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MOFFITT MOMENTUM[®]

THE FIGHT FOR 2 LIVES

Mom beats cancer with
help from little 'warrior'

HOSPITAL BUILT ON EXPERIENCES

Patients, families and
providers guided design

MOBILE MONITORING

Increasing access to
top-notch cancer care



Leadership Message



Patrick Hwu, MD
President and CEO

Dear Friends,

We are excited to share with you this issue of Momentum magazine, which features stories of hope, inspiration, advancements and commitment to the people we serve.

Jamie Losito was a young mother of one when she faced breast cancer in 2019. Shortly after her diagnosis, she found out she was destined to be a mother of two. At first, she was warned the baby would not survive cancer treatment, but a second opinion at Moffitt Cancer Center gave her hope for her growing family. Four years later, Jamie is cancer free, and she and husband Gene celebrate every moment with their family of four.

Every patient we treat has a story, and their experiences shape how we provide care. As Moffitt McKinley Hospital prepares to open its doors in July 2023, we take a look at the patients and caregivers who helped shape the new surgical hospital. From peaceful gardens to private waiting areas, the new hospital is designed around the patient and family experience.

As we expand our care beyond the doors of Moffitt's campuses, advances in mobile monitoring provide opportunities for growth in telehealth. Nasrin Aldawoodi, MD, is leading a trial using remote stethoscopes to take patient vitals during pre-anesthesia evaluations via Zoom. Brian D. Gonzalez, PhD, and Laura B. Oswald, PhD, are researching the potential for using wearable devices

such as Fitbits and Garmin watches to monitor patients between doctor visits.

Even as we make such great strides in expanding our access to care, our patient population continues to grow. Recent studies show the number of younger people who are being diagnosed with cancer is on the rise. Moffitt's Adolescent and Young Adult Program works to meet the unique needs of this population, providing support and services to prepare them for the road ahead. Meanwhile, our experts are racing to uncover why this trend is happening.

Moffitt's efforts to tailor our care to different patient populations are also reflected in our revolutionary HIV clinic. For many years, people living with HIV did not have access to aggressive cancer treatment out of concern for their compromised immune systems. Now, with improved treatments for HIV, people who are also diagnosed with cancer have much more reason for hope. Ana Velez, MD; Anna Coghill, PhD; and Julian Sanchez, MD, are leading the charge to provide coordinated care and explore how to improve cancer treatment for people living with HIV.

We hope you enjoy reading this issue of Momentum, which highlights both the patients and caregivers who inspire us and the team members who make it possible for us to continue pursuing our mission: to contribute to the prevention and cure of cancer.

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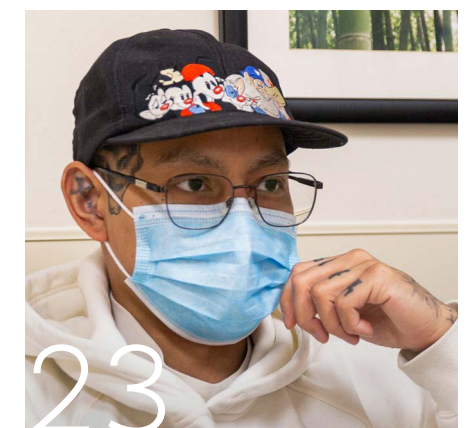
Jamie Losito reads to daughter Madison, who is now 3. Jamie had a mastectomy and began chemotherapy while she was pregnant with Madison. Four months after Madison was born, Jamie rang the bell, signaling the end of her treatment.



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Mommy, Baby *and the* Battle Against the Beast

By Sara Bondell

Photos by Nicholas J. Gould

JAMIE LOSITO
Cancer Survivor

One week after Jamie Losito was diagnosed with breast cancer, she found out she was pregnant. Then began the fight for two lives.

Madison Losito loves Disney princesses. Belle is her favorite.

She is dressed up as Belle for her third birthday party. She's running around with her friends, ecstatic in the iconic yellow ballgown with glittery sneakers on her feet and a tiara falling lopsided onto her forehead. There's a bounce house, crafts and even a visit from Belle herself. It's the party that little girls' dreams are made of.

"Birthdays have kind of turned into a big thing around our house," mom Jamie Losito said.

It's time for cake, and all the kids gather around Madison. They start to sing "Happy Birthday" as her mom lights the candles on the two-tier cake – shaped like Belle's dress, of course. Madison takes a deep breath. She makes a wish. She blows out the candles.

What she doesn't know is that her family's wish has already come true.

Jamie can't help but remember. "It's crazy to look back and think she may not have been here."

THE CHOICE

When Jamie met Gene Losito in college, they fell into an easy relationship. First comes love, then comes marriage, then comes baby in the baby carriage – well, not quite yet. They were both very career oriented and knew when the time was right, they would start a family.

Eventually the time was right. Baby fever hit. They tried and tried, but Jamie wasn't getting pregnant. Fertility specialists told them they would never be able to naturally conceive. So they underwent in vitro fertilization. In May 2018, their son, Landon, was born.

The Lositos spent the next year in baby bliss, soaking up every minute with Landon and navigating their new lives as working parents. Landon had just turned 1 when Jamie felt a lump on her breast. Her mom urged her to schedule a mammogram.

"I'm 32. I am a brand-new mom with a very plain vanilla health history. This shouldn't be anything that I should be worried about," Jamie remembered thinking.



Gene and Jamie Losito celebrate daughter Madison turning 3 with a Disney princess-themed party, right down to the yellow dress and the cake. Madison's birthday serves as a reminder of the joy that got the family through the toughest year of their lives.

Three days later, there was something to worry about. Jamie was diagnosed with breast cancer.

"The first words out of the radiologist's mouth were, 'This is not a death sentence, but it's cancer.' I don't remember anything else he said after that because all I could think of was: I am not going to see Landon grow older. I am not going to see my husband grow old. We are not going to grow old together."

"The first words out of the radiologist's mouth were, 'This is not a death sentence, but it's cancer.'"

Jamie began to make plans for treatment, but something didn't feel right. After a family birthday party, she walked into a grocery store and bought a pregnancy test. It was positive.

"I thought this can't possibly be because multiple fertility doctors told us we would never get pregnant on our own," Jamie said. "I decided God has given us this at this moment that I have cancer as well, and I don't know what this is going to mean. Can we even do treatment?"

It was a question Jamie immediately asked a local oncologist in Ocala. The answer was a mother's worst nightmare.

"She told me that I was too far along with my cancer to wait to treat until after the baby was born, and that the baby would not survive me being treated at the same time as I was beating cancer," Jamie said.

"I forgot I had cancer. Now I've lost my baby."

Jamie's family agreed when she was diagnosed that she should get a second opinion. Her mother called Moffitt Cancer Center and made an appointment.

When Jamie walked into Moffitt, she expected to once again be told she had to make the impossible decision between herself and her unborn child. Instead, she was told the Breast Oncology Department treats about two to three pregnant women with breast cancer each year.

She was told breast surgeon Christine Laronga, MD, has plenty of experience operating on pregnant patients.

She was told she didn't have to make a choice.

"I told her, 'Yes, it's going to be a rough journey. We have to do chemotherapy, but I promise you that we have enough evidence to say that we can do this safely for you,'" said Aixa Soyano, MD, Jamie's medical oncologist.

The chemotherapy given to patients like Jamie with hormone-positive HER2-negative breast cancer is filtered by the placenta and is generally safe for the baby. Jamie could have the exact same treatment regimen as a patient who isn't pregnant. The timing of treatment would just have to be altered because she could not have surgery too early into her pregnancy or begin chemotherapy treatment until her second trimester. The treatments would also have to be spaced out more because pregnant patients cannot have blood cell booster medications and would need more time to recover between rounds.

"I was completely overwhelmed," Jaime said. "Yes, I have cancer. I don't know how long I am going to be here, but that's OK, I am pregnant. I am going to have another baby, and maybe God gave me both of these at the same time because one had to get me through the other."



"I forgot I had cancer. Now I've lost my baby."

At 12 weeks plus one day into her pregnancy, Jamie had a mastectomy. A month later, she began chemotherapy. She tolerated the treatment well, but still had to face her greatest fear: that the treatment would have a negative impact on her baby.

"I was really afraid she would have some kind of birth defect, learning disability or something that I would have to stare in the face every day and say my daughter has this because of what I chose to do," Jamie said. "Was I making a selfish decision by bringing her into this world at a time in which I was doing chemotherapy?"

Her husband, Gene, also had to face his own fears throughout his wife's treatment: "Am I going to lose my wife? Am I going to lose my daughter before she even gets here? Am I going

“I don’t want to do anything harmful for my baby, so I am not going to do anything harmful for someone else’s baby.”

– Aixa Soyano, MD



to be a solo parent raising Landon trying to bring him up the best way that I can?”

Soyano was able to help calm Jamie’s fears. The oncologist also has a young family. She has a peaceful demeanor and is very knowledgeable about the treatment protocols.

And she was pregnant. A few weeks ahead of Jaime, both of them carrying girls.

“You want to understand what that patient is feeling, and I don’t want to do anything harmful for my baby, so I am not going to do anything harmful for someone else’s baby,” Soyano said.

“I felt like she was sitting in my seat and honestly telling me that my child was going to be OK,” Jamie said. “If she’s telling me this and she’s right where I am, then she must really mean it and this must be possible.”

Jamie was under the care of a high-risk OB-GYN in Gainesville during her pregnancy. She would go to her OB-GYN on



Aixa Soyano, MD, connected closely with the Losito family because she, too, was pregnant while treating Jamie. She was just a few weeks further along, also carrying a girl. In this family photo, Soyano holds newborn Camila with husband Eugenio Rojas and son Andres Rojas.

Tuesdays and Moffitt on Thursdays, logging hundreds of miles on her car to make sure she and her baby were receiving the best care. She had 12 rounds of chemotherapy while pregnant before pausing to give her body a chance to recover ahead of her scheduled cesarean section at 39 weeks.

“I think having Madison during the process was just a blessing in disguise because it just gave us so much to hope for and to wish for and count on and dream about, that it let you forget about some of the bad things that were going on,” Gene said.

On Jan. 27, 2020, Madison Grace was born.

“Madison’s name means a gift from God and a mighty warrior,” Jamie said, “and I couldn’t imagine a more perfect truth for her.”

PRINCESS DRESSES AND SPARKLES

After Madison was born, Jamie had to complete four more rounds of chemotherapy. These treatments were more difficult to get through than the ones when Madison was on board. She felt sicker and more tired. She then did 56 twice-a-day radiation treatments over a six-week period.

In May 2020, Jamie rang the bell to signal the end of her treatment, newborn Madison in her arms. Initially faced with having to choose between two lives, the family could now celebrate saving both.

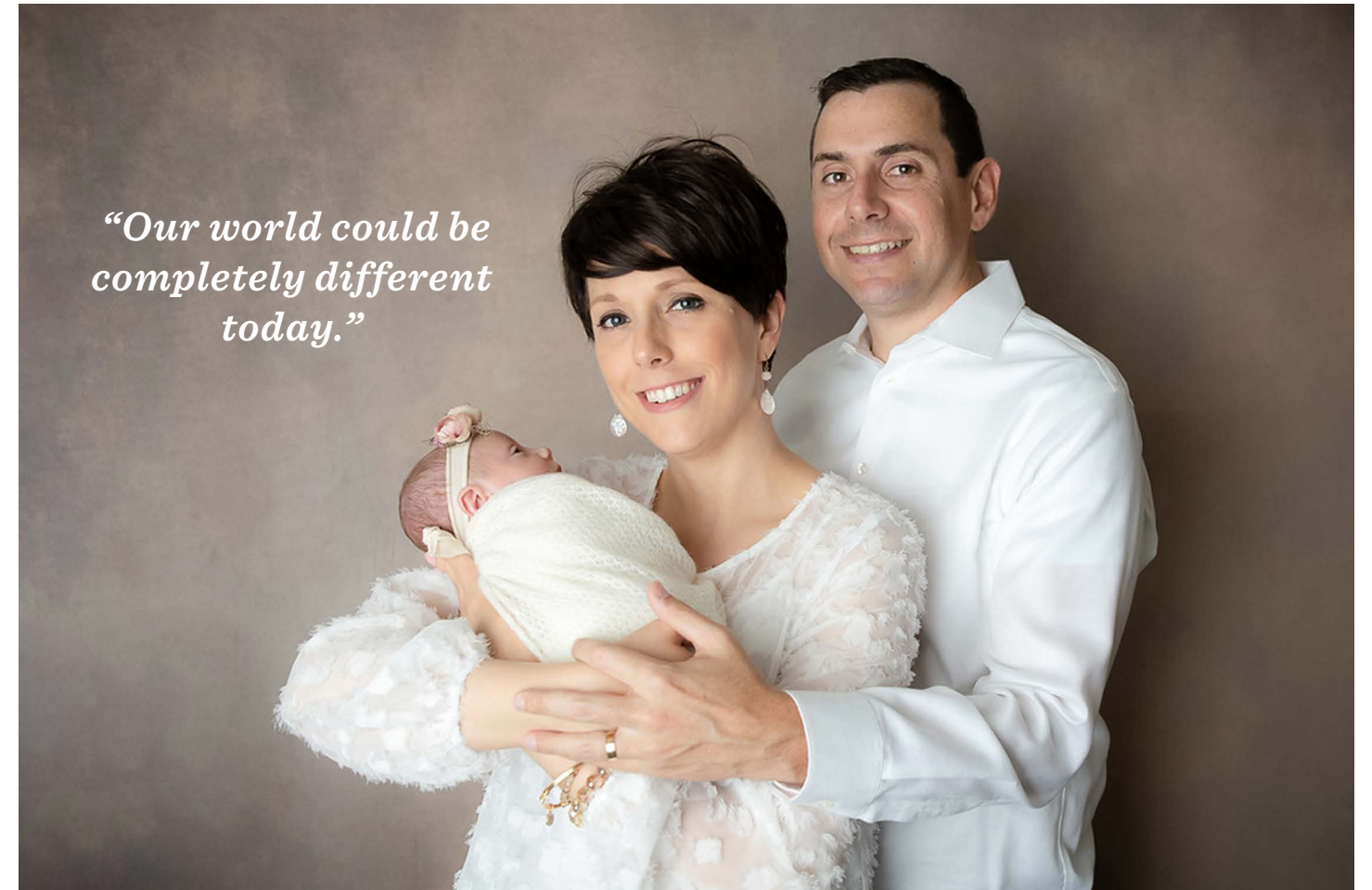
“It felt good to know that it was done, and I was ready to just get back to life as we had known it, or wanted to know it as parents of two under 2,” Jamie said.

Life as they know it now consists of belly laughs, ballet lessons and trips to Disney. It’s full of twirling in tutu skirts and singing songs. It’s cherishing every minute of every day.

“Our world could be completely different today. It could just be my husband and my son or neither of us here. But it’s not and it’s the four of us and we are loving every minute of it,” Jamie said.

There are times Jamie feels like she is a little tougher on Madison than Landon. After all, what’s a scraped knee when they’ve fought harder battles? There are also countless times where she looks at Madison and thinks, “You saved my life.”

“Our world could be completely different today.”



Through a mastectomy and chemotherapy, Jamie and Gene Losito put their hopes and dreams into the future they saw for daughter Madison. Madison’s name means “a gift from God and a mighty warrior.” This family photo celebrates her birth.

When Soyano looks at her now 3-year-old daughter, Camila, she thinks of Jamie and Madison. She smiles knowing Jamie knows the same love from a daughter that she does. She calls Madison her angel.

“Treating Jamie was double rewarding,” Soyano said. “We saved two lives.”

That’s why the Lositos celebrate birthdays big. They celebrate the fact everyone is here because they know things can change in a moment’s notice. They celebrate the little boy who made them a family and the little girl who has no idea she got her mom through the hardest year of her life.

“All she knows is that all is right in her world and that princess dresses all twirl and sparkles are fun,” Jamie said. “That’s what I want it to be for her. And if it wasn’t for Moffitt, she may have never known that.”

“All she knows is that all is right in her world and that princess dresses all twirl and sparkles are fun.”



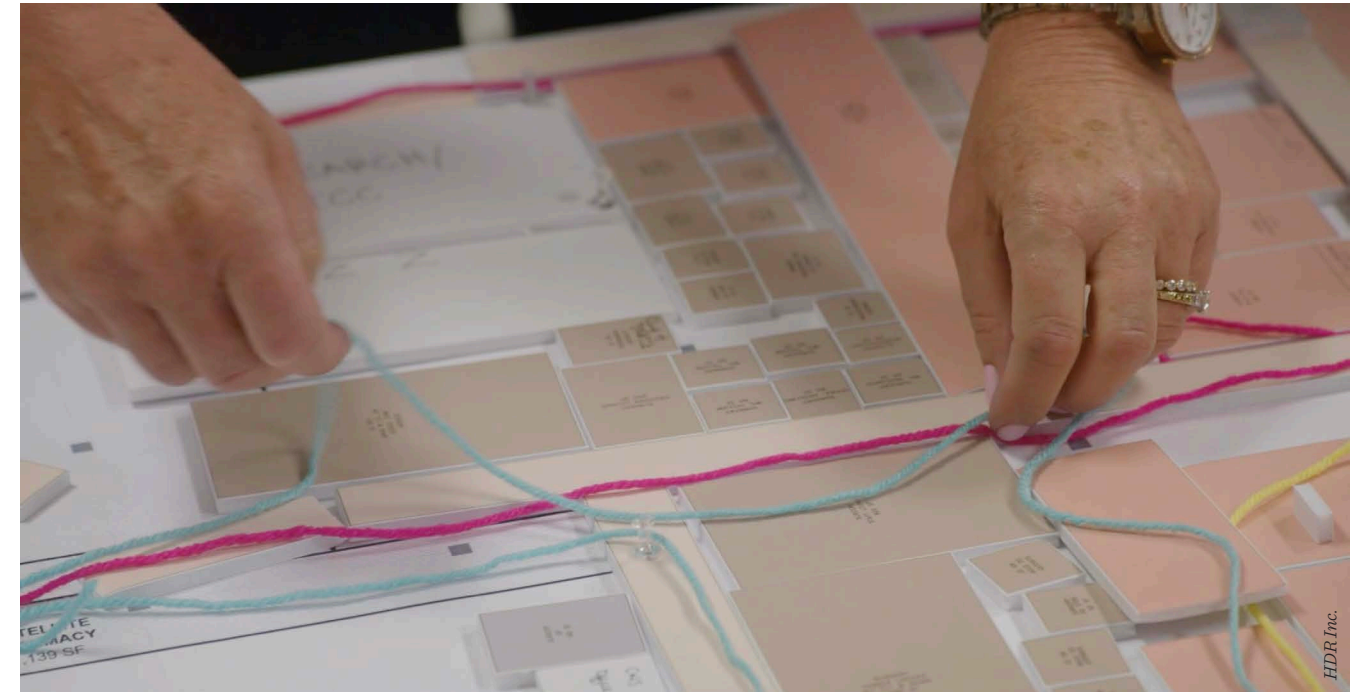
The Lositos cherish every moment they spend with son Landon and daughter Madison because they know how quickly life can change.

A HOSPITAL BUILT *on Experiences*

The 500,000-square-foot, state-of-the-art surgical hospital is centered around the patient experience.



Different colors of yarn represent the movement of patients, team members and supplies through Moffitt McKinley Hospital.



For the patients, families and team members who helped design the new Moffitt McKinley Hospital, the details make the difference

By Amanda Sangster

Photography by Nicholas J. Gould

Four years ago, an aging one-story building sat nearly vacant on 22 acres of land. In its heyday, the old building produced parts for rocket ships and allegedly held government secrets. Most recently, the plot was used as a temporary office building for Moffitt Cancer Center's administrative departments. Located directly across from the Richard M. Schulze Family Foundation McKinley Outpatient Center, it was a logical choice for the cancer center's future expansion.

A normally quiet piece of property, the building buzzed with energy in 2019. Within its humble walls, more than 170 people gathered to imagine a 500,000-square-foot, state-of-the-art inpatient surgical hospital.

Sprouts of weeds emerged from the worn pavement as patient and family advisors Laura Barber, Jason Bever, Rae Sawyer, Ron Giovannelli and Bruce Mackey walked into the



“Anytime I put on my advisor hat, I try to think about my own experiences and the details, but I also try to think about the typical patient at Moffitt.”

— Laura Barber

For Laura Barber, having accessible respite areas for families was a crucial part of the design of the new hospital.

building. As longtime volunteer advisors within Moffitt’s Patient and Family Advisory Program, the small group was elated to be invited to a design session for a future hospital. They arrived fully prepared to give their best insight as patients and caregivers. However, none of them anticipated being the guests of honor.

As they entered the large, crowded room, the advisory group stood on the sidelines and allowed others to take their seats first. As the back rows began to fill, the front row remained open and marked as reserved. The group suddenly found themselves being nudged toward the front row. They were surprised when they learned the reserved seats were for them.

“That’s how valuable they felt our input was,” said Barber, a breast cancer survivor and caregiver.

“Everywhere you go, hospitals want to do the right thing,” said Bever, a caregiver. “Hospitals want patient input, but Moffitt put us in the front row. The hospital executives were sitting three rows behind us.”

Alongside architects and neurosurgeons, Moffitt’s Patient and Family Advisory Program oversaw the entire construction of Moffitt McKinley Hospital. When designing a new hospital to treat the growing cancer burden, leaders knew that building

a facility that is truly patient and family centered requires the expertise of the patients who will be treated there and the families that will help them heal.

BUILDING BLOCKS AND YARN

The advisors joined a diverse group of surgeons, nurses, pharmacy staff, lab personnel, interior designers and architects as they worked through huge floor plans spread across tables. They were given small cardboard blocks to build the outline of patient rooms, workspaces and storage areas. One by one, each floor of the hospital was imagined.

The groups were charged with identifying the flow of the hospital. Pieces of colored yarn wound along drawn hallways to represent the movement of staff, supplies and patients throughout the building. Nurses planned their workflows using green yarn. Light blue pieces helped the pharmacy staff follow the delivery of medications. Pink yarn depicted the flow of patients through every floor. Red followed family members and caregivers. When traffic intersected or hit a roadblock, the workgroups collaborated to find a solution.

Following these immersive design exercises, patient rooms and operating suites were constructed from cardboard to give everyone a realistic feel for the spaces. A few years

later, a full-scale mockup room was built within another Moffitt campus. The advisors were invited to provide their feedback every step of the way.

“The collaboration that exists between Moffitt and patients, it was always recognized,” Sawyer said. “And we saw the changes being made in real time as the plans progressed. The administration at Moffitt really goes out of their way to make sure the patients are heard.”

When asked what the most important element of the new hospital will be, the advisors all shared a common thread. They all agreed that it’s truly not one major thing that will make the biggest difference in the lives of patients and their families at Moffitt. It’s actually all the little things.

MAKING IT ALL ACCESSIBLE

Laura Barber knows quite a bit about the little details and the inpatient experience. The average stay at Moffitt McKinley Hospital will be between three and seven days. In 2012, after husband Steve’s stem cell transplant to treat Myelodysplastic syndrome, she slept on a cot in his room at Moffitt’s Magnolia campus for 56 days. As a Master Gardener, she enjoyed exploring the grounds of the campus. Once her husband

was discharged, Barber was his caregiver for his first 100 days post-transplant, the most crucial time for transplant recipients.

“Anytime I put on my advisor hat, I try to think about my own experiences and the details, but I also try to think about the typical patient at Moffitt,” Barber reflected. “They’re usually older, maybe not very mobile. At Magnolia, there are beautiful gardens, but they’re not easy to get to. I really wanted things to be accessible at this new hospital.”

One of Barber’s biggest concerns was ensuring there would be enough open and welcoming spaces for caregivers and family members to enjoy. She remembers seeking respite in the spiritual room at Magnolia as hospital fatigue set in.

“People don’t bother me,” Barber explained. “But the space was so small that just one person entering the room rather disrupted my solitude.”

Based on Barber’s feedback, the architects of Moffitt McKinley Hospital designed the new spiritual room to be much larger and accommodating. It offers open spaces with soothing, wide-angled views of the gardens and distanced seating.



The patient rooms at the new hospital are larger than their predecessors, with recliners and sofa beds to accommodate family members.



Patient care manager Jennifer Stover reviews how patients and staff will flow through the hospital during an early design session.



The hospital will open its doors to patients in July 2023.

“I’ve worked in hospitals all my career. And having been at several different hospitals with my son, I had seen the things that really worked well and things that didn’t.”

– Rae Sawyer



Rae Sawyer points out how the comfortable accommodations and smart technology in the new patient rooms will improve the patient experience.

For Barber, accessibility goes beyond space. It also means convenience, safety and removing unnecessary stressors. Although the cancer center offers free valet parking for patients at various campuses, some patients and families prefer to self-park to avoid the introduction of additional germs into their cars. For transplant caregivers like Barber, fighting the fear of possible infections is like waging an unwinnable war. Every surface is potentially dangerous for their loved one. In those first 100 days post-transplant, any infection can jeopardize the treatment.

“When we got our car back after an appointment, I felt like I had to wipe it all down and drive home with the windows open,” she explained.

Barber and other advisors felt this was an unnecessary risk that could be easily avoided with additional parking options.

When the architects of Moffitt McKinley Hospital planned a parking garage for the property, they reserved an entire floor solely for self-parking. They also added covered walkways to shield patients from the elements.

MAKING IT ALL A LITTLE BIGGER

As a retired radiologist and parent of a son with cancer, Rae Sawyer offers a unique perspective. Her son Gregory had malignant melanoma and received immunotherapy when the science was in its early phases at Moffitt in 2013. After her son’s treatment, Sawyer joined Moffitt’s volunteer ranks as a family advisor in 2018.

When she was invited to contribute to the design of the new hospital, Sawyer’s focus was on improving the patient rooms. In fact, all advisors stressed that the patient rooms and the technology in them needed to be exceptional.

“I’ve worked in hospitals all my career,” Sawyer said. “And having been at several different hospitals with my son, I had seen the things that really worked well and things that didn’t. I have never seen a patient room that was so patient and family oriented as this one. It’s high-tech and pushing the envelope. It’s quite impressive.”

The patient rooms at Moffitt McKinley Hospital are equipped with virtual assistant technology, integrated pillow speakers and voice controls. Each room features large television screens that offer entertainment options and educational resources. Digital screens have replaced the standard dry-erase whiteboards known throughout all hospital systems. Information on the digital whiteboards will update in real time according to the patient’s medical records, allowing for patients to easily view their dietary restrictions, allergies, medical concerns and more. The digital screens will also display the names of the Moffitt staff entering the room, so patients will always know who’s caring for them.

To make lodging more comfortable, the patient rooms are larger than their predecessors. Every room offers a great window with vast views, a recliner and large sofa bed.

“It feels like a hotel room,” Sawyer said. “There’s a big window with lots of light, and directly under it, there’s a sofa that pulls out into a large bed so a family member can be there and help take care of them.”

The family area within the patient room was designed to be free from clinical interference, meaning clinical tools are all located on the other side of the room. So family members will never feel like they’re in the way of providers.

“I think the patient room is something big and small that will improve outcomes for patients,” Sawyer concluded. “Having a setting like that is so important for healing. That room is truly amazing.”

MEASURING IN MILLIMETERS

The smallest things can make a significant difference in the survival and outcomes of patients.

“In our world, millimeters matter,” explained Moffitt Chief of Neurosurgery Michael Vogelbaum, MD, PhD, who will be performing delicate brain surgeries at the new hospital. “Sometimes, the movement of the brain during surgery is in centimeters.”

Vogelbaum and other Moffitt team members gave extensive input into the new hospital’s design and technology. One of the most remarkable pieces of technology at the new hospital is the intraoperative magnetic resonance imaging (iMRI) system that will assist doctors like Vogelbaum during surgeries. An innovator in his field, Vogelbaum was an early adopter of iMRI technology. During his tenure at the Cleveland Clinic Foundation, he conducted research on the application of high-field iMRI in the removal of brain tumors.

Image guidance has revolutionized neurosurgery, enabling three-dimensional navigation systems to locate tumors, he explains. But more breakthroughs were needed to obtain intraoperative imaging that was truly diagnostic.

Ultrasounds and CT scanners don’t provide the detail required to pinpoint the location and state of a tumor. MRIs are the



Michael Vogelbaum, MD, PhD, was an early adopter of intraoperative MRI technology, which allows real-time imaging during surgery, without moving the patient.

best option, but the challenge is the magnetic environment because operating room instruments are ferromagnetic.

Moving a patient during surgery to get an MRI presents problems, though. When the patient is ready for imaging, they would be transferred between beds. However, moving a patient under anesthesia increases the risk of dislodging a breathing tube or other lifesaving apparatus. Additionally, every time the patient is moved, the brain shifts within the skull.

The iMRI allows the surgeon to conduct intraoperative imaging without moving the patient. The machine glides into the operating room from a centralized diagnostic room using a rail system. The operating room instruments and patient are secured before the imaging is performed. Once images are obtained, the machine recedes back into its shielded unit and the surgery continues.

“What we know for certain is that for the highest-grade brain tumors, the extent of resection, or the removal of the tumor, matters in terms of outcomes and survival,” Vogelbaum explained. “High-grade brain tumors grow and spread quickly through brain tissue, making them harder to treat and remove. In the past, surgeons did their best using image guidance but wouldn’t know how well they did until the following day when new scans could be obtained. Having real-time imaging will allow them to remove the tumor to its margins.”

“This has been a long time coming,” Vogelbaum added. “Having these kinds of state-of-the-art and cutting-edge technologies that help us to do our jobs most effectively as neurosurgeons, Moffitt will be better equipped than any other major hospital doing brain tumor surgery.”

“Having these kinds of state-of-the-art and cutting-edge technologies that help us to do our jobs most effectively as neurosurgeons, Moffitt will be better equipped than any other major hospital doing brain tumor surgery.”

– Michael Vogelbaum, MD, PhD

“I think there’s a difference between treatment and care. Treatment is medicine, and anyone can provide that. But care is a team member taking my wife out a different door so she’s not in pain. Care is listening to advisors.”

– Jason Bever



Based on his experience with his wife, Jason Bever advocated for a private discharge area at the hospital, as well as smooth pathways to make patients in wheelchairs more comfortable.

“I learned there were cobblestones outside the door that I was heading to,” Bever said. “For a patient who just had a double mastectomy and is coming out of anesthesia, going over the bumpy cobblestones could be painful. That team member made sure my wife was comfortable and took the time to take her through another door.”

This small gesture left a lasting impression on Bever.

“I started crying,” Bever recalled. “It was emotional. Who takes the time to do something like that when they’re so busy? I was blown away. And as we went through building a new hospital, I really wanted to make sure we paid attention to all these little things.”

IT ALL ADDS UP

The experiences gleaned from the advisory group and expertise from Moffitt team members resulted in far more than peaceful respite areas, self-parking spaces, bigger rooms, cutting-edge technology and smoother walkways. Their input resulted in small details throughout the hospital that will make a world of difference in the patients’ healing environment.

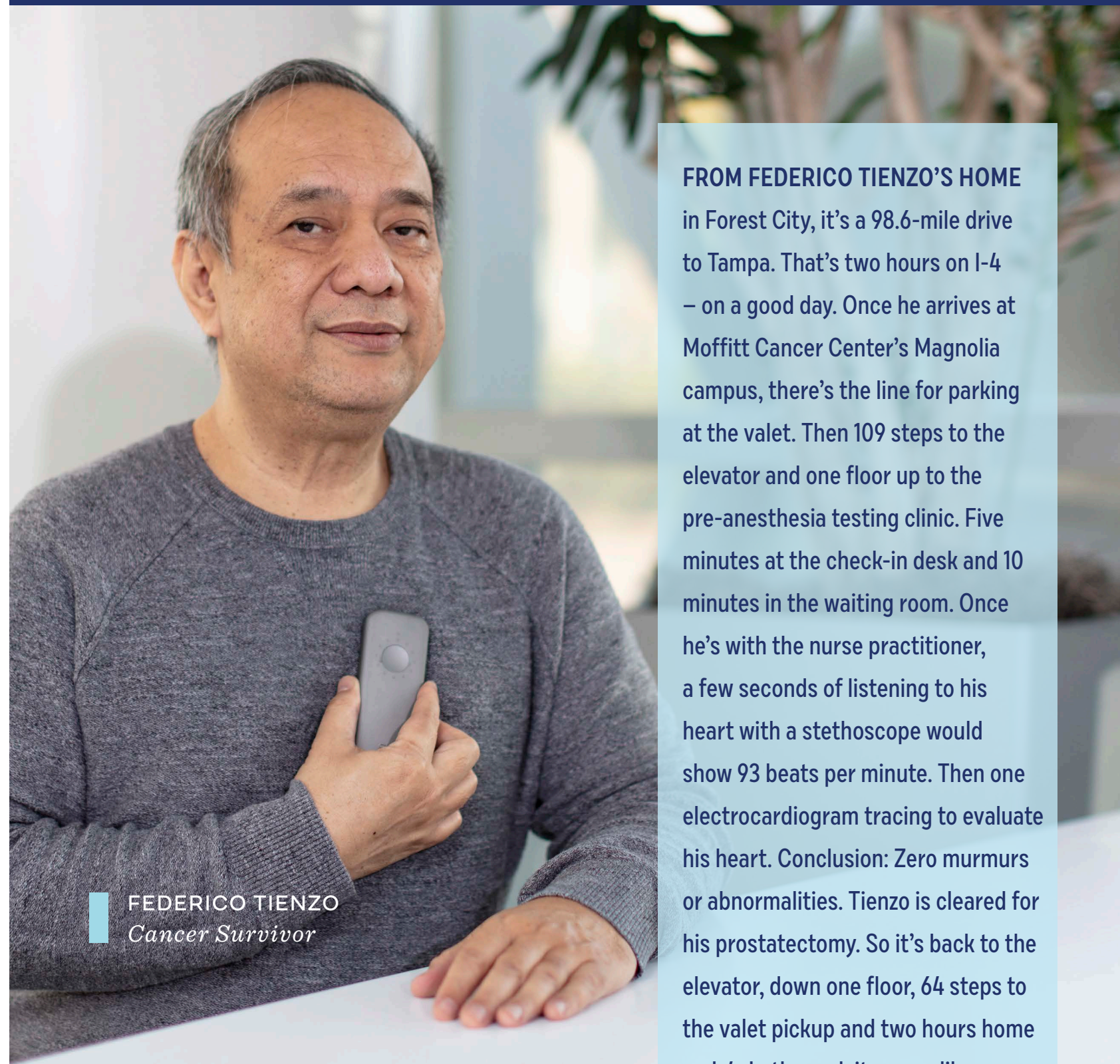
Ultimately, though, there is one feature that couldn’t be physically built for the new hospital but permeates the space nonetheless. Bever says it is the most important part.

“I think there’s a difference between treatment and care,” Bever said. “Treatment is medicine, and anyone can provide that. But care is a team member taking my wife out a different door so she’s not in pain. Care is listening to advisors. It’s not necessarily a fixture or the type of elevator being installed that’s going to make the difference at the hospital. It’s the people at Moffitt who understand what’s important.”

Moffitt would like to especially thank Bruce Mackey, longtime supporter, friend and volunteer, for his contributions to Moffitt McKinley Hospital and the Patient and Family Advisory Program. Mackey passed away in March 2023.

Mobile Monitoring

Making Cancer Care More Accessible



FEDERICO TIENZO
Cancer Survivor

By Corrie Benfield Pellegrino
Photography by Nicholas J. Gould

FROM FEDERICO TIENZO’S HOME in Forest City, it’s a 98.6-mile drive to Tampa. That’s two hours on I-4 – on a good day. Once he arrives at Moffitt Cancer Center’s Magnolia campus, there’s the line for parking at the valet. Then 109 steps to the elevator and one floor up to the pre-anesthesia testing clinic. Five minutes at the check-in desk and 10 minutes in the waiting room. Once he’s with the nurse practitioner, a few seconds of listening to his heart with a stethoscope would show 93 beats per minute. Then one electrocardiogram tracing to evaluate his heart. Conclusion: Zero murmurs or abnormalities. Tienzo is cleared for his prostatectomy. So it’s back to the elevator, down one floor, 64 steps to the valet pickup and two hours home on I-4. In the end, it seems like one more day hijacked by cancer.

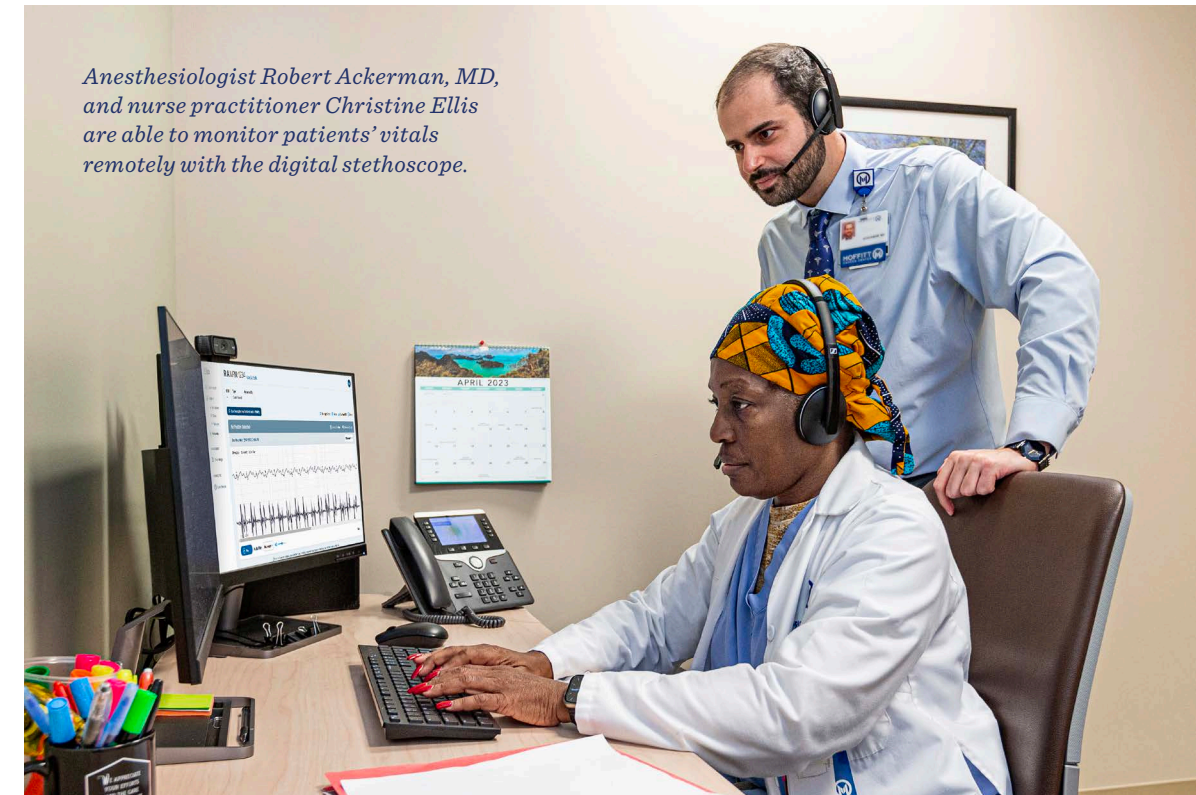
Moffitt researchers and clinicians are taking telehealth to the next level

But that's not what happened on this particular Wednesday. Instead, Tienzo left his home in Forest City, a small community 12 miles north of Orlando, and went to work like normal. When it was time for his pre-anesthesia evaluation appointment at Moffitt, he took a short break from his job in architectural design and logged onto Zoom. He got out a small digital stethoscope and held it to his chest like he'd been shown. He could see his heart rate and the electrocardiogram (EKG) tracing on an app on his phone. The nurse practitioner back at Moffitt could also see them. She listened to his heart and lungs and noted his heart rate. In 15 minutes, he was cleared for prostate cancer surgery and back at work.

Tienzo's telehealth appointment using the remote stethoscope was part of a clinical trial being led by anesthesiologist Nasrin Aldawoodi, MD, medical director of Moffitt's pre-anesthesia testing clinic. It also represents the next generation of telehealth initiatives being pioneered at Moffitt. Beyond virtual visits, remote monitoring devices offer more opportunities to reduce the burden on patients, minimize health disparities and improve outcomes during treatment.

"At Moffitt, most of our patients aren't coming from down the street," Aldawoodi explained. "As a specialty cancer center, we do some really unique surgeries. And patients are coming from the Panhandle, from South Florida. They are driving for hours. So this level of virtual care is uniquely useful."

"It was so easy. I didn't even need to tell my employer that I had an appointment," he said.



"As a specialty cancer center, we do some really unique surgeries. And patients are coming from the Panhandle, from South Florida. They are driving for hours. So this level of virtual care is uniquely useful."

- Nasrin Aldawoodi, MD

Nasrin Aldawoodi, MD, is leading a clinical trial using a remote stethoscope to conduct pre-anesthesia evaluations via telehealth ahead of surgery.

BRIDGING THE GAP BETWEEN VIRTUAL AND IN-PERSON VISITS

Moffitt has been offering virtual visits for certain patients since before the pandemic. The cancer center began offering telemedicine visits in the pre-anesthesia testing (PAT) clinic in 2020. During COVID-19, those efforts significantly ramped up. There is even specific space set aside in the PAT clinic now for providers to meet with patients via Zoom. More than 1 in 5 perioperative patients are seen via telemedicine.

Moffitt continues to expand its telehealth efforts to cover the full spectrum of care. Virtual visits are also being delivered for chemotherapy education, presurgical education, post-surgical appointments and evaluation, and allied health services such as dietitians. In addition, to ensure there is equitable access, interpreters are available for non-English language proficiency patients.

Of course, as convenient as telehealth visits are for patients, there are limitations as to what health care providers can evaluate through a Zoom call. Devices such as the remote stethoscope offer opportunities to bridge the gap between what can be done in a telehealth visit versus an in-person appointment.

As part of Aldawoodi's randomized telehealth trial, she is working with surgeons Julio Pow-Sang, MD, chair of the Genitourinary Oncology Department, and Mitchel Hoffman, MD, vice chair of the Gynecologic Oncology Department, to enroll patients who are scheduled for surgeries to remove the prostate and uterus. Patients get a lesson on how to use

the Eko Duo digital stethoscope from the Moffitt Virtual Care team. Then they take the device home along with an iPod Touch that is preloaded with Zoom and the stethoscope app.

Rather than returning to Moffitt for an in-person pre-anesthesia evaluation ahead of their surgery, the patients log in for a telehealth visit via Zoom and use the digital stethoscope. From hundreds of miles away, a Moffitt anesthesiologist and nurse practitioner can monitor the patients' heart rate, review EKG tracings, and listen for abnormalities and irregularities such as atrial fibrillation, which can lead to clots in the heart, or murmurs that indicate a valve disorder. These problems can prompt surgery delays and cancellations.

The pre-anesthesia evaluations are typically short appointments, but they're crucial. Some patients drive for hours to get to them. The opportunity to conduct the appointments remotely removes one more burden that patients face as they head into surgery.

"Our patients come from far away. They have a lot of appointments," Aldawoodi said. "Cancer treatment in general is like a full-time job."

"Cancer treatment in general is like a full-time job."

- Nasrin Aldawoodi, MD

ADDRESSING THE BLIND SPOT BETWEEN APPOINTMENTS

That full-time job continues for patients post-surgery and during ongoing treatment such as chemotherapy, radiation and immunotherapy. Patients receive detailed instructions on what to expect related to their treatment. They learn about side effects and potential physical limitations. Day in and day out, patients and caregivers are acutely aware of how their cancer and treatment are affecting them. But for their health care team, that time from one appointment to the next is often a blind spot.

Patients are sometimes hesitant to alert their oncologist to potential problems between appointments, explained Brian D. Gonzalez, PhD, a clinical psychologist in Moffitt's Department of Health Outcomes and Behavior. Patients may assume, for example, that their nausea level is normal, so they don't call the doctor. Or they think the doctor is busy and they just don't want to bother them. Or, if the patient is participating in a clinical trial, they may worry that "complaining" will lead to them being removed from the trial.



Brian D. Gonzalez, PhD

"Of course, that's not how it would work. The oncologists and nurses want to know about your side effects so that they can help you," Gonzalez said. "But many patients don't realize that."

Gonzalez and Laura B. Oswald, PhD, another clinical psychologist in Health Outcomes and Behavior, have been working with Moffitt oncologists to develop mobile health initiatives that could capture data from patients between appointments and reduce those blind spots. They do this by pairing wearable devices such as Fitbit and Garmin watches with remote patient-reported outcome surveys. The wearable devices capture data like heart rate, sleep and physical activity each day. The surveys collect information on symptoms, possible side effects and how patients are feeling. The goal is to identify patterns of data or changes in reported outcomes that could predict when a patient is about to experience problems, enabling the health care team to intervene and prevent the need for an emergency room visit or hospitalization.

Oswald and Kedar Kirtane, MD, medical director for solid tumor cellular immunotherapy, recently co-led a pilot study involving 15 patients who were being treated with adoptive cell therapies such as chimeric antigen receptor T-cell (CAR T) therapy. The patients started wearing Fitbits before their treatment began and continued wearing them for

90 days post-therapy. They also completed 14 electronic surveys during this time – daily for the first week after therapy and then less frequently.

"We tried to make it as remote as possible, so patients could go about what they were already doing and give data at the same time," Oswald said of the study, which was published in the journal *Cancers*. "And although we only recruited 15 patients, the amount of data that we got from the patients was extensive."

Gonzalez worked on a similar study led by Scott Gilbert, MD, a surgeon in Genitourinary Oncology, tracking data from a group of 15 patients with bladder cancer who had their bladders removed. The study, published in *The Journal of Urology*, used Garmin watches to track biometric data and collected daily surveys via a smartphone app for 30 days post-discharge.



Laura B. Oswald, PhD

Krupal Patel, MD, a surgeon in Moffitt's Head and Neck Oncology Department, also worked with Gonzalez on a pilot study of 12 patients with head and neck cancers who were undergoing chemotherapy with or without radiation. The patients wore Garmin watches for six weeks during treatment and four weeks after treatment. They also completed symptom surveys electronically every other day while on active treatment and once a week after completing treatment.

Results from all three studies showed that this type of remote monitoring is feasible, and patients are comfortable using the remote surveys to report how they're feeling. The next step is to conduct more expansive studies involving larger

"We're talking minute-to-minute, second-to-second data that would just not be feasible to collect in other ways, unless you're literally just following a patient around all day."

- Laura B. Oswald, PhD

Laura B. Oswald, PhD, and Brian D. Gonzalez, PhD, are researching whether wearable devices such as Fitbits and Garmin watches can be used to monitor patient data between appointments.

"We tried to make it as remote as possible, so patients could go about what they were already doing and give data at the same time."

- Laura B. Oswald, PhD

REDUCING THE BURDEN ON PATIENTS

Advances in virtual care have the potential to save patients time and money. A study led by Patel evaluated the impact of 25,496 telehealth visits with 11,688 patients from April 1, 2020, to June 30, 2021. It found that patients saved \$147 to \$186 per telehealth visit, taking into account the cost of travel and the potential loss of income from missing work. That includes 148.6 roundtrip travel miles and 2.9 hours of roundtrip driving time. The patients also saved 1.2 hours per telehealth visit, compared with in-clinic visits.



Krupal Patel, MD

Aldawoodi's work with the remote stethoscope could open up more opportunities for visits to be done virtually. And that is extremely important as Moffitt's cutting-edge treatment options draw patients from across the state, as well as nationally and internationally.

"There's the fact that geography could limit somebody's access to care for cancer, and there are socioeconomic factors that come into play," Aldawoodi said. "Some patients can't take time off of work. Some patients are caregivers themselves, to children or elderly relatives. They can't afford childcare or they don't have transportation. They might not even have support for someone to be with them on the day of surgery. We need to do whatever we can to eliminate those disparities."

In between visits, remote monitoring through wearable devices and patient surveys also has the potential to ultimately improve quality of life for patients. This could be as simple as tracking reported nausea levels and automatically alerting the care team when a patient may need a change in medication. It could also be as major as prompting intervention that saves a patient from a scary and expensive emergency room visit.

"Patients who come to Moffitt are already getting world-class care," Gonzalez said. "They're getting monitored. They're getting checked in on. There's the opportunity for virtual visits. This would not only improve the fantastic care patients receive, but it would expand access to patients who might not be able to come to Moffitt. People who live farther away might be able to come to get treated here and get monitored remotely."

LOOKING TO THE FUTURE OF VIRTUAL CARE

The research into remote monitoring through wearable devices and patient surveys is in the early stages. Gonzalez

led a larger study working with Eric Haura, MD, associate center director for Clinical Science, and Andreas Saltos, MD, clinical research medical director in the Thoracic Oncology Department. The study collected data from 60 patients with non-small cell lung cancer who were undergoing systemic treatments such as chemotherapy or immunotherapy. The patients wore Fitbits and completed surveys remotely for 60 days after beginning systemic therapy. The team is now working to find correlations between the data and how the patients responded to treatment.

Oswald and Kirtane have expanded their research, as well, pooling data from four observational studies at Moffitt that collected common patient-reported outcomes among 208 patients treated with CAR T therapy. An analysis by Moffitt's Machine Learning Department showed preliminary associations between the patient-reported outcomes and the patients' response to CAR T therapy, with up to 83% predictive performance.

As the research expands into exponentially larger sample sizes, the doctors envision a future where patients could be easily monitored remotely during treatment, with their health care teams alerted whenever the data points to a potential problem on the horizon. This level of virtual care could be a game-changer for improving outcomes.

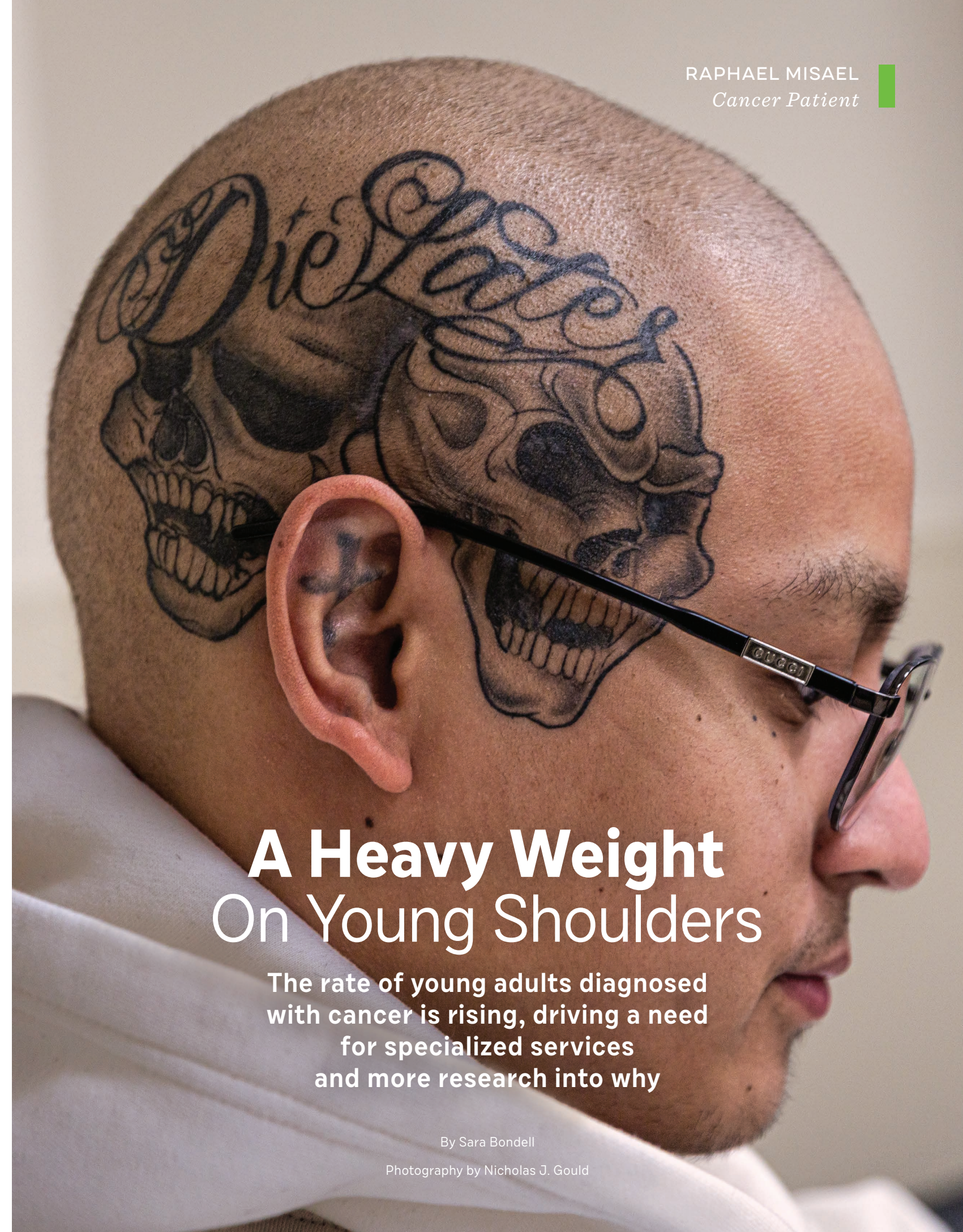
"We're talking minute-to-minute, second-to-second data that would just not be feasible to collect in other ways, unless you're literally just following a patient around all day," Oswald said.

For Aldawoodi, the future of telehealth has already started to hit home with the amount of off-the-shelf digital monitoring devices that are available. She points out that many patients became more comfortable with technology and telehealth during the pandemic, laying the groundwork to do more appointments remotely.

"A lot of patients already have a blood pressure cuff. A lot of patients bought pulse oximeters because of COVID. So they can capture a lot of vitals remotely. They have these smart watches that can capture their heart rate. And now this remote stethoscope is that additional step where we can listen to their heart and lung sounds," she said.

All of this translates to easier access to cancer care.

"This really does remove those high barriers that a lot of patients have to getting care," Aldawoodi said. "If we can almost replicate the in-clinic experience with a remote experience – and I think we can and the technology is making that possible – then it's a win-win for the patients, for Moffitt and for health care in general."



A Heavy Weight On Young Shoulders

The rate of young adults diagnosed with cancer is rising, driving a need for specialized services and more research into why

By Sara Bondell

Photography by Nicholas J. Gould

Raphael Misael fidgets in his wheelchair. He's cradling crutches in his lap while being wheeled in to see his social worker.

He's about to face a hospital stay at Moffitt Cancer Center for yet another intense round of chemotherapy. After that, doctors are recommending Misael have his leg amputated above the knee to remove the cancer that has riddled his bones.

It's a life-transforming decision for anyone, especially a 28-year-old.

Misael likes to rock climb and hike. He's a freelance videographer whose passion is music videos. One of his videos has 13 million views on YouTube. He has tattoos that creep out from under his sweatshirt and wrap around his knuckles. Over 20 actually.

He takes off his hat to show his social worker, Olivia Luginski, the newest one on his scalp: two skulls with the words "Die Later" sweeping over them.

It has been a tough year for Misael, who was diagnosed with osteosarcoma just eight months after his mother was diagnosed with colorectal cancer on her 30th wedding anniversary.

A much-needed smile starts to creep across Misael's face as he talks with Luginski. His dad brags about his handsome son, and Misael shares his dreams of returning to California to continue his career. Luginski helps Misael with questions about health care coverage and offers to connect him with other young patients who have faced amputation.

A licensed social worker in the Sarcoma Department, Luginski estimates that 1 in 5 of her patients are young adults – a large number compared with other outpatient clinics. She



Raphael Misael, pictured with dad Alan, is facing life-changing choices at the young age of 28 after being diagnosed with osteosarcoma. His story is one that oncologists are seeing more frequently as cancer cases rise among young adults.

has become a subject expert in adolescent and young adult (AYA) patients, who are between ages 15 and 39, and she is committed to ensuring all AYA patients and survivors have access to resources, services and events specific to their age.

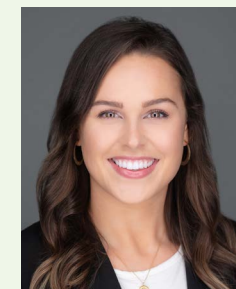
Her expertise is needed now more than ever, as the rate of young adults diagnosed with multiple types of cancer is rising. According to a 2022 review of global cancer diagnoses, cases of breast, colon, esophagus, gallbladder, kidney, liver, pancreas, prostate, stomach and thyroid cancers have been increasing in 30-, 40- and 50-year-olds since 1990.

It's a trend providers are also seeing at Moffitt. More and more, Luginski's colleagues in other clinics are coming to her with questions and requests for resources for younger patients.

Luginski is eager to help. "This is such a vital, fragile time to get a chronic or terminal illness diagnosis."

"This is such a vital, fragile time to get a chronic or terminal illness diagnosis."

- Olivia Luginski, social worker



A CHANGING PATIENT POPULATION

Colorectal surgeon Julian Sanchez, MD, stops for a moment while making the rounds to check in on patients he has recently operated on. Something is different.

It hits him. Every patient is 35 or younger.

"That's not happening every week, but the fact that it happened one week when it's never happened in my career, that means something is changing," Sanchez said.

Recent analyses of colorectal cancer rates confirm that more younger individuals are being diagnosed with the disease. A 2017 American Cancer Society study found that those born in 1990 – who will be turning 33 this year – have double the risk of colon cancer and quadruple the risk of rectal cancer compared with those born around 1950.

A 2023 American Cancer Society report found 1 in 5 colorectal cases in the United States occur in people younger than 55. This is about twice the rate in 1995, when a little more than 1 in 10 cases were in this age group. According to Moffitt's Cancer Registry, which collects data from patients diagnosed and/or treated at Moffitt since 1986, the number of colorectal cancer patients seen at the cancer center between the ages of 15 and 50 has doubled from 2000 to 2020.

"When it's a 30-year-old with two kids who are my kids' age, it just hits," Sanchez said.

Sanchez felt that gut punch when he met Karina Nicajevsky. She was a 29-year-old mother of two when she was diagnosed with stage 3 colorectal cancer in 2020. Her husband was deployed in Korea when she began treatment.

"I was always the youngest one in the chemotherapy area and doing radiation," Nicajevsky said. "I always got a lot of looks like, 'What are you doing here?'"

Nicajevsky moved in with her mother, who became her support system while her husband was away and helped take care of her daughters, who were 5 and 7 at the time. Surgery in 2021 left Nicajevsky with a permanent ileostomy, where the bowel is routed through an opening created in the abdominal wall so feces can leave the body and be collected in a bag overlaying the skin.

She just hit her one-year mark cancer free, but Nicajevsky feels the lasting impacts of a cancer diagnosis at a young age. While a history of an inflammatory bowel disease increased her risk of cancer, the recent trends are still staggering for her. "It's so sad to hear more and more people my age are being diagnosed. I would love to find out why it's happening."

In response to the rising colorectal cancer rates in young adults, in 2021 the U.S. Preventive Services Task Force began recommending screening colonoscopies start at 45 instead of 50 for those of average risk. Projections show that by 2040, colorectal cancer will surpass breast cancer as the leading cause of cancer-related deaths for Americans 20 to 49 years old.

"No way did I think I would be treating this patient population," Sanchez said. "But in my lifespan of a colorectal surgeon, I have seen more and more younger-onset patients coming in."

"No way did I think I would be treating this patient population."

- Julian Sanchez, MD



NO CLEAR ANSWER

No one knows for sure why cancer rates are rising in younger people. According to the National Cancer Institute, overall cancer incidence may increase by an additional 11% to 12% by 2030 in people 25 to 39 years old.

Early onset cancer has become a research priority across cancer centers, including at Moffitt. Researchers are investigating several major risk factors that could be to blame, such as obesity, diet, changes in the gut microbiome and early antibiotic exposure.

Doratha A. Byrd, PhD, is part of the early onset colorectal cancer working group. She is using grant funds to study whether the microbiome differs in early onset colorectal cancer cases compared to later onset cancer.

The gut microbiome is made up of trillions of microorganisms that live in the gastrointestinal tract. It processes nutrients and plays a major role regulating overall health. There is emerging evidence about how the gut microbiome works, including that it is modifiable by environmental factors and potentially plays a role in cancer.

"There are a lot of individuals really interested in studying early onset cancer. It's really concerning because historically, at



“I was always the youngest one in the chemotherapy area and doing radiation. I always got a lot of looks like, ‘What are you doing here?’”

- Karina Nicajevsky

Karina Nicajevsky was 29 with two young daughters when she was diagnosed with stage 3 colorectal cancer in 2020. Her husband was deployed in Korea when she began treatment, so she moved in with her mother for support. This family photo shows Karina, husband Tory, and daughters Korra and Abigail.

least for certain cancers, they have been a disease of aging,” Byrd said. “We really want to understand what’s happening and why are people getting this younger.”

Previous studies have linked obesity, sedentary lifestyles and Western dietary patterns to early onset colorectal cancer. A family history of the disease has also been associated with increased risk. Evidence supporting the role of other risk factors, such as smoking and antibiotic usage, is limited and the focus of ongoing research.

“We really want to understand what’s happening and why are people getting this younger.”

- Doratha A. Byrd, PhD



SUPPORTING YOUNG PATIENTS

When Amber Skinner became the AYA program coordinator at Moffitt almost six years ago, about 70,000 adolescents and young adults were diagnosed every year nationwide. That number has now climbed to 89,000.

The number of new AYA patients treated at Moffitt continues to rise each year, most recently increasing by 18.2% in the past three years. The largest increase is seen in the 35-39 age range.

“Every year these numbers are going up a bit. It’s not dramatic, but we can see it,” Skinner said. “The next three years, we are going to have more patients, and we need to prepare for that because they’re not just getting cancer younger, they are at risk for a secondary cancer later in life.”

Moffitt’s AYA Program provides patients ages 15 to 39 with specialized medical and psychosocial care that addresses the unique needs of the patient population. The program not only offers peer-to-peer support but resources on topics like fertility, financial toxicity and mental health.

Skinner didn’t even know the AYA space existed until she began her work at Moffitt. Her stepmother died five months after being diagnosed with an aggressive gynecological cancer at 43, leaving behind young children and the lasting impacts of losing a young mother. She knows what it’s like

to be a caregiver, stepdaughter of a young mother with cancer, and what challenges young cancer patients and their families may face. This fuels her fire to help grow the AYA Program at Moffitt and nationally.

“It’s essential that these patients have the support not only in treatment, but after. How do they navigate life after cancer? How do they navigate a recurrence? This is a stage of life where a lot of changes are happening. They’re getting married, going to school or trying to start a career,” Skinner said.

The program has grown alongside the increase in patients it serves, especially when it comes to research. The AYA population has been historically underrepresented in research studies and clinical trials. So the program created an AYA research cohort to build a repository of demographic information for patients within the age range that is readily available for use in upcoming research. A team of researchers meets annually to identify ways to improve the cancer care

experience for the AYA population. More recently, the team has also been using the cohort to enroll patients in research studies to create interventions and better study early onset cancers. There were only a few AYA research studies at Moffitt five years ago. As of January 2023, there are 15.

The program created an AYA specialty nurse role in 2021. There are now 25 AYA nurses working in outpatient clinics and the inpatient hospital floors. These nurses are specifically trained to care for young adult patients and work to identify patients who may need additional resources. The goal is to make sure every young patient walking through the doors is supported, learns about fertility preservation prior to treatment and knows the AYA Program exists.

Every social work intern and every new hire within the Social Work Department meets with Luginski during orientation so they can get a better grasp on the unique needs these patients face and how the AYA Program can offer support.

“It’s essential that these patients have the support not only in treatment, but after. How do they navigate life after cancer? How do they navigate a recurrence?”

- Amber Skinner, AYA program coordinator



Amber Skinner is the coordinator for Moffitt’s Adolescent and Young Adult Program, which provides patients ages 15 to 39 with specialized medical and psychosocial care that addresses their unique needs. The program offers peer-to-peer support and resources on topics like fertility, financial toxicity and mental health.

“It just puts it into perspective of how fragile life is and how beautiful it can be and that these support services, these advocacy efforts make a difference.”

– Olivia Luginski, social worker

LIGHT AT THE END OF THE TUNNEL

Like sarcoma patient Raphael Misael, most young adult patients can't even begin to comprehend the challenges they will face just because of their age when they are diagnosed. It's hard to focus on physically healing when you're moving back in with your parents, deferring student loans and deciding if you ever want to be a parent while you're still single.

“It's been a challenge to come back home,” Misael tells Luginski during his social work visit. “I have been independent for so long.”

“That's not off the table forever,” she replies. “In order to reach a larger goal, it is necessary to create smaller goals in between. We need that light at the end of the tunnel.”

Like all her patients, Luginski will continue to help steer Misael toward that light. It's a task she doesn't take lightly, one that is both extremely rewarding and heartbreakingly tragic. She faces the same reality that doctors and nurses do: Not every patient can be saved, and when a young patient's life is cut short, it can hurt more.

The dichotomy of the joy and pain that comes with cancer care is what keeps everyone moving forward. Researchers and providers are more dedicated than ever to investigate why cancer rates are increasing in young adults and how to better support and treat them.

It's a dedication Luginski renews every Oct. 1 as she pauses

to remember a patient she lost who shared the same birthday, down to the year.

“It just puts it into perspective of how fragile life is and how beautiful it can be and that these support services, these advocacy efforts make a difference.”



Raphael Misael, left, has moved back in with his parents for now, so dad Alan can help take care of him. But a future of living independently is still in the cards.

Improving Cancer Care for People with HIV



Moffitt's HIV clinic reduces burdens for patients fighting for their health on two fronts

By Steve Blanchard

Photography by Nicholas J. Gould

Moffitt's Adolescent and Young Adult Program

People who are diagnosed with cancer as young adults (defined as ages 15 to 39) tend to face a unique set of challenges compared with those who are older. Moffitt's Adolescent and Young Adult (AYA) Program helps patients navigate their journey through:

- Fertility preservation education
- Student loan deferment help
- Financial navigation
- New research opportunities
- Mental health support
- Peer-to-peer connections with fellow patients and survivors
- Patient advocacy



To learn more about Moffitt's AYA Program, use the camera on your smartphone to scan the QR code.

Every day, patients buzz in and out of the clinic on the first floor of Moffitt Cancer Center's Magnolia campus.

They are picking up medications to ensure their T cell counts are high enough to continue receiving infusion and compatible with their ongoing cancer treatments. These patients are part of a special population. Many have already faced a battle for their lives against one disease. Then, they were diagnosed with cancer.

Treatment for human immunodeficiency virus (HIV) has come a long way since the AIDS epidemic of the 1980s. HIV and AIDS, which stands for acquired immunodeficiency syndrome, are no longer a death sentence thanks to the introduction of antiretroviral medications in the mid-1990s. A once-life-

ending diagnosis has become a chronic condition, where a majority of patients can live normal, healthy lives.

However, as the HIV population ages with improved treatments, they face the growing burden of being diagnosed with other chronic conditions such as cancer. In 2021, Moffitt opened a clinic that is uniquely tailored to the needs of patients who are living with HIV and battling cancer. It's a way to monitor the delicate balance of cancer treatment and HIV medications.

“We have seen more than 300 patients in the last two years who are HIV-positive and seeking cancer treatment at Moffitt,” said Anna Coghill, PhD, an epidemiologist who studies the intersection between HIV and cancer.

FROM ONE BATTLE TO ANOTHER

For many years, people who were winning their fight against HIV found that they had fewer weapons when it came to fighting cancer.

“The guidelines now state that cancer treatments should not be withheld from HIV-positive patients,” Coghill said. “In retrospect, we’ve seen a lot of cases where this patient population was not treated as aggressively as their HIV-negative counterparts.”

That was mostly out of concern for a compromised immune system being able to handle cancer treatments like chemotherapy, Coghill said. Research has changed that perspective, though.

With improving antiretroviral treatment, many HIV-positive people are now “undetectable.” An HIV-positive patient reaches “undetectable” status when their HIV viral load is so low that HIV cannot be transmitted to sexual partners. Still, these people face a significant threat from cancer.

Approximately 1 in 4 deaths among people with AIDS are due to non-HIV-related causes, such as cancer, the National LGBT Cancer Network reports. HIV-associated cancers have dramatically increased in prevalence in long-term survivors of HIV/AIDS. They include Kaposi sarcoma, aggressive B-cell non-Hodgkin lymphoma, cervical cancer, anal cancer, Hodgkin lymphoma, lung cancer, mouth and throat cancers, liver cancer and some types of skin cancers.

Some of these cancers are linked to viruses, the American Cancer Society notes. These viruses can cause cancer in people with and without HIV, but the risk might be higher in those with HIV because their immune systems are weaker. For example, anal cancer and some mouth and throat cancers are linked to infection with human papillomavirus (HPV), the same virus that causes cervical cancer. Liver cancer is more common in people infected with the hepatitis B or C viruses. Hodgkin lymphoma is often associated with the Epstein-Barr virus (EBV). Human herpes virus 8 can cause

Kaposi sarcoma, a cancer that affects the lining of the lymph or blood vessels.

“Some viruses can cause chronic infection and changes, inducing changes in some human cells,” explained Ana Velez, MD, who specializes in infectious diseases at Moffitt. “For example, if an immune system is dysfunctional because of HIV infection, Epstein-Barr virus can cause lymphoma.”

“If the immune system isn’t strong, you can find HPV causing chronic replication in the cervix, which can lead to cervical cancer,” Velez continued. “The same can happen with anal cancer, so rectal pap smears are important in this population.”

“There is hope for cancer patients who also have HIV.”

- Ana Velez, MD

There are also behavioral factors that can increase cancer risks for people living with HIV. For example, high smoking rates are reported in the HIV-positive community, causing a large percentage of HIV patients to develop lung cancer. This, combined with the increasing average age of the HIV population in the United States, has contributed to lung cancer emerging as one of the two most common cancers expected to be diagnosed in HIV patients in the coming decade.

Coghill also stresses the importance of regular cancer screenings for older people living with HIV. In 2019, she was part of a team that explored whether cancer treatments had an impact on outcomes in this population. The study used data from the Medicare database (patients 65 or older) to demonstrate that older HIV-positive patients had a higher mortality rate after cancer diagnosis than their HIV-negative counterparts, particularly for common tumors such as breast and prostate cancer.

“As the HIV population continues to age, the association of HIV infection with poor breast and prostate cancer outcomes will become more important, especially because prostate



“The guidelines now state that cancer treatments should not be withheld from HIV-positive patients. In retrospect, we’ve seen a lot of cases where this patient population was not treated as aggressively as their HIV-negative counterparts.”

- Anna Coghill, PhD



Ana Velez, MD, consults with nurse Melissa Eaton-Moseley in the HIV clinic. Velez stresses the importance of keeping the immune system as strong as possible for people who are living with HIV and diagnosed with cancer.

cancer is projected to become the most common malignancy in the HIV population,” Coghill said. “It is why we are stressing the need for more research on clinical strategies to improve outcomes for HIV-infected cancer patients.”

EARLY DETECTION AND THE RIGHT PRACTITIONER ARE KEY

Like with all cancers, knowing what to look for and detecting irregular cells early is the key to prevention and successful treatment. But for patients with HIV, finding the right general practitioner who knows what to look for can be challenging.

“Some oncologists are very good at knowing which cancers are associated with HIV,” Velez said. “Part of the guidelines is to test HIV-positive patients at least once in their life, or even once a year if they have risk factors for infection. Many providers don’t test or discuss this unless a patient asks.”

“If a patient and his or her care provider is on top of their care, screening happens regularly and that allows us to detect suspicious cancers much earlier,” Velez continued. “This also gives us more opportunities to collect data and learn more about this patient population to continue improving the care we provide as a cancer center.”

New HIV treatments, for example, have been found to have limited or no interactions with chemotherapy drugs. This means a patient can continue their HIV treatment even while undergoing cancer care.

Injectable antiretrovirals are especially important for people living with HIV who are diagnosed with cancer. Coordinating those drugs with a pharmacist can help reduce or eliminate complications.

“If you learn you are positive, it’s so important to begin taking your medications right away,” Velez said. “That’s even more important if you are also diagnosed with any kind of cancer.”

Keeping the immune system as strong and stable as possible can only help with the treatment outcome, Coghill stresses.

“The goal is to be undetectable, of course,” Coghill said. “Someone should always be on antiretroviral therapy, but there’s not a whole lot of good data on what happens to HIV counts. CD4 numbers drop with chemotherapy, regardless of HIV status, so that drop doesn’t necessarily mean an interruption to cancer care. Cancer therapy is quite harsh, so we need patients to be as immune competent as possible.”



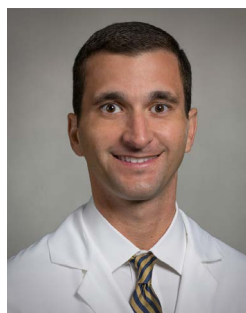
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– Ana Velez, MD

CD4 cells are a type of white blood cell that helps the body fight infection. In the past, CD4 count cutoffs had been used to exclude HIV-positive patients from clinical trials, Coghill says. But the National Cancer Institute no longer recommends that.

IMPROVING OPTIONS FOR CARE

More research is needed to improve cancer treatment among this patient population. Several clinical trials are available for patients with anal cancer and HIV, for example. One such clinical trial is made possible through the AIDS Malignancy Consortium (AMC) and the oversight of Moffitt colorectal surgeon Julian Sanchez, MD.



Julian Sanchez, MD

“Cancer is now the second-leading cause of death among people living with HIV, and we need to better understand what having two chronic comorbidities means for patients in terms of appropriate therapy and survival,” Coghill said. “The objective of this consortium is to bridge the gap between persons living with HIV and cancer clinical trials. The support we receive from the AMC will allow us to expand our work and offer more innovative trials to our patients.”

Securing those patient participants to help improve outcomes is sometimes difficult. Many patients don’t want to share their HIV status because of the stigma attached to the diagnosis. Patients who are newly diagnosed with HIV are sometimes depressed or embarrassed. The stigma can be difficult to overcome.

“Sometimes they get very depressed and feel shamed,” Velez said. “We sometimes have to educate them, remind them that a diagnosis like this is not a death sentence. However, we must also share with them that if they aren’t compliant with their HIV medications, their cancer can get worse.”



Eaton-Moseley meets with patients when they come to the clinic, taking their vitals and making sure they are healthy enough for cancer treatments. Coordinating care is crucial for this population of patients.

Moffitt strives to take some of the burden off patients who are facing this double diagnosis. Different grants are available to assist patients with medications, and Moffitt has team members in place to help HIV patients with cancer navigate their insurance. Clinicians are also on hand to suggest and recommend clinical trials that could benefit the patient — and many more in the future.

Coghill and Velez are working with their colleagues to develop a database that will help identify people living with HIV who are receiving care at Moffitt. This will ensure that oncologists

are aware of all relevant information and allow those patients with HIV unique access to clinical trials.

“Research has shown that cancer patients with underlying HIV infection are more likely to have poor outcomes, so knowledge of patient HIV status is imperative at the start of cancer therapy,” Coghill said.

Patients with HIV have long been excluded from clinical trials, especially ones involving immunotherapies that bolster the immune system to fight cancer. Moffitt is working to open clinical trials specifically for HIV-positive patients with anal cancer, lymphoma and lung cancer.

HIV AND CANCER CLINIC HELPS OVERCOME BARRIERS

In the past, patients who had both HIV and cancer needed to bounce around to receive their care and medications from different locations. Moffitt has changed that with its HIV clinic.

Having a clinic dedicated to patients with HIV and cancer has removed some barriers. It has also helped Coghill with her research.

“We don’t always have all the HIV information for these patients,” Coghill said. “We only treat cancer. So when we

look at medical records to answer research questions, we don’t always have a great history to work from. Integrating that HIV care at Moffitt is proving promising.”

Most of Coghill’s work focuses on molecular epidemiology. She is studying the differences between HIV-positive and HIV-negative cells and learning why their responses may differ. Other Moffitt researchers are focused on improving these patients’ quality of life and helping patients navigate two types of health care at once.

While for many, HIV and AIDS seem like conditions that are buried in the history of the 1980s and 1990s, Coghill and Velez point out that there are still many people who are newly infected each year. Florida has one of the highest HIV transmission rates in the country, trailing only the District of Columbia and Georgia. Knowing a patient’s HIV status can help doctors prepare a treatment plan that will not only bring comfort to the patient, but hopefully one day find a cure.

“There is hope for cancer patients who also have HIV,” Velez said. “It depends on what someone is diagnosed with, but I had one patient who had Kaposi sarcoma years ago that was related to AIDS. He started taking the right medications and is doing great. He’s been in remission for 15 years!”

HIGHER CANCER RISKS FOR PEOPLE WITH HIV

People who are living with HIV have a much higher risk of some types of cancer, known as HIV-associated cancers, according to the National Cancer Institute. Compared with the general population, people infected with HIV are about:

500 X more likely to be diagnosed with **Kaposi sarcoma**

3 X more likely to be diagnosed with **cervical cancer**

19 X more likely to be diagnosed with **anal cancer**

3 X as likely to be diagnosed with **liver cancer**

12 X more likely to be diagnosed with **non-Hodgkin lymphoma**

2 X as likely to be diagnosed with **oral cavity/pharynx cancer**

8 X more likely to be diagnosed with **Hodgkin lymphoma**

2 X as likely to be diagnosed with **lung cancer**



Source: National Cancer Institute

ABOUT MOFFITT CANCER CENTER

Moffitt Cancer Center in Tampa, Florida, has made a lasting commitment to the prevention and cure of cancer, working tirelessly in the areas of patient care, research and education.

MISSION

To contribute to the prevention and cure of cancer

VISION

Create revolutionary breakthroughs and innovations that rapidly impact and save more lives

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Save the date for the 18th annual Miles for Moffitt! Join us Nov. 18, 2023, in downtown Tampa or virtually as we come together to raise funds for lifesaving cancer research.



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MilesforMoffitt.com

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Visit Moffitt.org to find out about our upcoming events.

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