COVER: A PHOTOGRAPH TAKEN BY MGH PHYSICIAN STEVE GARDNER, MD, OF A PATIENT BEING EVALUATED FOR A HEAD INJURY USING A CT SCANNER. SEE STORY ON PAGE 19.
IN OCTOBER 2007, the Massachusetts General Hospital (MGH) Board of Trustees approved a revised mission statement for the hospital that reaffirms our longstanding philosophy established by the vision of the institution’s founders. This commitment is not just words on a page; rather it is the work we do every day.

The stories told on the following pages represent a tiny fraction of the countless journeys MGH staff, patients and friends take every year. These accounts provide a revealing glimpse into how the MGH fulfills its mission. From patients like Elaine Park, Kim Farah and Richard Horgan to MGH staff members George Velmahos, MD, Cameron Wright, MD, and Karleen Habin, RN, to hospital supporters Jim and Nancy Bildner, we see that each journey is an inward elevation of personal spirit and an outward force that truly makes a difference far beyond the individual. Nothing is the same at the beginning as it is at the end, not the individual and not the world.

As an institution, the MGH also is on a journey, one that constantly presents myriad obstacles that must be overcome. One of the most significant challenges we face today is the lack of space. We are at capacity in many of our clinical services, and other areas have outgrown our current facilities. In response, we have embarked on an exciting project that will help enable us to meet demand in the future.

The outdated Clinics, Tilton and Vincent Burnham Kennedy buildings have been razed. In their place, soon will rise the Building for the Third Century (B3C) — a 10-story, 530,000-square-foot facility slated to open in 2011. The new building will provide expanded space for radiation oncology, new surgery and procedural rooms, recovery and perioperative services. It also will feature five floors of private inpatient rooms dedicated to delivering excellent cancer and neurological care. In addition, the B3C will offer us the opportunity to streamline and expand our Emergency Department. We recently celebrated the groundbreaking of the site and are looking forward to watching the building take shape over the next few years.

The MGH also is expanding its outpatient capacity. We are collaborating with the North Shore Medical Center to construct an ambulatory care center scheduled to open next spring in Danvers, which will house primary care, imaging, surgical and subspecialty services. We also are working jointly with Brigham and Women’s Hospital to build a multispecialty ambulatory care center in Foxboro, part of the Patriots Place development. And, at Newton-Wellesley Hospital, we are dedicating space for a new linear accelerator to treat cancer patients.

Our Community Benefit Program has changed its name to the Center for Community Health Improvement, reflecting our commitment to improving the health and well-being of our community. The MGH Disparities Solution Center and Chelsea HealthCare Center have been working collaboratively to improve the quality of life for diabetic patients while reducing language, socioeconomic status and cultural barriers that too often stand in the way of optimal care. Our mission to assist Charlestown and Revere to combat the scourge of substance abuse is ongoing. The hospital recently was awarded the Corporate Leadership Award by the Urban League of Eastern Massachusetts in recognition of the MGH’s work addressing health care disparities in the Boston area as well as its commitment to hiring a diverse workforce.
On the research front, we have had many successes, including the results of a trial – published in The New England Journal of Medicine – involving five patients who participated in an experimental protocol to induce tolerance after kidney transplantation. Four of the five patients in the trial were successfully weaned from immunosuppressive drugs, which transplant patients usually require throughout life.

We have known for a while that in certain cancer patients, tumor cells circulate in the bloodstream, a warning sign that the cancer may be spreading in the body. But these cells in the blood have been difficult to detect. This past December, researchers at the MGH published a study showing how nanotechnology can be employed to capture these cells using a microchip-based device that can isolate, count and analyze circulating tumor cells from a simple blood sample.

These are just two examples of how research discoveries at the MGH are helping bring benchside practices to the bedside. The work of our scientists has received a great deal of attention in the press and has garnered many awards and honors. Gary Ruvkun, PhD, was among six top scientists awarded the 2008 Gairdner Award for medical research. Of the past 288 awardees of this honor, 70 have gone on to win the Nobel Prize. Also, Jack Szostak, PhD, on the heels of his 2006 Lasker Prize, received the prestigious Heineken Prize for Biochemistry and Biophysics in April 2008. Emery Brown, MD, PhD, received one of the distinguished National Institutes of Health Pioneer Awards in 2007.

This past year has seen a redoubled focus on our goal to be a national leader in patient safety. Our hand hygiene program, for instance, has achieved percentage rates in the mid to high 90s for hand hygiene compliance before and after patient contact. We won’t be satisfied, however, until we reach 100 percent. As a result of this work, the MGH received the Betsy Lehman Patient Safety Recognition Award from the Massachusetts Office of Health and Human Services.

We are now sharing our quality and safety measurements with the public. The MGH Center for Quality and Safety has created a web site, qualityandsafety.massgeneral.org, which provides information about our progress in many key quality and safety areas. We want to let the public know what we are doing to continuously improve upon the work we do and how we measure up. Similar information about all Partners institutions can be found at qualityandsafety.partners.org.

In April 2008, the MGH became the first hospital in the state to be redesignated as a Magnet facility, having been recognized as Massachusetts’ first Magnet hospital in 2003. Magnet designation is a prestigious and highly coveted honor bestowed by the American Nurses Credentialing Center. We are also proud that the MGH has earned a reputation as a quality workplace. For the third year in a row, Working Mother magazine honored the MGH as one of the top 100 places in the country for working mothers; the AARP has included the MGH on its list of top 50 workplaces for employees over the age of 50 for the second consecutive year; The Scientist, a magazine for life science professionals, named the MGH the best place to work in academia in the United States; and finally, the MGH was honored with a Fit Friendly Award by the American Heart Association for creating a culture that supports the health of employees by encouraging physical activity and good nutrition in the workplace.

Few of these accomplishments would be possible without the support of our donors and friends who do so much to enhance our ability to fulfill the mission of the MGH. This year saw an unprecedented outpouring of support, with two of the largest gifts in our history. Significant gifts came in to support the B3C. All told, the hospital raised a record $256 million in new gifts and pledges in fiscal year 2007. These gifts, both large and small, are vital to the success of the MGH journey into its third century of medicine.

I would be remiss if I did not also acknowledge the steadfast support of the MGH Board of Trustees, the committed members of the President’s Council, and each and every member of the MGH community. They truly have made a difference. Thank you.

Sincerely,

Peter L. Slavin, MD
President
Massachusetts General Hospital
A CALL TO SERVE

SINCE THE IRAQ WAR BEGAN in 2003, tens of thousands of Americans have been called upon to serve their country, and counted among these brave men and women are a number of employees from the MGH. From the first days of the conflict they have been at the frontlines of the battle, patrolling the dangerous checkpoints, performing house-to-house searches and caring for the wounded. Some were already veteran members of the armed forces when the war broke out, while others witnessed the sacrifices of their fellow countrymen and were compelled by their examples to serve. Here are four of their stories. ➤
“I was honored to serve our soldiers and Marines in Iraq. It was a life-changing experience for me.”
CAMERON WRIGHT, MD
LIKE MANY PEOPLE, Cameron Wright, MD, never thought he would experience the reality of the Iraq war firsthand. That all changed in 2006, two years after his son, Jim, joined the Marines.

An MGH thoracic surgeon since 1993, Wright had a successful career and a busy practice with the MGH Division of Thoracic Surgery. After Jim’s enlistment, however, Wright found his thoughts increasingly turning to Iraq and the many Americans serving there. Inspired by the examples of both his son and physician colleagues who also had served, Wright knew that he too had to take action. In May 2006, he made the decision to join the U.S. Army Reserves and received his commission in January 2007.

Wright underwent basic training in the summer of 2007, and that November was deployed to the Al-Asad Air Base in western Iraq’s Anbar Province – just a few hours away from where Jim had been stationed since that August. Father and son were able to meet twice during Wright’s three-month tour of duty – once during a supply convoy and again for a Christmas Eve overnight visit.

As part of a 20-physician team at Al-Asad’s 325th Combat Support Hospital, Wright worked as a general surgeon in conditions very different from those back home at the MGH. The two operating rooms had two beds each, medical records were noted on a piece of tape placed on the patient and the hospital had one of the only four CT scanners in all of Iraq. The infamous desert dust found its way into all corners of the building. Because the basic infrastructure of Iraqi cities had collapsed along with the medical system, there was no plumbing system, and the Iraqi water was contaminated. Bottled water was the rule.

In his practice at the MGH, Wright typically performs complex lung and esophageal cancer surgeries, but in Iraq, he often delivered trauma care to patients with debilitating, life-altering injuries. “The two most common injuries we saw were traumatic brain injuries and amputations from explosive blasts,” he says. “In those cases we had to do what’s called damage control surgery. You can’t fix the problem, so you just need to stop what’s bleeding.” After being stabilized, American soldiers were transferred to a military hospital in Germany, while contractors and Iraqi citizens remained in the hospital for further care until they could be discharged.

Wright returned to the United States in February 2008 and is eligible for redeployment for the next eight years. With trained medical personnel a constant need in Iraq, Wright hopes that by sharing his experiences, other physicians also will consider enlisting. “I was honored to serve our soldiers and Marines in Iraq,” he says. “It was a life-changing experience for me.”
WITH THEIR HANDSHAKES, easy banter and identical blue scrubs, it would be easy to assume that MGH surgical technicians Jonathan Alicea and Valentine Nde are close colleagues who have spent years working side by side. Few would ever guess their friendship was forged not while caring for patients at the MGH, but treating the wounded in the battlefields of Iraq.

The beginnings of their friendship can be found in the decision each made to join the U.S. Army Reserves – Alicea in 1999 and Nde in 2003. Neither was an MGH employee at the time of his enlistment, but for Alicea, that changed in 2001 when he joined the MGH Department of Outside Transportation after serving an eight-month stint in Kosovo. While he enjoyed his new job, he nonetheless felt drawn to the idea of providing direct patient care. In 2004, he left the MGH to undergo training as a surgical technician with the Army Reserves, completing a clinical rotation at the Walter Reed Army Medical Center in Washington, D.C. By the end of that year he had rejoined the MGH as a surgical technician in the operating rooms.

Meanwhile, Nde was a busy student at Worcester State College, studying for a degree in biotechnology. He also was an experienced surgical technician, having completed a clinical rotation at Dewitt Army Medical Center in Virginia after his enlistment. Nde was working in a new job as a scrub technician at MetroWest Medical Center in Framingham, Mass. when he and Alicea – both assigned to the same unit based in Taunton, Mass. – were deployed to Camp Speicher in Tikrit in September 2006.

In Tikrit, Alicea and Nde were members of a nonstop surgical team – their hospital was the third busiest in Iraq after Baghdad and Balad – caring for U.S. soldiers, Iraqi police officers and civilians and contractors from across the world. As surgical technicians, they helped ensure surgeries went smoothly, preparing the surgical area and assisting with instruments and equipment. With their team often shorthanded, the two quickly came to rely on each other. Nde says, “You and your buddies, that’s all you have there.”

Midway through their tour of duty, Alicea’s roommate was moved to another location, and Nde was assigned to share his room. The two spent much of their spare time lifting weights, playing cards and simply talking in the close confines of their room. Inevitably, their discussions would turn to the lives they had left back home, which in Alicea’s case, included the MGH. “The MGH is the best, and I always told my guys that,” he says. “I told Valentine that, with his skills, he should think about coming to work here.” It was a suggestion Nde took to heart.

Alicea and Nde were welcomed home in September 2007, and shortly after their return, Nde, a native of Cameroon, became a U.S. citizen. Soon after, he followed the advice of his friend, joining the MGH Same Day Surgical Unit in January 2008.
“The MGH is the best, and I always told my guys that. I told Valentine that, with his skills, he should think about coming to work here.”

JONATHAN ALICEA
AN MGH NURSE since 2003, Kevin Murphy, RN, was no stranger to the military when the Iraq war began, having enlisted with the U.S. Army Reserves in 1995. Despite his long record of service, however, Murphy had never before been deployed when he left for Iraq in September 2006 – coincidentally, as part of the same unit as Alicea and Ndé.

Murphy’s first stop was Mosul, the country’s second largest city, where he was assigned to the 399th Combat Support Hospital in the Forward Operating Base Marez East. Despite his many years of experience as a nurse, Murphy was unsure of what awaited him. “Nothing can prepare you for this,” he says. “You’re never ready until you have your first patient.” In Mosul, Murphy worked in the Trauma Intensive Care Unit, which would rapidly transform into an emergency room when victims of mass casualty events were brought in for emergency care. The demanding environment was made even more challenging by the frequent mortar attacks by insurgents, who often targeted the hospital and once even succeeded in striking the building’s roof. “Most attacks occurred during the evening and night,” Murphy says. “Usually you would hear a first explosion and you knew you had to seek cover right away as the next one was coming quickly.”

After four months in Mosul, Murphy moved to Al-Asad Air Base in Anbar Province – the same location where Wright was stationed. There, he was one of 12 nurses on a team that also included respiratory technicians, surgeons, anesthesiologists and medics. After serving three months in Al-Asad, Murphy received his final assignment: the Air Force Theater Hospital at Balad Air Base, approximately 40 miles northwest of Baghdad. As a Level 3 trauma center – one of only three such facilities in Iraq – the hospital offers some of the country’s most advanced facilities and patient care available, including three intensive care units, specialty services for brain, spinal, eye and ear injuries as well as trauma and orthopaedic care. Patients often were transferred there from other hospitals across the country, and Murphy cared for some of the most critically ill while working in the hospital’s Neurological Intensive Care Unit. And unlike Mosul, Balad was generally safe from the terrifying mortar attacks. “The insurgents wouldn’t bomb Balad,” says Murphy. “They knew it was a place where they could go if they needed medical care.”

Murphy returned to the United States in September 2007 after completing 16 months of active duty, one year of which was spent in Iraq. “I am grateful to the staff of the Emergency Department for showing such great support to a returning veteran,” he says. “It’s important that veterans be welcomed back in a supportive and understanding environment, and everyone has been wonderful.”
“Nothing can prepare you for this. You’re never ready until you have your first patient.”

KEVIN MURPHY, RN

MGH Heroes

Like Jonathan Alicea, Kevin Murphy, RN, Valentine Nde and Cameron Wright, MD, many other MGH employees have demonstrated the same selflessness, bravely serving their country in the armed forces. The following are the names of those hospital employees who have served in the military – both stateside and abroad – since 2003.

JONATHAN ALICEA
Sergeant, U.S. Army Reserves

REBECCA BABCOCK
1st Lieutenant, U.S. Army Reserves

RAYMOND BISIO, RN
Major, U.S. Air Force Reserves

LISA BOULAY
Specialist, U.S. Army National Guard

FRANCIS DONOGHUE
Sergeant, U.S. Army National Guard

DOUGLAS DRESNEK
Lieutenant Junior Grade, U.S. Coast Guard Reserves

JOSE ESTRADA
Specialist, U.S. Army Reserves

MICHAEL FITZSIMMONS, MD
Lieutenant Colonel, U.S. Army

EDWARD GEORGE, MD, PHD
Commander, U.S. Navy

MICHAEL GRASSO, RN
Major, U.S. Army Reserves

PAMELA HODGES, MS, MPH, NP
Major, U.S. Army

KATHLEEN MARTENS, NP
Commander, U.S. Navy

SHAWN MORRIS
Specialist, U.S. Army Reserves

KEVIN MURPHY, RN
Captain, U.S. Army Reserves

VALENTINE NDE
Specialist, U.S. Army Reserves

SAMUEL NICOLAS
Specialist, U.S. Army Reserves

RICHARD PINO, MD, PHD
Captain, U.S. Navy

TARYN PITTMAN, RN, MSN
Captain, U.S. Navy Reserves

ELIZABETH RYDER, RN
Major, U.S. Air Force Reserves

CAMERON WRIGHT, MD
Lieutenant Colonel, U.S. Army Reserves

This list includes veterans as of July 31, 2008.
AT A WEEKLY GROUP SESSION, Geraldine begins sheepishly. “Well, I was bad yesterday. It was my granddaughter’s birthday and everyone was eating cake, so I had a piece for myself.”

Eddie Horta, MA, MHC, unfolds his hands. The five patients around the table watch him. “That isn’t bad,” he says. “That’s perfectly all right.”

“But, I thought, my diet …” Geraldine says.

“There is no such thing as a diabetic diet,” Horta says. “You can eat everything that everyone else eats – just in moderation. You don’t need to feel guilty.” Geraldine is relieved. Horta continues, “You can say to yourself, I’m going to have a piece of cake because it’s my granddaughter’s birthday, but afterwards I’m going to walk for 20 minutes.” The patients around the table nod in understanding.

Such group therapy sessions are one of the ways that the Chelsea Diabetes Disparities Program (CDDP) helps patients gain control over their chronic diabetes to lead healthier lives. Established in 2006, the CDDP is a collaboration among the MGH Disparities Solutions Center, which seeks to eliminate racial and ethnic disparities in health care; the MGH Center for Community Health Improvement; the Massachusetts General Physicians Organization and the MGH Chelsea HealthCare Center, which treats the hospital’s largest Latino community. And indeed, the statistics are alarming: nationwide, diabetes affects 11.2 percent of African Americans and 9 percent of Latinos, compared with 7.2 percent of whites. In addition, Latinos are 33 percent less likely than whites to receive standard levels of care for the disease. If improperly managed, diabetes can lead to serious health complications such as nerve damage, blindness and liver failure. Depression is often a factor compromising care.

As the CDDP’s diabetes coach, Horta helps participants keep their diabetes in check and on track. Thanks to an information-sharing system within MGH Chelsea, Horta can monitor his patients’ blood sugar concentration levels – also called A1c’s – on his computer; if their A1c’s trend poorly over time, he is the one who intervenes. Through telephone outreach, one-on-one counseling sessions, computerized Diabetes Self Education Management courses and group therapy, Horta and the CDDP’s clinicians have so far empowered more than 350 people to lead healthier, more sustainable lives.

At the core of the model is the provision of culturally competent care. Himself Cape Verdean by birth and fluent in four languages, Horta represents the MGH’s commitment to treating each patient within the context of their culture and working to overcome individual and systemic barriers to wellness. For the average patient enrolled in the CDDP, diabetes is just one problem: patients also may be homeless, hungry, dealing with substance abuse, victims of domestic violence or uncertain about their immigration status. A case in point is the story of Alfredo, a 45-year-old El Salvadoran immigrant who, when Horta first met him, had an A1c level of 13 (anything over 8 is considered dangerous). Alfredo was homeless, undocumented with Immigration Services and had started to develop diabetes complications, including severe nerve damage. After several months of coaching sessions with Horta, Alfredo had successfully submitted an application for political asylum, secured a place of residence, obtained health insurance and reduced his A1c level to 7.4. Says Horta, “We just take it one patient at a time, one problem at a time.”

With an average patient A1c level decrease of 1.5, the CDDP’s impact truly has been significant. Furthermore, new results show the gap in diabetes disparities between whites and Latinos closing at MGH Chelsea. From 2005 to 2007, the percentage of Latino patients with uncontrolled diabetes has dropped from 35 to 29 percent, while for white patients it has fallen from 24 to 20 percent. Building on this success, the Disparities Solutions Center recently received funding from Tufts Health Plan to replicate a similar program targeting Cambodian patients at MGH Revere HealthCare Center.

The program’s director, Alex Green, MD, MPH, associate director of the Disparities Solutions Center, remarks: “Language barriers, socioeconomic status and cultural issues can make diabetes care a very real challenge. The CDDP is our way to concretely improve the quality of life of these patients while reducing the disparities between Latino patients and the majority population.”
At 8:30 on a Tuesday morning, the Surgical Intensive Care Unit (SICU) on Ellison 4 is quiet except for the beep of heart monitors and the gush of respirators. At the end of the hallway, a small cluster of clinicians in turquoise scrubs and white coats moves from one patient room to the next, waiting while a tall doctor with short curly hair and glasses enters each one, spends several minutes and returns.
TWO BOSTON POLICE OFFICERS stand outside one room. The tall doctor nods to them before heading in. Unfazed that his patient’s wrist is handcuffed to the bed, he leans over the young man, forges eye contact and questions him about his pain levels, head and neck. When he’s finished, the doctor steps back into the hallway, sliding the glass doors shut behind him. Some 20 surgical residents, SICU attending physicians, anesthesiology residents, nurses, nurse practitioners, trauma fellows, respiratory therapists and medical and nursing students are watching intently by the time he’s started speaking. George Velmahos, MD, PhD, MSEd, chief of the Division of Trauma, Emergency Surgery and Surgical Critical Care, is conducting this morning’s SICU teaching rounds.

The biggest difference between general surgery and trauma surgery is the difference between action and reaction.

In a methodical but almost lyrical tone – a native of Greece, English is his second language – Velmahos describes the patient’s condition: a male, early 20’s, gunshot wounds to the chest and abdomen. Gesturing with his hands and shifting his gaze to the different listeners, Velmahos explains the common presentations of gunshot wounds. He differentiates between an entrance and an exit wound, offering tips for proper clinical documentation.

“So this patient arrives,” Velmahos says, “and he is in a lot of pain and bleeding profusely. What do you do,” – he scans the group before settling on an anesthesia resident – “Daniel?”

Velmahos nods as the young doctor lists potential interventions, challenging him occasionally to explain how or why. The resident, though clearly on the spot, thinks his way through the issue. Satisfied, Velmahos then turns to his specialty: trauma surgery. “This is not elective, and time is short,” he says. He enumerates the roles of the members of the trauma team, explaining in encyclopedic detail the order of operations to stabilize the patient.

When he’s done, it’s time to go to the Emergency Department (ED) for the next case.

VELMAHOS WAS APPOINTED chief of the MGH Trauma Center in 2004, after a career that included some of the busiest trauma centers in the world. The MGH center’s clinical leadership includes Hasan Alam, MD, director of the Surgical Critical Care Fellowship and director of Trauma Research; Marc de Moya, MD, director of the Surgical Clerkship; and Alice Gervasini, RN, PhD, Trauma nurse director. Unlike a traditional unit-based practice, the MGH Trauma Center is virtual: “We’re wherever the patient is,” explains Velmahos.

Prior to the center’s founding, trauma cases were handled by general surgeons on call. These doctors also had private practices, however, and the hospital’s leadership identified the need for a dedicated trauma unit. Unlike general surgeons, for Velmahos, de Moya and Alam, trauma is a full-time job, and effective care for their patients requires depth and breadth of experience, operating room expertise and an environment that’s capable of supporting complex clinical efforts. Massachusetts mandates a trauma system, and the MGH is a state-designated Level 1 Adult and Level 1 Pediatric Trauma Center – meaning it is able to take the most complex and challenging cases. The MGH admits about 2,200 trauma patients and another 2,000 emergency surgery patients per year, the vast majority of whom are from the Boston metropolitan area. If the president of the United States suffered a trauma while in the Northeast, he or she would likely be brought here.

The biggest difference between general surgery and trauma surgery is the difference between action and reaction. Whereas in an elective surgery a comprehensive plan of care is established long before the operation begins, the trauma surgeon is lucky to be able to communicate with a patient before a major intervention takes place and must be able to establish rapport, explain the situation and incorporate any feedback as quickly as possible. Given the many thousands of conceivable complications that can bring a patient to the ED, the trauma surgeon relies on rapid access to information, the ability to make decisions quickly and an extremely broad base of knowledge. Says Gervasini, “In trauma, you’re responding. Your experience has taught you to react quickly and confidently – and to save lives by doing so.”

Teaching is another major function of the Trauma Center. For graduates of medical school pursuing a career in surgery, the MGH’s residency program is recognized as one of the best in the world, and trauma surgery, elective surgery and nontrauma emergency surgery comprise its core. As they progress through the seven years of the
residency the surgeons are given more responsibility and authority under a philosophy of gradual autonomy. Says Velmahos: “I want to feel comfortable knowing that, if I needed it, they could operate on me.”

**AT 9:05,** an elderly woman with dementia and a bowel obstruction awaits Velmahos in the ED. Having examined her CT scan during that morning’s 7 am pass-off rounds, he has a good idea of the nature and severity of her illness, but will examine her before she is prepped for surgery. He enters her bay space in the ED and, putting on gloves, leans over her. Velmahos looks deeply into her eyes, smiles and introduces himself. Touching different parts of her belly, he asks, “Does it hurt here? How about here?” She doesn’t respond verbally but he notes the discomfort in her face.

She is brought up to the Main OR on Gray 4 and anesthetized while Velmahos scrubs in. As he opens the door of the OR, however, his beeper sounds off as a general trauma page alerts him that a new case requiring immediate attention is arriving in the ED: a man has been struck by a car in the vicinity of the hospital. Velmahos turns heel and heads back downstairs.

Thankfully, the pedestrian is not seriously injured. Overseeing a resident perform the physical examination, Velmahos helps the doctor diagnose a possible rib fracture and a broken nose. A CT scan is ordered and Velmahos returns to the OR, where his patient is ready for surgery and a senior surgical resident has scrubbed in. Joining him are four anesthesiologists, two scrub nurses, two circulation nurses, a medical student and two research fellows. This is nontrauma emergency surgery: the patient was admitted to the ED during the night, with a subsequent CT scan indicating advanced bowel disease. Her symptoms and pain were managed and she was fit into the next day’s schedule for an exploratory laparoscopy – an incision into the abdomen to view what’s going on inside.

The patient’s stomach, which the resident is swabbing with antiseptic orange iodine, is the only part of her body not covered in blue scrub material. The scrub nurse, keeper of the hundreds of knives, tweezers, clamps, scissors, sponges, gauzes and sutures, passes instruments with wordless skill. The resident begins to make the incision.

**THE AFTERNOON PASSES:** a meeting with the patient’s son to explain that his mother’s operation – the removal of her sigmoid colon and placement of a colostomy – had been successful; a trip to the ED to assist in the intubation of a patient with respiratory distress; a hurried lunch at the Trauma Journal Club, where residents
As the trauma surgeon on call, Velmahos has a long night and day ahead. Each senior trauma clinician – Velmahos, de Moya and Alam – is always either on call, post-call or pre-call.

give presentations on recent articles of interest in academic and medical journals; another trip to the OR to repair an inguinal hernia. At 3 pm, Velmahos visits his office for the first time that day.

Large windows provide a sweeping view southward onto the brick facades and green roofs of Beacon Hill. More than 30 certificates, awards and plaques line his walls, several denoting excellence in teaching. Velmahos quickly sorts through dozens of e-mails before sitting down with one of the two research fellows the Trauma Center supports. The Trauma Center’s research suite is impressive: among Velmahos, de Moya and Alam, 2007 saw the publication of 36 peer-reviewed articles. The trio has 13 manuscripts in preparation and 18 clinical projects currently under way, of which 10 are lab-based.

The MGH Trauma Center specializes in the study of the early phase of trauma. In the last 50 years, the capacity of EDs to treat trauma victims has increased significantly, and the majority of fatalities from trauma now occur before the patient arrives at the hospital, most commonly owing to uncontrollable blood loss. Alam currently is investigating a technique he calls “fluidless resuscitation,” which would prevent cell death related to blood loss by communicating directly with the DNA inside the cell. The therapy has successfully been tested in rats and pigs, and while the physiological consequences of preserving life in this way are not yet known, Alam and Velmahos believe that, with further study, fluidless resuscitation has the potential for widespread use in emergency medicine.

IT IS 10:30 AT NIGHT and Velmahos, who has spent the late afternoon and evening between the OR and ED, where he treated a victim of a head-on motor vehicle crash, is back at his office to catch up with paperwork. As the trauma surgeon on call, he has a long night and day ahead. Each senior trauma clinician – Velmahos, de Moya and Alam – is always either on call, post-call or pre-call.

In trauma, the hours are long and the work is demanding. Split-second decisions require clarity, superior knowledge and experience. Velmahos laments that fewer and fewer students are choosing trauma as a career path, but he admits that it’s not for everyone. “If my kid came to me and told me he wanted to manage money for a living, I’d tell him to go for it,” he says. “If he told me he wanted to be a surgeon, I’d say, that’s great too – but make sure you want it.”

Having worked on three continents and visited hundreds of hospitals over the course of his career, Velmahos is proud to call the MGH his home. The special systems in place to enhance patient safety, he says, make it possible for him to execute his job with total confidence.

Checking his schedule on his way back to the OR, he sees that he has two full OR shifts the next day. Velmahos frowns, then shrugs. “When I look at the hours I work, and the intensity of those hours,” he says, “I’m not sure there’s money that can pay for it. But I know that I could never do anything else.” He flicks off the light in the deserted office behind him. “This is what I love.” It is 2:30 am.
LIKE MANY OTHER CANCERS that affect organs in the abdomen, liver cancer can be difficult to treat because it is often quite advanced before it is discovered. One type of liver cancer that is particularly challenging is cholangiocarcinoma, a malignancy that arises from bile duct cells. As is true with other forms of liver cancer, neither chemotherapy nor radiation are effective for cholangiocarcinoma. The only option for treatment is resection – surgery to remove the tumor – and it is not uncommon for the cancer to be so widespread by the time it is diagnosed that surgery is no longer possible.

Such was the case for 67-year-old Elaine Park of Essex Junction, VT, who came to the MGH in April 2007 with a diagnosis of cholangiocarcinoma. Local doctors had told her that because of the cancer’s location and the extent of its spread into both lobes of her liver, it was inoperable. Kenneth Tanabe, MD, chief of the MGH’s Division of Surgical Oncology and deputy clinical director of the MGH Cancer Center, agreed with their assessment but thought there might be one possibility, a complex procedure that is rarely performed even in tertiary care centers: liver surgery with veno-veno bypass to reconstruct hepatic veins.

“Mrs. Park’s cancer was unresectable by conventional means because the location involved all three hepatic veins,” Tanabe explains. The liver is a major stop on the human circulatory system – the organ holds between 10 and 15 percent of the body’s blood supply at any given moment, and the veins drain to the inferior vena cava, the large vein that returns deoxygenated blood from the lower part of the body to the heart. Any surgery that involved removing sections of those three hepatic veins, therefore, required finding an alternate way to supply blood to the heart during the long procedure.

The surgery itself took approximately 10 hours. Using the same equipment cardiac surgeons employ during open-heart surgery, Tanabe and his team rerouted Park’s blood supply, bypassing the liver entirely to return blood to her heart. They then detached the liver from her vena cava to excise the cancer, applying preserving techniques used during transplant surgeries to protect the liver and limit cell death while the organ was without blood. Because the tumor had grown into the vena cava and a very large segment of the right liver vein, Tanabe used artificial material to reconstruct those venous structures. “This was an extremely aggressive procedure,” Tanabe says, “and one that required the combined talents of surgical oncology and transplant surgery to be successful.”

The liver is the only organ in the body capable of regenerating itself, and Tanabe and his team removed approximately three-quarters of Park’s liver to achieve clean margins around her tumor. Even with successful surgery, however, the cure rate for cholangiocarcinoma is less than 25 percent, and Park recently discovered that she is among the 75 percent of patients who experience a recurrence. Still, she has no regrets about undergoing the landmark procedure at the MGH. “I am immensely grateful to Dr. Tanabe,” Park says. “Without the surgery, I was given no chance of survival. It has been a year since my diagnosis now, and I have no doubt that I am still here today because of him.”

To Tanabe’s knowledge, since his 2007 procedure no other hospital in the region has performed liver surgery with veno-veno bypass to resect and reimplant veins of the liver. The technique was pioneered in Europe, and is used only infrequently because of its complexity. While not many people are candidates for the surgery, Tanabe says he would “absolutely” perform the surgery again if the need were to arise.
KIM FARAH IS NOT SOMEONE you would expect to have a heart attack. Two years ago, the then 44-year-old college chemistry professor from New Hampshire considered herself exceptionally healthy: a vegetarian who often put in 15 or 20 hard miles a day on her bicycle and had completed numerous triathalons.

In September 2006, however, Farah suffered a major heart attack – an event at such odds with the vigorous picture of health she presented that clinicians at her local emergency department initially dismissed her complaint as heartburn.

Farah recalls that her symptoms developed rapidly one evening, just after she put her 6-year-old daughter to bed. She became nauseous and sweaty and felt heavy pressure in the center of her chest, classic symptoms of a heart attack. A single parent, Farah called a friend who lived nearby – who thought Farah had to be joking – and then 911. EMTs treated her with aspirin and nitroglycerin, but her preliminary EKG tracings were normal. Hospital emergency personnel were waiting on Farah’s lab results when a sudden increase in chest pain and a new EKG revealed what Farah intuitively knew: she was in the middle of a major cardiac crisis. A 20-minute trip to the cath lab turned into a two-hour ordeal. As cardiologists attempted to open a blockage in Farah’s left coronary artery, her heart stopped beating. With her heart not strong enough to beat on its own, Farah was put on a balloon pump and transferred to the intensive care unit, where four stents were ultimately inserted to open and repair two dissected arteries.

Even after her condition was stabilized and she was able to go home, Farah remained unhappy about the level of attention her heart problem was given. “I felt dismissed,” she says. “I was such an atypical heart patient, I felt my condition warranted more scrutiny.” Farah sought opinions from numerous other cardiologists before her gynecologist urged her to find a cardiologist who specialized in women’s heart health – a female cardiologist, preferably. In spring 2007, Farah found the answer in Malissa Wood, MD, an interventional cardiologist and director of the MGH’s brand new Elizabeth Anne and Karen Barlow Corrigan Women’s Heart Health Program. In April 2007, Farah became one of the program’s first enrollees.

“Cardiovascular disease is the number one cause of death among women in the United States,” Wood says. “And while cardiac deaths among men have decreased since the 1980s, they have actually gone up for women.” One of the reasons is that women’s symptoms are often absent or atypical – complaints such as shortness of breath or fatigue that can be readily attributed to other causes. Troublingly, a 2005 study in the Journal of the American Medical Association revealed that only one in four physicians recognize cardiovascular disease as the leading health threat to their female patients. The MGH Corrigan Women’s Heart Health Program was developed to address these very specific concerns. “We combine excellent patient care with teaching and research that focuses on the female population in a way we believe no other program does,” Wood says.

In Farah’s case, Wood agreed her patient’s profile did not support the diagnosis of “garden-variety” coronary artery disease. She reviewed Farah’s medical records, carefully considered her story and referred her to a genetic specialist, who identified a genetic component to her heart disease. As a result, Farah’s medical regimen includes not only typical cardiac medications, but also Lipitor – a drug typically used to control high cholesterol, which Farah does not have – to address the genetic disease. Today, Farah is healthy and active, and again has days when she logs 15 miles on her bike. She credits Wood for her return to near-normal.

“The situation I was in was not only frightening but frustrating,” Farah says. “Dr. Wood was really the only person to take my concerns about my heart condition seriously.” For her part, Wood sees Farah as an excellent example of the MGH Women’s Heart Health Program’s raison d’être. “We established this program with the belief that our female patients’ cardiac issues merit special attention,” she says. “Clinicians who are well-versed in the special issues that surround the presentation, diagnosis and treatment of heart disease in women can focus on tests and treatments proven to be effective and accurate.”
A DOCTOR'S VISION

STEVE GARDNER, MD
THROUGH THE VIEWFINDER of his camera, Steve Gardner, MD, watches a young boy wrap his arms around a man and lean his cheek in for a kiss. One might assume this affection is for a father or grandfather, but the man’s surgical mask and scrubs reveal his true role – the young boy’s doctor.

Gardner, a physician in the MGH Beacon Hill Health Associates, is building a portfolio of photographs capturing the intense bonds that often are born from caregiver relationships.

In 2006, Gardner was awarded the MGH Kendall Fellowship for Primary Care to pursue his photography at the hospital. He spent the 12 weeks of the fellowship gathering images from across the hospital of doctors, nurses, volunteers, ambassadors, social workers and others exhibiting the compassion and resilience that Gardner feels is central to the patient-caregiver relationship.

“The MGH has a legacy of almost 200 years of compassionate care,” he says. “I wonder if we sometimes lose sight of the fact that the people of the MGH today, our own colleagues and coworkers, carry on that special tradition with no less grace and dedication than our predecessors.”

Since the fellowship, Gardner has continued photographing the MGH community and is developing ways for his colleagues and patients at the MGH to benefit from his work. Many of his photos are on display at Beacon Hill Health Associates and in the Executive Health Offices at 165 Cambridge St., and he shares slideshows of his work with colleagues.

“The photos are to remind people that what they are doing is a calling – not just a job,” says Gardner. “Showing the images reminds caregivers that their work is really quite special and powerful to the patients they are serving.”

Gardner’s artistic inspiration came from his son, Graham, and his friends and counselors at Camp Jabberwocky on Martha’s Vineyard. Graham, now 21 years old, has cerebral palsy. For the past 12 summers he has attended the camp, which is especially for children with the condition. Gardner volunteers as the camp doctor and also takes pictures for the camp during the month he spends there each year.

“The experience of having a special needs son allows me to observe the extraordinary care people have provided him throughout the years,” says Gardner. “The relationships between the children and the counselors were the catalyst for my observations about the caregiver-patient relationship; Camp Jabberwocky is where my vision took shape.”

Gardner has compiled a rich catalogue of inspiring and heartfelt images exploring the extraordinary connections that develop between MGH staff and patients, often focusing on people whose relationships have helped them overcome overwhelming challenges, such as drug addiction, cancer and abuse.

He says he hopes to further their impact by offering films as educational tools to medical and nursing schools and MGH programs and events. He also hopes to design exhibits and programs at local museums that could help engage students in conversations on social topics revealed in his images.
“The photos are to remind people that what they are doing is a calling – not just a job. Showing the images reminds caregivers that their work is really quite special and powerful to the patients they are serving.”  

STEVE GARDNER, MD
SHE DIDN’T KNOW IT AT THE TIME, but in 1964, the tender care 4-year-old Karleen Habin gave her dolls at the “health center” she and her sister assembled in their childhood playroom was only a glimpse of what was to come. More than 40 years later, Habin is a Breast Health and Oncology Research nursing supervisor at the MGH Gillette Center for Breast Cancer. Her work has touched not only hundreds of women who have been in her direct care, but millions more who have benefited from the groundbreaking breast cancer research she has coordinated throughout her career.
The MGH celebrated many accomplishments in 2007. Among these are the dozens of awards and honors bestowed upon members of the Patient Care Services staff for forging innovative nursing research, championing health care for the disadvantaged and delivering compassionate and outstanding care to all patients.

Below is a list of MGH Patient Care Services staff members who were honored locally, regionally and nationally in 2007.

**PROFESSIONAL ACHIEVEMENTS 2007 | STATE AND REGIONAL**

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“Without the MGH, I would not have the opportunity to meet incredibly strong and inspiring women like Jane and Beth.”

KARLEEN HABIN, RN, BCCS, MPHC
A ROLL CALL of the MGH’s and Patient Care Services’ staff yields thousands of outstanding caregivers who skillfully blend the science of medicine with the art of providing compassionate care. For those patients undergoing breast oncology clinical trials at the MGH, Habin stands out among the best. Recently, the American Cancer Society (ACS) awarded her one of its top honors – the Lane Adams Quality of Life Award – for her compassionate, skilled approach to cancer care and the lasting contributions she has made in improving the quality of life for her patients and their families.

Among Habin’s many patients who consider the ACS award richly deserved is Jane Salini, RN, herself a registered nurse. With Habin’s assistance, Salini, who has three adult children and a husband who also received a cancer diagnosis nine months following Jane’s in 2000, was able to continue working at a community hospital while participating in a clinical trial at the MGH. “Karleen’s rational approach to care and attitude of respect and empathy showed me that she is interested in me as a human being and not a ‘test subject,’” Salini says. “I did not want a cancer diagnosis to take over my life. Karleen immediately reassured me that she would work with my schedule as best as she could while I participated in the study. She demonstrated that no patient request is insignificant.”

Habin expresses both a sense of accomplishment and gratitude for the people with whom she has worked at the MGH. “The MGH is a big institution,” she says. “But I’m able to collaborate well with colleagues and get things done for my patients, mentor nursing staff and coordinate these drug trials with patients and their physicians.” Habin sees the potential and opportunities available to her in her role, and when she sets her sights on a task or project, she truly makes a difference.
IN 1998, she developed the “Breast Cancer Resource Guide Project of Massachusetts” for patients, their family and friends and health care providers to navigate the breadth of cancer resources available to them. Today, she serves as the executive director of the guide, which has been replicated in other states and has been translated into Portuguese with funding from the Massachusetts Department of Public Health and the Susan G. Komen for the Cure Foundation. Today, she serves as the executive director of the guide, which has been replicated in other states and has been translated into Portuguese with funding from the Massachusetts Department of Public Health and the Susan G. Komen for the Cure Foundation. With colleagues, she also helped spearhead the development of the Dr. Mary Jo Nugent Breast Cancer Foundation to honor Nugent, a dear friend and previous colleague who died of breast cancer at age 28. The foundation provides financial support to breast cancer patients and works to increase awareness, education and research for breast cancer.

MGH cancer patient Beth Walsh also credits Habin with helping her during a difficult transition. Diagnosed in 2002 with an aggressive form of breast cancer, Walsh decided to participate in a clinical trial at the MGH under Habin’s guidance. “Karleen’s clinical knowledge is incredible,” she says. “She has a huge comprehensive knowledge of the most up-to-date information on breast cancer research and helped me to select a trial that would work for me.”

Walsh attributes the ease of participating in the trial to working with Habin. “My husband and I have known Karleen now for five years, and we agree that if you have to have cancer, having a connection with someone like Karleen makes it so much easier. By participating in the drug trials with her I feel very empowered, and I know that there’s something positive coming out of this experience. I feel like with her, I’m doing something good for myself and other women. We rely on her and she can count on her one hundred percent."

Habin views her patients as her true inspiration. “Without the MGH, I would not have the opportunity to meet incredibly strong and inspiring women like Jane and Beth,” she says. “There’s so much potential to help so many people. I sometimes wish I could do more.”

**MGH**

**JENNIFER BERNARD, RN**
Labord and Delivery
Molly Catherine Tramontana Award for Outstanding Service and Patient Care

**SUSAN CAHILL, RN**
Labor and Delivery
Molly Catherine Tramontana Award for Outstanding Service and Patient Care

**CLARIBELL DIAZ, RN**
Orthopedics
Ernesto Gonzalez Award for Outstanding Service to the Latino Community

**EDNA GAVIN**
Transplant, Burn, Plastic and Reconstructive Surgery Unit
Norman Knight Clinical Support Excellence Award

**PENELOPE HERMAN, RN**
Obstetrics and Gynecology
Molly Catherine Tramontana Award for Outstanding Service and Patient Care

**JESSICA JACAVAGE, PT, MSPT**
Physical and Occupational Therapy
Family Centered Care Award, MassGeneral Hospital for Children

**NATIONAL**

**CONSTANCE DAHLIN, RN, APRN, BC, PCM**
Palliative Care Service
Advanced Practice Nurse of the Year National Board for Certification of Hospice and Palliative Care

**DEAN HESS, PHD, RRT, FAARC, FCCP**
Respiratory Care Services
Robert H. Miller, RRT, Award National Board for Respiratory Care

**DOROTHY JONES, EDD, RN, FAAN**
Yvonne L. Munn Center for Nursing Research Rose and George Doval Education Award New York University College of Nursing

**MGH NEUROSCIENCE INTENSIVE CARE UNIT**
Outstanding Chapter of the Year Award American Association of Neuroscience Nurses

**NORINE O’MALLEY-SIMMLER, RN, BSN**
Cardiac Intensive Care Unit
Circle of Excellence Award American Association of Critical Care Nurses

**DEBORAH WASHINGTON, RN, MSN, PHD**
Patient Care Services, Diversity
National Nurse of the Year in the Advancing and Leading the Profession Category, Nursing Spectrum
“With all of the physicians working side-by-side to care for me and offering a lot of good communication, I felt safe and comfortable.”

RICHARD HORGAN
CHOOSING THE MGH VASCULAR CENTER for her husband’s care proved to be a life-saving decision for Marci Horgan of Westminster, Mass. In August 2006, Marci’s husband of 30 years, Dick, experienced a devastating stroke. Unfortunately, the stroke was just the beginning of a complex series of health issues that would interrupt the active life the 70 year old shared with Marci and their four adult children.

Horgan was treated for the stroke at a local hospital. There, Marci and her family members did not feel connected to his care nor informed about his condition or progress. “During this very difficult and frightening time, we often did not know who was taking care of Dick,” says Marci. “The nurses were asking me questions about his health when I felt that they should be informing me.” At one point, the hospital relocated Horgan to another room and did not alert his family. “Our daughter went to visit him and found his room emptied,” says Marci. “She was so confused and alarmed – she actually thought he had died.”

For three months, Horgan remained hospitalized while his health continued to deteriorate. At one point, doctors removed a nonfunctioning kidney after finding a tumor that they believed was cancerous. Following his recovery from that procedure, they soon discovered he also was dealing with an aortic aneurysm: a weakening of the large artery leading to the heart that could be fatal if left untreated.

With his health continuing to decline, Marci decided to transfer her husband’s treatment to the MGH. “I felt more comfortable moving him to a place where my friends and colleagues assured me he would get the most advanced care possible,” she says. “The doctors at the MGH Vascular Center took an entire day to run a whole battery of tests to find out exactly what they were dealing with and how they could best address Dick’s issues. They also included me and our children in his care.”

At the MGH Vascular Center, nationally recognized experts in the fields of cardiology/vascular medicine, vascular and endovascular surgery, vascular radiology, neurology, neurosurgery, cardiac surgery and nephrology collaborate on the diagnosis of and treatment plans for each patient. Michael R. Jaff, DO, medical director of the center, led the team that cared for Horgan. “Mr. Horgan had a very complex series of problems, all of which were interrelated,” says Jaff. “We worked together to develop a treatment plan that worked out very well.” All told some 50 MGH professionals were involved in Horgan’s care.

Today, Horgan is on his way to regaining his full strength, and he is healthy. “I am very thankful for the MGH,” he says. “With all of the physicians working side-by-side to care for me and offering a lot of good communication, I felt safe and comfortable.”

Marci adds: “Thank goodness the MGH was here. Without the physicians, nurses and specialists, we wouldn’t be in the place we are enjoying today. We are truly grateful to Dr. Jaff and the entire MGH team.”
WITH AN EVER-INCREASING SUPPLY of information about the genetic and molecular underpinnings of health and disease, this is one of the most exciting times for medical science – and one of the most challenging. The sheer volume of data generated by investigators around the world is growing at an overwhelming rate. A tight focus on the needs and concerns of individual disciplines can build the knowledge base, but the innovations that change the way medicine is practiced may require the perspective of specialists from totally different fields. The emphasis on multidisciplinary research that is now common at centers across the country has long been a fixture at the MGH.
LIGHT-BASED THERAPIES FOR SKIN DISORDERS DEVELOPED BY R. ROX ANDERSON, MD, (CENTER) HAVE BEEN ADAPTED FOR THE TREATMENT OF VOCAL CORD PROBLEMS BY STEVEN ZEITELS, MD, DIRECTOR OF THE MGH VOICE CENTER (RIGHT), AND THE CENTER’S RESEARCH DIRECTOR ROBERT HILLMAN, PHD, CCC-SLP (LEFT).
TODAY MGH RESEARCHERS have access to a unique range of expertise and technologies within the hospital; and facilities and programs have been developed to help and encourage collaboration at its most fundamental level. “People would be surprised to know that science is actually a very social pursuit,” says Robert Kingston, PhD, chief of MGH Molecular Biology. “Scientists collaborate with other scientists they know – people they may have met over lunch or coffee, as well as at meetings and lectures.”

Facilitating those kinds of connections and collaborations was an underlying principle behind the development of the Richard B. Simches Research Center, which opened in 2005. Housing four thematic research centers – the Center for Regenerative Medicine, the Center for Computational and Integrative Biology, the Center for Human Genetics Research and the Center for Systems Biology – Simches was designed to reduce physical barriers between and among research teams. Simply sharing key pieces of equipment has led to conversations that have blossomed into cooperative projects.

“The kinds of basic and clinical research collaborations that have always been a strength here are now becoming a necessity,” Kingston says. “We know that if you can get someone who thinks passionately and expertly about clinical science together with someone who thinks passionately and expertly about basic science, you’re going to do great things.”

The breadth of expertise at the MGH is distinctive among teaching hospitals. “Many academic medical centers bring clinical and basic biological researchers together, but the MGH is equally strong in technology,” says Mehmet Toner, PhD, of the MGH Center for Engineering in Medicine (MGH-CEM). Trained in mechanical engineering at Massachusetts Institute of Technology (MIT), Toner joined the MGH-CEM in 1989, working on technologies that can detect, sort and analyze hard-to-find cells. Today he directs the BioMicroElectroMechanical Systems (BioMEMS) Resource Center, which develops microdevices using living cells to find information critical to the diagnosis and treatment of disease.

“Mehmet and his group had developed nanotechnology devices to identify circulating fetal cells and were interested in applying that work to cancer cells,” explains Daniel Haber, MD, PhD, director of the MGH Cancer Center. “We were studying genetic markers for lung cancer, and the ability to identify those markers in blood samples would be ideal. Mehmet and I started with a conversation over lunch – along with Ron Tompkins [MD, ScD, chief of the MGH Burns Center] and Kurt Isselbacher [MD, director emeritus of the MGH Cancer Center] – and ended with a two-year collaboration that has given us a tool that should help us identify the best treatment for particular patients and monitor response of therapy.”

“With its strengths in clinical science, basic science and technology, the MGH is an unbeatable environment for cooperative research.”

MEHMET TONER, PHD

That tool is the “CTC-chip,” a microchip-based device for detecting and analyzing circulating tumor cells (CTCs) carried through the bloodstream at minute levels. While their existence has been known for more than 100 years, CTCs are so rare that it was not possible to investigate what their presence signified for an individual patient. Working with collaborators from the MGH Cancer Center, Toner and his team determined that a business-card-sized silicon chip with thousands of microscopic posts coated with an antibody to a tumor protein could capture CTCs from small blood samples.

Toner notes, “Universities like Harvard or MIT may have specialists in both life sciences and technologies; other academic medical centers have clinical and basic biological researchers. But with its strengths in clinical science, basic science and technology, the MGH is an unbeatable
environment for cooperative research. We can give our clinical colleagues a broader look at the tools available to solve their problems, and they remind us every day what is working, what isn’t and what is ultimately important – improving human health.”

WHEN THE MassGeneral Institute for Neurodegenerative Disease (MGH-MIND) was established in 2001, Anne Young, MD, PhD, chief of MGH Neurology, wanted to include something found at few hospitals: a drug discovery laboratory. MGH-MIND researchers would be unraveling the genetic and molecular underpinnings of disorders such as Alzheimer’s, Parkinson’s and Huntington’s diseases and identifying steps in the disease process that new drugs might interfere with to slow or even halt the inexorable progress of these disorders.

The transformation of biological discoveries into new drugs was traditionally done at pharmaceutical companies. But several factors have been slowing that process, particularly for conditions that affect relatively few patients, like Parkinson’s and Huntington’s diseases. Young invited Alex Kazantsev, PhD, to join MGH-MIND as director of the Drug Discovery Laboratory. A molecular biologist, Kazantsev and his team develop sensitive assays that can rapidly screen tens of thousands of compounds for potential action against disease processes.

Kazantsev and his team identified a compound called C2-8 as a potential Huntington’s treatment based on its ability to inhibit deposits of the mutant huntingtin protein that causes the disease. After the initial discovery in yeast and a fruit fly model of the disease, an animal study led by Steven Hersch, MD, of MGH-MIND, confirmed that C2-8 crossed the blood-brain barrier and appears to safely alleviate symptoms in a mouse model of Huntington’s disease. Further studies are under way to see how C2-8-based treatments might be improved and someday applied to patient treatment.

Another compound discovered in the search for potential Huntington’s therapies may be useful against Parkinson’s disease. Called B2, the protein was found to alter the size of brain deposits of both huntingtin and of the abnormally folded alpha-synuclein protein found in a brain structure involved with Parkinson’s. Subsequent research revealed that B2 blocked the action of an enzyme called SIRT2 and showed that more powerful SIRT2 inhibitors reduced alpha-synuclein damage in rat brain cells and an insect model of Parkinson’s.

“One of the most satisfying aspects of this work is how it has validated our approach to drug discovery, which incorporates both the most advanced tools for screening candidate compounds and outstanding collaboration with our clinical and scientific experts in human disease,” says Kazantsev.

“If we didn’t have the drug discovery lab on site here at MIND, we would never have done the experiments that identified these potential new drugs,” says Young, who is also principal investigator of the MGH/MIT Morris Udall Center of Excellence in Parkinson’s Disease Research. “Having the lab here definitely decreases the time required to identify potential drugs, and probably reduces the overall costs. And of course, we’re hoping this will lead to effective new drugs that will help improve patients’ lives. I would be delighted to accomplish that during my tenure as chief.”

THE ENTIRE FIELD of photomedicine – the application of light to the treatment of disease – was largely initiated at the MGH, and many breakthroughs in light-based therapies were made at what is now the Wellman Center for Photomedicine. In the early 1980s, R. Rox Anderson, MD, now director of the Wellman Center, first exploited the fact that pigmented cells and blood vessels only absorb specific wavelengths of laser light to remove disfiguring birthmarks without damage to normal skin. Those principles have since been applied to the removal of tattoos, permanent hair removal, and most recently, the treatment of benign and cancerous vocal cord lesions.

About 10 years ago, Anderson began collaborating with Steven Zeitels, MD, a specialist in vocal disorders who was then at Massachusetts Eye and Ear Infirmary. “Rox had been using lasers to treat vascular abnormalities in the skin, and I realized that most of the benign and malignant vocal-cord lesions I treat have abnormal microcirculation,” Zeitels says. “Combining our efforts could enhance the precision of vocal microsurgery and address persistent problems.”

Those conditions included benign lesions that can lead to chronic hoarseness – a particular problem for those whose work relies on their voice, including teachers and singers – and ruptured blood vessels that may be caused by overuse or misuse of the voice. Applying the same pulsed-angiolytic lasers developed to treat the skin to vocal disorders, Zeitels and Anderson transformed what used to be a surgical procedure carried out under general anesthesia into a clinic procedure under local anesthesia.

“We’ve completely revolutionized the way these disorders are treated,” says Zeitels, who four years ago created and now directs the MGH Voice Center. “Some of these lesions, such as papillomatosis and precancerous dysplasia, keep coming back, and in some parts of the world they weren’t being treated at all to avoid subjecting patients to repeated rounds of general anesthesia. Now they can be treated in a 20-minute office visit with little or no damage to vocal quality.”

The most recent application of this work is treatment of early vocal cord cancer, in which using laser light to target a tumor’s abnormal blood vessels echoes the use of drugs that suppress formation of the blood supply of other types of cancer. In May 2008, Zeitels reported that the first 23 patients treated with pulsed lasers remain cancer-free up to more than five years after treatment. “This is the first use of nonionizing radiation without chemical enhancement to treat cancer in an organ without significantly heating and destroying normal tissue,” he says. “Because normal vocal cord tissue is minimally affected, the typical hoarseness caused by classic radiation or traditional surgery is avoided.”

Anderson adds: “Steven has been very creative in applying our approach to selective removal of blood vessels from skin to vocal tissues, which are quite different. With its deep expertise in the biomedical applications of light and broad interest in solving many different medical problems, Wellman really is a unique resource for our physicians. And the clinical and educational environment of the MGH is ideal for nurturing these collaborations.”
A SOCIAL WORKER AT THE MGH for 18 years, Rebecca Murphy, LICSW, MSW, has spent the last 11 years helping patients and their families in the Surgical Intensive Care Unit (SICU) through some of the most challenging ordeals imaginable. Every day, she cares for people whose lives have been turned upside down and torn apart by traumatic injuries and illnesses. Five years ago, she provided support to several victims of the Rhode Island Station nightclub fire as well as the spouses, parents and children of those critically burned patients. The medical dramas in which Murphy has played a part don’t always have happy endings. Murphy, however, says she considers herself blessed to have had the opportunity in 2007 to care for a woman whose strength and resilience remains with her every day, a patient who inspires her on the most difficult days. And that patient is Monica Sprague.

Sprague’s story, the subject of a two-part Boston Globe Magazine article earlier this year, is well known in the Boston medical community. On Aug. 9, 2007, following the healthy Caesarean delivery of her daughter, Sofia, the 35-year-old mother from Ayer, Mass., developed a fever and abdominal pains that ultimately proved to be the first signs of a raging necrotizing fasciitis infection. When she arrived at the MGH from a local hospital Aug. 12, the so-called “flesh-eating bacteria” disease was so virulent that Sprague was literally hours away from death. Some 35 surgeries were required to save her life, a number of which were performed in her intensive care room because she was too unstable to be transferred to an operating suite.

In addition to newborn Sofia, when Sprague fell ill she also had a 9-year-old daughter from a previous marriage, Madalyn, and a fiancé, Tony Jorge, who was overwhelmed at the prospect of both losing his life partner and raising an infant alone. Because Sprague was comatose and unaware of her condition, Murphy’s initial priority was supporting Jorge in any way she could. “He had a tremendous amount to deal with all at once,” Murphy says. “There was a lot of fear and sadness, and also anxiety about the ongoing needs of Madalyn and his newborn daughter.” In addition to riding an emotional rollercoaster, Jorge was burdened with navigating a heavy load of complex medical information and making health care decisions on Sprague’s behalf.
As Sprague’s condition stabilized and she became more cognizant of her condition, Murphy adjusted her focus of care to include the challenges that her extremely sick patient needed to face. Indeed, Sprague’s final surgeries were the ones that would change forever not only the young mother’s life but the lives of her loved ones. She required amputation of all four of her limbs.

The powerful infection that attacked Sprague’s abdomen had put her into septic shock, a condition that had destroyed blood flow to her extremities so thoroughly that all four of her limbs were damaged beyond repair. Nineteen days after Sprague was admitted to the MGH, Murphy was part of a health care team led by Marc de Moya, MD, who explained to Sprague and Jorge that her survival would require amputating both arms and legs.

“I’ve certainly cared for patients who have lost one limb or even two,” Murphy says, “but until Monica came into the SICU, I never encountered a patient faced with the loss of all four limbs at once. There isn’t any guidebook.” The social worker spent many hours helping Sprague work through what the loss of her arms and legs would mean. She was amazed by her patient’s fortitude.

“If there ever was a patient with the right to feel sorry for herself, it was Monica, but that just wasn’t who she was,” Murphy says. “Of course, she got weepy at times, but she was the first to recognize that she could still be a good mother to her daughters and a wife to Tony. She set goals for herself and achieved them in ways that were absolutely inspiring. She never said ‘I can’t’ – no matter what the challenge was, her response was ‘Don’t tell me that I can’t.’”

In no small part because of her determined spirit, Sprague was discharged from the MGH to Spaulding Rehabilitation Hospital Oct. 17, and from Spaulding to home Dec. 15, just in time to achieve her goal of being home for Christmas. Murphy was not working the day Sprague went home, but was privileged to be front-and-center for several meaningful milestones. She conducted the majority of the arrangements for Sprague and Jorge’s wedding in the MGH Chapel Oct. 5, and was at Spaulding to witness some of Sprague’s first steps on her prosthetic legs in November.

Even after Sprague’s discharge from the MGH, the two women remain in touch. Murphy talks to her former patient every few weeks and has seen her at most of her follow-up visits at the hospital.

What draws Murphy to the difficult and emotionally draining work she does? She isn’t always sure. “Particularly in the SICU setting, social work is one of those jobs where it’s often impossible to leave the patients behind when you go home,” she says. The support and understanding of her interdisciplinary colleagues is what makes the work possible, and she does allow that with the great challenge often comes great reward. “In terms of my experience with Monica, it wasn’t about taking care of her, really. It was about being witness to her strength and accompanying her on her journey.”
DRUG ADDICTION IS A PROBLEM of epidemic proportions in the United States. An estimated 23 million people across a vast range of demographics suffer from alcohol and other substance use disorders; approximately 20,000 Americans die of addiction-related causes each year. And yet these numbers represent only a fraction of the lives that are affected by drug addiction. Parents, partners, children, siblings and friends of those in the grip of addiction suffer tremendous heartache as they watch their loved ones struggle to function. Many addicted individuals lose their jobs and homes, break laws and generally become unrecognizable as the people they once were. Addiction takes over their lives.

Jim and Nancy Bildner know the pain of drug addiction all too well. For three years, their son Peter fought to overcome his addiction to heroin. In spite of their tireless efforts to find him effective treatment, he died of an overdose in December 2005 at the age of 21. Unable to bear the thought of other families going through the same terrible ordeal, the Bildners made a significant donation to the MGH’s Department of Psychiatry, which had opened a new Center for Addiction Medicine. In October 2007, the department launched the Addiction Recovery Management Service (ARMS), established with the Bildners’ gift, to help 15 to 25 year olds who are seeking treatment for substance-related problems.

“This age group is at the highest risk for the onset of substance use disorders, which can have both acute and long-term repercussions,” says John Kelly, PhD, program director. “Because the brain is still developing at this age, early intervention is paramount, before structural and functional changes occur that make breaking addiction more physiologically difficult.”

The ARMS program employs the latest evidence-based, developmentally sensitive methods. It consists of a network of services that guides families to effective treatment programs, coordinates transitions between programs (such as from inpatient to residential or outpatient settings), and provides ongoing outpatient treatment, case monitoring and relapse prevention. Parents’ needs and worries are also addressed directly by the ARMS team and through a weekly parent support group.

Patients meet with a clinical team specializing in addiction medicine for a comprehensive needs assessment. Based on the extent and severity of the substance use and any related psychological problems, the team – which includes psychologists, psychiatrists, clinical social workers and resource specialists – recommends a particular course of treatment, with ongoing case management and oversight provided by ARMS. Each family is assigned a recovery coach who works with them during every stage of treatment and recovery.

Because adolescent addiction requires both short and long-term care, the Bildners’ gift has provided a critical foundation for the department to begin to build a comprehensive suite of services that can follow an adolescent from initial intervention through long-term case management. “We know firsthand how hard it is for any family to deal with adolescent substance abuse, and our hope is that ARMS is just the first step of many to provide a network of addiction services that can truly make a difference in the outcome for other families going through this terrible disease,” Jim says. “For too many families in the commonwealth, these services simply do not exist today, and that’s the real tragedy.”

“The Bildners’ gift, given in the wake of such immense sorrow, represents an act of extraordinary generosity and heart,” Kelly says. He and his Psychiatry colleagues strongly believe that the combination of state-of-the-art services and programs provided by ARMS can enable a very vulnerable population to conquer substance addiction.
Excerpts from internal financial statements (in thousands of dollars). Years ending Sept. 30.

<table>
<thead>
<tr>
<th>Revenue</th>
<th>2006</th>
<th>2007</th>
</tr>
</thead>
<tbody>
<tr>
<td>Net patient service revenue</td>
<td>$1,486,702</td>
<td>$1,627,519</td>
</tr>
<tr>
<td>Other operating revenue</td>
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<tr>
<td>Direct research revenue</td>
<td>378,450</td>
<td>390,636</td>
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<tr>
<td>Indirect research revenue</td>
<td>140,632</td>
<td>139,960</td>
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<tr>
<td>Other</td>
<td>142,330</td>
<td>145,509</td>
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<tr>
<td><strong>Total operating revenue</strong></td>
<td><strong>2,148,114</strong></td>
<td><strong>2,303,624</strong></td>
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<table>
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<th>Expenses</th>
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<tr>
<td>Operating expenses:</td>
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<td></td>
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<tr>
<td>Employee compensation and benefits</td>
<td>794,664</td>
<td>901,540</td>
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<tr>
<td>Supplies and other expenses</td>
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<td>728,267</td>
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<td>Direct research expenses</td>
<td>430,459</td>
<td>448,226</td>
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<tr>
<td>Depreciation and amortization</td>
<td>94,320</td>
<td>98,345</td>
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<tr>
<td>Interest</td>
<td>19,538</td>
<td>18,795</td>
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<tr>
<td>Provision for bad debts</td>
<td>28,947</td>
<td>33,295</td>
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<tr>
<td><strong>Total operating expenses</strong></td>
<td><strong>2,039,664</strong></td>
<td><strong>2,228,468</strong></td>
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</table>

| Income from operations                       | 108,450   | 75,156    |
| Nonoperating gains, net                      | 186,467   | 279,501   |
| **Excess of revenue over expenses**          | **294,917** | **354,657** |
## Financials

**Massachusetts General Physicians Organization, Inc.**

Excerpts from financial statements (in thousands of dollars)

Years ending Sept. 30

<table>
<thead>
<tr>
<th></th>
<th>2006</th>
<th>2007</th>
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<tbody>
<tr>
<td><strong>Revenue</strong></td>
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<tr>
<td>Net patient service revenue</td>
<td>376,801</td>
<td>428,774</td>
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<td>Other</td>
<td>103,775</td>
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<td><strong>Total operating revenue</strong></td>
<td><strong>480,576</strong></td>
<td><strong>547,059</strong></td>
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<tbody>
<tr>
<td><strong>Expenses</strong></td>
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<tr>
<td>Employee compensation and benefits</td>
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<td>Supplies and other expenses</td>
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<td>Depreciation and amortization</td>
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<tr>
<td>Provision for bad debts</td>
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<td>11,129</td>
</tr>
<tr>
<td>Interest</td>
<td>0</td>
<td>0</td>
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<tr>
<td><strong>Total operating expenses</strong></td>
<td><strong>451,274</strong></td>
<td><strong>520,458</strong></td>
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<tbody>
<tr>
<td><strong>Income (loss from operations)</strong></td>
<td><strong>29,302</strong></td>
<td><strong>26,601</strong></td>
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</table>

Nonoperating gains (expenses):

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<tbody>
<tr>
<td>Income from investments</td>
<td>13,387</td>
<td>10,796</td>
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<tr>
<td>Change in net unrealized gains on equity method investments</td>
<td>(1,592)</td>
<td>12,610</td>
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<tr>
<td>Gifts and other</td>
<td>(181)</td>
<td>(1,391)</td>
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<tr>
<td><strong>Total nonoperating gains</strong></td>
<td><strong>11,614</strong></td>
<td><strong>22,015</strong></td>
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<tbody>
<tr>
<td><strong>Excess (deficit) of revenue over expenses</strong></td>
<td><strong>40,916</strong></td>
<td><strong>48,616</strong></td>
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</table>

Other changes in net assets:

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<tbody>
<tr>
<td>Transfer (to)/from affiliates</td>
<td>(459)</td>
<td>(475)</td>
</tr>
<tr>
<td>Other</td>
<td>1,042</td>
<td>313</td>
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<tr>
<td><strong>Increase (decrease) in unrestricted net assets</strong></td>
<td><strong>41,499</strong></td>
<td><strong>48,454</strong></td>
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</table>
Facts and Figures

**Available beds** 907
**Average occupancy rate** 82.172%
**Admissions** 46,748
**Average length of stay** 5.82 (in days)
**Admissions to observe** 8,034
**Births** 3,503
**Surgical cases**
- Inpatient 18,755
- Ambulatory 17,329
- Total surgical cases 36,084

**Ambulatory visits**
- MGPO visits (approx.) 592,970
- Clinic visits 436,609
- Health centers (hospital and some group) 36,084
- Charlestown 54,372
- Chelsea 143,010
- Revere 83,371
- Back Bay 15,762
- Total health center visits 296,515
- Total ambulatory and emergency visits 1,402,961

**Emergency visits** 76,867

**Staff**
- Clinical staff 2,728
- Residents 942
- Clinical fellows 484
- Research fellows 1,094
- Nonclinical staff 1,173
- Registered nurses 3,580
- Per diem registered nurses 310
- Other per diem 849
- Bulfinch temps 1,293
- Other employees 10,201
- Total employees 22,654

**Research expenditures** $543,128,000
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Advancing Medicine with Support from Friends

MASSACHUSETTS GENERAL HOSPITAL is a legacy bequeathed by the first donors to the hospital, whose support made exceptional patient care available to the diverse community of 19th century Boston. It also laid the groundwork for the successful medical institution that is the MGH of the 21st century. Today’s donors are creating their own legacy for the future. Their support is reinforcing MGH’s role as an international leader in providing superb medical care; helping brilliant researchers find treatments for currently incurable diseases; allowing dedicated caregivers to reach out with their medical expertise to help diverse, impoverished communities worldwide; and educating the next generation of health care leaders.

Thanks to the remarkable munificence of hospital donors, MGH programs and services continue to flourish, despite challenging times in health care. During the 2007 fiscal year, MGH friends and supporters set a new record in philanthropy, providing the hospital with a remarkable $256 million in gifts, outperforming the previous year’s record. The MGH is exceptionally grateful to its donors; they are, indeed, everyday heroes. Their contributions are essential to advance cutting-edge research and develop new therapies and treatment. Charitable support also provides the cornerstone for the building of new facilities, which are essential in accommodating the latest technological advances in medicine.

Valued donors already have stepped forward to support the crucially important second phase of the MGH’s clinical expansion program by naming vital services within the facility. The Building for the Third Century of MGH Medicine, which is scheduled to open in 2011 — the 200th anniversary of the hospital’s charter — will be a state-of-the-art facility, allowing for the expansion and renovation of essential services. The project holds enormous promise for the future, and the MGH looks forward to forging new partnerships with key friends and donors to expedite the completion of this project.

The MGH Development Office serves as a resource to offer donors gift options, to assist donors in achieving their philanthropic objectives and to identify donor recognition opportunities. Donors may wish to direct their gift to a program or research initiative at the hospital that holds special meaning for them, or, they may choose to make an unrestricted gift to the MGH Fund, providing funding for the hospital’s most critical priorities.

The MGH needs and appreciates the support from its donors. We invite you to join the MGH in its ongoing effort to deliver leadership and excellence in the treatment and care of patients locally and worldwide.

For more giving opportunities or information, please contact the MGH Development Office:

Massachusetts General Hospital
Development Office
165 Cambridge Street, Suite 600
Boston, MA 02114

Phone: 617-726-2200
Toll free: 877-644-7733

E-mail: mghdevelopment@partners.org
Web site: www.mghgifts.org