

# FOX CHASE Forward

BROADENING THE CONVERSATION ABOUT CANCER | SPRING/SUMMER 2017

## SEX AFTER CANCER

Regaining Quality of Life

NURSES SHARE  
THEIR STORIES

ROLAND DUNBRACK:  
RENAISSANCE  
SCIENTIST

 **FOX CHASE**  
CANCER CENTER

TEMPLE HEALTH

## TRANSCENDING BOUNDARIES

**R**einvention and rebirth so often characterize the world of oncology. In studying and treating a disease once considered fatal, we find ourselves challenging old methods, testing personal limits, and overcoming perceived barriers. We use creativity. We collaborate. We lean on each other.

In these pages, we see how the cancer experience extends far beyond the immediate concerns of medical appointments and hospital stays to pervade the most personal aspects of patients' lives. Our cover story explores this idea by addressing a subject not often talked about, that of sex and cancer. Our clinicians and patients shared candid thoughts helping to communicate that quality of life means as much as survival.

In the lab of computational biologist Roland Dunbrack, members embrace diversity and engage in thoughtful discussion to help advance the work of colleagues around our institution. A visionary leader, Dunbrack himself sets this tone, teaching that artistic and

intellectual pursuits alike, new ways of thinking, and openness to possibilities bring about innovation, create synergy, and connect us to new discoveries.

Perhaps more so than in other areas of medicine, we have the privilege of developing relationships in oncology. Our nurses talk about this in one of the issue's feature articles, what drew them to the field, and what keeps them here despite some of the misconceptions others have about caring for cancer patients.

You will also meet Brian Kozeza, a devoted husband and father, police officer, and Ironman competitor. At just 36, this seemingly healthy, vibrant man faced the daunting news of being diagnosed with a rare form of cancer. Even worse, the disease already had spread throughout his body. It was my privilege to care for Brian, and I encourage you to heed his advice: "Persevere, Prevail."

Examples of inspiration and unconventional thinking abound throughout our Center's history. Our 'Rewind' article recalls one



of our most noted figures, Barry Blumberg. Blumberg's natural curiosity led him and his collaborators to discover the hepatitis B virus — work that earned him the Nobel Prize. His work transcended boundaries and had major implications for the prevention of cancer.

By pushing ourselves and by inspiring others, our Fox Chase community spurs advances in what we know about cancer. The lessons go deeper, though, to teach us about each other and the power of commitment and passion.

**Richard I. Fisher, MD**  
PRESIDENT AND CEO

### FOX CHASE **Forward** SPRING/SUMMER 2017

FORWARD magazine is published twice a year for friends of Fox Chase Cancer Center by the communications department of Fox Chase. One of the leading cancer research and treatment centers in the United States, Fox Chase was founded in 1904 as one of the nation's first cancer hospitals, and was among the first institutions to be designated a National Cancer Institute Comprehensive Cancer Center in 1974. Fox Chase joined Temple University Health System in 2012.

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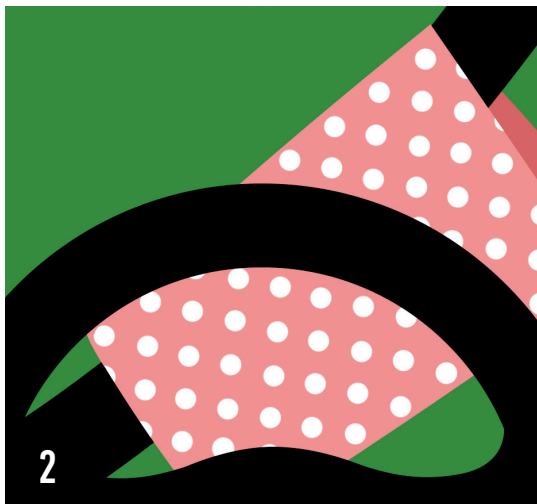
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## AN IDEA AS GOOD AS GOLD

**O**n a visit to Fox Chase Cancer Center during the summer of 2015, Sanjna Shelukar, 17, noticed a patient struggling with her seatbelt as she got into her car. She guessed that the seatbelt was extremely uncomfortable for the woman because she had had some sort of procedure done on her chest. Immediately, Shelukar decided to get involved.

“I’ve been a Girl Scout for 13 years,” Shelukar said, “One of our core values is to make the world a better place. I saw that there was a need and knew I had to help.”

At the time, Shelukar was planning a project to submit for a Girl Scout Gold Award, the highest honor a Girl Scout can earn. The competitive award requires applicants to identify and solve a problem affecting their community. After doing some research, she decided to create a seatbelt sleeve cushion for mastectomy patients.

Shelukar began developing prototypes, getting feedback from Allison Aggon, a surgical oncologist specializing in breast cancer, as well as Fox Chase nurse navigators. After months of trial and error, Shelukar had her final

product in June 2016; she named it the Soothing Sleeve.

Her next step was production, so along with six of her classmates at Wissahickon High School, Shelukar created 40 Soothing Sleeves, which were distributed to breast cancer patients at Fox Chase in the fall of 2016.

“I saw that there was a need and knew I had to help.”

— SANJNA SHELUKAR,  
STUDENT RESEARCHER



At the same time Shelukar also volunteered as a student researcher in the lab of Kerry Campbell, director of the Cell Culture Facility at Fox Chase. There, she assisted with research on natural killer (NK) cells to treat multiple myeloma, a plasma cell cancer that affects about 30,000 people each year.

“I’ve always been a curious person, which is why cancer research is so interesting to me,” Shelukar said. “There’s always more to know and discover. Working in Dr. Campbell’s lab, along with developing the seatbelt sleeve, definitely piqued my interest in breast cancer research.”

Rather than mass produce Soothing Sleeves, she developed a website that shows people how to make them. Shelukar hopes to inspire others to join her effort and make them for others, too. The Girl Scout Council recognized Shelukar’s extraordinary efforts with its Gold Award in November 2016.



## ART BLOOMS AT FOX CHASE

A new mural is brightening the halls and spirits at Fox Chase Cancer Center. The colorful painting of three large sunflowers stretches across a wall between the Hospital and Center buildings, and extends out into a peaceful corner of the courtyard. A brilliant red cardinal, a few small ladybugs, and some words of inspiration complete the mural.

Artist Loraine Dunn, who is also an ambulatory care representative at Fox Chase, painted the beautiful mural over the course of two weekends with support from the Friends of the Hospital of Fox Chase Cancer Center, a chapter of the Board of Associates.

Since its founding in 1969, Friends, which is comprised

“The new mural makes a special place more special... Now when I pass by, I think of my mom.”

— DAWN ELLIOTT,  
ASSISTANT DIRECTOR OF  
PHARMACY AT FOX CHASE

entirely of Fox Chase employees, has donated more than \$4 million to Fox Chase to support patient comfort and care. They have purchased items such as blanket warmers, wheelchairs, and inpatient room sound machines,

in addition to contributing to upgrades to the hospital chapel and surgical waiting room.

In fiscal years 2016 and 2017, the group funded the Art Committee to create an environment that enhances the patient, visitor, and employee experience. The new mural demonstrates how the committee is adding beauty and serenity to the Center.

“I’ve always believed when you see a cardinal that someone is visiting from heaven,” said Dawn Elliott, assistant director of pharmacy at Fox Chase. “Now when I pass by, I think of my mom, who was a Fox Chase patient and volunteer who passed away in 2012. The new mural makes a special place more special.”

## A NOTE OF HOPE

Even the best hospitals see their share of anxiety, loneliness, and sadness. Cancer survivor Charlie Lustman knows this firsthand, and makes it his mission to lift spirits at cancer centers all over the country. Lustman, a professional musician, spent a full day at Fox Chase in December 2016 as part of his Hope for the Holidays tour.

Throughout the day, Lustman's personal performances and one-on-one conversations brought smiles to patients, caregivers, and staff members all over the campus. In the afternoon, he gave a special performance in the cafeteria, during which he told a bit of his story, sharing how his own medical team and fellow patients inspired him to give back through music.

**“My job is to bring a musical message of hope to anyone dealing with cancer.”**

— CHARLIE LUSTMAN,  
MUSICAL PERFORMER AND  
CANCER SURVIVOR

In 2005 Lustman was diagnosed with a rare form of cancer in his upper jaw. According to the American Cancer Society there are about 400 new cases of osteosarcoma diagnosed in adults in the United States each year. The survival rate after five years is about 70 percent, but for

certain forms of osteosarcoma — like the type Lustman had — the rate can be much lower. Luckily, he was declared cancer-free after two surgeries and a year of treatment.

To beat his cancer, doctors removed three-quarters of Lustman's upper jaw. He was fitted for a prosthetic jaw, which he still wears. During his recovery he had to learn how to talk, eat, and, of course, sing again with his new jaw.

Lustman had been a singer and jingle writer before his cancer diagnosis, and he has spent the years since his successful treatment using his talent to bring cheer to patients.

“My job is to bring a musical message of hope to anyone dealing with cancer,” he said.



PHOTO COURTESY OF CHARLIE LUSTMAN

## SOMETHING SUITE AT FOX CHASE

With 5,000 surgeries each year at Fox Chase Cancer Center, creating a comfortable, serene, and private area for family and friends to wait for their loved ones is a top priority of the Center.

On October 10, 2016 Fox Chase unveiled the Marian and Emma Brungard Surgical Family Waiting Suite, a newly redesigned space on the third floor of the hospital.

Previously, the surgical family waiting area was situated in the midst of a well-traveled hallway with no privacy for surgeons to consult with family members. Senior leadership sensed there was an opportunity to better serve patients and caregivers with an enhanced space. With the annual In Vino Vita benefit and wine auction on the horizon, plans were put into motion to fund the project during the special pledge at the 2015 event. The space was also funded by the Trust of Marian Brungard, a longtime volunteer at the Center. The space is named in memory of Marian and her sister, Emma Brungard.

“I knew we could do better,” said Richard I. Fisher, president and CEO of Fox Chase Cancer Center. “We owed that to our patients, their loved ones, and our faculty.”

The lounge area, which is flooded with natural light, is outfitted with comfortable seating, flat-screen televisions, an expanded snack area, lockers for personal belongings, and a private restroom. Additionally, a HIPAA-compliant screen allows family members to follow the progress of their loved one.

The rear lounge, which is named for Donald and Lauren



“It reiterates the message we strive to communicate with the care we provide every day: our patients and their families are our number one priority.”

— RICHARD I. FISHER,  
PRESIDENT AND CEO OF  
FOX CHASE CANCER CENTER

Morel, is equipped with a large dining table and charging stations. There are also three private consultation rooms named for William J. and Susan C. Federici, Thomas W. and

Katherine W. Hofmann, and John M. and Palma Daly. These rooms provide a comfortable space for surgeons to speak with family members. The Friends of the Hospital also provided financial support, and a plaque recognizing their contribution is displayed in the kitchen area.

The Volunteer Services Department provides staffing for the room five days a week to greet caregivers as they wait for a loved one to emerge from surgery.

“The new space — which will host about 10,000 guests each year — affords privacy for the intimate and essential conversations that take place between families and surgeons in three private consult rooms,” Fisher said. “It reiterates the message we strive to communicate with the care we provide every day: our patients and their families are our number one priority.”

# Let's Talk About



## An Intimate Look at Cancer and Sex

CANCER CAN TAKE PEOPLE THROUGH A SERIES OF waiting rooms, infusion rooms, operating rooms, and hospital rooms. When it's over, another problem can be lurking in a different room: the bedroom.

"We talk about sex so often in this country," said Paul Gittens, director of the Philadelphia Center for Sexual Medicine. "It's all around us on TV, in commercials, on billboards. When it comes to sexual health and especially sexual health after cancer, nobody wants to talk about it."

BY PAIGE ALLEN

PHOTOGRAPHY BY ANN CUTTING





# the

majority of people live with some type of chronic issue after surviving cancer, ranging from pain to fatigue to issues with sexual function. Cancer patients in particular have unique needs when it comes to sex, as treatments can leave a lasting impact on a person's ability to resume a healthy sex life, even after treatment is behind them.

"As treatments continue to improve, patients are increasingly getting this gift of survivorship and we want to make sure they're getting a gift they can enjoy," said Jennifer Reese, assistant professor in the Cancer Prevention and Control program at Fox Chase Cancer Center, and a licensed psychologist. "It is important to address the whole patient."

In addition to changes in appearance and fatigue that are common with chemotherapy, radiation treatments can accelerate naturally occurring erectile dysfunction in men and can cause vaginal dryness and stenosis in women. Surgical procedures — especially those used to treat gynecologic and genitourinary cancers — can cause nerve damage that can entail months of recovery. However, doctors and researchers are developing tools to address these issues and improve quality of life for patients.

"People are terrified this part of their life is over. It doesn't have to be," said Alexander Kutikov, a urologic surgical oncologist at Fox Chase. "Addressing that fear is one of the first things we do."

Historically, it's been an awkward topic in clinic rooms, said Crystal S. Denlinger, chief of gastrointestinal medical oncology and director of survivorship at Fox Chase. While it's easy for doctors to ask patients about pain level or bowel issues, asking about their sex life can be uncomfortable.

Patients may be reluctant to bring it up initially because they're overwhelmed by their diagnosis, Denlinger said.

"For a lot of people, it's not a primary concern when weighed against treatment for cancer," she said. "When it does come up, there's usually a degree of sheepishness and embarrassment."

"There's also a level of provider discomfort. Providers bring their own feelings into it and if they are skittish about it, the conversation may not come up."

Even if the conversation is awkward, many physicians make sure they allow patients an opportunity to talk about it. Joshua E. Meyer, a radiation oncologist at Fox Chase who treats gastrointestinal cancer, addresses the impact that radiation can have on sexual function with every patient he treats. With gastrointestinal cancers, patients will receive radiation to the pelvis, which can lead to issues with sexual function.

"It can be a huge challenge to be a cancer survivor," Meyer said. "We try to support and prepare people and do as much as we can to help those who encounter issues."

Different kinds of treatments and surgeries can lead to a variety of problems.

For breast cancer patients who undergo mastectomies, there is loss of sensation, even if they have reconstructive surgeries, said Richard J. Bleicher, director of the Breast Fellowship Program at Fox Chase. During mastectomy surgery, the nipple and areola are removed, in addition to the tissue below the skin. Even in cases where the nipple can be spared, the sensation or feeling is generally lost in that area, he said.

"It's important for women to know reconstruction is not perfect," Bleicher said. "They can achieve good cosmetic outcomes but numbness is still an issue."

As patients recover from surgery, they may start to become irritated by the numbness.



***"It takes some persistence, some openness, and some willingness to try new things. You're learning your post-cancer body and that requires open communication."***

— JENNIFER REESE, ASSISTANT PROFESSOR IN THE CANCER PREVENTION AND CONTROL PROGRAM AT FOX CHASE CANCER CENTER

"Often patients don't worry until after they've done well from surgery," said Bleicher. "When patients get back to saying 'this is annoying to me,' that shows they've gotten through the most daunting aspect and they're moving toward focusing on quality of life."

Men who have their prostate removed — even those who undergo nerve-sparing surgery — will experience erectile dysfunction as their nerves recover and slowly heal. Salvaging the nerves is especially difficult for patients with bladder cancer who undergo concomitant bladder and prostate removal, Kutikov said. Even though a new bladder can be reconstructed from the small intestine, erectile function is very frequently affected as it can be difficult to preserve nerve function in these patients.

For women who undergo cystectomies, the uterus and part of the vagina are removed in addition to the bladder. Patients



who have part of their vagina removed can experience particular difficulty with intercourse, Kutikov said.

Surgeries to treat gynecologic cancers can also create challenges in resuming a healthy sex life.

Diagnosed with a rare form of vaginal cancer at 26, Ashley\* was consumed with worry as she recovered from surgery.

To remove her tumor, Ashley's surgical team at Fox Chase believed they would need to remove her vagina.

"I went into surgery and I was supposed to come out looking like a Barbie doll," Ashley, now 32, said.

During surgery, Kutikov, part of Ashley's surgical team, found a way to preserve a functioning vagina for her.

Still, the surgery was invasive and complex, leaving Ashley wondering how she would have a sex life moving forward.

"Who is going to love me now?" she asked herself at the time.

While Ashley worried, her doctors believed not only that she would survive cancer, but that she would have a vibrant, happy, and healthy life — sex included. While she lives with difficulties as a result of her surgery, that prediction has come true.

"If you are open with them, they will help you and set you up with what you need," she said. "They understand it's a priority."

### Breaking Down Barriers

At Fox Chase, clinicians and researchers from all disciplines work together to treat their patients for cancer and for life after cancer.

Marcel Knotek, a urologic physician assistant, leads the Center's erectile dysfunction clinic, where he sees patients with a variety of cancer types. In a private setting, Knotek meets with patients — and their partners, and goes over the available options.

Knotek finds most patients regain erectile function on their own over time and medications can be prescribed to help. Other options include injections and suppositories, a vacuum device that increases blood flow to the penis, and, in more extreme cases, implantable devices.

While the clinic is open to all patients, many are men who are grappling with the effects of a prostatectomy.

"After surgery, the nerves are damaged and shocked and they need time to recover," Knotek said. "Recovery takes place over months, not days or weeks. It really does take a while and patients should expect that it's normal after surgery to go through this."

The Women's Menopausal and Sexual Health Program directed by Cynthia A. Bergman, a gynecologic surgeon, provides

clinical support for a range of concerns from menopausal changes, to sexuality and intimacy, and fertility concerns.

"Historically, there hasn't been training for physicians," said Bergman. "That's been one of the biggest barriers."

Patients can experience post-treatment issues that cause pain during intercourse or in some cases, prevent intercourse. Using local topical estrogen that doesn't get absorbed into the body, using lubrication during intercourse, and dilator therapy can help.

Women can feel like they've lost their femininity after losing an ovary or their uterus, Bergman said.

"Some people feel connected to their organs as a representation of their womanhood," she said. "We help people get comfortable and understand their new anatomy so they feel better and more in control of their body."

Through the program, Bergman and Sharon Schwartz, a nurse practitioner, have developed a large network and can direct patients to more specialized treatment options.

"When we aren't able to provide complete solutions, we know who else might be able to help our patients," Bergman said.

For patients who require additional expertise, Gittens's practice focuses exclusively on issues of sexual function and he treats many cancer patients.

"It's not just about the physical aspect," he said. "It's about building their self-esteem and helping their relationships."

## Transformative Research

In addition to providing specialized clinics for patients seeking help for sexual function issues, Fox Chase investigators are conducting research into the area.

Reese focuses on issues of survivorship, quality of life, and sexual function. Currently, she is pilot testing a couple-based intervention aimed at helping breast cancer survivors cope with the effects of treatment and subsequent stress.

"We give them tools for coping with the impact of their cancer treatment on their intimate relationship," Reese said. "Couples get in the habit of relying on intercourse to show affection and when intercourse is removed from the equation, they can feel a loss of intimacy and affection."

Couples may struggle to transition from the caregiver-patient relationship that came into play during treatment back to their intimate relationship. Caregiver partners may worry about their partner's health or be afraid of hurting them.

"It takes some persistence, some openness, and some willingness to try new things," Reese said. "You're learning your post-cancer body and that requires open communication."

*"I believe there is more to cancer care than just the treatment itself."*

— ERIC M. HORWITZ,

CHAIR OF RADIATION ONCOLOGY  
AT FOX CHASE CANCER CENTER

In the past, Fox Chase conducted a clinical trial to determine if radiation techniques could be adjusted to decrease incidence of erectile dysfunction for male patients who were being treated for prostate cancer. While the results didn't show a difference, Eric M. Horwitz, chair of radiation oncology at Fox Chase, said it's an indication that Fox Chase clinicians and researchers take the issue seriously and are looking for ways to lessen the impact of treatment on patients and their quality of life.

"It's something we've been interested in for a long time," he said. "I believe there's more to cancer care than just the treatment itself."

When working with patients to determine the best course of treatment, doctors factor in quality of life issues, sex among them. For prostate cancer patients, when low-risk cancer is confined to the prostate, it can be closely monitored with PSA tests, physical exams, serial biopsies, and MRI imaging in a process known as active surveillance.

"In prostate cancer, it's one of the main conversations we have," Horwitz said. "We have so many effective ways to treat people. For prostate cancer patients, there's a genuine choice and quality of life issues end up being part of the conversation."

While surgery and radiation may be necessary later on, patients are able to live for months and even years without enduring the physical toll of surgical or medical treatments.

"Preserving sexual function is one of the key reasons people choose active surveillance," Horwitz said.

For men who are ineligible for active surveillance and need immediate treatment, helping them understand the side effects of radiation treatment and prostatectomy, and providing solutions for those problems is important.

When John\* was diagnosed with prostate cancer five years ago at age 56, he was initially wary about surgery. But after discussing treatment options with his doctor, Kutikov, he elected to have his prostate removed. Following surgery, he began suffering from mild erectile dysfunction.

He turned to Kutikov and Knotek for advice, and through a combination of medication and vacuum therapy, he's been able to recover. Typically, medication like Cialis and Viagra works, but occasionally he needs extra assistance and turns to vacuum therapy to increase blood flow quickly.

"I'm older, and that goes along with it but in my case, I'm 85 to 90 percent without a problem," he said. "I was naturally worried about it, especially after the operation. You've rearranged your insides, so when you start to feel sensation again, that's amazing."

Knowing he could talk to his oncologists about the problem and that they would work to solve it was a relief.

"They're so experienced that they break down those barriers fairly quickly," he said. "It's comforting to know you're not alone."

## Beyond the Physical

For some patients, the concerns and side effects they experience extend beyond just physical complications.

Some treatments come with side effects that bring patients into new, uncharted territory, such as using colostomy bags.

"Bags and pouches can be embarrassing for people and it can really affect their willingness to ask for intimacy," said Emmie I. Chen, director of psychiatry at Fox Chase. "There are a lot of challenges that we support patients and families through."

Fox Chase has a team of psychologists and psychiatrists trained to help patients through a variety of issues related to their cancer journey, including sex and personal relationships.

"Concerns about sexual functioning and sexual desire, or libido, tend to recede into the background in early phases, when patients are typically processing complex information and managing the immediate demands of treatment," said Michelle Rodoletz, a clinical psychologist at Fox Chase. "It tends to drop as a priority."



As time passes, issues related to sex, physical intimacy and relationships tend to emerge as people redirect their health-related focus and reassess priorities.

“Just like there is not a one-size-fits-all for cancer treatment, there’s not one solution for issues with physical intimacy either,” Rodoletz said. “We try to be very targeted and tailored, guided by each patient’s situation and needs.”

It’s important to emphasize that what patients are feeling can be completely normal and they’re not alone in feeling embarrassed or frustrated that their bodies aren’t the same, said Chen.

“Often people come to us and say ‘I just want to get back to my old self,’” Rodoletz said. “But we can only move forward, not back, and this may be especially true in this domain — even with regard to changes to sexual functioning that are associated with normal aging. A more realistic and adaptive goal may be to learn to edit one’s sexual ‘script’ to reinvent this aspect of identity.”

### Preserving Fertility

For younger patients, cancer treatments can also threaten their ability to have children.

Certain types of chemotherapy drugs can cause infertility, Denlinger said. Chemotherapy can also cause temporary or premature menopause in women.

Some surgical procedures, such as having the ovaries or uterus removed, can prevent patients from carrying biological children.

Radiation treatments also have an impact, especially for patients who have radiation to their pelvic area. For female patients, the area that needs treatment is immediately next to the ovaries, said Meyer.

“The ovaries can be removed from the radiation field to minimize the amount of radiation they receive, but the uterus will still receive a fair amount of radiation,” he said.

Men who undergo radiation treatment for any type of cancer must wait to make sure their sperm was never exposed to radiation before moving forward with planning a family.

“In men, sperm are typically viable after treatment but they should wait a full year to ensure all radiation-affected sperm are gone,” Meyer said.

To help patients navigate through fertility issues caused by cancer treatment, Schwartz serves as the point person for the oncofertility referral service at Fox Chase. In addition to meeting with patients to discuss resources and information,

Schwartz coordinates referrals and appointments so people are able to have all options on the table before moving forward with their cancer treatment.

The largest barrier is typically cost; Schwartz works with people to identify financial assistance that may help bring down the costs of freezing eggs. Additionally, Fox Chase has relationships with fertility clinics in the Philadelphia area that offer a discount for Fox Chase patients.

“There’s still a lot that gets in the way,” Schwartz said. “At least when we get them that information and get them in to see specialists, they can make that decision.”

As the number of cancer survivors grows, providers are opening the lines of communication with patients about quality of life issues and are increasingly turning their focus toward treating the whole patient.

“Just finishing treatment for cancer isn’t necessarily enough and it shouldn’t be enough,” Denlinger said. “We want to know how we can get our patients back to good – whatever that means for them.”

Patients like Ashley appreciate the openness and willingness of doctors in addressing concerns about sexual health after cancer.

“People need to talk about this,” she said. “It’s not about the feeling – it’s about the emotional component, the love. Life would feel empty without it.” ♦

*\*Names have been changed for privacy*

HOW ONE SCIENTIST FORGED HIS OWN PATH

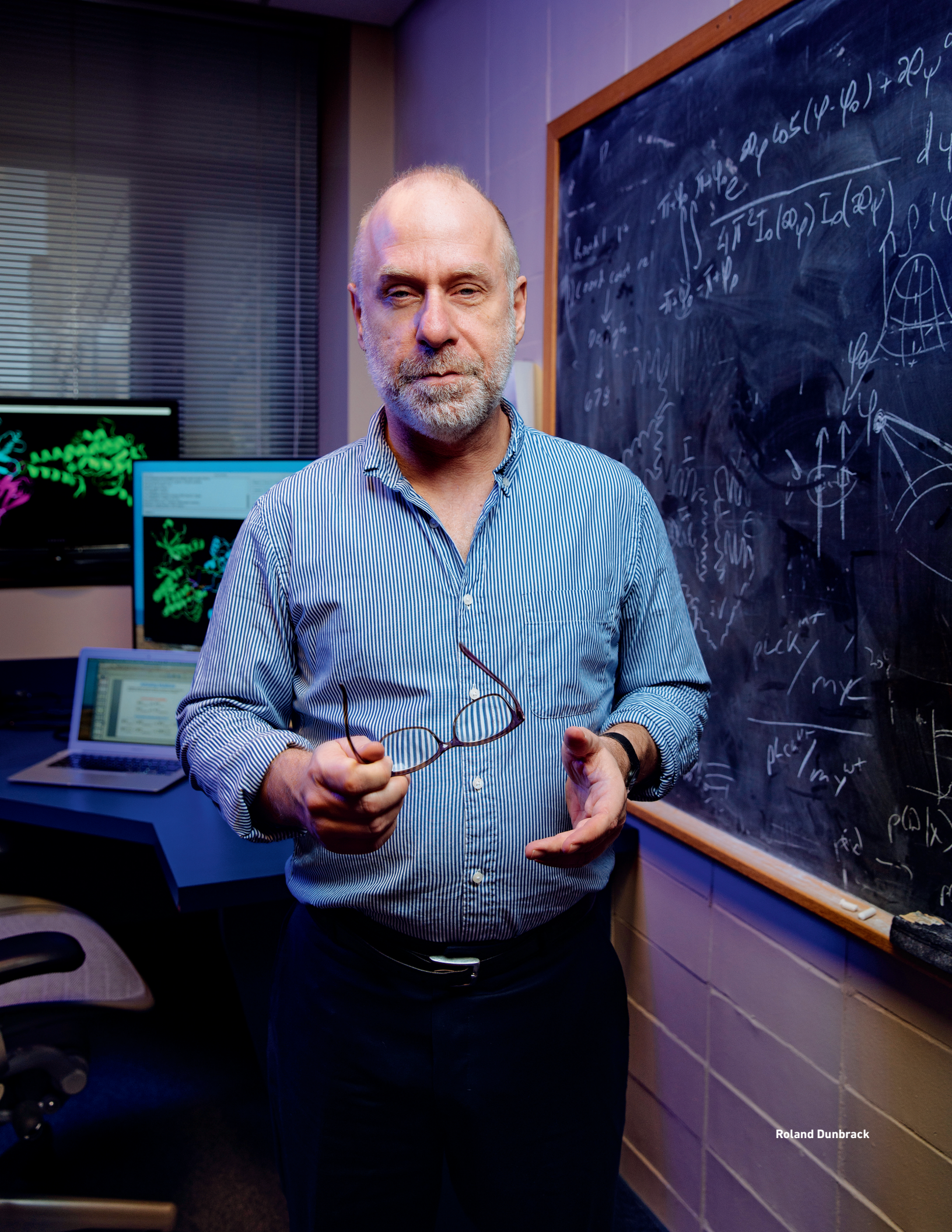
# PROTEINS —AND— PAVAROTTI

( BY  
PAIGE  
ALLEN )

**R**oland Dunbrack was a toddler when Stanley P. Reimann died. But Reimann — founder of the Institute for Cancer Research, which evolved into Fox Chase Cancer Center — shared some striking similarities with the scientist Dunbrack has become. They share a love of the performing arts, an interest in learning about the wider world outside of science, and a philosophy of research that encourages searching in unexpected places in order to answer important questions about cancer.

Growing up in the suburbs of Boston, Dunbrack, 53, found himself pulled to math and science. Chemistry, physics, biology, and math — he loved it all. Over the years he found a way to blend the different disciplines, and has become a renowned computational biologist. Today he is a pioneer in a field of science that barely existed when he was a student.

✓ PHOTOGRAPHY BY  
GENE SMIRNOV



Roland Dunbrack

In 1981, sitting in a freshman chemistry course at Harvard University, Dunbrack was fascinated watching a computer simulation of a protein. He soon realized he could apply what he knew about one area of science to others.

"I liked physics and mathematics but I could also apply it to biology," he said. "There wasn't a sharp divide. I could be a person trained in computing and physics and apply it to the world of biology."

After his sophomore year, he first tried working in a lab, where he quickly learned the value of good mentors and how to rebound from mistakes.

Following graduation, Dunbrack found himself at a crossroads, personally and professionally. Seeking a change of scenery, he swapped Cambridge, Massachusetts for Cambridge, England. There, Dunbrack focused his studies on biochemistry and computational chemistry.

After two years overseas, Dunbrack was recharged and ready to enroll in Harvard once again, this time for a doctorate in biophysics. His PhD mentor was Martin Karplus, winner of the 2013 Nobel Prize in Chemistry, and the professor from that very same freshman chemistry class.

He began a focus in graduate school on how to predict the structures of proteins, and that focus continues some 30 years later. Using computers, he built models of newly identified proteins based on the known structures of related proteins. This kind of work provides other scientists a more precise understanding of how a given protein functions, and enables them to devise more precise experiments.

In 1997, following the completion of his postdoctoral fellowship at the University of California San Francisco, Dunbrack returned to the northeast, to accept a position at Fox Chase. Before long, he was collaborating with his new colleagues across the Center to model the proteins they were working on.

In a time before computers became ubiquitous, Dunbrack showed researchers from various disciplines that they could be used to rapidly advance scientific discovery.

As technology crept into every aspect of life, and people generally became more comfortable using computers, Dunbrack developed numerous software programs that are in use by thousands of scientists and researchers around the world today.

At Fox Chase, as more people got wind of Dunbrack's work, more projects came his way. In 2003, the Center received a grant to start a molecular modeling facility, which allowed for a dedicated staff member.

"It's fun because I've learned a lot of biology, especially

cancer biology," he said. "I learn something new every time someone comes to me."

With his students, Dunbrack has performed extensive statistical studies of detailed aspects of protein structures. These statistical analyses are used in most of the protein structure prediction and design programs developed in labs around the world.

In recent years, he has turned his attention to the design of proteins – using the computer to design new amino acid sequences that produce proteins with new functions. He is applying this technology to designing new antibody drugs against cancer.

### BUILDING HIS TEAM

Over the years, Dunbrack has built a close-knit and diverse lab.

After meeting Dunbrack in India, Vivek Modi, a postdoctoral fellow, joined the lab in 2013. Modi was interested in Dunbrack's field of work and knew there was nowhere better to train.

"Roland's lab is one of the best places in the world in this area," he said. "It's kind of a dream come true to work with Roland. He's not just a great scientist, he's a great human."

Maxim Shapovalov first met Roland in 2003, when he was an exchange student from Russia collaborating with Fox Chase during a thesis project. He rejoined the lab in 2006 as a programming analyst.

"Working with Roland, I was exposed to the beauty of biology and math," he said. "Roland is not just a mentor, he's a very good friend."

Qifang Xu joined the lab in May 2005, when she was a graduate student studying computer science at Temple University. Upon receiving her PhD, she completed her postdoctoral fellowship at the lab and stayed on as a research assistant professor.

Simon Kelow, a graduate student at the University of Pennsylvania,

joined the lab in May 2015. He started out as an astrophysicist but quickly became enthralled with protein structure prediction and protein design, making him a perfect match to join Dunbrack's lab.

Training and working with one of the world's experts in the field is inspiring, Modi said, especially since Dunbrack has fostered a positive environment that allows the group to flourish.

"He doesn't put pressure on us," Modi said. "We feel motivated but we don't feel any pressure. We have a lot of fun in the work we do."

The group is very tight, socializing regularly, going skiing, and celebrating the Chinese New Year together.

"WORKING WITH ROLAND,  
I WAS EXPOSED TO THE  
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MATH. ROLAND IS NOT  
JUST A MENTOR, HE'S A  
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— MAXIM SHAPOVALOV,  
PROGRAMMING ANALYST AT  
FOX CHASE CANCER CENTER





**From left to right: Maxim Shapovalov, Simon Kelow, Roland Dunbrack, and Vivek Modi**

“There’s so much you can learn from him,” Modi said. “You can talk about all different things, from history to politics to science to everything else.”

Working collaboratively with Dunbrack and the team, Mark Andrade leads the Center’s molecular modeling facility.

“The lab is pioneering new discovery in cancer biology using computational methods and they’re also pioneering the methods themselves,” Andrade said. “The modeling facility is the liaison to other labs that can access and use the methods they’re creating.”

All of Fox Chase’s research programs use the facility, and due to the collaboration, either Dunbrack or Andrade co-authored some 30 scientific papers between 2010 and 2015. One of the more notable studies involved analyzing genetic mutations to determine which patients would and would not respond to chemotherapy for bladder cancer. Those findings are helping to bring personalized medicine closer.

With his dual role as a biochemist and manager of the modeling facility, Andrade has a deep understanding of the value Dunbrack and his group provide.

“It’s fun to be able to have minds from different areas of expertise applied to the problem at hand,” he said. “There’s a great synergy here.”

## BREAKING THE MOLD

Dunbrack feels his responsibility to his team extends beyond the lab. On any given afternoon, it’s not uncommon to find them at Fox Chase’s daily tea time, a tradition that dates back to the 1940s that was devised to foster collaboration amongst the researchers and clinicians across the Center.

Xu appreciates the family-like atmosphere that Dunbrack encourages in his team.

“I feel this group is my second family in the United States,” she said. “Roland treats everybody respectfully

and equally, and keeps our group diverse.”

Outside the lab they have free-flowing conversations about topics ranging from food to cultural differences to world politics.

“It’s good to get a break from the science,” Dunbrack said. “I want them to be comfortable talking about anything. They’re going to be interviewing for faculty jobs and they have to learn about more than just science.”

Dunbrack’s lab members appreciate the inclusive atmosphere and the chance to learn about one another’s backgrounds and interests.

“He encourages us to think about and engage in topics outside of the lab and science while applying the same measure of intellectual ambition,” Kelow said. “As a black student, I’ve often felt out of place in various science arenas, but being able to openly discuss problematic mindsets in society is helpful and he encourages that.”

Dunbrack wholeheartedly embraces his hobbies, as well. In college, he took clarinet, piano and art history classes. He’s an avid cyclist, and as a resident of South Philadelphia, he loves exploring the city’s offerings, especially the theater and opera.

Many of his close friendships have come through his participation in the city’s singing groups. He previously belonged to the Philadelphia Gay Men’s Chorus and now sings with the Philadelphia Voices of Pride.

“It’s just fun to sing,” he said. “It’s so different from what I do in my day job. It’s a great stress relief.”

While modeling the structures of proteins and singing don’t often go hand in hand, Dunbrack has found that his interests occasionally do overlap. He invited his lab members to one of his recent performances and was touched to find most of them attended.

“I was really moved when they came to my concert,” he said. “It made me very proud that they wanted to come.”

Dunbrack’s wide variety of interests and openness to exploring new opportunities and experiences isn’t a surprise to those who work with him.

“Roland is an amazingly bright, creative scientist. He moves so fast sometimes that I can barely keep up with him,” said Andrade. “As a scientist, his openness makes a lot of sense. It’s a sign of someone who has the creativity to pioneer new visions.”

One can assume that Reimann would feel his institute is in good hands with scientists like Dunbrack continuing his legacy. ♦

# WITH THESE HANDS

## STORIES FROM ONCOLOGY NURSES

**F**lorence Nightingale compared nursing to the fine arts, saying it required at least as much preparation and devotion as the work of a painter or sculptor. Contributing to every aspect of patient care throughout the entire cancer experience, nurses at Fox Chase Cancer Center provide unparalleled care with clinical expertise, kindness, and compassion. Nurses from several practice areas gathered recently to talk about working in oncology. Barbara Stewart, Intensive Care Unit (ICU); Candy Kehoe, Post-Anesthesia Care Unit (PACU); Julie Dameus, Pre-Operative Unit; Christa Shine, Medical Surgical Unit; and Deb Riordan, and Holly Kilpatrick, Clinical Research Unit, shared their stories.

### **Q: Why do you choose to work in oncology?**

**Barbara Stewart:** People come here to live. They're coming here to get their lives back and we help them do that. We help reduce their burden and we're right there with them every step of the way. It is not a sad place, not at all.

**Deb Riordan:** I get such a positive reaction when I meet people and they ask where I work. But after their initial positivity, the next question is always "Isn't that depressing?" I always say "No, it's not. It's anything but." It's very rewarding.

**Candy Kehoe:** I think cancer is something that has affected everyone. Everybody knows someone who's had cancer. Working in oncology gives us an opportunity to help people, see them get better, see them cured of this disease.

**Holly Kilpatrick:** I have only ever worked in oncology nursing. You develop a relationship as you help patients and their families. They're motivated to get well, that's why they're here. They know that we have the potential to help them beat their disease and get through a hard time. I've

never had a desire to work in another field.

**Stewart:** I used to think cancer patients were very fragile – no, they're strong. They're resilient, they're brave.

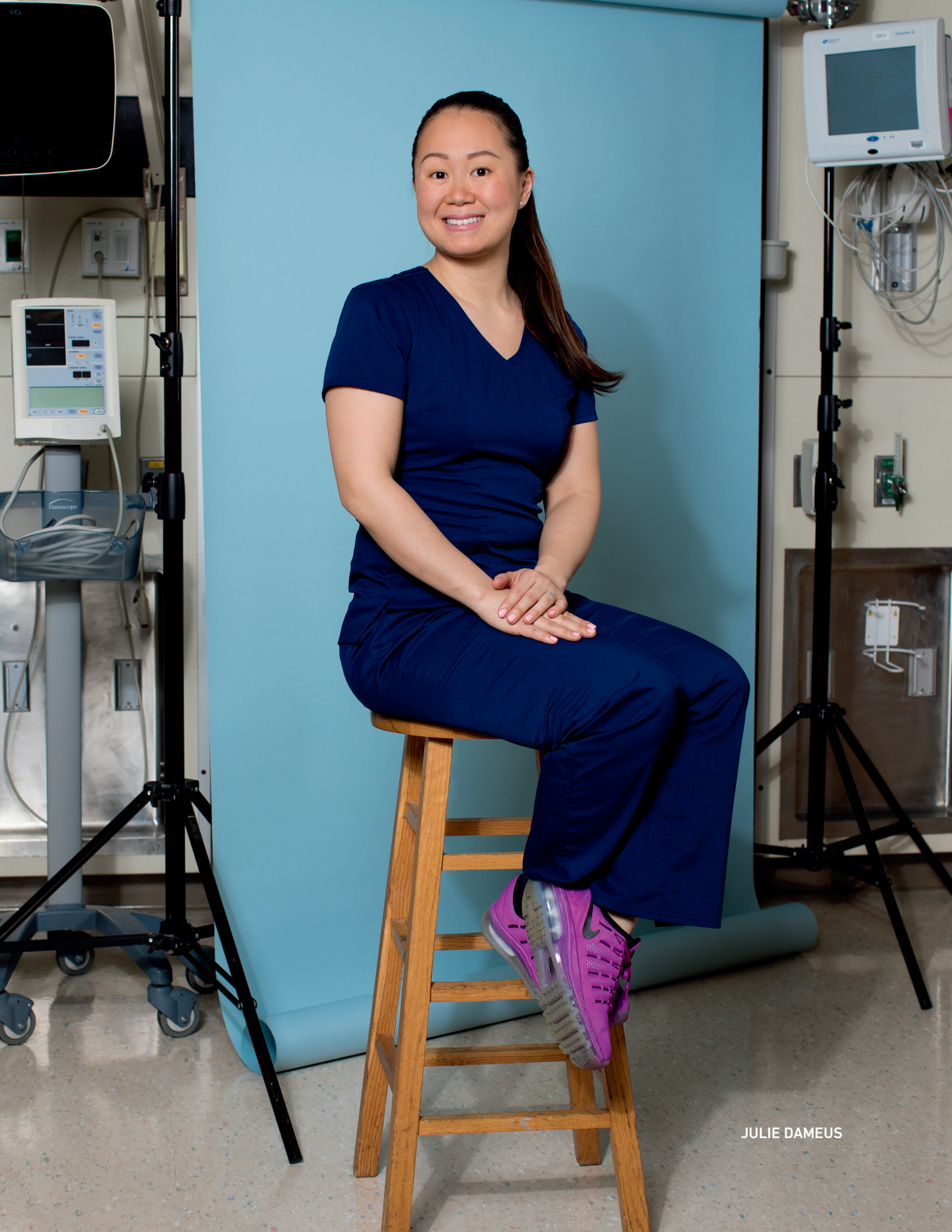
### **Q: Is there a story or particular patient that has stuck with you through the years?**

**Christa Shine:** I had a patient who was here for months and months, and she had a fiance. She unfortunately was not going to survive long-term, and they really wanted to get married. So they brought in a dress, we got her dressed up, put makeup on, and we brought them up to the chapel and they were able to get married here. It was a "wow" moment that we were able to give them an experience like that. It was just really touching.

**Julie Dameus:** I was walking inside at the start of a shift and saw a woman giving out candy. I asked her if she was volunteering today and she said, "No, I'm getting chemo today! I just feel like today's a good day because I got to wake up." She brought a basket of candy and was giving it to everyone in the infusion waiting room. I thought it

"We try to make today the best day possible while we're here together for the next eight to 12 hours. We're a team, and it feels like it."

— JULIE DAMEUS,  
PRE-OPERATIVE UNIT NURSE



JULIE DAMEUS

“I get such a positive reaction when I meet people and they ask where I work.”

— DEB RIORDAN,  
CLINICAL RESEARCH NURSE

“Everybody knows someone who’s had cancer. Working in oncology gives us an opportunity to help people, see them get better, see them cured of this disease.”

— CANDY KEHOE,  
POST-ANESTHESIA CARE  
UNIT NURSE

“Your patients can tell when there is tension in your unit, so when you relax and have fun, it’s better for them, and can sometimes ease a bit of the anxiety that they’re having.”

— CHRISTA SHINE,  
MEDICAL SURGICAL UNIT NURSE



DEB RIORDAN



CANDY KEHOE

was so sweet. Talk about a great way to start the morning.

**Kehoe:** I had a patient many years ago in the ICU. He and his wife were both from overseas, and I remember this gentleman would go to work every day after he had radiation therapy. He got so sick he wound up in ICU, and unfortunately he passed away. But I remember the family. His sister came from Europe to see him. I still remember their strength, their love. I still think about the family and him. It was just inspirational because he lived as normal a life as he could up until the time that he couldn’t do it anymore.

**Stewart:** We had a patient who wanted to see his dog. So we got him into his wheelchair, bundled him up, and we had his family bring his dog to the third floor entrance and brought him through the entrance so he could pet his dog. We didn’t tell anybody, we just did it.

**Shine:** I also had a younger guy who ran the hallways in his Superman cape because he said, “I’m going to beat this.”

**Q: Besides working with patients, what is your favorite part of your job?**

**Kehoe:** Our jobs are very serious, but we can laugh and be upbeat, too. That filters down to our patients, and they can enjoy their day a little bit more.

**Shine:** We work hard, but we can also go out and have dinner and celebrate. We’re very family oriented in our unit. Your patients can tell when there is tension in your unit, so when you relax and have fun, it’s better for them, and can sometimes ease a bit of the anxiety that they’re having.

**Kilpatrick:** My coworkers are definitely one of the highlights of my job. The job can cause stress but you can go to any one of them and they can make you laugh and smile and they are there to help you in a pinch. The staff at Fox Chase makes it worth coming to work.

**Dameus:** I feel really lucky to be able to work well with a group of men and women who share the same goals and can put aside their own personal issues. We try to make today the best day possible



CHRISTA SHINE



HOLLY KILPATRICK



BARBARA STEWART

while we're here together for the next eight to 12 hours. We're a team and it feels like it.

**Q: What is your most memorable accomplishment as a nurse?**

**Riordan:** I worked on a clinical trial a few years ago for second-line treatment for lung cancer, and we were chosen by the FDA as a site they wanted to inspect. In the end there was a debriefing meeting, and this FDA inspector praised my work while speaking to a room full of people. That was amazing, but the best part of the story is that the drug got approved and it works.

**Shine:** Recently I had a patient in her 20s. She was with us a long time and she told me how I had made her journey a bit easier, and that she didn't feel like a number under my care. She wanted to tell me before she passed away how much she loved me. She said it, then she said her goodbye. I sent her home and never saw her again.

**Dameus:** It's not uncommon to see the same patients come back again for different procedures or

treatments after you've cared for them. You never forget the first time a patient remembers you. It's nice that after all the people they see, from doctors to researchers, to everybody that runs up and down the hallway, out of a crowd of people, your former patient remembered you because you took care of them.

**Kilpatrick:** I had a patient once stop me in the mall. To have her see me someplace totally different, recognize me, and introduce me to her family was a special moment for me.

The nurses here contribute immeasurably to the atmosphere of caring and the legacy of successful research for which Fox Chase Cancer Center is world renowned. In fact, Fox Chase is the first acute care hospital in Pennsylvania and the first specialty hospital in the country to receive a Magnet designation four consecutive times for excellence in nursing services by the American Nurses Credentialing Center's Magnet Recognition Program.

"I have only ever worked in oncology nursing. You develop a relationship as you help patients and their families. They're motivated to get well, that's why they're here."

— HOLLY KILPATRICK,  
CLINICAL RESEARCH NURSE

"People come here to live."

— BARBARA STEWART,  
INTENSIVE CARE UNIT NURSE

# IRON WILL

BY PAIGE ALLEN

An avid endurance athlete, Brian Kozera knows how to work toward demanding goals step by grueling step. This quality brought him through a very difficult period to a triumph only a small number of people have achieved.

In the spring of 2014 Kozera, a police officer and father of three, suffered a hernia while training for a triathlon. During repair surgery at a local hospital, the surgeon discovered a cancerous node, but it was difficult to identify.

Unsure of his next step, he turned to his father, Richard Kozera, a noted physician who at the time was Executive Associate Dean at the Lewis Katz School of Medicine at Temple University. He sent his son to Fox Chase Cancer Center.

The diagnosis compounded a rough patch for the family, as Kozera and his wife, Kristin, had recently learned that their newborn daughter, the couple's third, was born with an extremely rare genetic abnormality and would have lifelong special needs.

"We were just getting pummeled," he said. "It was all so overwhelming."

Under the care of Richard I. Fisher, president and CEO of Fox Chase, Kozera learned he had one of the rarest forms of lymphatic cancer, lymphocyte deficient Hodgkin's lymphoma. He was in stage IV, as it had spread to his abdomen, hip, chest, and spine.

"I was 36, in great shape, and

had a healthy lifestyle," Kozera said. "Having cancer didn't seem even remotely possible."

Although he was confident with Fisher's treatment plan, there was no relief from bad news. During his months of intensive chemotherapy, his father died unexpectedly. Shortly after, the beloved family dog succumbed to an illness.

Good news finally came in April 2015, when Kozera was declared to be in remission after 20

Ironman — swimming 2.4 miles, biking 112 miles, and then running a marathon — helped channel Kozera's motivation and keep his focus on recovery. Although he was hospitalized for 24 days, he never stopped training.

"I drove the nurses crazy by constantly walking around the ward or exercising in my room," he said. "Nurses would frequently find me on the floor resting after a yoga session or workout."

"It was great to have that goal to work for, to push for," he said. "Everyone was behind me. I know I beat cancer because I stayed positive, had tremendous support, and and something to train for — Ironman Austria."

— BRIAN KOZERA, CANCER SURVIVOR

rounds of chemotherapy. But his doctors believed they could also prevent a recurrence. Under the care of Patricia Kropf and Stefan Barta, from the Fox Chase-Temple University Hospital Bone Marrow Transplant Program, Kozera underwent an autologous bone marrow transplant on May 4, 2015.

Just after the transplant, Kozera's friend Jon made him a deal: when he beat cancer, they would finish another 140.6-mile Ironman together. So they registered for Ironman Austria. The goal of completing another

While training, he had to come to terms with the fact his post-cancer body was not as fast or strong as it once was. Six months after his transplant, Kozera completed the Philadelphia Marathon in a goal time of 4 hours and 30 minutes.

"I struggled with running out of gas during what were once simple efforts," he said. "Still I realized that I was lucky to be alive and in the shape I was in."

In April 2016, he and Jon traveled south and finished a grueling Ironman 70.3 on an unusually gusty day in New



Brian Kozera

Orleans. Training was tougher than expected, so Kozera repeated the two simple words that were his mantra throughout his cancer experience: Persevere, Prevail.

“I know I beat cancer because I stayed positive, had tremendous support, and something to train for - Ironman Austria” he said.

On June 26, 2016, just 418 days after the bone marrow transplant, the Kozera family, along with Jon and his family, were in Austria’s Ironman Village. After chemotherapy, a bone marrow transplant, and more than 14 months of intense training, he

and Jon stood together lakeside when the cannon sounded.

They swam through the clear turquoise waters of Lake Wörthersee, rode through the picturesque mountains, and ran through the cobblestone-lined villages, which left Kozera feeling overwhelmed with emotion. For 13 hours, 2 minutes, and 7 seconds, he gave the scenic course everything he had.

“As Jon and I crossed the finish line with spectators cheering us on, I heard ‘Brian Kozera, you are an Ironman!’” he said. “These words had echoed in my dreams.”

Kozera later returned to Fox Chase and donated his Ironman and Philadelphia Marathon medals. They hang next to his room, with pictures of his family and BMT nurses. He wants patients who see the display to know that if they persevere, they will prevail.

Kozera has returned full time to police work, and most importantly, he is back to being an active father to Paige, Josie, and Avery.

“My three little girls need me,” he said. “I need them, too. I am blessed to have the chance to be here with them and thank Fox Chase for giving me that chance.”

# MAKING A DIFFERENCE

FOX CHASE PATIENT HELPS KICK START RESEARCHER'S CAREER



## WE HAVE LIFT OFF

### How Pilot Funding Aids Research

**A**fter Tom Leidy was successfully treated for kidney cancer in 2009, he and his wife, Judy, wanted to give back to Fox Chase Cancer Center. Tom was treated by Robert Uzzo, chair of surgical oncology,

who used robotic surgery to remove the cancerous portion of Tom's kidney while leaving the healthy portion intact. The surgery was a success, and Tom did not require any additional treatment.

"I was very happy with the outcome of my stay at Fox Chase," Tom said. "I got to know an amazing staff. The personal touch of everything was great from the day we walked in the door until we left."

COLIN LENTON





Kerry Campbell, with donors Tom and Judy Leidy.

Uzzo’s personalized care made a particular impression on the Leidys.

“With some doctors, you feel like you’re a number,” Judy said. “It’s not that way with Dr. Uzzo.”

While the Leidys had already been making annual donations to Fox Chase for many years, Tom’s cancer experience and their admiration for Uzzo inspired them to get more involved. They became especially interested in research aimed at curing more advanced

renal cell carcinoma.

In 2015, they made a donation to the lab of Kerry Campbell, an immunologist at Fox Chase with more than two decades of experience in cancer research. With the funds, Campbell was able to bring a clinical urologic oncology fellow, Mohammed Haseebuddin, aboard to work on a project exploring immunotherapy in relation to renal cell carcinoma, the most common type of kidney cancer in adults.

Competition for early stage

“The Leidys provided the foundation for Dr. Haseebuddin to come into my lab and work with the resources we already had available to carry out this project and move forward.”

— KERRY CAMPBELL,  
DIRECTOR OF THE CELL  
CULTURE FACILITY

grants is tremendous, so opportunities from funding sources such as government agencies and pharmaceutical companies require pilot data to show tangible promise. Often, donor support for projects at this stage can be the difference between the research happening or not happening, and can open the door to larger grants in the future.

Enabled by the Leidys, Haseebuddin analyzed results from a previous study and

discovered that elevated levels of the protein PD-1 on immune cells were predictive of poor cancer survival. Moving forward, Campbell’s group is hoping to identify PD-1 on monocytes, a type of white blood cell, as a biomarker predictive of poor cancer outcomes that can be used in future immunotherapy trials.

“We’re always looking for biomarkers in the blood of patients that could be important for the prognosis of the disease,” Campbell said. “This study provided us with a lot of good preliminary data and it’s started a snowball effect.”

The results of the work will have immediate impact in the clinic. Since Campbell’s original work was published, PD-1 has emerged as a highly effective therapeutic target to significantly extend the lives of some renal cell carcinoma patients. While not a definitive biomarker, a correlation has been established between PD-1 and prognosis. If this finding holds up it may enable clinicians to better match patients with the most effective form of therapy and switch to a different, more targeted treatment if needed.

Campbell’s team is in the process of publishing the results of the study and will use the results as a building block to pursue new grants so they are able to expand on their work.

“The Leidys provided the foundation for Dr. Haseebuddin to come into my lab and work with the resources we already had available to carry out this project and move forward,” Campbell said. “We really appreciate all that they did for us.”

While progress is ongoing in the lab, the Leidys are pleased to see where their donation has gone and how it has helped advance kidney cancer research.

“You don’t know what little thing will trigger a whole new approach,” Judy said.

## TOGETHER FACING LUNG CANCER

Lung cancer survivors, caregivers, and health care professionals started off National Lung Cancer Awareness Month with Together Facing Lung Cancer, an evening of education, discussion, and hope. Hossein Borghaei, chief of thoracic medical oncology at Fox Chase, hosted the program.

Surgical oncologist Stacey Su, director of the thoracic oncology fellowship training program; pulmonologist Rohit Kumar; medical on-

“Fox Chase became everything to me... I never questioned the decisions my lung cancer team made for me. They gave me strength and they gave me hope.”

— JOAN LAUTENBACHER,  
LUNG CANCER SURVIVOR

colologist Jessica Bauman; and radiation oncologist Mark Hallman, all answered questions from the guests. The discussion was wide-ranging, from how to increase awareness and availability of lung cancer screenings to what new treatments are on the horizon to how to shed the stigma of lung cancer as primarily a smoker’s disease.



From left to right: Stacey Su, Mark Hallman, Jessica Bauman, Hossein Borghaei, Rohit Kumar

Fox Chase patient Joan Lautenbacher was inspired to share her story with the audience, providing a perfect example of why Fox Chase’s Together Facing series is so meaningful. Diagnosed with lung cancer in 2009 at age 55, Lautenbacher searched all over southern New Jersey for a doctor. A friend who had been successfully treated at Fox Chase brought her to the Center and things finally clicked into place.

“Fox Chase became everything to me,” she told the crowd. “I never questioned the decisions my lung cancer team made for me. They gave

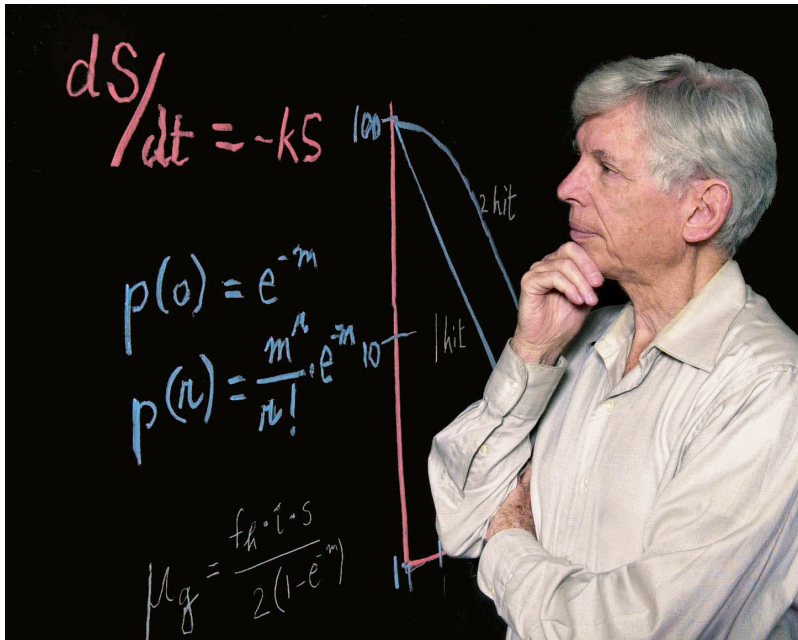
me strength and they gave me hope.”

Since her diagnosis, Lautenbacher has gotten married, retired, and become a volunteer at Fox Chase. She also takes RV trips with her husband, volunteering for the National Parks Service along the way. She urged her fellow patients to dive headfirst into living, but to stay committed to follow-up medical appointments so they can keep exploring what life has to offer.

“Get out, get physical, and get healthy,” she said. “Find something you love and give back to it. You will be a better person for it.”

## CANCER SURVIVORS DAY

On October 29, 2016, Fox Chase Cancer Center, in partnership with Temple University Athletics, hosted the Second Annual Cancer Survivors Day Football Game. The hometown Temple Owls hosted the Cincinnati Bearcats at Lincoln Financial Field, while patients, caregivers, doctors, and researchers celebrated survivorship and honored all who are affected by cancer. Just before kickoff, hundreds of survivors wearing color-coded scarves representing their cancer types flooded the field, as family members and friends cheered them on. The stadium’s jumbo screens featured survivors’ stories throughout the game and during halftime.



Al Knudson, former president and scientific director of Fox Chase Cancer Center

## HONORING AL KNUDSON

On July 10, 2016, the world lost a highly influential scientist and Fox Chase Cancer Center lost a longtime friend and colleague with the passing of Alfred G. Knudson, who died at home at age 93. Knudson was one of the true giants in oncology, a scientist who fundamentally changed the way we think about the origins of cancer.

His most transformative contribution was his two-hit theory of cancer causation, which explained the relationship between the hereditary and non-hereditary forms of cancer and predicted the existence of tumor-suppressor genes. Once it was confirmed, this work advanced the understanding of genetic errors that turn normal cells into cancer cells and earned Knudson international recognition.

Knudson first became affiliated with Fox Chase in 1970 as a member of the Center's scientific advisory committee, and joined the Center staff in 1976. Over the years he served in several roles, including as director of Fox Chase's Institute for Cancer Research from 1976 until 1982, Center president from 1980 to 1982, and scientific director from 1982 to 1983.

Throughout his career, Knudson received numerous distinguished awards and honorary doctorates, including the 1998 Albert Lasker Award for Clinical Medical Research, the 1999 American Society of Pediatric Hematology/Oncology Distinguished Career

This work advanced the understanding of genetic errors that turn normal cells into cancer cells and earned Knudson international recognition.

Award, the 2005 American Association for Cancer Research Award for Lifetime Achievement in Cancer Research, the Charles S. Mott Prize of the General Motors Cancer Research Foundation, the John Scott Award from the City of Philadelphia, and the 2004 Kyoto Prize in Life Sciences.

Beyond his many achievements in cancer genetics, Knudson was a great man, mentor, and friend. He will long be remembered and sorely missed by all who knew him.



**Camille Ragin**, (pictured), **Wafik S. El-Deiry** and **Alan Howald** earned honors from the American Cancer Society for their community outreach, research, and volunteer efforts, respectively.



The Iraqi Society of the UK honored **Tahseen Al-Saleem** with a lifetime achievement award at its November 2016 meeting.



Fox Chase Cancer Center celebrated the investiture of **Wafik S. El-Deiry**, deputy cancer center director and head of translational research, as the William Wikoff Smith Chair in Cancer Research on November 15.



**Eric M. Horwitz**, chair of the Department of Radiation Oncology at Fox Chase Cancer Center, has been selected by the American Brachytherapy Society (ABS) as an inaugural ABS Fellow.



**Eric D. Tetzlaff**, a physician assistant at Fox Chase Cancer Center, has been recognized as a Distinguished Fellow of the American Academy of Physician Assistants.



**David S. Weinberg**, chair of the Department of Medicine at Fox Chase Cancer Center, has been elected to the Interurban Clinical Club.



**Robert Uzzo**, chair of the department of Surgical Oncology at Fox Chase Cancer Center, gave the Andrew C. Novick Memorial Lecture at the 15th International Kidney Symposium in November 2016.

## WELCOME, MARTIN EDELMAN

In February 2017, Martin J. Edelman, a nationally renowned expert in lung cancer research and treatment, joined Fox Chase Cancer Center as chair of the Department of Hematology/Oncology and deputy cancer center director for clinical research. His dual role includes leading the effort to integrate discoveries from the Translational Research Initiative into a strong investigator-initiated clinical trials program.

At Fox Chase Edelman collaborates with clinical, scientific, and administrative leadership to grow robust therapeutic, clinical research, and translational research programs in hematology and medical oncology, while leading the department in evaluating emerging national trends in the delivery of cancer care. He comes to Fox Chase from the University of Maryland Greenebaum Comprehensive Cancer Center, where he served as head of the Section of Solid Tumor Oncology and associate director of the Division of Hematology/Oncology. He was also a professor of medicine and radiation oncology at the University of Maryland School of Medicine.



**Martin Edelman, Chair of the Department of Hematology/Oncology**

Edelman's achievements in oncology include developing one of the most commonly used regimens for treating advanced lung cancer and advancing the development of new agents and biomarkers to personalize lung cancer therapy. He has a particular interest in approaches that integrate surgery, radiation, and chemotherapy in the management of lung cancer patients.

In addition, Edelman has published more than 325 scientific articles, abstracts, and book chapters. He currently serves as deputy editor of the journal *Lung Cancer*.

## WALK THIS WAY

Tens of thousands of people in the Philadelphia region rely on public transportation to get to and from work. So when the SEPTA workers announced a strike in November 2016, it left many Fox Chase Cancer Center employees in a tough spot. Unlike other professions, where it might be possible to work from home or take a day or two off, health care workers simply don't have that option. It is imperative that Fox Chase nurses and doctors are able to get to work in order to provide high level care to patients. As a result, many of the Center's devoted staff members carpoled, took a taxi, or, in the case of Haydee Suarez, walked.

Suarez, a unit secretary and certified nursing assistant at Fox Chase was determined to get to her shift, so she walked more than seven miles from her home to Fox Chase.

"People depend on me to be here," she said. "If I'm not, it affects the whole flow of the unit."

Suarez was featured in an article published by the *Philadelphia Inquirer*.

## PAWS FOR THE CAUSE

Rainy weather didn't stop the many two- and four-legged supporters who came together to advance breast cancer research at Fox Chase Cancer Center at the 17th Annual Paws for the Cause.

FOX 29 news anchor Dawn Timmeney marked her fifth straight year as host of the event, joined by her dog Finley.

Mary Jean "MJ" Flannery, the event's featured patient advocate, spoke about her experience as a Fox Chase patient and why she supports the Center.

In all, Paws for the Cause 2016 raised more than \$50,000. Since its inception this annual event has raised \$375,000 for cancer research at Fox Chase.

The 18th Annual Paws for the Cause will be on Sunday, October 22, 2017.



**Dawn Timmeney with her dog Finley**

MICHAEL DEMPSEY

# LAUREL SOCIETY ANNUAL DINNER

On Thursday, October 20, 2016, members of the Fox Chase Cancer Center Laurel Society came together at The Kimmel Center for Performing Arts for its annual celebration of philanthropy and the advancement of cancer research and treatment. The Laurel Society is Fox Chase's signature donor society, comprised of its most generous supporters, many of whom are also Fox Chase patients, faculty, staff, or volunteers.

From the podium, Richard I. Fisher, president and CEO of Fox Chase, acknowledged the impact the Laurel Society members make advancing the mission of the Center. He highlighted the newly opened Marian and Emma Brungard Surgical Family Waiting Suite as the latest example of their philanthropy. Looking toward the future, Fisher shared exciting plans in development, including an expansion of the busy infusion room and a new retail pharmacy that opened this spring.

Paul Engstrom and his wife Janet were honored with the Laurel Society Award for their combined 80 years of service to the Center. It was the first time the award was given to a couple rather than an individual. Engstrom shared highlights of his 46-year career as a medical oncologist and his wife's thirty-plus years on the Board of Associates, and explained why giving back to Fox Chase is so important to his family. He ended his speech by blowing a kiss to Janet for their 55th wedding anniversary, which was the following day.

Rounding out the evening, Beth Brunswick, a patient at Fox Chase, shared her experience and paid tribute to the roles that clinicians, researchers, and



**Top: (from left to right) Paul Engstrom, Janet Engstrom, Richard Fisher. Bottom left (from left to right) Jeffrey Farma, Terri Goldberg. Middle right: (left to right) Yan Wang, Michael Yu. Bottom right (from left to right) Susan Johnson, Lillian O'Connor, Adelina Riggione.**

donors all play in the effort to prevail over cancer. Beth was diagnosed with ovarian cancer in 2014. Although she resides in New York City, she chose to be treated at Fox Chase, where she is under the care of Stephen Rubin, chief of gynecologic cancer. In fact, she was Rubin's first patient at Fox Chase. Raised by a father who instilled the importance of

philanthropy, Beth has supported Fox Chase research to help future patients. Although her treatment is ongoing, she is confident in her prognosis.

"By giving back, we give others the chance to beat this disease," Beth said. "Without research there is no cure." She began a new course of chemotherapy the morning following the event.

# THE MAN WHO SAVED A MILLION LIVES

Celebrating 50 years since the discovery of the hepatitis B virus

BY PAIGE ALLEN

Scientists are seekers. Their inquiries may lead them to the far reaches of the world, or inward to incomprehensibly small molecular worlds. At a time before research on individual genes was possible, the late Nobel Laureate Baruch S. Blumberg combined these approaches, saving millions of lives.

With Fox Chase Cancer Center as his base, he traveled the world collecting blood samples from diverse populations to study genetic variations among humans. Fifty years ago, in 1967, he discovered the hepatitis B virus.

Hepatitis B can develop into liver cancer or cirrhosis, and can cause liver failure. The discovery of the virus was significant, but what Blumberg did next was unconventional and deeply impactful. He began developing a vaccine.

“He went straight from fundamental discoveries into an approach we now term translational medicine, which was an unusual course to take and far ahead of its time,” said Jonathan Chernoff, chief scientific officer at Fox Chase. “Barry was an unconventional thinker, one of those guys who went outside the boundaries of his discipline frequently and without embarrassment. He was an epidemiologist, a virologist, a molecular biologist, and more, who did whatever he needed to do

to find answers.”

Blumberg and his colleagues prevented transfusion-related cases of hepatitis B by developing a sensitive blood test that allowed blood banks to screen for it. They also devised a way to make a vaccine, harvesting its outer protein from the blood of chronic carriers. This approach was critical, because the virus could not be grown in tissue cultures at the time.

Meanwhile, on field trips to

agent ever devised, and had an impact the like of which we’d never seen before or since.”

Following the vaccine’s FDA approval, a number of nations launched vaccination programs in consultation with Blumberg and his colleagues. Targeted to infants, these prevention programs may have reduced the incidence of primary liver cancer by as much as 80 percent or more in future generations, and they are credited

“It is probably the most effective cancer prevention agent ever devised.”  
Jonathan Chernoff, chief scientific officer at Fox Chase

Africa and Asia, Blumberg and others amassed important evidence showing the link between primary liver cancer and hepatitis B. The virus is now thought to cause at least 80 percent of liver cancers as well as many cases of cirrhosis.

In 1981 the vaccine received Food & Drug Administration (FDA) approval. It was the first vaccine capable of preventing a type of cancer in humans.

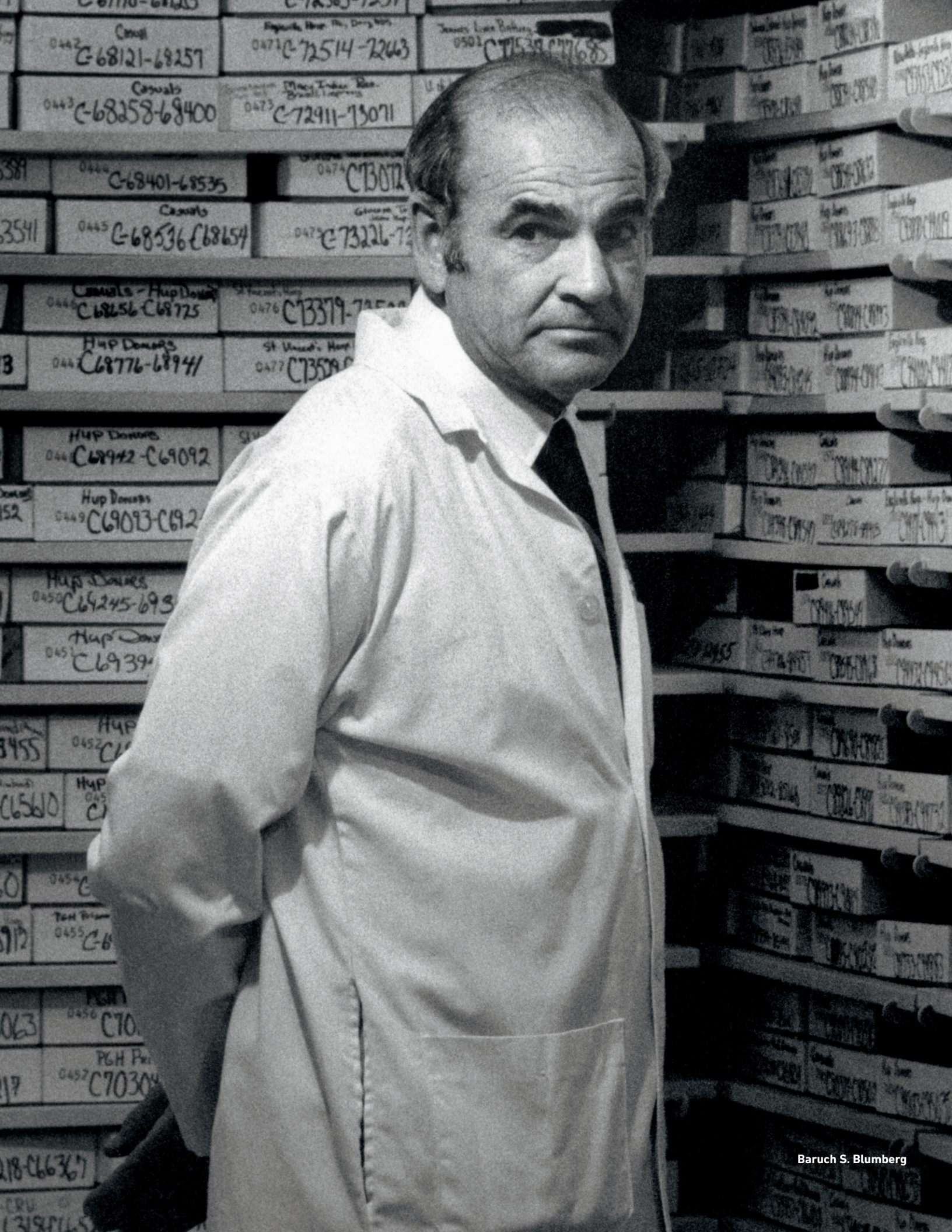
“That vaccine prevented between 10 and 100 million cases of liver cancer around the world,” Chernoff said. “It is probably the most effective cancer prevention

with preventing millions of cases of acute and chronic hepatitis.

The combination of the discovery of the hepatitis B virus and the vaccine development led Blumberg to win the Nobel Prize in Physiology or Medicine in 1976.

“The discovery and the vaccination made a huge difference in livelihood for many people,” Chernoff said. “His work transcended science into general culture.”

In 1993, Blumberg and his co-inventor, Irving Millman, were elected to the National Inventors Hall of Fame for their invention of the vaccine and diagnostic test.



Baruch S. Blumberg



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“The best chance to beat cancer is with the initial therapy.”

**Richard I. Fisher, MD**  
President and CEO, Fox Chase Cancer Center

No two cancers are ever exactly alike. That’s why, at Fox Chase, every treatment is uniquely designed for each individual patient. As a National Cancer Center, we can apply the latest research, the newest therapies, and the most experienced specialists in all types of cancer. All with one goal: To provide the best possible outcome—right from the outset. Because where you start matters.

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*Richard I. Fisher, M.D.*



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