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Acknowledging the strong link between obesity and cancer, Yale Cancer Center has formed a working group to strengthen collaborations between scientists. The group is studying the biological impact of obesity on cancer incidence and prognosis, among other factors.

director’s letter

Charles S. Fuchs, MD, MPH
Director, Yale Cancer Center and Physician-in-Chief, Smilow Cancer Hospital

Yale Cancer Center was founded in 1974 as one of the inaugural five Comprehensive Cancer Centers in the nation and has a rich history of cancer research and patient care. Last month, our Center received our official notification from the National Cancer Institute (NCI) renewing our Center as a Comprehensive Cancer Center and approving an additional five years of our Cancer Center Support Grant. I am pleased to share that based on the outstanding score on our application, we received a 74% increase in funding compared to our previous funding period.

Dr. Craig Crews’ story of cancer drug discovery through his chemical biology research is a prime example of the advances that NCI-designated cancer centers can foster through to drug development and, finally, to FDA-approval. As a mentor to countless investigators at Yale Cancer Center, Dr. Crews is a model for moving cancer research from the lab to the clinic in order to benefit cancer patients.

This issue of Centerpoint highlights some of the many areas of excellence at our Cancer Center and Smilow Cancer Hospital, including a new research collaboration on the increasing link between obesity and cancer, advances made in bladder cancer through targeted clinical trials, and the new therapy options the expanding field of Interventional Oncology is providing to our patients.

In addition, we are proud of the many accomplishments of our Gamma Knife Center, which is celebrating its 20th anniversary and recently treated its 5,000th patient. Through advanced technologies and research, the Center has led radiotherapy planning and treatment for patients with brain metastases.

I am confident that our increased NCI funding, coupled with our elite science and patient- and family-centered care model at Smilow Cancer Hospital and our Care Centers, will bring many new opportunities to impact research and cancer care in the coming years. On behalf of our entire team at Yale Cancer Center and Smilow Cancer Hospital, we look forward to sharing more stories of success with you in the coming months.

Sincerely,

Charles S. Fuchs, MD, MPH
Director, Yale Cancer Center and Physician-in-Chief, Smilow Cancer Hospital
Twenty years ago Craig Crews, PhD, and his colleagues, launched a research project that has generated two biotech companies, hundreds of millions of dollars in investments and partnerships, a list of honors for Dr. Crews, and an FDA-approved drug that has helped more than 80,000 patients so far. The project has also inspired drug candidates now in development against prostate cancer and breast cancer, among other diseases. Dr. Crews is confident that all of this is just the beginning. "It’s a platform technology," he said of his discovery, "meaning it could be applied to many different cancers and diseases."

Dr. Crews’ story combines groundbreaking science with strong entrepreneurship, a combination that he believes can streamline the arduous process of bringing new drugs to cancer patients.

The story began in the late 1990s when he was studying protein degradation, a quality-control mechanism by which worn-out proteins get tagged and removed from cells to make room for new proteins. The mechanism is critical to the health and growth of cells, including cancer cells. "My lab has long been interested in finding molecules that can control this," explained Dr. Crews, the Lewis B. Cullman Professor of Molecular, Cellular, and Developmental Biology and Professor of Chemistry and Pharmacology.

After the initial report of epoxomicin by Bristol-Myers Squibb, a natural product with anti-tumor characteristics, Dr. Crews and his team discovered that it is a potent new proteasome inhibitor that leads to the accumulation of toxic proteins in tumor cells, thus killing them.

Though it was great lab science, Dr. Crews believed that an improved version of this compound from his lab had potential as a drug. In 2003, he started his first company, Proteolix, to develop this novel proteasome inhibitor as a treatment for cancer. Onyx Pharmaceuticals saw potential and bought the company in 2009. Two years later, the FDA gave carfilzomib (trade name Kyprolis) fast-track status, and in 2012 approved it for use against multiple myeloma.

Meanwhile Dr. Crews had been busy designing new molecules called PROTACs (Proteolysis-Targeting Chimeras), a brilliant, pioneering technology that used a different tactic to fight cancer. Instead of blocking protein degradation like the proteasome inhibitor carfilzomib, these PROTACs stimulated it. The advantages were significant. The new PROTACs hunted down cancer-causing proteins, locked onto them, and destroyed them.

"Think of the PROTAC molecule as a dumbbell with two large ends and a connector between them," said Dr. Crews. "One end binds to a part of the intercellular machinery responsible for degrading and eliminating proteins, the other end binds to whatever target protein is causing the disease you want to eliminate. So you are literally dragging this target protein to the quality control machinery and feeding it into the buzz saw. Unlike with inhibitors, this is permanent. And inhibitors only work if you maintain high levels of them in the system; our molecule survives and goes off to seek-and-destroy again, so in theory a patient would need less of the drug."

This approach has another huge advantage over inhibitors. Every cell carries an estimated 20,000 proteins, but only about 25 percent of them can be inhibited by blocking their receptors or enzymatic functions. "That means the vast majority are undruggable because they’re scaffolding proteins or transcription factors," said Dr. Crews. "But our PROTAC technology makes all those proteins pharmaceutically vulnerable, not by inhibiting their biological function, but by making the problem proteins go away."

That’s the premise behind his second biotech company, Arvinas, which he founded in 2013. It has attracted investments of $113 million as well as licensing partnerships with Merck ($434 million), Genentech ($650 million), and Pfizer ($830 million). The company now employs 85 people in New Haven’s Science Park and 100 chemists in China. It has made over 10,000 different PROTACs over the last five years. "That illustrates the amount of effort that goes into drug development," said Dr. Crews.

Two Arvinas projects using PROTAC technology are in advanced stages. One is aimed at prostate cancer, the other at breast cancer. Prostate cancer is driven by the hormone androgen, and the standard of care is androgen depletion therapy using inhibitors. But when the tumor senses this interference, it increases production and mutations, requiring heavier and heavier doses of...
“We’re on the cusp of clinical trials at Yale with a compound that was a concept here in Kline Biology Tower 17 years ago.”

counteractive therapy. “Basically it’s chemical castration,” said Dr. Crews. Arvinas has designed an oral PROTAC that eliminates the androgen receptor protein from cancer cells, degrades androgen receptor mutations, and slows tumor growth. Dr. Crews expects clinical trials to begin at Yale and elsewhere later this year.

The PROTAC against breast cancer works similarly. An estimated 80 percent of new breast cancer cases are positive for estrogen receptor alpha (ERα), whose proteins encourage tumor growth. Current therapies try to stop growth in ERα breast cancers by inhibiting the receptor, but many breast cancers become resistant, allowing signals from the receptor to break through and stimulate tumor growth. Arvinas’ estrogen PROTAC solves that by eradicating ERα proteins. Clinical trials will begin next year.

Another Arvinas project demonstrates how broadly the PROTAC technology can be applied, said Dr. Crews. When the protein called Tau aggregates, it causes neural death that leads to Alzheimer’s. The concept Arvinas is working on PROTACs that drag Tau to its death.

Dr. Crews sees the company as the fruit of a “partnership between academia and private biopharma. Academia develops the idea and brings it to the lab, and then the company takes it out of the lab to his father, who worked on materials science at NASA. “He looked at alloys of metals and composite materials for aircraft engines, analyzing fatigue and fracture,” said Dr. Crews.

He traces his interest in propelling discoveries out of the lab to his father, who worked on materials science at NASA. “He looked at alloys of metals and composite materials for aircraft engines, analyzing fatigue and fracture,” said Dr. Crews. “He would tell me about plane crashes where the material had failed because the material had been overmatched by the loads it had to support. It’s the same failure.” So it was clear to me early on that my Dad’s basic research had practical applications. As a basic researcher driven by my scientific curiosity, I love what I’m doing here, but I’m always asking how we can take what we’re learning into the lab and help people.”

Right now, Dr. Crews and the 18 members of his lab are investigating leukemia, glioblastomas, lung cancer, and pancreatic cancer. “We’re very interested in some of these tough cancers that haven’t been easily addressed using the current drug repertoire,” he said. “And we’re making progress.”

I n May 2013, Joe Weber had just dropped his son off at Logan International Airport in Boston and was driving back to Connecticut when he decided to stop for a bite to eat. Before continuing his two-hour trip home, he visited the restroom and noticed an exceptional amount of blood in his urine. This came as a surprise to Joe as he had no indication that something was wrong in the weeks or days prior. He immediately made an appointment with his primary care physician. His physician referred Joe to a urologist, who diagnosed bladder polyps as the cause of the blood, and recommended outpatient surgical removal. Joe went ahead with the surgery, and would continue to be checked every three months for the next year, only to have polyps recur and be removed in two additional surgeries. After his third surgery, Joe questioned whether the polyps could indicate a larger problem and he sought a second opinion.

It was then that Joe received the diagnosis of muscle-invasive bladder cancer. His new urologist recommended he immediately start an aggressive regimen of chemotherapy to precede surgery to remove his bladder and a portion of his small intestine. As testing continued, it was determined the bladder cancer had metastasized to Joe’s lungs, elevating him to a stage IV cancer diagnosis, and surgery was no longer an option. In consultation with his doctor, they decided to proceed with the standard of care for his bladder cancer, and for the next eight months, Joe received chemotherapy once a week. While his treatment did begin to shrink the tumors in his lungs, the side effects were too challenging and Joe decided to end treatment.

Knowing Joe would not be able to tolerate a return to this treatment regimen, his doctor advised him to enter a clinical trial, and referred him to Dr. Daniel Petrylak, Professor of Medical Oncology and Urology, at Smilow Cancer Hospital. Dr. Petrylak is a leader in the development of new drugs to fight bladder cancer, and his success with clinical trials has expanded the treatment options for all patients, including many newly FDA-approved drugs.

Joe first met with Dr. Petrylak in July 2015, and for the next two years unsuccessfully participated in two separate clinical trials. In July 2017, Joe became eligible for a third trial touted as “targeted chemotherapy.” This trial combined an antibody targeted at a protein present in bladder cancer cells, with chemotherapy.

After three months, Joe had to again stop the treatment due to side effects, which in this case presented as neuropathy, or weakness and numbness in the feet. Joe paused his treatment for six months, but continued to have scans every eight
weeks during this break. Remarkably, the results of his scans began to show that his lung tumors were shrinking even while off treatment. It appeared that the three months of the initial treatment had been enough to cause tumor shrinkage.

Joe resumed the targeted therapy in April 2018 when his side effects improved, allowing Joe to resume his normal activities - working in the yard, albeit at a less rigorous pace, and playing golf. Joe’s treatment team is thrilled with his progress and he shares their excitement, exclaiming, “Dan is the man!”

“Dr. Petrylak is a world-class expert in research and trials, and the advances he has made in bladder cancer treatment in a few short years is truly amazing,” remarked Joe. “I am not sure whether a cure is in the realm of possibility, but I am confident that we can arrest bladder cancer with as few symptoms as possible.”

In the meantime, Joe aimed to check off a few big items from his bucket list: 1) play a round of golf with Dr. Petrylak, and 2) complete a West Coast road trip with his son. He is still working on, but number two, he was recently able to complete.

Squeezing in a trip between treatments, Joe and his son started their adventure by spending two days in Denver, Colorado before flying to San Francisco. As luck would have it, Joe’s wife, Maura, and daughter, Emily, were able to join them and for the next three days, they made family memories across the Bay Area including a special trip to Muir Woods National Monument to see the redwood trees. After Maura and Emily headed back to Connecticut, Joe and Michael picked up their convertible and started south to kick off their special trip.

Their first destination was Los Angeles, but not before passing through some of the most scenic vistas in California: Monterey, Carmel, Malibu, and Santa Monica. They flew to San Diego, where they visited the San Diego Zoo and swam in the warm waters of the Pacific Ocean. After San Diego, Joe and Michael drove eight hours east through the Arizona desert to their next stop, the Grand Canyon. After one day of sightseeing, they concluded their trip with an extravagant steak dinner before turning in the convertible and flying home.

After a jam-packed journey of 1,400 miles through three states, Joe can look back and be thankful for these newfound opportunities to explore and enjoy life that did not seem possible a few years ago. But after such a memorable and successful trip, another has taken its place. On the eve of their return to Connecticut, in a conversation with his son at dinner, they realized that Joe has visited 43 of the 50 states. Upon learning this fact, son Michael is now inspired to get his father to all 50 states.

As the famous quote goes, “Life is either a daring adventure or nothing.” And thanks to his second chance at life, Joe can embark upon his daring adventure and continue to work on his bucket list.

“I am not sure whether a cure is in the realm of possibility, but I am confident that we can arrest bladder cancer with as few symptoms as possible.”
Ten years ago Abe Lopman took a risk. He left a prestigious job and a comfortable future at one of the country’s great cancer centers, Memorial Sloan Kettering, for an enticing possibility in the small city of New Haven.

“No one then regarded Yale as a powerhouse in cancer,” Mr. Lopman remembered. “So it took a few visits and a lot of conversation with some key people—Marina Borgstrom [President and CEO, Yale New Haven Health System], Rick D'Aquila [now President, Yale New Haven Health System], and Bob Alpern [Dean, Yale School of Medicine]. They convinced me they were committed to doing something very different and very right in developing a cancer program at Yale New Haven.”

Part of their vision was going up on Park Street in New Haven—a new cancer hospital, still nearly two years away from opening, named after its major donor, Joel E. Smilow. “Very few of us get to finish designing and implementing a 500,000 square foot, half-a-billion-dollar hospital devoted to delivering top-notch care to patients and their families,” explained Mr. Lopman.

He seized the opportunity, and in February 2008 began his new job as Vice President of Operations for Yale New Haven Hospital and Executive Director of the half-built Smilow Cancer Hospital. In the last decade, he has played an indispensable role in Smilow’s story, a role that ended in October 2018 with his retirement at age 68. Charles S. Fuchs, MD, MPH, Director of Yale Cancer Center and Physician-in-Chief of Smilow Cancer Hospital, called Mr. Lopman “the architect of our great Center,” and added that his leadership and vision were instrumental to its growth into a nationally renowned hospital with a network of 12 cancer care centers throughout Connecticut.

Catherine A. Lyons, RN, MS, Vice President of Patient Services and Chief Nursing Officer at Smilow, seconds Fuchs emphatically. She was recruited by him in 2010 to revitalize the nursing and patient care programs. “Smilow would not be Smilow without Abe Lopman,” she said. In 2009 when Mr. Lopman teamed up with the newly-arrived Thomas J. Lynch, Jr., MD, the hospital’s founding Physician-in-Chief and new Director of the Cancer Center, “It was magic,” added Ms. Lyons. “It was a coming together of like-minded people driven to build a world-class organization that took care of patients and families with the utmost compassion. Smilow went from being a place almost no one knew about to a formidable facility.”

Mr. Lopman, with Dr. Lynch, Ms. Lyons, and the people they recruited, thought about every aspect of cancer care. That meant discarding the typical staff-to-patient ratio. In some areas, the nursing staff doubled. The medical school and Cancer Center recruited, thought about every aspect of cancer care. That meant discarding the typical staff-to-patient ratio. In some areas, the nursing staff doubled. The medical school and Cancer Center recruited, thought about every aspect of cancer care. That meant discarding the typical staff-to-patient ratio. In some areas, the nursing staff doubled. The medical school and Cancer Center recruited, thought about every aspect of cancer care. That meant discarding the typical staff-to-patient ratio. In some areas, the nursing staff doubled. The medical school and Cancer Center recruited, thought about every aspect of cancer care. That meant discarding the typical staff-to-patient ratio. In some areas, the nursing staff doubled. 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Collaborating Against OBESITY + CANCER

Steve Kemper writer

In the past decade, the list of cancers clearly associated with obesity or excessive weight has been growing: breast, kidney, uterine, pancreatic, colorectal, and esophageal cancers all are linked to obesity. Some evidence suggests that excessive weight also increases the risk of cancers of the liver, ovaries, cervix, and gallbladder, as well as non-Hodgkin lymphoma and multiple myeloma. Further, people with obesity, defined as a body mass index (BMI) over 30, who get cancer, run a higher risk of recurrence and mortality than people of normal weight (BMI < 25).

These findings are made more alarming by the fact that one of every three American adults is obese, and two of every three are overweight (BMI between 25 and 30). A report last year from the American Cancer Society found that excessive weight accounted for eight percent of all new cancer cases, second only to tobacco.

Some know a bit about both, and some know a lot about one type of cancer. Melinda Irwin, PhD, MPH, Professor of Epidemiology at Yale School of Public Health and Associate Director of Population Sciences at Yale Cancer Center, has spent 20 years studying how lifestyle behaviors affect cancer prevention and control, with a focus on obesity. Another area of focus, as Associate Director of Population Sciences, is facilitating transdisciplinary research among Cancer Center members. She combined both pursuits earlier this year by starting the Obesity and Cancer Working Group.

“My idea was to have a forum to bring together the lab scientists, the clinicians, and the population scientists,” she said, “who have an interest in obesity and cancer so they can share research, grants they’re working on, classes they teach, conferences they go to, papers they’ve published. The hope is that we’ll learn from each other, collaborate, and also work together to submit large NCI grants to study obesity and cancer. The goal is to develop translational strategies and interventions, whether they be lifestyle interventions or targeted drugs.”

Response to the idea has been strong. More than 100 faculty across Yale have joined the group, which met twice this spring, and is scheduled to gather again this fall. Dr. Irwin expects to settle into a regular rhythm of bimonthly meetings with two presentations, one scientific and one about resources at Yale that people might not be aware of.

“It’s a nice mixture of disciplines and faculty,” said Dr. Irwin. “Some of them don’t know much about cancer but know a lot about obesity. Some know a bit about cancer but not much about obesity. Some know a bit about both, and some know a lot about one type of cancer associated with obesity but not much about another type associated with it.”

Fostering collaborations is one of the group’s goals, and Dr. Irwin is leading by example. She recently began a new NCI-funded trial as co-Principal Investigator with Tara Sanft, MD, a breast oncologist, Associate Professor of Medicine, and Medical Director of the Survivorship Clinic at Smilow Cancer Hospital. The project will enroll 250 women with breast cancer who are about to start chemotherapy. Half of them will get behavioral counseling and commit to a program of exercise and good nutrition while undergoing chemotherapy. The other half will follow the usual chemotherapy regimen with behavioral counseling for diet and physical activity after chemotherapy.

“You obviously want women to complete chemotherapy because that’s going to improve their prognosis,” said Dr. Irwin, “but a lot of patients don’t complete it. They can have delays in chemotherapy or dose reductions. Common reasons are neuropathy or fatigue. We hypothesize that a lifestyle intervention of nutrition and exercise will improve the patients’ side effects, in turn improving their chemotherapy completion rate and also preventing weight gain, which is common after being diagnosed and starting chemotherapy.” Weight gain increases the risk of a recurrence.

A collaboration is also underway with the support of a Yale Cancer Center Pilot Grant between Leah Ferrucci, PhD, MPH, and Caroline Johnson, PhD, both Assistant Professors of Epidemiology at Yale School of Public Health. Dr. Ferrucci is a population scientist, Dr. Johnson is an analytical chemist. They are applying their dual expertise to data from the Lifestyle, Exercise, and Nutrition (LEAN) trial in which Dr. Irwin followed two groups of overweight breast cancer survivors after they completed their breast cancer treatment, half of the survivors were randomized to a weight loss program of exercise and improved diet for six months. The study looked for changes in weight as well as biomarkers associated with better or worse outcomes in breast cancer survivors. The women who lost weight had improvements in inflammation-related biomarkers, in particular, C-reactive protein.

Drs. Ferrucci and Johnson are using stool and serum samples from both groups of women to compare changes in the metabolome and microbiome. “Metabolites and the microbiome work together to modulate your health, and a large number of metabolites are produced by actions of the microbiome,” explained Dr. Johnson. “When something aberrant happens, whether it’s a genetic mutation, environmental exposure or other stressor, it can change the balance of both your metabolites and microbiome, which can lead to cancer.”

They analyzed the LEAN stool samples, and found differences between the intervention group and the control group in terms of short-chain fatty acids. “That makes sense,” she said, “because we asked the intervention group to decrease calories, to eat more fruits and vegetables, more whole grains, less meat and fats. In this small pilot study, there was an indication of a greater accumulation of potentially beneficial short-chain fatty acids in the intervention group compared to the control group.” These have been linked to decreased incidence of cancer, colorectal in particular, which is Dr. Johnson’s main research focus.

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And Dr. Ferrucci presented their preliminary findings to the Obesity and Cancer Working Group in June, and received helpful feedback about possible ways to proceed. “That’s one of the group’s purposes. ‘You may be able to find a logical collaborator who is very close by, but you wouldn’t even realize it if you were just in your office doing your own work,’” said Dr. Ferrucci.
Interventional Oncology: Moving Cancer Care Forward

Kevin Kim, MD

It is now referred to as the fourth pillar of oncology, alongside medical, radiation, and surgical oncology, Interventional Oncology is a young, but rapidly evolving field. Led by Kevin Kim, MD, Professor of Radiology and Medicine (Medical Oncology) at Yale School of Medicine, the Interventional Oncology Program at Smilow Cancer Hospital provides patients with additional treatment options for personalized cancer care.

Interventional Oncology was developed as a subspecialty of Interventional Radiology to provide definitive or palliative treatments of solid tumors using targeted, minimally invasive procedures performed under precision image-guidance. Procedures such as embolotherapy, immunoembolization, chemoembolization, Y90 radioembolization (selective delivery of immunotherapy, chemotherapy and radioactive particles targeted directly to the tumor), and thermal ablation (microwave ablation, radiofrequency ablation, cryoablation, and irreversible electroporation to heat, freeze or electrocute and destroy cancer cells) can be delivered as primary or adjuvant treatment, as part of a multidisciplinary care plan. Therapeutic options are also used for palliative care, including various therapies for pain relief, particularly for bone, soft tissue, and spine tumors, and are designed specifically to relieve pain caused by primary or metastatic tumors during cancer treatment, and to gain local control of a cancer so that other therapies can be effective.

One of the first programs of its kind in the country and one of the largest, the Interventional Oncology Program at Smilow is committed to treating patients with multiple types of cancers. First explored using liver directed therapies for liver cancers, Interventional Oncology has grown to become an integral part of the Gastrointestinal, Melanoma, Lung, Sarcoma, and Prostate and Urologic Cancer Programs. In addition, as participants of the Multidisciplinary Pain Program at Smilow, Dr. Kim and his team of Interventional Oncologists offer patients palliative interventions for solid tumors and bone metastasis.

“In my opinion, the field of Interventional Oncology is one of the most fascinating in cancer care right now,” said Dr. Kim. “We are already able to offer top notch care to our patients at Smilow thanks to the expertise in medical, surgical, and radiation oncology, but now we are also able to offer another layer to enhance the potential high impact of treatment with minimal side effects. We can provide more treatment options and clinical trial opportunities for our patients as well.”

After undergoing a grueling regimen of chemotherapy to treat colon cancer that had spread to her liver, Ms. Jo-Anne Gauger was ready to stop treatment. That is until her physician at the Smilow Care Center in Torrington, Dr. Christina Gomez, suggested she meet with Dr. Kim to discuss new options. Dr. Kim determined that she was a candidate for microwave ablation to treat the metastatic disease on her liver. The results have been life-changing.

“I was able to go to work the next day and have since undergone the treatment again to treat a small spot that remained on my liver,” said Ms. Gauger. “To have a ‘chemo vacation’ as we came to call it, is truly a blessing for patients like me. I had lost fifty pounds and chemotherapy was taking a huge toll on me both physical and mentally. As long as the cancer remains contained to my liver, I can continue to be monitored and treated this way without the need for chemotherapy. I now feel like I did 2 ½ years ago before I was diagnosed with cancer. I just hope that other patients out there realize there are other options.”

What would have once been a major procedure for a patient, can now be done through a small incision. The benefit for our patients is immeasurable.

Dr. Kim’s goals for the Program are to make safe and effective novel interventional treatments more available and accessible to patients, and to find ways to advance cancer care in the clinic via innovative research. He commented that he goes to bed thinking about cancer therapies and wakes up thinking about new ways that these therapies can benefit patients. Indeed, the Interventional Oncology Program at Smilow leads their field with novel research. Working in collaboration with colleagues throughout Smilow Cancer Hospital to enhance treatment for their patients is their top priority.

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Recognizing our Nurses

Liz DeLuca

Education has always been important to Liz DeLuca. She and her siblings were the first in their family to attend college, as was her husband, Fred DeLuca. Fred was founder and CEO of SUBWAY® Restaurants. The grants that are given through the foundation he and Liz established, The Frederick A. DeLuca Foundation, typically focuses on young people, and Fred and Liz were hoping for. “Fred and I felt it was important to acknowledge and reward the efforts of all caregivers. It is their work that makes a patient’s life better. It is my hope that the Foundation’s support will help in that regard.”

The oncology nurses work with patients who may not have long to live, but they still have to maintain a positive, encouraging attitude. “Liz started funding scholarships and tuition reimbursement. For us,” said Liz, “education was a road to being self-sufficient.”

For Liz, that meant training to be a nurse. After receiving her nursing degree at the University of Connecticut, she completed her clinical work at Yale New Haven Hospital. Then, for five years, she was a nurse in the surgical intensive care unit at the West Haven VA Hospital. “It was really satisfying to work with patients and families going through difficult situations,” she explained.

When Fred was diagnosed with leukemia in 2013, he and Liz particularly appreciated the day-to-day care and comfort they received from the nurses, nurse practitioners, and physician assistants at Smilow Cancer Hospital. Between the long stays after Fred’s stem cell transplant or short trips for blood transfusions and other tests, Fred was in and out of the hospital for two years, and the couple got a close up view of the dedicated staff at Smilow. Aside from the expertise of the doctors, what struck them most was the empathy and compassion of the nurses. “I think my husband’s life was better because of the care he received at Smilow,” Liz said. “The oncology nurses work with patients who may not have long to live, but they still have to maintain a positive, encouraging attitude,” Liz explained. “I used to think that my experience as a nurse was challenging, but when I saw what the oncology nurses were dealing with, it was just incredible.”

Fred DeLuca agreed, so much so that he told Liz, “I’d really like to thank the people who helped me so much. Let’s think how we can make that happen.”

After Fred’s death, determined to make that happen, Liz returned to Smilow to meet with one of Fred’s doctors, Nikolai Podoltsev, MD, PhD, Assistant Professor of Medicine (Hematology), as well as Catherine Lyons, RN, MS, Vice President, Patient Services, and Chief Nursing Officer, and Lisa Barbarotta, RN, Program Manager, Oncology Nursing Education & Practice. Both Cathy and Lisa were struck by Liz’s affinity for the nursing team. “Liz is a nurse through and through,” said Cathy. “She understands the challenges of trying to provide the best care you can, of keeping the nurses engaged and educated, and what is involved in making sure we have the best and the brightest nurses taking care of our patients.”

Given her nursing background and Fred’s long-time dedication to promoting education, it made sense that Liz decided to direct her generosity in those two areas, asking Cathy Lyons and Lisa Barbarotta in that initial meeting. “What does the nursing staff need most?”

First on the list of needs for nurses was finding a way to help them educate patients more effectively. “Instead of going over the same information again and again, we wanted a way to transmit information to patients clearly and efficiently,” Cathy said. With Liz’s support, Smilow established a fund for patient education that paid for the development of a patient app about cancer treatment and a video for patients undergoing radiotherapy for cancer.

The results of these ongoing efforts will impact nursing at Smilow for years to come. “Beyond the innovative educational instruments for patients and the training for nurses, the downstream effect of Liz’s support is that nurses here feel better about their job,” explained Cathy. “As word gets out, Smilow will become even more of a destination facility for nurses. A single donation can make a world of difference.”

That’s exactly the kind of result Liz and Fred were hoping for. “Fred and I felt it was important to acknowledge and reward the efforts of all caregivers. It is their work that makes a patient’s life better: It is my hope that the Foundation’s support will help in that regard.”

The DeLuca Foundation’s grants are supporting the professional development of Smilow’s nurses in other ways, too. Beginning in 2016, Liz started funding scholarships and offering extra tuition reimbursement that has made it easier for a number of nurses to pay for their education. The grants have also helped nurses attend national conferences and meetings, and have paid for a professional library...
“The Smilow Cancer Hospital Care Center in Guilford gives our patients access to multidisciplinary cancer care close to their homes on the Connecticut Shoreline. We partner with our colleagues at Smilow Cancer Hospital to offer genomic analysis, personalized treatment plans, and clinical trials, when appropriate.”

— Dr. Wajih Zaheer Kidwai
Medical Director

Our Gamma Knife Center recently celebrated its 20th anniversary and treated its 5,000th patient. Do the same patients benefit from stereotactic radiosurgery today as compared with 20 years ago? When our Gamma Knife Center opened in 1998, it predominantly treated inoperable or high surgical risk neurosurgical conditions. In its first year, 174 patients were treated using the Gamma Knife. Of these patients, over a third had a pain disorder known as trigeminal neuralgia, a quarter had benign brain tumors, and another quarter had brain metastases. Typically, only one lesion per patient was treated during each Gamma Knife session.

Not only has the number of Gamma Knife cases increased to 300-350 cases per year, but our patients have also changed. With improved cancer survival, more patients with brain metastases need Gamma Knife treatment to keep their disease under control. Gamma Knife has become first line treatment for brain metastases.

Our team is continually focused on new research to benefit patients with metastatic cancer. Newer cancer treatments, such as targeted therapies and immunotherapies, can cross into the brain and cause unintended consequences. In some cases, the therapies can be helpful in conjunction with Gamma Knife radiation, but many times the interaction can be harmful to the patient. Therefore, our research focuses on new combinations to determine when Gamma Knife should be used. Our physicians collaborate closely with our colleagues in medical oncology at Smilow Cancer Hospital to lead the field nationally in research in this area.

Veronica L.S. Chiang, MD, FAANS
Professor of Neurosurgery; Director, Gamma Knife Center

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How has the technology changed over the last 20 years?
While the Gamma Knife technology has evolved, our ability to use the head frame both as a localizer and as an immobilizer during radiosurgical treatment remains. The head frame is the best method to achieve submillimeter precision in the delivery of radiation allowing the Gamma Knife to treat targets less than 5mm in size with guaranteed accuracy. With the original Model C, all the coordinates for treatment targeting were set by hand and only single target treatments were possible. Today, multiple targets can be treated using our Gamma Knife Icon, which is designed so that the patient’s head is held in one position and the whole bed moves around to bring the targets into the correct position for treatment. The Icon can also deliver mask-based radiosurgical treatments. When treatments are several hours long, patients can often sleep comfortably in one position for the duration of their treatment.

What are the research priorities for the Gamma Knife Center?
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Read their stories:
yalecancercenter.org/survivors