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Cover photo: Hillary Yaffe, MD, donated a portion of her liver to save her father's life. Now, she's training with her surgeons.

Photos by Trevr Merchant

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is published twice a year by the University of Colorado 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.
As the state’s only allopathic medical school and based on one of the country’s premier academic medical centers, the University of Colorado School of Medicine continually demonstrates a substantial commitment to all who need the best medical care.

This past year has been filled with significant achievements, particularly in our efforts to provide clinical care to underserved and economically disadvantaged patients.

Last year, our faculty provided care to more than 141,000 patients who depend on Medicaid, a 12 percent increase over the prior year. It’s particularly notable that our Medicaid patient population went up at a time when the number of people served by the state’s Medicaid population decreased. That total number who received care doesn’t count Medicaid patients seeking emergency-room care where they must be served.

Our partner hospitals on the Anschutz Medical Campus are also the largest providers of care to Medicaid patients. UCHealth reported that its network of hospitals, which includes the University of Colorado Hospital on our campus, provided care for 285,000 patients in 2018, a number that has more than doubled since 2013. Children’s Hospital Colorado’s patient population consistently averages 50 percent Medicaid.

Our School is committed to serving everyone in our community and there are multiple ways we are working expand the availability of high-quality medical care to all residents of Colorado.

In partnership with Salud Family Health Centers, the School of Medicine is developing a location in Aurora to help reach families who need primary care. At least 80,000 Medicaid recipients in Aurora don’t have access to reliable primary care and we seek to help them find the care they deserve.

With Salud, we are developing the Aurora Community Health Commons to provide a full spectrum of primary medical care, dental care, and behavioral health services. We also plan to address social determinants of health through other functions and services at the site, including vocational training and a community urban farm.

It’s our belief that if we meet that need of this patient population, we will not only help them improve their health, but we’ll reduce their need for acute care services, and emergency room visits and unneeded hospitalizations will be prevented.

Working closely with state officials, the School has embarked on a plan to expand access to specialty care and to mental and behavioral health care. Through telemedicine efforts, we have extended our reach to all corners of the state.

Working with state legislators, the School is seeking state financial support for the rural track training program. By providing this funding, through scholarships and support for our training programming, the state can provide incentives to young physicians who want to live in less populous communities across the state.

We take our commitment to serve the whole community seriously. As we strive for breakthrough treatments and excellence in care and education, we are extending our reach to ensure that the best care is available to all.

With warm regards,

John J. Reilly, Jr., MD
Richard D. Krugman Endowed Chair
Dean, School of Medicine
Vice Chancellor for Health Affairs
University of Colorado
IN THE NEWS

Reporters locally and nationally turn to the School of Medicine for expertise and research news. Here are examples from near and far.

Jessica Cataldi, MD, assistant professor of pediatrics, discussed the importance of vaccination in a February report in the Denver Business Journal. In a study she wrote a study for Children's Hospital Colorado and the Colorado Children's Immunization Coalition, she found that Colorado residents spent $55 million on vaccine-preventable diseases in 2017. “When families vaccinate, they protect their children and our communities against preventable illness. Improving vaccination rates will help to prevent unnecessary personal and economic costs, hospitalizations and even death.”

Helen L. Coons, PhD, associate professor of psychiatry and clinical director of the department’s Women’s Behavioral Health and Wellness Service Line, offered perspective regarding miscarriage in a November report on National Public Radio. Coons noted that Michelle Obama’s disclosure in her autobiography that she had had miscarriage made it possible for other families to cope with grief from their own loss.

Kenneth Tyler, MD, professor and chair of the Department of Neurology, in October addressed the Centers for Disease Control and Prevention’s slow response to a polio-like disease that has struck hundreds of children of over the past six years. “This is the CDC’s job,” Tyler told CNN. “This is what they’re supposed to do well. And it’s a source of frustration to many of us that they’re apparently not doing these things.”

Sarah M. Perman, MD, assistant professor of emergency medicine, was quoted in the New York Post in November about her research into the reasons bystanders are less likely to perform CPR on women than men. Reasons included concerns about inappropriate touching and misconceptions that CPR is more difficult to perform on women. “While these are actual fears the public holds, it is important to realize that CPR is lifesaving and should be rendered to collapsed individuals regardless of gender, race or ethnicity,” she said.

Sukumar Vijayaraghavan, PhD, professor of physiology and biophysics and director of the Neuroscience Graduate Program, in November discussed with Colorado Public Radio the experiments created by scientists from the Anschutz Medical Campus for a grade school in Erie, Colorado. One such experiment called for wearing prism goggles while throwing a ball into a basket. “But what you also learn is that while you keep doing that, the brain will adapt and actually get you to the right place after a few trials,” he says. “So the idea that the brain is plastic and the brain can be trained to do stuff.”

Matthew Greenhawt, MD, associate professor of pediatrics, was quoted in a November report in Travel + Leisure magazine about a new airline policy allowing early boarding for travelers with nut allergies. “One of the more common misperceptions we deal with is worst case that peanut dust will somehow aerosolize,” he said. “Look, if you have a peanut allergy, you absolutely can fly and do it safely. I see too many families that often don’t go on a vacation because they’re scared to fly. It’s robbing them of the opportunity to live their lives.”

Emmy Betz, MD, associate professor of emergency medicine, discussed gun safety with National Public Radio in November. She suggested that families draw up a firearms agreement. The conversation could include questions like “Who do you want to be the one to say, ‘I think it’s time’? Who do you want to give [your guns] to? Is it your family member? Is it Joe down at the gun club? So that you’re still the one making the decision. Even if when the time comes, you’re not aware of what’s happening.”

Robin Deterding, MD, professor of pediatrics, compared the youth vaping epidemic to a “hurricane come upon us” in a February article in the Colorado Sun. “I have never seen anything like it in the time I’ve practiced,” she said about Colorado having the highest youth vaping rate in the country. “It’s unprecedented. These flavors and these clouds of smoke! They think they’re fun.”

Kevin Messcar, MD, assistant professor of pediatrics, told the Washington Post in November that the one intervention shown to offer benefits to all patients with acute flaccid myelitis is extensive physical therapy. Other than that, “we still don’t have good evidence on what is most effective.”

Elizabeth Pomfret, MD, PhD, professor of surgery and chief of transplant surgery, discussed a woman who made history by becoming the first-ever altruistic liver donor at UCHealth University of Colorado Hospital. “It’s a big commitment,” she said in an interview on the Denver-based ABC affiliate. “It’s a big operation. She is the perfect donor. She’s young, she’s healthy, she’s in great shape.”

Peter Forsberg, MD, assistant professor of medicine, was quoted in November on the Denver CBS affiliate in a report about treating a patient who considered it a good omen to be treated by the namesake of their favorite Colorado Avalanche player. “He and [his wife] are hockey fans and they thought this was just the coolest thing that the new doctor was going to be Peter Forsberg.”
Christine D. Jones, MD, assistant professor of medicine, was quoted in UPI regarding her study that found that more than half of home health workers don’t have enough information to properly care for patients. “We have heard of medication errors occurring between hospitals and home health care providers,” she said. “As a result, patients can receive the wrong medication or the wrong dose. Some home health providers don’t get accurate information about how long to leave a urinary catheter or intravenous line in.”

Emmy Betz, MD, MPH, associate professor of emergency medicine, was featured in a November report on National Public Radio about how gun shops are working with physicians to promote gun safety. “If you want to reduce suicide deaths, you have to talk about firearms,” she said. “And if you want to reduce firearm deaths, you have to talk about suicide.”

Thomas Finger, PhD, professor of cell and developmental biology, explained on WHYY, public radio station in Philadelphia, the appeal of fizzy drinks. “The perception we get from drinking a carbonated drink is actually quite complicated,” he said in December. “We would call it conversationally taste, but really the word taste is itself hiding some complicated biology.”

Steven Berkowitz, MD, visiting professor of psychiatry, served as an expert for a report on CNN about police handling of rape kits related to crimes against children. In column posted on CNN’s website in December, Berkowitz and a co-author wrote, “Based on our review of the documents provided by CNN, it appeared that destruction of this evidence was not the result of malevolence, but systemic issues facing law enforcement and the courts.”

Aaron Lazarowitz, MD, assistant professor of obstetrics and gynecology, explained to Reuters in March that his research findings suggested that a particular genetic variation could have an impact on the effectiveness of birth control pills. “If a woman came in and said she was taking birth control and got pregnant we assumed she did something wrong, missed a pill or wasn’t using the method like she was supposed to,” he said. “We need to believe the patient and to understand that there are other things outside of her control, like genetics, that could cause birth control to fail.”

Terry Fry, MD, visiting professor of pediatrics, was interviewed in December by the Denver affiliate of Fox to describe the CAR-T therapy provided to a patient diagnosed with lymphoma whose cancer went into remission. “We remove T-cells or immune cells from the patients and we genetically modify them. So we reeducate them to see the tumor and then we reinfuse those cells back into patients,” he said.

Lilia Cervantes, MD, associate professor of medicine, discussed with Reuters her research on providing scheduled dialysis for undocumented immigrants with kidney failure, rather than the emergency-only care provided in most states. Her studies have shown that scheduled care reduces suffering and costs less. “Given the collective research on this issue, there’s enough evidence to suggest that providing access to care for this community makes sense, whichever perspective you come from,” she said.

Mitchell Cohen, MD, professor of surgery and director of surgery at Denver Health, was interviewed in January by the Denver Post about the hospital’s care for two police officers who were shot in a standoff with a gunman. The officers had sustained “serious life-threatening injuries,” but they were both recovering due to the care they received. Cohen said he and his team are honored “when we’re called on to take care of Denver’s finest. We feel lucky to do that.”

Sam Wang, MD, assistant professor of pediatrics, discussed with CNN his research on unintentional exposures to marijuana in children. “The concerns with marijuana edibles are, they are attractive and palatable to children and can contain high amounts of THC,” he said in February. “When young children consume them, they can result in severe symptoms, including dizziness, excessive sleepiness and, in rare circumstances, impair their breathing.”

Sean T. O’Leary, MD, associate professor of pediatrics, was quoted in The New York Times in March explaining the difficulty of challenging myths about vaccines. “Debunking a myth is tricky,” he said. When you repeat the myth, he said, “you risk reinforcing it. All that parents remember about your complicated explanation about why vaccines don’t cause autism is that they’re somehow linked. So pediatricians should focus on the diseases we’re trying to prevent and if you have to address a myth, be clear that’s exactly what it is.”
Hillary Lum, MD, PhD, was at the bedside of both her grandmother and grandfather as they took final breaths following illnesses and after only a relatively brief time in hospice care. The experience has shaped her passion as a physician and researcher who is dedicated to caring for frail, older adults.

“As a primary care geriatrician, I have the privilege of supporting patients and families as they seek medical treatment while desiring to remain as independent as possible, adapting to changes related to dementia and other illnesses, and experiencing the final days of their lives,” said Lum, an assistant professor in the Division of Geriatric Medicine, Department of Medicine at the University of Colorado School of Medicine. She also is a physician investigator at the Geriatric Research Education and Clinical Center (GRECC) at the VA Eastern Colorado Health Care System.

“I am particularly motivated to provide the best possible care to older adults with serious illnesses by integrating my research, teaching, and community outreach efforts to address the needs of this vulnerable population.”

Lum conducts research to improve advance care planning for older adults and their family members that also will lead to health care system, local, state, and national policies to promote effective advance care planning processes. Her current research focuses on new models of care, including where advance care planning is discussed in a group setting.

In 2018, she was honored with the Department of Medicine Rising Star Award, which recognizes outstanding early career faculty members who exemplify the department’s core values of excellence in patient care, research, education, and community service.

Lum joined CU in 2011 and completed her Geriatric Medicine and Palliative Medicine fellowships at the university.

Away from work, she enjoys walking her two dogs, hiking, crocheting, and traveling. “Despite being from the upper Midwest, I have readily adjusted to 300-plus days of sunshine and mild winters.”

Much of your research deals with advance care planning. First, what does this entail? How is this different from what other medical/aging experts have advocated?

As a society, we don’t like talking about getting sick, growing older, living with disability, loss of independence, or death. Yet these things are part of the human experience, and in the United States, the potential for living longer with dementia or disability is arguably increasing. More than two-thirds of us will need someone to speak on our behalf if an end-of-life decision needs to be made.

Advance care planning is a process that supports adults in understanding and sharing their personal values, life goals, and preferences regarding future medical care. In lay terms, I want to make it easier for people to think about and talk about what matters to them related to future care before a medical crisis and the loss of the ability to speak for themselves.

My emphasis for advance care planning education and discussions is on primary care and community settings. Too often, future medical planning is only discussed with a lawyer and may not include considerations of the person’s medical and social situation. Additionally, medical decision-making may only happen in emergency settings or in the intensive care unit. These situations often leave out important topics, preferences, and family or close friends. With advance care planning, patients and their family and doctors can have multiple conversations over time, update advance directives, and make sure that information is known to all parties, as well as being available in the medical record.

Your efforts, in part, focus on respecting patient values. What does that mean in terms of medical care?

Individuals are the experts in their experiences, needs, and short- and long-term life goals. My goals in the advance care planning programs and tools that I design are to make it easier for people to think about what they want and to share those preferences. Once people know what is important to them, I work with colleagues to help the health system be more aware of those choices. This can involve education at the medical student, resident, and staff levels, as well as improving resources in the electronic health record so that advance directives are readily available. When health care teams focus on identifying what the patient has discussed about their future medical care, having that information in mind can help with in-the-moment decision making about current medical treatments.

As you transition some of your successful research results into the clinical setting, what tools do you use and how do they work? It’s very important to me to provide different advance care planning resources and processes to individuals outside of the clinic visit and the hospital.
Funded by the Colorado Health Foundation, and working closely with UCHealth, we launched first-of-their-kind advance care planning tools into My Health Connection, which is the patient portal of UCHealth. Our system now gives patients the opportunities to fill out a legal advance directive called the Medical Durable Power of Attorney through the secure online system that is linked to the electronic health record. Since July 2017, we’ve had more than 3,500 patients use these tools. I’m very fortunate that I have ongoing input from lots of patients into how we should design and update these tools so that they are most helpful to the people using them.

I’m also part of several community groups that wondered why Colorado didn’t have easy-to-find resources for advance care planning. Thus, to increase community-based education for all Coloradans related to future medical care planning, I developed Colorado’s first free, public awareness website for advance care planning. The website was launched in July 2018. I love connecting with community members about their advance care planning needs, including providing [www.ColoradoCarePlanning.org](http://www.ColoradoCarePlanning.org) as a user-friendly, accessible resource.

As part of the Denver Hospice-University of Colorado community-academic partnership, we are training community laypersons in communication skills to help discuss future medical planning among friends, family, and peers. Volunteers have been an extremely helpful part of my clinical and research work. Thus, our ACP Community Guide Certification Program is a free opportunity for individuals who want to be more comfortable talking about values and preferences that are important in the setting of serious illness.

One of the models you are researching is an Advance Care Planning Group Visit, called the ENgaging in Advance Care planning Talks (ENACT) Group Visit Model. What is this and how is it beneficial?

The ENACT group visit model provides a helpful way for a group of patients to meet with a medical practitioner and a social worker to learn and discuss their questions and next steps about advance care planning. We are doing these in primary care clinics at UCHealth.

In these groups, facilitators encourage patients to ask and answer questions, resulting in peer-based learning. Discussions include a wide range of topics and allow diverse perspectives and personal challenges to be shared. One patient gave us feedback on the group, stating: “I’m a little more sure now what I want and so by having this discussion group, it solved a lot of my concerns, a lot of my wondering about different things. I just feel more confident in what I want now.”

The magic of the group visit is the group dynamic. One patient talked about the value of the group, saying: “The different experiences that each one expressed . . . put me at ease to realize that there are people out there who have the same thoughts as I do, and they are in the same situation that I am in where their loved ones cannot bear talking about the subject . . . It gave me more encouragement to find a way to encourage my loved ones to listen to what I have to say.”

We’re currently testing the group visit compared to mailing advance care planning materials to a group of control patients in a study funded by the National Institute on Aging and American Federation for Aging Research. Once we have these results, our next steps will be to study how to implement and spread this model to other practices.

What is the most important thing you learned from patients?

I love creating space or setting the stage for these types of discussions, which encourage so many people to share their own individual stories. I have the privilege of hearing what their experience has been, and often the peace of mind they have from hearing the values and preferences of loved ones during their end-of-life period.

Patients, family members, and community partners also frequently remind me of the fact that advance care planning is a “medical term.” I am continually working to listen well to their concerns, the words they use, and what is most important to them to talk about.

“I am particularly motivated to provide the best possible care to older adults with serious illnesses by integrating my research, teaching, and community outreach efforts to address the needs of this vulnerable population.”
Hillary Yaffe, MD, is one of a kind: a living liver donor training to become a transplant surgeon with the doctors who performed the surgery.

Even more remarkable is that Yaffe donated a portion of her liver to save her father's life.

It was 2008 when Yaffe, a medical student at the time, provided a portion of her liver that was transplanted into her father to replace his diseased liver, which was failing due to primary sclerosing cholangitis.

Elizabeth Pomfret, MD, PhD, and James Pomposelli, MD, PhD, were the transplant surgeons leading the team that performed the surgeries. Now, a decade later, they are mentors to their former patient.

“I don’t think there’s another one like this,” Pomfret said. “I think there have been different people who have had surgeries or might even have been donors and then went into medicine, but I don’t really know of another story like this.”

Pomfret and Pomposelli were faculty at Tufts University School of Medicine and surgeons at the Lahey Clinic when they met Yaffe.

“I remember her just sitting there and she was very confident that this was all going to work out and she was going to be a donor for her father and I thought, ‘Good for you,’” said Pomfret, who is now professor of surgery and chief of transplant surgery for the CU School of Medicine.

Yaffe, who grew up in Worcester, Mass., came to meet Pomfret and Pomposelli in Boston because they were at the leading transplant center in the U.S. at the time.

“She’s this teeny little thing and I remember her walking into my office and thinking there is no way this girl is going to have a liver big enough for her father,” Pomfret said.

It’s not that Yaffe’s father, Alan, was a particularly large guy. It’s just that the donor needs to be big enough to donate a portion of liver that meets certain standards. Pomposelli said that a liver graft needs to be 1 percent of the recipient’s body weight.

“So if he weighed 155 pounds, then we’d like 1.55 pounds of liver,” Pomposelli said. “The question is, can your donor give that? It’s harder to go female to male for that reason.”

Yaffe aced that test.

“I had more than enough,” Yaffe said. “I met the requirement and then when they weighed the graft when it came out, there was more than they expected based on the imaging.”

For all her confidence, though, she acknowledged that the standard was her primary concern.

“The thing I was most worried about was would I have enough liver tissue because that’s kind of an absolute. You either have it or you don’t. It’s not a matter of what your level of commitment is, how much you want to do this, how scared you are. If you don’t have enough tissue, you can’t be a donor to that particular person. This was the hurdle we had to surpass.”

Yaffe also passed third-party medical evaluations and psychiatric and social work checks that are required before making the donation.

“When we started the evaluation, when he was first diagnosed, I was in graduate school doing my Masters in Medical Science,” Yaffe said. “It was about two years later, when he was really seriously being considered for liver transplant that I underwent the living donor workup. We did that over the course of a few months while I was still working in Boston. And then I went to medical school in Israel with the plan that the following summer would be our transplant date.”

Yaffe attended the Sackler School of Medicine New York State/American Program at Tel Aviv University.

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**FROM LIVING DONOR TO TRANSPLANT SURGEON**

**CU surgery fellow trains with the physicians who saved her dad**

By Mark Couch

Hillary Yaffe and her father, Alan, dancing at her wedding in 2010. He picked “I’ve Got You Under My Skin” for the father-daughter dance. Photo courtesy Hillary Yaffe.
I went to medical school in the summer of 2007 and then in 2008 my parents picked me up at the airport on the 19th of July. We went right from Logan Airport to the Lahey Clinic so that I could give them a unit of blood that they would hold for me. On July 23rd, we were transplanted.

To minimize the disruption to her medical school training, the transplant occurred over the summer recess.

“I went back to school just about a week late,” Yaffe said. “We had six weeks of recovery before I flew back to school in Israel. We timed it correctly. They were very accommodating, Drs. Pomfret and Pomposelli. They were very understanding that we had this window and that I was going to school out of the country, so I needed to have it happen as early as possible in the summer.”

Yaffe, like most medical students, was focused on her studies and particularly determined to stay on track toward her career goal. She had decided as a high school senior that she wanted to become a physician and spent a year shadowing a neurosurgeon at the University of Massachusetts Medical Center in Worcester.

“I spent about the next 10 years wanting to be a neurosurgeon,” Yaffe said. “During the first year of medical school, I did research in neurosurgery; I did research in neurology in grad school. And even a year after the transplant, I was still pursuing neurosurgery, which is what I thought my top interest was.”

The experience of being a living liver donor, though, prompted a reassessment.

“I was back in the United States doing a follow-up appointment with Dr. Pomfret,” Yaffe said, “and I was sitting in her office waiting for her to come in, on the exam table, thinking about life, and it just really hit me. I’m not supposed to be a neurosurgeon, I’m supposed to be a transplant surgeon.”

Her friends already knew. Calling her best friend from college, Yaffe told her about the new career direction. “And she said, ‘We were waiting for you to realize that,’” Yaffe recalled. “She said everyone had figured that out a year ago, and that they were waiting for when I was going to figure that out.”

Pomfret also remembered Yaffe’s eureka moment.

“I remember she wanted to be a neurosurgeon,” Pomfret said. “And then all of the sudden, she said, ‘I’ve decided I’m going to do transplant surgery.’ And I said, ‘You know, you still have to complete five years of general surgery before you can do transplant surgery.’

The path to become a transplant surgeon is lengthy – medical school, residency, and fellowship. It can take 11 to 14 years. It’s an experience that Yaffe’s mentors, Pomfret and Pomposelli, had already traveled themselves with their own remarkable story.
“We were high school sweethearts,” Pomposelli said. “We met on the school bus,” Pomfret said.

They went to medical school at Boston University, getting married in their final year. Then came the couple’s match for surgery residency, “which means we both get in or both don’t,” Pomposelli said. They matched at the Deaconess Hospital in Boston and were even featured on the cover of the Boston Herald newspaper with the tabloid blaring in its headline “Love Match” for an article about residency announcements.

Because of their expert care for her family, Yaffe’s bond with Pomfret and Pomposelli was strong. She was determined to train with them after completing her general surgery residency at the Albert Einstein College of Medicine/Montefiore Medical Center in New York.

“I decided I’m going to follow them,” Yaffe said. “At the time, they were still at the Lahey in Boston. My family is in Massachusetts, so this seemed like a logical decision to go back to Massachusetts.”

Pomfret and Pomposelli were recruited to CU School of Medicine in 2016.

“My fellowship application cycle started in the fall of 2016, so I had to make some decisions and I started thinking about coming here,” Yaffe said. “I had only been here once in my lifetime in 1994. I came out here to learn to ski with my uncle. I decided it’s literally a one in a million chance, even more, even riskier odds. It’s a once in a lifetime chance to train with the surgeons who operated on you.”

Other transplant fellowship program directors were interested in Yaffe, but they expected Pomfret and Pomposelli had first dibs.

“Every time we would go to a meeting with all of our colleagues – you know, transplant’s a small community – they would all say, ‘Well, the best applicant is Hillary Yaffe, but I’m assuming that you’re taking her because she told us she wants to train with you.’ And I’d say, ‘You’ve assumed correctly. Yes, I’m taking her.”

The dance between applicants and fellowship program directors is delicate, though. Personal choices inevitably factor into the decisions. Yaffe’s husband, Matthew Harris, MD, is a pediatric emergency medicine physician who would need to transition his clinical practice and research interests to a new institution after having established a well-respected and prolific early career within the Northwell health system in New York. They have 5-year-old twins, Ayelet and Benjamin, who had benefitted from growing up close to family.

“She was a top applicant,” Pomfret said. “She really was. So she came out to her interview here and I said, ‘I’m assuming you want to stay in New York or on the East Coast, so that you’re close to your parents, and she was like, ‘No, I want to train here.’”

“She told me that I have to close the circle on this,” Pomposelli said. Yaffe’s two-year fellowship began in August 2018 and she’s been working constantly since arriving. The hours in transplant surgery are frequently unpredictable and the shifts in the wards and operating rooms can be long. But it’s all worth it, Yaffe said.

“I want to give back to the community that helped my Dad,” Yaffe said. “We have a lot to be grateful for, that this procedure exists and these people exist, and in general, that organ donation exists, because this really gives families a second chance.”

In 2018, Hillary Yaffe came to the University of Colorado School of Medicine and the Division of Transplant Surgery as a fellow in the Transplant Fellowship Program, where she trains with the surgeons who performed the living donor surgery on her and her father, James Pomposelli, MD, PhD, Hillary Yaffe, MD, and Elizabeth Pomfret, MD, PhD.
The day before Joel Rutstein planned to leave for a week-long trip to Hawaii with his wife, Barbara, and their grown children, an oncologist in Fort Collins gave Joel bad news.

In the course of his annual checkup, Joel's physician noticed a trend of declining hemoglobin in his blood and referred him to an oncologist for a bone marrow biopsy. Joel learned the result that day before Hawaii.

“I said, Barbara, I think I just got a death sentence,” Joel says. “The oncologist said it was very bad and that I probably wasn’t going to live.”

They went to Hawaii anyway and Joel and Barbara agree: It was not their best vacation.

Joel's biopsy showed he had a malignant condition called myelodysplastic syndrome, or MDS. In Joel's form of MDS, blood-forming cells in bone marrow had mutated so that instead of making healthy blood cells, they were making dangerous, immature blood cells, called blasts, which were accumulating in his blood. If Joel's bone marrow passed 20 percent blasts, he would technically no longer have MDS. He would have acute myeloid leukemia (AML).

For patients under age 60, treatment for AML includes chemotherapy and, if needed, bone marrow transplant. Patients over age 60 are often unable to withstand such aggressive treatment. Despite being unusually fit – Joel swims most days at the noon-hour faculty and staff fitness program at Colorado State University, where he spent his career overseeing the library system – his age made him an imperfect candidate for treatment.

“When I was diagnosed, we heard about other people we know who had MDS,” Joel says. “One of them was a woman my brother knew, whom we had met, who was living in the Boston area. She started getting chemotherapy. Her MDS morphed into leukemia and she eventually died.”

The problem is that MDS and AML are conditions caused not just by cancer cells, but by cancer stem cells. Chemotherapy kills run-of-the-mill cancer cells, but it is almost completely useless against cancer stem cells.

Once Joel's MDS progressed to AML, his prognosis would be poor, with survival likely measured in months. Thus his oncologist's pessimism.

But south on I-25, on the Anschutz Medical Campus, a treatment program had grown up from groundbreaking research targeting cancer stem cells that create MDS and eventually AML.

“My story isn’t a real exciting one. There’s no car chase, no femme fatale. I don’t know why I happened to get diagnosed when I did or why this treatment happened to come around when it did. I just know that if I weren’t on this drug program, I wouldn’t be here.”

**THE SCIENCE OF LEUKEMIA STEM CELLS**

“People had been talking about the idea of leukemia stem cells (LSCs) since the 1950s. In the mid-1990s, they finally found them,” says Craig T. Jordan, PhD, investigator at CU Cancer Center, chief of the Division of Hematology and the Nancy Carroll Allen Professor of Hematology.

At that time, Jordan, who had completed school and training at Berkeley, Princeton, and M.I.T., had just taken his first independent research position as an assistant professor at the University of Kentucky. His previous studies had focused on normal blood-forming stem cells, or HSCs. Now, Jordan was intrigued by LSCs, and he shifted his research to focus on understanding and eradicating these cells.
What is an LSC? Think of it like an HSC with a pirate’s eye patch – if you can recognize the eye patch, you can distinguish beneficial HSCs from dangerous LSCs. In the year 2000, Jordan found it – an “eye patch” in the form of a cell-surface protein called CD123. LSCs coat themselves with CD123. HSCs don’t.

“That gave us the ability to separate normal HSCs from leukemia stem cells. Once you can separate them, you can study the differences between them,” Jordan says.

Jordan started looking for the LSC Achilles’ heel. He was seeking not only a difference like CD123, which marked LSCs as distinct from HSCs, but a difference that LSCs needed to live. Such a difference could then be targeted with drugs that would kill them.

It turned out to be surprisingly easy to find differences between HSCs and LSCs. There were literally hundreds of them, creating a new problem. Stem cells within one leukemia proved to be incredibly diverse, and there seemed to be no common difference.

“We found lots of things that were different and lots of ways to kill them, but few ways to kill all of them,” Jordan says. “If you kill 99 percent of the LSCs driving a leukemia, you can knock the disease down temporarily, but that little bit’s always going to grow back.”

In order to attack all LSCs, Jordan needed to find the common weakness shared by all of these cells and not also shared by the HSCs, which he didn’t want to kill.

“It turns out that the most common weakness of LSCs is how these cells make energy,” Jordan says. “The way leukemia stem cells make energy is different than how normal stem cells make energy. And we found that a drug called venetoclax stops them from making energy in this way, without harming the mechanism that normal stem cells use to make energy.”

ENTER THE DOCTORS

While Jordan was picking apart the science of LSCs, Daniel Pollyea, MD, was a hematology fellow at Stanford University.

“Fellows had to present journal articles at a weekly meeting, where faculty enjoyed grilling the presenter to ensure he/she understood the paper,” Pollyea says. “When it was my turn, the paper I chose happened to be from the lab of Craig Jordan, describing a new therapy he was developing to target leukemia stem cells. Over the course of my preparation I learned that paper very well, and starting then, became fascinated with the biology of leukemia stem cells and the potential to target them in the clinic.”

After Pollyea finished his fellowship, he accepted a position as junior faculty at CU Cancer Center. He was soon followed by Clay Smith, MD, an established leader in the study of blood stem cells, who was recruited as program director of CU’s Blood Cancer and Bone Marrow Transplant program.

“There were a couple of important reasons I came to CU,” Jordan says. “The first was the opportunity to build a program with Clay Smith, whom I had known for 20 years. The second big reason I chose CU was the opportunity to work with Dan Pollyea. It was clear from the first time we met that he would be a great partner in developing novel AML therapies.”

In the subsequent five years, Jordan, Pollyea, and Smith have built a program targeting the leukemia stem cells at the root of blood cancers.

“We’ve had an extraordinary partnership,” Jordan says. “Me in the lab, and Dan and Clay in the clinic. We live in each other’s worlds as closely as we can. That’s allowed us to do really deeply integrated research. We do things in the lab that are informed by the clinical problem, and then when things move into the clinic, we have an unprecedented level of depth with the patients.”

SCIENCE SAVES LIVES

One of these patients is Joel Rutstein.

“In February 2016, we got blood count results back and everything was shot to hell,” Joel says. “Normal blood cells had all dropped to practically zero. The MDS was morphing into leukemia.”

Joel’s request for a second opinion brought him to CU Cancer Center, where Pollyea explained the options: They could treat Joel’s leukemia with chemotherapy, but the stem cells that survived would likely restart the disease or Joel could take part in a new clinical trial open at CU and a
few partner centers around the country, adding venetoclax to standard-of-care treatment.

Joel chose the trial.

First was a course of the commonly used, low-intensity chemotherapy, azacitidine, to knock down the bulk of the cancer cells. Along with chemotherapy, Joel took the drug venetoclax to block the leukemia stem cells’ ability to make energy. After the short course of chemotherapy ended, Joel stayed on venetoclax.

“Blood counts recovered, blast counts went down. Eventually, by early fall, blood counts and even hemoglobin were back to normal,” Joel says. His only side effect has been diarrhea a few times per month. “Since I can live a normal life with this drug, I don’t have any interest in going off of it,” he says.

In all, there were 33 patients treated on this round of the clinical trial. All were older than age 65 and ineligible for the usual chemotherapy used to treat AML in younger patients. Thus all 33 patients had very poor prognosis. In this group, 91 percent of patients achieved what Pollyea calls an “overall response,” many of whom continue to be in durable remissions.

A NEW PARADIGM FOR AML TREATMENT

Since the early 1970s, chemotherapy and sometimes bone marrow transplant have been the standard-of-care for AML. The results have never been anywhere near perfect. Because the side effects are life-threatening, this imperfect treatment has been impossible for older patients. Now the Jordan’s lab science and the results from this clinical trial are leading to a new paradigm for the treatment of AML, offering new hope for all patients.

Members of Jordan’s lab, Courtney Jones, PhD, and Brett Stevens, PhD, have pinpointed the LSCs’ source of energy. Instead of glucose, these cells depend on “burning” amino acids. These researchers also have shown why venetoclax works: It stops the cells’ ability to use amino acids for energy. Their results are published in the journal Cancer Cell.

Meanwhile, others in Jordan’s lab have shown that the clinical trial did, in fact, target LSCs in these patients, and that the trial did this by nixing LSCs’ energy metabolism.

“Patients’ results showed that the trial was working, but we also needed to show why it was working — that it wasn’t just some other effect of adding venetoclax to treatment. Our work shows that the reason patients improved is because we turned off LSC metabolism and specifically killed these cells,” says Stevens, whose study and the results of the clinical trial are published in the journal Nature Medicine.

Based on the clinical trial results here and at other cancer centers around the country, venetoclax is poised to receive FDA approval for the treatment of AML.

“There is still plenty of work to do for patients with AML,” says Jordan. “Even though the early trials have shown major improvements, it’s clear that not all patients are cured.”

But the team is optimistic that patients with AML will soon have even more options.

“When I was a fellow, I learned how to tell AML patients they were going to die,” Pollyea says. “Now I’m talking with my patients about their vacations and how their grandchildren are doing. It’s a fundamental change to the treatment of AML.”

Joel Rutstein is one of them: “My story isn’t a real exciting one. There’s no car chase, no femme fatale. I don’t know why I happened to get diagnosed when I did or why this treatment happened to come around when it did. I just know that if I weren’t on this drug program, I wouldn’t be here.”
EDUCATION

ROLL MODELS

Horan family gives CU medical students a lesson in life

By Mark Couch

Each year, first-year medical students at the CU School of Medicine are treated to an extraordinary lesson of courage and compassion by a family with three sons who have Duchenne muscular dystrophy.

The Horans – parents Brian and Kimberly and sons Ryan, Aaron, and Ian – have been leading a class discussion in the Molecules to Medicine course for the past 13 years where they provide insight and a patient perspective not found in textbooks, lectures, or online.

The family offers a lesson on how to live.

Their session with students isn’t about some theory on disease progression. It isn’t a case study on how to make a diagnosis. It is a course on how to care.

The Horans show how physicians and aspiring physicians and anyone really should care for one another. Every day. All the time. They give an always honest, sometimes funny, occasionally bracing, look at life and how to live it.

Brian Horan always tells the class: “No question is off limits.”

Their way is practical and inspirational and grateful. Their advice to the students stems from their initial experiences with CU School of Medicine faculty who provided care to their family at Children’s Hospital Colorado.

“Ryan was diagnosed in 1992,” Kimberly said. “He was playing soccer at that time and we noticed that he couldn’t run or climb, run around the same way that other kids did. His kindergarten teacher also observed some physical challenges in him that she didn’t see in other kids.”

After testing Ryan, Richard Finkel, MD, a neurologist who was with CU and Children’s at that time, shared the news with Brian and Kimberly.

“He was just phenomenal,” Kimberly said. “He was the only one with us at that time. He had Ryan go out in the hallway to play with the nurses. And I thought that was kind strange because he then shut the door and sat down and grabbed my hand and he grabbed Brian’s hand and said, ‘How’s your marriage? Because this is hard and it’s really going to be stressful.’”

Finkel’s personal touch – a 20-minute heartfelt conversation – set a tone for the care the family would receive for decades. It still inspires the family and serves as the model that they recommend to the medical students.

“We’ve seen more doctors than most do in their lifetime - fivefold,” Brian said. “And we’ve had plenty of good experiences and plenty of bad experiences and if we want things to get better not only for us but for the people behind us, then you’ve got to take an active role.”

The inspiration for coming to the classroom came after one of the neurologists treating the Horan boys asked Brian and Kimberly to meet with another family.

“He had met a family that also had the same thing, three sons with disabilities,” Kimberly said. “That family was really struggling with dealing with it, so he invited us to dinner with this other couple. We basically took over the whole evening, talking about what to expect.”

That neurologist, Brian Tseng, MD, PhD, happened to be a member of the School of Medicine faculty and he saw an opportunity to personalize a basic science course that is fundamental to medical training.

“Our course is heavily science-based and it is easy for students to feel far removed from the clinical world of patients amongst the facts and concepts about how basic genetics and biology works,” said Matt Taylor, MD, PhD, professor of medicine and director of adult clinical genetics in the Department of Medicine.

It’s the experience of human interactions that are illuminated by the patient visits to the classroom. Over the eight-week coursework, faculty bring in patients for sessions that make those connections.

“The Horans are a remarkable family and each year share their meaningful story and their perseverance with our students,” Taylor said. “In addition to showing our students the human side of Duchenne muscular dystrophy, the Horans help our students think about cost of care, barriers to care, the good and less good elements of our medical system, how to behave professionally and compassionately to patients, and how to try to strive to do the right thing for patients.”

A significant experience the family discusses with the medical students relates to a life-or-death experience for oldest son, Ryan, when he was in his 20s. Despite the diagnosis of Duchenne muscular dystrophy, a genetic disorder that causes progressive weakness and atrophy in muscles, the family has always sought ways to remain as active as possible.

In this case, the family had gone skiing in Winter Park and Ryan was concerned about crashing.

“He’s always been a professional worrier,” Brian said. “But he worried himself enough to where he stressed his system and that allowed something to attack him.”

At dinner at the YMCA of the Rockies, where they were staying, Ryan was incoherent. At a nearby clinic in Granby, Ryan was in pulmonary
distress. He was flown by helicopter to a Denver area hospital, but not to Children’s, which had been his lifelong medical home.

As Ryan's condition worsened over the next few days, one of the physicians providing care was less-than-vigorous in offering hope and comfort. In fact, he advised the family give up.

“The doctor came in, worked for a while and then came up to me and said do you know what Ryan's wishes are?” Brian said. “I was like, ‘What do you mean by his wishes?’ He said, ‘I mean his living will and stuff.’ I said myself and his mom usually take care of that. He said, ‘Well, we need to consider that and he walked out of the room.”

Brian followed him out of the room. “He said, ‘I don’t think we have any options,” Brian recalled. “I knew he wasn’t right and I knew in my heart. And even the nurse that was taking care of Ryan, she turned away when she heard the doctor say that.”

A pulmonary therapist helped stabilize Ryan and over the next three weeks he recovered. The experience still crackles as the Horans tell the story. “He gave up on our son and that should never happen,” Brian said.

Time and again, the Horans have shown that they don't give up.

“Try not to let the disease dictate your life,” said Ryan. “It's not a death sentence. You can live your life any way you want. Be positive.”

The Horans describe cruise ship vacations and cross-country treks to see the NFL Hall of Fame, the Rock and Roll Hall of Fame, Ford's Theatre, and the Statue of Liberty. They talk about summer trips to Lake Powell to spend time on their houseboat.

They talk about life transitions, like when Brian, an auto service manager, and Kimberly, a nurse, traded places to stay at home with their sons. Kimberly was home when they were younger. Now Brian stays home with them.

They discuss how Brian went back to college at the same time as the boys, about installing an elevator in their house, about setting off Fourth of July fireworks in the neighborhood, about attending sporting events, including sitting ringside at a Colorado Avalanche game.

They are dedicated sports fans – “Actually we watch any sport that's on television,” said Aaron. All three boys served as team managers in high school. An ESPN alert buzzed during the interview for this article.

They explain how they mentor others with muscular dystrophy, about how they set up a “Band of Brothers” to meet for meals and beer. “I think we are role models to a degree,” said lan.

In the course sessions, the Horan sons said medical students often reserve their best questions for the lunch session after class. “No questions surprise us,” said Ian. “We're open books.”

The Horans may offer their advice in the words and interactions in classes, but they are teaching by example.

“It's difficult to live with, but you can live with it,” Ian said. “There are so many worse disease you can have. If you think about other people – everyone has their challenges – but they conquer it differently. This disease isn't as bad as some out there.”

Kimberly's message: “Don't hold anything back. There's so much to be gained from sharing your story. We've done it for years, not only with CU, but in other capacities as well. I think that you shouldn't be afraid to share your story because I think there's something to be gained and learned from your experience.”

The Horans took a cross-country trek to see the Rock & Roll Hall of Fame and the NFL Hall of Fame. Photos courtesy of the Horan family.
When Victor Spitzer, PhD, director of the Center for Human Simulation at the University of Colorado School of Medicine, talks about his friend Susan Potter, he recalls a “persistent” woman. She volunteered again and again to donate her body to the Visible Human Project, an effort to create digitized anatomically detailed, three-dimensional representations of human bodies from cadavers that are sliced into microscopically thin layers.

Potter asked and asked and then she asked again. She refused to take no for an answer. When Spitzer finally acquiesced to her request, Potter then pushed for even more. She wanted him to show her the large freezer where cadavers are stored. She also insisted on inspecting the equipment Spitzer used to grind cadavers into slices barely the width of a human hair.

Now, four years after Potter died at age 87 in February 2015, she persists mostly confined to a wheelchair. She expected to die within a year. She had been in a serious car accident, was suffering significant pain, and was assigned a photographer and writer to chronicle her journey. Originally, Potter's story is especially remarkable because National Geographic had assigned a photographer and writer to chronicle her journey. Originally, in 2004, the magazine's staff expected a one-year assignment. Potter had read a newspaper article about the Visible Human Project some 25 years ago. A CU team led by Spitzer and David G. Whitlock, MD, PhD, had sectioned, from head to toe, a male and a female cadaver, using a calibrated machine to grind off layers as small as one-third of a millimeter. Each layer of the body was then photographed. Spitzer's team, supported by the National Library of Medicine, took thousands of photos and then organized the data to allow users to interactively tour a virtual human body.

With Potter’s body, another will be available for a worldwide audience. Potter's story is especially remarkable because National Geographic assigned a photographer and writer to chronicle her journey. Originally, in 2004, the magazine's staff expected a one-year assignment. Potter had been in a serious car accident, was suffering significant pain, and was mostly confined to a wheelchair. She expected to die within a year. “National Geographic came on board to document her life for the next year,” Spitzer said, “and, in fact, continued on for the next 14 years.”

Technology has improved since the Visible Human Project originated in 1993, so much more detail will be seen in the virtual anatomy created from Potter's body. The original Visible Human was ground into sections of 1,000 microns for the male (300 microns for the female); Potter's body was ground off 63 microns at a time, resulting in thousands more photographs being taken. For comparison, a human hair is about 75 microns.

Spitzer’s lab ultimately aims to expand beyond photos. Through his company, Touch of Life Technologies, located in the Fitzsimons Innovation Community, a hub that offers opportunities to develop commercial enterprises from academic activities on the Anschutz Medical Campus, he is developing ways to fabricate the feeling of living tissue.

Early in their education, CU medical students are introduced to the cadaver process and hear from people who want to donate their bodies. Potter herself spoke to students, and several of them ended up following her life as they moved into their professional careers.

“So, she's already in front of our medical students, just not her anatomy. Next year, they'll see some of her anatomy, and every year they'll see more of her anatomy.”

In the video recordings of her life, they’ll also see how passionate she was about improving the understanding of the human body. “She told people she would be in a freezer,” Spitzer said. “She agreed — but not at first — to being on the internet for the entire world to learn from her. She mainly wanted to be a donation to help the students at CU.”

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“There’s no reason for us to keep a virtual cadaver,” he said. “We need to bring her back to life, to develop a living cadaver, one that you can see move or move in response to what you ask her to do. Being able to feel and touch and see is something very doable today.”

Identifying the entirety in Potter’s body is an enormous task, but assembling the images is a just small part of the overall project. When she is fully visualized, along with the material documented by National Geographic, medical students will be able to sift through her anatomical data, while also getting a picture of her psyche.

Potter’s personal history is a bit of a mystery. She didn’t talk much about her childhood, only that she grew up in Germany under difficult circumstances. As an adult, she was plagued by health issues, confined to a wheelchair, but always looking for some way to give to the CU School of Medicine. “We care about everything,” Spitzer said. “We want to correlate the anatomical with her feelings and her behavior, which is more the social sciences.”

Support from the School of Medicine and its Department of Cell and Developmental Biology and his company have allowed Spitzer to create the visualizations of Potter’s body. Spitzer’s goal, though, is even more ambitious and many more body donations are needed to fulfill it.

“We need to look at the anatomy of the virtual world as close as we do in the real world,” he said. “Someday, we need a bookshelf of bodies, or virtual human anatomy, from the very young throughout the aging process,” including people of all ethnicities.
STORM-CHASING PHYSICIAN HELPS HOSPITALS PLAN FOR DISASTERS

Tornado’s destruction spurs call for emergency preparations

By Joseph Carrillo

Meteorology and medicine might not seem a natural pairing, but for Jason Persoff, MD, the similarities between the two are plain to see.

“Medicine and meteorology overlap for me,” said Persoff, associate professor of medicine for the CU School of Medicine and hospitalist at UCHealth University of Colorado Hospital. “There’s an anatomy and physiology to a storm and both tap into my passion for complex thinking.”

With his knowledge as a storm chaser, Persoff is now able to help hospitals prepare better for unexpected disasters.

Persoff started his career in storm chasing nearly 30 years ago while attending the University of Colorado Boulder. With a nebulous understanding of weather systems, a handheld radio scanner, and more than enough reckless abandon, those first storms were trial by fire.

Racing down his share of dirt roads, stumbling into some dead ends, and making a few questionable decisions, Persoff has honed his skills as a storm chaser over the decades. Along the way, he’s captured spectacular photographs of severe weather events.

“I can get reasonably close,” he said. “Within a couple of miles, but I am always careful to keep a safe distance away.”

A telescopic lens coupled with the sheer size of the weather event would have you believe the storms are bearing down on Persoff. An average tornado can extend 2,000 feet from cloud base to ground, towering over the landscape around it. Although they may appear slow moving, tornadoes can travel between 30 miles per hour to 70 miles per hour, with the danger of changing directions abruptly.

Persoff’s passion for meteorology and medicine has always been inextricably linked with his love of problem solving, but one of the most destructive tornadoes in U.S. history truly combined his two passions into a single career.

On May 22, 2011, Joplin, Mo., was slammed by an EF5 tornado, the most severe category of tornado carrying wind speeds of over 200 miles per hour. The tornado decimated the town and wreaked catastrophic damage to St. John’s Regional Medical Center.

Persoff had been tracking the storm that day.

In a blog post, he recalls, “As we crossed over the Joplin town line, the tornado was busy spinning wildly at over 200 miles per hour, leaving behind a landscape that looked mowed down to its nubbins.”

Once the initial shock and awe passed through Persoff, he quickly got to work helping the injured. At Freeman hospital, the only hospital still standing, Persoff provided emergency care for dozens of patients over the course of a tireless 14 hours. In the same blog post, he writes, “I learned humility beyond words at the reality of what a city’s worth of people were facing.”

For Persoff, this storm was transformative and a first-hand lesson on the importance of an emergency preparedness plan.
“The biggest problem is people believe it’s happened to the extent it’s going to happen in this area or a very normal psychological trick: ‘It’s never going to happen to me,’” he explains. “People don’t want to spend the time training for something that may never happen.”

To counterbalance this human instinct, Persoff has spearheaded an initiative to integrate hospitalists into emergency management and incident response. Persoff and his colleagues elaborated in a review published in the October 2018 issue of the Journal of Hospital Medicine.

“[Emergency preparedness] has largely been ignored,” he said. “What we’re trying to figure out is how we make this structure flexible and approachable so everyone can be as successful as possible with the minimum amount of training.”

As Persoff puts it, streamlined chains of command help medical staff remain focused and well-utilized to better cope with disasters.

Although he’s worked since the Joplin tornado to develop these emergency response plans, he admits it’s still a work in progress with room for improvement. “It takes time,” he says. “Everything that looks great on paper can fall apart.”

Nonetheless, Persoff has worked closely with administrators and colleagues at UHealth University of Colorado Hospital to prepare for these emergencies: “Leadership has been tremendous at preparing the health system.” He hopes to bring this level of preparedness to hospitalists across the country.

In the meantime, Persoff continues to chase storms, capturing both the beauty and ferocity of nature. He warns any would-be storm chasers that chasing is fraught with danger and best left to the professionals. Inexperienced storm chasers on the road can quickly face life-and-death situations for themselves and for the first responders who may be called to care for them. For aspiring storm chasers, Persoff suggests a guided tour with Cloud9 or Tempest, which offer professional storm-chasing services.
ERIC CAMPBELL SHOWS HOW TO MAKE BIOETHICS MATTER

New program offers empirical research along with good ideas

By Tonia Twichell

Eric Campbell, PhD, had one major concern when he agreed to create a bioethics research center at the University of Colorado Anschutz Medical Campus.

He worried he might spend months sitting alone in his office at the Fulginiti Pavilion while looking for research partners. Instead, when Campbell arrived in April 2018, he found campuswide interest in bioethics research.

“I was afraid I wouldn’t have anyone to collaborate with, but the exact opposite happened,” he said. “Within a very short period of time, I’ve had so many great interactions with people who wanted to see how they could add a bioethics focus to their research.”

A recruit from Harvard Medical School, where he was director of ethics research and associate director of the Mongan Institute for Health Policy at Massachusetts General Hospital, Campbell’s research into conflicts of interest and medical professionalism helped make national changes to policy and law.

Focusing on building a new program, Campbell is hiring faculty and creating a program for postdoctoral fellows. On his wish list is a doctoral program or track focused on bioethics for students in any school or college on the Anschutz Medical Campus.

“I want to bring in a bright group of empirical researchers in bioethics to work on externally funded research on topics important to the field of medicine in general, but also on issues important to the state of Colorado.”

With that group, Campbell says he expects to continue his own research, which, in addition to conflict of interest, has included examining why doctors fail to report colleagues who are practicing while impaired, and doctors’ reasons for not always telling patients the truth.

Even before he arrived at CU, he had his eye on three research projects that are particularly relevant to Colorado.

End-of-Life Options Act. Colorado voters passed a ballot measure in 2016 allowing physicians to provide prescriptions to terminally ill patients who wish to end their lives. Since then, more than 60 physicians have written prescriptions for 200 patients.

Campbell knows that identifying the participating physicians will be a challenge because their names are not public. There are about 8,000 physicians licensed to practice in Colorado.

But there are many questions to explore to better understand the motivations and consequences of the act.

“There has been no state-level study anywhere in the country looking into doctors’ experiences,” Campbell said. “Who are these (prescribing) doctors? Why did they get involved in this? What was their experience like? What did they find challenging? What did they find rewarding? How can policies and practices be changed to avoid problems? How do they think about engaging in this practice within the context of the concept of ‘do no harm’? And who are the doctors who won’t be involved in this and why?”

Bariatric surgery. With Thomas Inge, MD, professor of surgery and chief of pediatric surgery at the CU School of Medicine, Campbell has developed a grant proposal to study physicians’ role in advocating or discouraging bariatric surgery for severely obese adolescents.

Some medical professionals attribute obesity to mental health problems or bad parenting and, as a result, are reluctant to perform surgery on a child for what they consider a behavioral problem, he said.

“It’s an effective medical treatment that appears to be underutilized. About 1.4 million kids are potential candidates, but nationally doctors only do 1,200 a year.”

Marijuana. Some doctors have recommended marijuana to patients, and some physicians have advocated cannabis as a replacement therapy for highly addictive opioid prescriptions.
Even in states where marijuana is legal, physicians who recommend its use could be exposing patients to other legal risks. Such patients include those serving in the military, people with criminal records, non-American citizens, and people who have jobs for which testing positive for marijuana could lead to discipline or dismissal.

“Our goal is to understand doctors’ attitudes and behaviors and how they consider the legal and ethical implication when making important decisions on what to tell patients about marijuana.”

Campbell said he is drawn to controversial topics where little to no empirical data exists because he thinks that’s where he can make the most impact.

**CHOOSING AN EVIDENCE-BASED APPROACH**

As a doctoral student at University of Minnesota in the mid-1990s, Campbell began studying conflict of interest following a mentor’s advice: “Find a group of people you’re interested in who behave in a way you don’t understand and make that the subject of your dissertation.”

He found his study subjects close to home.

“My whole family is in the medical field in one way or another, so I’d always been interested in how physicians behave. I wanted to have an understanding of the nature, extent, and impact of relationships between academic researchers and drug companies. What impact do these things have, should they be regulated, should they be stopped, do they need to be reported?”

He credits Arthur Caplan, PhD, a widely published bioethics pioneer now at NYU School of Medicine, with steering him in the direction of empirical research instead of theoretical bioethics.

“I told him I wanted to be a bioethicist, and he said, ‘No, we don’t need any more philosophers.’”

“He encouraged me to become an empiricist and do research on bioethical issues. Bioethicists will say whether something is good or not, whether you should do things or should not do things. The field as a whole doesn’t always consider the evidence behind those statements. Both are important, and when you put theoretical and empirical bioethics together, you make a strong whole.”

An interaction several years ago with a U.S. senator convinced Campbell that he was on the right path. Discussing medical conflicts of interest with the senator, the critical difference between theory and practice came to light.

“I was making an argument saying that some of these conflicts are inherently unethical and should be stopped because they are just not right. He said ‘Eric, you will never get policy in place based on ethics alone. You get policy in place based on showing what the impact is on the care that people receive.’”

Philosophizing might be a fulfilling academic exercise, but it wasn’t sufficient to convince policymakers when changes should be made.

“What changed practice and created policy was a whole body of published studies in the New England Journal of Medicine and JAMA (Journal of the American Medical Association) that showed these conflicts are frequent and have a bad impact on research and patient care.”

With former Harvard colleague David Blumenthal, MD, Campbell helped produce changes to conflict of interest policies for faculty at many universities. Their work also led to the Physician Payment Sunshine Act, which became part of the Affordable Care Act and now requires drug and medical device companies report payments to doctors in a public database.

“That’s an example of how over time our work changed policy and practice.”

Pharmaceutical companies fund drug studies so they are always going to be involved in research, but “should doctors be paid to promote products for drug companies, should they be able to go on fancy vacations, attend Super Bowls paid by drug companies? Should doctors get cars from drug companies?” Campbell asked.

Not everyone agrees. Years ago, the mother of a child participating in a drug study surprised Campbell with her response.

“I asked the mom, ‘Is it OK with you that your child is enrolled in a study where the person running the study has a large financial interest? Is it OK with you that your kid could be enrolled in a study that will enrich this doctor?’ She looked at me said, ‘I want this doctor to have every motivation possible to find something to cure my child.’

“I had never thought about that. But to this mom, this was a good thing. I carried that with me. The perspective of patients who see our work can be very different from what we see. Your vision as a researcher isn’t necessarily the vision of the people involved.”
Twenty years ago, Russell Glasgow, PhD, recognized that researchers were identifying solutions to public health problems but many, including himself, were failing to put their discoveries into practice. Troubled that useful and important research wasn't living up to promise, Glasgow helped develop a framework to guide researchers around the world who want to improve population health.

The technique, called RE-AIM, which stands for Reach, Effectiveness, Adoption, Implementation, and Maintenance, became the preferred model between 2000 and 2016 for dissemination and implementation grant applications, according to the National Institutes of Health and the Centers for Disease Control and Prevention.

His work to bring scientific evidence to communities and health care sites has, for the second year in a row, elevated him to the top 1 percent of the world’s most influential researchers, as ranked by Clarivate Analytics. Glasgow, who is research professor of family medicine and director of the dissemination and implementation science program of the School’s Adult and Child Consortium for Health Outcomes Research and Delivery Science, has more than 2,000 citations to his work in the field of social sciences.

“He’s been truly influential,” said Jodi Holtrop, MD, associate professor of family medicine. “RE-AIM is the go-to framework for people who want to do dissemination and implementation research.”

Through his career, Glasgow has focused on communities where people struggle with addiction, disease, or multiple health conditions, particularly in primary care, workplace, community health centers and low resource settings, where staff turnover is high and money is short.

“There’s no question that we have the best medicine and science in the world, but it has to trickle down to the people most in need, to people in poverty settings, where individuals are often left out and are the last ones to benefit,” Glasgow said. “That is truly adoption.”

REAL WORLD IMPACT

Several years ago, Holtrop started writing RE-AIM principles into grants to monitor outcomes.

“It worked,” she said. “I got some big grants funded, and I’ve been using it ever since.”

Holtrop’s work has focused on prevention and management of chronic conditions, particularly diabetes and obesity.

“You go to your doctor and you’re told you have diabetes,” she said. “Years ago, you might have gotten some pamphlets. You might even have been told where to go for a blood glucose monitor. You’d get a prescription for insulin and, maybe go to a class somewhere.”

That model didn’t provide the ongoing support patients needed, and research had shown that primary care clinics employing care managers were able to better improve patient outcomes. Holtrop’s research using RE-AIM demonstrated how to help practices successfully fund and incorporate care managers.

Problems with adoption and successful implementation still limit public health research, said Glasgow, who came to CU in 2013 from the National Cancer Institute where he was deputy director for implementation science at the Division of Cancer Control and Population Sciences.

“Oh, let’s take blood pressure for example,” Glasgow said. “We have incredible evidence that taking a certain medicine or following a certain diet will affect your blood pressure. What we have little evidence on is, first, how you get this information out so that people will come in to get treatment? Second, can they afford treatment? Third, can they keep doing what they’re supposed to do? Fourth, can this work in a real-world low-resource setting? And finally can it continue over time? Our science stops short of that.”

Russell Glasgow, PhD, has developed tools to help researchers measure the adoption of their scientific breakthroughs and improve population health. Photo by Tonia Twichell.
The CU School of Medicine Office of Diversity and Inclusion has launched the FirstUp Program to support first-generation medical students.

In medical schools around the country, first-generation medical students are often underrepresented. They tend to be older and have more pressures related to family and finances. They also often lack deep knowledge of academia and are unfamiliar with the steps necessary to become a physician.

To help these students, the FirstUp Program pairs them with mentors who help them along their medical school journey. This program was modeled after programs at Stanford University, Brown University, and the University of Southern Florida. In its first year at CU School of Medicine, more than 20 students requested mentors.

“The FirstUp Program is demand-driven because our students requested it, so to me that demonstrates both a demand and a responsibility,” said Regina Richards, director of the Office of Diversity and Inclusion. “We want to make sure our students are their best personal and professional selves.”

In fall 2018, 13 mentorships were formed. The mentors are alumni, faculty and medical leaders who want to give back to the CU School of Medicine.

“I've participated in mentoring since I was in college, and working with first-generation students was something I identified with,” said Assistant Professor of Anesthesiology Anthony Oliva, MD, PhD. “I was the oldest of my siblings, my parents didn’t go to college, so I can identify with some of the issues in being the first of my family to attend medical school.”

Mentors help students prepare for board exams and apply for residency. Each student-mentor relationship largely depends on the needs and questions of individual students. In each mentorship, the method of communication and timing of meetings vary to give both mentors and mentees flexibility.

“We meet every other month for lunch or coffee, and I give him advice along the way,” said Oliva, who graduated from the CU School of Medicine in 2009 and completed his residency in anesthesiology at the University of Colorado Hospital.

Oliva’s mentee, Troy Kincaid, is originally from the Chicago area and had concerns about moving to a new state. “I was nervous to move 1,000 miles away from home to attend medical school,” said Kincaid. “I didn't know what to expect, and my mentor can talk to me about school and personal issues that come up. It has been really helpful as I adjust in my first year of medical school.”

In the months since Oliva started mentoring, a common theme has emerged. As first-year medical students start classes, they are often under intense pressure to join clubs and engage in other aspects of the CU School of Medicine. “I want Troy to choose activities that he can fully participate in — not just add another line to his resume,” said Oliva.

“I told Troy to pick activities that are rejuvenating — something that isn’t a hassle,” said Oliva.

The FirstUp Program strengthens the collaborative nature of the CU School of Medicine by encouraging partnerships between students and alumni in the field.

“I'm hopeful that this program continues to expand and make an impact. It is a great way to stay connected with CU,” said Oliva.
Kelsey McNeill tears up during a short home video of her husband, Brian, playing the drums while their 4-year-old daughter shimmies to the groove under a blanket.

That strong emotion is because Brian, the father of two daughters, is still keeping the beat—both on his drums and in his young chest.

“I kind of feel like I died twice in the last couple months,” Brian said during an interview down the hall from the office of his surgeon, Muhammad Aftab, MD, assistant professor of cardiothoracic surgery at the University of Colorado School of Medicine.

In 2018, Brian, just 38, survived a range of severe ailments that might strike an elderly heart. One day, he learned he had a blood clot on his aortic valve. On another, doctors discovered he had suffered, likely during summer, several mini-strokes. On yet another, Aftab performed a 14-hour surgery—one of the most challenging cardiac surgeries of his career—on Brian at UCHealth University of Colorado Hospital (UCH).

While watching a football game on November 10 at home in Salida, Brian suddenly slumped on the couch. Kelsey and Brian’s parents kept him alive through CPR, getting an all-important specialized care to get to the root of the clot problem.

THE DISCOVERY: ‘CHUNK OF VEGETATION’

Brian and Kelsey went to UCH, where on September 11, he had a thrombectomy that removed another clot, now from the brachial artery in his arm. Doctors also found that Brian had suffered several mini-strokes, which accounted for some short-term memory problems.

Another test revealed a large clump on his aortic valve. Aftab, who first met Brian on Sept. 14, described it as “a big chunk of vegetation” on the valve—infective endocarditis. “It was like seaweed sitting on the valve,” he said. “We believed pieces of that infection had broken off and traveled through his body causing the clots."

They feared part of it could break off, triggering a serious cardiac event. The next day, it did.

“I had the classic elephant sit on my chest. It compressed so hard it was impossible to breathe,” Brian recalled. “Dr. Aftab said this could happen, and I was sure it just did, so he predicted the future."

The multidisciplinary team at UCH decided to administer a “vegetation buster,” or a tissue plasminogen activator (tPA). While it relieved the coronary embolization, it resulted in bleeding on the brain, a known risk for tPA.

Brian was transferred to neurosurgery ICU for close monitoring and more CT scans. His heart condition remained a concern, but surgery wasn’t an option with intracranial bleeding and several mini-strokes. The bleeding resolved in late September, then further tests showed the alarming extent of the endocarditis.

“It was not only an infection of the prosthetic aortic valve, but also in the aortic root of his heart, with a large abscess in that area,” Aftab said. “It was deeper in the heart involving coronary arteries, heart valves, and the aorta. So essentially, the infection had destroyed all these structures. At that point I realized this would be a very long surgery.”

The surgery started at 9 a.m. and ended close to midnight. It involved a graft, a coronary bypass and an aortic root replacement. At one key juncture, Aftab hand-massaged Brian’s heart to keep blood pumping while an extracorporeal membrane oxygenation (ECMO) heart-lung machine was hooked up. Brian remained on the ECMO for four days.

“On the 7th or 8th of October, he started to wake up and make sense of what had happened,” Kelsey said.

Brian was discharged from UCH on October 18 and returned home to Salida. A couple weeks later came that fateful afternoon of watching football.

“I don’t remember the football game at all,” Brian said. When he slumped on the couch, his eyes were open but he was already unconscious. “His breathing was raspy, and he was gasping,” Kelsey said. “We knew something was seriously wrong.”

THE TEAM: LIFE-SAVING RESPONSE

Brian’s dad began chest compressions and his mom blew into his airway. Kelsey, during a break from helping with the compressions, called 911.

“They worked on Brian for close to an hour at our house. They used an automated CPR machine and, over 15 times, they worked to shock (using an automated external defibrillator, or AED) to bring his heart back to rhythm.”

All signs indicated that Brian suffered ventricular fibrillation that put him in cardiac arrest.

From the moment Brian slumped on the couch until his transport to the Salida hospital where
the automated CPR and AED continued (a total of 18 shocks), the clock ticked toward an hour.

“He was down for a total of 45 minutes before his heart started again,” said Aftab, who remained on the phone with the McNeills and the Salida care providers for most of that period.

The ED team in Salida worked to stabilize Brian for roughly 75 minutes before he was airlifted to UCH where Aftab had a team waiting. Brian, who remained unconscious and unstable, received a CT scan of his head, chest, and abdomen and an echocardiogram.

“His vitals were improving, but he was posturing at that time, a typical sign of possible brain injury,” Aftab said. “His arms were out and straight. We were really concerned about neurologic damage given his prolonged CPR.”

The scans showed Brian hadn’t suffered a stroke, and Aftab remained cautiously optimistic. Brian had been put under sedation — a cooling of his body to a near-coma state, in order to minimize potential brain damage — from the time he was in the Salida ED until early the next day at UCH.

Within 24 hours of turning off the sedation, Brian opened his eyes and, to the surprise of everyone, immediately recognized his parents. His kidneys sustained some injury, but they showed recovery within 72 hours.

THE RECOVERY: ‘JUST REMARKABLE’

Overall, he was in ICU for 10 days.

“From day four, he was up and walking around,” Aftab said. “It’s very unusual to have this kind of recovery. It was just remarkable.”

Aftab gives credit to the EMT team in Salida, as well as the critical care providers in the ED and those aboard the helicopter during transport. But perhaps most essential was the quick CPR initiated by his family.

“If, during cardiac arrest, one person beside you is not vigilant, it could have been a fatal event,” Aftab said.

Before leaving the hospital on Nov. 25, Brian received an internal defibrillator that is much like a pacemaker. If it detects any interruption in heart function, it delivers an electrical shock to the organ.

Aftab believes Brian’s November 10 cardiac arrest stemmed from scarring on the heart that resulted from interrupted blood flow during his heart attack on September 15. Meanwhile, the source of the infective endocarditis remains a mystery, but it is known that the infection came from a common skin bacteria. Brian had undergone a dental procedure in June that could have been the source, but the bacteria also may have stemmed from a Christmas tree harvesting excursion, when he accidently sliced off the tip of his finger.

He is now on a cardiac rehabilitation regimen that he can complete at home in Salida.

THE COLLABORATION: ‘DISCIPLINES CAME TOGETHER’

Brian and his family remain amazed by the care and expertise they received.

“The cardio, neuro, vascular surgery … We got here and immediately they came together with their specialties,” Brian said. “It’s amazing because, with so many disciplines coming together, there could have been a lot of egos in the room. But that all went away. What matters to them is taking somebody who is sick and making them better.”

The multidisciplinary care approach is a hallmark at the CU Anschutz Medical Campus, Aftab said.

“The family becomes part of the team, and not one team can do it all,” he said. “It has to be multidisciplinary. It has to be focused on the patient with the one goal of making him or her better.”

Kelsey said all the care providers at every stage of Brian’s ordeal, from the surgical team to the nurses in the various ICUs, were incredible.

“We had six to eight different teams coming together to work on Brian’s case,” she said. “We needed all those teams to come together and figure out why Brian was having the problem and then figure out how to fix it.”

THE PAINTING: ‘SUNLIGHT’

Kelsey’s mother is an artist, and in the days after the marathon surgery, she crafted a colorful painting of Aftab’s left hand massaging Brian’s heart (as it happens, the surgeon is left-handed) back to a rhythmic beat. During the interview about Brian’s case, Aftab, mentioned that the name means “sunlight” in Farsi.

“My mom’s going to love that,” Kelsey said with a bright smile, one that has become the norm now that her husband is back home and in good health. “She thinks you are the sunlight.”
Dear Fellow Alumni:

As I finish serving my term as the Medical Alumni Association president, I do so with a deep sense of pride in all that we have accomplished together over the past year and a half. We have witnessed renewed energy and excitement among our board of directors, our community of alumni and our medical school. We have increased engagement and support by incorporating new opportunities for you and your fellow alumni to get involved. I am certain the Medical Alumni Association will continue to grow and build upon these successes, and as I reflect on the past, I want to share with you a few of our great achievements:

• Through the HOST (Help Our Students Travel) program, alumni welcome into their homes fourth-year medical students traveling out-of-state during their residency interviews. This year, 75 alumni reached out to extend their homes to our medical students.

• We held the annual Dean's Circle Dinner at the Wellshire Inn last November to thank generous alumni for supporting the CU School of Medicine and making a difference for our students.

• The Medical Alumni Association Endowment Scholarship reached a new goal of $300,000, providing $5,000 scholarships to two second-year medical students, as well as a Dean’s Distinguished Scholarship named in honor of the Association that provides four years of support for a current medical student.

• At the 2018 Matriculation & White Coat Ceremony, we provided 184 Littmann® Cardiology IV Stethoscopes to members of the Class of 2022, made possible with support from 141 generous alumni benefactors, 49 of whom were first-time supporters of the Stethoscope Fund.

• We hosted another successful alumni celebration and reunion, recognizing the Class of 1968 on their 50th anniversary of medical school graduation, welcoming the Class of 2018 to our alumni family, and honoring four extraordinary alumni with awards at our annual Silver & Gold Alumni Banquet. The Class of 1968 had the largest 50-year attendance in reunion history!

• In partnership with the Office of Diversity and Inclusion, we spearheaded a new FirstUp mentorship program, which provides support for first-generation medical students at the CU School of Medicine.

• We formed three new subcommittees of the Medical Alumni Association board of directors: the awards and nominations committee, chaired by John Bell, MD ’65; the fundraising and finance committee, chaired by Donald Crino, MD ’91; and the engagement and activities committee, chaired by Linda Williams, MD ’84.

These are just some of the many achievements we are making together to support our current medical students, advance and influence the interest of our alma mater, and connect with one another.

I encourage you get involved and stay connected, whether through volunteer service, philanthropy or advocacy. There are many ways to take part in moving the CU School of Medicine forward, and you can find out about upcoming events and opportunities at www.ucdenver.edu/healthalumnevents.

I want to personally thank each of those alumni who have contributed to our traditions and achievements. Lastly, thank you to my fellow members of the board for helping us make huge strides at the Medical Alumni Association.

We are always looking for board members and eager to hear from our fellow alumni. If you would like to become involved with the Medical Alumni Association or learn about other opportunities, please contact the Office of Alumni Relations at 303-724-2518 or healthalumni@ucdenver.edu.

With appreciation,

Jan Kief, MD | Class of 1982
President, Medical Alumni Association
University of Colorado School of Medicine
Save the Date:
2019 Alumni
Celebration
and Reunion
Mark your calendar! Join the fun on May 23-24, 2019.

You are invited to the 2019 CU School of Medicine Alumni Celebration and Reunion!
Reunion is a chance for you to reconnect with your classmates, share memories and more. All CU School of Medicine alumni are invited to participate, including faculty, residents, interns and fellows. Graduates from class years ending in 4 and 9 will reconnect at Class Reunion dinners. The Class of 1994 and Class of 1969 will receive special recognition for their 25th and 50th anniversaries of graduation from medical school.

Can you help contact your classmates?
With the help of Class Champions, we reach more alumni. Contact Vanessa Duran at vanessa.duran@ucdenver.edu or 303-724-2518, and let’s get started!

Maureen J. Garrity
Maureen J. Garrity, PhD, passed away at age 70 surrounded by friends on December 23, 2018, following a long and courageous fight with breast cancer. She was born June 23, 1948, in Bakersfield, California, the daughter of Joan and William Garrity.

Throughout her career, Dean Garrity was an exemplar of professionalism with a longstanding record of dedication to student wellbeing. She earned her PhD in psychology from the University of Texas at Austin and served on the faculty there before joining the CU School of Medicine in 1983, where her positions included associate deanships in admissions, student affairs, and student life.

Memorial gifts may be made to the University of Colorado Maureen Garrity Endowed Scholarship Fund at giving.cu.edu/GarrityScholarship, or to the Maureen Garrity/Little People’s Scholarship Fund, c/o Mary Jo Hunt, 2030 Lind, Quincy, IL 62301.

1968 Alumni Honor Class President
Classmates of E. Chester “Chip” Ridgway, MD ’68, gathered last fall at a new plaque placed at the memorial garden at the CU Anschutz Medical Campus. Dr. Ridgway, who was president of the CU School of Medicine Class of 1968, died in 2014. He served as senior associate dean for academic affairs and as head of the CU Division of Endocrinology, Metabolism and Diabetes from 1983 to 2007. His nephew, Grant, a current medical student, was among the many in attendance.

Medical Alumni Association Hosts a Night at the Ballet
The Medical Alumni Association hosted its annual event, A Night at the Ballet, in October 2018, bringing together more than 230 alumni, students, residents, faculty, staff, and guests for a performance of Sleeping Beauty by Colorado Ballet.

The Medical Alumni Association has hosted an annual cultural event for five years to foster conversation and build connections. We appreciate those who attend and support these events, including the newly formed engagement and activities subcommittee chaired by Linda Williams, MD ’84, which helped choose last fall’s cultural event.

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L-R) Paul Sayers, Larry Londer, Myron Smith, Peter Monheit, Phillip Sunshine, and Grant Ridgway

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Leslie Berg Named Chair of Immunology and Microbiology

Leslie J. Berg, PhD, who specializes in understanding how T cells develop and help fight infection, has been named chair of the Department of Immunology and Microbiology at the University of Colorado School of Medicine on the Anschutz Medical Campus, effective Feb. 1, 2019.

Berg was professor of pathology at the University of Massachusetts Medical School in Worcester, Mass., where she has served on the faculty since 1998. At UMass, Berg served as vice-chair of the Immunology-Virology Program from 2003 to 2006 and as chair from 2006 to 2009. From 2009 to 2014, she served as the program's Graduate Director.

Her responsibilities at UMass included teaching, leading a consistently funded research laboratory, and handling administrative duties for the Immunology and Virology Program. She brings to CU School of Medicine considerable expertise in studying the way the body addresses pathogens, which is key to developing treatments for ailments caused by immune system dysfunction.

Berg is the author of more than 100 articles in peer-reviewed journals, book chapters and invited articles. She served as President of the American Association of Immunologists in 2011-2012 and has received numerous academic awards and honors.

New Fellowship Explores Impact of Climate Change

Cecilia Sorensen, MD, is the inaugural fellow in the Living Closer Foundation Fellowship in Climate and Health Science Policy, a collaborative post-graduate training program offered through CU Anschutz, National Institutes of Environmental Health Sciences (NIEHS), Centers for Disease Control (CDC) and the Medical Society Consortium of Climate and Health.

The first of its kind in the nation, the fellowship was spearheaded by Jay Lemery, MD, associate professor of emergency medicine and co-author of “Enviromedics: The Impact of Climate Change on Human Health.” The program, which welcomes its second fellow this summer, received funding from the Denver-based Living Closer Foundation.

During the past year, Sorensen has surveyed neighborhoods in Puerto Rico to study the aftermath of Hurricane Maria; made treks to the Syria-Lebanon border to examine the role of environmental change on women’s health; walked through sugar cane fields in Central America where heat stress may be a culprit behind workers’ increasing rates of kidney disease; and attended numerous conferences and board meetings across the nation.

Lemery said the threat to human health from climate change — natural disasters such as heat waves, wildfire, hurricanes, and rising oceans as well as increases in vector-borne disease and air-quality degradation — is clearly borne out by science. However, physicians have been largely absent from the dialogue, and consequently, from the policy decisions that drive meaningful change.

Breaking Ground on New Campus Building

Leaders from the University of Colorado Anschutz Medical Campus and The Anschutz Foundation in January broke ground on the Anschutz Health Sciences Building.

The new seven-story building, which is expected to open in mid-2021, will serve as the home for personalized medicine, translational science, mental and behavioral health programs, and a patient simulation center. It will also provide additional office space for faculty. This new building is a resource that is much-needed because of the consistently outstanding work, the dedication and insight, and the continued breakthroughs of faculty and staff.

The construction could begin thanks to a gift from Philip Anschutz and The Anschutz Foundation, which have been steadfast supporters of the Anschutz Medical Campus since its founding.

The building is designed to promote collaboration on campus.

“Innovation doesn’t happen in a silo,” said Don Elliman, chancellor of CU Anschutz Medical Campus. “It happens when people work together, in teams, across disciplines, and we look at this building as being a hugely integral part of the future of the innovation ecosystem on this campus.”
Evalina Burger, MD, an expert spine surgeon and accomplished administrative leader, has been named chair of the Department of Orthopedics at the University of Colorado School of Medicine, effective Nov. 1, 2018.

Burger, who joined the CU School of Medicine faculty in 2006, is a successful and highly productive surgeon who has been recognized frequently by her peers as one of the best physicians in the country. In addition to her clinical work, Burger has been an active investigator and educator working to find new metal-alloy compositions to improve orthopedic implants.

She has written more than 60 peer-reviewed publications and several book chapters. She also serves on editorial boards of scholarly journals and has co-edited two textbooks on spine surgery. She has actively participated in FDA clinical trials for spine implants and has received several grants to support her work.

“Through innovation, infrastructure and inclusion, I see the Department of Orthopedics becoming a leader and an integral part of healthcare deliver on a national level,” Burger said. “With a diverse faculty, I hope to grow the Department into a global destination for healthcare excellence.”

Children with Autism May Benefit from Equine Therapy

In the first large, randomized study of its kind, researchers at the University of Colorado Anschutz Medical Campus have shown a lasting reduction in irritability and other positive social and communication impacts on children with autism spectrum through therapeutic horse riding.

“There is growing evidence that human-animal interventions can improve emotional health and social wellness in youth, particularly those with autism spectrum disorder,” said the study's principal investigator and lead author Robin Gabriels, PsyD, professor of psychiatry at the University of Colorado School of Medicine. “Our study was rigorous and the findings remarkable.”

The initial report of the researchers' randomized study of therapeutic horseback riding (THR) with 127 children ages 6 to 16 years was published in the Journal of the American Academy of Child & Adolescent Psychiatry in 2015. It was the first to show that participating in 10 weeks of THR resulted in significant improvements in irritability, hyperactivity, social skills, and word fluency compared to a barn activity control group that met at the riding center to learn about horses, but had no direct interaction with horses.

The researchers then did a 6-month follow-up of 44 percent of the participants from that initial study, published in a recent special issue of Frontiers in Veterinary Science. The study was the first to demonstrate that the initial benefits of 10-weeks of THR in this same population can have lasting benefits.

MISSION STATEMENT

CU Medicine Today will keep alumni and others knowledgeable about and connected with the School of Medicine and the University of Colorado by writing truthful and relevant articles and providing a forum for news and comments from alumni.

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STUDENT VOICE

CATALOGUING AN ANCIENT BURIAL SITE IN NORTHWEST ITALY

By Rocío Belén Griggs

Hairy, windy roads tuck the town of Erli behind the ear of the Neva Valley in the region of Liguria in northwest Italy, where I spent my first summer as a student in the Master of Science in Modern Human Anatomy (MSMHA) program at CU Anschutz.

I was immersed in northwestern Italian culture and working at the archaeological field site of Arma Veirana, 3D scanning the remnants of an Upper Paleolithic human burial.

The infant frontal bone fragment was light and delicate in my hand, but weighed heavy in heart and mind alike. Thought to be 11,000 years old, the tooth enamel caps without roots and the absence of long bone epiphyses hint that the infant was under three months old. The skeletal remains were recovered in the cave adorned with decorative shell pendants, shell beads, and surrounded by lithics (stone tools). It was clear that the infant was well loved.

The work at Arma Veirana, directed by paleoanthropologists Jamie Hodgkins, PhD, CU Denver Anthropology, and Caley Orr, PhD, CU School of Medicine and MSMHA faculty, and their international collaborators has recovered evidence of Neanderthal occupation dating older than 50,000 years ago, as well as more recent *Homo sapiens* from the Upper Paleolithic period.

Now, as one of only a handful of Paleolithic sites in Europe that preserve infant remains, Arma Veirana holds great significance because it illustrates ritualistic burial practices among the last populations of hunter-gatherers on the continent, prior to the advent of farming and more sedentary lifestyles.

As an MSMHA student, I was invited to join the archaeological team to help create the 3D catalog of burial artifacts using the Artec Space Spider 3D Scanner.

At Arma Veirana, the crew uses innovative technologies to record the artifacts and human remains. Digital surveying equipment logs the exact coordinates of every artifact in situ. Photogrammetry has been used to compile thousands of photos into one cohesive 3D image of the entire site. And finally, 3D scans of the artifacts themselves are taken once removed from the ground.

In that effort, I became intimately familiar with the Space Spider, a portable, high-resolution 3D scanner. This scanner is equipped with three cameras, one texture camera, one regular flash, and six blue-light LEDs, which together can render a 3D geometrical model with a point cloud accurate to one hundredth of a millimeter, overlaid with texture resolution as accurate as one tenth of a millimeter.

Using these scans, we hope to create an open database of our findings that allows material to be studied from afar. Italian law prohibits artifacts from leaving the country under most circumstances. The accuracy of the technology has even allowed us to document the presence of ochre, a decorative pigmented substance tying these artifacts to ancient cultural practices. It has also facilitated the production of 3D printed replicas for study in the lab and to provide a tangible representation of the data the team hopes to publish soon.

Much remains to be learned about the Arma Veirana infant burial. We are awaiting DNA results from the bones and other artifacts, higher resolution radiocarbon dates, and analyses of the culturally significant pendants and beads, as well as a full digital reconstruction of the partially crushed cranium. This and other work at Arma Veirana will provide important information about the archaic and early modern human inhabitants of southern Europe.

Ultimately, this will contribute to a better understanding of our origins and evolution as a species. Participating on the Arma Veirana team was a thrilling experience and I am honored to represent the MS Modern Human Anatomy program and the greater community of CU Anschutz.

Rocío Belén Griggs is a graduate student in the School of Medicine’s MS Modern Human Anatomy Class of 2020 and vice president of diversity on the CU Anschutz Student Senate.

Rocío Belén Griggs working at the archaeological field site of Arma Veirana. Photo courtesy Rocío Belén Griggs.
YOU CAN’T HAVE IT ALL: ON BEING A DOCTOR MOM

By Emily Gottenborg, MD

Vomiting daily for five months. Swollen legs and sciatica limiting the ability to stand or walk. A few months of 24/7 care of a newborn: hourly feeds, lack of sleep, emotional lability. And then, back to work – pumping in a closet every 3 hours, rushing to leave work to relieve the nanny, writing notes from home over dinner, all while fighting the overwhelming fatigue from months of sleepless nights.

I am a physician mom, and have had two children while completing residency training and starting my career as an academic hospitalist. This experience – the joys and tribulations - motivated me to better understand what women physicians experience in their quest to be both excellent doctors and mothers.

A team of fellow physician-mothers and I chose to explore this issue in more detail. Our study, "You Can’t Have It All: The Experience of Academic Hospitalists During Pregnancy, Parental Leave, and Return to Work," published in the Journal of Hospital Medicine in December 2018, intended to broadcast issues that women face as they become mothers while also pursuing an academic medical career. We also wanted to put forth solutions to support women in the field, and to help create systemic changes to bolster the physician mom workforce.

We interviewed ten women from top academic hospitalist programs across the country in this descriptive qualitative study. Our results highlighted five common challenges that physician mothers face:

• Lack of access to paid parental leave, causing many women to endure economic hardship or be forced to return to work prematurely.

• Difficulty in performing the daily work of a physician while enduring the physical challenges associated with the peri-partum period: the fatigue, discomfort, and sometimes medical complications.

• Breastfeeding challenges: as physicians, we promote adherence to medical guidelines, such as those published by the American Academy of Pediatricians, to breastfeed for twelve months. Oftentimes, women lack access to time, space, or storage to successfully pump at work, and are forced to quit breastfeeding prematurely.

• Becoming a mother can impact career opportunities: women described being passed over for opportunities, as colleagues perceived their plate was too full for additional projects.

• Responses from their colleagues in the health care profession included microaggressions directed towards their position as a mother.

On a positive note, women describe the impact of motherhood on their ability to empathize with their patients, allowing them to connect, communicate, and relate to them in a new and meaningful way. Some women also commented on the incredible value of a supportive environment.

There are solutions to relieve the challenges imposed on new physician mothers, and it is imperative that the health care field embrace these changes. As a starting point, access to paid parental leave is critical. We must create support systems, and access to coaches and mentors to help support and encourage women during this demanding transition to ensure their success. Finally, in the academic environment, addressing the critical and time-sensitive promotion clock, and instituting more flexible promotion schedules will help promote women's success in professorship and leadership roles.

Becoming a mother was the best thing I ever did. So was becoming a doctor. I’m hoping to help other women continue to do both successfully.

Emily Gottenborg, MD is an assistant professor of medicine in the Division of Hospital Medicine, and co-author of the study, “You can’t have it all: the experience of academic hospitalists during pregnancy, parental leave, and the return to work.”
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- Margie Green & Larry Green, MD