by his wife, three children, and two grandchildren.

Frank Deese 45M, of Ada, Okla., on Sept. 5, 2010. He is survived by a son and daughter and four grandchildren. He practiced at the Sugg Clinic in Ada for 34 years.

Hal Henschen 44M, of White, Ga., on Sept. 17, 2010. He is survived by his wife and four children.

William Moore Jr. 44M 48MR, of Atlanta, on March 29, 2010. He was 89. He was a neurosurgeon and was awarded the Distinguished Service Award from the Medical Association of Georgia.

Thomas Smith 47Ox 49C 54M 55MR

Frank Thorton 50Ox 56M 57MR

Jack Worth 41C 44M 55MR, of Newnan, Ga., on July 2, 2010. He is survived by his wife of 69 years, two sons, seven grandchildren, and 15 great-grandchildren.

F. Dewitt Stanford 43C 46M 47MR, of Windermere, Fla., on Aug. 30, 2010. He practiced orthopaedics and had a policy never to accept payment from teachers or ministers.

Charles D. Hollis 45C 48M 50MR, of Albany, Ga., on Nov. 15, 2010. He practiced internal medicine from 1954 to 1994. He helped establish the MAG Mutual Insurance Co., an insurance provider owned by physicians for physicians. He is survived by his wife, three children, and six grandchildren.

1950s

Walter Lusk 50M, of Los Angeles, on Oct. 3, 2010. He practiced in North Carolina before moving to California in 1965. He served as chief of endocrinology at Sunset Medical Center in Los Angeles until 1996. He is survived by his wife, three children, and three grandchildren.

John Schreeder 50M, of Snellville, Ga., on June 17, 2010. He was 95. He earned a degree in engineering from Georgia Tech in 1940 and then served in the Army during WWII. After graduating from medical school, he practiced family medicine in Chamblee. Schreeder and his wife were avid foster parents, opening their home to 33 children over the years. He is survived by his wife and a sister.

Dale Addington 48C 52M, of St. Simons Island, Ga., on June 24, 2010. He is survived by his wife.

Lloyd Burns 49C 52M, of Peachtree City, Ga., on June 16, 2010. He was a gynecologist in Sacramento, Calif. He is survived by his wife and four children.

Walter Long Jr. 53M, of Kingwood, Texas, on Oct. 7, 2010. He served in the public health service in North and South Dakota and was a flight surgeon with the Air National Guard in Wyoming. He later practiced surgery in Houston. He is survived by his wife, three children, and four grandchildren.

Hobson Rice 50C 53M, of Decatur, Ga., on Aug. 5, 2010. He is survived by his wife, two sons, a daughter, and nine grandchildren.

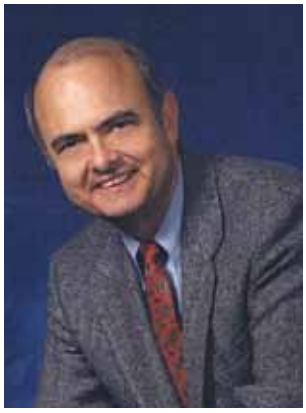
Thomas Smith 47Ox 49C 54M 55MR, of Valdosta, Ga., on Jan. 31, 2010. He practiced ophthalmology in Valdosta for 37 years until his retirement in 1998. He is survived by his wife and three children.

Frank Thorton 50Ox 56M 57MR, of Winter Haven, Fla., on May 31, 2010, of complications of diabetes. He was a family practice physician for 30 years. He is survived by his wife, three children, four grandchildren, and four great-grandchildren.

Lovic Hobby 57M 62MR 65MR, of Atlanta, on Aug. 8, 2010. He was 78. He served as director of Piedmont Hospital Laser Treatment Center and as chief of plastic surgery at the hospital. He is survived by two children and a grandchild.

William Lazenby 57M 63MR 64MR

Samuel Haddock 58M 59MR



James Milsap Jr. 59M 63MR

Deaths | alumni news

William Lazenby 57M 63MR 64MR, of Atlanta, on June 14, 2010. He is survived by his wife, three children, and 11 grandchildren.

Charles Geiger 58M, of Gainesville, Ga., on July 14, 2010. He served on the Emory faculty for two years after his pathology residency. He later obtained a license from the Atomic Energy Commission and opened the first radioisotope laboratory in North Georgia. He is survived by his wife, two sons, a daughter, and six grandchildren.

Samuel Haddock 58M 59MR, of Anderson, S.C., on June 19, 2010. He was a pediatrician in Anderson for 50 years. He is survived by his wife, three children, including son William 93M, and seven grandchildren.

James Milsap Jr. 59M 63MR, of Atlanta, on Aug. 16, 2010. He practiced radiology at Piedmont Hospital for 30 years. After retiring, he served as chief radiologist for the Olympic Games in Atlanta in 1996 and at Georgia Tech's student health center. He is survived by his wife, three children, and seven grandchildren.

1960s

William Mitchell Jr. 56C 60M, of Clermont, Fla., on April 16, 2010, of cancer. He is survived by his wife, four children, and six grandchildren.

Don Young 64M, of Sandusky, Ohio, on August 31, 2010, of cancer. He is survived by his wife.

1970s

Jerome McCuin 73M, of Los Angeles, on Aug. 25, 2010. He was 63.

John Bussey 74M 75MR, of Thomson, Ga., on June 19, 2010, of injuries sustained in a car accident. He is survived by his son and mother.

Richard Eckert 76M, of Evans, Ga., died May 12, 2010, after a long illness. He was a pediatric emergency department physician. He is survived by his wife, two sons, four daughters, 31 grandchildren.

Philip Role 76M 79MR, of Sandpoint, Idaho, on June 11, 2010, of multiple myeloma. He practiced internal medicine for 11 years. In 1995, he completed an anesthesiology residency in Denver and then joined Bonner General Hospital in Sandpoint. He is survived by his wife, three children, and his parents.

1980s

Randall Grimes 88M, of Atlanta, on May 18, 2010, of pulmonary hypertension. After earning his medical degree, he completed a doctorate in mechanical engineering at Georgia Tech in 1996. His research focused on the fluid dynamics of mitral regurgitation and prosthetic heart valves. At the same time, he completed an internal medicine residency at Morehouse. He then moved to Boston for a cardiology fellowship and joined the faculty of Harvard. He moved back to Atlanta in 2001.

He was a nine-time Ironman triathlon competitor, a marathon runner, and swimmer.

He is survived by his wife, three daughters, his parents, and grandmother.

Residency Deaths

Edward Bowen (obstetrics/gynecology) of Decatur, Ga., on July 20, 2010. He was in private practice at Northside Hospital in Atlanta. He is survived by his wife, three daughters, and seven grandchildren.

Norman Bowles (pathology) of Fort Myers, Fla., on April 26, 2009.

Joseph Brannen (urology) of Valdosta, Ga., on Sept. 9, 2008.

James Brooks (anesthesiology) of Dallas, on Oct. 15, 2009. He is survived by his daughter.

Kathryn Edwards (pediatric radiology) of Owens Cross Roads, Ala., on Feb. 27, 2007.

William Mitchell Jr. 56C 60M

Randall Grimes 88M

Louis Kent

Robert Galambos (internal medicine) of La Jolla, Calif., on June 18, 2010, of congestive heart failure. He was 96. Galambos was considered a giant in auditory research. His work included proving how bats navigated in total darkness (by sound) and deciphering the codes by which nerves transmit sounds to the brain. His studies led him to develop a hearing test for infants. He is survived by his wife, three daughters, five grandchildren, and three great-grandchildren.

Edward Garbacz (internal medicine) of Acworth, Ga., on July 27, 2009. He was 56.

Thomas Griffin (urology) of Wilson, N.C., on Aug. 28, 2010. He practiced at the Carolina Clinic for 25 years and served on mission trips of the First United Methodist Church for 15 years. He is survived by his wife, four children, and seven grandchildren.

Warren Jacobs (psychiatry) of Atlanta, on March 17, 2010. He is survived by his wife and two daughters.

Louis Kent (orthopaedics) of Clemson, S.C. on April 18, 2010. He is survived by his wife and two sons.

Raymond Lupse (obstetrics/gynecology) of Gastonia, N.C., on June 5, 2009. He was 64. He is survived by his wife and two children.

Milton Mazo (pediatrics) of Savannah, Ga., on Nov. 20, 2009. He is survived by his partner and his brother.

Fernando Mendez (thoracic surgery) of Cincinnati, on March 27, 2009.

Ernest Phillips Jr. (internal medicine and cardiology) of Winston-Salem, N.C., on April 29, 2010. He is survived by his wife, five sons, and his father.

Yonne Varese (medicine) of Harbor Island, S.C., on July 12, 2010. She was an internist in southwestern Virginia for 40 years.

John Vetter (family medicine) of Rockingham, N.C., on July 22, 2009. He is survived by his wife, two daughters, and three grandchildren.

Faculty Deaths

Robert Boger 57C 60M 65MR, of Atlanta, on Sept. 1, 2010. He practiced at the Atlanta VA center for 30 years. He is survived by his wife, two daughters, and a grandson.

James Clements Jr. 42Ox 47M 50MR, of Eatonton, Ga., on Sept. 27, 2010. He retired as professor emeritus and director of

A doctor for the people

Lindy Wolfenden

Lindy Wolfenden chose to work with cystic fibrosis (CF) patients so she would have the long-term relationships with patients that she so cherished. As a general pulmonologist, she would treat patients for a single ailment, and off they would go. But she would see CF patients at least three or four times a year, and that satisfying interaction was why she chose to specialize in CF.

In return, her patients cherished their doctor, who died July 24, 2010, of complications of breast cancer. She was 40.

"She got into medicine for the people," says her husband, Arjun Srinivasan.

Andy Lipman, 36, was one of Wolfenden's patients and writes a blog, thedriveat35.blogspot.com, about living with CF. Shortly after Wolfenden's death, he wrote, "I went through all of our old correspondences and realized how truly inspiring she was. She was always hopeful, believing she would be cured. I wanted her to be right. I'm sad that she was not. I wanted you to know the amazing optimism she showed and the fact that she was going through hell and still took the time to write me."

Wolfenden was founding director of Emory's adult cystic fibrosis program, established in 2008. Says David Guidot, division director of pulmonary and critical care at Emory, "She took over a team of nutritionists, respiratory therapists, nurses, and others to provide comprehensive care for patients. That combination made the adult center well known for high-quality care."

The Cystic Fibrosis Foundation granted full accreditation to Emory's adult program in 2010. "It's fair to say that she was nationally recognized for her work," says Srinivasan. "When the program was granted full accreditation, leaders in the CF field called to congratulate her."

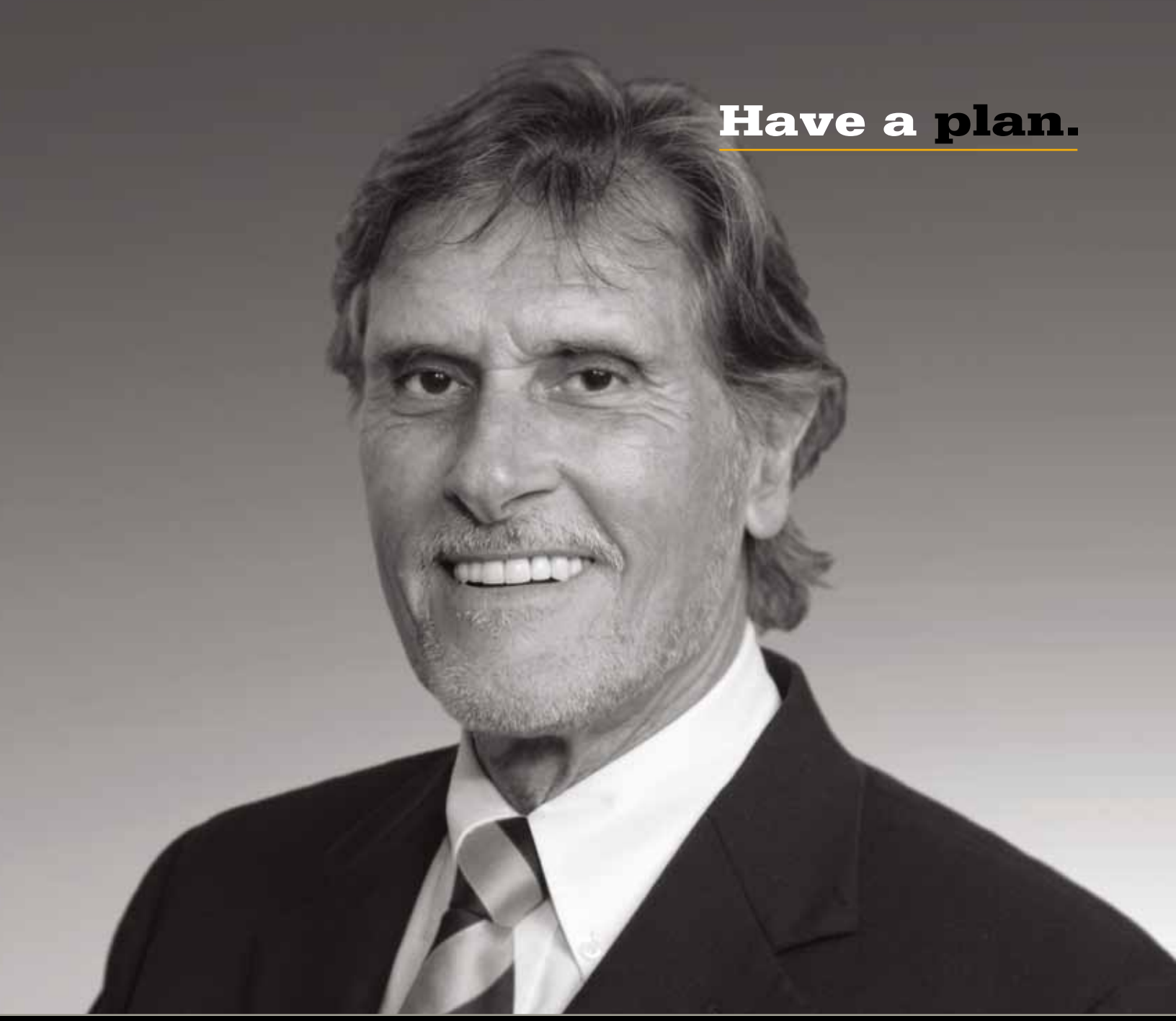
Wolfenden and Srinivasan met when they were both residents at Johns Hopkins Hospital. Wolfenden came to Emory in 2000. Srinivasan is an associate director of health care-associated infection prevention at the Centers for Disease Control and continues to raise the couple's two sons, Jackson and Joseph.

Faculty Deaths
Continued

gastrointestinal radiology. He was preceded in death by his wife and is survived by his daughter.

Marian Olansky, of Avondale Estates, Ga., on May 17, 2010 of complications from Parkinson's disease. After joining the faculty in 1959, she directed the allergy clinic at Grady Hospital for 27 years. She also served as chief of pediatric allergy at Children's Hospital of Atlanta at Egleston. She is survived by four children and three grandchildren. She was preceded in death by her husband.

David Vroon 72MR, of Atlanta, on Aug. 17, 2010, of complications of pancreatic cancer. He was 70. He served as director of the clinical laboratory at Grady Hospital for 30 years and served on faculty from 1972-2005. Says Audrey Gohr, a medical technician for Vroon for 30 years, "He had respect for the patient no matter their financial or socioeconomic level. He was a teacher for the residents and tried to instill in them the same focus he had. He was an advocate for the laboratory throughout Grady Hospital." Vroon also lived with multiple sclerosis. He is survived by his wife, three children, and 10 grandchildren.



Have a plan.

BRITISH PATHOLOGIST Peter Johnson 75MR considers his introduction to Emory University in the early 1970s as the fortuitous beginning of a cherished relationship. "I was impressed with the quality at Emory, the expertise and excellence of the faculty, the projects the university was involved with, and the depth of medical care," says Johnson.

Grateful for student support he received, Johnson has designated Emory as beneficiary of his retirement accounts, establishing an endowed scholarship for medical students and affording him and his family tax benefits.

"Giving back to Emory helps the whole community by allowing individuals to reach their educational potential in life," he says.

Learn more about how you can plan a gift to Emory. Visit www.emory.edu/giftplanning or call 404.727.8875.

Plan to make education possible.

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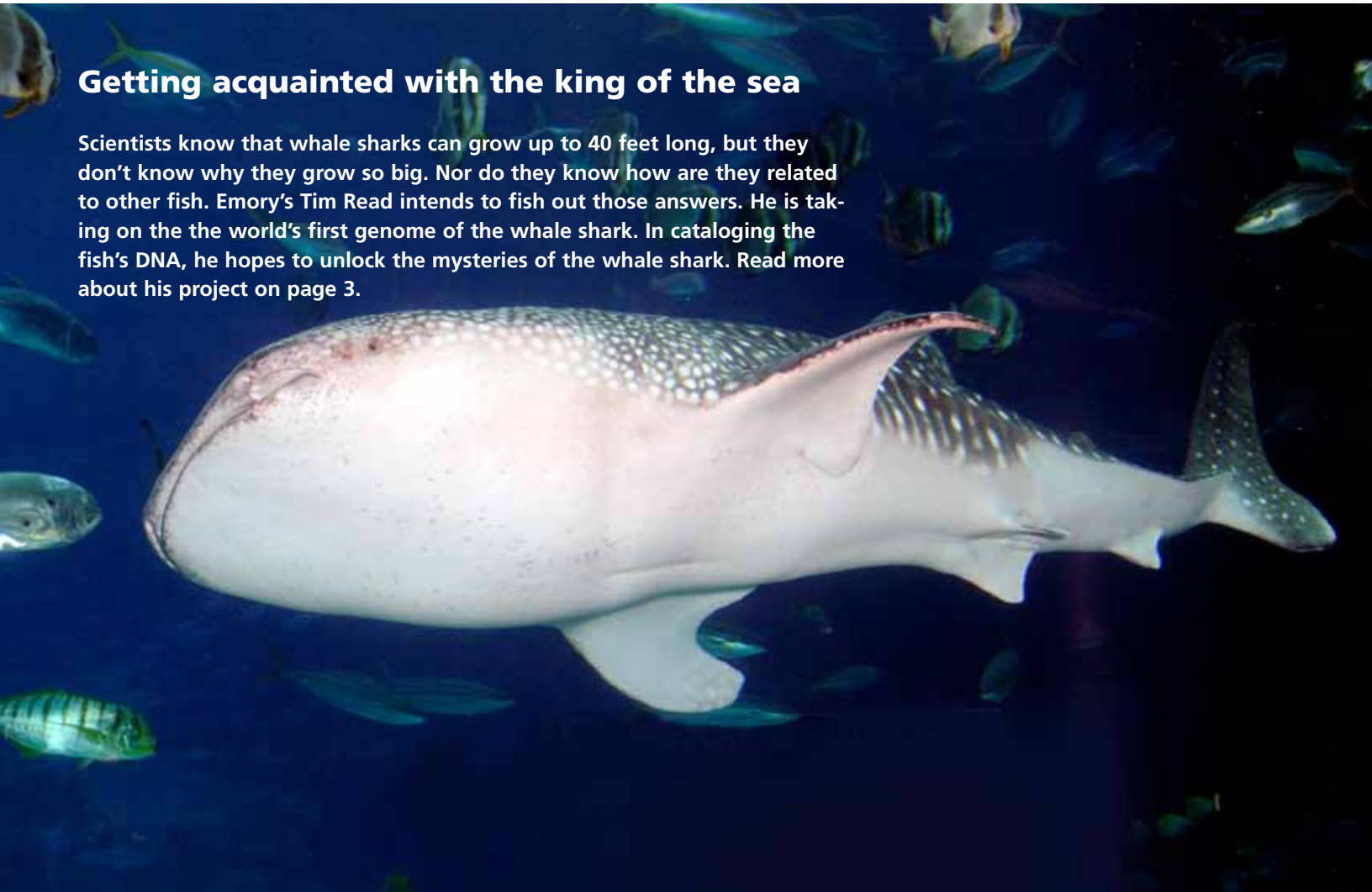

Getting acquainted with the king of the sea

Scientists know that whale sharks can grow up to 40 feet long, but they don't know why they grow so big. Nor do they know how are they related to other fish. Emory's Tim Read intends to fish out those answers. He is taking on the the world's first genome of the whale shark. In cataloging the fish's DNA, he hopes to unlock the mysteries of the whale shark. Read more about his project on page 3.