A year in review ...
A look to the future

Synergy
Our mission
To advance knowledge and to rapidly translate discovery into exceptional cancer care.

Our vision
We will bridge scientific discovery and clinical care to conquer cancer. For patients and their families, we will set the standard for excellence in personalized care.
Pioneering the forefront of basic science
A Nobel effort of discovery / Jack Szostak, PhD, receives the Nobel Prize
A new era of innovation / Dream Team awarded “Stand Up To Cancer” grant for CTC chip

From bench to bedside
Taking aim / Translating research into targeted therapies
Bad to the bone / Study addresses osteoporosis in prostate cancer treatment
The best feeling in the world / Study improves hearing in NF2 patients
X marks the spot / Treating Wilms tumor, a common pediatric kidney cancer
An ounce of prevention / Reducing cancer risk for patients with liver cirrhosis
The power of partnership / Collaboration reveals drug to slow brain tumor growth

New programs enhancing cancer care
A solid core of excellence / Improving the patient experience through new Quality Program
Personalized treatment for the whole person / New psychiatric oncology center
What’s next? / New Survivorship Program addresses living with and beyond cancer
No longer alone / Harris Center for Chordoma Care helps patients battle rare cancer
A lifeline to others / Warshaw Institute seeks answers to deadly pancreatic cancer

Serving our community
High-quality cancer care close to home / Mass General/North Shore Cancer Center opens in Danvers
The best of both worlds / Mass General radiation oncology in a community hospital setting
A continuum of care / Improving health in our communities

Building for the future
Reaching new heights / Facility to open in 2011 will improve delivery of care

Centerpieces / News from the Cancer Center

A year in review / By the numbers

How to make a gift to the Cancer Center / Partner with us in the fight against cancer

Synergy will distribute periodic updates throughout the year in electronic format. We invite you to sign up to receive Synergy updates by visiting massgeneral.org/cancernews.
Dear Friends,

This issue introduces the new Synergy, an expanded, annual publication that will update and inform the Massachusetts General Hospital Cancer Center’s benefactors about our progress in understanding, preventing and treating cancer. Focusing on “A year in review … A look to the future,” these pages highlight 2009’s progress and achievements while introducing the new vision and mission statements that will guide us in meeting our 2020 strategic goals. These principles reinforce our overarching commitment to rapid translation of discovery into effective clinical care and to setting the standard of excellence for care of patients and their families.

In support of our goals, we continue to search worldwide for the most qualified administrative leaders, physicians and researchers to join our staff. This summer, José Baselga, MD, PhD, will assume the position of chief of the Division of Hematology Oncology at Mass General Hospital and associate chief of the Cancer Center. Coming to us from the Vall d’Hebron Institute of Oncology, Dr. Baselga is an exceptional leader and commands international respect for his research and vast accomplishments in the field of clinical oncology. You will find more information about him inside this issue.

From this issue of Synergy, you can also learn about national and international recognition of Mass General investigators, including last year’s Nobel Prize winner in Physiology and Medicine, and a significant grant to help speed circulating tumor cell technology into clinical use. We introduce you to a new program that tests the genetic mutations of almost all cancers as part of routine patient care; we are the first cancer center to do so. This testing is a significant step forward in finding the correct treatment for individual cancers. Additionally you will read about how we are improving care for individuals, families and communities affected by cancer, including new partnerships with suburban hospitals and ongoing services for cancer survivors who may experience symptoms months or even years after treatment. You will also hear from the patients themselves about how the Cancer Center’s bridge between science and clinical care has given them extra time with their loved ones and improved their quality of life.

Thanks to your support, we are progressing toward conquering cancer. Periodic updates on this journey will be available in electronic format throughout the year. You may sign up to receive these updates by following the information at the bottom of the preceding page. Please provide any feedback by emailing us at Synergy@partners.org.

We hope you like this new format, and that you enjoy learning more about the depth and breadth of our research and services at the Mass General Cancer Center.
Introducing Dr. José Baselga

José Baselga, MD, PhD,
who assumes the position of chief of
the Division of Hematology Oncology
at Massachusetts General Hospital
and associate director of the Mass
General Cancer Center in July, began
perusing textbooks in his father’s
medical office at the age of six. Since
then, passion for finding cures has
not waned for this third-generation
physician.

Baselga’s career is focused on
development of targeted therapies,
especially for HER2-positive breast
cancers. Over the past decade, cure
rates for this aggressive disease have
risen from 50 percent to 90 percent,
a leap that Baselga believes means
“we found the Achilles heel.” His work
complements existing breast cancer
research at the Mass General Cancer
Center, which includes clinical trials
for HER2-positive breast cancers and
laboratory studies to expand the value
of targeted therapies.

Like many cancers, HER2-positive
tumors have a defense mechanism
that allows them to resist therapy
initially, or to develop resistance
over time. Baselga’s research seeks
to identify these mechanisms as well
as new agents or combinations of
agents that target the mechanism and
increase the tumor’s vulnerability.
This work will also help doctors
determine which patients will
respond to therapy, so that patients
need not suffer side effects from
medications that have no chance of
providing benefit.

World-class research wasn’t suffi-
cient to draw Baselga to the Cancer
Center. “I also wanted the assurance
that my patients are cared for by
physicians who are excellent at what
they do and compassionate with their
patients.” After observing patient care
“incognito” at Mass General, Baselga
summarized that “the quality of care
provided to patients here is second to
none in the world.”

Baselga’s career-long focus on
targeted therapies makes him an
ideal fit for Cancer Center leadership
because the promise of these therapies
is also the driving principle behind
the Center’s strategic plan, which
involves developing pioneering
treatment approaches to provide the
best of personalized cancer care.

“We now know that no two tumors
are likely to be identical,” Baselga
explains. “Therefore a massive effort
is needed to identify what makes each
tumor special.” The Cancer Center’s
initiative to provide genotype snap-
shots of tumors as part of routine
medical care is critical to this effort,
as is the commitment to cooperation
across academic disciplines and
institutions. “The new care paradigm
will be increasingly multidisciplinary,”
says Baselga, so that one approach
potentiates another.

In his administrative role, Baselga
will help determine what translational
research platforms need to be in place
and ensure they integrate well with
patient care and clinical trials. To stay
competitive globally, Baselga and the
Cancer Center leadership team will
also investigate ways to make drug
development more efficient, including
forming research partnerships with
pharmaceutical and biotech companies.

“The most exciting thing we have
is the ability to create,” Baselga says.
“Here we have some of the most accom-
plished people, we have technologic
capabilities unavailable elsewhere,
and we have an ideal balance between
research and patient care. The question
we will address in the coming months
is ‘where do we go from here?’”

Renowned clinical scientist joins
Cancer Center leadership
**A Nobel effort of discovery**

*Jack Szostak, PhD, Nobel Prize in Physiology/Medicine for telomerase*

His wife thought they needed a working phone in the bedroom. Jack Szostak, PhD, in Mass General Hospital’s Department of Molecular Biology, didn’t think it was necessary. But then the phone sounded at 4:45 am. “When I heard the ringing, I thought ‘this must be it,’” Szostak remembers of that October morning in 2009. “Sure enough, it was Goran Hansson, the Secretary of the Committee for the Nobel Prize in Physiology and Medicine, letting me know I’d won.”

The prize, which Szostak shares with former colleagues Elizabeth Blackburn, PhD, of the University of California, San Francisco, and Carol W. Greider, PhD, of the Johns Hopkins School of Medicine, recognizes an experiment done in the 1980s that opened the door to study of two cellular components, telomeres and telomerase, that play a vital role in cell division.

Telomeres are regions of repeating DNA sequences at the ends of chromosomes; they protect the chromosomes from deterioration during cell division. The enzyme telomerase adds extra DNA repeats to telomeres, maintaining them during repeated cycles of cell division. If the enzyme is turned off, as it is in most cells, telomeres gradually shorten leading to cell aging and eventually, cell death.

“One of the things cancer cells do to keep dividing is turn this enzyme back on,” says Szostak, so finding a way to turn it off could help in treating cancer. Although Szostak elected to pursue other scientific questions, his work launched investigations across the globe aimed at further understanding and controlling these cellular components.

At the time of the discovery, however, Szostak had no thoughts of therapeutic applications. He was simply curious, probing a half-century old question about why normal chromosomes retained stable ends during replication, whereas broken DNA resulted in deterioration and incomplete replication of genetic material. Among the things cancer cells do to keep dividing is turn this enzyme back on,” he says, so finding a way to turn it off could help in treating cancer. Although Szostak elected to pursue other scientific questions, his work launched investigations across the globe aimed at further understanding and controlling these cellular components.

“Perhaps the most clear-cut experiment I’ve ever done in my life,” Szostak says. In 1984 Szostak and Blackburn predicted the existence of an enzyme that added new DNA to chromosome ends. The enzyme itself, later known as telomerase, was identified the subsequent year by Greider, who was a student of Blackburn’s at the time. Ongoing discoveries about how cancer arises, performed by other research teams, eventually led to the connection between telomeres and cancer.

A man who uses the word “fun” frequently when talking about science, Szostak now probes the origins of life. “If we’re lucky,” he says, “maybe we will learn something about why biology is the way it is through our efforts to understand how we got here.”
“Sure enough, it was Goran Hansson, the Secretary of the Committee for the Nobel Prize in Physiology and Medicine, letting me know I’d won.”
— Jack Szostak, PhD
“We also are looking for ways to probe the biophysical characteristics of cells in a deeper way than ever before.”

—Mehmet Toner, PhD
A new era of innovation

Dream Team awarded “Stand Up To Cancer” grant for CTC chip

The confluence of innovative technology, advances in the understanding of cancer biology, and studies of how patients respond to new targeted drugs can lead to significant improvements in cancer therapy. However, this progress hinges on whether experts in these areas can collaborate toward a shared goal of rapidly translating discovery into treatment. Collaboration in large-scale team science isn’t easy, says Mehmet Toner, PhD, director of the Center for BioMicroElectroMechanical Systems at Mass General. To be successful, “you need a new way of thinking.”

Toner and Daniel Haber, MD, PhD, director of the Cancer Center, embraced this new way of thinking with the Stand Up to Cancer (SU2C) “Dream Team,” an interdisciplinary and multi-institutional team working together to further development of a Mass General Cancer Center innovation, the circulating tumor cell (CTC) chip. The Dream Team’s potential to revolutionize cancer care was recognized in May 2009 by SU2C with a $15 million grant. SU2C’s initial television broadcast raised $100 million for cancer research. In determining which research to fund, SU2C sought multi-institutional collaboration as well as projects with potential to improve patient care in the near future. Collaborators on the CTC chip Dream Team include physician-scientists from the Mass General Cancer Center, MIT, Memorial Sloan Kettering Cancer Center, the Dana-Farber Cancer Institute, and M.D. Anderson Cancer Center.

“They wanted very cutting edge science, but they insisted on deliverables within three years,” Haber says of the SU2C committee. “The CTC chip fit these criteria well because the technology is at the cutting edge, but we can already see the clinical applications.”

The chip uses a simple blood test to detect and capture extraordinarily rare invasive cancer cells traveling in the blood stream. Created by a team of scientists, engineers and researchers led by Toner and Haber, the chip will one day allow physicians to follow the genetic evolution of cancer during therapy and adjust treatment plans to reflect the sensitivity or resistance of the tumor cells to specifically targeted drugs without repeated biopsies. As the technology improves further, it might even allow detection of invasive cancers before the disease has spread. Capturing the cells without destroying them — a feat that has eluded scientists for more than a century — opens new avenues of study into how these cells overcome the body’s natural restraints against cell mobility and spread cancer to distant organs.

Clinical studies have demonstrated the chip’s ability to capture circulating tumor cells in patients with metastatic cancers of the prostate, lung, pancreas, colon or breast. Using the SU2C funding, the Dream Team intends to advance device use and refine sensitivity. Collaboration with partner institutions will ensure the technology is usable in environments outside the Mass General Cancer Center, a necessary step for making it more widely available, and to help expand innovation into other clinical areas.

“We also are looking for ways to probe the biophysical characteristics of cells in a deeper way than ever before,” Toner says. “For example, we will be able to study the characteristics of cancer precursor cells, an area about which we know very little.” These features and the mutations in circulating cells may present target opportunities for new drug development.

“It’s bringing together the very best from different disciplines,” Haber says of the Dream Team. “Not necessarily people who were already working on cancer, but scientists from very different backgrounds. It’s not that common to work together at such early levels of scientific discovery, especially when it involves bringing together complex bioengineering technologies with advanced molecular biology and cancer clinical research. This is a new paradigm.”
Taking aim

Translating research into targeted therapies

Traditionally, the first step in cancer treatment was determining where the disease began. Once the location was known, lung cancer was treated with lung cancer drugs, breast cancer was treated with breast cancer drugs, and so on. But that model is changing to a new approach known as personalized cancer care, which uses a new generation of drugs that target cancer-causing mutations across multiple tumor types. These new targeted drugs require a new method of diagnosis — the molecular fingerprint — an analysis of the tumor’s genetic changes.

Obtaining molecular fingerprints has been a cumbersome process used on only a few patients’ tumors, but the Mass General Cancer Center now has developed a unique and highly automated method for extracting the necessary genetic material and analyzing it gene by gene. The robotic equipment, purchased with the support of Aid for Cancer Research, is so efficient that the Cancer Center expects to routinely profile the tumors of each of the 7,000 new patients seen annually by the end of this year. Unlike other centers, which generally test only for the mutations most commonly associated with a particular tumor, the Mass General Cancer Center aims to test all tumors for a large variety of cancer-causing mutations — currently a total of 122 mutations on 15 genes. The equipment is scalable to accommodate new cancer gene mutations.

“Genetic testing is assuming an increasingly important role in the care of select patients with lung cancer,” says Alice Shaw, MD, PhD, a Cancer Center thoracic oncologist. “Patients whose tumors harbor specific mutations can be directed to new therapies — typically pills — which target their tumors much more effectively and with fewer side effects.” (see sidebar). The Cancer Center began routine testing with lung cancer patients, and has expanded in the last 12 months to other tumor types.

The benefits of molecular fingerprinting go beyond today’s cancer patients. The Mass General Cancer Center is building a storehouse of information on mutations collected from its screening process that can be combined with anonymous data on treatment success, which will be used by researchers looking for new targets or ways to improve existing drugs.¹ This information will help uncover potential targets for new drugs, speed promising drugs into clinical use, and reveal ways to make approved targeted drugs more effective.

One example of these benefits is providing new options for a patient whose tumor has become resistant to therapy. “Traditional chemotherapy had so many effects in a cell that scientists understood very little about how tumors became resistant,” explains Leif Ellisen, MD, PhD, an oncologist who, along with John Iafrate, MD, PhD, directs the Translational Research Lab where tumor profiling is performed. “With targeted drugs, resistance to therapy is much more specific.” In lung cancer patients, for example, an acquired resistance to one targeted drug is commonly caused by the same secondary mutation. Armed with that knowledge, Cancer Center scientists have begun developing drugs aimed at the secondary mutation.

This totally novel approach to diagnosing and treating cancer, says Iafrate, “gives our oncologists more information about a patient’s cancer so they can treat it in a very specific way, thereby significantly increasing the odds of success.”

¹ All information relating to human subjects is collected with the patient’s permission and oversight by the Massachusetts General Hospital Institutional Review Board.
Nicole Field Kurt was 38 and had never smoked when she was diagnosed with stage IV lung cancer. The diagnosis took her by surprise: she’d thought the pain in her shoulder was an exercise-related injury. Chemotherapy stopped the tumor for a while, but when the cancer began growing again, Nicole was most concerned about further options. “I have two young girls, ages eleven and nearly seven, and the thought of them not having a mother was very difficult,” Nicole says.

A few years ago, Nicole would have had few options, but her Mass General Cancer Center oncologist, Jennifer Temel, MD, suggested a molecular profile of her tumor might reveal a mutation that could be matched to a targeted drug. The test paid off: Nicole had a mutation of the ALK gene, a rare mutation in non-small cell adenocarcinoma lung cancer and other cancers, and she enrolled in a clinical trial of a drug so new it goes by a number instead of a name: PF-02341066. Researchers believe the drug, which is taken by mouth, will block the cell growth, migration and invasion of tumor cells.

Two months later, her tumor had shrunk to half its previous size and Nicole feels ready to “get back out there and do things,” including becoming a regular at the gym again. The pain in her shoulder, which was so sensitive she was reluctant to be touched, is now gone.

The drug’s effects won’t last forever — Nicole knows that — but for now she is taking one day at a time, grateful that researchers are continuing their hunt for new drugs and thankful she can participate in all aspects of her family life, from supervising homework to receiving great big bear hugs from her husband and daughters.
Hopscotch

Some side effects of cancer treatment, like hair loss, are quite visible. Others are more subtle, which explains why Steve Poulos, a prostate cancer survivor, had his osteoporosis discovered by his wife’s gynecologist and not by an oncologist.

“Her gynecologist is a family friend,” Poulos explains. “He had a new device for measuring bone density in the ankle, so he said, ‘stick your foot in here.’” The test revealed that Poulos’s bone density was two percent below normal for a man his age.

During that time, Mass General Cancer Center physician-scientists such as Matthew Smith, MD, PhD, noticed that men using androgen deprivation therapy for prostate cancer were suffering from bone fractures. Smith’s research revealed the relationship between the drugs and thinning bones, and recently led to proof that the drug denosumab helps prevent bone loss in men receiving androgen-replacement therapy. But the solution came too late to help Poulos avoid a painful vertebral fracture.

“I was playing hopscotch with my granddaughter,” he recalls, “I landed stiff-legged on number 10.” Two days later, “The pain in my back was so bad my wife had to lift my head to feed me.” Vertebroplasty immediately relieved his pain, but not before he had missed several weeks of work.

Poulos and his Cancer Center doctors agreed to stop the androgen-replacement therapy. “I never had much in the way of usual side effects,” Poulos says. But he did have the one that no one knew existed, resulting in a loss of more than six inches in height and the development of a stoop. He now observes the limitations imposed by his brittle bones. And, sadly, there’s no more hopscotch.

FDA approval for denosumab is expected this year. Once approved, the drug will be available to patients at risk for bone loss, including men like Poulos who have stopped hormone therapy to prevent further osteoporosis.

“If denosumab had been available to me,” says Poulos, who is now very cautious about the side effects of any medications he uses, “I probably would not have hurt my back when I was playing hopscotch.”
Bad to the bone

Study addresses osteoporosis in prostate cancer treatment

Targeted therapies provide hope for more than cancer treatment. They can also be used, as Mass General Cancer Center physician-scientist Matthew Smith, MD, PhD, has shown, to ameliorate side effects of existing therapies.

While caring for prostate cancer survivors, Smith noticed many of his patients receiving androgen-deprivation therapy, a commonly prescribed approach to treating advanced prostate cancer, were developing osteoporosis and suffering fractures that were severely affecting quality of life. Under Smith’s leadership, determining the cause for this bone thinning moved quickly from observation to clinical studies introducing a new targeted therapy agent. The agent, denosumab, was so successful at increasing bone density, stopping bone loss, and preventing spinal fractures that an FDA advisory committee last year recommended its approval for use in prostate cancer patients receiving androgen-deprivation therapy as well as in some breast cancer patients and post-menopausal women.

Treatments exist for thinning bones but they have only been studied in women. So, Smith carefully studied the relationship between androgen therapy and osteoporosis. He discovered that “the hormonal pathway that regulates prostate cancer growth overlaps with normal bone growth,” which, he adds, could also explain why metastatic prostate cancer frequently shows up in the bones.

The approach involved studying the biological processes that control cell communication. When a cell needs something, a “messenger” travels biological pathways to the supply mechanism and activates manufacture and delivery. In the bones, supply and demand occurs via two channels of communication: cells signal the need to form new bone and also to break down old bone. An imbalance between these signals results in bone being destroyed more rapidly than it is being replaced, which was occurring to men receiving androgen-deprivation therapy. In personalized medicine, the approach Smith used, an agent is identified or developed that stops the messenger before it causes damage.

Denosumab, the agent Smith selected for his study, targets the messenger responsible for destroying bone and is the first drug in clinical development that affects this particular messenger. It works differently from other osteoporosis drugs and has demonstrated that it is more effective than existing approaches. Smith’s international clinical study, launched after the drug passed a series of safety tests, showed that two injections a year were sufficient to reduce the risk for new spinal fractures in men receiving androgen-deprivation therapy for non-metastatic cancer by 62 percent.

“Denosumab contributes to the value of an effective existing therapy and will help the hundreds of thousands of men receiving androgen-deprivation therapy,” Smith says. “We’re currently conducting a clinical trial to see if this drug can help prevent prostate cancer from spreading to the bone.”

Thanks to PSA testing, most prostate cancer is discovered while it is localized. But some men have aggressive forms of the disease. Advances in understanding the molecular fingerprint of tumors will help doctors identify which patients are most at risk for developing bone metastases. New technology such as the CTC chip (see story page 7) can determine the effectiveness of chemotherapy by detecting the level of prostate cancer cells in the blood, which could prevent disease progression to the skeletal system. If the current clinical trial is successful, these high-risk patients can be given denosumab earlier in their treatment to avoid the risk of painful cancer in their bones.
“I felt completely shut out from the hearing world,” reports Edith Garrett, who has a condition that causes benign tumors to grow on the hearing nerves and throughout the nervous system (see sidebar). “I could understand less than 10 percent of what was said to me.”

Seven months later, following treatment with an investigational drug at the Mass General Cancer Center, Garrett recognized 96 percent of the words spoken to her. The drug, bevacizumab, demonstrated the ability to shrink tumors, restore hearing, and alleviate side effects in a small study of patients with neurofibromatosis type 2 (NF2). This drug is the first to deliver therapeutic benefit to patients who have previously relied on surgery or radiation to keep the tumors at bay. While those treatments carried high risks, the consequences of leaving the tumors untreated were even higher. Bevacizumab is also the first NF2 treatment to show that hearing can be improved and offers promise that other neurological complications from the diseases, such as difficulties swallowing, can be mitigated without surgery or radiation.

“Bevacizumab is an angiogenesis inhibitor,” explains Scott Plotkin, MD, PhD, director of the Neurofibromatosis Program of the Stephen E. and Catherine Pappas Center for Neuro-Oncology at the Mass General Cancer Center, and lead clinical investigator on the study. Angiogenesis, or the growth of new blood vessels, is a natural process in the body. Cancer’s ability to stimulate angiogenesis nourishes tumors, making agents that target this process a critical area of cancer research. Because the tumors associated with NF2 are benign, few researchers expected that they promoted blood vessel growth. However when Plotkin and Emmanuelle di Tomaso, PhD, his colleague in the Edwin L. Steele Laboratory at Mass General Hospital, examined tumor samples from patients with and without NF2, they found evidence that angiogenesis is indeed involved.

Taking this observation to the clinical setting, they gave bevacizumab to patients to test the efficacy of an angiogenesis inhibitor. Bevacizumab is approved for use in a variety of cancers and was selected because of its success with other tumor types. In nine out of 10 patients, the drug restored hearing and/or shrunk tumors.

Next steps, Plotkin says, involve confirming the response rate of the drug in a larger group of patients and continuing to follow the patients involved in the initial study, because NF2 patients may need long-term medication to keep their tumors at bay. Success with bevacizumab indicates that this class of drugs works for NF2 patients. Other angiogenesis inhibitors will be tested either following bevacizumab therapy or in conjunction with it to attempt to prolong beneficial effects.

“The race is now on for us to find dosing schedules or new drugs that can permit long-term benefits over years to decades,” says Plotkin.

Plotkin’s research is aided by financial contributions from a faithful friend — Plotkin’s college roommate, Jonathan Ephraim — and by a very grateful patient: Edith Garrett, who raises funds for NF2 studies at the Cancer Center.

Garrett has retained her hearing for more than two years, a result that makes her able to fully participate in any activity or conversation. “I have that freedom and sense of independence back,” she says. “And I gotta tell you, that’s the best feeling in the world.”
Her mother’s voice

As a sophomore in college, Edith Garrett had no idea she was deaf in one ear. The facial paralysis was subtle, noticeable only when she was tired. It came and went, so she wasn’t concerned. But her orthopedist, who had known her since childhood, was worried. He was treating her for a painful shin, but he sent her off to a neurologist for testing. MRIs revealed tumors growing on Garrett’s auditory nerves, and she received a diagnosis of neurofibromatosis type 2 (NF2).

“I went back to college,” Garrett recalls, “and I didn’t know what NF2 was. Late at night, when I should have been studying, I read some scary things about it on the Internet.” After deciding she wasn’t comfortable with the treatment recommendations at another research hospital, Garrett flew to Boston from Tennessee in February 2005 to meet with the team at the Mass General Cancer Center. For more than a year, her Cancer Center doctors monitored her condition, and her hearing remained stable until the summer before her senior year. But then the situation changed.

“That year, it just started to go downhill. And it went down fast,” Garrett says. She tried an oral chemotherapy, but it had no effect. By graduation, she was at 15 percent word recognition.

“I was afraid I wouldn’t hear the person call my name to cross the stage,” she says. Despite her challenges, Garrett headed to graduate school. She stopped the ineffective chemotherapy and began using bevacizumab, which was available on a compassionate use basis, under the direction of her neurologist, Scott Plotkin, MD, PhD. A month later, she was sitting in class wearing her hearing aide, when she heard a southern accent. “I thought my professor was just being goofy. It turns out, that was the first time I really heard his voice.” Later, back at her apartment, she woke from a nap, startled by a noise.

“I asked my roommates what it was. Turned out it was the dog barking downstairs. He’d been there since we moved in. We all just looked at each other like, ’did you really hear that?’”

Just 30 days after her first treatment, Garrett’s word recognition was at 48 percent. She went on to finish her graduate degree in education of deaf and hard-of-hearing children. Now she teaches high school math at the Atlanta School for the Deaf, but she still remembers the miracle of that day when she realized she could hear again.

“I sat on the floor in my apartment and called home,” she says. “I could hear my Mom’s voice. The voice I’d always known but had thought I’d never hear again.”
In August 2004, the Siekman family was on vacation in New Hampshire. The four-year old twins, Justin and Brandon, spent their days swimming and playing with friends. But then one mid-morning, Jody Siekman, a hemodialysis nurse, realized Justin hadn’t urinated since the night before. When he finally did, he passed blood clots. Two days later, he was in surgery at the MassGeneral Hospital for Children.

“I wasn’t thinking about cancer,” Siekman recalls of the family’s drive to the hospital. But when doctors used the words Wilms tumor, Siekman remembered this rare form of pediatric kidney cancer from nursing school. Six days of radiation and six months of chemotherapy followed surgery.

“Basically our world just stopped,” Siekman says of the period around Justin’s diagnosis and treatment. Fortunately, Justin responded well to treatment. The boys celebrated their 10th birthday this year, but the big event wasn’t the birthday; it was the fifth anniversary of Justin being cancer free. The family observed the milestone with a trip to Disney World.

Justin was diagnosed before the discovery of WTX, and so the Siekman’s don’t know whether he had a WTX gene mutation. However they do have lasting gratitude that their son was among the 85 percent of patients cured by existing Wilms tumor therapies. For the parents of children who don’t respond, the Siekman’s have deep compassion.

“I don’t know what I’d say to a parent whose child doesn’t respond,” Siekman says. “Other than that research is so important. It’s how you combat cancer.” Meanwhile Justin’s dad puts some serious muscle behind that belief and will participate for the second time this year in the 50-mile Granite State Quest. Proceeds from the ride support pediatric cancer research at the Center for Pediatric Hematology Oncology at MassGeneral Hospital for Children.

“I don’t think Justin missed a day of school from his illness,” Siekman says. “So thank God for research and the great care he received at Mass General.”
**X marks the spot**

*Treating Wilms tumor, a common pediatric kidney cancer*

Children affected by Wilms tumor, the most common pediatric kidney cancer, are most often cured. But success comes at a price: These children, usually under six years old when diagnosed, undergo surgical removal of a kidney and may experience long-term complications from therapy. For as many as 15 percent of these young patients, treatment fails.

However, recent research conducted by Daniel Haber, MD, PhD, director of the Mass General Cancer Center; Miguel Rivera, MD, assistant professor in the Department of Pathology and a Cancer Center researcher; and colleagues provides new critical information about this cancer. The group identified a novel gene mutation that is present in about 30 percent of Wilms tumors. The mutation is located in a gene, dubbed WTX, that has never before been studied. Once research uncovers the role of this gene and the connection between the mutation and patient outcomes, WTX status may be a useful marker for determining prognosis in Wilms tumor patients. The mutation may also be a target for future drug development.

WTX mutations are present in a significantly higher number of tumors than other gene changes associated with Wilms tumor. WTX mutations also show up in children with no family history of the disease, and they are likely to contribute to the development or progression of the tumor.

The discovery has repercussions beyond Wilms tumor. Located on the sex-determining X chromosome, WTX is, says Haber, “the first X chromosome gene directly implicated as a tumor suppressor.” Because of its relationship to gender, the X chromosome is ordinarily probed only when a disease strikes males more often than females. Wilms tumor affects boys and girls in equal numbers, so the X chromosome was not an intuitive place to look for a related mutation. However the Cancer Center researchers’ willingness to look “outside the box” brings the X chromosome into focus for research on all adult and pediatric cancers, not just Wilms tumor. As Rivera says, “This opens up the possibility that other genes on the X chromosome could be affected in any cancer that we study.”

“Because all cells have only one copy of the X chromosome, instead of two copies for all the non-sex chromosomes, the mechanism of gene inactivation and its implications are different,” adds Haber. In short, this discovery becomes a paradigm for using the X chromosome to find biomarkers for other tumor types.

Identification of WTX uncovers possibilities for understanding normal kidney development as well. Already, the team has determined that the gene is expressed during embryonic kidney formation. Further studies are using pre-clinical models to better understand the full function of this gene.

“We are living in amazing times in terms of medicine,” says Rivera, who is funded in part by the Physician Scientist Development Award from the Mass General Minority Affairs Office. The Cancer Center, he adds, is a great place to capitalize on the new tools and understanding that are improving cancer treatment because “the strong connection between basic and clinical research is very unique, as is the fact that you can quickly find someone in this community with the expertise to help maximize your research finding. The Mass General Cancer Center is built in a way that has incredible breadth and incredible depth.”
The key to success with cancer therapy has long been to detect and treat the disease early. But emerging work by Kenneth Tanabe, MD, chief of surgical oncology at the Mass General Cancer Center may take that model one step further: Preventing cancer in a high-risk population.

Tanabe’s lab studies hepatocellular carcinoma (HCC), a form of liver cancer that is the third leading cause of cancer death worldwide. The most common precursor of HCC is cirrhosis: 80 percent of patients diagnosed with HCC have preexisting cirrhosis. Last year, Tanabe’s research team showed that a single change in a gene that signals the need for cell growth and proliferation significantly increases the chance that an individual with cirrhosis will develop HCC. The gene, known as the epidermal growth factor (EGF), encodes a protein that activates the so-called EGF receptor (EGFR). When the receptor is stimulated by EGF, it broadcasts a message to grow more cells. If the EGFR is stuck in the “on” position because of too much EGF, the cell calls for continual growth, and this unchecked cell growth is a hallmark of cancer.

Scientists are investigating the role of EGF and EGFR in several types of cancer, but Tanabe’s team has raised understanding of the gene in liver cancer to a new level. Testing cirrhosis patients for the EGF mutation with a simple blood test could help identify individuals at increased risk for HCC, so that they could be more carefully monitored over time. Treatment could begin at the earliest sign of disease.

The team’s finding also is significant in that it presents a clear target for impacting the progression of cirrhosis to liver cancer. Pursuing the promise of personalized medicine — using the unique molecular “fingerprint” of a tumor to select the most effective therapy or to develop new drugs to target genetic abnormalities — Tanabe initiated a series of studies designed to impede this cancer-causing pathway. He chose the targeted drug erlotinib, which inhibits the action of EGFR, to determine its impact on HCC development. His team discovered the ability to prevent the formation of cancer with EGFR inhibition.

“We have definitive proof that erlotinib blocks cancer in a pre-clinical model,” Tanabe reveals. “And perhaps even more importantly, we reversed the severity of the cirrhosis.” These findings, adds team member Bryan Fuchs, PhD, “are unique to the Mass General Cancer Center, and will provide insight into the processes by which cirrhosis progresses to cancer.”

“Based on our observations,” Tanabe concludes, “we may one day use targeted therapy to prevent cancer.”

Another outgrowth of Tanabe’s research is the identification of a gene signature that can be used to monitor whether treatment is working. This exciting work was performed in collaboration with Todd Golub, MD, at the Broad Institute. While initial testing of EGF levels can determine who is most likely to benefit from erlotinib therapy, likelihood of benefit doesn’t necessarily translate to treatment success. But testing the cirrhotic liver’s genetic signature with a liver biopsy reveals early on in treatment whether erlotinib is actually working to reverse the cirrhosis. This time frame is a significant improvement over the years, or even decades, cirrhosis patients have had to wait to see if treatment helped them avoid HCC.

With the help of funding from the Cancer Center’s Tucker Gosnell Hepatobiliary Cancer Clinic, Tanabe is now working to launch clinical trials with erlotinib and other EGFR inhibitors in patients with cirrhosis. “Other cancer centers have worked with compounds similar to erlotinib,” Tanabe says, “but this work is the first to show its ability to reverse cirrhosis.”
“Based on our observations, we may one day use targeted therapy to prevent cancer.”

— Kenneth Tanabe, MD
Trapped by the skull, edema exerts pressure on delicate brain tissue, affecting speech, vision, mobility, personality and functions critical to life.

Diffusion tensor MRI, also called tractography, can be used to highlight the impact of therapy. White matter tractography shows an absence of tracts in the left frontal lobe, left, most likely due to a combination of edema and true infiltration and displacement of the tracts. One month after treatment, the tracts become more visible, right, again most likely due to reduced edema.
The power of partnership

Collaboration reveals drug to slow brain tumor growth

In March 2009, an interdisciplinary team of Mass General Cancer Center physician-scientists announced a drug they were studying, cediranib, could delay the growth of glioblastoma, a deadly brain cancer. The drug, they had learned, normalized the disorganized and leaky blood vessels nourishing the tumor and blocked their growth, thereby reducing swelling of brain tissue and fluid build up known as edema. Trapped by the skull, edema exerts pressure on delicate brain tissue, affecting speech, vision, mobility, personality and functions critical to life. The Cancer Center study was the first to show that this anti-edema effect with cediranib is better than that of the current treatment, which uses steroids.

However, this team of researchers, which includes Gregory Sorensen, MD, co-director of the Athinoula A. Martinos Center for Biomedical Imaging and a neuro-radiologist with the Stephen E. and Catherine Pappas Center for Neuro-Oncology; Tracy Batchelor, MD, director of the Pappas Center; and Rakesh Jain, PhD, director of the Mass General Edwin L. Steele Laboratory of Tumor Biology, quickly pushed their discovery further: In July they announced discovery of a potential biomarker to help identify which patients are most likely to respond to the new drug. This “vascular normalization index” biomarker may predict if cediranib will be effective in lengthening life as early as a single day after initial dose. Armed with this knowledge, doctors can switch to a new therapy if necessary rather than waiting weeks or months to see if current treatment is working. The discovery also opens avenues to further research into why some respond while others don’t, and how to help people whose tumors are unaffected by cediranib.

“We have been able to identify answers to scientific questions I wouldn’t have known to ask without Rakesh,” Sorensen says. “He couldn’t have answered these questions in humans without our tools, and neither of us could have asked or answered without the clinical insights provided by Tracy.”

In their initial finding, Jain noted that cediranib could “restore normal function to tumor vessels, thereby creating a period during which treatment with a variety of cancer therapies [such as radiation or chemotherapy] should be maximally effective.” Ongoing studies are aimed at testing this hypothesis and at combining drugs to help prolong cediranib’s beneficial effects.

The discovery also opens avenues to further research into why some respond while others don’t, and how to help people whose tumors are unaffected by cediranib.

The team’s work has impact beyond the brain, shedding light on why drugs like cediranib, known as anti-angiogenics, don’t produce the same dramatic effects in cancers in other parts of the body. The studies also have contributed to and benefited from development of some of the most powerful imaging systems that exist anywhere, including the first combination Magnetic Resonance Imaging (MRI) and Positron Emission Tomography (PET) prototype machine, which is being used to track treatment efficacy.

Batchelor, who acknowledges the importance of support from the Montesi and Simches families, adds that the proximity of a world-renowned scientific program and a large, world-renowned clinical program, is unique to the Cancer Center. “That,” he says, “is synergy.”
The solid core of excellence

Improving the patient experience through new Quality Program

Patients come to the Mass General Cancer Center seeking the best possible care. But how do they know if they receive it? The answer lies in the quality assurance programs that have long been embedded in Mass General’s individual departments. With last year’s launch of a Cancer Center Quality Program, these departmental quality efforts are increasingly integrated to improve the patient experience.

Quality improvement in healthcare involves continuous review of emerging medical information, best practices, patient outcome data and safety measures with the goal of providing high-quality care based on current medical knowledge. According to Inga Lennes, MD, director of the new Quality Program, “The model at the Cancer Center is for personalized medicine that’s built on a solid core of evidence-based treatment approaches.”

The Cancer Center’s commitment to quality extends to any location within the Mass General system and across all treatment modalities. “We are working towards establishing quality metrics and standards that we can track across the cancer care continuum, both at the Mass General Cancer Center and community affiliates,” says Mara Bloom, Mass General Cancer Center executive director. The Cancer Center also participates in quality and performance measures set by Mass General Hospital and by Partners HealthCare.

Within medical oncology, a current Cancer Center quality initiative focuses on the implementation and routine use of chemotherapy treatment plans. These plans educate patients, enhance communication between Cancer Center physicians and patients, and facilitate information sharing with other care providers. The project will enable providers to customize information sheets and consent forms for patients.

The Department of Radiation Oncology uses a quality assurance program based on national and institutional guidelines; staff scrutinizes data for areas of improvement. One recent quality improvement, says Torunn Yock, MD, quality assurance chair for radiation oncology, is the move to a paperless medical record system.

“This system incorporates safety features to ensure the prescribed treatment is delivered appropriately, and is verified and recorded in the electronic medical record,” she says.

Paperless documentation provides another benefit as well. According to Andrea Paciello, executive director of the Department of Radiation Oncology, “Having departmental team members able to access one common source of information on the patient from nearly any clinical area within the hospital ensures accurate and timely communication, which improves the quality of care.”

This year, Andrew Warshaw, MD, Mass General surgeon-in-chief, launched a quality and safety program aimed at using data collection and analysis to improve surgical outcomes and the patient experience. Michele Gadd, MD, quality director for the Division of Surgical Oncology, collaborates with surgical, nursing and anesthesia colleagues to implement the World Health Organization surgical safety checklist in Mass General operating rooms. The group also participates in a national program that provides benchmark information on surgical outcomes at other U.S. cancer centers, so Mass General can measure its results against peer institutions. Expanding on this national effort, the group is developing treatment programs that optimize patient outcomes and experience for specific cancers.

Finding appropriate quality measures involves reviewing thousands of metrics published by leading national cancer organizations and selecting those most relevant to the Cancer Center. But the Cancer Center Quality Program has one goal, says Lennes: “To ensure every patient receives the safest and most effective care.”
“The model at the Cancer Center is for personalized medicine that’s built on a solid core of evidence-based treatment approaches.”

— Inga Lennes, MD
Personalized treatment for the whole person

Mass General Cancer Center launches new psychiatric oncology center

While the Mass General Cancer Center has a long history of integrating psychiatric care into treatment for cancer patients, last September’s formal development of the Center for Psychiatric Oncology and Behavioral Sciences adds a clinical research and teaching mission to this service and enhances accessibility for patients and their families. The goal, says the new Center’s director William Pirl, MD, MPH, is to improve people’s psychological experiences during cancer and to look at how those improvements impact cancer outcomes.

“Personalized medicine sounds like it addresses the whole person,” Pirl says of the term typically used to refer to therapy that targets individual genetic mutation in tumors. “But that focus is usually more at the micro level. Our work adds another dimension by identifying and targeting ‘person factors’ such as depression and smoking, which have been shown to impact cancer survival. Personalized medicine needs to include these emotional and behavioral ‘targets’ to achieve the best possible outcomes.”

Even before the new Center, a psychiatrist was part of the multi-disciplinary team which participates in the care of every Mass General Cancer Center patient, and psychiatry was integrated into routine oncology care more than at most cancer centers in the country. Psychiatrists and oncology social workers work closely together to meet the emotional needs of patients. Unique to cancer centers in the Boston area, the Center for Psychiatric Oncology and Behavioral Sciences reaches out to Spanish-speaking patients by offering bilingual services. Care is administered using an individualized approach. This specialized service provides expertise in safely using psychiatric medications during cancer treatment, and separating out what symptoms might be more related to cancer or treatments instead of psychological issues.

Not only does this new Center have the potential to change individual and familial experiences of cancer, it shows promise of saving lives. Newly diagnosed lung cancer patients with depression, Pirl has shown, have dramatically worse survival compared to those patients who are not depressed. Some reasons for this difference are clear: Depression and anxiety may affect an individual’s ability to follow through with treatment. They impede a smoker’s ability to quit, despite recent research that indicates survival is halved for people who continue smoking after a lung cancer diagnosis. Smokers don’t heal as well after surgery, and the chemicals in cigarettes can reduce the effects of other treatments, so quitting remains important even though disease is already present. Other connections between depression and lung cancer outcomes may exist as well, including some very recent and exciting work Pirl has done at the molecular level.

“If we can figure out what the connections are,” says Pirl, “then we can intervene and anywhere from double to quadruple the survival of these patients. That’s better than some of our current treatments for lung cancer.”

“Caring for the whole patient goes beyond treating individuals with respect, dignity, and compassion,” Pirl continues. With the new Center for Psychiatric Oncology and Behavioral Sciences, he hopes to rapidly translate their research into “screening for and targeting those emotional and behavioral factors that affect survival, just as we screen for genetic mutations in tumors.”
Personalized treatment for the whole person

Mass General Cancer Center launches new psychiatric oncology center

As better cancer treatments become available, more people are finding themselves at the end of active treatment with the positive, but bewildering question, “What’s next?”

“Ongoing comprehensive medical and supportive care,” answers Inga Lennes, MD, clinical director of the Mass General Cancer Center’s new Survivorship Program. “Patients will have access to many resources should they experience any cancer recurrence, new disease or treatment-related side effects. These resources will be available even decades after treatment has ended.” Providing a link to these resources is at the heart of the new Survivorship Program.

The program will serve the needs of the growing number of cancer survivors by offering services in addition to those provided by primary care physicians and oncologists. During its initial phase, the program will focus on survivors of gastrointestinal, gynecologic, genito-urinary and head and neck cancers. It will also reach out to primary care physicians to let them know consultation and support for their patients are available for ongoing problems relating to cancer survivorship. Elizabeth Davis, MD, a specialist in both internal medicine and psychiatry, has recently been recruited for the Survivorship Clinic.

“Survivors have many issues, such as sexual health, chronic pain or anxiety, that are underdiagnosed or unrecognized in routine care after treatment,” says Lennes. “This program will help us connect these individuals to medical care and wellness programs that complement the care patients receive from their oncology and primary care teams.”

Because cancer survivorship is a relatively new field of medicine, more research is needed on long-term issues. The Survivorship Program will collect relevant data over time1, says researcher William Pirl, MD, MPH, director of the Center of Psychiatric Oncology. This information, when combined with other Cancer Center data, will create a powerful tool for research, possibly including the ability to connect molecular characteristics of tumors with quality of life outcomes.

The Survivorship Program will work cooperatively with existing survivor services such as the Maxwell V. Blum Cancer Resource Room, the Network for Patients and Families, and the HOPES Program. As the understanding of survivorship issues grows, the Blum Resource Room will stock relevant publications and update its website. Already, says Blum Resource Room Director Sally Hooper, MSW, LICSW, “We can direct people to publications and services that help them understand and address their symptoms, whether these concerns are side effects related to treatment and diagnosis, a different condition, or to normal aging.”

The Network for Patients and Families connects survivors with other survivors, including those who have been recently diagnosed or are facing a recurrence. Survivors’ Day, held annually, brings together survivors for networking and educational opportunities. Survivors also will continue to have a full complement of support and wellness services through the HOPES Program, including acupuncture, massage and various workshops.

“As people move forward from treatment to survivorship, they are looking for ways to empower themselves to achieve wellness,” says Katie Binda, MSW, LICSW, director of the HOPES Program. “We help people care for their whole self — mind, body and spirit.”

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1All patient information is collected with the patient’s permission and oversight by the Massachusetts General Hospital Institutional Review Board.
No longer alone

Harris Center for Chordoma Care helps patients battle rare cancer

Many cancer patients feel alone with their diagnosis, and they may feel responsible for searching for their own options and prognosis. This feeling is exacerbated in the face of a rare cancer. For Stephan Harris, who was diagnosed with recurrent chordoma in 1999, and his wife, their sense of isolation was challenging enough that they traveled from abroad to the Massachusetts General Hospital to see Henry Mankin, MD, who was world renowned in orthopaedic oncology.

They were referred to Francis Hornicek, MD, PhD, chief of orthopaedic oncology and co-director of the Center for Sarcoma and Connective Tissue Oncology in the Mass General Cancer Center. Chordoma is a slow-growing bone tumor that may occur anywhere along the spinal column. Although Harris eventually succumbed to the disease, his wife made a generous gift in his honor to the Mass General Cancer Center to ensure that other families coping with the same disease would receive highly skilled multidisciplinary care, compassionate support, and a warm community.

Mrs. Harris directed her gift to the establishment of the Stephan L. Harris Center for Chordoma Care, the first center in the world with a single focus on chordoma care. The Harris Chordoma Center, which exists within the Center for Sarcoma and Connective Tissue Oncology at the Mass General Cancer Center, brings together experts in reconstructive surgery, general surgery and neurosurgery, radiation oncology and proton therapy, medical oncology, pathology, nursing and other clinical specialties, and patient care and supportive services.

The program opened in April 2009 and already, says Al Ferreira, RN, nurse coordinator for the center, “We’re seeing more than double the number of patients that we saw before.”

One reason for the program’s popularity is its record of success. The standard of care for chordoma patients has been surgery alone, explains Hornicek, director of the Harris Chordoma Center. “There’s no proven chemotherapy, and radiation has only been used to help prevent the high rate of recurrence with surgery alone.” Hornicek’s team, however, treats patients with surgery and a combination of proton and photon radiation. Their results are promising. “For patients who have not had any previous treatment prior to our evaluation,” Hornichek says, “I have not had any local recurrences.”

To date, no specific gene mutations are associated with chordoma. Research is needed to find new treatments or even a cure. A prior gift from Mrs. Harris is fueling this research, which includes studying tissue from chordoma tumors to find molecular targets that can determine prognosis or provide intervention opportunities.

The chordoma team, which also includes nurse practitioner Anne Fiore, has built an informative website (massgeneral.org/cancer/harris_center), so that anyone facing chordoma can find help. In addition, the gift helps families receiving care at the Harris Chordoma Center with transportation and housing expenses.

“I made this gift to help other people with this disease,” says Mrs. Harris. “To create a place where they know there will be doctors and nurses, as well as other families who understand what they are going through. Stephan wanted this too.”
When Zdravko Divjak was diagnosed with pancreatic cancer, he was the number three wrestler in his weight class for the state of California and only 17 years old. Doctors told the Divjak family there was no hope and, indeed, statistics aren’t promising for patients with Zdravko’s disease: Pancreatic cancer is the fourth leading cause of cancer death, and most patients succumb to the disease quickly. Zdravko’s form was particularly rare, making it even more challenging to treat.

However his family was unwilling to abandon hope and traveled from California to the Massachusetts General Hospital Cancer Center to see pancreatic cancer specialist Andrew L. Warshaw, MD, Mass General Hospital chair of the Department of Surgery and surgeon-in-chief. Following surgery and radiation, Zdravko lived another 14 years before his disease overtook him. Out of gratitude for the care Zdravko received, his family committed $5.25 million to establish the Andrew L. Warshaw, MD, Institute for Pancreatic Cancer Research.

“This family has given us a magnificent opportunity to find answers to a problem that, so far, has not had any answers,” Warshaw says, referring to the need to find more successful approaches to pancreatic cancer treatment. The gift will expand the Cancer Center’s research strengths in this disease and enhance what is already the largest pancreatic cancer practice in the New England.

One area to receive funding is further development of a database and tissue bank, which will be used to help determine why some pancreatic cancers evolve slowly while others are highly aggressive. The Mass General Cancer Center pancreatic cancer tissue bank, says Warshaw, is unusually robust and may be the largest and most complete tissue bank of its kind in the world. Eventual development of a screening technique based on insights from these resources will help physicians determine the most effective therapy.

“If you look over the horizon,” Warshaw elaborates, “we will use a genetic marker or circulating tumor cell technology to isolate cells, characterize their genomic fingerprint, determine which tumors are good candidates for surgery, and personalize a drug therapy to that individual form of cancer.”

“The tools to understand cancer biology are very different now from just five years ago,” adds David Ryan, MD, clinical director of the Mass General Cancer Center and the Tucker Gosnell Center for Gastrointestinal Cancers. “With the ability to characterize the genetic pathways important for pancreatic cancer cells to survive and flourish, we will also learn ways to shut down these pathways.”

The second initiative funded by the Divjak gift provides seed money to investigators whose work shows promise but is too early in development to attract National Institute of Health funding. Four “Warshaw Fellows” have already received one-year grants, renewable for a second year.

The Divjak support comes at a fortuitous time. According to statistics gathered over the past decade, pancreatic cancer is on the rise, possibly by as much as 10 percent per year. Mortality rates at Mass General for pancreatic cancer patients undergoing an operation known as the Whipple procedure are lower than at many other cancer centers, but successful surgery isn’t a guarantee of cure. Better solutions are desperately needed.

Through the newly established Warshaw Institute, the Divjaks’ gift enables focused research at Mass General that may one day lead to these solutions and a lifeline for patients with pancreatic cancer.
With the opening of the Mass General/North Shore Cancer Center (MG/NSCC) last June, cancer patients living north of Boston have expanded access to top-quality, multidisciplinary care without having to travel to the city. This Center builds on a long-standing partnership between Mass General and the North Shore Medical Center to increase the range of services offered locally in a convenient, new facility.

“The North Shore Cancer Center has a history of high quality care in this community,” says Elena Sierra, RN, MPH, executive administrative director of MG/NSCC. “That local expertise and established reputation is now joined with the Mass General Cancer Center resources to create the best possible care for cancer patients living in the North Shore and southern New Hampshire communities.”

“One of the strengths we have up here is that all of the services a cancer patient may need are located together, which makes treatment and interdisciplinary collaboration easier,” says James McIntyre, MD, chief of radiation oncology at MG/NSCC. Services include radiation therapy, chemotherapy and outpatient surgical procedures.

The proximity has an obvious convenience factor — patients can obtain a test or treatment without having to drive to another location — and it also facilitates improvements in care. For example, says Joel Schwartz, MD, director of oncology services at MG/NSCC, radiation oncology and medical oncology are co-located so the performance improvement committee can review quality issues affecting patients receiving both treatment modalities, as opposed to medical oncology and radiation oncology reviewing quality measures separately.

The closeness extends to the relationship between the two centers as well: All MG/NSCC doctors adhere to the Mass General Cancer Center quality and safety guidelines. The Danvers physicians attend the Mass General Cancer Center clinical conferences, and the groups are collaborating to build on multidisciplinary clinics already existing in Danvers.

Since the June 2009 opening, MG/NSCC has launched clinics in sarcoma and in brain and spinal cord tumors.

Other services offered at the Danvers site include the HOPES Program wellness offerings, a Cancer Resource Room, support groups, workshops and the Images Boutique, which is made possible in this location by a gift from the Ladies’ Visiting Committee. There is also a healing garden, similar to the one in the Yawkey Building downtown, thanks to a generous gift by Robert Norton, chief executive officer of North Shore Medical Center, and his wife, Dianne Savastano, in memory of Norton’s mother Eleanor.

“We are working to have a seamless integration between the Danvers site and the downtown site, including multidisciplinary care and clinical trials,” says Beth Souza, senior administrative director for the Mass General/North Shore Cancer Center and the Mass General Cancer Center. “We want patients in this community to have the convenience of receiving supportive care services close to home.”

The Danvers staff has worked hard to make the transition seamless for patients as well. “This community helped raise money for the new Cancer Center facility through its annual Cancer Walk,” says Schwartz. “We made it our business to repay that trust by maintaining our high level of patient satisfaction when we moved into a bigger structure with different systems. Our goal is to maintain the best of community oncology and marry it to be the best of academic oncology. Our patients tell us we’re successful.”
Beginning last September, cancer patients living west of Boston who need radiation therapy can receive their treatment without the anxiety of lengthy travel thanks to the new Massachusetts General Hospital Department of Radiation Oncology located at Newton-Wellesley Hospital’s Vernon Cancer Center. This new center offers state-of-the-art technology in what Gayle Tillman, MD, radiation oncologist at Mass General’s Department of Radiation Oncology at Newton-Wellesley calls, “a comfortable place during a stressful time.” Patients in the new center are seen by Tillman and Sarah Thurman, MD, medical director of radiation oncology at the Newton-Wellesley site.

Previously, Newton-Wellesley cancer patients consulted with Mass General Hospital radiation oncologists, and those unable or unwilling to travel to Mass General in Boston for radiation treatment were referred to suburban facilities outside the Newton-Wellesley area. Frequently, this resulted in medical record transfers to the outside provider, plus daily travel for up to eight weeks — additional stressors for sick and elderly patients.

“We partnered with Newton-Wellesley Hospital to make things easier for these patients,” explains Andrea Paciello, executive director of the Mass General Department of Radiation Oncology in a community hospital setting. “Patients get the best of both worlds,” says Paciello, “including the ability to access the downtown expertise and resources of the Mass General Cancer Center in a smaller, more convenient location. It’s essential that patients treated anywhere in the Mass General system, regardless of the location, get the same consistent, high-quality care.”

Tillman stresses that this high level of care extends beyond technology. “Being in this location allows for a tremendous amount of collaboration with the medical oncologists at Newton-Wellesley,” she says. “We work closely with these specialists on a daily basis, which allows us to strongly integrate all aspects of patient care.” The intimacy of the site also contributes to a family feeling among staff. “Many patients comment that they will miss coming here, even though they are glad to be done with treatment.”

The new Vernon Cancer Center at Newton-Wellesley also brings integrative support services, such as nutritional counseling, social work and yoga, to patients. “On behalf of the patients and the community served by this hospital, we’re delighted by this partnership,” says Ellen Moloney, senior vice president of outpatient services at Newton-Wellesley Hospital. “The cooperation between the two facilities has been wonderful for our patients and for our referring physicians as well.”
The continuum of care

Improving health in our communities

A teenager in Chelsea avoids doctors’ visits out of fear her parents will learn she is sexually active, so she doesn’t receive an HPV vaccination to protect her from cervical cancer. In Charlestown, an eight-year-old boy samples a cigarette from dad’s pack and becomes a life-long smoker. In Revere, a Latina mother of three discovers a lump in her breast, but there is little to be done other than hope it goes away: Her husband is out of work, and medical care for the children takes priority over her own health.

Each of these scenarios, and many more occurring daily in the communities surrounding Boston, will be addressed by the Mass General Hospital Center for Community Health Improvement (CCHI) partnership with the Mass General Cancer Center. This partnership, funded by philanthropy, will focus on reducing disparities in cancer care across all Mass General patients.

“We conducted research that indicated that four types of cancer — colorectal, cervical, breast and lung — are more common and/or more deadly in our health center communities than in the rest of the state,” says Joan Quinlan, director of the Center for Community Health Improvement. “Thanks to the commitment of Bruce Chabner, MD, to ensuring all Mass General patients have equal access to quality cancer care and prevention, we created a vision and plan for reducing these disparities.”

The plan involves creating a comprehensive continuum of cancer care that includes prevention, outreach, screening, navigation and research in the targeted communities. Educational programs will include smoking prevention and cessation, safe-sex and HPV vaccination campaigns, as well as working with communities to increase physical activity and healthy food choices. Some of these programs are already in place. Additional programs will be aimed at helping patients from these underserved communities understand insurance coverage and screening recommendations, translate instructions for follow up for abnormal results or cancer diagnosis, arrange for child care or transportation, or secure time off from work.

The Avon Breast Care Program, funded by the Avon Foundation since 2001, provides proof of concept for this approach. This program, located at community sites in Chelsea, Mattapan, Dorchester and at the Avon Comprehensive Breast Evaluation Center at Mass General Hospital, reaches out to medically underserved patients to ensure timely follow up of abnormal findings and comprehensive care for patients who have a positive diagnosis of breast cancer. A patient navigator in Chelsea focuses personal attention on patients with abnormal test results, or a positive breast cancer diagnosis and multiple missed appointments.

“Pairing underserved patients with bilingual, bicultural patient navigators is an incredibly effective way to ensure that patients get the screening and follow up care that they need,” says Sarah Oo, MSW, director of Community Health Improvement at the Mass General Chelsea HealthCare Center. “These individuals live complex and challenging lives, and the support they receive from patient navigators empowers them to prioritize their health in a way that is comfortable and appropriate to their culture and circumstances.”

Disparities in access to health care and in cancer-related incidence and mortality continue to plague our communities and our health care system. The Mass General Cancer Center strives, with the help of its generous donors, to address and overcome these differences through scientifically based interventions designed to improve the health of individuals, communities and the country.
“Pairing underserved patients with bilingual, bicultural patient navigators is an incredibly effective way to ensure that patients get the screening and follow up care that they need.”

— Sarah Oo, MSW
This new facility will feature large, private patient rooms, an exercise room overlooking a six-story glass atrium, an entire floor where bone marrow transplant patients can walk the halls without increased risk of infection, and family space including a shower area with lockers.
The new paradigm in cancer care requires sophisticated technology; efficient communication among doctors, nurses, and other clinicians; and continual collaboration across scientific and medical disciplines. At the Massachusetts General Hospital Cancer Center, these requirements are balanced with the needs of patients and their loved ones to ensure the best physical and emotional care possible. The Building for the Third Century (B3C), scheduled to open in 2011, provides a unique opportunity to balance all of these needs with the growing number of patients served by the Cancer Center.

This new facility will feature large, private patient rooms, an exercise room overlooking a six-story glass atrium, an entire floor where bone marrow transplant patients can walk the halls without increased risk of infection, and family space including a shower area with lockers. Rooms for cancer patients will be centralized on two floors, and necessary services and supplies will be close by. According to Jackie Somerville, RN, PhD, associate chief nurse of the Mass General Cancer Center, “Providing extra space for patients and families and co-locating services will help increase engagement of patients and family members in care, enhance patient perspective on the responsiveness and coordination of care, and increase privacy.”

Many aspects of patient medical records are currently online, adds Somerville, a development that enhances clinician communication and patient safety. When the new building opens, Mass General will be well on the way to fully automating the patient record, which will enhance care team communication about patient test results, medications, allergies and other needs via computerized work stations in patient rooms.

“Connecting inpatient and outpatient services on the second floor will improve efficiency and communication among staff and reduce the need to move patients as well,” says Jean Elrick, MD, senior vice president of administration at Mass General Hospital and leader of the B3C project. For example, patients needing chemotherapy and radiation therapy on the same day won’t need to leave the building, and operating rooms will be equipped with MRI and CT imaging so that surgeons can check for remaining tumor without moving patients.

“We absolutely needed new construction to have this work well and efficiently,” says Elrick, since existing buildings are not equipped with the necessary infrastructure.

Need has outpaced capacity for the Cancer Center’s five linear accelerators, used for radiation therapy. The new building provides room for additional accelerators and includes appropriate design features for high-tech equipment that is moving toward clinical approval.

“The building will have brand new, high-end linear accelerators that will allow us to do treatments that are all image guided, and to do them quickly and efficiently for patients,” says Jay Loeffler, MD, chief of radiation oncology at Mass General. All of the new linear accelerators will have gating capabilities, which allow the radiation beam to move with each breath so that exposure to normal tissue is reduced. Additionally, the new facilities, agree Loeffler and Elrick, are designed to provide more privacy, more natural light, and a more attractive atmosphere.

“The new space is valuable to clinicians because of the specialty nature of our work,” says David Ryan, MD, clinical director at the Mass General Cancer Center. “But it’s immensely important that cancer patients can have family members stay with them during chemotherapy or treatment. That expanded capacity for emotional support in the new building is key to providing the highest quality of patient-focused care.”
New administrative leadership team at the Cancer Center

José Baselga, MD, PhD, joins the Massachusetts General Hospital Cancer Center in July as chief of Hematology Oncology and associate director of the Cancer Center. David Ryan, MD, has assumed the position of clinical director of the Cancer Center. In addition, he continues to serve as associate chief of Hematology Oncology and as clinical director of the Tucker Gosnell Center for Gastrointestinal Cancers. Bruce Chabner, MD, is stepping down as Cancer Center clinical director, and will serve as director of clinical research.

Glenn Siegmann, director of the Cancer Center Protocol Office, has been named administrative director for clinical and translational research. He also serves as the institutional administrative liaison to the Dana-Farber/ Harvard Cancer Center.

The Cancer Center’s new administrative leadership team also includes Executive Director Mara Bloom, JD, who was previously director of the oncology service line at New York-Presbyterian Hospital. She is joined by new Marketing Director Jodie Justofin, MBA. In addition, taking on new roles within the Cancer Center are Finance Director Stephen Doherty; Senior Director of Development and Cancer Campaign Sara Kelly; Senior Vice President Sally Mason Boemer; and Senior Director of the Cancer Center’s Yawkey Center for Outpatient Care and Mass General/North Shore Cancer Center, Beth Souza.

New clinical leadership at the Cancer Center

Thoracic oncologist Panos Fidias, MD, has been appointed the clinical director of the Cancer Center’s new Inpatient Nurse Practitioner Oncology Service. While stepping down from his role as clinical director of the Center for Thoracic Cancers, he will continue his active clinical practice. Thoracic oncologist Jennifer Temel, MD, has been appointed the new clinical director of that center.

Barbara Cashavelly, RN, is the new nurse director of Phillips House for inpatient cancer care. She previously held the position of nurse director of clinical practices at the Cancer Center’s Yawkey Center for Outpatient Care. Theresa McDonnell, NP, of the Tucker Gosnell Center for Gastrointestinal Cancers, has been named the new nurse director of the clinical practices at the Yawkey Center.

A number of new physicians recently joined the Cancer Center staff, and have taken on key clinical leadership positions. They include: Michael Birrer, MD, PhD, director of Medical Gynecologic Oncology and the Gynecologic Cancer Research Program; John Schorge, MD, division chief of Gynecologic Oncology for Massachusetts General Hospital Vincent Obstetrics and Gynecology Service, and clinical director of the Gillette Center for Gynecologic Oncology; Lori Julin Wirth, MD, director of Medical Oncology at the Center for Head and Neck Cancers; Keith Flaherty, MD, director of Experimental Therapeutics; Inga Lennes, MD, director of Clinical Quality, and clinical director of the Survivorship Program; and William Pirl, MD, MPH, director of the Center for Psychiatric Oncology and Behavioral Sciences.

New collaborations link the Mass General Cancer Center with Florida Hospitals

Florida’s Holy Cross Hospital in Fort Lauderdale and the Massachusetts General Hospital Cancer Center have launched a collaboration to expand oncology services for South Florida residents. Holy Cross Hospital CEO and President John Johnson hailed the new relationship as an opportunity to build on the comprehensive cancer care Holy Cross patients already receive, through access to “new clinical treatments and an additional network of nationally and internationally recognized specialists … while they continue their care at home in South Florida.”

David Ryan, MD, clinical director of the Mass General Cancer Center said the new collaboration enhances care for South Florida residents by providing “rapid access to subspecialty cancer care, genetics counseling and early phase clinical trials.”
A new collaboration also has been announced between the Mass General Cancer Center and Lee Memorial Health System’s Regional Cancer Center in Fort Myers, Florida, which is expected to enhance and expand access to oncology services for residents in that area.

“Our relationship with the Mass General Cancer Center will give our patients access to new clinical protocols and treatments, as well as timely referrals for second opinions and improved coordination of care,” said Sharon MacDonald, vice president for Lee Memorial’s Regional Cancer Center.

Paul Busse, MD, PhD, clinical director of radiation oncology at Massachusetts General Hospital also welcomed the new collaboration. “Novel approaches and treatments, such as genetic testing, genotyping, targeted drugs, proton beam radiation, stem cell therapies and bone marrow transplantation will be available through the Mass General Cancer Center to Lee Memorial patients, including those Mass General patients who reside part-time in Florida.”

Celebrating a ‘complete response’ to treatment
Calling it “Erin’s Party,” the family and friends of university student Erin Trish came together earlier this year to celebrate the successful conclusion of her treatment for Hodgkin’s Lymphoma. After nearly a year under the care of Mass General Hospital Cancer Center oncologist Ephraim Hochberg, MD, Trish was ready to throw a big party following her final test results that showed a complete response to the rigorous treatment regimen she received at the Mass General Cancer Center.

She wanted to give back to what she calls “the amazing team” of caregivers who had treated her. With a circle of friends on her planning committee, and festivities taking shape online and at the Multicultural Arts Center in Cambridge, Massachusetts, Trish organized an evening of eclectic festivities. Through a silent auction, and a dance floor rich with the sounds of celebration, the fundraiser produced more than $5,000 to support Hochberg’s lymphoma research at the Mass General Cancer Center.

Friends of Mass General salute cancer survival with reporter Kelley Tuthill at Saks Fifth Avenue fundraiser
The Friends of the Massachusetts General Hospital Cancer Center gathered for their 17th annual fundraiser held earlier this year at Saks Fifth Avenue in Boston to salute both style and survival with WCVB-TV reporter Kelley Tuthill.

A former breast cancer patient, Tuthill signed copies of the book she recently co-authored with writer Elisha Daniels, You Can Do This! Surviving Breast Cancer Without Losing Your Sanity or Your Style. Rickie Freeman, designer and CEO of the Teri Jon fashion company, was also on hand to preview copies of her Holiday 2009 Cocktail and Gown Collection. Participants received a 15 percent weekend shopping pass, with Saks Fifth Avenue donating five percent of all sales to The Friends.

The Friends volunteer group helps fund support and education programs for Mass General Cancer Center patients and their families. Those interested in getting involved are invited to call Amy Fontanella at 617-724-6426. Next year’s gala will be held at the John Joseph Moakley U.S. Courthouse on Thursday, November 18, 2010.
ESSCO-MGH Breast Cancer Research Fund supports CTC technology

When Albert Cohen’s daughter developed breast cancer in 1994 and started treatment at the Mass General Cancer Center, he became focused on finding a cure. After meeting with Director of Surgical Oncology Kenneth K. Tanabe, MD, and other physicians and researchers at the hospital, Cohen decided that his company, the Electronic Space Systems Corporation (ESSCO) would help fund the kind of innovative research that often attracts less support from major funders.

Today, breast cancer survivor Lynn Cohen and her sisters, Missy Cohen-Fyffe and Bambi Rosenquist, lead a team of committed volunteers who annually raise funds to continue the dream their father set in motion. The ESSCO-MGH Breast Cancer Research Fund has established a $3.2 million endowment that is helping to support the pioneering microchip technology being used at the Mass General Cancer Center to study circulating tumor cells (CTCs), the extremely rare cells that carry cancer through the blood stream. Clinical applications now in development at the Cancer Center’s Translational Research Laboratory may eventually permit earlier cancer detection, close monitoring of treatment, and detailed analysis of cancer cell biology.

Writing books, inspired by caregivers

Two writers grateful for the quality of care they experienced at the Mass General Cancer Center have decided that the sale of their books should benefit the caregivers and programs who helped them and their loved ones.

Dorothy Ridolfi, RN, had spent her entire working life caring for patients in some of New Jersey’s critical coronary care units and emergency rooms when she was diagnosed with a rare cancer in her right optic nerve. Pennsylvania physicians referred her to Mass General Cancer Center oncologists Fred Hochberg, MD, and Noopur Raje, MD. She had been in treatment for nearly four years when she passed away the day before her 72nd birthday.

Today the Dorothy B. Ridolfi, RN, Endowed Fund for Oncology Nursing, established by her husband, Ed Ridolfi with the proceeds from his latest book, is helping to support the nursing excellence that Dorothy cherished. Ridolfi’s novel, Sweet Justice, is a corporate thriller based on his many years as a publishing executive and college professor. Copies are available at the Mass General Gift Shop in the main hospital and at the Yawkey Center for Outpatient Care.

Also a patient of Fred Hochberg, MD, brain tumor patient Frank Lewenberg continues to update the story of his battle with cancer, from his home in the suburbs near the Mass General Cancer Center. His memoir, Interesting Times, describes his journey as a patient with glioblastoma under the care of what he calls his “medical dream team,” which was led by Hochberg and Department of Radiation Oncology Chief Jay Loeffler, MD.

The book is a valuable resource for both patients and professionals. While copies are available at no charge by emailing Lewenberg at flesquire@gmail.com, he suggests that those requesting the book consider making a donation to the Mass General Cancer Center.
“Party for a Cure”: Spanning the decades

Thirty years ago, Diane Moffa and her friends in Northborough, a suburb west of Boston, wanted to help friends whose son had a rare blood cancer. They organized a fundraiser around an “Oldies” dance party to help support their regional platelets donation program. Then after two years of successful fund-raising parties, Moffa and her friends became busy with raising their children.

But the dance bug came back recently. With their families grown, Moffa’s circle of friends felt it was time to reprise their “Oldies” fundraisers, this time focused on helping to support development of the innovative circulating tumor cell (CTC) technology, at the Mass General Cancer Center.

“I heard about the research, and we wanted to support something that could benefit all cancer patients,” says Moffa. “This sounded ideal.”

With music spanning the decades, from Elvis to Beyoncé, their “Party for a Cure” drew more than 200 people from the Northborough area. Dancers raised over $4,700, a contribution that went directly to the CTC project based at the Mass General Cancer Center’s Charlestown Navy Yard research laboratories.

Angel’s Masquerade Ball helps advance melanoma research

The Glenna Kohl Fund for Hope held its first annual Angel’s Masquerade Ball earlier this year, launching a campaign to fund melanoma research and educate the public about the importance of sun safety and skin protection. Popular Cape Cod lifeguard Glenna Kohl died at 26 of melanoma, which is today the second leading cause of death among women in their 20s. Like many of those who develop the disease, Kohl had spent years cultivating her tan at the beach and in sun tanning salons.

Her parents, Colleen and Bob Kohl, are committed to helping other young women avoid that mistake. The $25,000 raised by the Masquerade Ball will be used to create the Glenna Kohl Melanoma Research Fund to support the work of Kohl’s oncologist, Donald Lawrence, MD, clinical director of the Center for Melanoma at the Mass General Cancer Center. In addition to their focus on educating the public about the risks of over-exposure to the sun, the Kohl family is working to support legislation in Massachusetts that would require minors to have parental approval to use tanning salons. Plans are currently underway for next year’s Angel’s Masquerade Ball. For more information, please visit glennasfund.org.
Cancer Center Priorities Fund: Investing in breakthrough research and innovative programs

With rising economic pressures and waning federal support for biomedical research, the need for unrestricted resources to support key Cancer Center initiatives has never been greater. Fueled by unrestricted gifts from many generous donors, the Cancer Center Priorities Fund fills these gaps, supporting early research, underfunded initiatives and novel scientific concepts. The Fund’s investment in Cancer Center initiatives focuses on five guiding principles.

To discover the fundamental causes of cancer as a guide to prevention, early detection and treatment, a Priorities Fund grant was awarded to:

• The Center for Computational Cancer Discovery, which will use bio-informatics and computational biology to advance Cancer Center research on circulating tumor cells, next-generation sequencing, RNAl screens and breast cancer predictive and prognostic signatures

To target early cancers through precision surgery and focused radiation, Priorities Fund grants were awarded to:

• Investigate how 3-dimensional tumor volume mapping can enhance the targeting of radiation treatment
• Study three fluorescent dyes for more precise differentiation of cancerous cells prior to surgery on high and low grade gliomas
• Identify biomarkers in patients with localized muscle-invading cancer who will respond to focused radiation treatment as an alternative to bladder removal
• Evaluate the safety and effectiveness of natural orifice surgery, a minimally-invasive technique, in patients with rectal cancer

To target complex and advanced cancers through molecularly-designed therapies, Priority Fund grants were awarded to:

• Launch the first clinical trial using targeted agents delivered intrathecally, or directly into the spinal cord, for treatment of carcinomatous meningitis, an aggressive central nervous system cancer
• Analyze gastrointestinal tumor samples archived at the Mass General Cancer Center for the presence of the ALK mutation, a tumor type also present in some non-small cell lung cancers that has responded to a new targeted drug
• Study metformin, a drug that lowers insulin levels in men with castration-resistant prostate cancer (CRPC), given that higher insulin levels are associated with a poorer diagnosis in prostate cancer

To accelerate the delivery of research discoveries to people with cancer, a Priorities Fund grant was awarded to:

• The Cancer Center’s Protocol Office, which is vital to helping physician-scientists coordinate patient participation in more than 350 open clinical trials, managing protocol and regulatory compliance, overseeing trial budgeting and providing appropriate staffing to carry out research. Since most clinical trials are only partially funded by government and industry sources, the Protocol Office has operated at a deficit. It oversees initiatives that include:
  ■ Early phase, investigator-initiated, clinical trials exploring cancer treatments and novel biomarkers
  ■ Genotype-directed therapy in selected tumors across different histological sites
  ■ Novel therapies combining investigational and commercial agents

To sustain a world of care by treating the patient, supporting the family, and educating the community about cancer, the Priorities Fund is helping to build on the Cancer Center’s existing support and wellness programs by:

• Extending the HOPES Program, which provides education workshops, support programs and wellness services including acupuncture, massage and expressive arts therapy, to Mass General/North Shore Cancer Center
• Launching a new Survivorship Program to optimize each patient’s long term health and well-being through a new Survivorship Clinic, offering coordinated, ongoing care, educational workshops, a lecture series and support groups
Counting the late Senator Edward Kennedy among the one hundred

This year, at the Cancer Center’s third annual convening of the one hundred, the late Senator Edward Kennedy is honored for his lifelong commitment to strong federal support for cancer research and access to health care for all Americans. Kennedy is among the 100 individuals and groups named this year for their diligence and discoveries, philanthropy and passion in helping to advance the fight against cancer.

Addressing attendees at the Westin Boston Waterfront Hotel for this year’s celebration, keynote speaker Ted Kennedy, Jr, the son of Senator Kennedy, speaks as both a cancer survivor and the son of America’s most passionate warrior in the decades-long war on cancer. An expert on disability policy, he is both professionally and personally devoted to expanding civil rights for those who are disabled.

Along with Senator Kennedy, dozens of others in the Cancer Center family and beyond, including physicians and caregivers, researchers, donors and volunteers, are honored at the June 2 event. the one hundred event has raised more than $1.5 million over the last three years to support Cancer Center research, treatment advances and programs for patients and their families. For more information about the one hundred, or to nominate someone for 2011, please visit theonehundred.org or call Raquel Morales at 617-724-2818.

2010 Honorees

Olivia Achtmeyer
Aid for Cancer Research
Alex’s Lemonade Stand Foundation
Patty Allen
Sara Frost Azzam
José Baselga, MD, PhD
Madeline Bemiss
BigEd.org
The Billy Burchard Foundation
Boston Bruins
Debbie Burke, RN, MSN, MBA
Michelle Cadorette
Margaret R. Carvan
The Catholic Memorial School Challenge
Davi-Ellen Chabner
Edwin Choy, MD, PhD
The Colorectal Cancer Coalition
Christine Cook
Juliane Daartz, MSc
Douglas M. Dahl, MD, FACS
Jesuina Depina
Pamela Dicicco
The Douglass Family Foundation
Erin Evers
Dianne Finkelstein, PhD
Susan M. Finn, RN, MSN, AOCNS
Georgene Fontana, RTT
Mark and Marisa Forziati
The Gillette Center for Breast Cancer Patient Service Coordinators
The Goldhirsh Foundation
Valerie Horse Goldstein
Stan Golub
Ikuo Harris
John Hayes
Judianne Henderson, APRN, BC
Roberta Dehman Hershon
Win Hodges
Sally Hooper, MSW, LICSW
Othon Iliopoulos, MD
Illuminations Committee
Steven Jay Isakoff, MD, PhD
The Joe Andruzzi Foundation
The John and Carol Barry Foundation
Renée Johnson
Arthur Jones
Janel Jorgensen
Senator Edward M. Kennedy
Bob Kiesendahl
Michael Klonsky
Felicia Knaul, PhD
David H. Koch
Daniel B. Kopans, MD
Lorrie Kubicek, MT-BC
Lance Armstrong Foundation
Danielle Colby LeBlanc, RN, OCN
Norbert J. Liebsch, MD, PhD
Karen Lipshires, RN-BC, MS-HMP
Alice T. Lynch
Rev. Thomas A. Mahoney
Amy Mason
Massachusetts Affiliate of Susan G. Komen for the Cure
Theresa McDonnell, NP
Michael J. Dunlevy Foundation
Lyne Graziano Morin
Jeannie Morrissey
Beverly Moy, MD, MPH
Ronald Neal, RT
The New Balance Athletic Shoe Company
Nancy Lindholm O’Hagan
Paula O’Keefe
The Patty Fund Golf Tournament
Richard T. Penson, MD, MRCP
Scott R. Piotkin, MD, PhD
Sridhar Ramaswamy, MD, FACP
Paula K. Rauch, MD
Jerry Remy
The Ribakoff Family
Richard Welch’s Treatment Team
Noreen Rizzo
Bill Rodgers
Susan and Michael Schechter
Shonda Schilling
Shelonda Scott
Phillip A. Sharp, PhD
Helen A. Shih, MD, MS, MPH
Glenn Siegmann, MS, RPh
Julie Silver, MD
Laura Simmons-Stern
Louise Slotnick
Stand Up to Cancer
Billy Starr
Gail and Richard Stevens
Colin Stone
Strike Out Cancer
Bonnie Strudas, RN, BSN, OCN
Jack W. Szostak, PhD
Jennifer Temel, MD
Xenia Toney
Samantha Eisenstein Watson
Roni Woods, RN, OCN
A year in review

By the numbers

Cancer Center Research Funds 2009*
- Federal: NIH/NCI and Training Grants: 32%
- Non-Federal: Foundation and Industry Grants: 38%
- Research Philanthropy: 8%
- Other: 22%

Total: $77,854,000

*Includes Center for Cancer Research, Hematology/Medical Oncology, Radiation Oncology and Surgical Oncology

Mass General Research Funding from National Cancer Institute (NCI)*

Philanthropy FY 2005-2009

Philanthropy by Donor Group

Trust/Estate/Bequest: 38.6%
Corporations: 17.5%
Foundations: 33.6%
Groups/Organizations: 1.8%
Individuals: 8.3%
### Cancer Center Tumor Registry: Newly Diagnosed Cases 2008

![Cancer Tumor Registry Chart]

### Patient Care Statistics

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<thead>
<tr>
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<tbody>
<tr>
<td><strong>Total New Cancer Cases</strong></td>
<td>6,363</td>
<td>6,741</td>
<td>6,875</td>
</tr>
<tr>
<td><strong>Inpatient</strong></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Discharges (Medical)</td>
<td>3,485</td>
<td>3,425</td>
<td>3,551</td>
</tr>
<tr>
<td>Total Patient Days</td>
<td>21,475</td>
<td>21,889</td>
<td>22,071</td>
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<tr>
<td>Average Length of Stay</td>
<td>6.2</td>
<td>6.4</td>
<td>6.2</td>
</tr>
<tr>
<td><strong>Outpatient</strong></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Cancer Center Clinic Visits</td>
<td>97,820</td>
<td>104,167</td>
<td>110,331</td>
</tr>
<tr>
<td><strong>Diagnostics</strong></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Imaging Visits</td>
<td>15,891</td>
<td>15,451</td>
<td>16,295</td>
</tr>
<tr>
<td>Lab/Screening Visits</td>
<td>25,743</td>
<td>24,455</td>
<td>26,219</td>
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<tr>
<td><strong>Therapeutics</strong></td>
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<tr>
<td>Infusion Visits</td>
<td>42,234</td>
<td>46,803</td>
<td>53,108</td>
</tr>
<tr>
<td>Radiation Treatments</td>
<td>63,316</td>
<td>62,621</td>
<td>75,647</td>
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<tr>
<td>Surgical Cases</td>
<td>3,814</td>
<td>3,803</td>
<td>4,259</td>
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<tr>
<td>Transplantations</td>
<td>69</td>
<td>88</td>
<td>119</td>
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<tr>
<td><strong>Research</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Clinical Trials Accruals</td>
<td>778/1,106</td>
<td>741/1,229</td>
<td>862/1,491</td>
</tr>
<tr>
<td>(Interventional/Non-interventional)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Cancer Center Staff</strong></td>
<td>465</td>
<td>486</td>
<td>518</td>
</tr>
<tr>
<td>(Clinical and Non-clinical)</td>
<td></td>
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</tbody>
</table>
Partner with us in the fight against cancer

There are many ways you can support the Massachusetts General Hospital Cancer Center, and we invite you to partner with us to help advance the fight against cancer. Whether you contribute financial support, time, energy or compassion, you will enhance our community in a valuable and meaningful way. Through your participation, you show commitment to our goal — advancing cancer care and ultimately the eradication of this disease.

Vital support comes in many forms
Funding opportunities within the Cancer Center range from research initiatives and clinical trials, to educational opportunities for nurses and physicians, to wellness and supportive-care programs for patients and families. Unrestricted gifts are vitally important to the success of the Cancer Center as well — the acceleration of breakthrough research and advancement of patient care hinge on the availability of these resources.

There are a variety of ways to make a gift to the Mass General Cancer Center, including:

- Outright gift (cash)
- Gift of securities
- Family foundations
- Matching gifts from your employer
- Gift-in-kind (art collection, auction or raffle items, etc.)

Planned giving
Donors often choose to make a contribution in the form of gifts that provide them and/or their beneficiary income for life. These arrangements can provide donors with significant tax benefits. This invaluable support builds a foundation of hope for Mass General Cancer Center patients — those who come to the Cancer Center in search of exemplary care today and those who will come in the future.

Tribute giving
A gift to the Mass General Cancer Center is a meaningful and enduring gesture to remember a loved one, honor a friend or family member or thank an outstanding caregiver.

Organize a fundraising event
The Mass General Cancer Center is grateful to the dedicated volunteers who work tirelessly to build support for the hospital by finding new ways to engage the community and help raise funds. To learn how to kick-start your event, please call the Development Office and inquire about our Third Party Events Program.

Participate in the one hundred
Attend and/or sponsor the Mass General Cancer Center’s annual fundraiser, the one hundred, honoring one hundred individuals and groups whose diligence and discoveries, philanthropy and passion have helped advance the fight against cancer. Funds raised at the gala support the Cancer Center’s patient care, research, education and community outreach programs. To learn more or to nominate someone for the one hundred, please visit theonehundred.org.

Thank you for your support!
Countless caregivers, scientists, volunteers and philanthropists contribute their energy, talent, passion and financial support to help the Mass General Cancer Center provide the best possible care to patients and their families. This dedicated community is what makes the Mass General Cancer Center truly exceptional and a place of hope for patients from across the country and around the world.

Contact us
The Development Office is a resource for you. Contact us at 617-726-2200 or by email at mghccdevelopment@partners.org to learn more about how you can help patients and families at the Mass General Cancer Center.

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Cancer Center
Development Office
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A comprehensive cancer center

An integral part of one of the world’s most distinguished academic medical centers, the Massachusetts General Hospital Cancer Center is among the leading cancer care providers in the United States.

*U.S. News & World Report* consistently ranks the Mass General Cancer Center as one of the top ten cancer centers in the country. Its nurses were the first in Massachusetts to achieve Magnet status in recognition of the hospital’s exceptional nursing care.

Known for providing customized, innovative treatments and compassionate care to both adults and children, the Cancer Center comprises 20 fully integrated, multidisciplinary clinical programs and a vast array of support and educational services. Its network of affiliations extends throughout New England and the southeastern U.S.

The Cancer Center’s commitment to eradicating cancer is fueled by scientific investigation conducted as part of one of the largest hospital-based research programs in the nation. Through a powerful synergy between laboratory scientists and bedside physicians, the Mass General Cancer Center fosters innovation in all phases of cancer research. Physician investigators conduct more than 350 clinical trials annually.

The Massachusetts General Hospital Cancer Center is proud to be a founding member of the DF/HCC, a Harvard Medical School consortium designated by the National Cancer Institute as a comprehensive cancer center. This prestigious seven-member center forms the largest cancer research collaboration in the country. The promising new treatments developed through this partnership are revolutionizing the future of cancer medicine.