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ONCOLOGY Fellows

A specialty journal of OncologyLive®

Reminding Ourselves of How Far We've Come

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Making the Right Decision About Your Future

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ONCOLOGY *Fellows*

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TALKING AMONG OURSELVES

Dear Doctor:
Welcome to the first *Oncology Fellows* newsletter, a quarterly publication that highlights the first-hand experiences of oncology fellows as they weave their way through their fellowship programs. *Oncology Fellows* is unique because it addresses the challenges and milestones—both personal and professional—that fellows confront during their programs.

Highlighted below are recent stories from *Oncology Fellows* that addresses the problem of bias, medical ethics, and complex surgeries.

Do you have a story or experience that could benefit your colleagues? Contact **Anthony Berberabe** (aberberabe@onclive.com) for author guidelines. If your story is published, we provide a $500.00 honorarium.

Is Anchoring Bias a Real Phenomenon?
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The American Cancer Society has launched a new grant program to support early career clinicians aiming to become clinician scientists. For more information, visit

Watch your inbox for our *Oncology Fellows* e-newsletter— written for fellows, by fellows. Send an email request to Jason Harris (**jharris@onclive.com**) to receive your copy.

GERALD HSU, MD, PhD

Hematology/Oncology Fellowship Program Director
Associate Clinical Professor of Medicine
University of California, San Francisco (UCSF)

Searching for Applicants With Vision

By Jason Harris

LIKE ALL FELLOWSHIP DIRECTORS, Gerald Hsu, MD, PhD, is looking for applicants with intelligence, ambition, and a desire to advance cancer research and clinical care. The trick is finding the right combination of talent, intellectual curiosity, drive, and diversity to join the community at the University of California, San Francisco (UCSF).

But the most important trait, he said, is vision. Hsu is looking for applicants who have a clear idea of what they want to accomplish in medicine and specific ideas about how to achieve those goals. UCSF only accepts 7 hematology/oncology fellows each year, so finding the right people is a challenge.

"In addition to looking for the best fit, we're looking for people who will best serve hematology/oncology in the future," he said to *Oncology Fellows*. "That also means ensuring adequate representation of the diversity [in] this country. In thinking about the composition of who we want to bring in, that factors quite heavily."

Hsu became the fellowship program director in 2018. He earned his medical and doctoral degrees at Duke University in Durham, North Carolina, before going on to complete his residency at Brigham and Women's Hospital in Boston, Massachusetts. Hsu performed a fellowship in hematology and medical oncology at UCSF before returning to Brigham and Women's to serve a yearlong stint as chief resident.

In discussing his work as a fellowship director, Hsu talked about his love for San Francisco, the benefits of working at UCSF, and the best way to present yourself in your fellowship application.

Q: What led you to this position?

As chief medical resident, I recognized the importance of medical education in fostering opportunities for personal and professional growth for trainees. It was also a wonderful time to spend a dedicated amount of educational investment in science and medicine again.

My focus when I came [to UCSF] was primarily clinical care and medical education. In the course of my first few years as a faculty member, I was able to build on this interest and develop additional training for a program called Teaching Scholars that provided perspective and opportunity to delve into medical education scholarship.

Through that experience at the undergraduate medical education level, I built enough of a background in medical education. That eventually led to this job.

Q: What's your typical day like?

There is no typical day. My commitment to clinical care is 2 half-days per week, [but] it's really more like 2 three-quarter days of outpatient practice, during 1 of which I'm supervising fellows. I do 4 months on our inpatient service at the San Francisco Veterans Affairs Medical Center, which is a consultant service for both hematology and oncology.

My weeks are built around those clinical care responsibilities. Beyond that, most of my time is spent in various meetings with individuals about the fellows program and meetings representing our program. I don't know how much time I spend doing email. That's a lot of it.

Q: What are you looking for in a fellow?

We're looking for the best fit for our institution. I think about UCSF as an institution for pioneers. I think about UCSF as an institution for future leaders, both in lab-based research and clinical research. I think of UCSF as a place that has a broad range of resources to support endeavors that will be coming online for research and clinical practice. Fundamentally, we're looking for people who are pioneering in their spirit, people who have initiative, people who are committed to excellence in whatever they choose to do.

Q: What makes an application stand out?

Everyone has their own approach to looking at an application. My approach is to start with the personal statement, because that is the place where an applicant has the opportunity to communicate with me directly. What I'm looking for is someone's vision for themselves. Not just their career aspirations, but how they are going to get there. I think about it as providing some broad goals but also very specific ways they're going to cultivate new skills, what sort of training they're looking for, the coursework they want to do to reach what they view as their 5- to 10-year career plan. The degree to which you can be really specific about what you hope to achieve serves an applicant well and provides a nice opportunity to discuss how a program might fit with your personal and professional goals.

I'm looking for intellectual curiosity and ways in which that may have driven somebody over the course of their educational experiences. I'm really looking to learn more about people in a personal statement. I care deeply about where people come from and what they're like. The degree to which you can get that out of a personal statement, and communicate that in a personal statement, is quite a challenge. The best personal statements do all of that.

Q: What is something applicants do that you find unhelpful?

Applicants often start with a patient experience to frame their desire to go into hematology or oncology from a clinical lens. It's not a bad way to structure a personal statement—you can use a case to highlight all the things I talk about—but to use a case and say that was one's inspiration for going into oncology without then providing the vision is probably not going to serve you best.

Q: How important is a desire to do research?

We're looking for fellows who want to do research in the lab, in the clinical environment, in global health. We want fellows to do research to cultivate that intellectual curiosity, because intellectual curiosity is so fundamental in clinical practice, in developing new research questions, and applying research to clinical questions. That's a key element to what makes us good physicians.

Q: What's great about living in San Francisco?

The best part about the Bay Area, in my mind, is the appreciation of diversity and people's unique differences. The Bay Area is a place where people are genuinely inclusive and, were it not for cost-of-living concerns, it's the kind of place where anyone can make a home and feel accepted.

It's a place that's rich in cultural resources and natural resources. It's a great place if you love the outdoors. It's a great place if you love cities. It's awfully nice to know that you [could] come here and have a cultural home and feel accepted.

Q: What's great about being a fellow at UCSF?

It's a large, public institution that is committed to excellence. It's a place where we are committed to professionalism, respect, inclusiveness, and diversity. It's a place where visionary people can come and use the resources and commitments of this institution to build something new and different. It's a place that's truly forward thinking and prizes intellectual curiosity and vision.

I love that we're a big university supported by the state of California that's responsible to the people of California and to this country. There's a mindset here that your work is supposed to contribute to the greater good. ■

> “We're looking for people who are pioneering in their spirit, people who have initiative, people who are committed to excellence in whatever they choose to do.”

Reminding Ourselves of How Far We’ve Come

Russell J. Ledet, PhD
MD and MBA Candidate, Class of 2020
Tulane University School of Medicine
and A.B. Freeman School of Business
New Orleans, Louisiana

Rachel M. Turner, MA, MS
MD Candidate, Class of 2020
Tulane University School of Medicine

Christen Brown, MS
MD Candidate, Class of 2020
Tulane University School of Medicine

FOR US, A GROUP OF 15 black students at Tulane University School of Medicine (TUSCOM), a visit to the Whitney Plantation in Edgard, Louisiana, was a no-brainer. The process of navigating medical school is pure hell at times, and you need inspiration wherever and whenever you can get it.


Russell J. Ledet, PhD

We draw inspiration and motivation from one another. New Orleans, after all, was one of the largest slave markets in the country, and the Whitney Plantation is less than an hour from Tulane. There was no better place for a group of black prospective doctors to celebrate our triumph over systems meant to annihilate us. Ledet, a molecular oncology scientist, reached out to his colleagues at TUSCOM with the following email. Eventually, they received international acclaim and an opportunity to have an impact on people far beyond New Orleans.

Thursday, September 19, 2019; 1:44 AM

Russell: Over the summer, one of my closest friends from New York City came to visit me. During the stay, we took a trip to the Whitney Plantation, preserved in the Whitney Plantation Historic District near Wallace, Louisiana. That experience was so different from anything I had ever witnessed. The Whitney Plantation is unique compared with ones that celebrate the plantation owners—it is the only plantation museum in Louisiana with an exclusive focus on the lives of enslaved people.

Considering the aforementioned, I presented the idea of gathering the melaninites of the School of Medicine to experience the Whitney Plantation and take a photo in our white coats. I figure that photo will be iconic and speak volumes, and I also think it is an opportunity for us to be reminded of how far we have come.

Prior to this email, I had presented the idea to some of my colleagues, and they were on board 100%, all agreeing this was a necessary trip. I reached out to Joy Banner, the museum's director of marketing, and she was elated to give us a tour.

My colleagues immediately understood the underlying purpose of this proposition. One may ask, "Why is that unity important?" Our answer is that we have a shared understanding of the importance of remembering the resilience and resistance of our ancestors, »


The 15 White Coats took both inspiration and motivation from their visit to the Whitney Plantation.

Photo courtesy of The 15 White Coats.

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Rachel M. Turner, MA, MS

which ultimately has afforded us the opportunity to be in the position we are today. Their strength courses through our veins. We are fully aware of that and wholly acknowledge it.

To be candid, this was about our needing something. We needed a soul revitalization. We needed a visitation from souls long gone. We needed to be reminded of our instilled resilience, and the Whitney Plantation expedition on December 14, 2019, did that for us. Fifteen TUSCOM students made it out to the Whitney Plantation, and we are all the better for it now. We went there in all black with our white coats on. Other patrons were in awe of us just walking around.


Christen Brown, MS

Each of us gained something different from the trip. For some, it was a remembrance of a violent, monstrous, irrefutable crime that still does not have the power to stop our progress. For others, it was an out-of-body experience that left them numb. Before we left, we took these iconic photos in front of an original slave quarter on the plantation.

Those photos wound up in *People* magazine, on websites for HuffPost UK, CNN, MSNBC, NPR, and on the front page of the New Orleans *Times-Picayune*. We have been thrust onto an international platform, spoken on news stations, and addressed hundreds of school-age children. We plan to place these photos in classrooms and homes nationwide. Our photo will hang in the halls of K-12 learning institutions from New Orleans to Minnesota, New Jersey, Texas, Georgia, Washington State, Missouri, New York, Washington, DC, and more.

This is only the beginning, but we are grateful for our beginnings. We started a group, the 15 White Coats, and launched a website, www.the15whitecoats.org, to take advantage of this moment. Opportunities to share our story and the impact we intend to make have not slowed down. Our mission is to (1) install 100,000 photos in 100,000 classrooms nationwide by 2022, (2) raise enough funds to aid medical school applicants of color, and (3) place cultural literacy centers in classrooms nationwide. People cannot be what they do not see, and by placing our photo in schools, we further the process of reimagining cultural imagery about who can do what, especially for children. Just applying to medical school costs $3500 on average, and we can help to lighten that burden for folks who simply cannot afford the cost but have all the qualities to be great clinicians. Finally, we need our young people to read books that resonate with their reality, and by placing literature that aligns with their lives, we hope to encourage more literacy.

> “There was no better place for a group of black prospective doctors to celebrate our triumph over systems meant to annhilate us.”
>
> – RUSSELL J. LEDET, PhD

Our goal is to make photos like these commonplace so we can move on to other issues in humanity. If we are to ever move the needle on breaking down structural racism and its manifestations in the healthcare system, having more people from disenfranchised histories in medicine has to be part of the equation. We are not the ultimate solution, but we are surely part of the remedy.

We’ll close this by saying we are not looking for sympathy. Don’t misconstrue this. This ain’t the story about the unfortunate black folks who survived opposition and are now training in medicine. This is the story about the triumphant queens and kings who illustrated resilience. As Uché Blackstock, MD, once wrote, we chose “bravery over fear.” We do not see that changing anytime soon. The 15 White Coats are here to change the world for the better. ■

FOLLOW US

@the15whitecoats

Find out how you can help the 15 White Coats at **www.the15whitecoats.org.**

MAKING THE RIGHT DECISION ABOUT YOUR FUTURE

Mohammed Najeeb Al Hallak, MD, MS
Wayne State University School of Medicine–Karmanos Cancer Institute
Detroit, MI

I WAS IN MY LAST YEAR of medical school in Syria when I lost my father to chronic lymphocytic leukemia. I had encouraged him to seek treatment after seeing him suffer from disease-related fatigue and early satiety because of his huge spleen. I never expected, with my limited knowledge back then, that rituximab could cause such severe tumor lysis syndrome with disseminated intravascular coagulation on the third day of its administration.

Mohammed Najeeb Al Hallak, MD, MS

I had to take some time off from my school to close my father's local business. Then, I worked as an English translator for a medical equipment company to earn what was barely enough to support my family. Eventually, I graduated from school and left for the United States to start the long path to becoming an oncologist.

After completing my internal medicine residency from the University of North Dakota School of Medicine & Health Sciences, I had to work for several years to secure permanent residency in the States. Since my dream was to become a physician-scientist and develop new treatments for patients with cancer, I completed a master's of science in clinical research design and statistical analysis from the University of Michigan. Finally, I started my ultimate journey as an oncology fellow at Wayne State University School of Medicine in Michigan.

One month into the fellowship, full of hope and passion, I quickly realized how deep and complicated this specialty is. It was very different from the medicine I practiced before; there are so many genomic alterations to learn—*EGFR*, *KRAS*, *BRAF*, *HER2*, microsatellite instability, and PD-1/PD-L1—before I could choose the most beneficial treatment for my patients. Plus, I had to master not only chemotherapy, but also immunotherapy and targeted therapies.

I needed to get up-to-speed quickly. Some of my friends suggested that I skim the National Cancer Care Network guidelines to gain basic knowledge on the management of common cancers. Others suggested I browse a small handbook; still others directed me to watch hematology-oncology board review course videos. I was not able to work on any research projects during the first year. I felt like a wrecking ball, swinging wildly from one rotation to another.

By the end of the first year, I started to develop a special interest in gastrointestinal (GI) cancers,

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particularly pancreatic cancer. I enjoyed managing those patients, trying to get them to surgery, then adjuvant chemotherapy, all while hoping for a chance of a cure. Even when the chemotherapy is only palliative, I loved the moment when my patient came back to the clinic after a few treatment sessions, free of pain, free of fatigue, and able to eat without bloating or nausea.

At the beginning of my second year, I chose my GI oncology mentor and established my GI clinic parallel to his. I was then introduced to our GI team's basic scientist, who involved me in several exciting projects exploring new drugs for pancreatic cancer. I learned how to culture cancer cells, perform western blots, create patient-derived xenografts (PDXs), and develop pancreatic orthotopic mice models. I was fascinated by the tumor shrinkage some of these new drugs achieved in the PDXs.

> “I sought advice from a member of our faculty who has been in academia for 30 years. He told me, 'You will not be poor as an academic faculty. Choose what makes you feel happy when you drive to work every day.'”
>
> — MOHAMMED NAJEEB AL HALLAK, MD, MS

I then started to get more involved in the clinical trials conducted under my clinical mentor's guidance. I wrote my first phase II trial protocol to test a new drug combination in patients with pancreatic cancer, and I was able to get the protocol approved by the independent review board and the FDA. I also worked with my basic science mentor on a translational trial to test biomarkers in patients with pancreatic cancer. I was then honored to become a scientific member in the tumor microenvironment biology program at my cancer institute.

In the middle of all the excitement, while advancing my academic GI oncology career, I noticed that my prefellowship savings account was getting depleted. I began worrying that I wouldn't be able to support my family if I stayed in the academic field after graduation. I told myself that it isn't easy to find private jobs in GI oncology, and even if I found one, it wouldn't satisfy my career goals.

I sought advice from a member of our faculty who has been in academia for 30 years. He told me, “You will not be poor as an academic faculty. Choose what makes you feel happy when you drive to work every day.”

By the end of the second year, I began to feel that pursuing an academic career in GI oncology with a focus on drug discovery was the right choice after all. Initially, I didn't think I could run my own lab if I wanted to focus on conducting clinical trials; however, I found that collaborating with our GI basic scientist gave me what I was looking for: the opportunity to develop new treatments for pancreatic cancer from bench to bedside.

I was announced as the new chief fellow at the end of the second year. Soon after that, I started to work on the fellows' rotations schedule and didactics curriculum. At the same time, I was preparing to start my interview season to find my future academic GI oncology position. Meanwhile, I got an offer to join a successful pharmaceutical company as a leader for their clinical trials pipeline.

The offer caught me completely off guard; joining the pharmaceutical industry didn't even cross my mind when planning my future career. However, it was a great opportunity: lots of travel, a role designing the company's clinical trials on cancer drug discovery, and of course, a higher income. For all its advantages though, a job in industry meant that I would miss the interaction I enjoyed every day with my patients. Ultimately, I decided to turn down the position.

I finally made my career decision and signed with my current institution as a junior GI oncology assistant professor. I'm currently leading several clinical trials as a subprincipal investigator under my mentor's direction. In a few months, I will take over as the principal investigator. I am sure this will be the beginning of a successful academic career. I hope that one day I will be part of a team that finds new and promising therapies for pancreatic cancer.

Making a decision about your career is not easy, especially when trying to meet the tremendous challenges of fellowship. After I went through the experience of struggling to make a decision, I learned that my colleague was right: What matters in the end is what makes you feel happy driving to work every day. ■

Overcoming Burnout: Caring for Ourselves While Taking Care of Our Patients

Janice Shen, MD
Hematology-Oncology Fellow
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I REMEMBER HOLDING my grandfather's hand as he took his last breath, a soft sigh that meant the end of all the hardships he endured while battling metastatic colon cancer. I vowed then to become a hematologist-oncologist. Watching a family member suffer through an advanced stage of cancer gave me profound insight into the fears that accompany a terminal diagnosis. I always admired the compassion required of a cancer specialist and yearned for a career in which I could develop meaningful long-term relationships with my patients.

Throughout medical school and residency, I prided myself on my ability to build strong rapport with patients and draw from my personal experience with bad news to empathetically console those in distress. However, as fellowship began, my bountiful pocket of empathy quickly ran low, and I struggled to recharge between the seemingly endless consults and beeping pagers.

The first few months of my fellowship were riddled with long days that ended with choosing between eating dinner, exercising, or sleeping. Surely there would be no time to do all the above and still survive the next day filled with conferences, consults, and chemotherapy orders. Here I was, starting at the bottom again,

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a position I was all too familiar with during my first years of high school, college, medical school, and residency. This hierarchical structure typically meant that every first year of training entailed more time spent studying and working longer hours, while simultaneously being underacknowledged by the senior staff.


Janice Shen, MD

I became callous, especially toward patients who would note that, as an Asian American woman, I looked younger than my age—too young to be making critical medical decisions. I lost patience with those who would angrily ask, "Isn't it all in the chart?" when I asked them about their medical history.

I became extremely sensitive to microaggressions from my colleagues, who appeared equally drained. It was difficult at times to maintain the same level of passion for medicine I once had, but I soon realized that I was limiting myself from becoming a successful physician. As a new fellow, I was burning out and simply did not know how to cope.

While We Take Care of Others, Who Takes Care of Us?

The effects of my burnout, like an angrily shaken soda bottle, resulted in episodic explosions that splashed on those who deserved it the least—my significant other, my immediate family members, and my friends. I envied those in my nonmedical support system who already had sizeable incomes and growing families, while I struggled to study for national board exams and pay off my student loans. It is difficult for me to think about the friendships that faded away due to the many birthdays, baby showers, anniversaries, and vacations I missed because of nights and weekends spent working.

It took a few more months of settling into fellowship, and new onset heartburn, before I understood that I had to care for myself in order to properly care for others. It became clear to me that I was sluggish and inefficient on the days I went to work sleep-deprived or nauseated with hunger pains. I thought I was maximizing my time. In reality, I was cheating my patients and putting my own health at risk.

This realization pushed me to make my own physical fitness a top priority. I rarely skip meals these days. I make time to go to the gym for a few evenings every week. I took up kickboxing again, a hobby I'd neglected during my residency. As a result, I'm more energized and motivated to work through my 12-hour shifts.

I also made a conscious effort to reach out to senior faculty members and other fellows, all of whom helped me tremendously to remain resilient, rediscover my passion for medicine, and recognize that I had the ability to take care of patients with cancer. One mentor told me that after a long day of seeing patients, it often helps to unwind by reflecting on what motivated us in the first place and pinpoint what makes our work meaningful. Personally, it is the little things that remind me of how lucky I am to be a doctor—whether it is a warm smile from a patient, a handwritten thank-you note, or a hug of gratitude. These small nuggets of appreciation make this job a privilege and help keep me from burning out.

> **"The first few months of my fellowship were riddled with long days that ended with choosing between eating dinner, exercising, and sleeping. Surely there would be no time to do all of the above and still survive the next day filled with conferences, consults, and chemotherapy orders."**
>
> — JANICE G. SHEN, MD

The most useful advice came from a social worker at the cancer institute, who met with the fellows weekly to discuss our emotions in a safe space, gave us tips on how to achieve restful sleep through meditation, and advised us on other helpful breathing techniques. She emphasized the importance of fueling our brains with good nutrition, which is essential for optimal functioning. During one group activity, each fellow was asked to share his or her own way of reducing stress.

For more practical articles from *Oncology Fellows*, go to **onclive.com/link/2375.**

For some, relieving burnout took the form of listening to music or going for a jog to raise endorphins; for others, lengthy venting sessions with coworkers or even trained medical professionals were therapeutic.

Beating Burnout

In May 2019, the World Health Organization officially recognized burnout as an occupational phenomenon.[1] Furthermore, the disturbing rates of physician suicide indicate an absolute need for every healthcare institution to address physician wellness.

Findings from a recent meta-analysis showed that 28.8% of physicians in training reported experiencing depression or depressive symptoms.[2] Not only do these symptoms affect a physician's long-term mental health, but they also have significant consequences for patient care. Therefore, it is essential to give providers the right tools to recognize burnout in both themselves and their colleagues.

Female physicians are at particular risk for burnout. Studies have shown that within 6 years of completing training, 22.6% of female physicians no longer work full time, compared with just 3.6% of their male counterparts.[3] Approximately 40% of female physicians complete approximately 25 years of schooling and medical training, only to take a part-time position or stop practicing medicine completely in the prime of their careers, due to unresolvable home and work conflicts. This is in part because women continue to take on the majority of the burden of household tasks, compared with men, in male-female partnerships.

There is an added challenge when there are 2 working parents who must negotiate how to split their responsibilities regarding childcare. Even then, the number of hours mothers, including physicians, spend on childrearing continues to surpass that of fathers. It is unfortunate, but understandable, that family responsibilities, chronic problems of unequal pay, and barriers to professional advancement leave some women to feel as if they have no choice but to exit the medical profession early.

The gender disparity highlights a potential modifiable risk factor for burnout. Providing on-location daycare facilities, supporting parental leave, or hiring more staff can decrease overall physical and emotional fatigue, allowing women to continue building a successful medical career while simultaneously tending to family obligations. Ultimately, there is still a significant amount of work to be done in championing wellness in the medical profession for all physicians.

Here are 5 tips I can offer from my experience to prevent and combat burnout:

- The first year of fellowship in hematology and oncology requires a deep exploration and an open mind. Attend the American Society of Hematology and American Society of Clinical Oncology conferences to network with other faculty members and fellows. Building connections early on can help reduce the stress of last-minute networking when applying for jobs as a third-year fellow.
- Getting to know your interdisciplinary team while on the wards minimizes burnout by promoting teamwork, enhancing communication, and reducing misunderstandings. Encouraging all members to work at the top of their licenses can help improve workplace relationships and decrease passive-aggressive behavior, resulting in better patient care.
- Don't be afraid to ask for help. Whether that means seeking mentorship, finding support groups, or obtaining assistance on a complex medical case, your supervising attendings and ancillary staff can help ease anxiety and provide the appropriate resources to guide you through your first year.
- For physicians with children, spending quality time with your patients and family remains a difficult balance to maintain. Hiring household help, recruiting family members to babysit during call days, and speaking with your superiors about flexible scheduling are all considerations that may alleviate the overall burden of being a parent and physician.
- Finally, be kind to yourself and to others. Surround yourself with those who empower you and support your growth as a person and physician. ■

REFERENCES

1. World Health Organization. Burn-out an "occupational phenomenon": International Classification of Diseases. who.int/mental_health/evidence/burn-out/en/. Published May 2019. Accessed January 5, 2020.
2. Mata DA, Ramos MA, Bansal N, et al. Prevalence of depression and depressive symptoms among resident physicians: a systematic review and meta-analysis. *JAMA*. 2015;314(22):2373-2383. doi: 10.1001/jama.2015.15845.
3. Paturel, A. Why women leave medicine. AAMC. www.aamc.org/news-insights/why-women-leave-medicine. Published October 2019. Accessed January 5, 2020.

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Pursuing an Oncology Fellowship Overseas Creates Unique Challenges and Opportunities

POSTGRADUATE FELLOWSHIP TRAINING is an essential cornerstone in medical training, especially if you want to develop an academic career. Although the individual decision to train is quite complex, the main considerations usually boil down to several factors:

- Gaining specific skills that were not well emphasized during residency
- Exposure to world experts in certain fields
- A chance to see "how things are done" elsewhere
- An opportunity to obtain more clinical experience before starting your own practice
- "Winning" some points that will help you negotiate a contract

Arnon Lavi, MD

Results from several North American surveys reported similar arguments for pursuing a fellowship among residents and fellows.[1,2]

I started thinking about applying for a fellowship overseas sometime in the middle of my residency. I had hoped to someday get an academic position, but that would be nearly impossible if I did not do a fellowship after residency. But my country, Israel, is small; there are not a lot of fellowship options in general and none in my field of urologic oncology. If I wanted to do a fellowship, I would have to leave Israel behind.

Although these professional arguments are the leading considerations in the decision to pursue a much-in-demand oncology fellowship, there are other non-professional/personal considerations that are usually overlooked or regarded as "second best." These factors often play a much greater role than the professional considerations in determining whether you should go into a fellowship.

The average medical resident finishes residency roughly between the ages of 25 to 30 years. At this stage, a substantial proportion of residents are either married or in a meaningful relationship. Others already have children. Hence, a decision to pursue a fellowship has a great impact on the candidate's family.

Some would say that almost any sacrifice is acceptable if it is for the sake of the breadwinner's career. But is that true? I will try to shed some light from my personal experience on how my family and I made the choice to leave Israel and pursue a fellowship in Canada.

When I began thinking about pursuing an overseas fellowship, I was 35 and married with 2 little children, aged 4 years and 18 months. My wife had just started

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> “We decided that if we were to go overseas, we should regard it as an adventure that would draw our young family even closer together.”

a new job and we were thinking about a third child. Financially, we were breaking even, and upsetting that delicate balance seemed unthinkable. Leaving home with 2 children and traveling to a foreign country across the Atlantic appeared unlikely at best.

But as time passed and we were thinking the idea over, we began to get used to it. The obvious pro arguments were the advantageous effects on my professional career and how that would reflect on the chances of securing an academic position at the end. However, we would be putting our family's life on hold for 2 years and my wife would have to leave her new job and start from scratch in a different country. Also, fellowship salaries are far from enough to support a family of 4 to 5 people. Moreover, the children would have to leave their school to start a new life in a different country with a language they did not know.

Leaving my family behind and traveling alone was not on the table.

While considering all these arguments, we decided that if we were to go overseas, we should regard it as an adventure that would draw our young family even closer together. It goes without saying that relocating one's family, especially a family with young children, is very challenging. But we reasoned that, if we could balance those challenges with positive experiences, we could transform the obvious disadvantages of moving overseas into potential fruitful advantages. That helped make our decision much easier.

So, after many hours of thought, we decided to take on this adventure. After completing the long application, interviews, and matching process, I matched at the University of Western Ontario in London, Canada. In total, from the time we started thinking about the idea to the time we left home, it has been 4 years. We had added another child by the time we left Israel for the other side of the world, giving us 3 children younger than age 7.

My first year of fellowship is dedicated to research, which is much more relaxed at the beginning than the second, stressful, clinical year. The first few weeks in Canada were very nice as we tried to create a fun atmosphere filled with activities to make it an easy start for the children. But the start of the school year brought with it the cold slap of reality. My wife, who was trying to get used to her new life, had to juggle it all and help the children find their place, while I was busy at the hospital. My children spoke only Hebrew and no English, so those first school days were especially difficult.

Fortunately, with time, we started to settle in. My wife acclimated to our new environment and began making new friends. But probably more importantly, the children adjusted. They started to understand English and make friends, and Canada started to feel like home.

About 6 months have passed since we made this giant leap of faith. It has been challenging, but I hope that we will remember this period as a great adventure in our lives. We decided to make the best use of our stay in North America and use every bit of spare time to collect family adventures. Whenever we can, we like to travel across Canada and the United States to make the best of family leisure time—something we did not have the time to invest in back home.

The main purpose of going on a fellowship is, obviously, professional. But the fellow's family are a true part of the process together with the difficulties and benefits that come with a fellowship. We take pains to keep our patients involved and take part in shared decision making during patient counseling. The same should go for our families.

Although the sacrifice my family made by leaving their familiar and comforting environment is quite substantial, a lot can be gained from the fellowship period beyond the professional advantages. We have all made new friends, and my children are learning a second language, getting to know a new environment, and collecting lots of great memories. Like so many things in life, it is all about seeing the half-full glass, maintaining a good spirit, and reflecting it in your environment. I expect that in a few years, when we are looking back at this period, we will remember it as an excellent time. ■

REFERENCES

1. Freilich DA, Nguyen HT, Phillips JL. Factors influencing residents' pursuit of urology fellowships. *Urology*. 2011;78(5):986-992. doi: 10.1016/j.urology.2011.05.068.
2. Touma NJ, Siemens DR. Attitudes and experiences of residents in pursuit of postgraduate fellowships: a national survey of Canadian trainees. *Can Urol Assoc J*. 2014;8(11-12):437-441. doi: 10.5489/cuaj.2136.

Patient Input Should Inform Oncology Trial Design and Interpretation

Maurie Markman, MD

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THE ULTIMATE GOALS of cancer investigation, from the laboratory through the last stages of clinical trials, are well understood. Even the most basic investigation into fundamental mechanisms of the development and progression of cancer in an in vitro system may generate data that, ultimately, prove vital to developing new approaches to prevent, diagnose, and treat malignant disease.

Although laboratory scientists may have limited experience or background in the clinical manifestations of the illness they are investigating, it is not unreasonable to suggest that some basic knowledge of the clinical entity might inform their investigative efforts. In this regard, it is disappointing to read an abstract of a translational laboratory paper dealing with ovarian cancer in a major scientific journal (*Scientific Reports*) that declares: “Although 70% to 80% of newly diagnosed ovarian cancer patients respond to first-line therapy, almost all relapse and 5-year survival remains below 50%.”[1]

In fact, recently published studies have reported 3- to 4-year progression-free survival (PFS) rates of greater than 50% for molecularly defined advanced ovarian cancer subsets,[2-4] and a recent analysis of survival from 7 high-income countries (not including the United States) noted substantial improvement in 5-year overall survival (OS) for all these countries (absolute change, 4.5%-10.1%) over the past 20 years.[5]

It is unclear why statements such as the one above continue to appear in high-impact scientific journals, but they are most unlikely to be helpful to patients if, when reporting provocative laboratory results, the lay media and others continue to highlight these highly questionable statements.

There is another important aspect of the patient–cancer science interface, and this is the involvement of patients in the actual design and interpretation of the investigation itself—specifically, the clinical study.

Consider, for example, the nearly nonstop debate regarding the appropriate interpretation of the outcome of advanced ovarian cancer studies, which today appropriately permit a focus on the primary trial end point of PFS rather than OS. It is important to acknowledge that my attention here on this malignancy highlights the major point of this commentary, although using PFS, as opposed to OS, as a statistically significant event to justify declaring a particular strategy’s superiority over an alternative is not limited to ovarian cancer.

In 2018, the final survival results of a phase III randomized trial that examined the addition of bevacizumab to carboplatin plus paclitaxel in ovarian cancer were reported and revealed no improvement in OS for the bevacizumab-containing regimen (delivered during chemotherapy and as a maintenance

strategy); earlier, well-known data from the same trial indicated that this strategy resulted in a statistically significant improvement in PFS.[6,7] The overwhelmingly likely explanation for this dichotomy is the positive impact of postprogression therapy on this specific trial's outcome, including the observation that 39% of patients in the non-bevacizumab–containing treatment arm ultimately "crossed over" to receive an antiangiogenic agent (with the large majority receiving bevacizumab).[8] This fact has remarkably not prevented some clinicians from concluding that this approach lacks meaningful efficacy because the study failed to confirm an impact on OS.[9]

But why should it be the clinical investigation community that determines the clinical relevance of the study end point? Why not simply acknowledge that this is an academic debate, for which opinions understandably vary, and that the only opinion that really matters (once the regulatory agencies and payers permit access to given agents) is that of the individual patient with ovarian cancer who is considering treatment options?

What is wrong with presenting the facts, including the final study survival outcomes, the data on crossover, and the uncontrolled delivery of subsequent therapies to the study population, and then letting the patient (with the assistance of her advisers—generally, her family) decide?

A second example of the importance of the patient voice in clinical studies involves a series of trials developed by the gastrointestinal cancer investigation community, which explored the relative value of 6 versus 3 cycles of adjuvant chemotherapy for high-risk surgically resected colon cancer. In these highly relevant studies, investigators sought to determine if lowering the number of courses from the standard of care (6 cycles) would reduce clinically meaningful adverse effects (AEs)—well recognized to be associated with several established regimens in this setting—without compromising efficacy (OS).

Asking the following question, although hypothetical, emphasizes the patients' role in the design of such studies: To establish the potential reduction in efficacy that patients with colon cancer might theoretically accept to reduce the risk of serious AEs (such as temporary or long-lasting neuropathy), would it not be reasonable to seek the opinion of individuals who had experienced such AEs while undergoing the 6 standard cycles of adjuvant chemotherapy?

A highly provocative survey of patients (n = 160) who participated in one of the several studies examining this question, which included individuals randomized to both the 6- and 3-cycle arms, generated strong evidence that calls into question the magnitude of difference in OS between the trials, which should be required to define the shorter regimen as noninferior to the longer-duration program. For example, for the 82% of individuals (n = 132) who completed the survey and had experienced symptomatic neuropathy, the consensus was to require an "extra 5% [median survival gain] beyond a 65% 5-year survival" to justify having this toxicity.[10]

It must be emphasized that this was a single report of a reasonable but still limited number of patients. However, a strong argument can be made that interpreting the real-world relevance of these important, large, expensive, and complex studies would have been substantially enhanced if such data had been available and appropriately employed to help prospectively design such trials. Who could reasonably object to this conclusion? ■

REFERENCES

1. Shuford S, Wilhelm C, Rayner M, et al. Prospective validation of an ex vivo, patient-derived 3D spheroid model for response predictions in newly diagnosed ovarian cancer. *Sci Rep*. 2019;9(1):11153. doi: 10.1038/s41598-019-47578-7.
2. Moore K, Colombo N, Scambia G, et al. Maintenance olaparib in patients with newly diagnosed advanced ovarian cancer. *N Engl J Med*. 2018;379(26):2495-2505. doi: 10.1056/NEJMoa1810858.
3. Coleman RL, Fleming GF, Brady MF, et al. Veliparib with first-line chemotherapy and as maintenance therapy in ovarian cancer. *N Engl J Med*. 2019;381(25):2403-2415. doi: 10.1056/NEJMoa1909707.
4. González-Martin A, Pothuri B, Vergote I, et al. Niraparib in patients with newly diagnosed advanced ovarian cancer. *N Engl J Med*. 2019;381(25):2391-2402. doi: 10.1056/NEJMoa1910962.
5. Arnold M, Rutherford MJ, Bardot A, et al. Progress in cancer survival, mortality, and incidence in seven high-income countries 199502014 (ICBP SURVMARK-2): a population-based study. *Lancet Oncol*. 2019;20(11):1493-1505. doi: 10.1016/S1470-2045(19)30456-5.
6. Tewari KS, Burger RA, Enserro D, et al. Final overall survival of a randomized trial of bevacizumab for primary treatment of ovarian cancer. *J Clin Oncol*. 2019;37(26):2317-2328. doi: 10.1200/JCO.19.01009.
7. Burger RA, Enserro D, Tewari KS, et al. Final overall survival (OS) analysis of an international randomized trial evaluating bevacizumab (BEV) in the primary treatment of advanced ovarian cancer: a NRG oncology/gynecology oncology group (GOG) study. *J Clin Oncol*. 2018;36(suppl 15; abstr 5517). doi: 10.1200/JCO.2018.36.15_suppl.5517.
8. Chan J, Java J, Monk B, et al. Patterns of crossover to antiangiogenesis agents in recurrent ovarian cancer patients: an analysis of a Gynecologic Oncology Group ancillary data study (GOG#218, abstract). *Gynecol Oncol*. 2013;130(1):e122. doi: 10.1016/j.ygyno.2013.04.351.
9. Buckanovich RJ, Rustin G, Uppal S, et al. No role for maintenance bevacizumab for up-front stage IIIc (R0) ovarian cancer. *J Clin Oncol*. 2019;37(29):2707-2708. doi: 0.1200/JCO.19.01650.
10. Blinman PL, Martin AJ, Jefford M, et al. Patients' preferences for 3 months versus 6 months of adjuvant chemotherapy for colon cancer in the SCOT trial: what survival benefits make longer chemotherapy worthwhile? *J Clin Oncol*. 2018;36(suppl 15; abstr 3602). doi: 10.1200/JCO.2018.36.15_suppl.3602.

Clinical Chats

OncologyLive Advisory Board Members Weigh In

What Were the Most Impactful Advances in Cancer Care Over the Past Decade?

MOLECULAR BIOLOGY

Ezra Cohen, MD
Moores Cancer Center, University of California San Diego Health

- Immunotherapy, the concept and execution of personalized therapy, ie, the idea of tailoring treatment based on genomic profiling and immunophenotyping

The past decade has seen advances in tissue analytics that have resulted in the understanding that no 2 tumors are alike at the molecular level. This provided the ability to match targeted therapy to specific tumor alterations and led to several subsequent drug approvals. On the cusp of those efforts and the explosion of immunotherapy, we have begun to immunophenotype tumors and patients to allow for the precise selection of immune-directed agents. Toward the end of the decade, this reached its ultimate expression with truly individualized, neoantigen-based vaccines that are created for 1 patient only.

The past decade has laid the foundation for precision immunotherapy that will dominate oncology therapeutics in the future.

A. Oliver Sartor, MD
Tulane University School of Medicine

- The rise of germline genetics, going far beyond *BRCA* to now include a large variety of hereditary cancer–associated mutations
- The rise of predictive biomarkers, including those applicable to both immunotherapy and a panoply of precision therapies
- [The use of] ctDNA for both prognosis and prediction of therapeutic outcomes
- The rise of specialized PET for disease assessment, staging, and prognosis

NOVEL STRATEGIES

Omid Hamid, MD
The Angeles Clinic and Research Institute

- An EMR that can share information, such as Epic
- The rise of imaging, immuno PET
- Oncolytics
- Expanding role of immuno-oncology in the adjuvant setting
- Targeted and immunotherapeutic combinations—*BRAF*, *MEK*, and PD-1

FDA

Arjun V. Balar, MD
NYU Langone Health Perlmutter Cancer Center

The FDA has clearly reinvigorated its approach over the past decade in expediting the review and approval of promising new agents. This reflects a renewed commitment to accelerate patient access to promising therapies. It's no wonder that the recent pace of drug development and approvals is truly unprecedented.

Many excellent advances have already been suggested by a number of the advisory board members. Outside the obvious (immunotherapy, genomics [NGS platforms, big data]), I'd like to think the FDA's reinvigorated approach to prioritize the review and approval of novel promising agents to accelerate access for patients is a significant advancement.

BREAST CANCER

Terry P. Mamounas, MD, FACS
University of Florida Health Cancer Center at Orlando Health

- The establishment of sentinel lymph node biopsy as a SOC for node-negative and select node-positive patients and after neoadjuvant chemotherapy. Minimizing the use of axillary lymph node dissection.
- Demonstration of benefit from extended endocrine therapy in pre- and postmenopausal patients
- Refining the use of genomic profiling to predict the risk of recurrence and benefit from adjuvant chemotherapy in node-negative and node-positive patients
- Demonstration of benefit
    - From adjuvant therapy in TNBC and HER2+ patients who undergo neoadjuvant chemotherapy and are found to have residual disease at surgery
    - With PARP inhibitors in patients with advanced breast cancer and deleterious *BRCA* germline mutations
    - In advanced TNBC with checkpoint inhibitors [with] very encouraging data in the neoadjuvant setting
    - In advanced HR+ breast cancer with CDK inhibitors
    - From RT in prolonging survival in patients with node-positive breast cancer

Hope S. Rugo, MD, FASCO
University of California San Francisco, Helen Diller Family Comprehensive Cancer Center

- Survival improvements in MBC with CDK4/6 inhibition for HR+ and for TNBC with immunotherapy ([albeit] only a subset)
- Suggestion of improved pCR with immunotherapy in the neoadjuvant setting in TNBC
- New [agents] for HER2+ disease! For example, fam-trastuzumab deruxtecan-nxki [Enhertu] and tucatinib. Finally, progress in brain metastases
- First approval of a drug (alpelisib [Piqray]) based on ctDNA findings
- Better symptom management
- Expanding use of genomics, [specifically] mutations and expression analyses

GI MALIGNANCIES

Tanios S. Bekaii-Saab, MD, FACP
Mayo Clinic Cancer Center

The past decade has revolutionized how we treat various GI malignancies, from an enhanced and more refined understanding of how to best select patients likely to respond. For immunotherapy, this translated into improved selection of patients more likely to respond to PD-1/PD-L1 inhibitors. For molecularly targeted agents, this led to positive identification and enhanced selection of disease-specific genetic alterations that are likely to be the "fit." For traditional cytotoxic and multitargeted therapies, we learned that less may be better with comprehensive dose escalation and de-escalation strategies, depending on the setting. With the knowledge gained over the past decade and the advent of AI, the next decade will get us closer to the dream of "cancer cures."

- An improved understanding of targeted strategies such as BRAF and HER2 inhibition in CRC, FGFR inhibition in biliary cancer, and immunotherapy in GE cancer
- MSI-H in CRC and non-CRC transforming a bad disease into a potentially curable disease with immunotherapy
- *BRCA* and pancreas cancer—a first targeted strategy in a small subgroup of patients. I call this the tip of the iceberg, which will launch us into the next decade with improved strategies in this subgroup of patients.
- The combination of immunotherapy and VEGF inhibition: a game changer in HCC
- De-escalation strategies in GI malignancies to improve outcome and QOL

HEMATOLOGY

Anas Younes, MD
Memorial Sloan Kettering Cancer Center

- ICIs in Hodgkin lymphoma
- BTK inhibitors in MCL
- CAR T cells in DLBCL

AI indicates artificial intelligence; CAR, chimeric antigen receptor; CRC, colorectal cancer; ctDNA, circulating tumor DNA; DLBCL, diffuse large B-cell lymphoma; EMR, electronic medical record; GE, gastroesophageal; GI, gastrointestinal; HCC, hepatocellular carcinoma; HR, hormone receptor; ICI, immune checkpoint inhibitor; MBC, metastatic breast cancer; MCL, mantle cell lymphoma; MSI-H, microsatellite instability-high; NGS, next-generation sequencing; pCR, pathological complete response; QOL, quality of life; RT, radiation therapy; SOC, standard of care; TNBC, triple-negative breast cancer.

Value of Wearable Health Tech in Oncology Remains Unclear

By Rachel Narozniak, MA

ALTHOUGH USE OF WEARABLE mobile health (mHealth) monitors has soared in many fields of healthcare, adoption of these electronic devices has lagged in oncology, mainly because of the need to further define how to implement these devices in this setting. Experts say wearables have great potential in oncology, but technological upgrades and further research are necessary for the devices to realize their full potential.

"There's a lot of promise with this technology, but we need to study it and better understand where it would fit," said Ana María López, MD, MPH, MACP, vice chair of medical oncology at Sidney Kimmel Medical College at Thomas Jefferson University in Philadelphia, Pennsylvania.

Ana María López, MD, MPH, MACP

The practical value of mHealth devices, which make up a large and growing segment of the healthcare industry, is clearer in other branches of medicine than in oncology. Wearable devices are attractive to consumers and providers alike for their ability to monitor patient health parameters such as activity, blood pressure, sleep, heart rate, and weight in real time, making remote monitoring a possibility for physicians.[1] The Fitbit and Apple Watch wearables are examples of commercially popular fitness monitors that quietly collect data on the wearer's health.

Whether wearable mHealth devices can become a regular part of oncology practice hinges on their capacity to not only conveniently deliver functional and reliable data for patients and physicians but also demonstrate a definitive, care-enhancing purpose.[2] López said that means oncologists first need to ask, "What's the problem we're trying to solve?"

"We need to keep the patient front and center [so we don't] just become enamored with the technology," Lopez said.

These devices are a potential solution to the shortcomings of existing tests used to evaluate patients' level of function and their ability to tolerate systemic treatment, or performance status (PS), López and other experts said. Today, physicians rely on ECOG PS and Karnofsky PS (KPS) scales to guide care decisions[2]; these simple checklist measures can lead to subjective results because they are based on human assessment. The electronic measurement inherent in wearable technology can provide accurate data that, properly refined and interpreted, could supplement results of PS tests.

"Our current approaches to determining PS are incredibly subjective. We ask patients about what percentage of time they're active and what they do—that's not very objective at all," said George J. Weiner, MD, CE Block Chair of Cancer Research and director of the Holden Comprehensive Care Center at the University of Iowa in Iowa City. "Very often, they're with family members, and it's not uncommon for the patient to say one thing and for the family member to clarify that [what the patient said] isn't fully accurate."

ECOG PS is a simple, 6-level scale that evaluates a patient's functionality using descriptions such as "fully active" and "completely disabled." The KPS index has a similar, somewhat broader range of measurement intervals, but both scales have been shown to correlate with each other. Neither is highly rigorous.

However, results from these tests are important to therapy choice, and inaccurate PS evaluations can lead to serious error. Because poor PS is indicative of increased risk of chemotherapy toxicity and inferior outcomes, an oncologist would be less likely to recommend

FIGURE. Survival at 6 Months Correlates With Daily Steps[3]

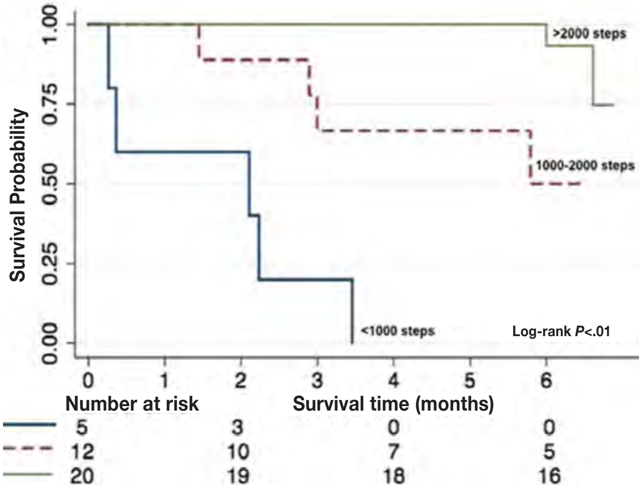

TABLE. Number of Steps Per Day Is Associated With Better Outcomes[3,a]

	Adverse events OR (95% CI)	Hospitalization OR (95% CI)	Overall survival HR[b] (95% CI)
Steps (per 1000 steps)	0.34 (0.13-0.94)	0.21 (0.56-0.79)	0.48 (0.28-0.83)
Floors (per 10 stairs)	0.77 (0.58-1.0)	0.67 (0.48-0.92)	0.78 (0.63-0.96)
Sleep (per 1 hour)	1.78 (0.89-3.5)	1.93 (0.86-4.23)	1.79 (1.14-2.82)

OR indicates odds ratio.
[a]Adjusted for age and sex.
[b]Calculated average over 2 weeks.

a regimen that includes chemotherapy for a patient with a low PS. Moreover, inaccurate PS scores could cause a patient to be excluded from a potentially beneficial clinical study or lead to use of a trial therapy that the patient ultimately cannot endure.

Patients may also misjudge these measures. "Many studies have demonstrated that patients will usually overestimate their physical activity," said Gillian Gresham, PhD, a postdoctoral student at Cedars-Sinai Medical Center (CSMC) in Los Angeles, California.

The objective data that wearable activity monitors amass about the duration, intensity, and frequency of physical activity can supplement ECOG PS and KPS assessments, offsetting subjectivity and bridging the informational gaps caused when patients miss appointments.

"When patients see their provider, it's only for a small amount of time; you're only really getting an hour, maybe even less, to try to make assessments of their functionality and activity. You don't really get the full picture," Gresham added. "If a patient misses a clinic visit, then you don't have anything."

Early Exploration

Gresham was the lead author of a CSMC study whose results demonstrated the feasibility of using wearable activity monitors to assess PS in patients with cancer. The investigators used the Fitbit Charge HR to measure the daily activity of 37 patients with stage IV or unresectable advanced stage III cancer.[3]

Patients of varying ECOG PS and KPS ratings agreed to wear the Fitbit for 3 consecutive clinic visits over a 2-week period. Investigators assessed participants' ECOG PS and KPS scores and determined associations between metrics and PS, clinical outcomes, and patient-reported outcomes during this time.

On average, patients walked 3700 steps, or 1.7 miles, daily; climbed 3 flights of stairs daily; and slept 8 hours per night, as measured by their wearable device. Investigators observed the strongest correlation between average daily steps and PS scores. They found an association between each additional 1000 steps per day and reduced odds for adverse events (OR, 0.34; 95% CI, 0.13-0.94), hospitalizations (OR, 0.21; 95% CI, 0.56-0.79), and risk for death (HR, 0.48; 95% CI, 0.28-0.83) (**TABLE**).[3]

Furthermore, 6-month survival for patients with a daily step count >2000 was superior compared with patients who averaged 1000 to 2000 steps and those who averaged <1000 steps (**FIGURE**).[3]

Defining the type of patient information to be aggregated, and how often, will be crucial to developing a data-driven workflow for institutions that intend to use mHealth technology in the future. "What is the timing of the data? Are you getting data in every day? What's the quantity? Is it something that your team can manage?" said Susan K. Peterson, PhD, MPH, a professor in the Department of Behavioral Science, Division of Cancer Prevention and Population Sciences, at The University of Texas MD Anderson Cancer Center in Houston.[4]

Gresham said larger, randomized studies that examine how wearable technology can improve patient assessments will be the next step.

"I suspect that eventually we'll end up doing some controlled studies comparing reported PS to PS determined by wearables, and we'll find huge differences," Weiner said. ■

REFERENCES

1. Liao Y, Thompson C, Peterson S, Mandrola J, Beg MS. The future of wearable technologies and remote monitoring in health care. *Am Soc Clin Oncol Educ Book.* 2019;39:115-121. doi: 10.1200/EDBK_238919.
2. Kelly CM, Shahrokni A. Moving beyond Karnofsky and ECOG performance status assessments with new technologies. *J Oncol.* 2016;2016:6186543. doi: 10.1155/2016/6186543.
3. Gresham G, Hendifar AE, Spiegel B, et al. Wearable activity monitors to assess performance status and predict clinical outcomes in advanced cancer patients. *NPJ Digit Med.* 2018;1:27. doi: 10.1038/s41746-018-0032-6.
4. Peterson SK. Walk this way: wearable devices and remote monitoring for patients with cancer. Presented at: 2019 American Society of Clinical Oncology Annual Meeting; May 31-June 4, 2019; Chicago, IL. https://meetinglibrary.asco.org/record/168015/video.

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www.onclive.com/link/7289

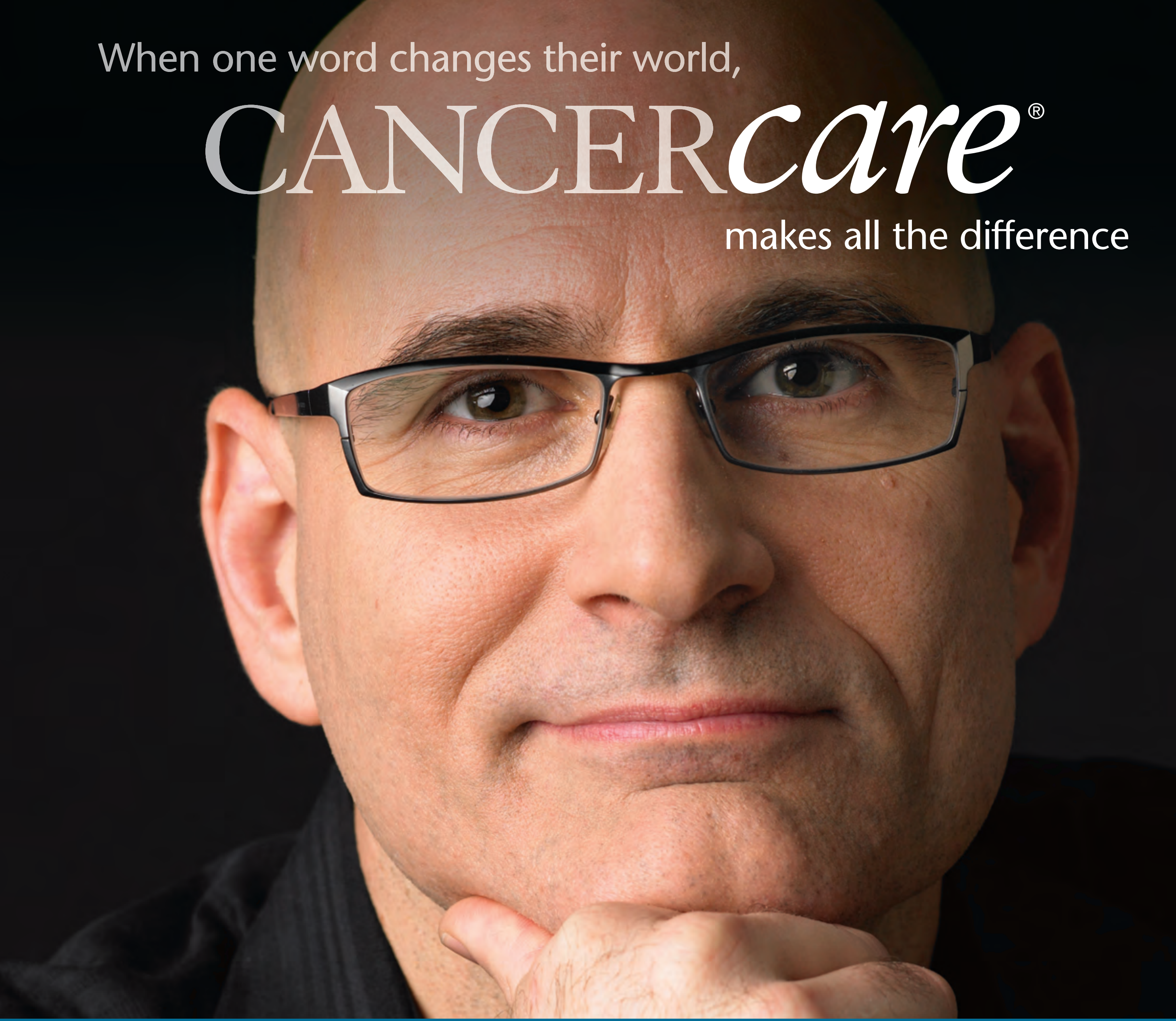
July 31-August 1
***4th Annual* School of Nursing Oncology™**
Hilton Nashville Downtown
121 Fourth Avenue South
Nashville, TN
www.onclive.com/link/7447

September 9-12
Society of Hematologic Oncology 8th Annual Meeting Oncology
Hilton Americas Houston
1600 Lamar Street
Houston, TX
bit.ly/2wWDI1Q

November 4-6
***38th Annual* CFS®: Innovative Cancer Therapy for Tomorrow®**
New York Marriot Marquis
1535 Broadway
New York, NY
www.onclive.com/link/7448

November 5-7
***18th Annual* School of Breast Oncology®**
Emory Convention Center
1615 Clifton Road NE
Atlanta, GA
www.onclive.com/link/7449

November 7
***15th Annual* New York Lung Cancers Symposium**
InterContinental New York Barclay
111 East 48th Street
New York, NY
www.onclive.com/link/7450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