UNIVERSITY OF COLORADO

MEDICINE TODAY

Fall / Winter | 2026

MORE INSIDE

AI'S ROLE IN INFECTION PREVENTION | PG. **13**
MEET THE NEW 3-YEAR MD PROGRAM | PG. **4**
REAL LIFE IN 'THE PITT' | PG. **28**



THE RESEARCH JOURNEY:

FROM BENCH TO BEDSIDE

PG. 6

VOLUME **39** | ISSUE 2

Anschutz
School of Medicine

Fall - Winter 2026

Volume 39 I Issue 2

On the Cover

Sujatha Venkataraman, PhD, left, and Rajeev Vibhakar, MD, PhD, MPH/MSPH, CU Anschutz professors specializing in pedantic hematology, oncology, and bone marrow transplantation, work to bring treatment options to children with a rare brain cancer. Read how they do it, starting on Pg. 6.

Photo by Melissa Santorelli

1 LETTER FROM THE DEAN

2 IN THE NEWS

4 NEWS
Welcoming the New 3-Year MD Program

5 Q&A
Understanding Sarcopenia and Women's Health

6 COVER STORY
From Scientific Discovery to Transformative Treatment: Navigating Critical Health Research

12 RESEARCH
NIL's Impact on Team Physicians

13 TECHNOLOGY
AI in Infection Prevention

14 INNOVATION
Pioneering Stereostatic Radiosurgery

16 RESEARCH
New Discoveries in Chikungunya Virus

17 ADVANCING CARE
Investigating Abdominal Aortic Aneurysms and Women

18 CLINICAL CARE
Treating Cancer, One Peak at a Time

20 FACULTY
Blending Art and Science on the Canvas

22 CLINICAL CARE
Meet the Team that Treats Tremors with HIFU

26 ALUMNI CORNER

28 CULTURE
Portrayals of Emergency Medicine in TV: 'Giving Us a Platform'



CU MEDICINE TODAY
is published twice a year by the University of Colorado Anschutz School of Medicine. Views and opinions expressed in this publication are not necessarily those of the University of Colorado, the School of Medicine or the Medical Alumni Association. Contributions to support this effort are welcome and appreciated.

OFFICE OF ALUMNI RELATIONS
13001 E. 17th Pl., Mailstop A080
Aurora, CO 80045
E-mail: healthalumni@ucdenver.edu
303-724-2518/877-HSC-ALUM
https://www.cuanschutz.edu/offices/advancement/home/alumni

SCHOOL OF MEDICINE
John Sampson, MD, PhD, MBA
Dean, Vice Chancellor for Health Affairs, University of Colorado

EDITOR
Mark Couch
Chief of Staff, Associate Dean of Public Relations

MANAGING EDITOR
Kara Mason
Senior Content Writer

ASSISTANT EDITOR
Chanthy Na
Assistant Dean of Communications

PHOTOGRAPHY
Melissa Santorelli

WEB CONTENT
Jeffrey Harris

PRODUCTION
CU Design & Print Services

WRITERS
Greg Glasgow
Amber Carlson
Mark Harden
Tayler Shaw
Makenzie Hardy

WE HAVE HAD A BUSY SUMMER!

We have been working nonstop to strengthen our school culture and reward excellence in all aspects of our school's mission.

Our education team is piloting a new three-year MD program that offers selected medical students the opportunity to become residents in our prestigious training programs.

Our clinicians are working in closer partnership with our campus partners at UCHealth and Children's Hospital Colorado to align our efforts to expand programs, improve quality, and deliver excellent care to our patients and their families.

Our research administration is implementing efficiency measures to ensure that we are using laboratory space to its highest and best use.

We've continued to recruit and promote outstanding leaders on our campus:

- In August, we announced that Michael Englesbe, MD, joins our school as chair of Surgery in November. He's joining us from the University of Michigan Medical School.
- Paul Picton, MB ChB, joined us as our new chair of Anesthesiology in September. He also comes to us from the University of Michigan Medical School.
- Edward Stenehjem, MD, MSc, professor of medicine, has been named senior associate dean for Clinical Affairs.

We also are making great progress in financial performance and operational efficiencies that will fuel our push us toward our ultimate goal of being a top 10 medical school.

- Our faculty practice approved moving forward with a partnership with Epic to run professional billing operations in a way that preserves our identity and independence, while modernizing our revenue cycle and enhancing the amount we are able to collect for our clinicians' hard work.
- The School of Medicine renewed its commitment to basic science departments with a three-year funding plan that encourages growth and collaboration.
- Our new Office of Clinical Trials is accelerating our ability to bring cutting-edge treatments to patients, expand faculty investigator opportunities, and position our campus as a world-class destination for clinical trials. In July, Bayer announced a strategic alliance with us.

I am reflecting on all these accomplishments with tremendous gratitude and awe. Earlier this year, I received some alarming news about my own health about a mass on my kidney. After several unnerving weeks of tests and preparation, I had surgery in early June that went extraordinarily well.

We are fortunate to be members of a professional community so dedicated to bringing such outcomes to others who depend on us. I have redoubled my commitment to making that happen and I am confident that we at CU Anschutz will be at the forefront of delivering such excellent care to others.



John H. Sampson, M.D., Ph.D.

John Sampson, MD, PhD, MBA

Richard D. Krugman Endowed Chair

Vice Chancellor for Health Affairs

Dean, University of Colorado Anschutz School of Medicine

IN THE NEWS

In the News

Lilia Cervantes, MD, MPH, professor of medicine and director of immigrant health, discussed a JAMA Internal Medicine study she co-authored that describes adverse effects on physicians of federal and health care system policies that cause immigrants to cancel appointments. "It's this sense that you can't provide the care that you know the patient needs because of outside forces," Cervantes told Colorado Public Radio in August.

Sarah J. Wherry, PhD, assistant professor of medicine in the Division of Geriatrics, described the effects of GLP-1s on bone mineral density. "Bone is a mechanically sensitive tissue—all that really means is that it responds to the load that's placed on it, and body weight is a form of load," she said in an article published in August by Women's Health. "So, when you 'off' load, you're going to remove some of that stress and strain on the skeleton and it's going to adapt."



Apoorva Ram, MD, assistant professor of medicine, discussed the impact of federal immigration policies on immigrant families and physicians who care for them. "Devastating" is the word Ram chose in an interview with Colorado Public Radio in August. "And I think the other one is more how I feel, which is hopeless." Ram was one of dozens of primary care doctors nationwide interviewed for a study published in July by JAMA Internal Medicine.



Alexis Ritvo, MD, MPH, associate professor of psychiatry, defined alcohol use disorder in an August New York Times article about the decreasing number of people who drink alcohol in a way that crosses the line into a medical disorder. "You can define a use disorder as continued use despite consequences," she said.

Sean O'Leary, MD, MPH, professor of pediatrics, was quoted in a fact-check report in August by CNN Politics regarding comments by President Trump that vaccines cause autism. The idea of a link between vaccines and autism has "been debunked many times," said O'Leary, adding, "It is considered settled science."

Kristy Hawley, MD, MPH, assistant professor of surgery, was featured in a Wall Street Week report on Bloomberg Television in July. She discussed the impact of robotic surgery on training programs. "Robotic surgery definitely adds another element of complexity to general surgery training," she said. "The resident physicians are being asked to not only learn open operations and laparoscopic operations with straight sticks but now they are also being asked to learn how to operate on a robotic console. At my institution, I'm the director of robotic surgery education for about 80 general surgery residents."

Adit Ginde, MD, MPH, professor of emergency medicine and senior associate dean for clinical research, described a research study he led that found an AI-powered oxygen delivery system allowed hospital patients to stay in their target oxygen range significantly longer than standard care patients. "Oxygen is one of the most widely used therapies in medicine, yet even in 2026, it is still managed largely through repeated manual adjustments made by clinicians," he said in a July report by Inc. "Our findings show that autonomous oxygen titration can help patients remain in their target range more consistently while reducing both underoxygenation and overoxygenation."

David Douin, MD, associate professor of anesthesiology and first author of a study of an AI-powered oxygen delivery system, told Inc. in July: "This system responds in real time, helping patients spend more time in their target oxygen range with less manual adjustment."

Matthew Wynia, MD, MPH, professor of medicine and director of the Center for Bioethics and Humanities, was quoted in August in an article in The Guardian about court records showing that U.S. Homeland Security officials subjected at least 10 hunger strikers to involuntary medical procedures, including force-feeding. "It is unethical to force treatment on someone who is saying, 'Don't do this to me'," he said. "People who are on hunger strike do not want to die, they are not suicidal. They are using the only tool available to them to protest the circumstances of their confinement."

Rachel Frank, MD, professor of orthopedics, was quoted in July in a Verywell Health report about an advisory committee for the Food and Drug Administration voting to add six popular peptides to an approved drug compounding list. "I want to be very clear there's really no controlled human clinical data showing that it improves ligament or tendon healing in people, and so when you hear about success, it's almost entirely anecdotal athletes self-reporting faster recovery," she said. "They're often doing other things like physical therapy."

Jay Lemery, MD, professor of emergency medicine and co-director of the Climate & Health Program, is featured in a Colorado Public Radio report in July that describes making house calls on scientists at the Summit Station, a research facility in Greenland. "We have physicians up there, and part of our job was just to make sure that we're providing a safe and healthy environment for the science to take place in a very remote and austere place," he said.

Gina Kruse, MD, professor of medicine, in a July article in The New York Times, called for additional research of the health impacts of nicotine pouches. "A lot of the studies that have looked at things like the cytotoxicity of pouches, or the constituents, have come from industry," she said. "And there's an urgent need for more independent research to understand what risks come with these."

Michelle Barron, MD, MPH, professor of medicine, was quoted in a Washington Post article about a COVID vaccine study that appeared in JAMA Network Open after it was withheld from publication by the CDC's Morbidity and Mortality Weekly Report. "Science was never the issue," she said in June. "Certainly it was within [the CDC's] purview to keep it out, for whatever reason, but it was clearly not for scientific reasons that the study was withheld from publication in the MMWR [Morbidity and Mortality Weekly Report]." Dawid Zyla, PhD, assistant professor of biochemistry and molecular genetics, described his colleagues' reaction to his study of measles in 2020. "There was zero interest in it," he said in a June article in The New York Times. "Measles was like a solved issue back then."

Jennifer Adams, MD, professor of medicine and associate dean for medical education, discussed a pilot three-year accelerated option to earn an MD offered by the School of Medicine. The new program fast-tracks students into in-state residency. "We are concerned about student debt," she said in a May report by Colorado Public Radio. "We are concerned about the workforce. So this is an investment that we believe in."

Melanie Cree, MD, PhD, professor of pediatrics, was interviewed in May by National Public Radio about a study published by the Lancet that led to renaming polycystic ovary syndrome to polyendocrine metabolic ovarian syndrome. She was a co-author of the study. In the NPR report, she explained how changing the name of the condition impacts patients. "For teenagers, it's going to make a huge difference for us when we talk to the teens and then their parents," she said. "We don't use those ovary ultrasounds in teenagers. So, it's very confusing when we were saying, you have a polycystic ovary syndrome condition."



James DeGregori, PhD, professor of biochemistry and molecular genetics, described for a Los Angeles Times article in June his lab's study finding that when lab mice with dormant breast cancer cells were infected with either influenza or SARS-CoV-2, the animals were significantly more likely to develop aggressive lung tumors. The results of the study were published in 2025 in Nature. "When [cancer] comes back, it comes back with a fury," he said. "We think that these virus infections can be almost like fuel for the fire."



Thomas Johnson, MD, assistant professor of medicine in the Division of Geriatrics, was quoted in an Associated Press report in May about the benefits of dancing for older adults. In the report, he remembered a man in particular whose passion for dance was so strong that he willed himself to attend one last class before he died in his late 80s. "His No. 1 priority was that he danced until the day that he died," he said of his patient.

Introducing the 3-Year MD Program

The Peak-to-Peak Pathway program will help to reduce barriers to medical school and reduce shortages in some specialties.

By Greg Glasgow

Physician shortages in certain specialties in medicine and changes in federal student loan borrowing limits have prompted the University of Colorado Anschutz School of Medicine to meet the moment by offering an accelerated three-year MD degree.

"We're joining a small but mighty group (of academic institutions) that is trying to address two important factors. One is rising concerns around student debt and the cost of medical education, and the second thing is physician workforce shortages," says Jennifer Adams, MD, professor of internal medicine, associate dean of medical education, clerkship phase, and director of accelerated pathway programs.

A recent change to federal student loan rules that caps the lifetime amount students can borrow at $257,000 puts medical school out of reach for many students who already have taken loans for their undergraduate or other graduate degrees, especially as the cost of medical school continues to rise.

"It has put into sharp focus how important it is for us to think creatively about how we can reduce the cost of medical school, or we face a future where students from disadvantaged backgrounds, those from the communities we think are really important to serve and to bring in future trainees, simply can't attend medical school," she says. "Shortening training from four years of tuition to three is one concrete way we can do that."

The first class of students in the three-year program, called the Peak-to-Peak Pathway, will matriculate its first class in summer 2027.

The core curriculum will be identical to that taken by students in the traditional four-year program; only certain electives, career preparation courses, and unstructured time that current students use to interview for residencies will be eliminated. Students can select one of five accelerated-track pathways that are linked to residency programs in Colorado that students will directly enter once they graduate.

"We're going to enroll eight students, one or two per pathway, in pediatrics, rural family medicine, urban family medicine, urban primary care internal medicine, and internal medicine/infectious diseases," Adams says. "We want to identify students at the time they matriculate who are committed to these specialties, grow them up in this work environment, and provide early mentorship…We eliminate a lot of the extra time and resources required in the residency match process, because they slide right into that residency spot after completing three years of medical school."

In addition to addressing the growing cost of medical school, the Peak-to-Peak Pathway program is designed to solve a second problem — a shortage of physicians in areas such as pediatrics, infectious diseases, and primary care.

The Association of American Medical Colleges expects physician demand to continue to grow faster than supply, leading to a projected shortage of between 13,500 and 86,000 physicians by 2036.

"There's a mismatch and a discrepancy in the type of specialties and the type of geographic locations that many of our students are going to and where there are real needs and real gaps," Adams says. "We are hoping to take those students who are really goal-directed and really clear in what they want to do, eliminate a lot of the elective time for career exploration, and get them into the workforce sooner."

Adams predicts that the students most likely to succeed in the Peak-to-Peak Pathway are those already committed to the included specialties who want to serve communities in Colorado.

"I know there are students out there who want to do this work and are committed to doing this work but are scared away when they look at the salary discrepancies in these specialties and the size of the loans. They say, 'Gosh, I want to be a primary care doctor, but I can't take on this kind of debt, and how am I going to pay that off?'," she says.

"We can try to solve this problem by taking those students who are really committed to the work and trying to reduce the debt to make it possible for them to be successful in this career path."



Sarcopenia: An Emerging Subject of Women's Health Research

A gynecologist's goal to understand the intersection of skeletal muscle mass loss and menopause.

By Kara Mason

A growing focus on healthy longevity across medicine has University of Colorado Anschutz gynecologist Jaime Arruda, MD, thinking more about her aging patients who are approaching a postmenopausal state and experiencing skeletal muscle mass loss and the accompanying effects, including falls and fractures.

Arruda, a professor of clinical practice in the CU Anschutz Department of Obstetrics and Gynecology, wants a more complete picture of how sarcopenia — gradual muscle mass loss that happens with age — intersects with reproductive health and the steady decline in estrogen that comes with menopause in women in their early 50s.

"While sarcopenia is traditionally associated with chronological aging, there is increasing recognition that menopause acts as a critical inflection point in the trajectory of muscle decline," Arruda writes in a paper published this year in The Journal of The Menopause Society. "As global populations age and women spend a greater proportion of their lives in the postmenopausal state, addressing sarcopenia must become a central priority in women's health.

Arruda explains the state of research and how patients may benefit from these investigations.

WHAT EXACTLY IS SARCOPENIA AND HOW DOES IT AFFECT WOMEN IN MENOPAUSE?

▶ Sarcopenia is the progressive loss of skeletal muscle mass and function, and it has a significant but often under-recognized impact on aging women. We usually think of this as an issue that increases with age.

Menopause is a time where we start to see a big drop off in muscle mass. Historically, people have been told that there's not much they can do about it and that it's normal. Then suddenly, we have a postmenopausal woman in our care with a bone fracture that we probably could have been doing something about earlier.

WHAT'S THE STATE OF RESEARCH RIGHT NOW? WHERE IS IT HEADED?

▶ It's just really starting to gain traction – and a lot of that, I believe, is coming from patients.

There's an opportunity to investigate whether menopausal hormone therapy impacts muscle mass. We have a lot of data on testosterone therapy in women — which at one point was thought that it could be the be-all end-all to improving muscle mass around menopause, but it doesn't seem like it's quite the magic bullet we thought it was.



JAIME **ARRUDA,** MD

With the rise of GLP-1s, there are a lot of questions around how that impacts muscle mass around menopause.

HOW DOES SARCOPENIA AND FOCUSING ON IT AT A YOUNGER AGE COME INTO PLAY?

▶ A lot of patients are worried about osteoporosis, but they don't really understand what sarcopenia is. We just don't talk about it at this stage of life that much. When you explain that it means they're physically less dense than they used to be, it all begins to make sense. They realize that they're frailer than when they were younger.

WHAT DOES THIS LINE OF THINKING MEAN FOR EVEN YOUNGER WOMEN AND THEIR MEDICAL PROVIDERS? IS SARCOPENIA SOMETHING THEY SHOULD BE THINKING ABOUT EVEN BEFORE MENOPAUSE?

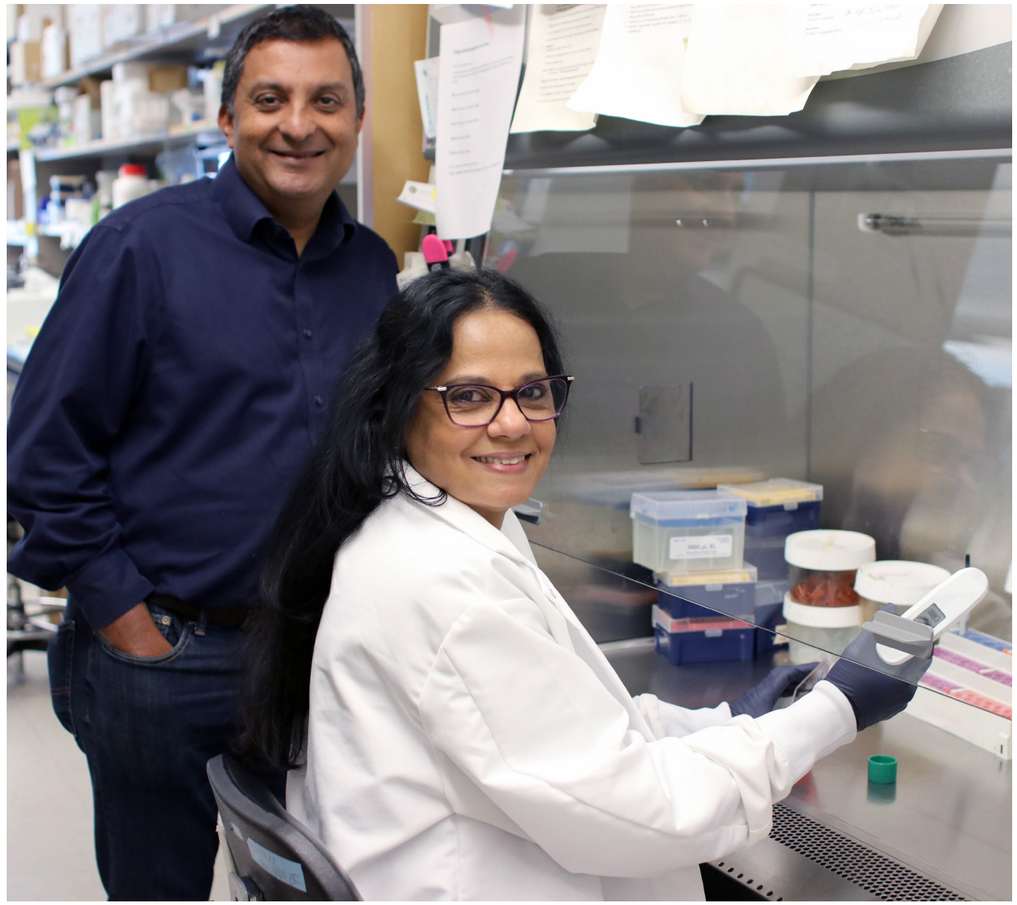
▶ Yes, because that's when habits are made that will make a difference in older age. It's hard to tell someone who's 45 to 55 and in perimenopause, who doesn't do a ton of weight-bearing exercise, that they're now at risk for sarcopenia and it's time to start a whole new regimen that they had no idea they should be doing.

There's an opportunity in OB-GYN practices to talk about this and educate patients on how they can be building strength earlier in life so that they may face better outcomes later in life.

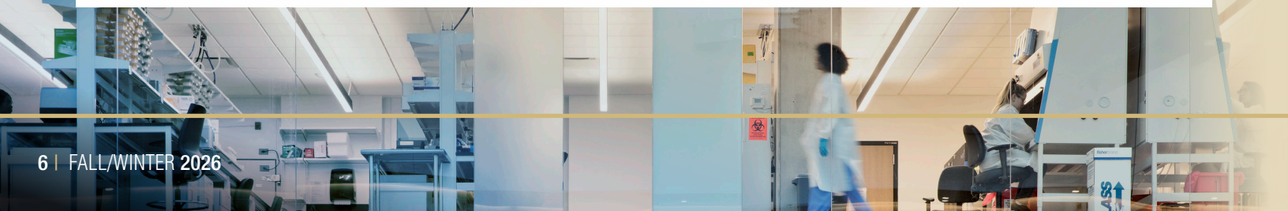
FROM SCIENTIFIC DISCOVERY TO TRANSFORMATIVE TREATMENT:

*THE JOURNEY FROM **BENCH** TO **BEDSIDE***

By Amber Carlson and Kara Mason



Rajeev Vibhakar, MD, PhD, MPH/MSPH, left, and Sujatha Venkataraman, PhD, faculty members in the Department of Pediatrics, work in the lab to find potential treatments for DIPG, a rare pediatric brain cancer. Photos by Melissa Santorelli.



While cancer research is advancing rapidly, a deadly type of pediatric brain cancer has long stumped oncologists and medical researchers. It mainly affects children ages 5 to 10, and there are no specific, targeted chemotherapy drugs or immunotherapies to treat it.

Diffuse intrinsic pontine glioma (DIPG), a subtype of diffuse midline glioma (DMG), is rare, occurring in only about 300 children in the U.S. every year. It's even rarer in adults. But its impacts are devastating: After the cancer emerges in glial cells within the pons, a part of the brain stem that controls actions like breathing and swallowing, it is aggressive, fast-growing, and nearly universally fatal.

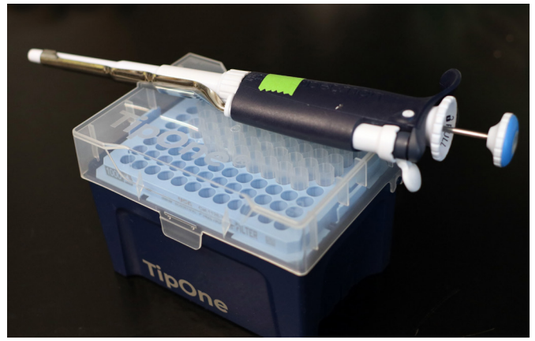
Patients usually die within a year of diagnosis. Steroids and radiation therapy can reduce inflammation and potentially slow the growth of the cancer, but they can't stop it. And while researchers haven't given up on finding chemotherapy drugs for DIPG, existing drugs have not been effective, in part because many drugs can't get through the protective blood-brain barrier that surrounds the brain and central nervous system. DIPG tumors are also embedded deep in the brain stem, where it's physically difficult for drugs to permeate.

Faculty members in the University of Colorado Anschutz Department of Pediatrics are striving to find better solutions for children with DIPG. Through years of research, Rajeev Vibhakar, MD, PhD, MPH/MSPH, and Sujatha Venkataraman, PhD, both professors specializing in pediatric hematology, oncology, and bone marrow transplantation, have identified a gene implicated in DIPG and developed a lab-created antibody that can deactivate it. Their discovery could be a major step in finally developing an effective treatment for this cancer and offering a ray of hope to children with DIPG and their families.

Vibhakar and Venkataraman are two of hundreds of researchers across the CU Anschutz campus who collaborate at every stage to transform a scientific discovery at the lab bench into a viable treatment option that clinicians can offer for patients.

This "bench-to-bedside" process is long, complex, and can be fraught with uncertainty. Lab researchers must try out hundreds, if not thousands, of ideas that may not work just to find a few promising ones. They sometimes make new discoveries that are unrelated to what they set out to find. These discoveries then need to catch the eye of industry partners who can translate them into drugs and sponsor clinical trials. The clinical trials themselves are the ultimate test of whether a treatment will succeed or fail.

Such is the nature of medical discovery. Out of the innumerable initial ideas explored in a lab, only a fraction will make it all the way through the research, development, and trial process, which can take years and involve many steps. For any one idea, the likelihood of success can be quite small. However, new treatments that do make it through the clinical trials stage to the bedside can radically improve patients' lives.



BASIC SCIENCE RESEARCH: THE QUEST TO DISCOVER 'WHY'

The journey toward making any new scientific discovery and developing it into a fully-fledged medical treatment for patients almost always begins with basic science research in a laboratory.

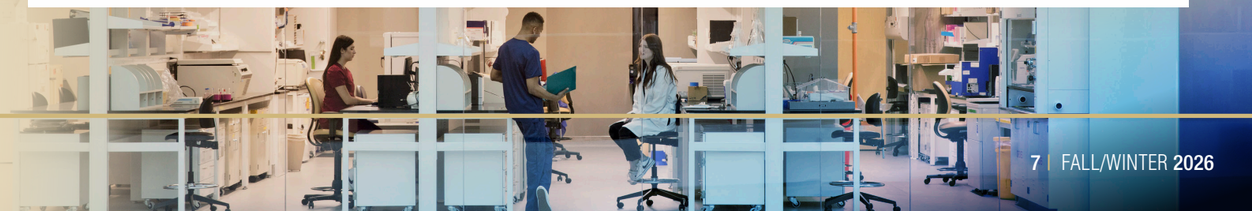
"If you don't understand why something happens, you won't know how to fix it. And if you don't do the basic science, you'll never know the why," Vibhakar says. "It's like a car. If you don't understand why your car is not working, it doesn't matter what you're trying to do. You're not going to be able to fix it."

That quest to understand the "why" is at the heart of basic science research. Scientists need to understand the logic underpinning the treatments and ideas they are exploring. For their part, Vibhakar and Venkataraman have sought to better understand why some children develop DIPG and what causes it.

Scientists have long known that a specific gene mutation called H3K27M drives DIPG. The mutation involves the substitution of a specific amino acid in a specific position within an abundant protein that coats a cell's DNA strands. In 2017, Venkataraman set out to explore why this mutation happens and what it does to cells in the body.

Venkataraman tried adding the mutation to some cells and deleting it from others using CRISPR technology. She and Vibhakar used RNA sequencing to study how the cells changed when they added or deleted the mutation. Across these studies, one gene in particular — a protein on the cell surface of DIPG cells — began to catch the researchers' attention.

Every time the researchers modified the H3K27M mutation, this gene, called CD99, consistently showed the most change. And after more experiments and gene manipulations, the researchers found that when they simply turned off the CD99 gene in tumor cells, the cells stopped growing and eventually transitioned into normal, mature cells.



Now, Venkataraman and Vibhakar had found a gene that could be targeted with a treatment. So, they started searching for an antibody — a specialized protein found in blood and lymph that binds to foreign substances like viruses, bacteria, and even abnormal cells (such as cancer cells) made within the body. Antibodies essentially serve as markers for the immune system, telling it what to destroy.

In cancer immunotherapy, antibodies can be used to seek out and mark cancer cells for destruction. And after plenty of searching and testing various options, Venkataraman and Vibhakar finally found a lab-created antibody that would bind to CD99. Its effects surprised even the researchers.

"The first time we put that antibody into cells, it was like the antibody blocked the signaling, and the tumor cells all stopped growing. It was amazing," Vibhakar says. "I didn't believe it at first, but sure enough, every time we tried it, that's what happened."

The researchers continue to test the antibody and explore its potential as a DIPG treatment. Last summer, they and other researchers published a paper showing that the antibody stops tumor growth in animal models. They also showed the antibody can cross the blood-brain barrier, and that it can work in combination with radiation therapy, a standard treatment for many types of cancer (including DIPG).

"The antibody clearly is stopping tumors from growing in animal models. We've rarely seen anything for DIPG that works. So, this was a really cool thing," says Vibhakar.

> ***Both scientific research and the business of science are like solving a puzzle, We may uncover compelling science, but without guiding it toward product development, some discoveries may never become solutions that benefit patients.***
>
> GALI **BALER,** PHD

LAB RESEARCH: A MARATHON, NOT A SPRINT

This DIPG-targeting antibody took years of dedicated lab research to uncover. Vibhakar and Venkataraman's journey illustrates what can happen when researchers are given the tools and resources they need to explore the "whys" of the world. But this work usually takes tremendous amounts of time, energy, stamina, persistence, and funding.

Leslie Berg, PhD, senior associate dean for biomedical research with the CU Anschutz School of Medicine and professor and chair of the CU Anschutz Department of Immunology and Microbiology, has spent many years in the lab as an immunologist. She says there's usually "a lot of hard work and a lot of failure" involved before major breakthroughs can happen.

"It takes years to do this. It takes lots of money, and lots of belief," Berg says. "90% of ideas don't lead to anything. The ones that end up successful are either people who got really lucky and something worked right away, or the ones where the belief in the project and the concept is so strong that they don't let the failures derail their progress."

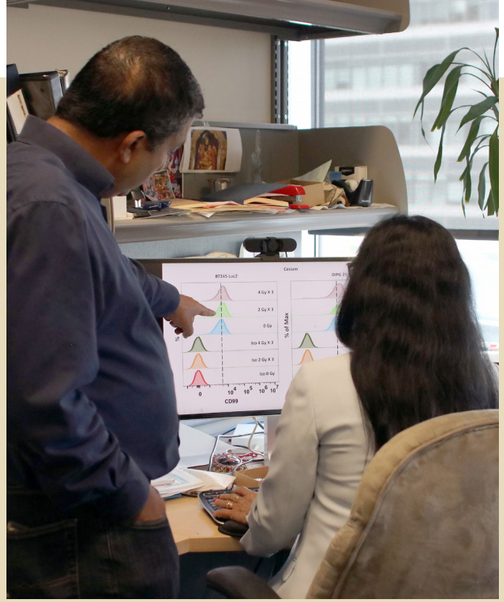
Most of the time, it takes many repeated attempts, many trials and failures, to yield a success. And instead of giving up after an experiment doesn't work, scientists have to keep thinking about where they're going next. They might think about what pieces of the experiment design they could tweak that might give different results next time.

Berg compares this trial-and-error process to doing a jigsaw puzzle. A researcher might pick up the piece of the puzzle and think they see where it goes, but then later realize it doesn't fit with the other pieces around it. In this process, the researcher can take the puzzle piece and shave a little off the end to see if that makes a difference, but it can take many attempts to get a piece that truly fits.

The difficulty lies in how unpredictable basic science research can be. Berg says it's important to have many researchers testing out many different ideas to "spread a wide net" and seek answers to many questions at once.

Sometimes, crucial discoveries also happen completely by accident. GLP-1 drugs exist because of a group of scientists from the U.S. Department of Veterans Affairs who were studying the eating patterns of Gila monsters, a type of venomous lizard. Gila monsters are known to go months at a time without eating. The researchers, who were not affiliated with CU Anschutz, found the lizards produce a hormone similar to GLP-1, also known as glucagon-like peptide-1, a gut hormone that regulates blood sugar in humans. Later, a pharmaceutical company drew inspiration from Gila monster DNA in creating the synthetic GLP-1 drugs that many use today for treating diabetes and losing weight.

Berg says this is just one of many examples illustrating why scientists need the funding and leeway to explore a wide range of topics and questions — both commitments the CU Anschutz School of Medicine has made to its six basic science departments.



"If you try to direct research too much, you're going to miss all the unknowns," Berg says. "The more you narrow the scope of research that can go on, the less likely you are to learn something totally new. You have to go out of the box, and you'll never find it if you color only in the lines."

This philosophy has served CU Anschutz researchers well. The Nature Index 2026 Research Leaders, which tracks contributions to research articles published in high-quality natural-science and health-science journals, identified CU Anschutz as No. 11 in the U.S. among health care institutions and No. 13 in the world.

This year, the School of Medicine was also named a top tier research institution by U.S. News and World Report, a boost from tier 2 in 2024.

THE MIDDLE STEP: FUNDING AND COMMERCIALIZATION

Unknowns don't exist only in the lab. There are lots of them on the journey to the bedside. Clinical trials ultimately lead to new treatments for patients. But they require regulatory approval, funding, and industry partners to become a reality.

Moving a discovery to the drug development and clinical trial phase isn't always a guarantee, but resources across CU Anschutz aim to take those scientific achievements all the way.

Vibhakar and Venkataraman say CU Anschutz Innovations, a team of experts that help researchers commercialize their discoveries and protect their intellectual property, was instrumental in taking their discovery to the next stage of drug development. Innovations helped them file patents to protect their intellectual property and set up a biotech startup so the two could start working on drug development and manufacturing.

The two researchers have applied for a business development grant from the National Institutes of Health (NIH) for small companies that advance therapies from the lab to patients. They've also received generous amounts of philanthropic funding to pursue this work, as well as funding from the SPARK Accelerator Program. One effort has resulted in Venkataraman co-founding Vināśa Oncology for the research.

"We've connected them with regulatory pathway recommendations, experts, advisors, and SPARK program mentors to support company formation and business model development," says Gali Baler, PhD, managing director of ventures and investments for Innovations. "Most recently, we've worked with one of our entrepreneurs-in-residence to help them consider a pediatric voucher through the FDA, which could unlock a fast-track review or larger funding opportunities."

At CU Anschutz Innovations, finding the right pathway to success looks different with each project, says Baler. So far, Innovations manages a portfolio of 3,300 patents and has helped secure over a half billion dollars in startup financing.

"Both scientific research and the business of science are like solving a puzzle," Baler says. "We may uncover compelling science, but without guiding it toward product development, some discoveries may never become solutions that benefit patients."

That work creates an entire ecosystem. According to 2023 economic impact data, Innovations' work generated $423 million for Colorado's economy, supported 691 jobs and more than 1,000 indirect or induced jobs, and altogether sustained 962 Colorado households.



While the middle parts of the bench-to-bedside journey can sometimes be messy, Baler adds, they're also ripe with creative spirit. That's what makes the work so rewarding.

"One common trait among successful startups is the ability to pivot. A company may start with a roadmap, test it in the market, gather customer discovery and other data, and realize the market is different than expected. Then it adjusts," he says. "Many of the most successful companies in our portfolio pivoted five or six times before finding the right product-market fit."

"Investigators bring breakthrough science and discoveries. At Innovations, we help build the framework around that science; protecting intellectual property, assessing commercialization opportunities, establishing company structures, and identifying the milestones needed to navigate the market. That process continues to evolve and iterate over time."

Other resources on campus include the CU Anschutz Gates Institute, which supports translational research and offers biomanufacturing capabilities. Executive Director Terry Fry, MD, says it can be a challenge to move beyond the proof-of-concept stage of scientific development — but it's entirely possible with the right team of experts.

"Transitioning an idea from something that looks promising in animal models and turning that into a new drug that we help treat humans with is a fairly heavy lift," says Fry, who is also a professor of pediatrics at the CU Anschutz School of Medicine. "It involves regulatory agencies, biomanufacturing and more. I view our role on campus as being able to fill that gap."

CLINICAL TRIALS: TESTING POTENTIAL 'GAME CHANGER' TREATMENTS FOR PATIENTS

Clinical trials are often the culmination of years of tireless effort — and the last, crucial step before new medical treatments can finally go to market. These trials turn scientific discoveries into treatments for patients that can make a tangible, real-world impact.

After a decade of studying DIPG, Vibhakar and Venkataraman are nearly ready to run a clinical trial for a new treatment. Their goal is to begin the trial by 2027, and if it yields a viable treatment, the impact on patients and their families could be immeasurable.

Getting to this place has been quite a journey, but the future looks bright. Says Vibhakar: "We went from finding this random gene and asking what it does to finding a therapy that we think will be a gamechanger for patients with DIPG."

However, clinical trials aren't the end of the research process. They often spark new questions and ideas for future study and innovation. They provide valuable food for thought and real-world data that informs all levels of research.

"You have to have the data from the clinical trials to go back, do the basic science, and understand what happened," says Vibhakar. "Then, you can take that knowledge back to the patients."

These kinds of trials are unfolding across campus at CU Anschutz. In April, the Gates Institute received Investigational New Drug clearance from the U.S. Food and Drug Administration, marking the first chimeric antigen receptor (CAR) T-cell therapy authorized for clinical testing that was developed entirely on the CU Anschutz campus. The therapy offers a novel approach for patients with relapsed or refractory acute myeloid leukemia.

The first-in-human Phase 1 clinical trial for the CAR T-cell therapy developed on campus started over the summer, marking years of work by researchers and the Gates Institute.

Reaching the point of a viable clinical trial is "where you really start to see the fruits of your labor," Fry says. Even then, uncertainty often lies ahead.

"You have to be adaptable. Clinical trials often reveal things that make us rethink our approach," he says. "Sometimes it's as simple as modifying the eligibility criteria. Other times, it can be as drastic as going back to the drawing board on manufacturing."



RAJEEV **VIBHAKAR,** MD, PHD, MPH



SUJATHA **VENKATARAMAN,** PHD



ADIT **GINDE,** MD



LESLIE **BERG,** PHD

This means bench to bedside isn't often a linear journey. "It's bench to bedside and then back to the bench depending on what the bedside tells you," Fry says.

Adit Ginde, MD, MPH, senior associate dean for clinical research with the CU Anschutz School of Medicine, professor of emergency medicine, and assistant vice chancellor for clinical trials, says a campus where world-class clinical trials and basic science research can happen under the same roof creates a wealth of possibilities.

"On our campus, clinical trials and basic science research are clearly synergistic," he says. "When we can take our discoveries and move them forward within our clinical trials ecosystem, that's a very special opportunity to be able to advance our faculty, our ideas, and to be able to get promising treatments and products to our patients years before commercial availability."

Ginde believes having a robust infrastructure on campus for clinical trials helps carry innovations from the discovery phase to the finish line and bring new treatments to patients as quickly as possible.

CU Anschutz is actively expanding its focus on clinical trials, which he says is a step toward delivering innovative, cutting-edge medical care and treatment.

"We have an opportunity as a campus to make a major impact here. We have our relationships with our health system partners, our geography, and our footprint across the Mountain West. Patients are referred to us from a nine-state region for complex care, and our unique patient population and clinical setup really allow us to fill a gap in care," says Ginde.

Campus researchers are focusing their efforts on health conditions that are prevalent in the community so they can tailor their scientific approach to what their patients are experiencing, he says.

Ginde also emphasizes the importance of approaching basic science research with the whole patient and their clinical context in mind so the transition from bench to bedside can be as seamless as possible.

The road from bench to bedside is often long and arduous and navigating that journey takes dedicated collaboration from countless people. Venkataraman says it "requires a village" — a wide range of people from lab scientists, clinicians, research fellows, and students to regulatory experts and industry partners — to move an idea from its inception all the way to a finished treatment that can go out to patients. But they all share the same ultimate goal: developing new treatments and bringing hope to patients and families.

"Everybody has to work together for the successful clinical translation of any product," she says. "So much is involved in taking science from the lab bench to the bedside. But when we design an experiment in a laboratory, we always think that there is a patient out there waiting for a better option, and so we try to move it forward as fast as we can."



Changing the Game for Team Physicians

NIL is creating pressure for athletes and for the doctors who care for them.

By Greg Glasgow

There have been a lot of questions around how the 2021 NCAA rule that allows college athletes to profit from the use of their name, image, and likeness (NIL) has changed sports. There are, of course, ramifications for the athletes, their coaches, and trainers. There are also new impacts for team physicians, researchers and experts say.

There's a "new reality where financial rewards are playing a greater role in both athlete behavior and medical management," University of Colorado Anschutz School of Medicine student Michael Nocek writes in a commentary published earlier this year in the journal Sports Health.

Sports medicine physicians, he continues, "must now contend with complex considerations that span the disciplines of health care, law, and commerce."

Nocek, who completed a research year at the Steadman Philippon Research Institute in Vail before returning this year to CU Anschutz for his fourth year of medical school, collaborated with Vail-based orthopedic surgeon Peter Millett, MD, and CU sports medicine expert Eric McCarty, MD, professor in the Department of Orthopedics, on the commentary.

Overall, Nocek says, the new NIL rule is a boon for college athletes, but it creates added pressures for the team physicians and orthopedic surgeons who regularly treat them. One of the biggest concerns is when to safely return an athlete to play after an injury.

"Before NIL, the athlete mindset was, 'I'm injured. Somebody might take my spot for a couple of weeks, but I can probably come back. Worst case, I'd have to earn my spot back, but it's more about my long-term health, because I want to play at the next level,'" Nocek says. "Now, with sponsorships or business partnerships in the mix, there's more pressure to be visible and available. Time away matters more, because it can affect exposure and earnings, and that can accelerate return-to-play timelines toward coming back sooner. It may also affect how readily athletes report symptoms."

A new world of pressures from social media and online sports gambling also means physicians must be more vigilant than ever about the mental health of athletes in their care, Nocek says.



ERIC **MCCARTY,** MD

"Say you have a bad game and lose," Nocek says. "You're a 19-year-old athlete still developing the executive functioning and emotional regulation skills needed to put things in perspective. You're juggling school, relationships, and family pressures, and then you see a wave of criticism online. That can really undermine confidence at a time when many young athletes are especially vulnerable to outside feedback. We need to make sure athletes have access to mental health support so they can be safe and able to manage those pressures."

Nocek includes a list of recommendations, adapted from a presentation McCarty delivered to the American Orthopaedic Society for Sports Medicine. They consist of implementing clear return-to-play protocols, establishing protocols for coordinating outside medical care, creating formal systems for medical record sharing between institutions (particularly important in the era of the transfer portal), and above all, providing athlete-first care.

McCarty, who also is head team physician for the CU Buffaloes, says NIL is changing the way physicians work with college athletes.

"I don't think the concept of NIL is bad; it's just the way it's being conducted that is causing a problem," he says. "There aren't many rules or guardrails over it yet, and you have a kind of wild West of players and agents trying to get the money that's out there. It could be done in a better way."

For McCarty and Nocek, the commentary was an opportunity to reiterate the most important aspect sports medicine.

"Dr. McCarty always says, essentially, do the right thing," Nocek says.

"Always keep the athlete's well-being as priority number one, above all else. Prioritize their long-term health and don't put them at any undue risk for a potential financial benefit."

Implementing AI in Infection Prevention

LLMs offer an opportunity to enhance surveillance and boost education.

By Kara Mason

Artificial intelligence (AI) can track vital signs, help support diagnosis, and free up clinician time. Can it improve infection prevention in hospitals? Research increasingly says "yes."

Guillermo Rodriguez Nava, MD, assistant professor of infectious disease at the University of Colorado Anschutz School of Medicine, says large language models (LLMs), a type of AI that is designed to understand and analyze human text, are promising tools for processing the vast amounts of unstructured clinical data generated in health care that is often needed in infection prevention work.

LLMs have been evaluated for healthcare-associated infection surveillance, mostly central line-associated bloodstream infections, surgical site infections, and catheter-associated urinary tract infections, with pooled sensitivities exceeding 90% across various studies.

"It's important to remember that these algorithms are not thinking machines. AI is not here to replace a doctor, and I don't think they ever will, but they will help us improve in our workflow in infection prevention," says Rodriguez, who is also the associate medical director of infection prevention and control at Denver Health.

MAKING TIME FOR ENHANCED STRATEGY

Currently for most hospitals utilizing electronic health records (EHRs), the system screens charts for specific criteria, then flags them for potential infection risk.

When a patient record is flagged, the infection prevention specialist gets an alert to review whether the patient meets the surveillance definition outlined by the Centers for Disease Control and Prevention (CDC) and the National Healthcare Safety Network.

Most hospitals have a team of infection prevention specialists that review charts when flagged. This can make up most of their work shift, as the CDC estimates that approximately one in 38 hospital patients has at least one health care-associated infection on any given day.

These specialists must also strategize how to prevent these infections, for patient safety and for the hospital or clinic, which can face fiscal or regulatory penalties if infection rates are deemed too high.

"In a lot of hospitals there's limited time in the day to visit units and review external devices on the patient, develop new strategies to prevent infections, or educate staff about infection prevention strategies, like handwashing," Rodriguez says. Having fewer flagged EHRs to review, however, may allow specialists to do more of that.

EXPANDING PROGRESS

In the last several years, infection prevention in most places across the country has improved. The latest National and State Healthcare-Associated Infections Progress Report shows that acute care hospitals experienced an 11% decrease in C. difficile infection, 10% decrease in catheter-associated urinary tract infections, a 9% decrease in central line-associated bloodstream infections, and a 7% decrease in methicillin-resistant Staphylococcus aureus (MRSA) over the previous year.

Still, there's room for progress, and because so much of infection prevention is based on strict definitions and criteria, AI can be a helpful tool, Rodriguez says. "We are not asking AI to make clinical decisions, but to summarize the data and to look for criteria and make a determination of whether it fits the surveillance definition outlined by the CDC."

With the assistance of LLMs, this work can be done much faster. Rodriguez says that double-checking the work of AI tools is necessary just like it is in nearly all medical settings. "At the end of the day, you would only have to review the cases that the AI system marks as the true positives because they are very good at finding almost all true negatives," Rodriguez says.

VALIDATION AND THE FUTURE

EHRs are often comprised of unstructured clinical text — lots of notes that can span many days if the patient has a longer hospital stay. This text requires sorting and analysis to be beneficial for infection prevention. An AI system can more quickly maneuver through these notes, make sense of them, and determine whether the flagged EHR does meet standardized infection surveillance definitions.

Many hospital systems are already deploying their own AI tools, some reporting 100% sensitivity when it comes to detection. However, Rodriguez cautions that more validation is needed to ensure true accuracy and efficacy, especially because it can be difficult to replicate similar outcomes in different hospital settings.



GUILLERMO **RODRIGUEZ NAVA,** MD

"Before there's a widespread adoption of AI in infection prevention, we should further validate, especially across diverse settings to ensure their use as a screening and decision-support tool," Rodriguez says.



Pioneering Stereotactic Radiosurgery

With the surgical expertise of Robert Breeze, MD, treatment strategies for brain metastases that were once considered controversial are now commonplace.

By Makenzie Hardy

When Robert Breeze, MD, started medical school at the University of California San Diego in 1977, brain metastases from melanoma were considered a terminal diagnosis. Surgery to remove brain metastases was a rare occurrence since the standard of care was strictly palliative.

"At that time, treatment of cancer relied heavily on chemotherapy, and most of those agents did not cross the blood-brain barrier," says Breeze, a professor of neurosurgery at the CU Anschutz School of Medicine. "Once cancer went to the brain, there was a strong likelihood of death within six weeks to six months since brain metastases progress rapidly without treatment."

Today, specialists in medical oncology, radiation oncology, and neurosurgery work closely to aggressively treat brain metastases from melanoma and other cancers — a level of collaboration that was uncommon at the start of Breeze's career.

In the 1980s, Breeze attended the University of Southern California for residency training. It was there he performed his first brain metastasis surgery on a patient experiencing frequent seizures. "The surgery relieved the patient's seizures," Breeze says. "This made their last six months better for them."

Despite the optimal outcome and consent from the patient, Breeze recalls that surgical decision was considered controversial at the time.

"The general consensus among people outside of neurosurgery was that brain surgery required a long recovery and would cut into a patient's life span," Breeze says. "But the techniques for brain metastases were evolving and recoveries could be much shorter than expected."

THE REVIVAL OF STEREOTACTIC DEVICES

In the 1950s and 1960s, stereotactic neurosurgery was used exclusively to treat movement disorders and relied on brain atlas coordinates to target the ablative surgery. The invention of the CT scanner revived stereotactic surgery.

Breeze recalls reading about the invention of the CT scanner when he was in high school. By the time he started his residency training, the technology was available in most major U.S. hospitals. In the 1980s, image-guided stereotactic neurosurgery using CT scans was introduced.

At USC, Breeze was part of a team that tested one of the two original prototypes of the first dedicated image-guided stereotactic frame. During residency, he was put in charge of the frame and quickly mastered stereotactic biopsies.

"It was a new generation of stereotactic neurosurgery," Breeze says. "We could now accurately target lesions deep in the brain for both biopsy and, at times, resection."

> *"Things are always changing with new technology. If the last 40 years are any indication, the future for melanoma patients is very bright."*
>
> ROBERT **BREEZE,** MD

AHEAD OF THE CURVE

Soon after Breeze arrived at the University of Colorado in 1987, he met Bill Robinson, MD, PhD, a medical oncologist with an academic interest in melanoma. The two combined their expertise and began treating patients with brain metastases from melanoma.

"Dr. Robinson wanted me to operate on melanoma metastases," Breeze says. "That's how I got interested in melanoma."

Because their approach was not yet considered the standard of care, Breeze says he and Robinson faced criticism that their surgical treatment was "too aggressive."

Breeze persevered and refined his surgical skills to treat patients with brain metastases from melanoma who may have died sooner without his care. Slowly, perceptions of stereotactic surgery in these cases began to change as technology advanced and the surgery and treatments became more effective.

STEREOTACTIC SURGERY IN COLORADO

In 1993, a Gamma Knife® machine was installed in Colorado — among the first in the country — and because Breeze had extensive stereotactic experience, he was asked to use it.

The machine is a noninvasive stereotactic radiosurgery device primarily used to treat brain tumors and other neurological conditions by delivering a single shot of high dose radiation to a precise location in the brain to shrink or eliminate a tumor. The new technology helped minimize harm to the surrounding tissue and exposes the body to less radiation than conventional radiation treatments.

Today, medical centers across the country with a high volume of melanoma cases routinely offer multidisciplinary treatment of melanoma brain metastases.

"Now, oncologists are actively treating brain metastases and actively engaging me," Breeze says. "To have this kind of interaction where an oncologist asks me to take something out would have been unimaginable in residency."

BRAIN METASTASES FROM MELANOMA

Brain metastases from melanoma often can go undetected, sometimes up to a year.

In the past, when brain metastases appeared on a scan, oncologists would stop the systemic therapy that kept the cancer in the rest of the body at bay. In those cases, they presumed that treatment was no longer effective.

Breeze explains that in many cases, brain metastases are likely present when the cancer begins to metastasize to other parts of the body, like the lungs, but are too small to be detected by medical imaging.

"Every time I treat someone with eight brain metastases, they might actually have 10," Breeze says. "I scan them every four to eight weeks for up to a year or more, and then every six months."

In the past, neurosurgeons focused on treating the brain while medical oncologists and radiation oncologists focused on treating the rest of the body. Today, treatments are more integrated.

"Brain metastases always defined when the disease was fatal, but now many drugs penetrate the brain and it is a joint effort between neurosurgery, medical oncology, and radiation oncology," Breeze says. "This has resulted in the brain metastases not always being the limiting factor in the overall survival of cancer patients."

Early in his career, surgically treating three brain metastases was unheard of. Today, Breeze says treating patients with many brain metastases is common. The most he has treated in a single patient is 101.

THE FUTURE OF TREATMENT

Currently, there are more than 50 melanoma clinical trials offered at the CU Anschutz Cancer Center.

When clinicians detect a brain metastasis, they immediately consult a neurosurgeon. Breeze participates in a weekly conference with specialists from across campus, where clinicians discuss new drugs and targeted therapies.

Breeze recently had a routine follow-up appointment with a melanoma patient who was first treated in 1998. That patient is considered cancer-free today, even after a recurrence in 2011. Without the care offered by Breeze and Robinson, the patient likely would not have survived. Together, Breeze and Robinson challenged the 1990s standard of care for melanoma patients.

Breeze, who was once considered ahead of the curve with his treatment of melanoma brain metastases, now sees a rising generation of oncologists passing him.

"When I was in medical school, residency, and as an early attending, all we could really hope to do was prolong quality of life when we treated brain metastases," says Breeze.

"Now if a patient comes to see me, I can often control their brain metastases for long periods of time, and the patient's survival may hinge on the effectiveness of the systemic therapy," he continues. "Things are always changing with new technology. If the last 40 years are any indication, the future for melanoma patients is very bright."

New Buzz in Chikungunya Virus Research

A CU Anschutz lab leads the way on understanding a chronic form of the disease.

By Kara Mason

A small lab located in semi-arid Colorado is helping to solve the mysteries of a virus most often transmitted by mosquitos in subtropical regions outside of the U.S.

Chikungunya virus is most common in places like Brazil and Argentina. Infected Aedes mosquitoes transmit the virus, which is characterized by high fever and joint swelling and pain. About half of cases progress to a chronic form of the disease. Patients experience relapsing arthralgia and arthritis that can span years.

For a long time, researchers haven't known what causes some cases to turn chronic and why.

"We've been interested in trying to better understand how this infection leads to chronic symptoms," says University of Colorado Anschutz immunologist Thomas "Tem" Morrison, PhD, professor of Immunology and Microbiology. "Mosquito-transmitted viruses are significant problems in resource-limited regions of the world where many people rely on physical work for their financial wellbeing."

Morrison and his team of researchers — including Kristen Zarrella, PhD; Ryan Sheridan, PhD; and Brian Ware — now say they've made a substantial step forward that could lead to treatments that would be significant for public health in regions hit hardest by the virus.

In research published in *Nature Microbiology* earlier this year, the Morrison Lab says they've discovered that chikungunya virus, an arthritogenic alphavirus, persists in joint-associated macrophages, a specialized type of white blood cell that helps the body defend against pathogens.

Chikungunya virus symptoms typically occur four to eight days after exposure and include headache, nausea, fatigue, rash, high fever, and joint pain and swelling. For some, intense joint pain ensues for years.

Morrison's research, which found macrophages in joints harbor the virus, utilized single-cell RNA sequencing, spatial transcriptomics, and flow cytometry to investigate tissues in alphavirus-infected animal models.

Previously, researchers hypothesized that the virus triggered an autoimmune response, causing symptoms similar to rheumatoid arthritis. Supporting research for this theory has so far been inconclusive.

Another hypothesis, which is what Morrison and his lab have been exploring, is that there is long-term persistent infection. When a person acquires the virus and experiences the acute infection, an immune response to control that infection fails to eliminate the virus from some tissues.

"This is known to occur in virus infections where the immune response can clear the infection from some parts of the body but struggles or fails to clear the infection from other parts of the body," Morrison explains. "So, this is a virus that gets into a lot of tissues. The idea here is that the immune response is unable to clear it from certain tissues, and in this case, those are the joint-associated tissues."



TEM **MORRISON,** PHD

For years, the Morrison Lab has been able to detect long-term infection in joint-associated tissues. In their latest study, they used advanced techniques including single cell RNA sequencing and spatial transcriptomics —together these methods allowed the researchers to map gene activity in tissue sections and profile individual cells — to better understand precisely where in the tissue which cell types are harboring the virus.

The lab also asked whether the detection of persistent infection was actually contributing to the disease and chronic symptoms or if it was some other mechanism.

"We hadn't had a way to really answer that question for a while, until this study, which was supported by the development of small molecule antivirals that can inhibit viral replication," Morrison says. "Using those sequencing techniques, we found the virus in specific cell populations — which include macrophages — present in the joint-associated tissue. This means that macrophages seem to act like a sanctuary."

In the study, the small molecule inhibitor — which can stop the virus's ability to replicate — reduced chronic viral RNA and joint inflammation. This signaled to Morrison and the research team that the macrophage sanctuary contributed to sustained inflammation.

Researchers were able to take joint tissue, digest it into single cells, and study it. Analyzing each cell with single cell RNA sequencing, researchers could distinguish cell types and then determine if the cell had the viral RNA causing chronic disease.

Morrison says his team is now interested in how the virus is able to persist in macrophages and why these cells become a "safe reservoir" for the virus.

Most importantly, the findings highlight a path toward treating people with chronic pain from the virus.

"Our data signals that antiviral therapy may be useful to prevent the development of or to resolve chronic disease," Morrison says.

Investigating Abdominal Aortic Aneurysms and Women

Why do women experience worse outcomes after surgery for AAA? Margaret Smith, MD, set out to learn more.

By Greg Glasgow

When the body's largest blood vessel expands or dilates in the abdomen and ruptures, it can be very serious. These abdominal aortic aneurysms (AAA) can lead to intense pain and sometimes death. They have been dubbed "a silent killer" because symptoms prior to the rupture often go unnoticed.

The need for more data and research in AAA, especially in women, has led the University of Colorado Anschutz Department of Surgery to start a new clinic aimed at doing just that.

"In men, the U.S. Preventive Services Task Force recommends a one-time screening ultrasound between ages 65 and 75 for anyone who has ever smoked," says clinic leader Margaret "Meg" Smith, MD, assistant professor of vascular surgery. "They don't recommend it for women, and it's not because the data says we shouldn't; it's because there's not enough data on women for the task force to make a statement about it."

Collecting more data on women with AAA is one focus of the new clinic, but its primary focus is treating the condition, which is typically found incidentally, Smith explains.

"People come into the emergency department and get a CAT scan for a kidney stone or abdominal pain or a cancer diagnosis, and the imaging also reveals an aortic aneurysm," she says. "The thing we're trying to prevent is AAA rupture, because if the biggest pipe in your body bursts, you have a very high chance of dying before receiving medical treatment."

Because women don't get the same screening protocol as men, they often don't seek treatment until they are showing signs of rupture or impending rupture — symptoms that include intense, acute abdominal pain that often radiates to the back.

"It is a very severe pain. Nothing makes it better, nothing makes it worse," Smith says. "It's not subtle, and it's a pain that's different than any other pain you've ever had before. Patients will also have high heart rate, low blood pressure, they'll pass out — all the signs of someone who's bleeding."

In women whose AAAs are found early from other imaging, surgeons monitor them and typically perform surgery once the aneurysm reaches five centimeters. The minimally invasive repair procedure, known as endovascular aneurysm repair, or EVAR, uses stent grafts to reline the aorta and block out the aneurysm. For reasons still unknown, women fare worse than men when it comes to the surgery, with higher death rates in the 30 days following the operation.

"We have all this new technology that has transformed our field, but it's been studied primarily in men," Smith says. "When we put these grafts in that were studied primarily in men, women have higher rates of death within 30 days, even after a successful operation. Part of our motivation is to study this through a female lens. The treatments are the exact same, but women's outcomes are different, and we don't know why."

Smoking is the biggest risk factor for women developing AAAs, Smith says, but in the clinic, she also wants to investigate the role of factors such as family history, menopause status, and childbirth on developing AAAs.

"I want to be really honest about the fact that women do worse, and we shouldn't hide that," Smith says.

"Should we be doing something different for them? I don't have the answer right now. We'll continue to provide the gold standard of care, but I think we also have to start being really intentional about the questions and the data we gather. We want to create a true database where we can track these patients and hopefully start to change the outcomes."



MARGARET **SMITH,** MD

> ***Part of our motivation is to study this through a female lens. The treatments are the exact same, but women's outcomes are different, and we don't know why.***
>
> MARGARET **SMITH**, MD

Treating Cancer, One Peak at a Time

Mountaineer Rob Mahedy's bladder cancer hasn't stopped his sense of adventure.

By Greg Glasgow

Living alone in a small cabin in Crested Butte, Colorado, and doing solo climbs of mountains around the world any chance he got, Rob Mahedy had gotten pretty used to being on his own.

In fact, he preferred it that way.

Then he was diagnosed with bladder cancer, and everything changed.

"You realize how much people really want to help — it helps people to help others," says Mahedy, 59. "A big part of my journey with cancer was to ask for help and to accept help. Medicine and surgeries were a major part of it, but there's this whole other inspiration of love and humanity that has helped me cope and have a positive attitude."

SYMPTOMS LEAD TO TREATMENT

Mahedy was first helped by doctors and a urologist at a medical center in Gunnison, where he went in late 2024 after seeing blood in his urine and feeling an increased urgency to urinate. An ultrasound and cystoscopy revealed a large tumor in his bladder, and he was referred to the University of Colorado Anschutz Cancer Center.

There, Mahedy was seen at the bladder cancer multidisciplinary clinic, which brings specialists from different areas together to examine a patient and come up with a treatment plan, all on the same day.

Cancer center member Laura Graham, MD, put Mahedy on a 12-week course of chemotherapy to shrink the tumor in advance of surgery; he then received a radical cystectomy — surgery to remove the bladder — from cancer center member Janet Kukreja, MD, a national leader in robotic bladder surgery. It was discovered that the cancer had spread to multiple lymph nodes at the time of surgery, so those were removed as well.

"Hearing that my cancer was quite aggressive and had a good chance of spreading through my body — I felt fearful, but I didn't go down the rabbit hole of doing too much Google research," he says. "I just put my trust in Dr. Kukreja and Dr. Graham. And I got to a point of acceptance within a couple of weeks."

Two months later, his cancer recurred in his lungs.

"Chemotherapy and surgery all went as well as we could have hoped for, but cancer can be really frustrating," Graham says. "We put Rob on a combination of an immunotherapy and an antibody drug conjugate — a now-standard treatment that was partially the result of a clinical trial we had open here several years ago — and he had a beautiful response."

ASKING FOR HELP

Throughout his initial treatment and his infusions of the two-drug combination every other week, Mahedy continued to reach out for help, primarily through two cancer support groups in Gunnison County: Living Journeys and Gunnison Tough.

"Gunnison Tough started as a breast cancer support organization then expanded. They have a fleet of five vehicles that I use to come down to CU Anschutz, and they'll even pay for hotel or gas," he says. Living Journeys does the same. They'll bring food to your house, they have volunteers who will come and clean your house — these two organizations have been a major source of strength for me."

> *"...there's this whole other inspiration of love and humanity that has helped me cope and have a positive attitude."*
>
> ROB **MAHEDY**

ON THE CLIMB

Mahedy continued to follow his passion for climbing during his treatment, taking a break from the infusions in July 2025 to climb Mount Hayes in Alaska. In preparation, and to practice using his artificial bladder in extreme mountain conditions, he got help from yet another source — famed Colorado climber Eric Larsen, who underwent his own battle with colorectal cancer in 2021.

"He has to give himself enemas to go to the bathroom every morning, using warm water, and I have this freezing issue with my bag when I'm in a tent and it's five below, or maybe even lower," Mahedy says. "I had to figure out how to keep it warm, how to attach it properly so I don't spill, because getting wet can be very dangerous when you're winter camping. So I practiced with Eric, and we were both joking and making fun of ourselves dealing with these bodily fluids."

A few months after that climb, Mahedy got another bout of bad news — scans showed that there were remaining cancer cells in his lungs. Graham prescribed targeted radiation therapy, but first, Mahedy had another climb to make. This one in Nepal.

"I told them I wanted to go over and climb in the Himalayas, and they said that should work out fine," Mahedy remembers. "They said, 'Let's let that tumor grow a little bit.' It was a quarter inch, and they said they had a better chance of hitting with the radiation it if it gets up to half an inch."

So, with his doctors' blessing, Mahedy took another break from the infusions to go to Nepal, where he spent 40 days climbing Ama Dablam.

"I got as high as 21,000 feet, and I felt pretty darn good," he says. "Some people say Ama Dablam is the most beautiful mountain on the planet, and it's highly technical. It's harder than Mount Everest, but it has less people. That's what I like."

Mahedy and the two friends he brought with him were welcomed by the Sherpa community in Nepal; Mahedy also got some unexpected support from a fellow climber from Ireland.

"I met this guy two years ago in Nepal, and he found me on Facebook and said, 'I saw one of your posts, and I got inspired by your story. My company is going to sponsor me to come to Nepal and climb the peak you climbed in 2023 to raise money for cancer research.'

"He said, 'I would love to see you,' and as we were coming down from the mountain, he messaged me and said, 'I flew in from London to Kathmandu, I started hiking last night, and I'm in a little town called Monjo.' And I said, 'Are you kidding me? We just got into Monjo.' We met up and took pictures together. That was a whole loving shot in the arm for me."

CONTINUING TREATMENT AND HELPING OTHERS

After the Nepal trip, Mahedy returned to Colorado and received radiation therapy for the cancer in his lungs. He continues to get infusions of the immunotherapy drug every six weeks — Graham removed the antibody drug conjugate because of its side effects.

Mahedy now works with Living Journeys and Gunnison Tough to help others through their cancer journeys. Once wary of asking for help, he now knows how vital it can be.

"My oncologist in Montrose was very frank with me when I started treatment there," Mahedy says. "He said, 'You have a 40% chance of surviving five years.' So given that diagnosis, I said, 'I'm going to be in that 40%. I'm going to make it and take that attitude and keep living my life and then see what I can do to give back a bit.' There's been this whole transformation in my life of what's important.

"I'm not just surviving," he says. "I think I'm thriving."





MAKING THE INVISIBLE ***VISIBLE***

A new documentary features a neuro-gastroenterologist's second life in art.

By Kara Mason

For most of Jaime Belkind-Gerson's career in medicine, he was keeping a secret.

As a trainee in Boston in the '90s, the pediatric neuro-gastroenterologist, now a professor of pediatrics at the University of Colorado Anschutz School of Medicine, would keep small canvases, paint, and brushes in his backpack. While he was waiting on lab results to return for his patients, he'd lock himself away in a break room and practice his other passion, art.

Belkind-Gerson feared he would face judgment and criticism from colleagues that he could be doing more with the time he spent painting away from medicine.

"I was so scared I'd be found out," Belkind-Gerson, MD, MsC, recalls of those early days. "If I had even the smallest bit of paint under my fingernails, I was scrubbing them so there'd be no trace of my double life."

Keeping his art under wraps was easy to do, but it was harder to keep his passion quiet.

Even when life at the hospital got hectic and Belkind-Gerson stepped away from his art, it would call him back. "The art has to come out eventually," he says.

Now, Belkind-Gerson doesn't have to hide. He has an online presence for his artwork, and he's surrounded by supportive colleagues who see the value in him pursuing his creative passion. After so many years of keeping his two lives separate, they've finally blended together.

Belkind-Gerson's work has been featured in more than 30 art exhibitions, including last year's "Migrants: A Tale of Two Hearts" at the Museo De Las Americas in Denver, and now is the subject of a documentary of the same name, directed by Colorado filmmaker Trevr Merchant.

The film "A Tale of Two Hearts" chronicles Belkind-Gerson's personal journey to bridge science and art despite the pressure and anxiety that often existed between the two.

"My goal was to make a quiet, intimate film that reflects that same tension, showing how art can make the invisible parts of our lives visible," Merchant says in his director's statement.

THE IMMIGRANT EXPERIENCE

Raised by his maternal grandparents who had immigrated to Mexico City from Poland in the 1930s because Ellis Island in New York had stopped accepting newcomers, Belkind-Gerson suspected it would be heartbreaking for them if he pursued art as a career.

"So, I did the second-best thing I could think of," he says. "I became a doctor."

After attending medical school in Mexico, Belkind-Gerson took his training to the U.S. Later, he'd return to Mexico with his wife, who he met in Boston, and their children. For more than a decade, he worked as a physician there, until gang violence sent the family fleeing for safety, again to the U.S. East Coast.

While most of the physician's art represents the human body in some form, he also leans into his experience as an immigrant.

In the exhibition "Migrants: Tale of Two Hearts," Belkind-Gerson turned items left behind near the U.S-Mexico border into sculptures. His art pieces included dolls, pieces of found clothing embedded with memories, such as a wedding dress and intimate apparel, and furniture such as a baby chair, a school desk and children's toys all dipped in porcelain and resin, fossilizing their existence.

"I put a lot of focus on the 'saying goodbye' aspect of migration because you do leave a lot behind," he says of the pieces in the show.

'IT'S MADE ME A BETTER DOCTOR'

A job offer at Children's Hospital Colorado brought Belkind-Gerson and his family to Colorado, where he sees young patients who are desperate for answers about gastrointestinal issues. As a neuro-gastroenterologist, Belkind-Gerson specializes in the brain-gut connection.

While the work is challenging and rewarding, it can also take a mental toll, Belkind-Gerson says. Art helps.

Human form has always been a focus of art, he says, but for most of history artists have concentrated on the outside of the body, Belkind-Gerson likes focusing on the inside.

"I think it's made me a better doctor," Belkind-Gerson says of his art. "It makes me happier and more whole."

His young patients seem to like it, too. Some have admired the art and asked Belkind-Gerson if it's their stomach he painted on the canvas.

"I tell them, 'Well, it's not literally your stomach, but I was thinking about your stomach a lot when I painted it because I want you to feel better,'" he says. "It's therapeutic for me to have this outlet and what I care about so much is helping my patients. It comes out in the art."

"Sometimes my patients have seen multiple other specialists, and they get to me after everything else has failed," he says. "When it's difficult for my patients, it can also be difficult for me."

As a visual artist, Belkind-Gerson sees the beauty in medicine and especially the human body, which is often at the center of his artwork. He describes the body as the "perfect machine," but it's also ever-changing and susceptible to injury and illness.

In his most recent art pieces, he reimagines the human anatomy in metalwork, adapting machinery metal parts he finds and transforms to look reminiscent of human organs and bodies.





> *"It's therapeutic for me to have this outlet and what I care about so much is helping my patients. It comes out in the art."*
>
> JAIME **BELKIND-GERSON,** MD, MSC

A Team Approach to Treating Tremors

Neurosurgeons and neurologists have now performed high-intensity focused ultrasound procedures at CU Anschutz.

By Tayler Shaw

Twelve seconds — that's how long it typically takes for hundreds of ultrasound beams to burn a lesion deep in a patient's brain as they lie awake.

Neurologists and neurosurgeons at the University of Colorado Anschutz School of Medicine collaborate to perform these high-intensity focused ultrasound (HIFU) procedures to reduce involuntary tremors in patients with essential tremor by disrupting the brain's pathways.

Millions of Americans have essential tremor, a neurological condition that causes trembling, often in the hands, when moving. This progressive condition can limit a person's mobility and reduce their quality of life. For some, medications are ineffective at calming these tremors, which can worsen over time. HIFU is a surgical option that aims to immediately reduce a patient's tremors, no incisions needed.



DANIEL **KRAMER,** MD



DREW **KERN,** MD, MS



STEVEN **OJEMANN,** MD

Neurosurgeons Steven Ojemann, MD, and Daniel Kramer, MD, as well as neurologist Drew Kern, MD, MS, of the multidisciplinary CU Anschutz Movement Disorders Center, performed the 100th HIFU case at the UCHealth University of Colorado Hospital this year, a significant milestone in their ongoing mission to help patients through a team-based approach.

"The number is a testament to the fact that we've been able to build a strong collaboration with the institution, with each other and other members of the treatment team, and with patients who are willing to put their trust in us," says Ojemann, director of stereotactic and functional neurosurgery and a professor in the CU Anschutz Department of Neurosurgery.

Kramer, an assistant professor of neurosurgery and co-founder of the Neural Engineering Research and Design of Colorado laboratory at CU Anschutz, adds, "Through a dedicated team, we are able to offer cutting-edge treatments with the expertise of a well-oiled machine."

Delivering the best care possible is what matters most to the treatment team, explains Kern, an associate professor of neurology who specializes in advanced stages of movement disorders, such as essential tremor and Parkinson's disease, that require surgical interventions.

"Neurologists and neurosurgeons plan and perform this procedure together. We're the only center in the world that I'm aware of that does it this way," Kern says. "We've had patients travel from other states to our center because of our team approach. They feel they get a holistic, total evaluation and treatment."

A UNIQUE APPROACH

Many of the everyday movements that people perform — such as drinking a cup of coffee, using utensils to eat food, applying cosmetics, and writing on a piece of paper — can be difficult or nearly impossible for people with essential tremor. Unlike with Parkinson's disease where tremors occur when remaining still, an essential tremor typically occurs when a person is performing a reaching movement.

The condition affects an estimated 1% of the overall population and around 5% of people over the age of 65, Ojemann, Kramer, and Kern explain.

The exact cause of essential tremor is unknown, but it often runs in families. It's most likely a heterogenous disease, meaning there are multiple causes for it, Kern explains.

CLINICAL CARE

While further research is needed, many believe the tremor may stem from abnormal signaling happening in a pathway of the brain called the dentato-rubro-thalamic tract, which goes from the cerebellum (considered the organ of balance) to the ventral intermediate nucleus of the thalamus (the brain's information relay center that processes movement and sensory information).

"We unfortunately cannot treat the underlying disease of essential tremor, partly because it is so poorly understood, but we can treat the symptoms effectively," Kramer says. "Here at CU Anschutz, research in my lab is specifically focused on understanding the functional role of the circuit that results in essential tremor, and we hope to soon have more effective treatments."

Ojemann adds, "Since essential tremor likely has a number of different causes, it's really important for neurologists and neurosurgeons to work together so we can combine our expertise to best understand and treat these nuanced cases."

> *"We've had patients travel from other states to our center because of our team approach. They feel they get a holistic, total evaluation and treatment."*
>
> DREW **KERN**, MD, MS

100 HIFU: Drew Kern, MD, MS, smiles alongside Steven Ojemann, MD, as they celebrate the 100th HIFU case at the UCHealth University of Colorado Hospital. Photo: Makenzie Hardy.



CHOOSING A SURGICAL OPTION

There is no cure for essential tremor, but there are two medications to reduce tremors. It's estimated that these medications can improve tremor severity by about 50%.

However, roughly half of patients who use these medications will still have "disabling symptoms," which is why patients may consider surgical treatments instead. Surgical treatment options can improve tremor severity by roughly 70-90%, Kern explains.

The two surgical options are HIFU, characterized by using ultrasound beams to create a brain lesion, and deep brain stimulation (DBS), where an electrode is implanted into a specific region of the brain to disrupt the pathways causing tremors. The electrode is connected to a battery placed under the skin near the collarbone, similar to a cardiac pacemaker. This generator can be programmed and adjusted to help control tremors.

Unlike DBS, doctors don't make any incisions, and they don't implant any devices into the body for a HIFU procedure. Instead, a patient's head is shaved before Ojemann and Kramer apply local anesthesia above the eyebrows and ears. Then, they pin a head frame to the patient's skull so that an apparatus can be securely placed on their head.

The apparatus is like a hood dryer at a hair salon, Kern explains. It surrounds the patient's head so that ultrasound waves can converge to create heat that will burn brain tissue without causing permanent damage to the skin or skull.

Patients lie awake in an MRI machine with the apparatus on their head as Ojemann, Kramer, and Kern slowly dial up the amount of energy the ultrasound beams deliver.

"It's like a magnifying glass. Heat is generated by focusing hundreds of ultrasound waves at a single site in the brain," Ojemann says. "We essentially destroy a small piece of tissue that is propagating an abnormal rhythm in the brain to interrupt the tremor circuit."



To perform a HIFU procedure, patients will lie awake in an MRI machine.

'STILL GET AWESTRUCK BY IT'

It takes only seconds to create the brain lesion, but countless hours of preparation and collaboration precede the operation to safely and precisely locate the part of the patient's brain that receives the ultrasound beams.

Ojemann, Kramer, Kern, and other members of the treatment team — such as neuroradiologists, neurophysiologists, nurse practitioners, and occupational therapists — carefully review, assess, and consult with patients to determine whether HIFU is an appropriate procedure. Then, neurosurgeons and neurologists work in tandem to create a plan. While this procedure has occasionally been performed to treat tremors in patients with Parkinson's disease, HIFU is primarily used to help patients with essential tremor.

During the procedure, Ojemann, Kramer, and Kern use a gradual approach to ensure they are focused on the correct brain tissue. The MRI machine monitors temperature changes, allowing the doctors to first apply a minimal amount of heat to ensure the ultrasound waves target the right place.

Then, they apply a slightly higher amount of energy that stuns the tissue, causing a temporary effect on the brain. This allows clinicians to see whether there are any negative side effects and evaluate the effectiveness of the treatment in real time. They remove the patient from the MRI machine and have them draw spirals on a piece of paper. These spirals are compared to spirals made pre-procedure to assess if the tremors have lessened.

"We are one of only a few centers that have a movement disorder neurologist like me evaluate the patient during the procedure," Kern says.

If there are no adverse effects and the patient's spiral drawings demonstrate improvement, for 12 seconds at a time, the doctors will increase the temperature of the beams so that they deliver enough energy to permanently destroy the brain tissue. Within a few hours after the procedure, the patient will be able to go home, and they will return to the clinic the next day for a follow-up appointment. Six months later, the doctors will meet with the patient again to make sure the tremor severity is still reduced.

Due to essential tremor being a progressive condition with no cure, the procedure cannot fully prevent tremors from occurring or progressing in the future. However, research has found that there was an average 73% improvement in tremor severity five years after the procedure. On rare occasions, patients may re-develop severe tremors after the procedure. Doctors may consider doing the procedure again to target new brain tissue that is perpetuating the issue.

"When you see a patient's tremors stop, it's almost like a light switch. I'm always impressed with the before and after pictures of the spirals," Ojemann says. "I still get awestruck by it. It's a remarkable thing to have a patient talking to you as you perform this significant intervention to change their brain circuits."

> ***"It's a remarkable thing to have a patient talking to you as you perform this significant intervention to change their brain circuits."***
>
> STEVEN **OJEMANN**, MD

'WHAT MATTERS TO US IS THE PATIENT'

While this procedure has helped many patients, it may not be the right choice for everyone, Kern notes. Although HIFU is commonly presented as a minimally invasive procedure, Kern tells patients that it is invasive given that it involves making a permanent lesion in the brain. There is roughly a 10%-20% risk of experiencing side effects such as balance impairment, speech changes, coordination impairment, and sensory changes, though when these risks occur, patients usually describe them as mild.

Doctors performing HIFU are also only permitted to treat one side of the brain at a time. This means that if a person has essential tremor on both sides of their brain, they will need two separate HIFU procedures, and they will have to wait at least nine months in between the operations.

"We have a lot of pride in the quality of the HIFU treatment we provide, and in the fact that patients are willing to put their trust in us to make a lesion in their brain," Ojemann says. "At our comprehensive center, our objective is to provide the whole spectrum of treatment options to patients and personalize our approach to their needs."

ALUMNI CORNER

MEET MICHAEL CARIUS, MD '73, THE NEW PRESIDENT OF THE CU MEDICAL ALUMNI ASSOCIATION

The University of Colorado Medical Alumni Association is pleased to welcome Michael Carius, MD '73 as president of its Board of Directors, bringing a lifetime of service, leadership, and dedication to medicine to this role.

A graduate of the CU Anschutz School of Medicine, Carius has built a distinguished career in emergency medicine spanning more than four decades. Following medical school, he served in both the U.S. Navy and U.S. Air Force before completing his emergency medicine residency at the University of Southern California. Throughout his career, he has held leadership positions at the state and national levels, including serving as president of both the American College of Emergency Physicians and the Connecticut College of Emergency Physicians. He currently chairs the Board of Directors of the American Board of Medical Specialties.

For Carius, leadership has always been rooted in service Throughout his career, he has championed physician well-being, mentorship, and professional engagement, while remaining committed to caring for patients and supporting colleagues. His first official alumni event as president was the School of Medicine's White Coat Ceremony, where he joined fellow alumni volunteers in welcoming the Class of 2030 and presenting stethoscopes through the CU Medical Alumni Association Stethoscope Fund. The experience served as a powerful reminder of the lasting bond between generations of CU physicians and the important role alumni play in supporting future healthcare leaders.

As he begins his term, Carius looks forward to expanding opportunities for alumni engagement through reunions, mentorship, volunteer service, and philanthropy. His vision is centered on strengthening connections among alumni while creating meaningful pathways to support current students and young physicians.

"The strength of our alumni community comes from staying engaged, supporting one another, and investing in the next generation," Carius says. "Together, we can continue to make a meaningful difference for our school, our students, and our profession".

SUPPORTING THE NEXT GENERATION OF PHYSICIANS

One of the most meaningful ways alumni can make an impact is by helping prepare the next generation of physicians for successful careers in medicine. CU School of Medicine alumni continue to play an essential role in supporting students both inside and outside the classroom.

A key example is the Community Health Action and Mentorship Program (CHAMP), a partnership between the CU Medical Alumni Association and the Medical Student Council. The program empowers students to develop innovative solutions that address pressing health needs across Colorado while strengthening their leadership skills.

This year, students submitted 33 project proposals focused on improving access to care, advancing health education, and reducing disparities in underserved communities. Proposed initiatives addressed a wide range of community needs, from diabetes management and preventive health programs to language-access resources and rural healthcare initiatives. Alumni volunteers serve as mentors throughout the process, providing guidance, professional insight, and feedback that help students refine their ideas and bring projects to life.

Through CHAMP, alumni are supporting individual student projects and helping cultivate the next generation of physician leaders committed to improving the health of Colorado communities. By sharing their expertise and mentorship, alumni strengthen the School of Medicine's mission while inspiring students to become compassionate, community-focused physicians.



INTERESTED IN SERVING AS A CHAMP MENTOR OR LEARNING MORE ABOUT ALUMNI VOLUNTEER OPPORTUNITIES?

Contact Maria Jose Villacis, Associate Director of Alumni Relations, at mariajose.*villacispadilla@cuanschutz.edu*

WELCOMING THE CLASS OF 2030



The CU Anschutz School of Medicine welcomed the Class of 2030 during the annual White Coat Ceremony, a milestone that marks the beginning of each student's medical journey Surrounded by family, friends, faculty, and alumni, students received their white coats and officially joined a tradition of service, professionalism, and compassionate care.

A special highlight of the ceremony was the participation of the CU Medical Alumni Association. Led by newly elected President Michael Carius, MD '73, alumni volunteers Diana Lujan, MD '85; Bruce Waring, MD '87; Mark Robinson, MD '22; Shawnecca Burke, MD (Residency '22); Roy Thompson, MD '83; Mark Goncalves, MD '82; and John Papilion, MD '81 presented stethoscopes to incoming students, a longstanding tradition that connects generations of CU physicians.

More than a gift, the stethoscope serves as a symbol of the support, mentorship, and encouragement alumni provide as students begin their medical education. Through stethoscopes and other engagement initiatives, alumni create meaningful connections across generations while helping prepare future physicians for lives of service, leadership, and compassionate care.

To learn more about giving opportunities, contact: *vanessa.duran@cuanschutz.edu*

SAVE THE DATE - 2026 SILVER & GOLD ALUMNI AWARDS BANQUET

Join us as we celebrate the extraordinary achievements, leadership, and service of CU School of Medicine alumni at the annual Silver & Gold Alumni Awards Banquet.

THURSDAY, NOVEMBER 12, 2026
ANSCHUTZ HEALTH SCIENCES BUILDING - UNIVERSITY OF COLORADO ANSCHUTZ MEDICAL CAMPUS

This year's honorees include:

- **Lois Bookhardt-Murray, MD '84** | Silver & Gold Award
- **John Bell, MD '65** | Richard Krugman Distinguished Service Award
- **Frank Scott, MD (Fellowship '78)** | Distinguished Achievement Award
- **Calvin Wilson, MD '73** | Humanitarian Award
- **Amy Feldman, MD (Fellowship '13)** | Recent Graduate Achievement Award
- **Sarah Axelrath, MD '17** | Recent Graduate Humanitarian Award

We look forward to recognizing these distinguished alumni and celebrating the impact they continue to make in medicine, education, research, and service.

UPCOMING EVENT: 2027 ALL ALUMNI CELEBRATION

Calling all alumni from class years ending in 2 and 7. Plans are underway for the **2027 All Alumni Celebration,** taking place **Thursday, September 23 through Saturday, September 25, 2027,** featuring reunion events, campus activities, and opportunities to reconnect with classmates and the School of Medicine community.

Interested in serving as a Class Champion? Contact Maria Jose Villacis at *mariajose.villacispadilla@cuanschutz.edu*

ENGAGE WITH US

Looking for ways to stay connected and make a difference?
The CU Medical Alumni Association offers opportunities to support students, strengthen alumni connections, and give back to the School of Medicine community.

- Volunteer as a **mentor to students**
- Serve as a **Class Champion**
- Support **student scholarships** and alumni initiatives.
- **Attend alumni events** and reunion celebrations.

To learn more about alumni engagement opportunities, contact:
Maria Jose Villacis, Associate Director of Alumni Relations, at *mariajose.villacispadilla@cuanschutz.edu*

Real Life in 'The Pitt'

Television loves the storylines of the emergency department, but accuracy varies.

By Mark Harden

When Jean Hoffman, MD, was growing up, she watched *ER,* the long-running NBC series about an urban hospital's often-chaotic emergency department. The experience steered her toward a career in emergency medicine.

"I can't believe my parents let me watch that show," Hoffman says with a laugh. "I loved that show, and it was motivating to me. That was my world, and I knew I was meant for it."

ER featured young actor Noah Wyle, who, at the start of the series, was a medical student who almost vomited at the sight of severe trauma. Now, in his mid-50s, Wyle stars as a senior attending physician in *The Pitt*, HBO Max's hit streaming series about an urban hospital's often-chaotic emergency department. In the show's premiere episode, a medical student faints at the sight of severe trauma. (A cynical resident starts calling her "Crash.")

Hoffman – an associate professor in the University of Colorado Anschutz Department of Emergency Medicine, and medical director of the ED at UCHealth University of Colorado Hospital (UCH) – sees a lot to like in the show, which is expected to kick off a new season in 2027. But she would like to have a word with Noah Wyle.

"I would like to invite Noah Wyle to come tour here. Or anybody on the show. My door is always open," she says.

Hoffman wants to show Wyle – who also serves as executive producer of *The Pitt* – that there are big differences between her ED and the one in the show, with a waiting room filled with sick and injured patients waiting hours to see a doctor.

BIG DIFFERENCES

"Our emergency department does not look like that, even though we see an extraordinary number of patients," Hoffman says. "*The Pitt* shows an antiquated way of how you operate an ED. We have done highly innovative things to get care to patients quickly, so we don't have a waiting room full of people and total chaos."

First and foremost, she says, "We eliminated nurse triage" – a system in which a nurse sets a care priority for incoming patients after asking questions to assess the severity of their condition.

This change was part of a broader, nurse-driven redesign of the department's front-end intake process, with ED nurses identifying that their expertise had the greatest impact at the bedside while earlier team-based assessments supported more timely evaluation and care. Several recent studies have shown that traditional triage models can result in incorrect triage decisions and treatment delays.

"We have medics and doctors see you immediately," Hoffman says. "We don't have someone going through first and asking, 'What did you have for lunch? Do you have any allergies?' We're going to ask, 'Why are you here?' And you say, "Chest pain,' and we say, 'That's an emergency. We're going to get you seen by a doctor.'



JEAN **HOFFMAN,** MD

"That's probably the biggest difference here from the show," she adds. "We're getting people what they came for, which is getting their medical emergency treated quickly. If you get people in front of a physician quickly and get them what they need, they don't need to sit in the waiting room for 12 hours to get their asthma inhaler refilled."

A FOCUS ON BOARDING

Characters in *The Pitt* complain about "boarding" – admitted patients who must wait in the ED for long periods because no inpatient beds are available in the hospital.

"We have boarding sometimes, and I do love that the show brings that issue to the forefront as a problem in hospitals," Hoffman says. "No one is immune to it because the number of hospital beds per patient is decreasing in this country. But we do not experience that to the extent they show in *The Pitt* because we have excellent hospital throughput," meaning that UCH focuses on moving patients efficiently through their care journey by optimizing staffing, bed management, communication, and other factors.

Hoffman hopes the series' scenes of a packed waiting room don't scare people who need to come to an ED. "I'm not saying we're perfect. Sometimes you're going to wait. But I think we do a really good job at all levels of personnel and processes to make sure we take care of people as soon as possible."

In *The Pitt,* the ED staff seems resigned to the chaos and dysfunction that surrounds them. Not so at UCH's ED, says Hoffman, where her colleagues feel they have agency to identify problems and find ways to improve processes. "I don't want people to think that we are victims who are doing nothing about any problems that come up," she says.



Photo: Warrick Page/HBO Max

Also, as an ED administrator, Hoffman doesn't relish the show's depiction of hospital managers "as the source of all evil, when all of us are just trying to make things better. We're not trying to inflict misery; we're trying to get the patients the care they need."

'GIVING US A PLATFORM'

One of the things *The Pitt* gets right, Hoffman says, is the medicine, including the jargon used and how providers treat patients. She notes that Joe Sachs, MD, FACEP, one of the series' executive producers and writers, is also an emergency physician, lending authenticity to its scripts.

The series is valuable in focusing on provider stress and burnout under trying conditions, she says.

> ***The show does an excellent job of bringing the providers' stories to light and showing how hard it can be.***
>
> JEAN **HOFFMAN,** MD

"During COVID, we were heroes. People were thanking us, and it felt good. After COVID, it's been a beat down. I can't put my finger on why, but it's hard. We see a lot of death, destruction, and darkness every single day. That can take a toll, and we work to ensure that all our medical providers feel supported. The show does an excellent job of bringing the providers' stories to light and showing how hard it can be."

Hoffman also credits *The Pitt* and its popularity for "giving us a platform to have this discussion about how we can do things better in EDs, about things we've been saying for a long time. Emergency departments are the canary in the coal mine of health care."

Hoffman says she has worked before in EDs that were more like the one in *The Pitt*. "A lot of the operational things we do here, if they were implemented elsewhere, would help mitigate some of those issues," she says. "I love that *The Pitt* has highlighted problems in emergency medicine. What I don't love is that it doesn't highlight places that are doing a good job and have found solutions to some of these systemic issues."

What do Hoffman's emergency-medicine colleagues think of the show? "Most of them don't watch it," she says with a grin. "There are two camps. One is people who don't want to go home and watch it because that's what they did all day. The other is people who share some of my criticisms of the show. I don't know any ED doctors who have watched the whole thing."

Changing Student Lives

Anschutz

Easing financial burdens for medical students is a top priority of the CU Anschutz Medical Alumni Association (MAA). Through the Scholarship Endowment, scholars receive not only crucial monetary aid, but the peace of mind that allows them to focus fully on their education. Thanks to a $20,000 matching opportunity from two MAA alumni, there is now a chance to help the Scholarship Endowment's support go even further.

To change more student lives, visit **giving.cu.edu**, scan the QR code or contact **Vanessa Duran** at **vanessa.duran@cuanschutz.edu** or **303-724-2518**.



I owe much of my professional success to my training at the CU Anschutz School of Medicine. Just before graduating in 1982, I did not have enough money to pay for my final tuition installment or travel to start my medical internship. Having already borrowed a significant amount in student loans, my options were limited. That experience made me want to help other students facing the same financial difficulties.

Robert Rigg, MD | Class of 1982
Family Practice Physician and Member of the MAA Board of Directors