

How will our efforts help people with cancer, autism, or Alzheimer's? How will what we do everyday matter in the long run? How will our work contribute to what other scientists across the world are doing to fight disease and suffering?

Emory University School of Medicine Doing what matters



EMORY  
UNIVERSITY  
SCHOOL OF  
MEDICINE



**Over the past five years, I have had the honor of serving in various leadership roles** in the Association of American Medical Colleges (AAMC), which represents the

131 accredited medical schools in this country and 17 in Canada. In November, I begin a one-year term as chair of the AAMC's board of directors.

As I have observed medical schools during my time with AAMC, my understanding of what a school's mission should be has become increasingly distilled. It can be summed up in just three words—doing what matters.

If this is our aim, how do we know when and if we are succeeding? Every day here at Emory, I see numerous and unmistakable signs of just such success.

At least twice each year, for example, our faculty lead groups of students, like those at right, to provide care in Haiti. This past year saw more trips than usual after the devastating earthquake in January. In venues like this, our doctors and doctors-to-be make the best of very bad situations, setting up makeshift clinics, enlisting and training locals, reading x-rays by sunlight, using camping headlights to perform surgery into the night. When they come back home, they work to raise funds to ensure that they can return to Haiti as well.

On the local scene, I see other signs. Faculty teach students not just the Krebs cycle and blood chemistries but also the healing power of heavy-dose compassion in interaction with patients. Faculty serve as good role models in other ways too, partnering with county officials to help rescue the elderly and disabled from abusive situations and providing more telehealth services in underserved areas throughout the state.

In research likewise, our faculty are concentrating their efforts to maximize impact, using genomics, for example, to learn why flu vaccines are often ineffective in the very young and old and working with colleagues at Georgia Tech to develop dialysis units for children.

Doing what matters may be open to interpretation, but I have found that seeing what we do turns out to be a sure and steady way over time to see just how we're doing.

Thomas J. Lawley, MD, Dean  
Emory University School of Medicine



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Accompanied by faculty, students typically make two trips to Haiti each year. When they come back home, they work to raise funds to ensure that they can keep returning to Haiti to provide badly needed care. To see the Emory team in action, visit [whsc.emory.edu/r\\_haitivideo.html](http://whsc.emory.edu/r_haitivideo.html). To read student blogs from Haiti, visit [emorymedishare.org](http://emorymedishare.org).



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Emory researchers understand that their real goal is to leave a lasting impact on science and on society.

Barbara Stoll, who recently was elected to the Institute of Medicine, heads the Emory-Children's Center, the largest pediatric group practice in Georgia (and a joint venture with Children's Healthcare of Atlanta). Emory and Children's are collaborating on a joint research building scheduled to break ground soon.



## RESEARCH:

# Questions and answers that matter

As Emory researchers define the school's research goals and strategy for the next five years, their focus is less on “market share” (number and value of research awards compared with those of other schools) and more on “mind share”—how they are using the awards and how their work will matter in the long run. How, for example, will their efforts help people with cancer, autism, or Alzheimer's? How will their work contribute to what other scientists across the world are doing to help fight such diseases as well?

It isn't that these researchers can't take considerable pride in their market share—it's just that they understand their real goal, which is to leave a lasting impact on science and on society.\*

Following are examples of how these researchers are looking for answers that will truly matter to patients in the long run.

**PROTECTING BRAIN CELLS** Several years ago, an Emory researcher discovered that progesterone plays a neuroprotective role following traumatic brain injury. A new Emory-directed phase 3 trial of progesterone began this year in 17 trauma centers nationwide. Progesterone eventually may prove effective in mitigating other types of brain damage as well.

**Emory researchers now also have identified other substances that may protect brain cells from the toxicity associated with seizure, stroke, Parkinson's, and other neurologic diseases.** One such compound mimics BDNF, a brain-derived growth factor that is unable to cross the blood-brain barrier when administered as a drug. The new BDNF-like compound, a flavonoid found in foods like cherries, overcomes this problem.

*Getting the big picture*—A new research MRI/PET scanner installed at Emory—one of only four in the world and two in the country—simultaneously collects PET and MRI images so that the neural state of the patient is the same during both acquisitions. It also shortens the time of collection for research subjects who are cognitively impaired and/or have trouble tolerating scanning procedures.

*Effective treatment for dystonias*—Current treatments for the muscle contractions and spasms of dystonias are generally ineffective, and Emory is leading an 18-center Dystonia Coalition, funded by a five-year, \$6 million NIH grant, to develop effective treatment for the most common of these disorders, which appear to share genetic and environmental risk factors.

**REDUCING HEART DISEASE** *Improving ACE inhibitors*—ACE inhibitors were a major advance in treating hypertension, but they



Pathologist Keqiang Ye has discovered a compound in the form of easy-to-deliver molecules that hold promise as a foundation for a new class of brain-protecting drugs.



Hyder Jinnah (neurology and genetics) is co-directing an NIH-sponsored Dystonia Coalition to find better therapies for this debilitating disorder.

\*Emory medical faculty received more than \$420 million in sponsored research last year, including awards received via Yerkes National Primate Research Center, Atlanta VA Medical Center, Winship Cancer Institute, and Emory's Center for Comprehensive Informatics.



Cardiology researcher Kathy Griendling helped clone a receptor that led to development of new antihypertensive drugs. Her work is widely recognized as groundbreaking and influential—four of her papers have been cited 1,000-plus times each.



Matam Vijay Kumar and his colleagues in pathology have added fuel to the theory that excess calorie consumption may be due not just to undisciplined eating but also to intestinal bacteria unchecked by a missing gene.

sometimes stop working after several months (“ACE inhibitor escape”), and they never work well for some groups, including African Americans. Emory scientists and colleagues at University of Alabama and Fukuoka University in Japan discovered why and what to do about it. ACE inhibitors work by preventing the body from processing angiotensin II, a hormone that constricts blood vessels, thus elevating blood pressure. The scientists found that another enzyme, chymase, also can process angiotensin. Adding drugs that interfere with chymase to ACE inhibitors significantly boosted recovery of heart function in animals after heart attack. This paves the way for studies in humans.

**Getting SOD to the rescue**—Enzymes were key to a discovery by Emory and Georgia Tech researchers: a way to get extra amounts of an antioxidant protein to the cells that need it following heart attack. When injected, the enzyme superoxide dismutase (SOD) remains in the body too briefly to have beneficial effects. Microscopic polymer beads developed by the Emory/Tech team, however, proved effective in rats in delivering SOD to heart cells after simulated heart attack, reducing cell death and improving cardiac function.

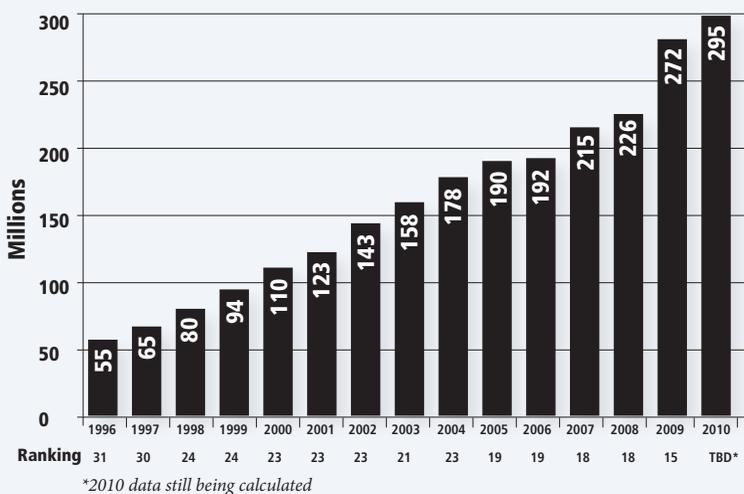
**Biomarkers of oxidative stress**—In a study of more than 1,200 people undergoing cardiac imaging because of suspected heart disease, people with high blood levels of cystine were twice as likely to have a heart attack or die over the next few years. The finding was independent of variables such as diabetes and levels of C-reactive protein. Cystine could be a valuable marker of cardiovascular risk, and it also may point to a helpful new treatment strategy. Previous studies have found that oxidized cystine blood levels tend to rise with aging and with tobacco and alcohol consumption, and that they can be lowered with zinc supplementation.

**UNDERSTANDING OBESITY Bacterial factors**—**Emory pathologists reported new evidence that bacteria contribute to obesity and metabolic disease.** Mice engineered to lack the TLR5 gene, which helps control bacteria in the intestine, ate more, weighed more, and

exhibited metabolic syndrome. Transfer of intestinal bacteria found in the TLR5-deficient mice to regular mice transferred many of the characteristics of metabolic syndrome, including increased appetite, obesity, elevated blood sugar, and insulin resistance.

**Behavioral factors**—Neuroscientists at Yerkes National Primate Research Center found that subordinate monkeys generally ate less and weighed less than dominant monkeys—until their low-fat diet was changed to one high in fat and sugar. Then the subordinate monkeys

## NIH Funding, School of Medicine





The first pharmaceutical treatment for fragile X could open the door for treatment of other autism spectrum disorders.

Young Cody Hardin has fragile X syndrome. His mom and maternal granddad are carriers of the abnormal gene.

ate almost nonstop and continued to do so when the diet went back to low fat, suggesting that their set point had changed and that they had learned that food, any food, could alleviate the chronic stress caused by their low social status.



Urologist John Petros and co-investigators developed a serum test that can identify patients infected with XMRV, a retrovirus possibly implicated in chronic fatigue syndrome and also found by Petros in some patients with prostate cancer.



Emory medical geneticist Jeannie Visootsak is leading a study of a compound that puts the brake on a glutamate receptor that contributes to learning and behavior problems in fragile X syndrome.



Winship Cancer Institute brain tumor researcher Erwin Van Meir and colleagues have identified a chemical that stops cells from making a transcription factor needed by tumors to create new supplies of oxygen.

**DEVELOPMENTAL DISORDERS *Fragile X syndrome***—Emory geneticist Stephen Warren discovered the mutated gene that causes fragile X syndrome, the most commonly inherited cause of intellectual disability, and he later developed the first screening test. Now a compound developed by Warren is in phase 2 clinical testing at Emory and four other centers. If effective, it would be the first pharmaceutical treatment for fragile X and could open the door for treatment of other autism spectrum disorders.

***Autism***—Thanks to a \$3.4 million federal stimulus award to Emory, raw genetic data from more than 200,000 cases of autism collected from 100+ clinical labs around the world soon will be available online. The new International Standard Cytogenomic Array Consortium follows the model of the Human Genome Project, in which all data are freely and publicly available.

**STRATEGIES IN CANCER *MRI for detection***—Emory researchers in surgery, radiology, and biomedical engineering have developed tools to improve breast cancer diagnosis by attaching iron oxide nanoparticles to a molecule that binds specifically to breast cancer cells. In mice with implanted human tumors, injected nanoparticles stay in the blood for several hours, during which time they are taken up by breast cancer cells, where they are clearly visible under MRI. Researchers believe this is an important step toward developing cancer-specific breast MRI that could allow for early detection and treatment monitoring. Women with inherited and other cancer risk factors could especially benefit.

***Viral links to prostate cancer***—Emory researchers have developed a clinical test for a retrovirus recently found in some patients with prostate cancer. Little is known about transmission of xenotropic murine leukemia-related virus (XMRV), and no method is available to screen blood or tissue donors for possible infection. The Emory technology, adapted from HIV antibody assays, will make it possible not only to test for infection but also to answer basic questions about XMRV transmission, frequency, and association with prostate cancer. In a separate study at Emory and University of Utah, researchers found that four drugs currently approved for treating HIV can inhibit XMRV.

***Preventing angiogenesis***—When cancer cells outgrow their blood supply, they send out signals to encourage new blood vessel growth. Winship Cancer Institute researchers recently identified a chemical that puts a monkey wrench into the cells' machinery for responding to low-oxygen conditions. The compound KC752 stops cells from making HIF-1a to essentially suffocate the cancer cells. The researchers believe the identification and development of novel HIF-1 pathway inhibitors may lead to new types of treatment for many solid tumors.

***Leveraging cancer data***—Emory's Center for Comprehensive Informatics was awarded grant funds from the National Cancer Institute based on its standing as one of five "In Silico" Research Centers of Excellence. The goal of the program is to empower research

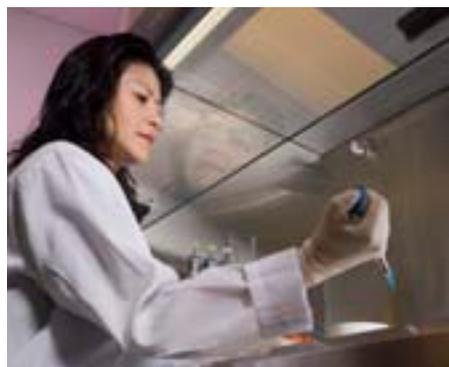
in which rich data sets currently available to the cancer community are analyzed to produce discoveries leading to more effective treatments. Emory's center will leverage vast amounts of molecular, pathology, and radiology data on brain tumors.

**PEDIATRIC RESEARCH *Building for children***—Emory has a long-standing partnership with Children's Healthcare of Atlanta, with groundbreaking scheduled soon for a joint research building. The building will house research in heart, cancer, vaccines, and new drug discoveries. Children's also is investing \$75 million to establish eight research centers in cancer, immunology and vaccines, transplant immunology and immune therapeutics, technology innovation, cystic fibrosis, developmental lung biology, endothelial cell biology, and cardiovascular biology.

***Individualizing Crohn's treatment***—Emory recently received a \$5 million grant from the Crohn's and Colitis Foundation to study Crohn's disease in children. The multi-center study will enroll 1,000 children with newly diagnosed disease from 20 pediatric centers across the nation, with the goal of finding biomarkers of risk for complications that may require surgery, thus allowing individualized therapy.

**ENHANCING VACCINES *Predicting vaccine effectiveness***—Scientists at Emory Vaccine Center recently received a \$15.5 million NIH grant to use "systems" vaccinology to predict vaccine-induced immunity. Combining tools in immunology, genomics, and bioinformatics, this approach permits them to observe a global picture of the nearly 30,000 genes, proteins, and cells participating in immune responses to vaccination. With yellow fever vaccine (one of the most successful vaccines ever developed), the investigators identified signatures of gene expression in the blood a few days after vaccination that could predict the strength of the immune response with up to 90% accuracy. **They also will use combined tools to predict effectiveness of vaccines for flu, pneumonia, and shingles, which currently are ineffective in a substantial proportion of the elderly.**

***International conferences***—Emory and University of Georgia hosted an international symposium on H1N1 last spring, and this fall Emory's Center for AIDS Research will serve as local host of AIDS Vaccine 2010, the largest global scientific conference on this topic.



Emory surgeon and Georgia Cancer Coalition Scholar Lily Yang has worked with colleagues at Georgia Tech to develop iron oxide nanoparticles that can discriminate between breast cancer and healthy cells in magnetic resonance imaging.



Immunologist Max Cooper is receiving this year's international Robert Koch Award for his fundamental contributions to immunology, including the finding that there are two types of white blood cells, now known as T and B lymphocytes. To hear a podcast about his work, visit [tiny.cc/immunology](http://tiny.cc/immunology).



## Little kids vs. big machines

**Emory physicians teamed up with both Children's Healthcare of Atlanta and Georgia Tech** to develop a kidney replacement device for children needing dialysis. (The one at left is for adults.) There are no FDA-approved devices specifically designed for children, and adult devices adapted for children can be inaccurate and potentially dangerous. The device being developed can be used for patients weighing as little as 6 pounds.



Students are learning compassion in more deliberate and measurable ways than ever before.

EDUCATION:

## Patient centered, discovery oriented

**The medical school's class of 2011—the first students to begin their education under a new curriculum inaugurated in 2007—are now well on the way to becoming the kind of doctors with which Emory wants to “seed” the medical profession.** They are learning real-world health care, involved with patients from their second week in medical school and spending an unprecedented amount of time in outpatient settings. They are completing full-scale research projects, often in the field of their anticipated residency, and publishing their results in leading journals. They also are learning compassion and professionalism—qualities they see modeled by faculty and advisers—in more deliberate and measurable ways than ever before.

**REAL PATIENT CARE, REAL RESEARCH** *Foundations and Applications phases*—In the new curriculum, the traditional first two “basic science” years of medical school have been replaced by a 17-month Foundations Phase in which students learn basic science not in isolation but within the context of patient care. The Foundations Phase is followed by a **12-month Applications Phase, a full fourth of which takes place in outpatient settings, where, after all, 90% of doctor-patient encounters occur.** Emory's primary care colleagues in the community, many of them alumni, make it possible for every student to spend 12 weeks of half days with an internist and six weeks of half days with a primary care pediatrician. In these primary care settings, students have the opportunity to learn the importance of long-term relationships that shape both patient and doctor. They also learn how to manage the earaches, sprained backs, rashes, and other



Above: Faculty members Henry Blumberg (infectious disease) and Jennifer Goedken (gyn-ob) mentored student Mark Adelman (center), who did Discovery Phase research in Ethiopia. Below: The school's simulation facility was the site of a recent brain “boot camp” for incoming neurosurgery trainees from around the country.





Pediatrician Andi Shane co-directs a “SoCRATES” program (short course on clinical research and translational experiences in science) to help students learn to apply their research to patient care.



Beau Bruce (ophthalmology) analyzes eye images from a hypertensive patient with a student whose Discovery Phase project focused on hypertension.



For his orthopaedic research, student Vishnu Potini went regularly to a local slaughterhouse to obtain specimens.

problems that make up much of real-world outpatient practice. The remaining six weeks of outpatient half days are spent with Emory specialists in dermatology, otolaryngology, ophthalmology, orthopaedics, palliative care, and urology.

*Discovery Phase*—In recent years, four out of five Emory medical students have participated in research, but the new curriculum provides for longer, more in-depth, more highly mentored research experiences. The minimum time students spend in the Discovery Phase, which follows the Applications Phase, is five months, but many students elect extra time to do research. **Research projects are taking students to Africa, Bolivia, Haiti, and other distant points or immersing them in labs at the CDC, Emory, Georgia Tech, NIH, and elsewhere.** One student drives regularly to McDonough, Georgia, to pick up material from a local slaughterhouse for his orthopaedics research project.

And Emory’s ongoing success in the research arena has attracted students who have published in *Science*, *Nature*, *JAMA*, and other mainline publications, based on work done prior to their time at Emory or while they are here as students.

*Final year*—Beginning with fall semester, the class of 2011 moved into the Translation Phase (clinical rotations in intensive care and emergency medicine and a subinternship in medicine, surgery, or pediatrics). This will be followed in the spring by the Capstone course (a final month of preparation for residency training).

**MEASURING THE FORMERLY INTANGIBLE** *Teaching, enhancing, quantifying*—In the past, many medical educators might have said that empathy, resilience, burnout, professionalism, and other such qualities were a little like pornography, as described by the U.S. Supreme Court: easily recognizable but devilishly difficult to define, much less quantify. However, as the new curriculum unfurled, Emory medical educators were determined to measure how well students were being infused

with the personal qualities essential in truly great physicians. They developed new programs to teach and enhance these qualities and new methods to measure them. A major effort to measure professionalism is being coordinated with the Association of American Medical Colleges.

**STUDENT SATISFACTION** Student surveys show increased student satisfaction with how and what they are being taught. More students show up to attend class every day than in the past—class is too exciting to miss, students say. One reason for this may be that the new curriculum brings more real patients into the classroom than ever before.

Students also give high marks to the system in which eight students are grouped into a “society” led by a carefully chosen faculty member who serves as adviser to the group throughout their entire medical school experience. Society mentors meet with students as often as twice a week during the Foundations Phase, every two weeks during the Applications Phase, and monthly during Discovery. These groups benefit greatly, students say, from the “cohort” effect of all learning the same thing together.

**TRAINING THE TRAINERS** For their part, society mentors and other faculty are benefitting from new efforts to help them hone their teaching skills. This includes weekly sessions with society mentors to prepare them to lead small group sessions on specific case histories. It also includes workshops providing special training in “humanistic” techniques. **Faculty who undergo humanistic training say they have become more reflective and that their students and residents rank them higher on listening carefully and being a caring person.**

Where teaching compassion is concerned, faculty are aiming their efforts not only at students but also at residents, who themselves serve as role models for students. For example, residents learn “habitual reflection”: looking back on interactions with patients, imagining themselves in the patient’s place, and understanding how their own words and body language may have affected the situation.

**TRENDS FOR THE FUTURE** The new curriculum beginning in 2007 was possible thanks to completion, also that year, of the James B. Williams Medical Education Building, widely considered one of the finest medical education facilities in the country and certainly one of the most environmentally green. The 162,000-sq-ft building was designed in part to address the worsening U.S. physician shortage. The entering class immediately expanded by 15%, and the class that will graduate in 2014 (76 women and 64 men) will be the largest in school history.

The class of 2014 as it exists today, however, is sure to differ somewhat in its membership by the time these students graduate—some will take time out for extracurricular pursuits, like the 75 students in the other classes at the moment who are “away” from the medical school working on an additional degree. The class of 2014 reflects other trends among Emory’s medical students as well, including growing proportions of women and foreign-born students and increasing numbers also of nontraditional students—more than half of this class have been out of college for one or more years.



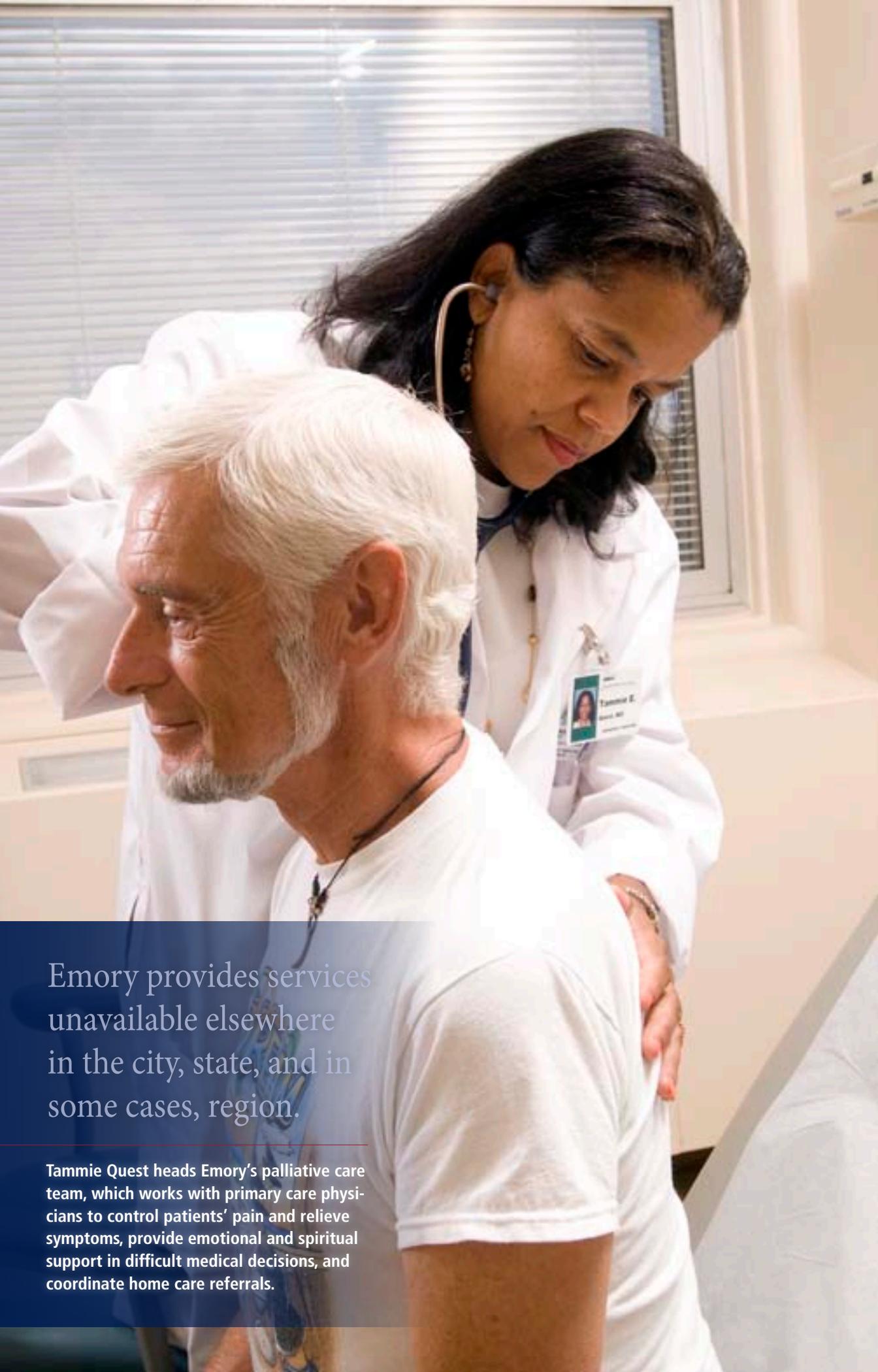
Griffin Baum is president of the class of 2011, the first class to go through all four years of the new curriculum. He describes the society system, in which the same small group of students and mentor meet regularly throughout all four years, as a great source of support in coping with the challenges of learning to be a doctor.



Faculty member Erica Brownfield (above center) in internal medicine is leading a pilot project to help students learn teamwork and how to hand the care of patients over to a following team of caregivers.



Past teaching award recipient Lisa Bernstein (above left) participated in a study designed to help faculty teach caring attitudes and provide constructive feedback to students.



Emory provides services unavailable elsewhere in the city, state, and in some cases, region.

Tammie Quest heads Emory's palliative care team, which works with primary care physicians to control patients' pain and relieve symptoms, provide emotional and spiritual support in difficult medical decisions, and coordinate home care referrals.

PATIENT CARE:

## Making people healthy

**As an academic medical center, Emory has both special opportunity and responsibility to make health care better, not just pioneering innovations but also creating new models of providing care to make it more accessible, affordable, and effective.** To understand this opportunity and responsibility, one needs only to look at Emory's footprint in Atlanta, where last year Emory medical faculty provided almost 4 million patient services, a substantial proportion of all care in the city. These services ranged from neonatal medicine to geriatrics, from primary to tertiary care unavailable elsewhere in the city, state, or, in some cases, region. Emory doctors make Emory Healthcare the largest, most comprehensive health system in Georgia. They also provide the majority of care at Atlanta's public hospital, at the Atlanta VA Medical Center, and at the nationally ranked children's hospital, with which Emory operates the largest pediatric multispecialty group practice in the state.

**CLINICAL TRIALS** *Improving research through partnership*—Established in 2007 as part of a national NIH clinical research consortium, the Atlanta Clinical & Translational Science Institute (ACTSI) has been a powerful force in accelerating translation of lab discoveries into innovations for patients. Led by Emory, ACTSI partners include Morehouse School of Medicine and Georgia Tech. A major ACTSI focus is engaging the community in the biomedical discovery process. Through community interaction, ACTSI researchers seek to discover what new health care tools, tests, and therapies a community needs and then find ways to meet those needs. ACTSI's clinical interaction network currently supports more than 260 research protocols, with clinical sites throughout Atlanta. This year ACTSI received an additional \$1.6 million in NIH funding to support translational imaging studies and expand health promotion to address health disparities.

**Making room for more—Last fall, Emory's Winship Cancer Institute opened a new 2,000-sq-ft unit dedicated to phase 1 (first-in-human) clinical trials designed to test safety of new treatments.** Community oncologists had expressed strong interest in such a unit, which increases the odds of finding new treatments.

**CANCER** *Turning the table on BRCA genes*—Emory's Winship Cancer Institute is leading a national study for patients with mutations in BRCA1 or 2 genes who have breast, pancreas, colon, ovarian, or any other type of cancer. The drug under study is ABT-888 (Valiparib), which inhibits an enzyme that helps cancer cells repair DNA damage and which may make tumors more vulnerable to existing chemo compounds.

**Herceptin-resistant breast cancer**—For the majority of women with HER2-positive breast cancer, Herceptin can be a silver bullet, targeting HER2 cells while sparing healthy ones. About 10% of HER2-positive breast cancers are resistant to Herceptin at diagnosis, and almost all metastatic HER2-positive cancers eventually become so. A



Hematologist Sagar Lonial is conducting a phase 1 trial of the first antibody to work against multiple myeloma. The trial adds the antibody elotuzumab to two standard drugs to target a protein found abundantly on multiple myeloma cells.



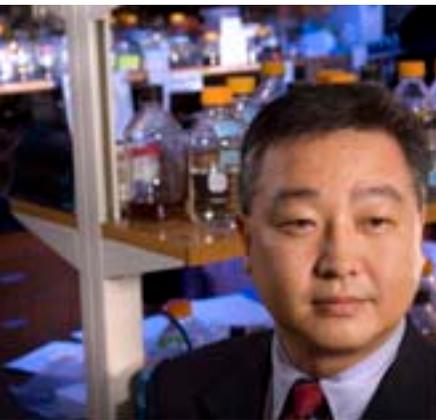
Oncologist Suresh Ramalingam is leading trials of new strategies for treating hard-to-treat cancer, including non-small cell lung cancer.



New panels of genetic tests developed at Emory help physicians like Paul Fernhoff in diagnosing several severe developmental disabilities and neurologic disorders.



Psychiatrist Helen Mayberg is helping lead a clinical trial to determine whether a pacemaker-like stimulation implant in the brain can help patients with severe depression.



Neurologist James Lah leads Emory's participation in clinical trials testing gene therapy and a vaccine for Alzheimer's.

recent phase 1 trial found that adding taxol and RAD001 (Afinitor) to Herceptin caused the cancer to either stop growing or shrink in almost 80% of Herceptin-resistant cases. Disease control rate in cancers resistant to both Herceptin and taxanes—a group of drugs that includes taxol—was even higher, about 85%, suggesting that Afinitor is responsible for reversing Herceptin resistance. Data from a phase 2 trial will be available this year, and a phase 3 trial is under way.

***Finding a reset button after treatment—Winship Cancer Institute offers a variety of programs to counteract the debilitating emotional and physical problems that cancer patients suffer both during and after treatment.*** Surgery, chemotherapy, radiation, and stress all activate the immune system, leading to release of cytokines that cause inflammation and result in depression, fatigue, and impaired memory and concentration. Doctors in Winship's mind-body program are working with former cancer patients whose depression has failed to respond to other treatments, using brain imaging to pinpoint cytokine damage and exploring whether they can block cytokines to reduce depression and fatigue.

**BRAIN AND NERVOUS SYSTEM** ***Gene therapy for Alzheimer's—*** Emory is one of 12 institutions involved in a phase 2 trial to see if gene therapy can slow progression of mild to moderate Alzheimer's. An experimental medication, CERE-110, is injected directly into the part of the brain where neuron death occurs. CERE-110 packages a gene for nerve growth factor, a naturally occurring protein that helps nerve cells survive and produce acetylcholine, which plays a vital role in memory and cognitive function. An earlier study found that the treatment was safe and well tolerated and also that it increased brain metabolism.

***Treatment-resistant depression—***Early findings from a clinical trial at Emory hold out hope that deep brain stimulation (DBS) can

restore function in patients with severe, treatment-resistant depression. Although DBS has been used for Parkinson's and essential tremor, its use for depression is new. Electrodes implanted in the brain are connected to a small battery unit implanted in the chest. The battery lasts up to five years. When it dies, patients regress to their depressed state within weeks and then improve rapidly when a new one is implanted.

**HEART DISEASE** *Fat around the heart*—Emory cardiologists have determined that imaging epicardial fat tissue provides valuable diagnostic intelligence. Patients with a large volume of fat around the heart tend to have the noncalcified atherosclerotic plaques that cardiologists deem most dangerous. In addition, in patients with chest pain but no known cardiovascular disease, the presence of ischemia correlates more closely with volume of epicardial fat tissue than with the heart's overall coronary calcium burden, itself a good predictor of heart disease. The doctors say that imaging fat around the heart could be used as a "gatekeeper," helping cardiologists decide if a patient should go on to have a nuclear stress test.

**Telehealth**—Emory's Heart & Vascular Center now offers access to specialized heart care throughout Georgia using telehealth technology. Video cameras and computer monitors allow the doctor, often hundreds of miles away, to examine a patient's legs and feet for swelling. An on-site nurse reviews vital signs and uses an amplified stethoscope so the doctor can listen to the patient's heart and lungs. The result? Patients in rural areas without access to cardiac specialists get the help they need and are able to participate in clinical trials that otherwise would be unavailable to them. **Emory is linked to nearly 40 telehealth sites throughout the state through the Georgia Partnership for Telehealth.**

**TRANSPLANTATION** *Less toxic drugs*—Emory Transplant Center helped develop a new immunosuppressant called belatacept. A recent trial showed that kidney transplant patients taking belatacept had graft survivals similar to those taking cyclosporine, while maintaining higher kidney function and lower blood pressure and cholesterol. In addition, belatacept can be given once every few weeks compared with twice daily dosing regimens necessary for standard immunosuppressive drugs.



Paolo Raggi, who leads Emory's cardiac imaging center, says that imaging the fat layer around the heart with CT or MRI can help in decisions of whether a patient needs a nuclear stress test.



Surgeon Chris Larsen leads Emory's transplant center, which has helped pioneer a less toxic drug for immunosuppression.



Stuart Knechtle performed a rare domino liver transplant last year, the first such procedure in Georgia.



## Help for those on borrowed time

In Emory's ALS center, neurologists, nurses, a speech language pathologist, a social worker, dieticians, and occupational, physical, and respiratory therapists address all aspects and stages of the disease, focusing on independence and quality of life. "The patient and family come to us, and we bring the providers to

them," says center director Jonathan Glass. Glass, a neurologist, is working with Emory geneticists to find protein biomarkers that can predict the severity and progression of ALS. He also is participating in a landmark phase 1 trial to treat ALS with injection of neural stem cells into the spinal cord. To hear Glass talk about the study, visit <http://tinyurl.com/ALS-study>.

# Blue Zone



Emory has some 285 full-time equivalent faculty at Grady Hospital along with more than 360 residents and fellows.

IN THE COMMUNITY:

## Helping those in need

**Ask a medical student at Emory, and he or she will tell you that the word on the street is this: Emory is not the place for you unless you're interested in serving those who need help the most.** Emory faculty, students, and residents work in varied ways to serve the underserved, both close to home and far away. Whether they are caring for patients at the publicly owned Grady Hospital, helping local high school students become interested in a science career, or packing up their expertise and energy to ease suffering in Haiti, helping the community is what they're all about.

**CARE AS A FIRST PRIORITY** As Georgia unemployment rates and lack of health coverage continued to exceed those elsewhere in the nation, Emory physicians provided almost \$50 million in charity care last year through Emory Healthcare. They provided another \$23 million in uncompensated care at Grady Memorial Hospital, Atlanta's safety net hospital for indigent patients, where Emory medical faculty provide 85% of care (the other 15% provided by Morehouse School of Medicine).

**In past years, Grady had been threatened with closure. More recently, however, new leadership and financial support from the community—including a substantial debt reduction thanks to Emory—started paying off. For the first time in many years, Grady is now operating in the black.** Emory and Grady have been engaged more closely in the public health system's strategic planning, including negotiating new contracts as a framework for mutual growth.

Last year, Emory faculty member Charles Moore established the Healing Community Center not far from Grady. The free clinic operates in three small rooms at the City of Refuge, an Atlanta nonprofit that serves almost 20,000 meals a month and provides transitional housing, job training, and other services in the Bankhead area. With a number of partners, including Grady and Emory, Moore is working on a clinic ex-



Every summer for two weeks, students and faculty in the physician assistant program and in family medicine trek to south Georgia to provide free basic health care to migrant farmworkers near Valdosta and Bainbridge.



## Helping veterans with PTSD

**Barbara Rothbaum, director of Emory's Trauma and Anxiety Recovery Program, was involved in creating Virtual Vietnam exposure therapy in partnership with Georgia Tech and the Department of Veterans Affairs. Virtual Vietnam laid the groundwork for Virtual Iraq and other applications. Recently, she was part of a two-day seminar to teach mental health clinicians from the Department of Defense how to use such therapy to treat post-traumatic stress disorder (PTSD). She is also a co-investigator in an NIH trial at Emory on virtual reality (VR) therapy for returning Iraq/Afghanistan military personnel with PTSD. VR therapy uses a helmet to recreate traumatic experiences.**

## Addressing abuse of the elderly and disabled

In a first-of-its-kind collaboration, Emory's Wesley Woods Center and the Office of the DeKalb County Solicitor-General have established a program called VALARI (vulnerable adults living at risk invisibly) to help elderly and disabled adults find safe shelter from harm, receive care for possible injuries, and if necessary, be moved to an appropriate temporary living environment. Possible victims identified by police or fire rescue are assessed in their residences by a VALARI team member and, if appropriate, taken to Emory University Hospital's emergency department. At Wesley Woods Center, these victims receive comprehensive medical care for the treatment of their injuries and are provided safe shelter until a more secure living situation is obtained. VALARI team member Tom Price is chief of medicine at Wesley Woods Geriatric Hospital.



PHOTO BY SAMIRA ZHEH



PHOTO BY NICOLAUS VITONE

Emory students in Haiti on a trip before the quake in January (top) and after (above).



As an NIH Fogarty fellow (the third from Emory in three years), Seema Shah spent a year in India on a project to maximize effectiveness of medical strategies against diabetes.

pansion expected to quintuple patients served, to 5,000, in the first year.

Emory faculty and trainees help in free clinics like this one and in a downtown Atlanta sliding-scale clinic founded by an alumnus. They also take their skills and compassion to places like Haiti, where an Emory group travels twice a year as a part of Emory Medishare, a student branch of Project Medishare for Haiti. When the Haiti earthquake occurred this past January, many from Emory were quickly on the scene.

Neurosurgeon Nick Boulis, for example, packed OR instruments along with mosquito nets and flashlights and began working just hours after arrival. By his fifth day, he had become chief medical officer for a big field hospital. Emergency medicine resident Mark Fenig quickly found himself in charge of 60 patients in cramped quarters. By the time he had to leave, he had trained his interpreter to be a medical assistant to run a mini-clinic he had set up to do patient intakes. Medical students Gabe Wardi (class of 2011) and Greg Staeheli (class of 2010) encountered medical challenges on a scale few first-world professionals ever see. At Emory, they would have checked with a resident at every stop; in Haiti, they drew on their training, which proved invaluable.

**ECONOMIC ENGINE** Since the early 1990s, Emory has brought the state more than \$788 million in licensing revenues from drugs, diagnostics, devices, and consumer products. A recent report by the Science Coalition, called "Sparkling Economic Growth," highlighted four of Emory's 51 start-up companies as national success stories, illustrating the power of federal investments in basic research. Emory companies highlighted developed the AIDS drugs now taken by more than 90% of all U.S. HIV-positive patients on therapy, promising preventive and therapeutic HIV vaccines in clinical trials, and cardiac imaging software.

Right: Last spring, a group of students from South Atlanta High School graduated from the Emory Pipeline Program, designed to foster interest in the sciences among Atlanta area high school students, particularly those affected by generational poverty. The program uses interactive cases developed and facilitated by medical students with help from residents and faculty. To see a video on the program, visit [tiny.cc/pipeline](http://tiny.cc/pipeline).



The Woodruff Health Sciences Center (WHSC) has some 2,500 faculty and 4,700 students, residents, fellows, and postdocs. The medical school, the WHSC's largest teaching component, has 2,200 faculty, more than 500 students, and more than 1,100 residents and fellows in training.



**From the  
interim EVPHA**  
**Why we do**

**For those of us in the  
Woodruff Health Sciences  
Center, what matters is  
clear**—better health for all

people. That's the extraordinary nature of the work we do here day-to-day and the ultimate goal of our innovative and comprehensive programs in education, research, and patient care.

Each and every day, we get the satisfaction of interacting with bright, talented students who have a passion for helping others through medicine, nursing, and public health; the excitement of working toward breakthroughs in health-related research; and the reward of knowing we're making a difference in the lives of patients in need and their loved ones.

But beyond the day-to-day, we do this work because it lays the groundwork for a healthier future—not only for the people we serve here and now, but for generations to follow here in Atlanta and around the world. Our students will be doctors, nurses, and champions of population health around the world for decades to come, and they will in turn teach others. Our research breakthroughs will be translated from the lab to the bedside, where they have the most potential to save and improve lives. And our patients will live longer, healthier lives that will impact generations of their families.

That's why we have such a passion for our vision of transforming health and healing—because we're not only doing what matters today but also what will continue to matter well into the future, not only for the thousands of people whose lives we touch every day but for all those yet to come.

A handwritten signature in black ink that reads "S. Wright Caughman MD". The signature is fluid and cursive, with the "MD" being particularly prominent.

S. Wright Caughman, MD  
Interim Executive VP for Health Affairs  
CEO, Woodruff Health Sciences Center  
Chairman, Emory Healthcare

# Emory's Woodruff Health Sciences Center

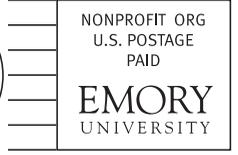
- **Emory University School of Medicine**
- **Nell Hodgson Woodruff School of Nursing**
- **Rollins School of Public Health**
- **Yerkes National Primate Research Center**
- **Winship Cancer Institute of Emory University**
- **Emory Healthcare**, the largest, most comprehensive health care system in Georgia
  - **Emory University Hospital**, 579 beds, staffed by Emory faculty (95%) and community physicians
  - **Emory University Hospital Midtown**, 511 beds, staffed by Emory faculty and community physicians
  - **Emory University Orthopaedics & Spine Hospital**, 120 beds, staffed by Emory faculty
  - **Emory Johns Creek Hospital**, 110 beds, staffed by Emory and community physicians
  - **The Emory Clinic**, made up of 1,500 physicians, nurse practitioners, physician assistants, and other providers, is the largest, most comprehensive group practice in the state
  - **Emory-Children's Center**, the largest pediatric multispecialty group practice in Georgia (and a joint venture with Children's Healthcare of Atlanta)
  - **Wesley Woods Center of Emory University**
    - **Wesley Woods Hospital**, a 100-bed facility with inpatient geriatric care and hospice service
    - **Wesley Woods Clinic**, providing outpatient primary care for geriatric patients
    - **Budd Terrace**, a 250-bed skilled nursing care facility
    - **Wesley Woods Towers**, a 201-unit residential retirement and personal care facility
  - **Emory-Adventist Hospital**, 88 beds, jointly owned by Emory and the Adventist Health System

## HOSPITAL AFFILIATES

- **Grady Memorial Hospital**, 953 licensed beds, staffed by Emory faculty, residents, and fellows in collaboration with Morehouse School of Medicine, with Emory providing 85% of care
- **Children's Healthcare of Atlanta**
  - **Children's at Egleston**, 255 beds, Emory campus, staffed by Emory and community physicians, with Emory providing 80% of care
  - **Children's at Hughes Spalding**, 24 beds, Grady campus, staffed by Emory, Morehouse, and community physicians, with Emory providing 50% of care
  - Some Emory pediatric faculty also teach and have admitting privileges at Children's at Scottish Rite, 250 beds
- **Atlanta Veterans Affairs Medical Center**, 165 hospital beds and 100 nursing home beds, staffed by Emory physicians



EMORY  
UNIVERSITY  
SCHOOL OF  
MEDICINE



Do no harm: the first principle taught  
in medicine and part of the Hippocratic  
oath. The unstated corollary to this  
counsel: Do what matters.