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This summer, workers raised the 10-year-old Grace Building, a former nursing residence and classroom building for the Grace-New Haven School of Nursing. In its place, we will soon begin to construct the 14-story Yale-New Haven cancer center. The road that led to this point was daunting, but as we are poised for the groundbreaking this fall, the future is where our minds and hearts are squarely focused.

For us, that's exactly where the excitement is — the future. We are well-known for delivering outstanding care to patients with cancer; our new facility will allow us to expand our diagnostic capabilities, deliver care and treatment in a state-of-the-art setting, provide follow-up treatment in an environment that affords more privacy, treat children in the cancer center but return them by skybridge for recovery in the Children’s Hospital, and afford patients from throughout the state and the northeast the opportunity to take part in breakthroughs in the war on cancer.

Over the years, our hospital has benefited from collaboration will indeed flourish in the new facility and in the Children’s Hospital, and afford patients from throughout the state and the northeast the opportunity to take part in breakthroughs in the war on cancer.

In this issue of Yale-New Haven magazine, you will learn about advances in pediatric surgery and some of the extraordinary professionals who perform once- unimaginable procedures on some very small and sick infants and children. You will also learn more about radiation therapy and how we have invested in some of the finest and fastest technology that harnesses energy to destroy diseased tissue while sparing healthy tissue.

Have you ever heard the term "hospitalist"? In this issue, you will learn how our board-certified hospitalists provide on-site, 24-hour resident care. It is a model partnership between our department of medicine and community physicians. The net result is improved care for our patients, many of whom do not have their own doctors.

And, speaking of the future, you will read about our very special, 10-year-old School-to-Career program. Each year, we "hire" New Haven high school students and pay them to learn about any and all jobs we need filled here at YNHH — from nursing to security to heating, ventilation and air conditioning. Many of our interns go on to school and apply to work here when they graduate.

Please enjoy this issue. We want you to know more about any and all jobs we need filled here at YNHH — from nursing to security to heating, ventilation and air conditioning. Many of our interns go on to school and apply to work here when they graduate.

MINIMALLY INVASIVE PEDIATRIC SURGERY — Distinguishing Yale-New Haven Children’s Hospital from other hospitals in the state is the exceptional quality and innovation of its pediatric surgery services. Pediatric minimally invasive surgery — operations performed through Band-Aid-size incisions — is light-years ahead at Yale-New Haven, offering infants and children less pain, faster recovery, shorter hospital stays and minimal scarring, by Kathy Katella; photography by Robert Lisak

MARRA BORGSTROM: Meet the new president and CEO of Yale-New Haven Hospital — A Q&A with Marra Borgstrom provides background and insight about the new president and CEO of Yale-New Haven Hospital. Borgstrom began her career at YNHH as an administrative fellow 27 years ago and has served as the hospital’s executive vice president and chief operating officer since 1993, interviewed by Katie Murphy; photography by Frank Puuse.

WHAT IS A HOSPITALIST? — Yale-New Haven’s hospitalist service is an up-and-coming way for patients to be cared for at YNHH, as well as hospitals throughout the country. The number of patients being cared for by the hospitalist service has increased five-fold in the last five years. What are the benefits of this service and why is it working so well at YNHH? by Katie Fischer; photography by Harold Shapiro

BUILDING A BRIDGE FROM SCHOOL-TO-CAREER — One of YNHH’s exciting outreach programs is the School-to-Career program, which has introduced over 300 New Haven public high school students to healthcare careers through paid internships in several different areas of the hospital. At least a dozen of them have gone on to become full-time employees at Yale-New Haven Hospital. by Taijha Nichols; photography by Ray Ploeg
Laurie Title was at a routine medical checkup with her fourth child, 10-month-old Robin, when the doctor put the stethoscope to the baby's chest and discovered her heart was in the wrong place. He calmly sent her straight to the hospital for an X-ray. When the radiologist saw the results, he told Laurie she'd better act quickly: There was a hole in the baby's diaphragm, her intestines had pushed through the hole into her chest, and that had affected the position of her heart.

The Title's pediatrician sent them directly to R. Lawrence Moss, M.D., a pediatric surgeon at the Yale-New Haven Children's Hospital (YNHCH), and Robin Title of Waterford became the first baby in Connecticut to have minimally invasive surgery for a diaphragmatic hernia, a congenital opening in the diaphragm usually detected at birth.

Congenital diaphragmatic hernia is often a surgical emergency that causes respiratory failure in the newborn. In a subset of children, like Robin, it becomes apparent later in childhood. The disease affects one in 5,000 babies, and 7 to 15 children a year are operated on for it at YNHCH. Dr. Moss picked Robin out as the first candidate for a minimally invasive approach because she had no symptoms, her breathing was not restricted and she was an otherwise healthy baby.

New hope for young surgical patients

An anxious mother and father sit down with the surgeon who is going to operate on their child, and they are full of concern and questions: How much anxiety will this cause our child? What are the risks of the anesthesia? How long will we be apart from our child? Underneath it all are more burning questions that can be difficult to articulate: You are going to cut my child open. Will my child recover?

At the Yale-New Haven Children's Hospital, the answers to these questions are growing more promising for more children every day. Better surgical tools and techniques, and advancing medicine based on groundbreaking research, are allowing pediatric surgeons to move rapidly toward using minimally invasive techniques on everything from routine gall-bladder operations on school-age children and teenagers to rare, complicated, highly specialized operations on tiny premature babies the day they are born. The diaphragm hernia repair Dr. Moss performed on Robin Title two years ago is already looked upon as routine surgery as surgeons rise to meet new challenges every day.

"The best way I can summarize the overall goals of pediatric surgeons at YNHCH during this period of rapid change is to say that we want to improve the lives of children with surgical problems — and clearly that's something that we are getting better at every day," said Dr. Moss, surgeon-in-chief for YNHCH. "What distinguishes the Yale-New Haven Children's Hospital is that we are not only providing cutting-edge, state-of-the-art care to children in our own backyard, but we are also advancing the field through our research and education programs, and in those ways we are reaching children who are thousands of miles from us."
Surgical firsts

Milissa McKee, M.D., director of the YNHCH center for pediatric minimally invasive surgery, has been the first in Connecticut to perform several new pediatric minimally invasive operations. She was the first pediatric surgeon in the state to use a minimally invasive approach to removing lobes of the lungs from infants born with cysts or masses of tissue on their lungs. In May, Dr. McKee performed the state's first thoracoscopic esophageal atresia repair on a newborn baby with a disconnected esophagus. She performed the highly complicated operation through three tiny incisions. The surgery involved collapsing one of the baby's lungs and stretching the two ends of the esophagus together in a 2-centimeter space in the baby's chest cavity.

Complicated operations such as esophageal atresia are still a matter of refining surgical skills and seeking out the right patients, said Dr. McKee. Some more common pediatric surgical procedures are already routinely minimally invasive. Among them are appendectomies, or removal of the appendix; and pyloromyotomies, which involve spreading open the muscle at the bottom of the stomach in a child whose stomach is blocked. Gall bladder removal was one of the first operations to be performed in children using minimally invasive techniques through abdominal incisions that take a stitch or two to close.

"Less than 10 years ago, pediatric scopes and spreaders were too large to use in children younger than 1 year. In the last few years, instruments became available that allow us to do operations on babies as small as 4 or 5 pounds," Dr. McKee said. These include instruments as small as two millimeters that allow for laparoscopic and thoracoscopic operations for tiny preemies. Miniature cameras with microscopes provide views of the inside of the body with crystal clarity.

Minimally invasive procedures are changing the experiences of young surgical patients in dramatic ways. Children who would have permanent scars halfway around their torsos can now leave the operating room with wounds that measure a fraction of an inch. Pain is minimized, complications are reduced, and patients leave the hospital sooner and get on with their lives more quickly. Cases that once revolved around saving the child's life are now focused on providing the child with the best possible quality of life as they grow up.

Dr. McKee sees more operations becoming minimally invasive as more surgeons master the techniques. "Many people think the challenge with these operations is that most babies won't be able to tolerate them; but it's really a matter of surgeons learning the techniques. They need a lot of experience in less-specialized minimally invasive surgery to do the highly specialized cases because the work is so technically demanding," Dr. McKee said. "But I would say that in the future, the vast majority of operations, even the most complicated operations, will be done minimally invasively."
Mapping the future

Meanwhile, as the field evolves, Dr. Moss sees Yale-New Haven taking a lead role in tracking its success. "Surgery is one of the most dramatic and potentially life-altering events in a patient's life, and it is important that we base our decisions about it on scientific evidence," Dr. Moss said. "We need rigorous outcome studies on patients to see where minimally invasive surgery is needed and where it is not needed. I think it's fair to say that Yale is probably the leading center nationally in pushing the envelope of clinical research in pediatric surgery."

Dr. Moss himself was principal investigator of the first multi-center randomized controlled trial comparing two operations in children, one invasive and the other much less so. An article published in the New England Journal of Medicine in May described how the two surgical procedures showed virtually identical results for premature infants with intestinal perforation due to necrotizing enterocolitis, a severe inflammatory disease of the intestine and the most common surgical emergency among premature infants.

"The study is important because it's the first time a trial had been done to look at an operation that way," said Dr. Moss, a specialist in necrotizing enterocolitis. "That's been a problem in children's surgery - much of it is not based on science, it's based on tradition, anecdote and how people were trained. This sort of research is a big step to bring science to surgery."

New generations of surgeons

The third step in guiding pediatric surgery into the future is training new generations of surgeons, who Dr. McKee believes are quick learners of minimally invasive techniques just as young people have been quick to advance computer technology. "It's a different way of working, and it can mean a change in mentality," Dr. McKee said. "It's like writing papers by hand versus word processing on a computer, which may not be as easy as you think."

Pediatric surgeons at the YN HCH are accredited to train one fellow in pediatric surgery every two years, and are now educating their sixth young surgeon. Fellows have the advantage of working at a hospital with a newborn special care unit, a level-1 trauma center and tools such as extracorporeal membrane oxygenation (ECMO), a sophisticated infant life support system installed at YN HCH in 1991 as the first of its kind in Connecticut. ECMO is used on patients with acute, reversible cardiac or respiratory failure who are unresponsive to conventional medical or pharmacologic management.

"There are very few of these fellowships in the country," said Dr. Moss. "Our graduates have gone on to a variety of leadership and research positions at top universities and other institutions, and they are going to help bring these new techniques all over the world."

Better lives for children

Of course, the most important job pediatric surgeons have is saving lives and providing better quality of life for young patients and their families. "Pediatric surgeons take care of many, many rare problems: babies born without an esophagus, babies born with a hole in their diaphragm, babies born with their intestines outside their bodies," said Dr. Moss. "Even though we provide all these complex services at the highest level, we also do a lot of routine surgery for kids in the region. We fix hernias and appendicitis, and take out lumps and bumps for kids all over New England."

Sometimes families expect to meet with the surgeon only for the operation and are surprised to see the surgeon take an overall lead role in the case, sometimes maintaining contact until the child is a grownup.

"We can never overlook the importance of sitting with family, discussing the implications of the operation, and making sure they are aware of any long-term complications," Dr. Touloukian said. "The first meeting between a family and the surgeon can have an important impact on how well the family understands the case and how reassured they feel that their child will recover."

Families at YN HCH are also supported by specially trained and highly skilled pediatric perioperative and perianesthesia nurses. Child life specialists and other staff talk to families about their anxieties, allow them to stay with their child through anesthesia and be there when the child opens their eyes again, and provide space for parents to stay overnight either at their child's bedside or in a separate room with beds and showers. "We have a huge presence to deal with any issue that comes up," Dr. Touloukian said. "Many of the families whose children have passed through YN HCH's operating rooms find they have a personal connection with the surgeons, and they often send cards and pictures of their children as they grow up. The staff hang the photos on a bulletin board as a reminder of what's possible. "Those things are never going to change," Dr. Touloukian said.
Quin Silva: A waiting game

When she was pregnant for the second time, Christine Silva was surprised to see that her uterus was growing much larger than it had with her first child. At eight months, an ultrasound showed how different this pregnancy actually was: the baby’s esophagus was disconnected between his mouth and his stomach, and this was causing excess fluid to build up in her uterus.

The technical term for the diagnosis was esophageal atresia. It occurs in one of 3,000 to 5,000 births, and it was fatal before the first successful repair was performed in 1939. Over the past 50 years, refinements in neonatal surgical technique, preoperative support, anesthesia and neonatal intensive care have brought the survival rate of otherwise healthy babies to almost 100 percent.

When the Silvas’ baby, named Quin, was born on July 22, 2005, at Yale-New Haven Hospital, Robert Touloukian, M.D., told Christine and her husband, Chris, in a clear, straightforward manner that the case was a complicated one, with a break in the esophagus that encompassed almost the entire length of the thorax, and that he would be performing an open surgery.

“It was a balancing act to find the right time for surgery,” Christine Silva said. The family could wait until the parts of Quin’s esophagus grew long enough to pull together, or perform a more complicated operation to create a new esophagus from parts of Quin’s intestines when he was one year old. Any waiting period would mean daily nutrition through a tube. Quin would also be scanned monthly to see how the ends of his esophagus were growing.

The Silvas drove from their home in Wilton to YNHCH every day to sit beside their son while they waited. Finally, on October 31, Dr. Touloukian performed a successful five-hour thoracotomy. It was an open operation because Quin’s separation was too wide. The surgery involved further stretching the two ends of the esophagus until Dr. Touloukian could connect one end to the other. The operation posed potential risks, including stricture (unacceptable narrowing of the esophagus), which could lead to a failure of the repair.

Seven months later, Quin is recovering. He still has medical issues, including a bad case of esophageal reflux, but doctors say those problems may resolve themselves over time. “It’s just a waiting game now,” said Christine Silva.

“It’s been a long road, but I feel fortunate,” said Christine Silva. “Now that the hospital stay and the surgery are in our past, it’s beginning to seem like a blip in the history of Quin’s life.”

Tissue-engineering opens new door

Yale is one of the top three research centers in the country exploring the use of tissue-engineering, an amazing field focused on growing cells to repair or replace structural tissues such as bone, cartilage, blood vessels or organs such as the bladder, the liver and the heart. For infants and children with major congenital anomalies at the Yale-New Haven Children’s Hospital, the implications are tremendous.

In the last few years, a team of about 100 researchers at the Yale School of Medicine has intensified its focus on vascular tissue engineering, a specific niche of tissue-engineering that involves growing blood vessels.

“Ultimately, if you really want to look into the future, blood vessels are the building blocks of tissue-engineering,” said Christopher K. Breuer, M.D., lead surgical researcher, who was recognized by the American Surgical Association as the most promising researcher in the country. “Any complex tissue, including tissue for the liver, the kidney or the heart, is going to require a blood supply.”

Tissue-engineering is simple in theory. Scientists have known for 100 years that cells germinate and grow much like flower seeds. A breakthough came 15 years ago, when they went from growing cells one-dimensionally in a petri dish to three-dimensionally on a scaffold visible only through a powerful microscope to form the shape of a bladder or other bodily structure. The cells continue to grow once the structure is transplanted into a patient’s body, often within a few hours.

“What’s exciting about it is that we’re very close to using this technology to help patients,” said Dr. Breuer, who is involved in talks with the Food and Drug Administration to launch phase I clinical trials at YNHCH. For many children who need surgery, the news is especially exciting. Instead of using synthetic tissue in certain operations and performing multiple follow-up surgeries to replace it as the child grows, surgeons may be able to use tissue from live cells that will grow with the child. That will mean fewer operations, less trauma and better outcomes for children over time.
What interested you in health care as a career? 
I grew up in a healthcare family. My dad was a doctor and some of my aunts and uncles were doctors or nurses. My first job was as a volunteer at Meriden-Wallingford Hospital when I was 13. When I was in college, I thought about being pre-med but I didn’t especially like medicine. Then I had an opportunity to work on a project with the CEO of Stanford University Hospital and that was it... sometimes, it’s the opportunities that define what you do.

What has prepared you for this role?
It’s been the cumulative result of many things, including the opportunities I’ve experienced during two years in California and 27 years here. I’ve also been fortunate to have extraordinary mentors along the way who provided me with assessments of my capabilities – notably, Julia McKenna, Julie president of Avera Magnus, College and chair of our health system board. She has achieved wonderful things in academia, and for this community, because she is extraordinarily smart, gracious and principled. She is a person people want to do well for.

Tell me about some of your mentors.
My primary healthcare mentor was Joe Zaccagnino. What made Joe such a great mentor was his absolute commitment to Yale-New Haven Hospital and to improving health care – in large measure, by recruiting, developing, and retaining future leaders. He also had an incredible ability to give time, direct feedback without being critical on a personal level. I always had the sense that he was doing that to make me better than even I thought I could be.

In many ways, my father was my first mentor. He was a stickler for two things – grammar and table manners. My parents were both from families that immigrated to this country and wanted their kids to be as well educated as they could possibly be.

You didn’t mention any female mentors in your life. Does that say something about women in health care?
I have been fortunate to know several women who have strong leadership attributes – notably, Julia McKenna, Julie president of Avera Magnus, College and chair of our health system board. She has achieved wonderful things in academia, and for this community, because she is extraordinarily smart, gracious and principled. She is a person people want to do well for.

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Tell me about some of the highlights of your career?
Planning and oversee the construction of the Yale-New Haven Children’s Hospital was a wonderful experience. Also the 1993 acquisition of the Temple surgical and radiological entities was a real learning experience since I knew nothing about mergers and acquisitions at that time. And of course, being part of the planning for our new cancer hospital – what can I say about that? It’s a once-in-a-lifetime opportunity to build something tangible of this substance. We are on the cusp of making healthcare history in our state, and hopefully nationally as well.

How would you describe Yale-New Haven Hospital today?
Yale-New Haven is a leading teaching hospital and a community hospital, committed to achieving excellence in the delivery of safe, high-quality care. We strive to be the provider of choice and the employer of choice, but we never take those goals for granted – we work to achieve and sustain them. Our success depends on the quality and commitment of the people who work here. I believe our employees feel this is a very good place to work.

What is the hospital’s role in the community?
We have a rich, 180-year history in this community. We are an integral part of the community. Although our presence is critical in many ways, no single organization can... Our patient population is certainly not an issue Yale-New Haven can solve alone - it is something we have here for over 25 years - that really an incredible testimonial. A hospital might have old or new buildings, but the cost of good health care is the knowledge, the value, the competence and the commitment of the people who provide that care. They are an exceptional team.

What are your concerns about the future?
One of my biggest concerns is how we are going to staff our hospitals in the next 10 to 15 years. There is a growing demand, yet we have fewer men and women entering traditional healthcare jobs. From that perspective it is critical for us to be the best employer possible – truly the employer of choice.

Another thing that really worries me is the growth of the uninsured and underinsured populations and the pressure that’s putting on organizations like Yale-New Haven. But how can we pay for that care if it is not an issue Yale-New Haven can solve alone – it is something we as a nation must address.

Do you have a message for Yale-New Haven’s patients?
Our patients do have a choice, as do their physicians, and I hope patients will come here because they – or a friend or family member – have been well treated here because they have confidence that our good reputation was earned. That is a core value of this leadership team - that we treat people the way we would want to be treated, that we treat a member of our own family. Patients should never have to worry about their safety and their care at Yale-New Haven. That’s what we have to guarantee every day.

Can you discuss some of the negative publicity that preceded the recent cancer center agreement?
We were all concerned about the false and distorted accusations about our role in the community. We are an integral part of the community. Although our relationship with Yale University is very important to us and really helps distinguish us as a hospital, we are not Yale University. We were very out of the need to care for the patients who need our services, and we have never forgotten that. Our medical services, health education, support services, community partnerships and even our stature as a national healthcare leader - stem from the needs of this community.

Do you have a message for the employees at Yale-New Haven Hospital?
My message is simple: Thank you. Our employees work very hard each and every day for our patients and their families. Because of their great work, patient demand continues to grow, as do our needs for a highly skilled, competent group of employees. We will continue to work hard to make this place where our employees want to work and can grow.

Photo credits: Jennifer Sweeney
Making radiation therapy
easier and better

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of radiation to kill the cancer.
Edward Cleary, a New Haven probate clerk who recently completed 35 sessions of radiation therapy to treat prostate cancer, found he often had to clear up people's misconceptions about radiation treatment. "People sometimes confused it with chemotherapy, and assumed I would be weak, nauseous and lose my hair," said Ed. He added, "I did receive some sympathy from my poker group during treatment, but not enough to let me win!"

Joking aside, Cleary found the only real significant side-effect of his seven weeks of radiation therapy was fatigue, and that the fatigue continued for three weeks after he had completed treatment. "The first week or two was fine, but after that I'd feel pretty tired by the end of the week and I'd regroup over the weekend and start the next week feeling pretty good."

He was surprised how quick the treatment was - it only lasted about five minutes. "Initially I thought it would take more time but they got me in and out very quickly. And there was free parking right outside."

Cleary admitted he didn't know much about radiation therapy when he first started, but he left with more of an understanding of the complexity of radiation therapy. "Initially I didn't know that much about radiation treatment but I came to discover that great strides have been made in the past five years. My physician, Dr. Pesche, convinced me that the current technology could zero in on the area where they thought the cancer was and avoid the healthy areas. He was able to eliminate any lingering concerns I might have. He explained there were a lot of different experts involved, including a physicist. It was reassuring."

Most patients, like Cleary, leave treatment with the knowledge that radiation therapy for the most part is a fairly easy process with manageable side effects like fatigue and skin irritation. Many patients often leave treatment with new friends, as well. "Patients say, 'I didn't know it would be like this, everyone here is so upbeat.' People cry when they have to leave us," said Mary Starno, R.T.T., chief therapist. Radiation therapists position patients on the treatment table and operate the computer-controlled linear accelerators that administer the radiation. "I have a patient that seeks me out every year when she comes in for her follow-up exams. She's been doing this for 20 years, just to say thank you and catch up," said Starno.

What patients probably have not learned during their treatment is about the technological advances made in recent years to improve the precision with which radiation is now administered or about the team of physicians, dosimetrists and physicists working behind the scenes to make sure patients receive the maximum amount of radiation to kill the cancer while not harming surrounding healthy tissue.

Jean Cherni, who learned last summer she had a lump in her right breast which would require surgery, said, "My first thought was not that my health might be in jeopardy but that I was too busy to be ill." But somehow she worked breast cancer treatment into her packed schedule. After nipple-sparing surgery, Cherni underwent radiation therapy at a follow-up treatment. Because Cherni lives in Branford, she decided to have her radiation therapy at the Yale-New Haven Shoreline Medical Center in Guilford. "It was so convenient I almost didn't notice it. I had the first appointment in the morning so I just whisked in and whisked out. I would get up, brush my teeth, get radiation therapy and then just get on with my day."

(above) Positioning patients correctly on the radiation treatment table often takes longer than the treatment itself.
Support and inspiration

The Yale-New Haven radiation oncology clinics try to make patients feel comfortable during a stressful and frightening time. In addition to offering complementary therapies like massage and emotional support from social workers, the waiting area is stocked with coffee and snacks, puzzles, books and magazines. There is even a journal for patients and their families to jot down their thoughts. One read, “I thank God for all of you who have helped to make this trip a piece of cake.” Despite the pleasant atmosphere and welcoming reception staff, most patients don’t spend that much time in the waiting area.

“They were very accommodating,” said Jose Maisonet, a 34-year employee in material services at YNHH who is receiving treatment for prostate cancer. “They rescheduled my treatment so I could go to New York for my son’s graduation from NYU. They treat me like a king, honest to God.” Cleary agreed. “The people were great - from start to finish. The receptionist was very friendly; the people who administered the treatment had a very calming influence.” Cleary liked to joke around with them. But, he said, safety was just as important. “No matter how friendly they were and how well they got to know me, every time I came they insisted I give them my name and date of birth to be sure I was who I was,” he said.

Technological advances increase accuracy of treatment

Nick Papale, director of radiation therapy at YNHH, uses a cylinder shape to illustrate both the complexity of targeting cancer cells with radiation and the advances in radiation therapy technologies.

A cylinder generally appears as a long and wide object. But a cross-section view of a cylinder appears as a small circle. If a patient’s tumor is cylindrical, the radiation treatment field must adjust to match the shape of the tumor as the radiation enters the body from different angles. Otherwise surrounding healthy tissue would be damaged. For example, a long and wide field is applied over a small circular portion of the tumor.

Early radiation therapy involved administering square or rectangular fields of radiation to the body. Later, lead blocks were shaped to match the tumor outline and block radiation to nearby normal tissue. The early 1990s saw the development of the multi-leaf collimator, a device that uses finger-shaped leaves to match the shape of the tumor and block radiation to healthy tissue. Further enhancements to the multi-leaf collimator lead to the introduction of intensity-modulated radiation therapy, or IMRT, which administers radiation at non-uniform intensities.

By manipulating beam intensities, IMRT creates radiation doses that precisely conform to the shape of the tumor volume, allowing higher doses of radiation to the tumor and lower doses to surrounding normal tissue, greatly improving patients’ quality of life during treatment.

Within the next year, YNHH will purchase a new treatment machine, or linear accelerator, that not only will administer radiation but also will provide CT scans of patients. Currently, patients’ tumors are scanned at the beginning of treatment and their radiation therapy plans are developed from those scans. In the case of prostate cancer, the position of the tumor can change daily or hourly based on the progress of the patient’s digestion — gas in the nearby intestines can reposition the prostate and the tumor within the body. With YNHH’s new image-guided linear accelerator, radiation therapists will be able to scan the patient on each visit to better match the delivery of the radiation to the precise location of the tumor that day.

The people behind the technology

Wilson is the director of the Yale Total Skin Electron Beam Therapy (TSEBT) program, which was developed 25 years ago to treat cutaneous lymphomas and other skin disorders. Working with dermatologists and medical physicists, Wilson and his team develop protocols for treating skin cancer using a modified treatment design to irradiate large areas of skin without causing damage to interior tissues. Yale’s Total Skin Electron Beam Therapy program is recognized as a world leader in the treatment of this disease.

Technological advances have changed the field of radiation oncology in ways that were once unimaginable. “Twenty years ago, I used graph paper and slide rules,” said Shamsa Toumazou, chief medical dosimetrist and manager of radiation physics, speaking about the rapid changes and developments in radiation therapies. “Today, the earliest IMRT systems sold obsolete and even five years ago, we didn’t know what changes were coming and we can’t predict what’s coming in the next five years.”

Using composites of CT, PET and MRI scans and tumor maps created by radiation oncologists, dosimetrists plot the path of the radiation beam through the body to the target, which includes the tumor and a margin of healthy surrounding tissue. Advances in treatment machine technology such as IMRT allow dosimetrists to “shrink” — exposing tumors to larger doses of radiation while simultaneously administering smaller doses to normal tissue.

For most patients, their daily radiation therapy treatment lasts and 15 minutes, with the bulk of that time spent ensuring they are positioned correctly on the treatment machine. However, the planning of their radiation treatment is a complicated and highly technical process that takes hours, sometimes days, to develop and requires the behind-the-scenes cooperation and expertise of a variety of medical professionals.

“T here is a misconception that radiation oncology is just about technology,” said radiation oncologist Lynn D. Wilson, M.D., M.P.H., clinical director and vice chairman of therapeutic radiology and associate professor Yale University School of Medicine. “When I meet with new patients, I review their records and perform a comprehensive exam. Based on medical evidence and patients’ medical history, I make my treatment recommendations, for example, when treating lung cancer, past versus good lung function will affect how the target will be treated.”

A cancer patient’s treatment requires radiation therapy, a “simultaneous” session is scheduled. During the simultaneous session, a series of CT, PET and MRI scans are taken of the affected area. The scans are combined with computer software to produce a three-dimensional model of the “treatment field” — the tumor and surrounding normal tissues. The radiation oncologist then “maps” a precise outline of the treatment field and specifies the amount, or dose, of radiation to administer.
As a teaching hospital, YNHH benefits from having a staff of medical physicists on site — rather than using outside consultants — to ensure quality and advance the practice of radiation oncology.

A team of eight board-certified medical physicists provides clinical support to four radiation therapy clinics at YNHH. Their primary responsibility includes developing and maintaining a comprehensive quality assurance program to ensure the safe and accurate delivery of prescribed radiation doses to patients. They work alongside radiation oncologists and dosimetrists to help plan radiation treatments by measuring and characterizing the radiation produced by the linear accelerators and modeling the radiation sources in the treatment planning computers.

In addition to ensuring the safety of patients and staff during radiation therapy and aiding in the development of treatment plans and advances in medical practice, medical physicists engage in research and development to introduce and implement new technologies and procedures in YNHH’s therapy clinics. They also teach the physics of radiation therapy to radiation oncology residents and radiation therapy students.

When patients begin radiation treatment, oncology nurses interview them to assess if they have any health, financial, emotional or logistical concerns — such as transportation needs — in order to provide patients with referrals and coordinate care. As patients’ treatments progress, radiation oncology nurses help them deal with side effects like skin irritation and assess their physical condition, bringing their physician into the discussion when necessary.

“It’s important for people to know how excited we are as nurses to work in radiation oncology,” said Cara Penta, R.N., M.P.H. “I want to make this journey for the patient as comfortable as possible and help them access resources to make it easier.”

Oncology nurses like Penta participate in specialized training in radiation oncology. “Our practice is moving forward,” said Penta. “Because of knowledge and expertise in radiation, we collaborate closely with the physicians in the management of the patient. We see the patients frequently, sometimes on a daily basis, so we get to develop close relationships with them and become their advocates.”

Making cancer treatment easier for patients

Half of the cancer patients treated at Yale-New Haven Hospital receive radiation therapy. In addition, some patients may have surgery and also chemotherapy treatments. Currently, those services are located in different locations on the hospital campus which can be confusing and inconvenient for patients and their families.

To better serve cancer patients, YNHH will begin construction of a 497,000-square-foot, 14-story cancer center in September 2006 with an estimated completion date of 2009. The new cancer center will integrate inpatient and outpatient cancer services and will include inpatient beds, expanded operating rooms, radiology services and diagnostic services all in one location.

“Our patients will continue to receive the best possible care but in a more contemporary and comforting setting,” said YNHH President and CEO Marina Borghese. “We will also be able to offer patients the ability to take part in clinical trials that may help treat their disease and lead to innovative treatments for others.”

In addition to the new cancer center in New Haven, patients living in the Shoreline communities east of New Haven can now receive radiation treatment at Yale-New Haven’s Shoreline Medical Center, which provides Shoreline residents with radiation therapy treatments, full clinic services, including patient consultation and follow-up visits for patients who have completed their prescribed course of radiation therapy.
"Your doctor's partner"

"I wish I could clone Will Cushing!" said 69-year-old Vivian Gesuero, of Branford. "He makes himself available whenever I have a question. He's on top of everything. He's a doll!"

Cushing, a physician assistant (P.A.), is a member of the hospitalist service at Yale-New Haven Hospital (YNHH) — made up of physicians and P.A.s who are called hospitalists and who specialize in the care of hospitalized patients like Mrs. Gesuero. This service allows primary care physicians to concentrate on the needs of their office patients while the hospitalists ensure continuity of care for inpatients from admission to discharge. After patients are discharged, the primary care physician once again resumes their ongoing care.

"The hospitalist service allows a patient's primary care physician to focus on the needs of outpatients, without interrupting their daily office schedule, secure in the knowledge that an experienced physician is caring for his or her patients," said Victor Morris, M.D., medical director of the YNHH hospitalist service.

Relatively new in the United States, the hospitalist trend has its roots in the United Kingdom and Canada. About 85 percent of hospitalists are trained in internal medicine. Yale-New Haven Hospital first created a hospitalist service in 2000. Today the service includes 31 physicians and 21 physician assistants, who are board-certified eligible in internal medicine. Increasing demand for their services, as well as an expanding role at the hospital, has sparked the rapid growth.

"In 2000, YNHH hospitalists took care of 700 general medicine patients at Yale-New Haven," said Dr. Morris. "This year they expect to care for over 6,500 patients."

Dr. Morris believes the number of hospitalists in this country will grow from 12,000 to 30,000 by the year 2010. "It's been an internal medicine phenomenon," he said.

YNHH hospitalist physicians provide many services; they monitor inpatients who do not have primary care physicians; they act as attending physicians on the internal medicine units; and they provide a hospital-wide consult service to fellow physicians.

By serving as an easily accessible, centralized resource for information and patient care, hospitalists manage, in many cases, to reduce length of inpatient stay and, at the same time, improve quality of treatment.

"Patients can be discharged whenever they are ready, since a member of the hospitalist team is available around the clock to handle the discharge procedure," said Cushing. "The hospitalist service also increases patient satisfaction, because doctors and P.A.s are available at any time, day or night, to visit with a patient and speak with the patient's family. In addition, if an emergency occurs during a hospitalization, the hospitalists are on the premises and can see the patient right away. I tell patients, I'm your doctor's partner in the hospital. They get the best of both worlds: their primary physician's knowledge and our 24-hour care."
Because hospitalists do not maintain an outpatient practice, they spend all of their time in the hospital setting, where they treat a wide range of patients. In addition, the hospitalists often care for patients who don’t have a primary care physician of their own.

Anthony Caggiano, of East Haven, was a patient on the hospitalist service for several weeks, after he was admitted through the YNHH emergency department for chronic obstructive pulmonary disease.

“They are awesome, just awesome,” said Mr. Caggiano, speaking about the hospitalist team. “They are my medical team. They saved my life. They are excellent at what they do.”

Because of the complexities of Mr. Caggiano’s illness, he sees many specialists during his inpatient stay.

“We have used the hospitalist service for the past few years and have been impressed by the quality of care of our patients,” said Catharine Arnold, M.D., a community physician in Guilford. “We appreciate the phone calls from the attendings and the PAs covering our patients, as it helps us feel connected. We always get discharge summaries in a timely manner, which is paramount in our following the patients up in the office. On a more practical note, having our patients admitted to the hospitalist service allows us to be more efficient and spend more time with our patients in the office.”

At Yale-New Haven Children’s Hospital, the two hospitalists play a different role from that of their counterparts who work with adult patients through the internal medicine service. The pediatric hospitalist program serves to supplement clinical care on the infant-toddler and school-age/adolescent units for anywhere from two to 10 patients a day. Depending on their patient’s condition, they consult with sub-specialists, surgeons and pharmacists and arrange conferences with family members and other caregivers, and make frequent contact with the child’s regular pediatrician.

Despite the fast pace of a hospitalist, Dr. Victor Morris says that burnout is not a problem. He developed a schedule for day and nighttime shifts that he says is “sustainable,” and that allows for balance between work and family life. To avoid burnout, the physicians provide nine months of patient care interspersed with three months of something else such as teaching, research or vacation, “to recharge batteries.”
Building a bridge from School-to-Career

"I always had the desire to become a nurse," said Dayna Shields, "but what I needed was to encounter a nurse." When Shields was a junior at Hill Regional Career Magnet High School in New Haven, she had the opportunity to work at Yale-New Haven Hospital (YNHH) for a semester. She had heard about the hospital's School-to-Career Program from one of her teachers, applied to it and was accepted.

I thought this would give me the chance to see what nursing was really like," said Shields, who began the program in January 2002. For the next five months, she observed and worked with the nurses and patient care associates on the transplantation unit. Shields, 22, is now in her second year of nursing school at Gateway Community College and works as a patient care associate in the YNHH Women's Center. Shields feels the program really prepared her for the work she is doing now. "The program basically showed me what was ahead for me," said Shields. "My experience here is preparing me for becoming a nurse."

While Yale-New Haven Hospital has a number of programs that promote interest in healthcare careers, School-to-Career offers high school students real-life experience in health care and paying jobs at the hospital. School-to-Career was designed to show students how what they learn in school can be applied to a work environment and how they could develop the skills necessary to reach their potential in the workplace.

According to Patricia Worth, R.N., who coordinates the program at Yale-New Haven, the program began in 1994 as a joint effort of the hospital and the New Haven Board of Education. The mutual goal of the program was to expose students to various careers, while helping them develop a good work ethic. It is also one of many ways Yale-New Haven Hospital is working to help address the nursing shortage.

Each year, the program offers a 16-week paid internship (January through May) for 20-25 high school students who work in different hospital departments, such as facilities, information systems, the mailroom, medical records and numerous patient care units, including the adult emergency department, inpatient nursing units and the primary care center. There is a summer job component to School-to-Career, which is offered to those same students during July and August.

"It helps the community grow," said Worth, who is the manager of workforce diversity at YNHH. "It is an investment in the hospital workforce, it's true, but more importantly, it helps the community grow." Since its inception, over 220 high school students have participated in the School-to-Career program—some are exposed to trades like plumbing or electrical work and decide to pursue one in trade school; others go on to college for nursing or an allied health career; still others apply to YNHH when they graduate from high school. So far, more than a dozen of these former School-to-Career interns have become YNHH employees.

School-to-Career
One student whose internship exposed him to computers is Celestino Rivera, a 2001 graduate of Hillhouse High School. "I learned about computers during my School-to-Career internship junior year and I applied to Gateway to study computer engineering," said Rivera. "Before I enrolled in the program, I wanted to be a computer specialist, but as time went on, I changed my career goal and now I want to get into engineering." Rivera now works as a business associate in medical oncology at Yale-New Haven Hospital, where he is planning to return to Gateway to finish his degree. "The program gave me the opportunity to work with terrific co-workers for a wonderful institution that has endless opportunities, so I'm very grateful."

The program, which was initially only offered to Career High School students, has since evolved. Yale-New Haven Hospital now partners with four high schools in New Haven: Career, Wilbur Cross, Hillhouse and Metropolitan Business.

The internship application process is similar to that of employees hired at Yale-New Haven. Students must formally apply and submit an essay describing their interest in the program, as well as teacher references supporting their capabilities, interest and potential work ethic. The students are interviewed, must undergo a drug test and have a physical or notification from their primary physician verifying that their immunizations are up-to-date. Once students are accepted, they are assigned to a manager/supervisor and a mentor who provides them with feedback on their performance at set times during the internship.

"Despite the fact that this program is very competitive," said Worthy, "it is accessible to everyone. The students don't have to be superstars. They may not be straight-A students and college may not be in the picture for all of them, but they must want to learn and show dedication and interest in doing a good job."

"Yale-New Haven Hospital is an attractive employer in this area because it's a world-class medical institution with tremendous opportunities," added Worthy. "But recruiting a top-notch workforce is a continual effort for us. School-to-Career helps us both shape and vet our future workforce. And it's also a great way for us to give back to the community."


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Making room for a new cancer hospital

In March, Yale-New Haven Hospital and the City of New Haven reached an agreement that allows the construction of a new cancer hospital to begin. Over the summer, the Grace Building, a 50+ year-old nursing dormitory and classroom building, was razed and in September, the ground will officially be broken for the new 14-story cancer building — a center that will be able to serve patients in New Haven, in Connecticut and beyond for years to come. The building is expected to take about three years to complete. To find out more about the proposed clinical cancer center, visit www.ynhh.org or call 203.688.2000 or 1.888.700.6543 toll-free for the latest issue of Cancer Center News.
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