One of the chief sources of the city of Chicago’s global stature sits prominently on the South Side in the historic, tree-lined Hyde Park neighborhood. The University of Chicago Medical Center—almost a city in itself—draws healers and patients from around the world to the corners of 58th Street and South Maryland Avenue. From the nurses, technicians, housekeepers and administrators to the world-renowned physicians and scientists who have built and maintained the Medical Center’s reputation, the institution stays at the forefront of medicine 24 hours a day, seven days a week.

The following pages offer a glimpse into a typical week inside a vast academic medical center. At any given moment, caregivers, researchers, executives and technicians—everyone from housekeeping assistants to helicopter pilots to computational neurobiologists—work together to make this city, the state of health care, the world of medicine and sometimes even themselves a little bit better.

AT ANY GIVEN MOMENT: 24/7
most of the 9,500 people who work at the University of Chicago Medical Center are doing something that, for them at least, is quite routine. They might be waxing the floor, wielding a scalpel or writing a research paper. At any time they could be filling out reports, filing a grant proposal or flying a helicopter. In the middle of the night, they could be telling a funny story to a frightened child, transporting an elderly patient to her CT scan or transplanting a pair of lungs. Many are engaged in activities that may seem highly specialized, even daunting to an outsider, but are fairly ordinary if you are the person who does them over and over, day after day.

This annual report is designed to provide an episodic tour through an extraordinarily complicated and diverse institution as it advances through the moments, hours and days of a typical week. As in most workplaces, those hours can be filled with routine and repetition. As in most hospitals, they involve the potential for tragedy and the opportunity for triumph. But, on a scale that is rarely encountered, this is a place where remarkable things happen with some regularity. Where small, clever notions, innovations, discoveries and kindnesses can pile up through the course of a day. Where people with very different thoughts regularly share them, polishing and reshaping their ideas by bouncing them off of each other and testing them in unexpected ways until they gain enough weight and consequence to become the new way, the way things will be done here from now on, and eventually how they will be done everywhere else.
The University of Chicago has long had a reputation as a source of such big, world-changing ideas. It is the birthplace of sociology, of nuclear energy, of organ transplantation and of new forms of cancer therapy. But large thoughts, according to writer Nicholson Baker, “depend more heavily on small thoughts than you might think.” Each thought, he says, has a size. Most are “about three feet tall, with the level of complexity of a lawnmower engine.”

What we find constantly surprising at the University of Chicago is the sheer number of these moderately complex, three-foot-tall thoughts, the thousands of creative techniques that Medical Center staff—physicians, nurses and everyone else—invent on a daily basis to make diagnosis, treatment and recovery better. These may be little things, small touches that make surgery smoother, or medications more effective, or help patients feel more comfortable during what could be a very challenging time.

Of course, here and there we saw bigger ideas at work. “Once in a while,” Baker says, “a thought may come up that seems, in its wooly, ranked composure, roughly the size of one’s hall closet.” Those thoughts travel quickly. They turn up in the morning paper or on the evening news. In the past year, physicians and scientists from our institution made landmark discoveries about the evolution of life on our planet, the genetic changes that have made humans so different from their distant ancestors and how other organisms, such as the bacteria that prey on humans, have learned to keep pace.

This tendency to think about old problems in new ways, to cross academic boundaries and produce closet- and even kitchen-sized ideas, attracts a different sort of welcome attention—people who want to hasten and share in the discovery process. In the first four months of 2006, four huge gifts, in the eight-figure category, helped to set the stage for a series of future discoveries. All four were crucial, but perhaps the most remarkable, a $42 million donation to help make Comer Children’s Hospital bigger and better, came from Lands’ End founder Gary Comer, a local boy with a heart as big as a house who made a fortune by focusing on the details. Sadly, after a long illness, Gary died in October. We miss him more than we can say.

But his ideas and inspiration will live on in all the things we do, large and small. That legacy includes a piece of advice that he was famous for telling his staff, and which applies just as well, at any given moment, to those at an academic medical center. “Worry about being better,” he said. “Bigger will take care of itself.”

Valerie B. Jarrett
Chair, University of Chicago Medical Center Board of Trustees

James L. Madara
Vice President for Medical Affairs, University of Chicago
Chief Executive Officer, University of Chicago Medical Center
This morning there are no children crying in the third-floor cardiac intensive care unit (CICU) in the University of Chicago Comer Children’s Hospital. Although 10 beds wrap in a U-shape of muted pastels around the central desk, and every bed embraces a child, the only noises come from the physicians and nurses as they travel between patient beds and consult one another about medications or recent occurrences.

The unit is quiet today because the children here are so sick. Many are either sedated or unconscious. It’s also because in Comer, the new $135 million facility—two-and-a-half times the space of the previous children’s hospital—individualized pagers and wireless phones have replaced the standard overhead paging system traditionally used in hospitals.

Phineas Oren, MD, is the attending physician this week, and his work at the University of Chicago Medical Center is multi-layered. In addition to seeing patients, Oren teaches medical students, directs the training program for pediatric ICU fellows and is developing a resuscitation curriculum. Today, he’ll spend most of his shift, which sometimes lasts 16 hours, conducting physical exams and the rest of his time re-checking medications and keeping on top of paperwork.

Oren begins with a tiny 18-month-old girl who lies in one of the CICU’s four private rooms—her shiny black hair in pigtails, her eyes closed, her heart failing.

These rooms are reserved for patients with unusually long hospital stays, “so the families can be comfortable since they’re going to be here a long time,” Oren says, or for patients who require isolation or quiet that the bay of beds in the CICU doesn’t always provide.

A feeding tube, taped to the right side of the girl’s body, leads directly into her stomach. A ventilator helps her breathe. In addition to congestive heart failure, she was born with situs inversus, which means the organs in her chest and abdomen are reversed, left to right, mirroring where they should be. She also has a defective spleen, which means she needs antibiotics to prevent infections that others fight off naturally.

Due to daily treatment, the toddler has grown tolerant to her pain medications and requires higher and higher doses. “It’s a big challenge to keep her comfortable and still,” Oren says. Physicians have paralyzed her muscles to keep her from tugging on the tubes and lines coming from her mouth, nose, chest and stomach.

“These patients are some of the sickest in the hospital, with very complicated problems,” Oren
Pediatrician Phineas Oren discusses a patient’s improvements over the past hour at the nurses’ station in the Comer cardiac intensive care unit. A child’s health status can unexpectedly falter at any moment in the ICU. As the attending physician today, it’s Oren’s job to keep track of all children in the unit’s 10 beds.

As Oren leaves the girl’s room, he runs into pediatric critical care fellow Chris Montgomery, MD, who splits his time between caring for patients in the hospital and studying deadly infectious diseases. They discuss the best plan of action with respect to the girl’s pain medications. Oren then moves on to his next patient.

He’s helping these children fight for another chance at a healthy life. Yet, with every decision he makes, Oren wields a double-edged sword. “Everything I do to save someone’s life has a chance of killing them too,” he says. “Nothing I do has zero risk.”

While Oren is making his rounds, Michelle Obama, Vice President for Community and External Affairs, scurries between meetings. Her job involves “keeping community affairs at the front of [her] mind and funneling through information [she’s] hearing from the ground troops,” she says.

This morning, she and other vice presidents discussed hospital expansion. After that, she met with a community member who serves on the Federally Qualified Health Centers (FQHC) board. They discussed research on the expansion of the 16 South Side community-based health centers that partner with the Medical Center to offer people preventive care before medical conditions get so extreme that people end up in the already-congested Chicago ER. Now she’s off to a meeting about business diversity.

By late afternoon, after hours of meetings, Obama has returned to her office. Family photos take front row to the dense shelves of sociology and law books beside her desk. Her children’s drawings fill the marker board behind her.

Under Obama’s leadership, the Medical Center’s involvement with and support of minority- and women-owned businesses has risen to 40 percent—15 percentage points higher than the city’s minority goals and 35 percentage points higher than its women-
owned goals. The number of hospital volunteers has also more than doubled in the past two years. And Obama is constantly working on the South Side Health Collaborative, which, after a year of establishing relationships between the Medical Center and various neighborhood health centers, has found primary care “medical homes” at nearby clinics for more than 1,200 patients, substituting routine preventive measures for emergency care.

This project seems especially close to Obama—a South Side native who grew up unaccustomed to regular physical check-ups. “The Medical Center can’t be everything,” she says, referring to how people make frequent trips to the ER because no one in the family has a personal doctor. Without routine care, nagging health issues mount and warning signs go unheeded. Soon little problems become genuine emergencies.

Obama says the Medical Center’s reputation for excellence is partially at fault. Many people don’t trust their neighborhood clinics. “We’ve been able to survive like an island,” Obama says, “but now the world is seeping in, and our salvation will be the success of our partners.”

More than 1,000 community-based FQHC health centers exist across the country, serving 11 million patients, nearly half of whom are uninsured. Obama’s goal is to connect people in the community with doctors at these centers, to let them know that they can use those physicians on a regular basis instead of ignoring symptoms until they send them to the ER, where care can cost five times more than at an FQHC.

Once patients’ emergencies are resolved, ER social workers and patient advocates, currently funded by a Healthy Communities Access Program (HCAP) grant, help patients find medical homes near where they live.

“Now we’re working together to get people to the right place,” Obama says, “to make sure everyone stays generally healthy with routine care.”

Around a few corners and down a couple of corridors from Obama’s office, social worker Rebecca Streifler is doing exactly that. While other parts of the Medical Center may see rises and falls in activity levels throughout a typical day, the emergency room at Chicago is a guaranteed source of constant commotion. Each of the ER’s three sections (two for adults, one for children) has a bank of computers and desks where clinicians review patient charts, gather information, call for translators… Through the turbulence, however, Streifler stays focused on what she has to do.

As a social worker covered by an HCAP grant, Streifler visits with ER patients after they’ve seen a doctor. A typical workday could involve assessing a 2-year-old’s safety, intervening in a teenager’s personal crisis, screening a 40-year-old for drugs and alcohol and setting up home care for an elderly patient. Above all else, she’s there to listen.
Across the street from the ER, human genetics professor Jonathan Pritchard sits in his office in the Life Science Center proofreading a paper he and his team are about to submit for publication. This study piggybacks one published early this year after the scientists scanned the human genome in search of genetic variations that could signal recent evolution. Pritchard and his team found more than 700 possible genetic variants.

“There have been a lot of recent changes over the past 10,000 years—the advent of agriculture, shifts in diet, new habitats, climatic conditions,” Pritchard says. “This approach allows us to take a broad perspective to see what kinds of biological systems are undergoing adaptation.”

The data the scientists analyzed were collected by the International HapMap Project and consisted of genetic data from 209 unrelated individuals who are grouped into three distinct populations: 89 East Asians, 60 Europeans and 60 Yorubans from Nigeria. The researchers found roughly the same number of signals of positive selection within each population. They also found that each group shares about a fifth of the signals with one or both of the other groups.

Among the signals found were previously known sites of recent adaptation, such as the salt-sensitive hypertension gene and the lactase gene, which enables the digestion of milk to continue into adulthood. This lactase mutation appeared in approximately 90 percent of Europeans, making it the strongest signal in the genome hunt.

And she’s heard a lot. Streifler has worked at the Medical Center for four years. She spent the first two and a half exclusively in the pediatric ER. Now she alternates between pediatrics and adults.

Streifler has seen more than 20 patients since she arrived for her shift 12 hours ago. There’s no limit as to how much time a given patient will require, and there’s an older couple in one of the curtained rooms that she has yet to see. Streifler finds the chart on the counter and parts their curtain. A man sits propped up in bed. He fell earlier today, and Streifler wants to find out if the couple wants homecare to help with daily chores, hygiene or whatever else they might need.

The man is quiet and serious, but can’t help but break a bit of a smile at Streifler’s encouraging words. Her voice is soft, friendly and optimistic, like a kindergarten teacher’s.

As they chat, the man’s wife laughs, and her smile takes over her whole face. Apparently the man’s fall was an isolated mishap, not the result of dizzy spells or loss of balance. They tell Streifler they don’t need anyone to visit their home. Before Streifler leaves, she offers them an information pamphlet. The couple accepts it for future reference and thanks her.

Jim Walter, MD, Section Chief of Emergency Medicine, says the social workers’ impact has “changed our ER dramatically. They’re doing exactly what the Medical Center needs.”

In a place that can be extremely intimidating, Streifler offers a helping hand and a smiling face. But for now, she’s ready to head home.
Standing beside the first patient she’s cared for since the lung transplant team moved to the University of Chicago last November, pulmonologist Sangeeta Bhorade, MD, shakes her head. None of this is new to her. The team’s first transplant was in 1988. Since then, the same team of physicians, nurses, transplant coordinators and case managers has performed nearly 500 transplants and now is working to build a patient base in a new location. The team already has 30 patients in various stages of the process leading up to a transplant.

“Are you okay?” Bhorade asks Allen Leonard, 44. He has been a personally endearing but technically challenging patient. A former Chicago policeman, Leonard suffers from pulmonary fibrosis, caused by scleroderma, a particularly difficult disorder for transplantation. But he has recovered well after his—at least clinically. This morning he seems a little out of sorts, grumpy and sullen when he should be eager to show off his recovery, to get out of the ICU and go home. “We want to have to hold you back from running out of here,” says Bhorade, medical director of the program.

Instead, Leonard stares out of the floor-to-ceiling glass wall, which provides a clear view of the ICU, and the ICU a clear view of him. He’s been frowning since the team entered his room. Bhorade rubs his shoulder before leading everyone out of the room.

At the ICU’s central station just across from the patient’s room, Bhorade and the team discuss the source of Leonard’s distress. His lungs are fine, but his mood, at this moment, is not. One of the nurses mentions that he may feel on display because of the windowed-wall that enables caregivers to look in on him. “He is a very autonomous guy,” Bhorade says. “I’d feel the same way.”

Giving Leonard a new pair of lungs, the transplant team has solved his core problem. Now the team hatches a strategy for his peripheral concern. Nurse Vicki Fron returns to his room. She consults with the attending nurse, who then pulls his drapes closed, blocking views from both sides, allowing for some privacy. Leonard’s distress, possibly amplified by his medications, slowly resolves itself. Within two weeks, he and his new lungs are on their way home.
As Bhorade returns to her office, procurement coordinator Ozzie Rivero rushes into the operating room carrying an ice-packed cooler. Inside, wrapped in three plastic bags, is a heart that Rivero flew to Tennessee to collect, but it could just as well have held a set of lungs. In the case of this donor, the University of Pittsburgh Medical Center obtained the lungs, and a team from Vanderbilt Hospital in Tennessee took the kidneys.

Rivero is under a tight deadline. Hearts last only four to five hours outside the body. Since his pager went off at 1 a.m., he has been on the move: calling the surgeons who will harvest the heart, the operating room staff and Aerocare, the medical transportation company that provides the Chevrolet Suburbans, helicopters or Lear jets that enable the transplantation. “We’re really the linchpin that holds everything together,” he says.

Rivero is on call 24 hours a day, seven days a week, every other week. Angel Rivera, another procurement coordinator, covers the alternate weeks. The typical burnout time for coordinators is 24 months, probably due to the hours and the emotion that fuels their work. Rivero and Rivera, however, have been coordinating procurements for more than nine years. They’ve seen a lot over that time and know that there exists “a huge disparity between people needing and people donating,” Rivero says.

Between procurements, which may happen every few days or every couple weeks, the coordinators work with Gift of Hope in Elmhurst, Ill., to encourage people to register as donors. In Illinois, the Organ Procurement and Transplantation Network currently lists nearly 5,000 people waiting for a kidney, liver, pancreas, heart, lung or intestine. Rivero and Rivera will play a vital part in helping many of those people move off that list and on to healthier lives.
1:02 PM

The atmosphere in Margaret Tobin’s office is distinctly less urgent than that in the operating room. Soon enough, however, the decisions she makes as Director of Operational Planning, Design and Construction will affect the surgeons currently hard at work. Tobin holds weekly meetings with surgery and anesthesia working groups to help her and the design team tailor the plans for Chicago’s new hospital pavilion to suit their needs.

“We’re working with some of the most interesting people because they’re smart, they care about quality and they excel at what they do. Meetings can get very intense,” says Tobin, who also helped plan the Comer Children’s Hospital and the Duchossois Center for Advanced Medicine. “It’s a lot of work just combing through the details, making sure nothing gets lost in translation.” In addition to meeting with surgeons and anesthesiologists, Tobin also spends Wednesday, Thursday and Friday of most weeks conferring with radiologists, nurses and gastroenterologists, as well as other people from various ends of the Medical Center, including those from Support Services. “In three days you really get to see a cross-section of the Medical Center and come to understand the workings of functional health care,” she says.

The new pavilion will add 500,000 square feet to the Medical Center, increasing capacity by more than one-third. Opening in 2011, it will stand 10 stories tall and two blocks wide on 57th Street between Cottage Grove and Drexel Avenues, adjacent to DCAM and Comer.

Tobin spends her days planning that future. “We’re always raising the bar for better patient care,” she says. “It’s all about efficiency, circulation and flow. So much of the Medical Center’s vision and mission are tied up in the new building.”

1:07 PM

As they enter the American School, which sits between Comer and Mitchell and is now being renovated, surgeons turn toward a second-floor room to discuss a construction project of their own—the new hospital pavilion—and the design specifications they’ll need to make it work.

5:15 PM

Of all the patients in the Medical Center, the ones with whom Maria Kalifa works come from farthest away and possess some of the most serious ailments. Kalifa began at Chicago six years ago as part of Physicians Services. Among her many other responsibilities, she was the liaison for the Medical Center’s only international patient. But as the international program grew, so did the number of patients. Now, Kalifa directs a four-person team that helps coordinate care for approximately 70 patients each month, 45 percent of whom travel to the Medical Center from Persian Gulf countries. Ten Arabic-speaking and two Spanish-speaking translators work with her.

Kalifa, originally from Lebanon, speaks fluent Arabic, along with French and English, and she’s using Arabic today as she stops by Tareg Alawadh’s room to see how he’s doing. Alawadh came to the United States from Kuwait. He knows enough English to get by when he’s interacting with his physicians and nurses, but opts for Arabic as soon as Kalifa enters his room.

On April 2, Alawadh underwent a triple organ transplant at Chicago—heart, kidney and pancreas. Although 95 percent of cadaver organs must go to U.S. citizens, regulations allow one out of 20 donated organs to be used to help those from abroad. Alawadh originally came to the States for a heart transplant; however,
when physicians here conducted further exams, they discovered that Alawadh’s diabetes had affected his kidneys and pancreas to the point that they, too, needed replacement.

One month after the surgery, Alawadh’s daughter sits on the foldout bed next to his in the hospital room. She’s 13 years old with large hazel eyes and short black hair. For now, the dark cloth wrapped around her head falls over her shoulders. Toothy grins take over her face as she laughs and pokes fun at her father while he praises his caregivers and questions Kalifa about his embassy’s financial aid.

Kalifa tells him that she is traveling to Washington, D.C., on Thursday. “Don’t worry, I will address it there,” she says, regarding the financial issue. “I do regular trips to D.C. to acquaint myself with the embassies,” she adds. In the coming months, she will also help the Alawadhs find temporary housing in Chicago and introduce them to what will become their major social support network: the more than 20 other Kuwaiti families also at the Medical Center for care. “Chicago is a better place because of her,” Alawadh says.

Moments later, when a group of male physicians knocks on the door to check on Alawadh, Kalifa asks them to wait while the daughter covers her head. The covering is a vital part of the Alawadhs’ culture, something Kalifa must understand in order to do her job, making the patients feel at home when they are, in fact, thousands of miles away. “Maria,” Alawadh says, “she is like family to me.”

From the sounds of it, Kalifa considers her patients family too. “Every day is new, and every patient is different,” she says. “People think it’s strange because I love my job so much. But I think that’s the way to be successful—to feel passionate about and love what you do.”

Hundreds of miles away, in laboratories overlooking the Potomac River in Virginia, researchers are preparing their labs and working on ways to attract the graduate students who will arrive next fall.

The Howard Hughes Medical Institute opened the Janelia Farm campus in early October. By this time next year, the University of Chicago, Cambridge University in England and Janelia—a 281-acre research campus—will have collectively welcomed a few carefully selected, highly motivated students from around the world into a research partnership that joins the three institutions and enables students from the two universities to earn their PhDs in a remarkable new setting.

The partnership between the University of Chicago and HHMI will be administered through Chicago’s new Interdisciplinary Scientist Training Program. The program will grant jointly trained students the PhD in biology. These students will enjoy a novel interdisciplinary environment that will connect Janelia’s “think-tank” campus with Chicago’s prestigious faculty and create opportunities for joint projects.

Access for graduate students comes only through the University of Chicago or Cambridge. Because HHMI will completely fund the scientists who will use the campus, the researchers will be free to follow any leads they may uncover rather than adhering to strict requirements imposed by grant funding.
The Wyler lobby smells more like a country kitchen at sunrise than a sterile hospital building this morning. That’s because in a conference room just beyond the lobby, people from the Office of Volunteer Services are uncovering steaming platters of eggs, sausages, biscuits and bacon. Colored leis hang from their necks and wrap around their ankles. A stack of hula hoops leans against one wall, and Bob Marley’s “Is This Love?” rings from corner speakers.

The office hopes to bring a little piece of the tropics to the University of Chicago in celebration of the Medical Center’s dedicated group of 633 volunteers, who run the gamut of ages between 16 and 85. These volunteers do everything from cuddling babies and playing with children to greeting patients and assisting in the ER.

“Volunteerism here is really two-sided: bringing people in to improve quality care and sending doctors and nurses out to schools, gardens, churches and elsewhere in the community,” says Leif Elsmo, Director of Volunteerism. “The South Side’s not such a faraway place once you’ve planted a garden in Woodlawn. Our theory is that the only way to build trust is through interaction.”

Once the room is decorated, Beverly Billy, Manager of Volunteerism, grabs a bag of leis and heads for the door to welcome the volunteers who are waiting in the lobby. One of those volunteers is Addie Matten. She remembers the exact date she began volunteering as a foster grandmother at the Medical Center: July 6, 1998. Since then, she’s spent four hours a day, five days a week holding, feeding, rocking, reading and playing with some of Chicago’s tiniest patients. “I love holding them,” she says. “My energy comes from them.”

There’s also Carla Velazquez. She’s quieter than Matten, who talks and jokes with the other volunteers like long-time friends. Since September 2005, Velazquez has traveled to the Medical Center a few times each week. And while her duties may seem minor—walking through lobbies to offer patients and families coffee and her comforting presence—seeing a friendly face makes an important difference to people under stress in a place as big and fast-paced as the Medical Center. “It’s the little touches that make our patients feel better,” Elsmo says.

Velazquez agrees. “I like when people smile and say they really appreciate our help,” she
Volunteer Addie Matten has played grandmother to hundreds of children during the past eight years, holding, rocking and feeding babies in the PICU. This morning, though, she sat around a table with other volunteers, laughing and enjoying a Hawaiian breakfast the Medical Center organized to say thanks.

This afternoon, David Frim, MD/PhD, Section Chief of Pediatric Neurosurgery, stands with his head lowered over a table in Operating Room 2 of Comer Children’s Hospital. Like the volunteers, he’s committed to what he does. His hands work quickly, steadily, and the rest of his body remains still as he draws a rectangle just below the crown of 12-year-old Christian Collier’s scalp, drills holes in the rectangle’s four corners and pulls an electronic knife across its lines. He will peel back the shaved section of scalp and lift the small fraction of skull, 3-by-2 inches perhaps, to expose Christian’s brain.

Frim, with his trademark brown beard and bow tie, is a major reason Chicago’s name carries so much weight in the world of pediatric neurosurgery. Children come to the Medical Center from across the country to see him. Among them is the now-famous Baylie Owen, a 7-year-old Texan who has donated more than $100,000 to Frim for research on the incurable brain disorder Chiari malformation. Baylie raises the money through her web site, www.baylieforbrains.com, where she sells beaded blue bracelets featuring such words as “cure” and “hope.”

Christian is on Frim’s table today because he and his family are seeking a cure for his epilepsy. He suffers from multiple seizures daily, and the epilepsy team wants to pinpoint their origin. “We can remove part of his brain if the seizures are coming from that one part,” Frim says. “If they come from all over, we’re stuck.” He and the team of clinicians will monitor Christian for about a week before deciding what to do.

says. Having moved to the United States from Peru and speaking Spanish and English fluently, Velazquez occasionally translates for patients as well.

There are about 20 other volunteers, in addition to Matten and Velazquez, who arrived promptly at 8 a.m. for their celebratory breakfast. As they file in, Billy smiles and slips leis around their necks, encouraging everyone to join in later on the hula hoop contest.

“This is all about celebrating what you do for us,” Elsmo says, addressing the volunteers seated around the long wooden table that takes up most of the room.

“You guys make it worthwhile for me to get up and come into work,” office secretary Angela Thomas continues. “Today, let us cater to you.”
Frim is confident and focused behind the clear goggles covering his eyes and the teal paper mask covering his nose and mouth, but he’s also aware of what’s going on around him—a dozen nurses, technicians and students who flow in and out of the room and around the table. In the midst of it all, he clearly outlines the steps of the surgery to the handful of medical students shadowing him.

Sara Wiemer is one of those students. She’s in her third year and is studying to become a pediatrician. “It’s amazing to see the brain for the first time,” she says. Though she’s not specializing in neurosurgery, Wiemer says the experience will help her do her job better. “I understand the process now and will be able to explain it to patients,” she says.

Christian’s surgery lasts three and a half hours. He is unconscious and covered with sheets. After Frim exposes the brain, he uses tweezers to slide each set of electrodes in straight lines under the remainder of Christian’s skull.

Christian’s epileptologist, Michael Kohrman, MD, is also in the OR with Frim. The two consult about the precise placement of the electrodes, which come in thin white strips, with wide-band rainbow ribbons for tails that wind down from Christian’s head and onto the table. With the electrodes in place, Frim replaces the missing segment of skull, like the last piece of a puzzle, and pulls the ribbons through the little circles he had drilled in the rectangle’s four corners. Wiemer helps him stitch the scalp back in place. Frim encourages her as she ties each knot, telling her she’s already a pro.

Frim performs approximately a half dozen surgeries each week and spends the time between procedures updating records, rounding, teaching and attending conferences. His plate is full. As soon as his work on Christian is done, Frim steps out of the room and removes his gloves, mask and surgical cap. From here, he’s on to a meeting and then rounds. He arrived at work before 7 a.m. and won’t get home until well after 7 p.m. Perhaps when he returns tomorrow, he’ll be at least one step closer to solving Christian’s problems.

6:08 PM
Neurosurgeon David Frim finishes a four-hour surgery on a young epilepsy patient. But before leaving for the evening, Frim needs to see one more patient: a teenager who checked into Comer on Monday with severe headaches caused by Chiari malformation—a disease in which the bony space at the lower rear of the skull is smaller than normal, blocking the flow of cerebrospinal fluid.

By the time the moon outside Christian’s window in the pediatric intensive care unit has risen, he’s asleep. White cloths wrap like a turban around all but the top of his head, and his swollen eyelids hide his eyes even when he’s awake.

Christian’s mom, Jacquelyn Collier, is wide awake. She sits in a chair beside his bed, watching. She has folded her hands over her chest and shakes her head as she thinks back on the years of seizures that have brought them both to this room.

When she would bathe her son at less than a year old, he would shiver, she remembers. “I just thought he was cold,” she says. But one day she called her sister and told her about Christian’s shaking, and her sister called an ambulance. It was then that Jacquelyn discovered that her baby hadn’t been cold after all.

Christian had been having seizures, and though he has reached the physical age of 12, his mental age mirrors that of a 3- or 4-year-old. “He just trusts everybody, and you can’t go through life like that,” says Jacquelyn praying that the doctors at Chicago will help her son.
While David Frim focuses on human brains, the ones Peggy Mason, PhD, studies are significantly smaller.

Rats make up her laboratory. And within the past year, Mason, along with research associate Haley Foo, reported in the Proceedings of the National Academy of Sciences that “OFF” and “ON” cells in the animals’ ventromedial medulla (VMM) work jointly to allow hunger, thirst and urination drives to override pain.

This helps even healthy, well-fed rats eat when a “feed or flee” mindset is present. “Escaping pain and potential dangers may be important protective behaviors, but eating, drinking and eliminating wastes are absolutely essential,” Mason says.

Mason and Foo conducted the experiment using adult male rats. They put them in containers with wire mesh floors and delivered radiant heat to one hind paw. The heat wasn’t intense enough to cause damage, but was annoying enough to make the rats move their paws within seconds.

The rats’ reactions changed, though, with food. They delayed retracting the heated paw for up to eight seconds, continuing to eat whether the reward was standard rat food, chocolate chips, yogurt drops or butter cookies.

During this time, Mason and Foo discovered, the animals’ pain-enhancing ON cells were inhibited and their pain-suppressing OFF cells were energized. The animals responded similarly while drinking and urinating.

Their findings are huge in the world of neurology, and yet another facet of what is underway at the Medical Center at any given moment.
Thursday

9:49 AM

“I don’t want to be in a lab again,” says CBS 2 Chicago medical reporter Mary Ann Childers, glancing around the University of Chicago Medical Center’s ER for another location. Her videographer lugs his camera and lighting equipment as he walks beside her. The news crew has come to the Medical Center to interview Robert Daum, MD, a pediatric infectious diseases specialist and arguably the world’s leading expert on community-associated methicillin-resistant Staphylococcus aureus, or CA-MRSA. This potentially deadly new form of staph infection, resistant to virtually all antibiotics, recently began showing up in communities.

Childers interviewed Daum about the same subject last fall in his laboratory on the sixth floor of the Wyler building. Then, Daum’s most well-known patient, 9-year-old Jewaun Smith, was barely breathing after the germ and its toxins almost killed him, eating away tissue leaving hundreds of holes in his lungs, putting him in a coma for two and a half months. The infection overwhelmed Jewaun after he fell and scratched his leg while biking in his neighborhood.

Jewaun, healthy today, is one of the lucky ones. CA-MRSA occurs in varying forms, and of the 14 severe cases Daum has treated, half of the patients have survived. The first to publish the description of a cluster of community-associated cases, Daum tells Childers in the interview, “Staph has figured out how to get around every antibiotic that’s been brought onto the market. So what are we going to do? We’re working on making a vaccine.”

It’s not only Daum’s expertise that triggers interview requests from media outlets around the world, including “60 Minutes” and *Time* magazine, but it’s also his ability to keep calm and reasonable, to provide hope in the face of an infection that, unlike the hypothetical bird flu pandemic, “is here and now.”

9:55 AM

As the cameraman adjusts the lights, CBS 2 Chicago medical reporter Mary Ann Childers and infectious diseases specialist Robert Daum chat like old friends, probably because Childers’ health coverage often leads her to Daum, a prominent researcher who specializes in Staphylococcus aureus infections.

Daum arrives in the ER for the interview full of apologies for his tardiness. Childers shakes her head and tells him not to worry. They’ve found a suitable room for the interview, but will have to wait until the nurses finish running tests on a patient there before the crew can settle in.
By 11 a.m., the interview is over. While the cameraman packs up his equipment in the cluttered room, Daum and Childers chat about work and Daum’s wife’s recent surgery. Before they leave, Childers decides she wants a shot of herself and Daum walking down the hallway, talking. They start at the opposite end of the bright corridor, and as they walk, members of the Medical Center’s lift team rush past on their way to a patient’s room.

The lift team was assembled to help bedside nurses get patients out of bed. The nurses often would injure themselves by using incorrect positions to elevate overweight patients. However, with a specially trained team equipped to transport and lift patients, on-the-job injuries have decreased and overall patient care has improved.

7:12 PM

Around the corner from the ER, Michael Vannier, MD, a diagnostic radiology expert, swings his encased laptop over his shoulder before leaving the radiology reading room, where he has spent the day interpreting the 150 CT scans administered within the past 24 hours. Vannier’s laptop contains the same program that’s on the reading room’s desktop computers. Powerful, it displays scans and realistic 3D images from the 64-slice CT scanner, the newest in a 15-year-old line of scanners with an impact so impressive, its development has been compared to the discovery of X-ray imaging. Now past 7 p.m., Vannier has a train to catch and will bring the laptop with him so he can continue his work.

The 64-slice scanner provides images never before seen via non-invasive means. “We’re looking at images from different planes,” Vannier says. As a result of the new scanner, his computer shows detailed 3D images of the heart and its major vessels, as well as how contrast agents move through and around a tumor, enabling doctors to predict a cancer patient’s response to treatment instead of simply observing the reactions once they occur.

Technicians run the scanners, which, in half a second, can complete a 360-degree rotation, producing 128 images within a full second and 1,000 within the seconds it takes to complete a full study. “We’re in high demand,” Vannier says, attributing much of that to the 64-slice scanner, which features an automated voice that tells patients, for example, when to hold their breath. There are six multi-slice scanners housed throughout the Medical Center, and all are available 24 hours a day.

When Vannier arrives each morning, he and other doctors go over the cases from the night before. By late afternoon, a group of about 10 physicians pulls down a giant screen in the reading room and discusses particularly difficult or unique cases. “This is going to be one hell of a surgery,” Vannier had said earlier from the back of the room as an image of a child’s face with massive tumor growths appeared on the screen. The physicians proceeded to discuss the case—surgery options, post-surgery possibilities… The group’s feedback will help guide each individual’s physician in deciding treatment options.

Vannier can’t stop working just because his hours are over. Not only does he travel the country, giving talks on radiology procedures and technology, he also brings the images with him virtually everywhere he goes, so long as he has his laptop with him.

7:21 PM

The new computer software that radiologist Michael Vannier uses corresponds with the 64-slice CT scanner. It generates realistic depictions from the scans and has been changing the way physicians examine the human body.
Fourteen hours have passed since Diane Yamada, MD, arrived at the Medical Center, and it may be another hour before she walks out the door. She could leave now if she wanted to. Her meetings, which began before 7 a.m., are over; her conference with the other gynecological oncologists, nurses and social workers to discuss patient treatment plans ended nine hours ago; and she has finished rounding and seeing patients in clinic. But up on Mitchell’s sixth floor, there is one particular patient she wants to see one more time today, just as she has every day since the patient arrived on Monday.

As Yamada catches an elevator, patient Sondra Hannafan curls up under the sheet on her bed, having just returned from two hours in radiology for CT scans of her brain. The retired teacher-turned-homemaker says she’s not hungry but knows she must eat. Her husband, Michael, sits on the guest bed, helping her decide what to order from the menu, which provides inpatients with multiple breakfast, lunch and dinner options. The one Hannafan ordered before going to radiology has grown cold.

They can hear Yamada’s tiny heels click-click-click down the hall. “She’s been with us since the very beginning,” Michael Hannafan says as she enters. “We think Dr. Yamada is the greatest thing since sliced bread.” When his wife was diagnosed with ovarian cancer in April, the Hannafans interviewed oncologists at three teaching hospitals. Despite having to drive past two of them on the way from their home on Chicago’s North Shore, the couple chose the University of Chicago because of Yamada.

They first connected one evening in late April when Yamada received a call from the Hannafans and arranged to meet with them the next morning. After hours together, the three of them mapped out the possibilities of how to handle the cancer. Less than a week later, Hannafan underwent a five-hour hysterectomy.
and debulking surgery at Chicago to remove any detectable tumor. After successful surgery, she began intraperitoneal chemotherapy, a form of treatment that injects anticancer drugs through a tube directly into the patient’s abdomen.

The treatment plan Yamada developed in conjunction with other specialists was intense—not one, she says, that a patient would undergo at a smaller community hospital. “It’s important for us to talk about all the options of chemotherapy,” she says, “and to be prepared to deal with all their complications.”

Hannafan had been doing fine with the treatment until a Monday in mid-June, when her husband brought her back to the Medical Center after she suffered what doctors refer to as a “change in mental status.” Suddenly unable to recognize her husband or recall the year, “she was clearly a different person,” Yamada says, looking at Hannafan from where she sits at the foot of her bed. Hannafan shrugs as the handful of nurses who have entered her room say how thankful they are that she’s doing better.

Nephrologist Patrick Murray, MD, enters the room quietly and stands beside Hannafan’s bed so he can check her heartbeat and breathing. With a slight Irish accent, Murray tells the couple that the change in Hannafan’s mental status may be related to her sodium levels. He assures them, if it’s an issue with her brain, the battery of scans she’s just had will surely reveal that. Yamada is quiet through most of the talk, but keeps her eyes on her patient.

Once Murray and some of the nurses leave the room, things are quieter. Yamada pats Hannafan’s blanketed leg, telling her how impressed she is with her improvements. It’s after 9 p.m. now, and Yamada will head home. Hannafan, however, will stay at least one more night in the hospital, so the couple turns their attention back to the menu to order dinner.

At the Forefront of Research

Studying the human brain requires more than looking at it. It also requires listening to it. Neuroscientist Nicholas Hatsopoulos can do more than eavesdrop. Along with colleagues at Brown University, he has developed a way to record signals sent out by large groups of neurons—commands telling the body how and where to move—and to translate the orders into a language a computer understands and acts on.

The technology is called a brain-computer interface—BCI for short—and it’s not a new phenomenon, but it’s only in the past decade that the technology’s true potential has been realized. The main thrust today is developing BCI systems to aid people who are paralyzed by injury or illness. While these patients’ limbs may be still, studies show that the motor cortex is not. Hatsopoulos’ team is one of only about half a dozen university research groups working on the problem in the United States.

Ten years ago, Hatsopoulos and John Donoghue, his former postdoctoral advisor at Brown University, became the first scientists to teach monkeys how to move a computer cursor with their minds. Two years ago, they taught a person to do it—a quadriplegic was able to turn on a television, check e-mail and wiggle the fingers of an artificial hand, all with his thoughts alone. The patient is part of an FDA clinical trial of the BrainGate system, the product of a company Donoghue and Hatsopoulos launched in 2000.

In a nutshell, the researchers have found a way to turn thought into action—without moving a muscle.
By quarter after 10 Friday morning, nurses from the oncology ward on 6SW have filled the 25 chairs of the makeshift lobby just outside their floor’s elevator and overflow into the hallway beyond the chairs. The nurses are here to celebrate one of their own, Esmerelda Garcia, whom they’ve nominated for the 2006 Patricia H. Morgan Award for Excellence in Oncology Nursing.

The Morgan family has sponsored the award since 1992. One nurse is honored with the award each year through nominations from peers. The award recognizes Patricia Morgan, a registered nurse for more than 30 years who was diagnosed with cancer. The University of Chicago is known for its cancer treatment and compassionate healing, and these nurses are a large part of that renowned care for patients and families at times when they’re most vulnerable.

“The passion and compassion that people bring to their work makes the difference,” says Jamie O’Malley, Vice President and Chief Nursing Officer, addressing the crowd. Garcia, her parents and three sisters sit in the second row of chairs directly in front of O’Malley. They know Garcia has won the award. Before she accepts, however, the other 10 nominees—the most the award has ever garnered—are recognized.

The crowd explodes in cheers as Garcia stands to accept her award. Fighting back the tears, she approaches the podium and wipes her eyes. “It’s okay Esme. Take your time,” says one of the nurses from the hall. When Garcia does speak, her voice is soft, and she expresses her gratitude in a straightforward way. It’s not recognition that motivates her, but the patients who need her.

On the second floor, half a dozen researchers sit down to their weekly meeting. David Meltzer, MD/PhD, leads the group, after having arrived only minutes ago, out of breath.

Meltzer keeps a busy schedule. As a researcher, he’s involved in multiple projects. As a hospitalist, he sees inpatients, specializing in their hospital care. And as an administrator, he advises junior faculty on their research and fills his days with meetings—including today’s with a group of other hospitalists and researchers.

“I look at this group as a team,” Meltzer says. “It’s a very powerful partnership between research and quality improvement.” He speaks quickly, outlining the meeting’s schedule: research updates until 1:30 p.m., operations discussion and new employee introductions.
Next, Elmer Abbo, JD/MD, talks about his work on quality of care for patients with pneumonia. As part of the Medical Center’s response to Medicare’s new quality of care initiatives, Abbo works on projects to assess and improve patient immunization rates against pneumonia. He also studies end-of-life care and is working with physicians who specialize in pediatric palliative care.

Vineet Arora, MD, Assistant Dean of Students for Pritzker School of Medicine, briefs the group on this year’s Training Early Achievers for Careers in Health (TEACH) Research Program. The National Institute of General Medical Science contributes to the program, which gives a socio-economically and racially diverse group of Chicago Public School high school students the opportunity to experience clinical research and encourages them to pursue careers in the health sciences.

As each person takes a few minutes to discuss the current status of his or her research project, others jump in with questions or additional information. Most of the projects focus on patient care. Meltzer talks about his pain research, with hospitalist program Associate Director Chad Whelan, in which inpatients are given Palm Pilots that beep randomly, signaling patients to stop and use the Palm Pilots to rate their pain at that moment.

Meltzer and Whelan believe that more accurate measures of patients’ hospital experiences will improve care. The Palm Pilot project is based on the idea that measures of pain recorded in the moment are more meaningful than standard pain measures that ask patients to recall pain experiences in the hospital through a survey after they return home. “Even if patients are satisfied with their pain control overall, we know there are times we could have done better,” Meltzer says. “We want to be able to identify those times and test new interventions to improve pain control throughout the hospital stay.”
The technicians, pharmacists and nurses in the outpatient chemotherapy suite on DCAM’s sixth floor work as a team too. They’re responsible for the 5,200 chemo doses that go out monthly to 1,500 patients. The pharmacy usually starts to wind down around 3 p.m., but today the day has run long. Right now, for example, there’s a rush order on medication for a 50-year-old woman whose nurse found her smoking through her tracheotomy in the bathroom.

Ann Calandro, PharmD, heads the oncology clinic’s pharmacy. She’s a friendly woman, originally from Texas, who advises the technicians. As the pharmacy, which has been open since 7 a.m. and will not close until 6 p.m., begins to see a break in the constant stream of orders and questions, Calandro alternates between bagging medications with bright yellow caution notices and answering physician inquiries that come in on the Omnimote message machine. The machine sits on the counter on one side of the room and beeps as it prints receipt-sized notes. Calandro answers questions from a physician who wants to know about the compatibility of certain drugs. His inquiries remind Calandro of something she wanted to tell one of the nurses, and after she responds, she heads down the hall to the clinic area.

Located seconds away from the two wings where outpatients receive chemotherapy, three rooms compose the pharmacy: one with a computer where Sandra Hou, PharmD, is entering at least 100 orders and another two where technicians in masks and white coats prepare medications. Giant plastic hoods cover the technicians’ workstations, each hood penetrated by two portals where green tubes lead into blue gloves on the hood’s interior.

On her way back to the pharmacy, Calandro runs into nurse Kathy Foley, who asks if a rush can be put on the drugs for the patient who persistently escapes to the bathroom to smoke. “They’re under the hood right now,” Calandro says. Foley nods a thank you and rushes off.

Across the Medical Center in Mitchell, occupational therapist Cheryl Esbrook and physical therapist Amy Bowers are walking down the hall with their patient, Jack Zunica. The act is anything but minor for the 47-year-old, who suffered massive heart failure in March. Though Zunica’s case is dire, the therapists are up to the challenge.

Both Esbrook and Bowers have worked at the Medical Center for about three years. And both specialize in patients with cardiac problems. This means they see people with a wide range of issues, because cardiac problems often lead to other troubles as well. Both therapists are slender with friendly faces and don’t look immediately like people equipped to help grown men who can’t help themselves out of bed. “It’s knowing where to be, how to stand,” Esbrook says. “It’s not just brute strength.”

The therapists work with patients who used to be fiercely independent, like Zunica, who owned his own landscaping business and spent his free time boating. They often need to give pep talks to motivate their patients. They cover the unit seven days a week, alternating weekends and beginning their eight-hour shifts at 8 a.m. As an occupational therapist, Esbrook
Humans and chimpanzees may be moving farther apart but evolutionary and systems biologists Kevin White and Yoav Gilad are back together. Gilad did his post-doc in White’s lab at Yale before coming to Chicago in 2005. One of the projects that came with him was a study of the vast differences between humans and chimpanzees.

If the genes from humans and chimps are almost 99 percent identical, why are the two species so different? In the March 9, 2006, issue of the journal *Nature*, Gilad and White showed that the divergence was due more to changes in gene regulation than differences in individual genes themselves.

Using novel gene-array technology, they showed that as humans diverged from their ape ancestors in the last five million years, genes for transcription factors—which control the expression of other genes—were four times as likely to have changed their own expression patterns as the genes they regulate.

“When we looked at gene expression, we found fairly small changes in 65 million years of the macaque, orangutan and chimpanzee evolution,” Gilad says, “followed by rapid change, along the five million years of the human lineage, that was concentrated on these specific groups of genes. This rapid evolution in transcription factors occurred only in humans.”

“The big question,” says Gilad, “is why are humans so different?” The same team might find an answer. This summer, White came to Chicago as the director of the new Institute for Genomic & Systems Biology at the University of Chicago and Argonne National Laboratory. They both now have offices on the third floor of Cummings Life Science Center.

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**5:38 PM**

*Therapists Cheryl Esbrook and Amy Bowers see some of the weakest and most immobile patients in the Medical Center. When those patients succeed at tasks that they never thought possible, Esbrook and Bowers, like the patients, gain the motivation to go on.*

helps patients get back to their daily care routines, such as combing hair and brushing teeth. As a physical therapist, Bowers works on the patients’ overall mobility development. “A lot of our goals overlap, so we end up working on everything,” Bowers says.

They’ve gotten to know Zunica especially well, and joke with him as they challenge him to do his daily tasks. “Are you finished combing your hair?” Esbrook asks.

Zunica nods from where he sits at the side of his bed. His responses now are limited, as he relies on a tracheotomy to breathe. When he does speak, his voice comes out in shallow wisps that Esbrook and Bowers have learned to interpret.

“It doesn’t look like it,” Esbrook says, shaking her head with a slight smile.

“Are you going to take that?” Bowers asks.

Zunica works a few more seconds, his effort obvious as he gathers up the energy to swing his arm up to his head and pull the comb over just the tips of his brown hair. Once he has finished, Esbrook and Bowers suggest a hallway walk. Zunica isn’t so sure, but their relentless encouragement helps get him out of bed and slowly but surely plod down the hallway—about 10 feet, which is a good four feet more than the day before.

Esbrook and Bowers have seen a dozen patients today, traveling to different areas of the Medical Center around the patients’ schedules. One man, for example, underwent kidney dialysis in the morning, so they waited until the afternoon to visit him. Because of Zunica’s walk down the hallway and back, they’ve ended their day late, but on a high note. They’ll return tomorrow to walk with him again, hopefully a little farther and a little faster.
4:22 AM
Sometimes the sound of a radio or technicians’ laughter fills a laboratory. But in general, these are some of the calmest areas in the Medical Center.

4:36 AM
It’s the silence and lack of distractions that encourage Shiwei Duan, PhD, to work such unconventional hours. The other post-doctoral researchers in Eileen Dolan’s laboratory fill their shifts by day. Their studies, along with Duan’s, contribute to the growing genetics knowledge base that keeps the University of Chicago at the forefront of cancer research.

In Dolan’s lab, a group of about a dozen post-docs, graduate students and technicians studies cancer-related genes and how they react to various chemotherapy treatments. The work also involves identifying metabolic pathways, or genes associated with the processing of certain drugs. “It’s a real marriage between pharmacology and genetics,” Dolan says.

Dolan, PhD, whose research projects often cross disciplinary boundaries, fits in perfectly at Chicago. One of her favorite things about being here is the exposure to different types of research projects, as well as the scientists conducting them. “It’s very conducive [to] interdisciplinary work,” she says. “You can bounce ideas off each other, collaborate.”

There’s also an influx of diverse speakers that comes through. “I always say, I’m just going to retire and go to talks all day.”

For now, however, there’s still work to be done. In addition to working with young researchers, Dolan spends much of her days in front of the computer polishing grant proposals and submitting research papers, which will help attract more grants, to fund more research. A few corridors away from her office on the Medical Center’s second floor, scientists work double-gloved and behind hoods in the series of sterile rooms that comprise her lab. The white walls and high-ceilinged sterility of the rooms don’t completely rob the lab of personality, though. By day, a tiny radio fills one room with pop music, as researchers use some of the most powerful computers on campus.

With virtually the entire lab automated, the scientists rely more on computers to provide quantitative information instead of making educated guesses. Their experiments are often fragile and time-sensitive, so researchers give up free weekends or stay late during the week to complete them.

No matter the day of week or time of day, the work continues. Duan may spend his night transferring cells, typing notes or conducting part of an experiment. As long as he’s surrounded by silence, he’ll get his work done by the time the sun rises.
As Duan leaves for the day, the sky is beginning to clear, and pilot Dave DeFauw approaches the helicopter stationed on the Medical Center’s roof. It’s one of more than 700 medical helicopters in the United States. Private companies own some, but as its white letters set against a deep maroon proclaim, this one belongs to the University of Chicago Aeromedical Network (UCAN).

Two hundred seventy programs such as UCAN exist across the country. This one began in 1983 with a team of residents, nurses, dispatchers and pilots. Ira Blumen, MD, heads UCAN and says that the Medical Center introduced the helicopter transport to Chicago, though transports now have shifted more to privatized companies.

DeFauw, dressed in a maroon jumpsuit and dark boots, crosses the plank-like walkway from the Medical Center’s penthouse to the helipad. For the next hour, he inspects the helicopter through eyes that call even the slightest scratch into question. After nine months of repairs in Texas, the $4 million, twin-engine Dauphin 2 helicopter—the safest non-military helicopter on the market—returned to Chicago early this year.

Though the helicopter is civilian, DeFauw’s a retired military man whose interest in flight stems from a staged helicopter rescue he took part in during a training session. He played a drowning victim who was rescued by the craft. From that day on, DeFauw knew he wanted to fly.

“It’s not too bad a way to retire,” DeFauw, who became one of four UCAN pilots 11 years ago, says with a slight smile. Transports typically take him within a 200-mile radius of the Medical Center.

He continues his inspection of the helicopter, a routine he goes through at the beginning of each of his eight-hour shifts. He uses the open helicopter door to hoist himself up so he can inspect the mechanics beneath the rotary wings. It’s a labyrinth of metallic pipes, all of which make perfect sense to DeFauw.

Once his check there is over, he heads back down to UCAN’s basement office to wait for someone, somewhere to make an emergency call.
Five hours later, the phone rings. Dispatcher Julie Hart answers: “UCAN, this is Julie. How can I help you?” After a few moments, she hands the phone to nurse Jane Kirkley.

“Air?” Hart asks after summing up the case for manager Karen Arndt. Arndt nods. Given the patient’s condition and traffic conditions, the situation is imminent enough to warrant going by helicopter.

Across the city, in a western suburb, 23-year-old Yesena Zaragoza sits propped up in a hospital bed. She’s 31 weeks pregnant with her fifth child and has gone into pre-term labor. Despite having more than two months left until her baby’s anticipated birth, Zaragoza is having contractions. She needs to be transported to the Chicago’s maternal-fetal medicine unit, one of only 10 regional perinatal centers in Illinois.

The perinatal coordinator on the other end tells Kirkley that Zaragoza is dilated three to four centimeters. “The picture [the hospital] paints when they initially call might be completely different from the picture we see at the bedside,” says Teri Campbell, another flight nurse. Kirkley decides that the patient might be stable enough for transport, but she will re-evaluate her condition at the bedside. She prepares for a trip that will involve herself, perinatal nurse practitioner Kim Knox and pilot DeFauw.

Minutes later, as Kirkley waits for the elevator, she thinks about what equipment she’ll need. Zaragoza is too far dilated, and despite drugs that have slowed her contractions to every 14 minutes, the chance that she will deliver while in transit is low but not nil. “Delivering the baby is the easy part,” Campbell says. It’s afterward, she adds, when they may encounter complications. If Zaragoza were to give birth in the helicopter, the optimal equipment to keep the premature baby warm wouldn’t be immediately at hand.

Kirkley raids the cabinets before heading to the flight deck where DeFauw and Knox are climbing into the helicopter. The trio adjusts the heavy helmets that will serve to block outside noise and provide a way for everyone to communicate via the speakers and microphones attached. They fasten their seatbelts.

The flight lasts only six minutes. Upon landing, the team removes their headgear, and with careful speed extracts the stretcher. The nurses and DeFauw, who will help with logistics, travel through the maze of hallways to the elevator and then around another half dozen turns until they reach Zaragoza. Through the entire process they don’t stop or slow once, having taken the same route countless times.

Various machines, one issuing a beep every few seconds, surround Zaragoza. She blinks slowly, her lids heavy, and her eyes focused on her husband. Before anything else, the nurses check
1:15 PM

Yesena Zaragoza is in labor. Though the trip from the suburbs to the Medical Center may have felt long to her, nurse Jane Kirkley, part of the UCAN team, evaluated and moved her with remarkable speed.

On any given day, University of Chicago researchers are working with scientists 25 miles southeast of campus at Argonne National Laboratory, one of the U.S. government’s oldest and largest science and engineering research laboratories managed by UChicago Argonne, LLC.

It’s there that cancer researcher Wei-Jen Tang and colleagues deciphered the three-dimensional structure of insulin-degrading enzyme, a promising target for new drugs because it breaks down not only insulin but also the amyloid-beta protein, which has been linked to the cognitive decline of Alzheimer’s disease.

In the Oct. 19, 2006, issue of Nature, the researchers described the structures of insulin-degrading enzyme in complex with four of the proteins it digests: insulin, amyloid-beta, amylin and glucagon. The team was able to solve the structures using Argonne's Advanced Photon Source.

“The structure of insulin-degrading enzyme tells us a lot about how it works, which is somewhat unorthodox,” Tang says. “Understanding how it works gives us clues about how to design drugs either to inhibit or activate it.”

The structures are exciting because they suggest ways to develop drugs that could either speed up or slow down this ubiquitous enzyme’s activity.

“By introducing small, targeted mutations, we have already been able to increase the enzyme’s activity by as much as 40-fold,” Tang says. “That gives us a blueprint for the next step, trying to devise a drug that would produce a similar effect.”
It’s usually the sound of children crying that wakes parents in the wee hours of the morning, but it isn’t Collins Yearwood’s young daughters who get him up at 1:30 a.m. Sunday. They are soundly asleep in their beds. Instead, Yearwood’s pager wakes him. He’s been on call since Friday for the University of Chicago Medical Center Public Affairs Office, and tonight the page comes from the Chicago Tribune. A reporter wants to know the conditions of three children who were brought to the Medical Center’s ER from a house fire that broke out on the city’s West Side.

Because of privacy regulations, Yearwood tells the reporter that he needs the children’s names in order to ask for permission from their parents to release condition reports. Eventually, the reporter comes up with names. By then, other reporters are calling too.

After a few phone calls, Yearwood tracks down a 13-year-old girl in the pediatric intensive care unit. In critical condition after jumping out of a second-story window, she has multiple fractures and a concussion. Her 3-year-old cousin will spend his birthday in the Medical Center’s burn unit, one of only three in the metropolitan area, getting treated for severe smoke inhalation and burns over 10 percent of his body, mostly his left arm and leg. His five-month-old sister died of smoke inhalation at the scene.

Before Yearwood finds the 3-year-old’s parents in the burn unit to ask them if they want to speak to the press—as it turns out, they do—young Noe Torres already has had a lot of medical attention. Firemen carried him from the burning house, and paramedics quickly inserted a tube through his mouth down into his lungs to keep his airway open. When he arrives at the burn unit, the
staff, in purple scrubs under yellow gowns, surrounds him. They connect the breathing tube to a mechanical ventilator and insert a central line into his chest to control his fluids and an arterial line into his right arm to monitor his blood pressure. Before long, he has a half dozen lines dripping fluids into his tiny body, including antibiotics and drugs for pain and sedation. As one team cleans, debrides and evaluates Noe’s burn wounds, another team assesses his lung injury. The early signs are not good. The evidence—soot around and in the mouth, elevated carboxyhemoglobin—suggests prolonged exposure to thick smoke. Soon, Noe is cleaned up, his wounds are dressed, wrapped and protectively splinted, and his bed is surrounded by numerous devices that monitor his progress and perform crucial tasks. He’ll soon go to the OR for skin grafts and a closer look at his damaged lungs, but for now, he’s stable, immobile, swaddled in soft cloth and quieted by medications. Although hard to imagine, in 16 days he’ll leave the hospital and begin rehabilitation. Yearwood, meanwhile, returns a few phone calls, then heads back home.

8:04 AM
Nurses in the burn unit see some of the most critically ill patients. They just sent 3-year-old Noe Torres to the OR for skin grafts and a closer look at his damaged lungs. Torres was rushed to the hospital for burns on his left arm and leg from a house fire early this morning.

2:03 PM
As neurosurgery patient Christian Collier naps, his mom dozes in a chair next to his bed. Outside his room, Connie Tribble from Environmental Services brings her cart of cleaning supplies to a halt. She grabs fresh trash bags, some paper towels and cleaning solution before entering the room. With soft steps, she wipes down Christian’s counter top, bathroom fixtures and window. Then she empties his wastebaskets into the bin on her cart and inserts the new bags before leaving.
Neurosurgeon David Frim typically spends 12 hours in the Medical Center each day. His youngest son talks about someday becoming a heart surgeon because, Frim says, he likes the sound of a beating heart.

Elyria Mogler’s flight from Denver got in about 15 minutes ago. She flew nearly 900 miles to see Stephen Hanauer, MD, one of the country’s leading gastrointestinal specialists.

In 1997, Mogler’s physicians diagnosed her with Crohn’s disease, an inflammation of the digestive tract. Since then, her disease has progressed to the point where she suffers from chronic pain, which is why her Denver physician referred her to Hanauer. “I’m very optimistic,” Mogler says. “I’ve seen some of the top doctors in the country, and they highly recommend the University of Chicago. These doctors know what they’re doing.”

So this afternoon, Mogler, in a blue tank top and with her red hair pulled back, boarded a plane for Chicago. She says the hardest part of leaving was saying goodbye to her 4-year-old son, Gabriel Michael, named after two Biblical archangels. Gabriel came into her life as a surprise. She hadn’t initially realized she was expecting because she attributed her recent weight gain to previous surgery she underwent for her disease.
When her cell phone rang last fall, Funmi Olopade had just begun a lab meeting. She said she would call back. When she did, she learned she had been named a MacArthur Fellow for 2005, which meant $500,000 in “no-strings-attached” support over the next five years.

“As we talked,” she says, “it just got nicer and nicer. Then I had to go back to the lab, pretend nothing had happened and finish the meeting without spilling the news.”

Olopade was selected for “translating findings on the molecular genetics of breast cancer in African and African-American women into innovative clinical practices in the United States and abroad.”

As a co-director of the University of Chicago Center for Interdisciplinary Health Disparities Research, Olopade and colleagues Martha McClintock and project director Sarah Gehlert explore the multiple possible causes of breast cancer—everything from genetics to social stress. The goal is to understand why so many African-American women get breast cancer at an early age.

The research team works closely with community members in Chicago—and women in Nigeria. They have already found that breast cancers in women of African ancestry often produce a different pattern of gene expression from that seen in Caucasians. The next step is to develop a global strategy to reduce the death, disfigurement and disability caused by breast cancer in young women at high risk worldwide.
Seven days a week, 24 hours a day, at any given moment, faculty and staff, clinicians and scientists, healers and researchers alike, uphold the University of Chicago’s presence at the forefront of medicine—pushing boundaries and going beyond expectations. They create a unique environment where medical breakthroughs, innovative research and patient-centered care change lives and define the institution.
This was a year of change and accomplishment at the University of Chicago Medical Center. There were the usual advances: an ongoing parade of fundamental discoveries, of patients restored to wholeness and of young genius carefully nurtured.

But this also has been a year of organizational discovery, of restored institutional unity and of budding innovation—also carefully nurtured. In an effort to bring biomedical research, education and patient care at the University of Chicago and its hospitals closer together, the boards of trustees agreed in June to concentrate leadership of the entire biomedical enterprise under a single chief executive.

James L. Madara, MD, who has been serving as dean of the Biological Sciences Division and the Pritzker School of Medicine and vice president for medical affairs since July 2002, took on the expanded role, effective July 1, 2006.

As dean and Medical Center CEO, Madara now works closely with the University president and a newly created nine-member Medical Center Executive Committee, which includes University President Robert Zimmer, Dean Madara, James Crown and Valerie Jarrett—the chairs of both the University and the Medical Center boards—and five selected board members.

Academic health centers live at the boundary between science and medicine. They cross back and forth between the cautious and deliberate culture of a university and the fast-paced, market-based economy that increasingly dominates health care. This adjustment was designed to bring unity, clarity and responsiveness to a system that has to straddle that divide.

Madara is “the right person to lead Chicago Medicine at this critical time,” President Zimmer says. “He has demonstrated the ability to recruit exceptional faculty and physicians and build leading clinical and research programs.”

Also in June, Valerie Jarrett was appointed chair of the University of Chicago Medical Center Board, chair of a newly created Executive Committee of that board and vice chair of the University’s Board of Trustees. Her appointment coincides with an expanded role for the former Hospitals Board to include not just the activities of the Hospitals but also clinical-medical programs located in the University’s Biological Sciences Division. Because these programs jointly comprise the University of Chicago Medical Center, the Hospitals Board will now be known as the University of Chicago Medical Center Board.

Jarrett is managing director and executive vice president of the Habitat Company, a real estate development and management company. She has been a member of the University of Chicago’s Board of Trustees since 2001 and vice chair of the Hospitals Board since 2002. She succeeded Paula Wolff, who served as chair of the Hospitals Board for 10 years.

Jarrett served for eight years in city of Chicago government posts, including deputy chief of staff for Mayor Richard Daley and commissioner of the Department of Planning and Development. She was chair of the Chicago Transit Board, and is currently board chair of the Chicago Stock Exchange and executive council vice chair of Metropolis 2020.

A lifelong resident of Chicago’s South Side, Jarrett also has close ties to the University and the Medical Center. She attended the University of Chicago’s Laboratory Schools, where her mother, Barbara Bowman, taught while earning a graduate degree in education. Jarrett’s father, James Bowman, is professor emeritus in the departments of Pathology and Medicine and the College.
The University of Chicago
Medical Center Board

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Hospital services at the University of Chicago Medical Center ended fiscal year 2006 with an excess of revenues over expenses of $72 million, or 8 percent of $884 million in operating revenues, following net income of $100 million in 2005. The strong surpluses in both years provide the capital capacity to invest in programs, technology and facilities to advance the forefront of medicine. Within the overall 2006 results, $59 million came from investment income and other non-operating sources, including strong realized gains on stocks. Earnings from operations were $13 million, consisting of $15 million at the main hospitals net of $2 million in support for regional doctors offices; this result is down from the record $70 million generated in 2005. The shift in the components of income demonstrates the importance of maintaining investment reserves to help bridge the cycles in both payment rates and expenditures that we, like most academic medical centers, experience over time.

Overall patient activity—measured by admissions and patient days, as well as outpatient visits to the clinics and emergency rooms—increased by 1 to 2 percent in 2006. Hospital operating revenues (net of the provision for doubtful accounts and provider taxes paid) rose by less than 5 percent, representing an increase in payment rates well below the underlying growth rate in medical costs. This reflects a shift in activity toward Medicare, Medicaid and other health plans that pay less than traditional private insurance, and in the case of government reimbursement, far less than the cost of care. Notably, Illinois’ Medicaid provider tax program has not yet been approved by the federal government, resulting in a $17 million shortfall in 2006.

Net expenses increased by nearly 13 percent, including approximately $20 million of costs for the first full year of operation of the new Comer Children’s Hospital. Spending for highly skilled staff, employee benefits, new drugs and technology, insurance, and the support of physician practices and new programs, also contributed to the greater growth in expenses compared to revenues. As payment shortfalls continued through 2006, we began a program of rebalancing costs and revenues, applying national benchmarks to improve the efficacy of operations across hospital services. This effort is expected to reduce costs by $20 million in the coming year.

Operating expenses included nearly $70 million for program development, outpatient and specialty practice support, primary care, medical direction of hospital services, supervision of residents, and other physician work at the Medical Center provided by the clinical faculty of the Division of the Biological Sciences. An additional $15 million was transferred from net assets to fund academic renewal in clinical and basic sciences. At nearly 10 percent of revenues, these funds demonstrate a continuing commitment to the human capital represented by the faculty, who serve as the Medical Center’s medical staff.

The hospitals provided a record $87 million of charity care in 2006, up nearly 90 percent from the previous year. Charity care includes the unreimbursed cost of care to those with no insurance, plus the amount by which costs exceed payments for patients covered by Medicaid. This second component increased sharply due to the absence of the Medicaid provider tax program in 2006. The University of Chicago Medical Center is one of the largest providers of care to the poor and uninsured in Illinois.

The balance sheet demonstrates continued commitment to building financial and physical capital at a time of economic uncertainty. Investments increased by $129 million to $612 million at June 30, 2006, reflecting strong investment returns, philanthropy and continuous improvement in management of accounts receivable and other working capital. Net property, plant and equipment increased by $31 million to $497 million, including development of computer systems to provide clinicians with enhanced access to information for diagnosis and treatment. Net assets, or the amount by which total assets exceed total liabilities, increased by $99 million, reaching $676 million by year-end. The 17 percent growth in net assets during 2006 is largely the result of the $72 million in net income and $42 million in major gifts, net of the $15 million transfer for academic renewal.

The Biological Sciences Division recorded a $4 million budget surplus on $543 million of revenue. Revenues increased 9 percent overall with 9 percent growth in fees for physician services. Support from grants and contracts increased by less than 2 percent, a modest growth anticipated given a decrease in the federal National Institutes of Health budget last year. Faculty and other academic compensation rose by 6 percent, and facility and other support costs increased by 22 percent with the opening of the Gordon Center for Integrative Science during the year. Strong philanthropic support and growing revenue remain critical to funding academic programs.

At a time of increasing pressure on payments for patient care, the University of Chicago Medical Center is meeting the challenge by securing a strong and diversified capital base while improving its operations to generate the resources required to advance its missions of patient care, research, education and community engagement.
### Financial Report 2006

#### University of Chicago Hospitals

**STATEMENT OF REVENUES AND EXPENSES**  
For the years ended June 30, 2006 and 2005 (in millions of dollars)

<table>
<thead>
<tr>
<th></th>
<th>2006</th>
<th>2005</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating revenues</td>
<td>$884</td>
<td>$869</td>
</tr>
<tr>
<td>Compensation, supplies, services and other</td>
<td>766</td>
<td>680</td>
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<tr>
<td>Provision for doubtful accounts</td>
<td>44</td>
<td>51</td>
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<tr>
<td>Depreciation and interest</td>
<td>61</td>
<td>53</td>
</tr>
<tr>
<td>Medicaid Provider Tax</td>
<td>0</td>
<td>15</td>
</tr>
<tr>
<td>Operating expenses</td>
<td>$871</td>
<td>$799</td>
</tr>
<tr>
<td>Operating income</td>
<td>13</td>
<td>70</td>
</tr>
<tr>
<td>Investment income and unrestricted gifts, net</td>
<td>59</td>
<td>30</td>
</tr>
<tr>
<td>Excess of revenues over expenses</td>
<td>$72</td>
<td>$100</td>
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</table>

#### PATIENT ACTIVITY

For the years ended June 30, 2006 and 2005

<table>
<thead>
<tr>
<th></th>
<th>2006</th>
<th>2005</th>
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</thead>
<tbody>
<tr>
<td>Admissions</td>
<td>26,933</td>
<td>26,449</td>
</tr>
<tr>
<td>Patient days</td>
<td>174,995</td>
<td>172,591</td>
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<tr>
<td>Length of stay</td>
<td>6.50</td>
<td>6.53</td>
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<tr>
<td>DCAM visits</td>
<td>394,720</td>
<td>390,586</td>
</tr>
<tr>
<td>ER visits</td>
<td>79,534</td>
<td>77,783</td>
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</tbody>
</table>

#### Division of the Biological Sciences

**STATEMENT OF REVENUES AND EXPENSES**  
For the years ended June 30, 2006 and 2005 (in millions of dollars)

<table>
<thead>
<tr>
<th></th>
<th>2006</th>
<th>2005</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tuition</td>
<td>$29</td>
<td>$28</td>
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<tr>
<td>Grants and contracts</td>
<td>210</td>
<td>207</td>
</tr>
<tr>
<td>Endowments and gifts</td>
<td>59</td>
<td>41</td>
</tr>
<tr>
<td>Patient care</td>
<td>176</td>
<td>161</td>
</tr>
<tr>
<td>Hospital transfers for academic renewal</td>
<td>15</td>
<td>15</td>
</tr>
<tr>
<td>Other income</td>
<td>54</td>
<td>48</td>
</tr>
<tr>
<td>Total revenues</td>
<td>$543</td>
<td>$500</td>
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<table>
<thead>
<tr>
<th></th>
<th>2006</th>
<th>2005</th>
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</thead>
<tbody>
<tr>
<td>Faculty and other academic compensation</td>
<td>$218</td>
<td>$205</td>
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<tr>
<td>Financial aid</td>
<td>27</td>
<td>24</td>
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<tr>
<td>Grants and contracts</td>
<td>167</td>
<td>165</td>
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<tr>
<td>Facilities and other costs</td>
<td>127</td>
<td>104</td>
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<tr>
<td>Total expenses</td>
<td>$539</td>
<td>$498</td>
</tr>
<tr>
<td>Excess of revenues over expenses</td>
<td>$4</td>
<td>$2</td>
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</table>

#### BALANCE SHEET

For June 30, 2006 and 2005 (in millions of dollars)

<table>
<thead>
<tr>
<th></th>
<th>2006</th>
<th>2005</th>
</tr>
</thead>
<tbody>
<tr>
<td>Current assets</td>
<td>$186</td>
<td>$206</td>
</tr>
<tr>
<td>Investments</td>
<td>612</td>
<td>483</td>
</tr>
<tr>
<td>Property, plant and equipment, net</td>
<td>497</td>
<td>466</td>
</tr>
<tr>
<td>Other assets</td>
<td>26</td>
<td>24</td>
</tr>
<tr>
<td>Total assets</td>
<td>$1,321</td>
<td>$1,179</td>
</tr>
<tr>
<td>Current liabilities</td>
<td>189</td>
<td>164</td>
</tr>
<tr>
<td>Long-term debt, less current maturities</td>
<td>364</td>
<td>343</td>
</tr>
<tr>
<td>Other liabilities</td>
<td>92</td>
<td>95</td>
</tr>
<tr>
<td>Total liabilities</td>
<td>$645</td>
<td>$602</td>
</tr>
<tr>
<td>Net assets</td>
<td>676</td>
<td>577</td>
</tr>
<tr>
<td>Total liabilities and net assets</td>
<td>$1,321</td>
<td>$1,179</td>
</tr>
</tbody>
</table>
A Record Year of Philanthropy

On June 30, 2006, the University of Chicago Medical Center and the Biological Sciences Division celebrated the most successful year ever, with a record $152 million in philanthropy. The year was distinguished by four eight-figure gifts made in rapid succession, at a pace that reflects the momentum of science and medicine at Chicago.

On January 24, Frances and Gary Comer announced a new gift of $42 million to create the Comer Center for Children and Specialty Care, which will adjoin the Comer Children’s Hospital. The Comers’ most recent gift is the largest in the Medical Center’s or the University’s history.

Two weeks later, the Wall Street Journal broke the news of Gwen and Jules Knapp’s $25 million gift for construction of the Gwen and Jules Knapp Center for Biomedical Discovery, a 10-story, state-of-the-art laboratory facility to open early in 2008.

After a very brief pause, Ellen and Melvin Gordon’s gift of $25 million to name the University’s largest science building—the Gordon Center for Integrative Science—was announced at the Center’s formal opening on April 26.

Within another short month, a fourth major donation was announced: $10 million from the Duchossois family to fund the Duchossois Family Metastasis Research Program.

The headlines and excitement generated by these extraordinary gifts tell only part of the story of philanthropy for Chicago’s medical enterprise. More than 15,000 donors have made commitments thus far to the Spark Discovery, Illuminate Life campaign. At the close of FY06, with the support of each of these donors, the campaign sped past the $600 million mark, moving headlong toward the new goal of $700 million by June 2008.
In Memory of

Gary Comer (1927–2006)


By creating the University of Chicago Comer Children’s Hospital, the Pediatric Emergency Room and the Comer Center for Children and Specialty Care, Gary Comer and his wife, Frances, built a state-of-the-art facility for healing children with serious illnesses. The doctors and nurses of Comer Children’s Hospital have cared for thousands of children in Mr. Comer’s childhood neighborhood on Chicago’s South Side, and they will care for thousands more in the years to come. And the treatments those physicians are bringing from the bench to the bedsides of these young patients are helping children in other hospitals around the world.