

BreakThroughs

FALL 2018



Duke Cancer Institute

In the Family

Page 08

WOMEN'S CANCERS

Working toward prevention

Page 04

TEAM TOM

One man's fight with melanoma

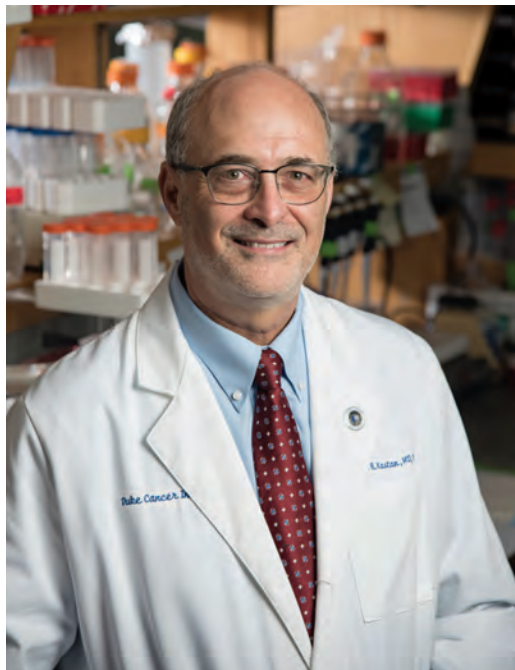
Page 12

SOMETHING TO HOPE FOR

The Duke Brain and Spine Metastasis Center

Page 14

Facing Tough Problems, Head-on



MICHAEL KASTAN

ON THE COVER:

IN THE FAMILY. Duke breast cancer patient Kate Houff with her mother, Margaret Powers, who is a long-term survivor of a rare form of breast cancer called inflammatory breast cancer. Houff's family raises funds for the research of Noah Kauff, MD, who runs Duke Cancer Institute's Hereditary Cancer Clinic. Read more on page 8.

At Duke Cancer Institute, inspired by the bravery of our patients, we don't shrink from even the most daunting challenges. We tackle them head-on.

For example, it is a challenging situation when tumors spread to the brain or spine, and we are seeing this situation more often nowadays as people are living longer with many types of cancer. Current treatments for brain and spinal metastases are inadequate and often toxic. At Duke, we are focusing on this condition by offering patients fast access to multidisciplinary care and working to develop treatments that are more effective and less debilitating.

In other stories in this issue, learn how Andrew Berchuck, MD, and colleagues are trying to stop ovarian cancer from catching women unawares. The disease is much more treatable when caught at an earlier stage, but for most women, there are not reliable screening options. Berchuck is trying to change that. He and others have been working on this problem for years, and he may not see it solved during his career. But he's not giving up.

You'll also read about how being unafraid to treat patients with once-mysterious familial breast and ovarian cancer syndromes has led Noah Kauff, MD, to make major discoveries regarding how to reduce cancer risk for these women.

"Inspired by the bravery of our patients, we don't shrink from even the most daunting challenges."

Michael B. Kastan

With you on our side, we'll solve even more intractable problems like these. Please join us.

Michael B. Kastan, MD, PhD
Executive Director, Duke Cancer Institute
William and Jane Shingleton Professor,
Pharmacology and Cancer Biology
Professor of Pediatrics

Breakthroughs is produced two times a year by Duke Cancer Institute Office of Development
710 W. Main Street, Suite 200
Durham NC, 27701 • Phone: 919-385-3120

Advisory Committee: Rachel Greenup, MD;
Donald McDonnell, PhD; Steven Patierno, PhD;
Hope Uronis, MD

Senior Executive Director of Development,
Duke Cancer Institute
Amy Deshler

Publisher **Amy Deshler**

Editor **Angela Spivey**

Writers **Julie Harbin, Jessica Hyland, Whitney J. Palmer, Mary-Russell Roberson, Miriam Sauls**

Designer **Pam Chastain Design**

Art Director **David Pickel**

Photography: **Mike Belleme, Alex Boerner, Colin Huth, Ken Huth, Jessica Hyland, Bob Leverone, Erin Tait, Les Todd**

Illustration: **Ken Orvidas**

If you would like to remove your name from the mailing list or are receiving duplicate copies, please email dcidevelopment@duke.edu, or contact us through U.S. mail at the address above or by phone at 1-800-688-1867.

Produced by Duke Health Development and Alumni Affairs ©2018 Duke University Health System. 8544

DCI Nurse Named Certified Breast Cancer Nurse of the Year

Duke Cancer Center ambulatory care nurse Susan Kane, RN, BSN, CBCN, CNIII, was selected as the recipient of the 2018 Certified Breast Care Nurse of the Year Award by the Oncology Nursing Certification Corporation. The award is given to a nurse “chosen from among the best in the country as a shining example of oncology nursing at its finest.”

A nurse for more than 40 years—nine of those in oncology—Kane is responsible for clinic flow at the breast cancer clinic, supervision of unlicensed staff, symptom management, and chemotherapy teaching for patients with all stages of breast cancer. She also handles

triage and patient education for select patients and is active in unit and hospital education.

“I was immensely surprised to be nominated and even more surprised to be selected for the award,” Kane says, adding that she is grateful for the support of her nurse manager Heather Sperling, MSN, RN, OCN, who nominated her, together with breast oncologists Kelly Marcom, MD, and Jeremy Force, MD.

In her nomination letter, Sperling, who’s worked with Kane for five years, wrote that Kane “has been an inspiration to all of the nurses on the unit and oncology nurses across campus and the nation.”

Kane says, “I stay in cancer nursing



APRIL MCNEIL

SUSAN KANE

because it allows me the privilege of helping people through some of the toughest times they will ever have. That is something I have been able to do throughout my nursing career, and I find it very rewarding.”

— by Julie Harbin



KEN HUTH

AMY DESHLER

Amy Deshler Joins DCI Development

In May 2018, Amy Deshler, senior executive director of Duke Children’s Development, was named to serve as senior executive director of Duke Cancer Institute Development. She will also retain all current responsibilities for Duke Children’s fundraising.

Deshler first joined Duke Children’s in July 2016, overseeing the development team. Over the past two years, Deshler

has led her team to increasing levels of success in a wide variety of programs, including major gifts and community engagement.

Prior to coming to Duke, Deshler served as associate chair of Development at Mayo Clinic in Rochester, Minnesota, where, for more than 15 years, she held successive leadership positions in development. Prior to her work in development, Deshler was team leader for Mayo’s Cancer Education Program.

Susan Dent Joins DCI to Co-lead Cardio-Oncology

Susan Dent, MD, FRCPC, joined Duke Cancer Institute in September 2018 to co-lead Duke’s efforts in cardio-oncology—a discipline focused on the intersection of heart disease and cancer. She will also serve as professor of medicine and associate director of breast cancer clinical research.

Before joining the Duke faculty, Dent was a medical oncologist at the Ottawa Hospital Cancer Centre and professor in the Department of Medicine at the University of Ottawa. Her areas of interest include breast cancer, treatment toxicities, and cardiotoxicity. She is the founder of the Ottawa Cardiac Oncology Program as well as the Canadian Cardiac Oncology Network, organizations dedicated to improving our understanding of how cancer treatments impact cardiovascular health with the ultimate goal of preventing cardiotoxicity.



SUSAN DENT

Survivors, family members, and researchers have been working together for more than a decade to detect ovarian cancer earlier and educate women about its signs.

BY ANGELA SPIVEY

EVERY SEPTEMBER, AVIS WAINWRIGHT leaves her farm and beehives in eastern North Carolina to travel to Raleigh for the Gail Parkins Memorial Ovarian Awareness Walk. Raleigh resident Melanie Bachelor started the walk in 2002 to honor her mother, who had just died of ovarian cancer after two years fighting it with the help of doctors at Duke. The Parkins Walk, which raises funds for Duke gynecologic oncology research, was also a way for Bachelor to distract herself from her grief. “I wanted to do something for Duke for all they did for my mom,” she says.

Wainwright faithfully attends the walk to honor her childhood friend Kathy. Much the same as Bachelor’s mother, Kathy went through months of primary care doctors treating her for irritable bowel syndrome and depression before being diagnosed with stage 4 ovarian cancer. The disease causes such vague symptoms—abdominal bloating, gas, discomfort, weight loss—that it often goes undetected until the later stages.

Wainwright attended the walk for the first time in 2011, when Kathy was first diagnosed. Kathy lost her fight with the disease in 2012. Wainwright has attended every year since. Except for 2016. Wainwright missed it because she was having

chemotherapy. She had been diagnosed with ovarian cancer herself.

When Wainwright began having stomach trouble in 2015, she didn’t think much of it. Her husband had just passed away, and she was taking over their farm and its corporation. “I started having abdominal symptoms but didn’t really pay attention because I just thought it was grief and stress,” she says.

But as the symptoms continued, she thought of Kathy. And she remembered Bachelor’s mother, and all the information about ovarian cancer symptoms that Andrew Berchuck, MD, and other Duke doctors had presented at the educational forum at the walk each year. “I thought, ‘Let me go to my gynecologist

first, to rule this out,’” she says. “I have a family history of diverticulitis, and if I had gone to a gastrointestinal doctor first, that may have been the diagnosis.”

The disappointing fact is that, as with Wainwright and with Bachelor’s mother, ovarian cancer often sneaks up on women.

For women with mutations in the so-called breast cancer genes, BRCA1 and BRCA2, it’s pretty clear that ovarian cancer risk is greatly increased. Steps to prevention include considering having their ovaries removed at age 40, after they are finished having children.

But for most women, the path to



AVIS WAINWRIGHT

AVIS WAINWRIGHT attends the Parkins Ovarian Walk every year in memory of her friend Kathy. She says the education she’s received there helped her recognize her own symptoms and get diagnosed early.

Opposite: **MELANIE BACHELER** started the Parkins Ovarian Walk in memory of her mother, Gail Parkins. The 2018 walk has been rescheduled to October 27.

COLIN HUTH

Stopping a Stealth Disease



prevention isn't that certain. Berchuck and an international group of collaborators—the Ovarian Cancer Association Consortium (OCAC)—aim to change that. These researchers envision creating a screening tool that could predict individual risk. A woman would plug in her information—age, how many children she has had, smoking history, use of oral contraceptives, blood test results showing common genetic variants—and receive a personalized ovarian cancer risk score.

“If we fully understood all the behavioral risk factors and common low-penetrance genetic variants that contribute

to ovarian cancer, there might be another group of women who'd be considered at intermediate risk,” says Berchuck, who is a lead investigator for OCAC. Those women would be candidates for increased screening. Right now, the available screening test, which detects a blood protein called CA-125, which is elevated in some women with ovarian cancer, produces too many false positives to be used in all women. And those false positives cost too much, not only in health care dollars, but also in harm from emotional stress and needless surgery, according to work from Duke Professor of Obstetrics and

“My event is not a day to be depressed. It is a happy, family day, and it's a day of recognition for the survivors.”

Melanie Bacheler

Gynecology Laura Havrilesky, MD, MHSc.

The OCAC has enrolled 100,000 women to date in studies that compare genetic and lifestyle differences in women with ovarian cancer and those without. That sounds like a lot of people. But Berchuck, the James M. Ingram Professor of Gynecologic Oncology, says it's just the beginning. “We probably need 600,000 subjects if we really hope to define all the genetic variants that contribute to ovarian cancer risk,” he says.

That's because there are probably thousands of factors that increase risk by a tiny



ANGELES SECORD and ANDREW NIXON

EMERGING OPTIONS

FOR GYNECOLOGIC CANCERS

Women with gynecological cancer have more treatment options than ever. Currently, Duke has 15 clinical trials open for women with gynecologic cancers, including ovarian, endometrial, or cervical cancer. Many of those trials are aiming to understand immunotherapies—new treatments that boost the body's own immune system's ability to fight cancer.

For instance, in September 2018, Angeles Alvarez Secord, MD, and colleagues reported results from a trial that combined

a chemotherapy (paclitaxel) with an immunotherapy called pembrolizumab for women with platinum-resistant ovarian cancer. “These are the patients where we have the highest unmet need,” says Secord, professor of obstetrics and gynecology. “In our patients who were treated on this trial, we saw quite an amazing response rate and disease control.” In general, immunotherapies have not shown as much promise for most ovarian cancers. But this study suggests a combination approach may work. “With what we found with this most recent trial, I do believe there's an interactive effect, and we don't completely understand the mechanism behind that interaction,” Secord says. Those results were presented at the International Gynecologic Cancer Society meeting.



REBECCA PREVIS

It may also be possible to learn from other types of cancer to improve ovarian cancer's response to immunotherapies. Rebecca Previs, MD, assistant professor of obstetrics and gynecology, explains that one of her mentors, Chair of the Department of Pharmacology and Cancer Biology

Donald McDonnell, has found that breast cancer patients whose tumors have higher expression of a protein called CaMKK2 tend to have worse outcomes. “I've been able to use patient tumors and have seen this exact same thing with ovarian cancer,” she says. CaMKK2 is expressed on the surface of tumor cells and immune cells. “If patients stop responding to immunotherapy, maybe there are ways that we can overcome this resistance by targeting CaMKK2.”

Also emerging are ways to predict which treatment is best for each patient. Collaborating with Andrew Nixon, PhD, associate professor of medicine, Secord found that measuring blood levels of a protein called IL6 predicted which patients would benefit from bevacizumab (a drug that prevents tumors from growing new blood vessels). Patients with higher levels of IL6, which is linked to inflammation, tended to benefit from this drug. That work was presented in 2016 at the meeting of the American Society of Clinical Oncology. Secord and Nixon are developing an entire panel of biomarkers to predict ovarian cancer response to agents like bevacizumab and to immunotherapies.

amount. When it comes to lifestyle, the factors that have emerged are related to reproduction. Limiting the number of times you ovulate in your lifetime, either by having children or by using oral contraceptives is linked to lower risk.

But there may be many more factors that influence risk. In 2018, researchers from OCAC discovered 12 new genetic variants linked to ovarian cancer, and they published 28 scientific papers, some of them on lifestyle factors such as vitamin D levels and alcohol consumption.

All of this seems daunting. And it will take time (the OCAC has been at it since 2005). But Berchuck and colleagues are committed. “I’m hopeful because we’re trying to make a better future, whether it’s through personalized risk prediction or through clinical trials of new therapies,” Berchuck says.

That work and many other projects have benefited from the Parkins walk, which has raised more than \$3 million since Bachelier started it in 2002. The funds have helped Duke hire new gynecologic oncology researchers and enabled them to move their research forward. “If you want to do research, you have to get the dollars,” Berchuck says. “That could come from grants. But philanthropy’s also a big part of that equation, and without it, your research program is going to be a lot less productive.”

But to many of the attendees, the walk’s most important accomplishment is spreading hope. “My event is

not a day to be depressed,” Bachelier says. “It is a happy, family day, and it’s a day of recognition for the survivors.”

As for Wainwright, after surgery, chemotherapy, and radiation at a hospital near her home, she has been cancer free for more than a year. She was back in attendance at the Parkins walk in 2017, though she was still exhausted from radiation. “There are no words to explain, but when I’m doing the walk, I look up,” Wainwright says. “I just say, ‘Okay Kathy, this is for you. We’re going to make sure we fight this disease that took you too early.’ I talk to her the whole time.”

“I’m hopeful because we’re trying to make a better future, whether it’s through personalized risk prediction or through clinical trials of new therapies.”

Andrew Berchuck

HOW YOU CAN HELP

Your support makes new therapies for gynecologic cancers possible. To help, use the enclosed envelope, or visit bit.ly/dcifall2018



ALEX BOERNER

ANDREW BERCHUCK

In the Genes

You learn you have a genetic history of cancer. Now what? Noah Kauff, MD, is at the forefront of answering that question, especially for women's cancers.

BY WHITNEY J. PALMER

EARLY IN HIS OBSTETRICS AND GYNECOLOGY

CAREER, NOAH KAUFF, MD, ran into a conundrum. A woman with a family history of breast and ovarian cancer came to him for treatment in rural New Jersey. Doctors had a lot of information about the importance of genetic history, but at that time (the late 1990s), it wasn't clear what to do with that information.

"She had a family history that was classic for hereditary breast and ovarian cancer syndrome," says the clinical cancer geneticist. "No one else wanted to take her as a patient. The BRCA1 and BRCA2 genes had only been identified a few years earlier, and although we could detect who had a huge increased risk for breast and ovarian cancer, it wasn't clear we could do anything to reduce the risk."

So, Kauff developed his own program for individuals with hereditary predispositions to breast and ovarian cancer. Following 15 families in similar situations stoked his interest in genetic risk assessment and led him to complete in 2002 a joint fellowship in cancer genetics with Memorial Sloan Kettering and New York Presbyterian Hospital.

Today, he's the director of Duke Cancer Institute's Hereditary Cancer Clinic, which offers genetic testing and counseling to individuals diagnosed with any type of cancer. His specific interest, though, is still finding solutions for patients who show a genetic predisposition for breast and ovarian cancer.



WHAT DIFFERENCE DO GENES MAKE?

Every woman faces at least a small risk for developing breast cancer. In the general population, women have a 12 percent chance of battling the disease through age 80 and 2 percent by age 50. But, odds increase for women with mutations to BRCA1 or BRCA2, genes responsible for repairing certain DNA proteins.

Women with those mutations have a 65-80 percent breast cancer risk through age 80. And, their risk of developing disease early (before age 50) is increased 15 fold compared to women without the mutation. BRCA mutation carriers also face a greater risk of ovarian cancer: a 36-53 percent chance by age 80, compared to just 1.3 percent in the general population.



ALEX BOERNER

TWO-TIME BREAST CANCER SURVIVOR

Kate Houff with clinical cancer geneticist Noah Kauff



ERIN TAIT

DUKE BREAST CANCER PATIENT

Kate Houff with her son Quin, a NASCAR driver, who donates a portion of his winnings to Noah Kauff's research on hereditary cancer risk. To learn more, visit beatincancerwithduke.org.

“The risk is incredibly elevated compared to the general population,” Kauff says. “This is why we even talk about drastic risk-reduction strategies like removing ovaries.”

In fact, in 2002, Kauff’s group published the first study showing that post-childbearing, pre-menopausal ovary removal lowered breast cancer risk. Data showed women with BRCA2 mutations experienced a 40-70 percent reduction, and women with BRCA1 saw up to a 40-percent drop. This strategy is less effective for BRCA1 because these cancers don’t express estrogen or progesterone receptors, making them less responsive to hormonal interventions.

His research also revealed a link between BRCA1 mutations and serous uterine cancer, an aggressive form accounting for 10 percent of uterine cancer cases and 40 percent of associated deaths. The mutation increases the likelihood 20 fold. However, removing the uterus simultaneously with the fallopian tubes and ovaries is a cost-effective treatment strategy that offers a clinically relevant improvement in life expectancy, he says.

Still, there’s a need for more effective ways to screen women to find out whether they have an inherited predisposition. That’s why the Hereditary Cancer Clinic is so important, Kauff says.

CHANGING PATIENT CARE THROUGH RESEARCH

The most effective way to combat inherited cancer risk, he says, is to move genetic risk assessment out of cancer centers and into primary care settings as much as possible. Not only could it offer life-saving treatments to women with mutations earlier, but it could also identify previously unknown risks in their close female relatives.

In fact, going through genetic screening told two-time breast cancer survivor and Duke patient Kate Houff that her daughter carries the BRCA1 and BRCA2 mutations.

“Duke tested me for 17 genes, and I tested negative. But, we learned my

In the United States, there will be more than 113,000 patients diagnosed with cancer this year who qualify for genetic counseling, but there are less than 1,000 practicing cancer genetic counselors.

daughter carries both mutations,” she says.

It’s for cases like Houff’s, Kauff says, that the clinic tries to focus on patients in its research efforts. He calls it research that passes the “handshake test.” “We’re studying patients, whose hands we can actually shake, for their benefit and the benefit of their immediate relatives, the next generation, and the general population,” he says.

In part because of her concern about her daughter, Houff has decided to help raise funds and awareness for Kauff’s research. Her son, Quin, a NASCAR driver, donates a portion of his winnings (\$10,000 for Kauff’s work to date), and he raises funds through a website, beatcancerwithduke.org.

Kauff and colleagues have also received support from the Gray Foundation, the largest private philanthropic organization with a specific interest in the link between BRCA1 and BRCA2 mutations and hereditary breast and ovarian cancer. A \$1 million grant will further efforts to more effectively follow individuals with inherited risk long term

and will help develop better ways to assess genetic risk.

For example, the clinic is investigating ways to streamline genetic counseling. In the United States, there will be more than 113,000 patients diagnosed with cancer this year who qualify for counseling, but there are less than 1,000 practicing cancer genetic counselors. With sessions lasting up to 90 minutes, the workload is taxing, and the wait time for counseling can be long.

Kauff’s clinic is testing the efficacy of video-assisted genetic counseling coupled with molecular genetic screening ordered by a primary care doctor. The goal is reducing the number of patients seen face-to-face by a genetic counselor by two-thirds.

The grant supports other projects, including an investigation of whether women with mutations would be receptive to alternative ovarian cancer risk reduction strategies, such as only removing the fallopian tubes and leaving the ovaries, that may offer less protective effects but a greater quality of life.

“The money from the Gray Foundation provides critical funding to help an interesting hypothesis provide enough proof-of-principle that we can go into definitive trials down the road,” Kauff says. “These pilot projects are often the hardest to get funding for.”

GETTING PATIENTS INVOLVED

Ultimately, all of the clinic’s research is motivated by reducing future cancer devastation.

“The clinic’s research is designed to inform clinical care,” Kauff says. “We’re still trying to care for patients and their close relatives to reduce their risk of dying from cancer or even getting cancer.”

JOIN THE FIGHT!

To make a gift to help Duke create new models of care for hereditary cancers, visit bit.ly/dcifall2018

Gauging Risk

Duke helps women understand their individual risk of breast cancer



JENNIFER PLICHTA (right) with **AMANDA HUDSON**, who has battled breast cancer and receives services from the Breast Risk Assessment Clinic that Plichta leads.

BY WHITNEY J. PALMER

“If you notice a change in your breasts, discuss it with your care provider.”

Jennifer Plichta

Your gift can support physicians and researchers working to improve breast cancer detection and prevention and save lives. To learn more, visit: bit.ly/dcifall2018

BREAST CANCER RISK EXISTS FOR ALL WOMEN. Led by breast surgeon and Assistant Professor of Surgery Jennifer Plichta, MD, MS, Duke’s Breast Risk Assessment Clinic helps women learn about their individual likelihood for developing the disease. Any woman can participate to determine her risk level, but the services mainly target women with a family history, genetic mutation, or an abnormal breast biopsy.

In addition to individual meetings with Plichta or one of her colleagues, high-risk women can attend group meetings where they learn about nutrition, exercise, breast imaging, genetic testing, and more. The group leader, nurse practitioner Kathy Trotter, DNP, FAANP, may even pass around breast models with lumps so women can learn to quickly identify possible future tumors.

“These group meetings give women an opportunity to relate to each other on levels other than medical,” Plichta says. “They’re going through similar situations and face the same anxieties, risks, and decision-making about prevention and screening.”

The clinic also offers educational opportunities, including a free, day-long “What’s Best for Breasts” event, including information about screening, prevention, and treatment options.

In 2017, a quarterly lecture series, open to the community, offered free sessions about breast imaging, diagnosis, surgery, and sexual health. Additional sessions are scheduled for 2018.

While the clinic gives patients access to breast specialists, it offers the same

benefit to Duke's primary care and gynecology providers, Plichta says.

"Breast cancer is an ever-changing field, and primary care providers are responsible for so many things, including diabetes, thyroid problems, managing blood pressure, and controlling chronic conditions," she says. "They do a great job of reminding women to get mammograms, but it's our job in the clinic to stay up on the latest with breast cancer."



THE SCREENING QUESTION

An important aspect of breast cancer screening is for women to know their own bodies, including how their breasts normally look and feel, Plichta says. "If you notice a change in your breasts, discuss it with your care provider," she says.

When it comes to formal screening, guidance has been murky for years. However, according to Jay Baker, MD, professor of radiology, recommendations now encourage some women to begin breast cancer screening earlier than ever.

Baker shares the following guidance that he gives to women who come to Duke radiology clinics.

- All women should begin annual screenings at age 40.
- African-American women, who often face increased breast cancer risk, should consider risk assessment at age 30.
- Breast screening should continue if the woman is expected to live an additional 10 years.

Radiologists also now have a more sensitive tool, covered without copay by most insurance providers, available to screen women for breast cancer—mammograms with 3D tomosynthesis.

"This technology offers a 20-40 percent improvement in identifying breast cancers earlier and more accurately with fewer false alarms," Baker says. "It also results in 15-30 percent fewer unnecessary recalls for additional image of false alarms."



« On September 21, the Duke Breast Program featured breast cancer heroes in a pink-carpet fashion show. All proceeds benefitted the Duke Breast Education Fund, which sponsors the free community symposium, "What's Best for Breasts?" Fundraising is ongoing; visit dukepinkrunway.org.



LARS GRIMM with an image of a mammogram (left) and the features of the mammogram that are meaningful to a computer trained to read the images (right).

MACHINE LEARNING

Ductal carcinoma in situ (DCIS) is a low-risk breast cancer form that largely presents as small calcifications on mammograms. For women with DCIS, Duke researchers are working to use "machine learning" to reduce unnecessary follow-up breast imaging and offer some women less-invasive treatment options.

Assistant Professor of Radiology Lars Grimm, MD, MHS, and colleagues, led by Professor of Surgery Shelley Hwang, MD, are using artificial intelligence to train computers to screen images to identify which DCIS incidences can be monitored over time without treatment and which ones are suspicious and require more immediate intervention. Other collaborators include Associate Professor of Surgery Jeffrey Marks, PhD, and Professor of Radiology Joseph Lo, PhD.

The goal, Grimm says, isn't to replace radiologists reading and diagnosing images, but to extract more information from the images. Greater knowledge about DCIS findings can also benefit surgeons and patients.

"We can guide surgeons and give patients more information up front without relying on tissue sampling and biopsy," Grimm says. "We can tell women and their surgeons if we think they have DCIS or more invasive cancer so they can make more informed decisions about care."

To date, with patients from Duke, the group has demonstrated the strategy is successful. The goal, Grimm says, is to test the strategy with larger patient populations at multiple institutions.

"Right now, the trained computer is as good as a radiologist in describing DCIS," he says. "With more refinement of our algorithms, we want to replicate the same level of performance on a larger scale."

Hwang says, "We are only starting to unlock the immense potential of digital imaging data, and the kind of work that Drs. Grimm and Lo are doing could be tremendously important for the over 40 million women who undergo mammography annually in the United States."

— Whitney J. Palmer

A willingness to try a clinical trial, plus his own brand of humor, are helping this man beat advanced cancer.

Fighting Melanoma *with Team Tom*

By Miriam Sauls

It would be hard to find a more affable person than longtime

Durham resident Tom Drew. Even as he is being treated for advanced melanoma, he is determined to find humor and make new friends.

Seven years ago, Drew discovered a pea-sized place on his scalp, which was surgically removed and diagnosed as melanoma. After surgery, he was considered cancer free and lived five years feeling home free. Then, two years ago, he experienced a dizzy spell, and his worst fears were confirmed—the melanoma had moved to his brain.

In the hospital for radiation treatment, he set up *Team Tom*. “My room had one of those white boards, so I wrote



Team Tom across the top and welcomed each caregiver to the team and told them we'd try to have some fun,” recalls Drew.

His oncologist, April Salama, MD, associate

professor of medicine, was a good person to have on *Team Tom*, as she is director of Duke Cancer Institute's melanoma program, and as such has intricate knowledge of Duke's broad array of clinical trials.

“Ten years ago in melanoma, long-term survival was virtually unheard of,” Salama says. “Now 50 percent of patients with previously incurable disease are living years.

“In the last seven years there have been eleven new drugs approved. I started my career in 2010, and it was very challenging,” she says. “We had almost no drugs and no clinical trials. In 2011 things started taking off in the development of immune and targeted therapies. Now we have many trials for different stages of the disease.”

Another element that sets the Duke melanoma team apart is their multidisciplinary approach. “We’re in clinic together with dermatologists, medical and surgical oncologists, radiation oncologists—so we are getting a collective opinion, offering a focused expertise across the spectrum of melanoma,” she says.

Salama guided Drew to some of the standard immune therapies that have benefitted many patients, and the tumors

“I’m tired,” Drew told Salama, “but you saved my life before, so I will do whatever you say.”

initially shrunk. However, after 10 months, new tumors in the lymph nodes in the abdomen turned up.

Salama directed Drew to a new clinical trial. “I’m tired,” Drew told Salama, “but you saved my life before, so I will do whatever you say.”

Drew is currently doing well on a treatment that is suspected to work by turning off cells that may act to “hide” the cancer from immune-system cells. He continues taking the drug even though the original clinical trial has since closed.

“He is doing well more than two years after a diagnosis of metastatic melanoma, which was almost unheard of at the time he was originally diagnosed in 2012,” Salama says. She adds that it is precisely patients like Drew, who are willing to participate in clinical trials, who have made such advances possible in a relatively short period of time.

Drew cannot say enough kind things about Salama. “She comes into my room and holds my hand while discussing my options. You know she’s special from the time you meet her. She becomes friend, sister, mother to you. And the team approach is wonderful,” he says.

Despite the success Salama and her team are experiencing, she is not satisfied. “Now is not the time to say we’ve done a good job, because we have to keep moving forward. The field has moved so fast but leaves more unanswered questions.”

And Drew isn’t resting either. He lives life fully, still working at his fundraising consulting firm, enjoying his family and the many friends he has made on his medical journey.



APRIL SALAMA and **TOM DREW**

HOW YOU CAN HELP

Your donation makes clinical trials of new therapies possible. To give, use the enclosed envelope, or visit: bit.ly/dcifall2018



SOMETHING TO HOPE FOR

BY MARY-RUSSELL ROBERSON

THE DUKE CENTER FOR BRAIN AND SPINE METASTASIS is a beacon for patients with a diagnosis that was once considered the end of the road.

In April, Natasha Hullett, an emergency room nurse and the mother of a three-year-old, was working an overnight shift at Blue Ridge Regional Hospital in Spruce Pine, North Carolina, when she had a seizure. The cause? The breast cancer she had battled three years earlier had spread to her brain. After surgeons in Asheville removed the tumor, Hullett made a decision: “I’m at a stage where I need the best of the best, so we decided to switch to Duke.”

The transition was seamless, thanks to Natalie Ashley, the patient navigator at the new Duke Center for Brain and Spine Metastasis. “My philosophy is to be accessible and to provide personalized, coordinated, and timely care,” Ashley says. “I act as a central person for patients to call, and I can help them navigate where they need to go from there.”

PERSONALIZED CARE

Ashley makes sure new patients are seen within a couple of days, and sometimes within a couple of hours. “The physicians are very responsive,” Ashley

says. “They understand the patients are often in a precarious emotional and clinical state.”

Hullett describes Ashley’s work this way: “Anything I need, she tries everything in the world to take care of.”

Ashley’s role in many ways symbolizes the mission of the Duke Center for Brain and Spine Metastasis. In the past, metastasis in the central nervous system often was considered the end of the road for cancer patients. Treatment, if offered, tended to reflect this fatalistic attitude.

“We want to be the place that doesn’t forget about those people, but makes them the focus,” says Peter Fecci, MD, PhD, assistant professor of neurosurgery. “We want to be pushing the field forward and give people something to hope for once they land at Duke.”

The time is right to focus on brain and spine metastasis because it’s becoming more common as patients live longer after an initial diagnosis of a primary cancer.

A TEAM OF EXPERTS

Coordinated care is the backbone of the center.



MIKE BELLEWE

NATASHA HULLETT was diagnosed with breast cancer while pregnant with her daughter, Paige. Today, Paige is three years old, and Hullett is fighting cancer that has spread to her brain.

HOW YOU CAN HELP

Your gift will fuel life-saving collaborations like the Duke Brain and Spine Metastasis Center. To help, visit bit.ly/dcifall2018

People with brain or spine metastasis need the medical expertise of an entire team including neurosurgeons, orthopedic surgeons, radiation oncologists, medical oncologists treating their primary cancer, and palliative care physicians, who manage symptoms and help patients identify their goals for treatment. Other team members might include medical physicists to participate in radiation and surgical treatments, and physical and occupational therapists to help with mobility issues.

These experts pool their knowledge at weekly meetings to create a treatment plan for each patient, which could include a combination of surgery, radiation, chemotherapy, immunotherapy, and palliative care.

John Kirkpatrick, MD, PhD, professor of radiation oncology, says, “We’re working together to deliver the best overall effect. There are benefits from the coordination apart from just doing things in the right order—we’re just learning how these tools may behave synergistically to give you a unique benefit longer term.”

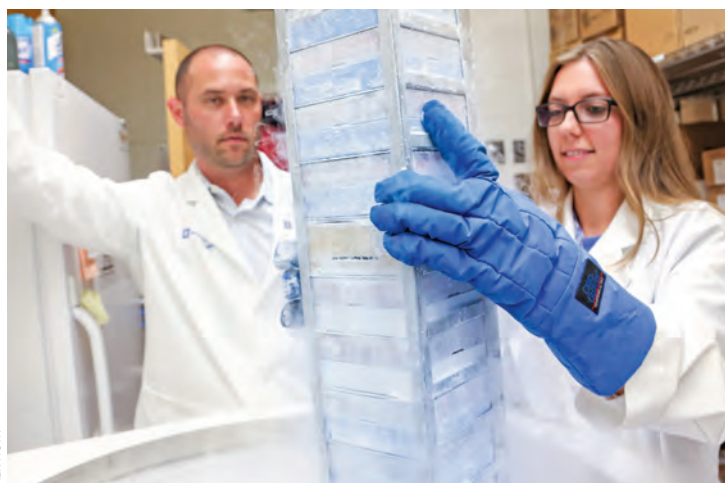


LES TODD

Patient navigator **NATALIE ASHLEY** and radiation oncologist **JOHN KIRKPATRICK** are part of a team of working together to deliver the best outcomes for brain and spine metastasis patients.

PRECISION RADIATION

One of the most powerful tools in Kirkpatrick’s toolbox is stereotactic radiosurgery. It’s not actually surgery, but it is “surgically” precise. “We can deliver an extremely high dose of radiation to the tumor, but the dose falls off rapidly so we’re protecting normal tissue,” Kirkpatrick says. That’s an improvement over whole-brain radiation, which delivers the same radiation dose to normal brain tissue and metastases, and



KEN HUTH

Neurosurgeon **PETER FECCI**, with a student in the lab. He’s developing ways to make laser therapy for brain tumors even more precise.

can cause problems with memory and concentration. Duke is a leader in stereotactic radiosurgery, doing more than 500 such cases a year.

In order to deliver the radiation with sub-millimeter accuracy, radiation oncologists and medical physicists work together to determine the precise location of the lesions using high-resolution MRI and CT scans. Patients wear custom-molded masks to hold their heads in place during the radiation treatment. If the patient’s head is even a millimeter out of place, the team is able to reposition them and confirm the location of the lesion before zapping it. “We know we are treating the lesion and only the lesion,” Kirkpatrick says. “We strive to protect the brain, because what makes us human is our ability to think and love and process things with our brains.”

Stereotactic radiosurgery is also used for spine metastasis, where it can be effective in reducing pain and killing tumors.

MINIMALLY INVASIVE SURGERY

Duke is also a leader in a minimally invasive surgical technique called laser interstitial thermal therapy, or LITT for short. The team makes a one-centimeter incision in the scalp, and drills a small hole in the skull. Using a computerized navigation system, the surgeon inserts a laser into the lesion. “Then we roll out an intraoperative MRI scanner and we convert it, through clever physics, into a giant thermometer,” Fecci says. “We use a laser to cook the lesion until it’s killed.”

LITT can also be used to reduce symptoms from radiation-damaged brain tissue.

Fecci is working with colleagues in the Pratt School of Engineering on a technique that uses nanoparticles to make LITT effective with larger tumors, and increase its precision around

tumor margins. The nanoparticles accumulate in tumors and act as “lightning rods” for the laser. Computer models and experiments with mice indicate the technique works. Next, Fecci and researchers at the North Carolina State University College of Veterinary Medicine plan to test the nanotechnology-LITT system on brain tumors in pet dogs.

SPINE METASTASIS

LITT has not yet been used to treat spine metastasis at Duke, but it will be soon.

Patients with spine metastasis greatly outnumber those with brain metastasis. They often suffer excruciating pain, loss of bowel and bladder control, and inability to walk.

Those symptoms are a big focus of Rory Goodwin, MD, PhD, assistant professor of neurosurgery. Goodwin says quality of life improvements can translate into quantity of life. “The patient who can walk is eligible for a clinical trial,” he says. “The patient who can’t walk isn’t. If we can turn people who can’t walk into those who can, then they’ll be eligible for trials of systemic therapies and immunotherapies.”

Goodwin also does research to understand how spine metastasis develops. “We’re trying to find ways to prevent it or treat it through non-surgical means,” he says. “There’s not a good drug for spine metastasis, but we hope to develop one in the future.”

BUILDING A COMMUNITY TO ADVANCE TREATMENT

Everyone at the Duke Center for Brain and Spine Metastasis is driven to find better treatments. Chemotherapies and immunotherapies that work well in other parts of the body have thus far been fairly ineffective in the brain or spine.

The center aims to advance treatment by encouraging collaboration among researchers and physicians across Duke, funding research, and enrolling patients in clinical trials.

One of this year’s funded projects, headed by Fecci, is investigating how brain tumors thwart the immune system. Inflammation is an important part of the immune response, but swelling is dangerous in the brain, so the brain has evolved ways of shutting down immune activity. “Tumors are happy to manipulate and usurp those mechanisms,” Fecci says. “We are going to have to combat that if we want to develop immunotherapies that work in the brain.”

Specifically, Fecci is studying ways brain tumors turn off, disrupt, and sequester T-cells, which are designed to attack and kill invaders. Fecci is working on developing a drug to prevent T-cell sequestration, in collaboration with Nobel laureate Robert Lefkowitz, MD, James B. Duke Professor of Medicine. The drug could open the door for using immunotherapies that harness T-cells to attack cancer in the brain.

While no one’s saying there’s a cure for brain or spine metastasis, some patients (“Not as many as we’d like,” says Kirkpatrick) are thriving several years after diagnosis. And physicians and researchers are working hard to improve the odds.



Neurosurgeon **RORY GOODWIN** is trying to find non-surgical ways to treat spine metastasis.

As for Hullett, Kirkpatrick used stereotactic radiosurgery to treat four small lesions as well as the cavity where her larger tumor was surgically removed. After recovery, she was able to return to work.

“When I met Dr. Kirkpatrick, I knew that Duke was exactly where I needed to be,” Hullett says. Her care team at Duke also includes physicians specializing in medical oncology, surgical oncology, palliative care, and cardiology. “Everybody’s been great,” she says. “I think I made the best decision. My whole family does.”

DUKE CENTER FOR BRAIN AND SPINE METASTASIS AT A GLANCE

The Duke Brain and Spine Metastasis Center offers multi-disciplinary, team-based care for patients with brain or spine metastasis, while also working to improve current treatments and discover new ones by funding research and creating a community of physicians and researchers.

Center leaders: Peter Fecci, MD, PhD, assistant professor of neurosurgery; John Kirkpatrick, MD, PhD, professor of radiation oncology; Rory Goodwin, MD, PhD, assistant professor of neurosurgery; April Salama, MD, associate professor of medicine.

Key Players: The center is a joint effort of the Department of Neurosurgery, Department of Radiation Oncology, and Duke Cancer Institute.

Launched: 2017

Funding: Initial funding provided by the Translating Duke Health Initiative

STRIKE OUT FOR SARCOMA.

The ninth annual **5K and family fun walk**, held September 9, 2018, raised **more than \$45,000** for Duke sarcoma research.



KEN HUTH

«**NO PRESENTS, PLEASE.** In summer 2018, as Angeles Alvarez Secord, MD, was about to turn 50, she wasn't thinking about presents, but about two patients of hers who had just died of endometrial cancer. Not to mention the increasing prevalence of the disease. Secord decided to mark her **milestone birthday** with a fundraiser for endometrial cancer research at Duke. She has brought in \$4,000 to date, which will support **clinical trials for endometrial cancer patients**. Fundraising is ongoing. "We will never stop," Secord says. "Four thousand dollars is not enough to really make any difference with endometrial cancer research, but at least it's a start." **Visit bit.ly/SecordDCI to donate.**

Blurring the Racial Lines on Prostate Cancer

An increased survival benefit for black men with advanced prostate cancer and a stronger response to hormone therapy were the centerpieces of racial disparity studies presented by researchers from Duke's Prostate & Urologic Cancer Center at the 2018 American Society of Clinical Oncology (ASCO) Annual Meeting.

Black men are underrepresented in clinical trials for prostate cancer, despite an almost two-fold greater incidence and mortality of disease in black versus white populations.

In a study led by Susan Halabi, PhD, professor of biostatistics and bioinformatics, researchers pooled data from nine randomized phase 3 trials of more than 8,000 men with advanced prostate cancer who received chemotherapy. Surprisingly, the results showed that chances of survival are as good for black men as for white men on clinical trials. While the median survival was the same (21 months), black men had a 19 percent lower risk for death than their white counterparts when adjusting for important variables.

"By pooling data across clinical trials, this study provided a unique opportunity to evaluate how race might affect prostate cancer survival and response to treatment," says Halabi. "The results of this analysis suggest there might be biological variations associated with race in either the disease or response to treatments that need to be further explored. Our study highlights the importance of minority groups participating in medical studies."

Similarly, in a prospective, multi-site study led by Daniel George, MD, researchers enrolled equal numbers black and white men with metastatic, resistant prostate cancer who were treated with the anti-hormone therapy, abiraterone, and the steroid, prednisone. black men had a greater response to therapy, characterized by more dramatic declines in a tumor blood marker called prostate-serum antigen (PSA) and had a longer median time to PSA progression than white men (16.6 vs 11.5 months).

"There is an urgent need to explore the underlying genetic differences associated with treatment response," George says.

Duke researchers believe the study suggests a potential strategy for new therapies and hormonal treatment plans



JESSICA HYLAND

SUSAN HALABI presented study results that suggest there might be biological variations linked to race that influence response to prostate cancer treatment.

that could narrow the disparity between survival rates for blacks and whites in prostate cancer.

— by Jessica Hyland

INVESTING IN THE FIGHT AGAINST CANCER



BOB LEVERONE

Tom Kean of Norwood, North Carolina, thinks of his investments in Duke cancer research and education as “money well spent.”

He and his late wife, Janet, were married for 66 years. Together, they started the Janet Hartquist Kean Endowment Fund for breast cancer research. Recently, Kean began funding the Joseph O. Moore, MD, Endowed Fellowship, in honor of one of his physicians. “Dr. Moore is just a down to earth, real doctor,” Kean says.

“Cancer is such a horrible disease, and every family experiences it in one way or the other. The more we know about it, the better off we are.”

▶ To learn more about how to give to Duke Cancer Institute in a way that is most meaningful for you, please contact Senior Director of Development Michelle Cohen, 919-385-3124 or michelle.cohen@duke.edu.



Duke Cancer Institute

YOU CAN SUPPORT THE FIGHT

Gifts to Duke Cancer Institute help us develop new treatments and provide compassionate care. To make a gift, visit bit.ly/dcifall2018, or use the enclosed envelope. Thanks for your support!

DCI Office of Development
Amy Deshler, Senior Executive Director
919-385-3129
changingtherulesoncancer.org

CONNECT WITH US!

Duke Cancer Institute is on Facebook, Twitter, and YouTube.

facebook.com/dukecancerinstitute

twitter.com/dukecancer

youtube.com/user/dukecancerinstitute



Putting a Family at Ease

When sisters Caitlin Jantzi (left) and Megan Yelenic, of Raleigh, North Carolina, were just nine and five, their mom passed away from breast cancer.

Their father encouraged them to seek genetic testing, and both learned that they carried mutations in one of the BRCA genes, the so-called breast cancer genes. Both eventually decided to have preventative mastectomies. "We don't have to have that in the back of our minds anymore," Caitlin says. "That concern has gone away because of our experience with Duke."



READ MORE about about these sisters on dukecancerinstitute.org or facebook.com/dukecancerinstitute.

To learn about sharing your **#MyDukeCancerStory**, email dcidevelopment@duke.edu.