

# MSKNews

2026, Issue 2

MEMORIAL SLOAN KETTERING CANCER CENTER

## Caring for the Caregiver

While Keisha supports her brother, MSK supports her.



Memorial Sloan Kettering  
Cancer Center

### ALSO INSIDE

Tommy's Team at MSK Kids

Help for a Young Scientist With Cancer

When a Patient Is Pregnant

Understanding Cancer's Ecosystem

Dear MSK Community,

The power and promise of artificial intelligence (AI) are on my mind every day as we chart the course for MSK's future.

AI's anticipated transformation of nearly every aspect of our lives — including cancer care — fills me with excitement, yet I am deeply aware of the responsibility we all carry as we explore its potential for good. We're seeing patients increasingly turn to AI chatbots to learn more about their diagnoses, but we know that AI systems, while powerful, aren't perfect. That's why we're moving forward with both enthusiasm and caution, integrating AI thoughtfully to fulfill our mission of ending cancer for life. Here's what it looks like in practice so far:

- **In the clinic**, AI is transforming how we care for you. It's helping us to detect cancer earlier through advanced imaging analysis and to target radiation therapy with greater precision. Automatic notetaking makes it possible for our care teams to spend more time with you and less time on paperwork.
- **In the lab**, as research has become more data intensive, MSK scientists have been using machine learning and other types of AI to analyze vast amounts of information. These tools will be increasingly important for long-term initiatives like the **Marie Josée and Henry Kravis Cancer Ecosystems Project**, focused on the critical role that the environment surrounding cancer cells plays in the development and spread of the disease.
- **Behind the scenes**, AI is streamlining everything from scheduling appointments to routine administrative tasks, making MSK more efficient and better able to expand our impact in the community and beyond.

Above all, this technology frees our people to do the work that matters most — caring for our patients and reaching for the next breakthrough discovery. These are profoundly human pursuits, which you'll read about in this issue of *MSK News*.

You'll meet Tommy, a student athlete whose leukemia diagnosis was met with such extraordinary care that his grateful father wrote a letter thanking some 50 members of the MSK Kids team who saved his son.

You'll learn how we support devoted caregivers like Keisha, whose brother moved in with her when he was diagnosed with a rare blood cancer, so she could do everything in her power to help him.

And you'll be moved by the story of Cassandra, who was 17 weeks pregnant when she came to MSK for care that saved her life, protected her unborn baby, and sustained her throughout an uncertain and emotional journey.

These stories illuminate a fundamental truth: Behind every data set is a person and a family. The latest technology is simply a means to an end — helping our patients live better, longer so they can enjoy more life with their loved ones. At MSK, artificial intelligence doesn't replace the human touch — it deepens it.



With gratitude for your trust in us,

Selwyn M. Vickers, MD, FACS  
President and Chief Executive Officer

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To learn how the MSK Giving community is supporting a better future for cancer care, scan the QR code.

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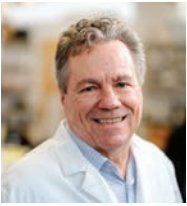


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### Dr. Chatbot Is In

Can you trust AI's advice when it comes to cancer? MSK experts offer guidance.

# TOMMY'S TEAM



As a high school quarterback and lacrosse player, Tommy Ryan already knew plenty about teamwork, grit, and determination.

But nothing could prepare 17-year-old Tommy and his loving family for a harrowing cancer journey that would require the removal of one of Tommy's lungs, a 150-day hospitalization, and a hard-fought struggle to regain the strength to move and walk again.

Tommy's long road began in April 2025 when he was diagnosed with a blood cancer called B-cell acute lymphoblastic leukemia, better known as B-ALL. This is the most common childhood cancer, and it usually has a good prognosis.

Tommy, however, was found to have a particularly aggressive subtype, called Philadelphia +B-ALL. Even worse, he developed a rare fungal lung infection that forced MSK doctors to stop intensive chemotherapy and immediately schedule surgery.

"The infection destroys the lung tissue and can damage blood vessels and airway structures," explains pediatric hematologist-oncologist Maria Luisa Sulis, MD, who led Tommy's care. MSK

thoracic surgeon James Isbell, MD, performed a high-stakes surgery that removed Tommy's infected left lung.

A possibly fatal outcome was averted, but Tommy then faced a grueling recovery that forced him to stay at MSK for more than four months, testing him and his family to their limits.

## Thanking the MSK Kids Team

Tommy's family chronicled every step of his journey with photos and videos — his smallest victories, his setbacks, his flashes of joy and humor, and his indomitable willpower.

They also meticulously documented the compassion that MSK staff showed Tommy.

Soon after Tommy returned home from MSK, his father, Dan Ryan, wrote a heartfelt letter to MSK Hospital President Shelly Anderson, MPM: "Although we were going through the most challenging times of our lives, we have met some of the finest people and would like to bring them to your attention. We want

to let you know what a great job they are doing..."

Throughout the letter, he recounted acts great and small that helped Tommy's recovery, including:

- The nurses who spent more than an hour carefully getting him out of bed to safely transport him outside for a few precious minutes of fresh air and sunshine when he was in a medically fragile state.
- Social worker Nora Fleming, whose chats with Tommy about anything except cancer could make the disease fade into the background for at least a little while.
- The kindness of people like Judy Hernandez from Food and Nutrition Services who brought nutritious meals and good cheer that helped ease the stress for Tommy's worried family.

Dan named some 50 staff members who helped care for Tommy at MSK Kids.

"Everybody gave 110% — they are a special breed of people," Dan says. "Today, Tommy is even beginning to run a little bit, and he's gaining back strength and pushing himself a little more each day."

This is the story of Tommy's recovery — which is still unfolding — in words and pictures.



Above: Tommy Ryan being interviewed for his high school newspaper after his first varsity start as quarterback in September 2024, about six months before he was diagnosed with cancer. Tommy led his team to victory in the game.

Right: Tommy and his girlfriend, Emily Serfass, weren't able to attend junior prom, so Child Life Services turned a corner of his hospital room into a romantic Italian restaurant for the night, complete with faux red-brick walls, vintage photos, and dinner for two. "It meant so much that they were thinking about my mental health and went out of their way for us," says Tommy. "I was crushed thinking we were going to miss prom, but we really enjoyed the night."



Above: Pediatric oncologist Dr. Maria Luisa Sulis was Tommy's primary doctor at MSK Kids.

Left: Tommy at MSK Kids surrounded by his blended family wearing matching T-shirts that say "Bumpy Strong," a nickname of Tommy's. "This family is a model for how adults should come together to support a child with cancer," says Dr. Sulis. Clockwise from bottom left: Tommy's girlfriend, Emily (in mask); Tommy's mother, Kelly Ryan; his stepfather, Wayne Sheriden, and stepsister, Jocelyn Sheriden; Tommy's older brother, Jack Ryan (in white sweatshirt); Tommy's father, Dan Ryan; and his stepmother, Michele Ryan.



Above: Tommy showing off a Zach Bryan concert T-shirt, a surprise gift from his physical therapist Timothy Crann and occupational therapist Mackenzie Smith (at right), since Tommy wasn't able to go to the concert. "I love to tell people about this because it shows just how caring the people at MSK really are," Tommy says. He bonded with his PTs, who helped him regain the strength to sit up in bed, move his arms, take a single step, eventually walk down the hall with help, and finally to walk unassisted. Tommy says he is now considering becoming a PT himself.



Right: Nurses like Chelsea Lubischer helped Tommy get fresh air — even if he could only handle two minutes outside after the hourlong process to move him. "They would talk to me about anything in the world, like I was a neighbor or a friend," Tommy recalls. "Sometimes they asked people walking by if I could pet their dog." His father, Dan, says, "All the nurses were such big advocates for Tommy, no matter how much work it meant for them."

Far right: Tommy grew stronger step by step, with the constant support of his care team.



**TOMMY'S STORY**

Watch this *Good Morning America* segment to hear more of the story from Tommy and his family.



After Tommy was discharged in August 2025, he reunited with some of the MSK staff who cared for him in the Pediatric Intensive Care Unit. From left: Caroline Cohen, Kelly Terken, Emma Calabrese, Sam Sicker, Kimberly Foti, Hailey Siemek, and Mia Majeski.



Tommy at the MSK Kids Pediatric Convocation in June. Remarkably, he was able to graduate from his high school on time and walked the stage with friends. He plans to attend a local community college.



"Tommy never once said, 'Why me?'" says his father, Dan. "He never faltered. He would say about some setback, 'Oh, that sucks. How do we correct this?' He was always willing to do anything — physical therapy, occupational therapy, music therapy. He said, 'I'll do it all.' And I think that made a big difference to his success."

# There Goes the **CANCER** Neighborhood



**MSK scientists are learning  
to attack the cellular ‘ecosystem’  
that lets tumors thrive**

**A neighborhood can change one loss at a time. A cornerstone business closes. A family moves away. Another falls on hard times. Soon the informal networks that hold a community together — the mutual support and watching out for one another — begin to fray.**

**“Our findings point  
toward a new era where  
we don’t just go after  
tumors, but also the  
broken neighborhood  
that supports cancer.”**

—Dr. Scott Lowe, Scientific Director  
of MSK’s Cancer Ecosystems Project

**But things don’t unravel all at once.** They tip, gradually, as each small change reshapes conditions for everyone. And if those dynamics aren’t reversed, they can create a feedback loop of accelerating decline.

Now scientists are coming to understand the ways in which something similar happens in the “neighborhood” surrounding cancer cells, which reshape their immediate environment to foster tumor development.

For decades, the field focused on the genetic changes inside individual cancer cells that cause them to go rogue. This enormously valuable work gave rise to tools like **MSK-IMPACT®**, which can identify the specific mutations driving a patient’s cancer and match them to drugs designed to target those mutations.

But a deeper puzzle remains: Genetic mutations alone are generally not enough to cause cancer. By the time we reach our senior years, we each carry an estimated

100 billion cells with cancer-causing mutations — yet many people never develop cancer. That’s because the environment around a mutation-carrying cell also plays a critical role in what happens next.

Cancer cells, researchers are finding, are active architects of their environment — sending out signals, corrupting neighboring cells, weakening the immune response, feeding off and causing inflammation, and remaking the neighborhood in their own image.

Understanding this process — and learning to interrupt it — is the goal of an emerging field of research that sees cancer not just as a disease of individual cells gone bad, but also of the compromised neighborhoods around them. MSK is helping to lead this evolution in thinking, fueled by a transformative philanthropic gift that created **the Marie-Josée and Henry R. Kravis Cancer Ecosystems Project**.



Collaborative research from the labs of Drs. Scott Lowe and Dana Pe’er is revealing new details about how cancer spreads its influence to nearby cells.



Research from Dr. Tuomas Tammela's lab shows how a small population of “highly plastic” cells can drive cancer’s ability to grow and to resist treatment.

“Cancer cells don’t exist in isolation,” says **cancer biologist Scott Lowe, PhD**, the project’s scientific director and Chair of MSK’s **Cancer Biology and Genetics Program**. “From the very beginning, they’re engaging in complex interactions with their neighbors and with the immune system.

“What we’re learning,” he adds, “points to widespread features of cancer neighborhoods that transcend individual cancer types — features that are already paving the way for new prevention and treatment strategies.”

**Cancer: A Wound That Doesn’t Heal**

The understanding of tumors as “wounds that do not heal” has guided medicine for decades. Now MSK researchers are showing in remarkable detail just how cancer hijacks the programs that repair injuries — and how it spreads its influence to its neighbors.

Consider what happens when you slice your finger. Within moments, the surrounding tissue springs into action: It sends signals that there’s an injury, immune cells rush in to ward off infection, new skin

cells are generated to close the cut. And then, critically, when the job is done, the alarm is switched off.

Cancer borrows this same emergency response, but the repair never completes. The alarm never stops, and the tissue remains in a state of crisis.

**When Flexible Cells Have Faulty Brakes**

A recent collaboration between Dr. Lowe and **computational biologist Dana Pe’er, PhD**, revealed how this hijacking works and how it’s driven by a surprisingly small number of “highly plastic” cells.

These are cells that respond to injury by temporarily becoming unusually flexible, so they can produce whatever new cells are required to make the repair. But when cancer-causing mutations are present and when the genes that normally prevent tumors from growing are also compromised, that temporary emergency can extend indefinitely.

Among the genes that suppress tumors, *p53* is the most famous and well-studied, earning it the nickname “guardian of the genome.” The genomes

of cells that lose *p53* become unstable and develop further changes that can fuel cancer progression.

The MSK study revealed that the tug-of-war between *p53* and cancer-driving programs takes place in these highly flexible, plastic cells: When *p53* is turned on, it acts as an emergency brake on cancer progression — and when it’s lost, the cancer can prevail.

“What we’re finding is that *p53* is even more than the guardian of the genome — it’s the guardian of plasticity,” says Dr. Pe’er, Chair of MSK’s **Computational and Systems Biology Program** and a **Howard Hughes Medical Institute (HHMI) Investigator**. “Cells need to become flexible for healing and repair to happen, but *p53* is there to pump the brakes if they try to go rogue. Without *p53*, this flexibility can be hijacked by cancer.”

The advanced computational and artificial intelligence–driven approaches developed in recent years by Dr. Pe’er’s lab, in conjunction with MSK’s **Single-Cell Analytics Innovation Lab (SAIL)**, have allowed MSK researchers to push the boundaries of what spatial imaging technologies and cell-by-cell analyses can teach us — enabling the study of cancer neighborhoods in unprecedented granularity.

“Most artificial intelligence is task-oriented, optimized to solve one particular type of problem,” Dr. Pe’er says. “We treat it more like a microscope, a true discovery tool.”



MSK developmental biologist Dr. Joo-Hyeon Lee recently led research investigating how mutated cells transform their local environment so a tumor can develop.



**Scan here** to learn how MSK scientists are using insights from cancer ecosystems to develop new therapies.

**A Few Bad Apples**

It doesn’t take many of these abnormal, highly plastic cells without *p53* to cause havoc, according to a related study from the lab of **Tuomas Tammela, MD, PhD**. Working in mouse models of lung cancer, his team found that this population makes up only about 3% of cells in early lesions — yet it drives cancer’s ability to grow, resist treatment, and advance. As disease progresses, their numbers rise to about 15% in established tumors and up to 30% in cancers that have spread.

“But if we kill off these plastic cells very early, we can prevent mutated cells from ever becoming cancers, our research shows,” Dr. Tammela says, noting that the work could inform prevention strategies in high-risk populations, such as smokers.

Dr. Lowe’s lab made a similar finding in a mouse model of pancreatic cancer. Almost all pancreatic cancers are driven by *KRAS* mutations. A short course of treatment with a *KRAS*-blocking drug was enough to disrupt the early-stage cancer neighborhood.

“A three-day treatment in mice paused cancer development for months, which would be the equivalent of years on a human timescale,” says Dr. Lowe, who is also an HHMI Investigator.

**How Cancer Corrupts Its Neighborhood**

When cells get stuck in emergency repair mode, the damage doesn’t stay contained — it spreads to nearby tissue and immune cells. A study from the lab of **developmental biologist Joo-Hyeon Lee, PhD**, tracked individual lung cells from the moment they acquired cancer-causing mutations, mapping in mouse models and lab-grown miniature organs how neighborhood corruption begins even before a tumor forms.

The research showed the mutated cells broadcast distress signals to surrounding tissue, triggering the formation of scar tissue and recruiting immune cells that suppress the body’s defenses rather than attacking the cancer — essentially

adapting the surrounding area to support a tumor. When the team blocked those initial distress signals using a lung cancer drug, these changes were prevented. And where tumors had already started to form, many reversed course.

“Communication with nearby healthy cells to build a ‘pre-cancer niche’ is essential for tumors to grow,” Dr. Lee says. “Encouragingly, at these early stages, it’s possible to switch those altered surrounding cells back to normal.”

**Cleaning Up the Neighborhood**

Together, these studies and others from across MSK are not only shedding new light on how cancer ecosystems develop, function, and reinforce themselves — they also point directly toward new treatment strategies.

For example, another recent study from the **Lowe Lab** showed that a type of personalized immunotherapy called CAR T cell therapy could be used to target cancer neighborhoods.

The team, in collaboration with researchers at Columbia University, identified a protein called uPAR that is found on the surface of tumor cells, and on the surrounding tissue and immune-suppressing cells that help cancer thrive. Critically, however, uPAR is not found on most healthy cells. And when researchers targeted uPAR in mouse models in the lab, it dramatically shrank lung, pancreatic, and ovarian cancers — and even cleared metastases in some experiments.

Based on these encouraging results, MSK researchers are now working to advance uPAR-targeting therapeutics into clinical trials.

“Our findings point toward a new era where we don’t just go after tumors, but also the broken neighborhood that supports cancer,” Dr. Lowe says. “The MSK Ecosystems Project is bringing together researchers across labs and disciplines to investigate these key ideas from a variety of angles.

“And the patterns we’re uncovering appear true across different types of cancer,” he adds. “That gives us real hope that therapies targeting these neighborhoods could work for many patients — whether the goal is cancer prevention, early interception, or treating advanced disease.” •

**Dr. Lowe’s research is supported by the MSK donor community, including Break Through Cancer, The Mark Foundation for Cancer Research, and The Lustgarten Foundation for Pancreatic Cancer Research.**

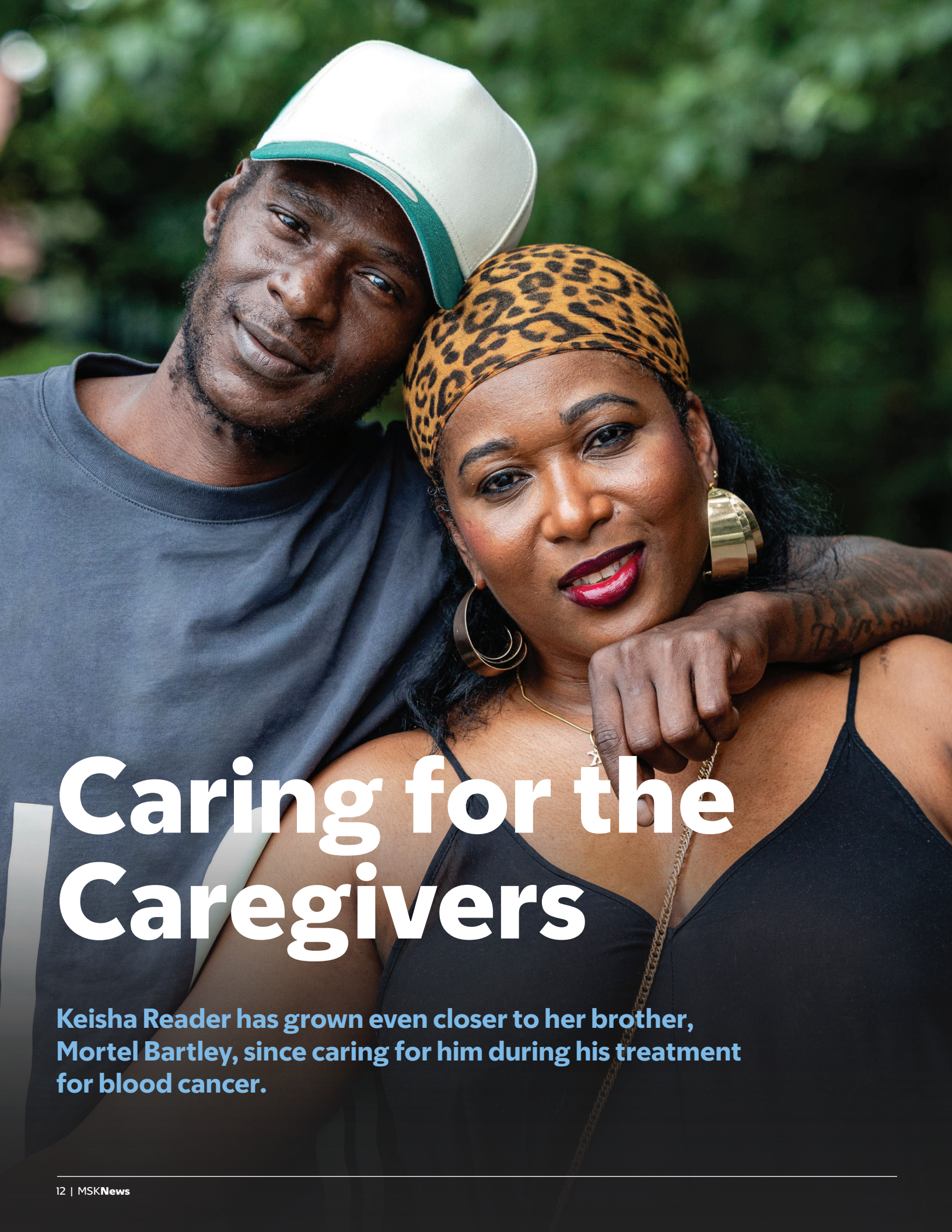
**Dr. Pe’er’s research is supported by the MSK donor community, including Alan, Sandra, and Adam Gerry through their Gerry Foundation.**

**Dr. Tammela’s research is supported by the MSK donor community, including The Mark Foundation for Cancer Research.**

**The Marie-Josée and Henry R. Kravis Cancer Ecosystems Project is supported by the MSK donor community, including The Marie-Josée and Henry R. Kravis Foundation.**

**Dr. Pe’er holds the Alan and Sandra Gerry Endowed Chair and is a Howard Hughes Medical Institute Investigator.**

**Dr. Lowe holds a Geoffrey Beene Cancer Research Center Chair and is a Howard Hughes Medical Institute Investigator.**



# Caring for the Caregivers

Keisha Reader has grown even closer to her brother, Mortel Bartley, since caring for him during his treatment for blood cancer.

As children, Keisha Reader and her younger brother, Mortel Bartley, spent hours together picking mangos and apples, then cooling off with a swim in the irrigation canals of their farming community in Jamaica. Close in age, they've been close in life. When they ended up living in different cities in the United States, frequent phone calls kept them connected.

So when Mortel was diagnosed with a rare blood cancer at age 38, there was no question Keisha would do everything in her power to help him.

That included making space for him in her two-bedroom apartment in Brooklyn. Mortel had been living in Pittsburgh, but he needed treatment at Memorial Sloan Kettering Cancer Center (MSK) in New York City. Keisha's 9-year-old daughter, Serenity, would need to give up her bedroom for her uncle.

"It was definitely a big change for me. Everything about my life changed," says Keisha, a single mother who works as a specialist in **Patient Financial Services at MSK**. "But he's my brother, so of course I was going to be there for him."

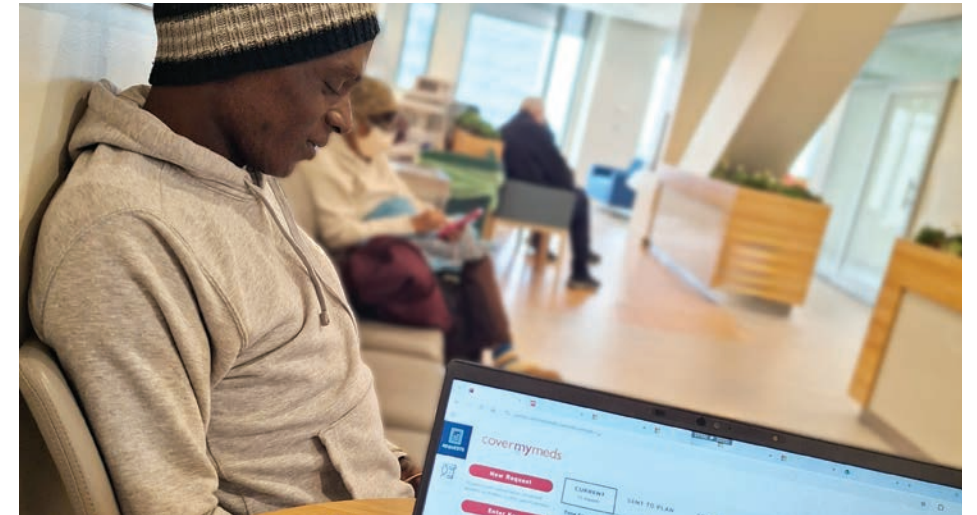
"Most of us never imagine we'll become a caregiver," says **clinical social worker Sheila Langan**, who helps guide MSK's online caregiver support group. "Even when you are committed to doing whatever it takes, the weight of this can be overwhelming. And you still must show up for the rest of your life."

**Clinical social worker Emily Rogers**, who co-leads the group, puts it simply: "And while you're coping with so much uncertainty or you're feeling angry about the unfairness of it all, you're also trying to figure out how to help the person you're caring for."

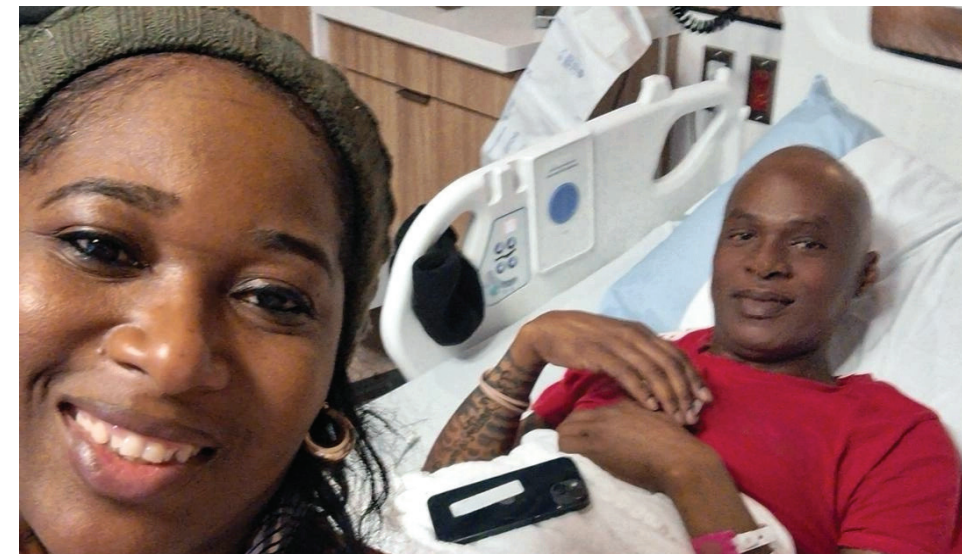
## A Rare Diagnosis Requires Urgent Action

Mortel was diagnosed in January 2025 with adult T cell leukemia/lymphoma (ATLL), an uncommon and aggressive blood cancer. His doctors in Pittsburgh urged him to seek a second opinion at a hospital with more experience treating this rare disease. MSK's lymphoma specialists have expertise in treating patients with ATLL. And for Mortel, there was added comfort in knowing that Keisha already worked here.

After running tests, Mortel's new doctor, **lymphoma specialist Robert**



Keisha is fortunate to be able to work on her computer while waiting with Mortel at his appointments.



While Mortel was hospitalized, Keisha made frequent trips to visit him, including bringing him home-cooked meals.

**Stuver, MD**, broke the news that his disease was life-threatening, and he needed to start chemotherapy right away.

"That's when it became real," Keisha remembers. "It was clear he wasn't going back to Pittsburgh. He was going to be staying with me in Brooklyn for a long time."

Life changed quickly. Serenity not only gave up her room, but Keisha had to

take time off from work. As Mortel's treatments progressed, Keisha found herself feeling overwhelmed. "It was very draining," she says. "But you just roll up your sleeves and say, 'We gotta get to work.'"

## The Heavy Lift of Caregiving

Keisha's experience is one that many caregivers can relate to. No matter your

relationship to the patient, the responsibilities of caring for someone with cancer can pile up quickly: Driving them to and from appointments. Managing medications. Tending to wounds or chemotherapy ports. Preparing meals. Helping with personal hygiene.

And on top of all of that, you are likely spending hours on the phone coordinating between doctors' offices, insurance companies, and pharmacies. You may feel like you've become something of an unpaid case manager who never gets a break.

Keisha was fortunate that MSK allowed her to take extended leave to dedicate herself to caring for Mortel. It's common for caregivers to reduce their work hours or leave their jobs entirely. This can create a financial burden on top of everything else, as it did for Keisha's family. Mortel had been employed in a fiberglass factory, and he hasn't been able to work since beginning treatment.

The Emotional Toll on Caregivers

The challenges caregivers face are not just about managing tasks and logistics. Caregiving also has a deep impact on your emotional well-being.

While you're dealing with the complexities of cancer treatment, you're also managing your own shock and grief about your loved one's diagnosis. In addition to fear and sadness, it's common for caregivers to feel helpless and even resentful, which can in turn lead to guilt.

"Many caregivers feel they are not entitled to complain," Langan says. "They look at what the person they're caring for is going through, and then they minimize their own feelings. A lot of what we do in our support groups is to honor and normalize how challenging caregiving can be."

"When Mortel gets discouraged, I need to be a cheerleader for him," Keisha says. "But it's hard, because I'm tired. And then I have to think about my daughter too. She used to be the center of my world, and now I don't have as much time to spend with her."

Keisha has often had to rely on friends to pick up Serenity at school and care for her. "There were so many days when I just wanted to get home in time to see her for a few minutes before she went to bed," she says.

Tips for Caregivers

1

Have your own support team.

"You may have a tendency to think you can do it all on your own," Keisha says, "but you don't have to do it alone. Let other people know when you need help."

2

Take care of your own mental health.

"Put on your own oxygen mask before helping others," Rogers says. "You can't be an effective caregiver if you're not taking time out for yourself, even if that just means getting caught up on sleep."

3

Understand your workplace's leave policy.

The Family and Medical Leave Act (FMLA) provides some employees with up to 12 weeks of unpaid, job-protected leave per year. But there are eligibility restrictions you should discuss with your employer.

4

Share your own emotional and financial challenges with the medical team.

Mortel's doctors and nurses were able to guide Keisha to programs that defray costs, including free transportation to and from MSK.

The Stress of Cancer Treatments

After several rounds of chemotherapy, Mortel had a stem cell transplant in the summer of 2025 using cells from an unrelated donor. Because this type of transplant is especially challenging, his transplant doctor, **Mohammad Alhomoud, MBBS**, said he would need a caregiver in place for at least three months. Of course, Keisha said she would be there for Mortel.

Keisha's devotion has paid off. The transplant was successful, and a year later Mortel is in complete remission from the ATLL. But he's had to take steroids to treat side effects, and they make him feel stressed out and angry. "I feel bad, because sometimes I take that out on Keisha," he says.

Mortel is still living with Keisha, but life is getting easier. Keisha went back to work in April 2026. Mortel can now help with school pick-ups for his niece, whom he rarely saw before the cancer. His connection with Serenity has deepened, and he loves spoiling her with little treats. She misses her room but loves having her uncle around.

Mortel's relationship with his big sister has deepened too. "I've had to deal with so much, and there have been times when I didn't know how I would go on," Mortel says. "But the best part of this whole experience has been having Keisha to get me through it all." •

The Other End of the Microscope: Supporting a Young Scientist With Cancer



MSK researcher Ana Codo in the lab at SKI

**"It's cancer."**

The text from her sister came when Ana Codo was presenting in journal club. A student training in the lab of Sloan Kettering Institute immunologist **Justin Perry, PhD**, Ana was in the midst of discussing new research in her field with fellow students while trying to ignore a nagging worry in the back of her mind.

Beatriz, her identical twin sister, was studying at Oxford University and had found a lump in her left breast. Ana had been awaiting the test results from Beatriz with a mixture of optimism and dread: The sisters were only 31, but their family in Brazil had a strong history of cancer.

When Ana looked at her phone, the message threw everything into turmoil. All at once, academic matters gave way to urgent, troubling questions: "What does this diagnosis mean for Beatriz — and for me?"

“Even though I knew I shouldn’t Google medical questions,” Ana says, “I searched *What are the odds of twin sisters having the same cancer at the same time?*”

By chance, Ana had a doctor’s appointment scheduled that very day. When Ana mentioned Beatriz’s news, he suggested she get screened. The mammogram showed she had a suspicious lesion in her left breast. Pathology results soon confirmed that Ana also had cancer.

“It was shocking at our age to have cancer in the same breast at the same time,” Ana says. “The only difference was hers was stage 2, while mine was stage 1.”

Suddenly, nothing seemed certain. Ana was in the third year of her six-year PhD program. Just three months earlier, she had been selected as a prestigious **2025 Gilliam Fellow by the Howard Hughes Medical Institute** for her research in immunology and microbial pathogenesis (the process by which microbes cause disease).

But just as the weight of her diagnosis threatened to derail both her health and her promising scientific career, Ana discovered she was not alone.

**A Community That Showed Up**

Although far from her native Brazil, Ana was buoyed up by the MSK scientific community surrounding her. Mentors, fellow students, doctors, and the dean of the **Gerstner Sloan Kettering Graduate School of Biomedical Sciences (GSK)** came together to support Ana and shepherd her through a difficult time.

It started with Dr. Perry, her lab head and mentor.

“Our top priority was ‘What can we do to help you take care of yourself?’ ” he says. “Sure, the science is important— but nowhere near as important as our health.”

He sprang into action, contacting **Michael Overholtzer, PhD, the Dean of GSK**, to make sure Ana could receive care at MSK. He also arranged for Ana to be seen by **breast cancer surgeon George Plitas, MD**.

“This is the true MSK community — we take care of our people,” Dr. Perry says.

**Surgery and Support**

After conferring with Dr. Plitas, Ana was relieved to learn that she could have surgery with no additional treatments. Due to her family history, she opted for a



Like most identical twins, Ana and Beatriz were close growing up.



As adults, both sisters chose career paths in science.



When Ana was diagnosed with breast cancer, SKI immunologist and lab mentor Dr. Justin Perry sprang into action to ensure that she could be treated at MSK. “This is the true MSK community — we take care of our people,” he says.



SKI immunologist Dr. Gretchen Diehl helped ease Ana’s load by cooking and freezing meals for her to eat later and inviting her to have dinner with her family.

double mastectomy to lower her risk. This would require repeated procedures — surgery to remove the cancer and insert tissue expanders, multiple office visits to expand the tissue to create space for implants, and a final surgery to insert the implants. Ana had the first surgery on February 10.

“All the doctors and nurses I talked to were very kind,” Ana says. “Being a scientist, I probably made things harder for them because I would ask questions they’re not used to. But they would get super excited when they found out I was doing research at MSK. It made me think about how our research has an impact on their work.”

As Ana recovered over the next few months, people across the GSK program rallied to support her. Her fellow-student friends, especially **Jesús E. Romero-Pichardo, Achuth Nair**, and **Nicole Walker**, helped by organizing meals and cooking her homemade dishes. **Gretchen Diehl, PhD**, head of a lab in SKI’s **Immunology Program**, cooked and froze meals for Ana to eat later or invited her to have dinner with her family.

Given the intensive treatment, Dr. Perry and other GSK faculty and administrators told Ana she could take all the time she needed to recover and that it was OK to push back her research and the timetable for completing her program.

But Ana wouldn’t hear of it. She was deep into an exciting project that she did not want to abandon, even temporarily. She and fellow researchers

were investigating the effect of microplastics on the human immune system and were close to publishing provocative findings.

“This speaks volumes about Ana’s character — she was almost offended by the idea that she would need extra time,” Dr. Perry says. “Her drive and motivation make her a great scientist.”

**Studying the Impact of Microplastics**

Even as she prepared for her surgery, Ana kept her focus on the research that had driven her to MSK in the first place.

The **Perry Lab** studies large, specialized immune cells called macrophages (the name means “big eaters”), which engulf and destroy everything that looks like it doesn’t belong — mostly dying cells. This enables organs to function normally.

Ana’s research focused on how microplastics affect macrophages. As evidence emerges that microplastics are piling up in human tissue, understanding exactly how they affect immune function has major implications. By late 2025, Ana and her SKI collaborators had made intriguing insights into the interaction between microplastics and macrophages.

“The macrophages eat microplastics, but they don’t have the machinery to break them down,” Ana says. “We found that after engulfing microplastics, macrophages are made dysfunctional as they try to digest them rather than moving on to eat more dead cells. It’s like after a big meal you don’t want to eat more because you’re full.”

The failure to remove dead cells throws everything out of balance. There are already suggestions that the accumulation of dead cells can cause fertility issues and liver damage.

“Ana was able to prove a direct mechanism that had never been shown in this early-stage world of microplastics research,” Dr. Perry says. “From the perspective of cancer, we want to understand how this relates to chronic inflammatory diseases or diseases of aging, which give rise to cancer.”

The Perry Lab published the research in the prestigious journal *Immunity* in February 2026 with Ana as the first author — unusual for someone only in their third year of PhD training. In a moment of perfect symmetry, the paper was published on the same day her surgical drains were removed.

“That was a very nice day all around,” she says. “I’m thinking, ‘I’m free! I can finally shower normally!’ ”

**Ongoing Support**

“Everyone has been very accommodating to help lighten the load,” Ana says. “Dr. Perry said I don’t have to present in our lab meetings this semester. Dr. Diehl told me not to worry about missing classes or seminars.”

“It goes to show that MSK might be 20,000 people, but it’s still small in a way that we take care of each other,” Dr. Perry says.

Ana says the biggest lesson from her experience was learning to ask for help.

“It’s OK not to have everything figured out, to be a mess every once in a while,” she says. “Everyone here stepped up and made it possible for me to get through this. I realized I’m not alone.” ●



**Learn more** about inherited risks for breast cancer.

# A DELICATE BALANCE

## Tailoring Cancer Care for Pregnant Mothers

**It's the cruelest irony, nurturing a new life only to learn your own is at risk. When expectant mothers are diagnosed with cancer during their pregnancy, they face a harrowing question: How do I save my baby and myself?**

**That's the dilemma** **Kassandra DeMaio** confronted when she was pregnant with her second child. In August 2024, an ambiguous result from a prenatal blood screening test led to a full-body MRI, which turned up suspicious lymph nodes and bone lesions in her spine, ribs, and pelvis. This was a red flag for cancer.

Doctors at her local Connecticut hospital said the only way to confirm the diagnosis was a highly invasive, painful bone biopsy under general anesthesia guided by fluoroscopy — an imaging technique that could expose the fetus to radiation.

"I was so worried about the baby's safety and was terrified of general anesthesia, especially while pregnant," Kassandra says. "At the time, you feel like everything is out of your control. It's incredibly scary to have cancer, and that fear is heightened even further when you're pregnant."

She made the pivotal decision to get a second opinion at Memorial Sloan Kettering Cancer Center (MSK). Specialists at MSK know how to modify tests and treatment protocols to navigate the special needs of people who have cancer during pregnancy. Beyond the medical expertise, MSK offers emotional support for expectant mothers facing a heartbreaking circumstance.

"We are seeing this situation more often because of the rise in certain cancers among younger people," says MSK psychologist **Amanda Balakirsky, PsyD**, who counseled Kassandra during her treatment. "Being pregnant with cancer can cause a lot of grief and feelings of isolation. We try to normalize the experience as best we can, to help them adjust from what they were expecting in their pregnancy and feeling different from their peers."

### Reassurance From the Start

When Kassandra met with **lymphoma oncologist Paola Ghione, MD**, she was relieved to learn that MSK could make a diagnosis with a much less invasive procedure — taking a biopsy from a lymph node under local anesthesia. It would not put her child at risk.

When the results came, the diagnosis was dire: stage 4 Hodgkin lymphoma. Kassandra, by then 17 weeks pregnant, suddenly faced treatment decisions that affected two lives.

But Kassandra believed she was in the right place.

"Dr. Ghione was confident, well-informed, and very direct, which I appreciated," Kassandra says. "She also was a mom herself, so I felt I could trust her to understand how I was feeling."

"I absolutely love taking care of pregnant patients," Dr. Ghione says. "Although it's such a difficult time for them, I feel close to what they are going through. I had my last baby a few years ago, and being a toddler's mom helps me understand the challenges they face at the moment and in the future."

### Finding Safe Treatment Options

Because the cancer was advanced, Kassandra had to start treatment right away. Dr. Ghione and other MSK specialists agreed on a chemotherapy regimen that had been proven safe for pregnant patients.

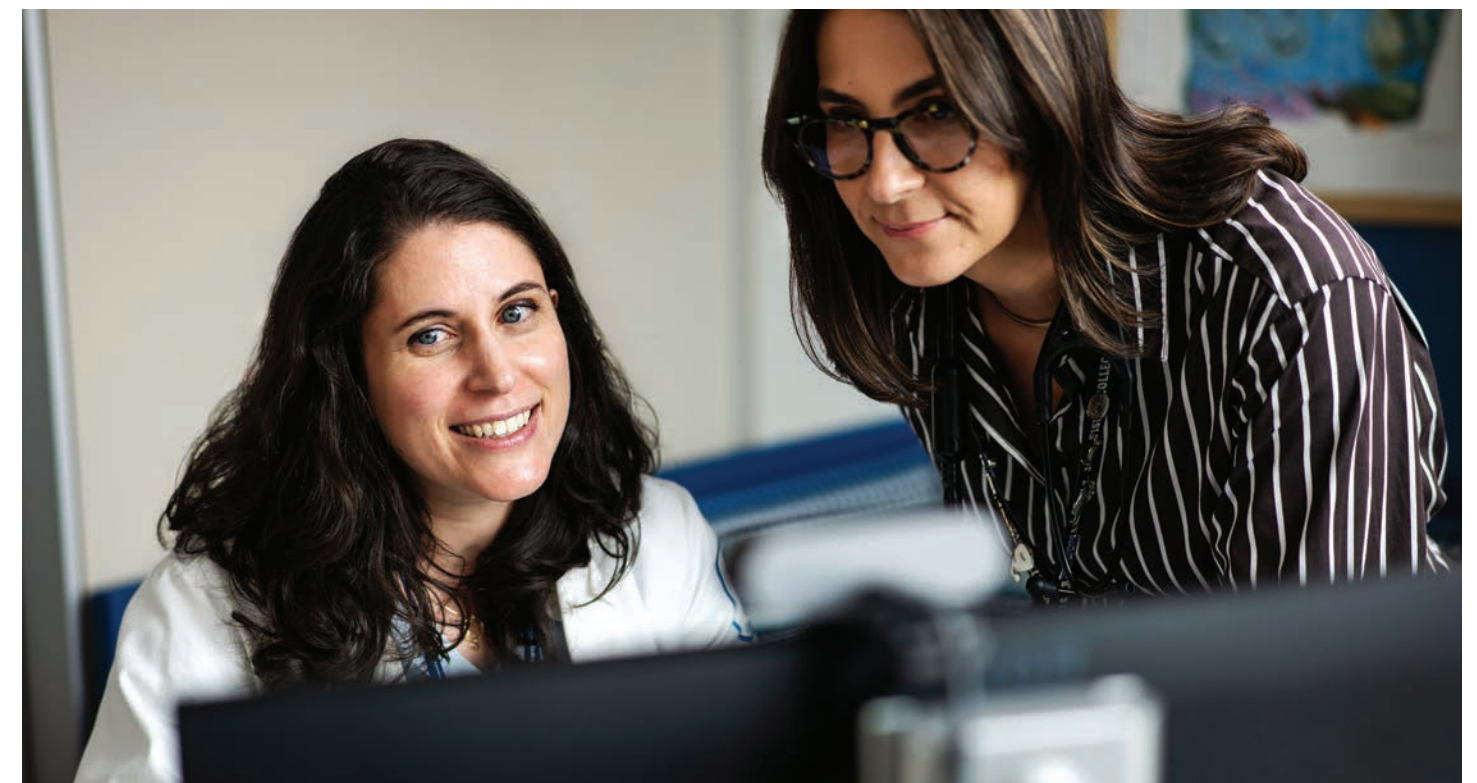
"Thanks to research published on lymphomas treated successfully during pregnancy, we knew some of the older chemotherapies could be given safely



Kassandra paused chemotherapy to have her baby before resuming treatment.

during the second and third trimesters," Dr. Ghione says. "In most cases they work well until we deliver the baby, and after birth we may choose to modify the treatment and add newer drugs."

Dr. Ghione and MSK medical staff — including nurses, office coordinators, and a pharmacy team — tailored the treatment and schedule to what was



"I absolutely love taking care of pregnant patients," says Kassandra's lymphoma oncologist Dr. Paola Ghione, left, with nurse practitioner Laura Kiersz. "Although it's such a difficult time for them, I feel close to what they are going through."

Kassandra DeMaio holds her son, Theo, who was born healthy after she began treatment for stage 4 Hodgkin lymphoma during pregnancy. Photography courtesy of Tiffani Photography.

best for Cassandra. They worked with Cassandra’s personal obstetrics doctor to coordinate care.

Normally, people with her diagnosis receive six total cycles of chemotherapy. Cassandra would instead receive four cycles and then pause treatment. After a few weeks, when the chemotherapy was cleared from the body, Cassandra would be induced to have the baby slightly early at 37 weeks. She would resume the final two chemotherapy cycles soon after.

Worried About Delivery

When Cassandra was nearing the day of delivery, doctors at her local hospital advised against giving her an epidural for pain because the needle might bump into one of her bone lesions and cause a possibly fatal spinal bleed. Cassandra was fearing a potentially long, painful induced labor.

“I called Dr. Ghione crying and panicking about this,” Cassandra says. “She reviewed my scans and sought the approval of MSK interventional radiologists. They agreed the bone lesions should not be an obstacle for an epidural. I was relieved to have Dr. Ghione’s guidance.”

In February 2025, she gave birth to a healthy boy, Theo.

Resuming Cancer Treatment

A week and a half after giving birth, Cassandra returned to MSK for a PET scan. Because it involves using a small amount of radiation, Cassandra could not touch Theo for 24 hours after the scan.

“It was very emotional for me, not being able to touch the baby and also being anxious waiting for the results,” she says.

Although the scan showed the cancer was already going into remission, Dr. Ghione recommended that she finish the chemotherapy to wipe it out completely. A few days later, Cassandra resumed the final two cycles of chemotherapy, which was especially grueling.

“The treatment after pregnancy was the hardest part, which surprised me a bit,” Cassandra says. “I was just depleted from everything and felt sick, all while trying to care for the baby and my other son, who was only 2 years old. My husband, Nick, was truly my rock during this time — supporting me mentally, emotionally, and physically.”



Cassandra supported MSK by riding at Cycle for Survival’s event in her town of Darien, Connecticut, in February 2026. Cycle for Survival provides essential funding for AYA cancer research at MSK.

She completed treatment in April 2025. A PET scan in May showed no evidence of disease. Cassandra was in full remission and has stayed that way for more than a year.

A Growing Trend

Experts predict that a cancer diagnosis during pregnancy is likely to become even more common. In addition to the increased cancer incidence in young people, more pregnant women — such as Cassandra — are receiving noninvasive prenatal tests (NIPTs) that screen for genetic abnormalities in the fetus. In some cases, NIPT results are normal for the baby but detect cancer in the mother.

MSK is leading the way to meet the needs of this growing patient population. In recent years, MSK has established the **Lisa and Scott Stuart Center for Adolescent and Young Adult (AYA) Cancers**, the **Center for Young Onset Colorectal and Gastrointestinal Cancer**, and the **Young Women with Breast Cancer Program**. All of these unite

experts across many specialties to address the challenges of younger patients, including treatment during pregnancy.

Grateful and Giving Back

Now 36, Cassandra enjoys going on family walks in her neighborhood and at a nature preserve, as well as visiting the beach nearby. She does interior design for Nick’s architecture firm and helps him run the business.

She is especially grateful to MSK not only for diagnosing and treating the cancer, but also for being a partner during her pregnancy.

“MSK was the only place that gave me a clear and confident path to a diagnosis, which was needed in order to begin treatment,” she says. “If you’re lucky enough to live in the vicinity of a place like MSK, the extra time it might take is well worth ensuring that you are getting the best care. I’m proud that I trusted my instincts to advocate for both my health and my baby’s safety.” •

Dr. Ghione’s research is supported by the MSK donor community, including the **Lymphoma Research Foundation**.

All About Herbs



Bringing traditional Chinese medicine to cancer care

Dr. Jun Mao, Chief of the Integrative Medicine and Wellness Service, and pharmacist Dr. Jason Hou, at left, consult in MSK’s herbal dispensary, where patients can receive traditional Chinese medicine prescriptions for cancer-related symptoms like fatigue, anxiety, pain, and nausea.

Erin Bogren is grateful to be cancer free after nearly a year of treatment for breast cancer. She says, however, it’s been hard to cope with the long-term effects of those treatments, including ongoing hormone therapy, which pushed her body into premature menopause at 46. It caused hot flashes so severe they disrupted her sleep and interfered with her daily activities, including work.

“I think a lot of cancer care is missed when the treatment is over,” she says. “It’s an entirely different journey of learning how to adjust to the new body that you have and the effects of ongoing medicine to prevent recurrence.”

Erin works for a biotech company and knows firsthand the lifesaving value

of drugs, but she also has a long-standing interest in acupuncture and other complementary therapies.

She approached her medical oncologist, **Mark Robson, MD, Chief of the Breast Medicine Service** at Memorial Sloan Kettering Cancer Center (MSK), about adding herbal remedies to her

other medications, and he referred her to the **Integrative Medicine and Wellness Service** at MSK.

“There’s a lot of interest in looking for complementary approaches — very clearly not alternative approaches, but rather those that work alongside mainstream treatments,” says Dr. Robson. “At MSK, we’re lucky to have a group of experts who straddle both worlds, with expertise in Western and herbal medicines.”

In 2019, MSK became the first — and remains the only — cancer center in the United States to establish an in-house herbal dispensary, where patients can get

In a 2023 survey, 71% of patients who'd received herbal prescriptions through the MSK dispensary said their symptoms had improved — 7% reported minor side effects.



During a recent trip to Sweden, Erin fulfilled a lifelong dream of seeing the elusive Northern Lights. She says the herbal prescriptions she received through MSK have helped relieve her severe hot flashes.

prescriptions based on traditional Chinese medicine for symptoms including fatigue, nausea, constipation, pain, and anxiety.

“Patients are already looking at these products online,” says **Jun Mao, MD, MSCE, Chief of the Integrative Medicine and Wellness Service**, who established MSK’s **Herbal Oncology Program** that oversees the dispensary. “Rather than ignoring that reality, we want to provide a safe, evidence-based way to guide them.”

**Herbs Are Surging in Popularity but Carry Risks**

Nearly two-thirds of Americans say they take herbs and supplements, according to a recent study from MSK — a trend fueled in large part by an endless stream of health information online, both reliable and unreliable.

Cancer patients may be particularly susceptible to online messaging about herbal supplements, especially as they seek ways to relieve the side effects of treatments.

“For healthy adults, most herbal supplements may pose little risk,” Dr. Mao says, “but for cancer patients, it’s a different story.” Herbs and supplements can interact with cancer drugs, making them less effective or more toxic, and can cause potentially serious side effects such as liver or kidney injury.

Dr. Mao makes it clear that there’s no natural remedy that can cure cancer. “Instead, we aim to incorporate herbs and natural approaches to help people manage the symptoms of cancer and its treatments,” he says. “For a lot of patients, just the fact that we at MSK are open to having that conversation brings a sense of control and relief.”

**Why MSK Created Its Own Herbal Dispensary**

Building the first cancer-focused herbal dispensary in the U.S. meant more than simply stocking the shelves — it took years of painstaking work to translate, analyze, and standardize ancient formulations, and it required extensive collaboration across teams at MSK. **Gastrointestinal medical oncologist Leonard Saltz, MD**, was an early champion.

Dr. Mao’s team identified 14 common symptoms caused by cancer treatment and connected them to the appropriate traditional Chinese medicine formulas. In some cases, that meant translating Western symptom descriptions into an Eastern framework. In the U.S., for instance, fatigue tends to be lumped into one problem — in traditional Chinese medicine, there are many kinds of fatigue that originate in various systems of the body, with specific herbal formulations for each.

Because much of the research on traditional Chinese medicine in cancer care has not yet been translated into English, bilingual researchers at MSK help to summarize extensive data sets and report clinical trial results.

“These are classic formulas, and there are records going back thousands of years,” says **Jason Hou, PharmD, LAc**, who helped build the dispensary and manages MSK’s extensive About Herbs database with editor **Jyothirmai Gubili, MS**. The database integrates traditional knowledge with the latest scientific data for hundreds of herbs and supplements. “Because I have training in both pharmacy and traditional Chinese medicine,” Dr. Hou says, “one of my roles is to look for potential interactions with cancer drugs.”

Ensuring the safety of these products also means sourcing the highest-quality herbs. Dr. Hou traveled to Taiwan to visit manufacturing facilities, where herbs from regional farms are tested for heavy metals, pesticides, and other contaminants before being formulated into pills, capsules, and powders.



Goji berries drying at KPC Herbs in Tainan, Taiwan, where many of the herbal prescriptions dispensed at MSK are manufactured. KPC Herbs supplies traditional Chinese medicines to hospitals across Asia.

“We wanted to understand how these products are made,” Dr. Hou says. “We wanted to observe the whole process, from the raw herbs all the way to the finished product.”

MSK patients interested in learning more about herbal prescriptions can ask their care team for a referral to an Integrative Medicine specialist, who can offer a comprehensive consultation that may include diet, exercise, acupuncture, and other complementary therapies.

**Advancing the Science of Complementary Cancer Care**

To establish a factual foundation for using herbal formulations, Dr. Mao has launched clinical trials for treating common treatment side effects. One trial underway is studying an herbal formula for chronic constipation and exploring the impact on the gut microbiome. Another is looking at using topical herbal treatments to treat pain, to reduce the need for high doses of opioids.

To truly advance this growing field, Dr. Mao and colleagues hope to take their research beyond MSK by launching larger clinical trials that include diverse populations and more cancer types. He and Dr. Hou are actively involved in helping other cancer centers in the U.S., Singapore, and elsewhere to establish

their own herbal dispensaries, using MSK’s program as a model.

Some international research offers encouraging signs, says Dr. Hou.

A review of observational studies of breast cancer patients in Taiwan found that receiving traditional Chinese medicine in addition to standard treatment was associated with better outcomes than standard treatment alone.

But before we can bring herbal prescriptions into the clinical guidelines

for cancer treatment in the U.S., much more research is needed, cautions Dr. Hou. “If we never integrate herbs and supplements with cancer drugs and study the outcomes,” he says, “we’ll never be able to answer questions that really matter to patients and their families.”

**Looking to the Future**

This kind of rigorous research depends on philanthropy. MSK’s Integrative Medicine and Wellness Service — which also studies the benefits of acupuncture, music therapy, and other complementary therapies in cancer treatment — was established in 1999 through the generosity of MSK board member Laurance S. Rockefeller, a legacy sustained by his daughter, current MSK board member Lucy Rockefeller Waletzky, MD.

“We’ve made so much progress,” Dr. Mao says. “Ten years from now, I would love to see many other cancer centers implementing MSK’s approach to using traditional Chinese medicine to help more people cope with the side effects of cancer treatment and improve quality of life.”

As for Erin, she says the herbal prescriptions she received from the dispensary have significantly improved her hot flashes. “I feel so much better — I noticed a huge difference even after a week,” she says. She’s also continuing to take all of her prescribed cancer medications.

“My dad was a pharmacist and also very into prevention,” says Erin. “Like him, I think the marriage of Western and Eastern medicines is a good thing.” ●



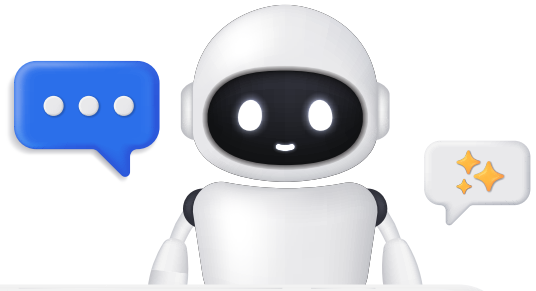
**MORE ABOUT HERBS**

Explore MSK’s extensive About Herbs database, which includes what you need to know about hundreds of herbs and supplements.

**The Herbal Oncology Program** is supported by the MSK donor community, including the **Laurance S. Rockefeller Fund**.

**The Integrative Medicine and Wellness Service** is supported by the MSK donor community, including the **Laurance S. Rockefeller Fund**; **Lucy Rockefeller Waletzky, MD**; **Lois H. Mann Charitable Foundation**; and **Ping Y. Tai Foundation Inc.**

**Dr. Mao** holds the **Laurance S. Rockefeller Chair in Integrative Medicine**.



## How Smart Is Artificial Intelligence About Cancer?

**As millions of Americans turn to AI-powered chatbots for health information, research shows that while many responses are accurate, others are misleading. “One of the challenges is that patients may latch on to the misleading parts, especially if they confirm what they already believe,” says Memorial Sloan Kettering Cancer Center (MSK) radiation oncologist James Janopaul-Naylor, MD, author of a study in the *American Journal of Clinical Oncology*.**

That said, the accuracy of chatbots is rapidly improving, and Dr. Janopaul-Naylor says it’s OK for patients to use these tools — with the understanding that they are not perfect. “Think of a chatbot as a research assistant rather than a decision-maker,” he says. “Any medical decisions you make should always involve your care team.” Here are some tips on how to use chatbots wisely.

### Best Uses

**Questions to ask your care team:** Consulting AI before appointments may help you to better understand a diagnosis and to ask better questions. Bring print-outs or screenshots from an AI chat, so your doctor can provide more nuanced, accurate information.

**Explaining complex terms:** Chatbots can use plain language to make medical terminology more accessible.

**Clarifying test results:** When results have arrived in your portal and you’re waiting to speak with your care team, chatbots can help summarize findings and potentially reduce your anxiety.

### The Risks

**Chatbots may pull data from unreliable sources.** These tools scan the entire internet. Information may come from medical journals, but also from discussion forums, personal blogs, or websites trying to sell products.

**Chatbots can make things up.** If an answer doesn’t seem right, try asking your question in a different way or consulting another chatbot. If you get different responses, beware.

**Chatbots tell you what you want to hear.** If you show a preference for certain treatments — for example, avoiding surgery — the chatbot will likely agree.

**Chatbots may not respect your privacy.** Remove your full name, birthdate, and medical record number before sharing medical history or uploading documents.

### Other Key Considerations

**Don’t rely on chatbots in an emergency.** If something is seriously wrong, call your doctor or go to an emergency room.

**Chatbots use the information you give them.** Recommendations can differ greatly for a 35-year-old versus an 80-year-old. Be sure to provide complete details, or responses will be less relevant.

**Chatbots may not have access to the most current data.** They have a “knowledge cut-off date.” The most recent treatments could be missing.

**Chatbot information is based on averages.** Chatbots report findings with a high degree of confidence, but the truth is often nuanced — especially regarding survival rates, which pull from thousands of patient records to establish averages. You are an individual, and your situation is unique. •

