Wilderness Medicine
CU Prepares Physicians For Adventurous Patients
ON THE MOVE

CU physicians must be ready to care in many locales. On pages 14-18, CU Medicine Today features programs that prepare physicians for their adventurous patients.

Cover photo and left by Todd Miner, EdD, FAWM, instructor CU Department of Emergency Medicine, Wilderness Medicine Section
Working together to make Colorado better

You may have heard that I asked the University leadership in January to begin the process of searching for the next dean of our school. For the past 24 years, it has been my privilege to serve as dean of the University of Colorado School of Medicine. I was appointed interim dean in 1990, and in March 1992, the interim was removed.

We have enjoyed tremendous successes at the School of Medicine during these years. We launched more than 3,000 physicians on their careers. We established world-class educational, research and clinical programs. We moved to the amazing Anschutz Medical Campus in Aurora, where a $1 billion School of Medicine enterprise has emerged from the fallow grounds of a former U.S. Army garrison.

In 1990, I was planning a sabbatical to Belgium to study that country’s child-protection system. But those plans took a detour when then-Chancellor Bernard Nelson, MD, asked me to “stop by the house.” He was looking for a medical school dean. After polling the two factions on the faculty, he said I was fifth on one list and 13th on the other. I said that didn’t sound like a ringing endorsement. He said I was the obvious choice because I was the only person on both lists.

I found out right away how hard the job would be. In my first hour, Lilly Marks, who is now the university’s vice president for health affairs and executive vice chancellor of the Anschutz Medical Campus, welcomed me with the news that three key departments were facing a combined 30 percent hole in their revenue.

During those interim years, I didn’t quit my day job as director of the Kempe Center for the Prevention and Treatment of Child Abuse and Neglect. I figured I’d be back at it full time soon enough. In those days, nobody lasted as a medical school dean for more than two or three years.

Turns out being a pediatrician working with child-protection teams was excellent training. I had worked with physicians, police officers, teachers, judges and social workers—a group of competing interests with a common goal. As dean, I have worked diligently to join the common interests here. We are together engaged in an enterprise united to make Colorado and the world a better place.

That commitment spans generations. At this year’s graduation ceremony, I will be handing a diploma to Tom Seibert, one of the MD candidates in the class of 2014. His mother, Jeanne Day Seibert, was in that first class to graduate in 1991 when I was interim dean.

Though I am stepping down as dean, I have no intention of shuffling off the stage. I will return to the Kempe Center to conduct research and help with fundraising. And I still have that research project to complete. Many thanks to all who have made being at this school such a joy.

With warm regards,

Richard D. Krugman, MD
Dean, School of Medicine
Vice Chancellor for Health Affairs
University of Colorado
Jason Stoneback, MD, assistant professor of orthopedics, explained lateral compartment syndrome, a condition that benched Denver Broncos safety Rahim Moore, to USA Today in November: “You essentially get ischemia to the muscles in that compartment—or lack of blood flow, and the muscle then dies. You can lose function of those muscles permanently, and it can destroy nerve function, or you could even lose your leg.”

Michael Weissberg, MD, professor of psychiatry, offered advice for overcoming seasonal affective disorder in a December article in the Boulder Daily Camera: “What you find is that patients, especially when they’re depressed, don’t go outside. Basically, they turn into mushrooms. When you go outside, you’re getting a lot of light. Go outside for 45 minutes. Walking outside will help immeasurably.”

Catherine Proenza, PhD, assistant professor of physiology and biophysics, was quoted in The New York Times in October on research showing slower heart rates later in life: “We know that you can stimulate these (heart) cells, so if you could provoke them just a little bit more, you could boost the maximum heart rate just a little. Suddenly a person is able to carry that laundry basket or go down those steps to the basement, so they can still live alone.”

Stephen Daniels, MD, PhD, chair of pediatrics, commented to the Associated Press in November on research that suggests children today cannot run as fast or as far as their parents when they were young. “Kids aren’t getting enough opportunities to build up that activity over the course of the day. Many schools, for economic reasons, don’t have any physical education at all. Some rely on recess.”

Andrew Monte, MD, assistant professor of emergency medicine, discussed synthetic marijuana products with the Los Angeles Times in January. “These substances are not benign,” he said. “You can buy designer drugs of abuse at convenience stores and on the Internet. People may not realize how dangerous these drugs can be—up to 1,000 times stronger binding to cannabis receptors when compared to traditional marijuana.”

Margaret Kelsey, MD, associate professor of pediatrics, called for more funding for community and school-based activities to promote exercise for children. “It is important to teach kids lifetime activities, ways to change their activities in their everyday lifestyles rather than hard-core sports that may be intimidating to kids and their families,” she told NBC News in January.

In January James Hill, PhD, executive director of the Anschutz Health and Wellness Center, discussed with ABC News ways to lose weight. “People who have maintained long-term weight loss had many failed diets in their past,” he said. “Just because you haven’t succeeded yet doesn’t mean you can’t do it.”

Stephen Daniels, MD, PhD, chair of pediatrics, was quoted in a January Associated Press report about how a child’s “weight fate” is set by age 5. “You can change your fate by things that you do early in life,” with more exercise and eating a healthy diet, he said. “Once it occurs, obesity is really hard to treat. So the idea is we should really work hard to prevent it.”

Richard Johnson, MD, professor of medicine, discussed sugar consumption in the January issue of Glamour magazine. “Sugar is not a toxin in the sense you should never eat it,” he said. “We’re just eating too much.”

Michelle Cardel, PhD, RD, post-doctoral fellow at the Anschutz Health and Wellness Center, offered healthy Super Bowl snacking tips on 9News, the NBC affiliate in Denver. “Instead of using full-fat sour cream, which has a lot of calories, a lot of fat, use non-fat Greek yogurt [when making dips]. Surprisingly, it doesn’t change the taste at all… It tastes wonderful. You can’t tell the difference at all.”
Kerry Brega, MD, associate professor of neurosurgery, was interviewed in February by ABC News for a report on concussion risks for Olympic athletes. “You worry someone had a concussion in training, whether they are able to process things as quickly as they must under normal circumstances,” she said. “What they are doing requires such extraordinary precision. Just small changes in how quickly you’re processing things may make a significant difference.”

Cory Portnuff, AuD, PhD, clinical instructor of otolaryngology, told Fox31 Denver that fans at an NFL football game should consider wearing earplugs. “In your average NFL football game, you’ll have times where it goes almost up to 120dB, which is about as loud as a jet engine taking off,” he said. “By the time that you’re up into the hundreds (of decibels), you only have a few minutes that you can safely listen. A Broncos game can last upwards of three, maybe four hours.”

Christian Hopfer, MD, associate professor of psychiatry, discussed marijuana addiction with the Los Angeles Times in February. “A lot of people who use marijuana heavily in their 20s eventually quit on their own,” he said. “It’s probably easier than stopping [tobacco] smoking.”

Paula Riggs, MD, professor of psychiatry, was interviewed in February for ABC’s “This Week” program about the effects of marijuana use. “Brain development is really rapidly occurring from about age 10 well into our mid to late 20s,” she said. “Your brain is kind of under construction and it disrupts the development of circuits. And the latest studies show that regular use when you’re an adolescent is associated with a 6 to 8 point reduction in IQ.”

Robert Neumann, MD, associate professor of neurosurgery, director of the neuro-intensive care unit and co-director of the stroke program at University of Colorado Hospital, talked in March with 9News, the NBC affiliate in Denver, about a patient who returned to the hospital from Australia to offer his gratitude for the care he received. “For someone to travel across the globe to visit with us,” he said, “for us, it’s what keeps us going.”

Larry Allen, MD, MHS, assistant professor of medicine, discussed in a New York Times article in February his case study, published in The New England Journal of Medicine, of a woman who suffered heart failure after having metal-on-metal hip implants. While she showed signs of cobalt poisoning, the cause of her heart problems was initially a mystery, he said, because “literally tens of thousands of people had these hips without her problems.”

Laura Hurley, MD, MPH, assistant professor of medicine, was quoted by Medical News Today in February discussing her study, published in the Annals of Internal Medicine, revealing “stubbornly low” vaccination rates in adults. “Our study suggests that missed opportunities for adult vaccination are common,” she said, “because vaccination status is not being assessed at every (physician’s) visit, which is admittedly an ambitious goal.”

George Sam Wang, MD, clinical instructor of pediatrics, commented in an article in The New York Times in January on his study, published in JAMA Pediatrics, of emergency-room visits by children who had consumed marijuana-laced cookies, cakes or candies: “Those edible products are inherently more attractive than what a bud [of marijuana] would look like.”

John Hill, DO, director of primary care sports medicine fellowship and professor of family medicine, in January explained on the LiveScience website the impact of cold weather for athletes playing in the Super Bowl. “Endurance goes down in the cold, because muscles can’t oxygenate as well, so energy levels decrease.”
Reducing the Risk of Opioid Overdose

Ingrid Binswanger studies preventive strategies

By Mark Couch

Ingrid Binswanger, MD, MPH, MS, associate professor of medicine in the Division of Internal Medicine, joined the University of Colorado School of Medicine in 2006. She received her medical training at the University of California, Berkeley/University of California, San Francisco (UCSF) Joint Medical Program and completed her residency at UCSF. Currently she is director of the Primary Care Research Fellowship and the Patient-Centered Outcomes Research (PCOR) Scholars Program.

In November 2013, Binswanger coauthored an article in the Annals of Internal Medicine that reviewed the use of opioids as a factor in the deaths among recently released prisoners.

Q: What brought you to the University of Colorado School of Medicine?

I trained in primary care, internal medicine, and then I did a research fellowship at the University of Washington with the Robert Wood Johnson Clinical Scholars program. I was looking for a faculty position in an environment that would support me as junior investigator and I found a position here with Jean Kutner in the division of general internal medicine that fit the bill.

In this recent article, you looked at mortality after prison release. How did that topic become something of interest to you?

I've been interested in issues around the intersection of criminal justice involvement and health as well as medical complications of drug use for a long time, probably since I was a medical student. Initially, I was interested in thinking about how we could deliver preventive interventions in correctional settings to try to improve the health of some of our most vulnerable populations. Individuals who interact with the criminal justice system can be very vulnerable from social, economic and medical perspectives, as well as frequently having problems with drugs, alcohol and mental health issues.

I thought if we could design interventions and try to improve the health of this population, we may really be able reach an important group that has consequences. And so when I moved to Washington state, I met the health services director of the Washington Department of Corrections and I spent some time in Washington, D.C., at the Bureau of Justice Statistics, and that's where I got the idea initially to look at the mortality experience of people coming out of prison.

This study is really a follow-up to a project that we've been working on for a number of years to try to understand the health outcomes of people as they transition from correctional institutions back into their home communities.

You found that in the recently released population that opioids were involved in 14.8 percent of all deaths.

That's correct. Opioids include pills like oxycodone or hydrocodone, commonly known by brand names like OxyContin and Percocet. But opioids also include heroin. We knew from our prior work that there was a high risk of overdose after coming out of prison, but what we found in our more recent work, in Washington state at least, is that opioids are now representing a larger share of the overdoses and the complications that we're witnessing after release from prison.

This is also true in the general population. Drug overdose now exceeds motor vehicle accidents as a cause of death in the United States.

Is it because it's easier to get these drugs or is it because the concentration of these drugs is more potent than it used to be?

Probably both of those factors play a role. Physicians have become much more liberal about prescribing these medications. We've become much more attentive to treating pain. And that's a good thing. But on the other hand, these pills can be very potent and they do have dangers associated with them. And so I think we need to exercise as a physician community more thoughtfulness and caution in how we manage these particular medications.

How would you do that?

I think there are a number of strategies that are being tried in the general community. I'm part of the Colorado Consortium to Reduce Prescription Drug Abuse and that group is looking at a number of strategies to try to address this problem. That includes physician education. It includes encouraging safe storage of the medications in the home. It includes thinking about improving access to drug treatment among others. So there are a lot of strategies being tried.

I think there are two main strategies that I and my research colleagues have been interested in. The first is that we've been trying to develop ways for people to safely store their medications at home so that youth or people who are...
That's data from the National Survey on Drug Use and Health. Nonmedical use of pharmaceutical opioids in 2010 and 2011. One of the statistics cited says that 4.6 percent of persons 12 years old or older reported nonmedical use of pharmaceutical opioids in 2010. The rates of nonmedical opioid use in this country are staggering to me personally, and Colorado is the second-leading state for nonmedical pharmaceutical opioid use.

The use of these medications is very widespread for nonmedical purposes and very risky because some of the medications can be quite potent, and for individuals who don’t have tolerance to the medicine, they can in particular cause respiratory depression and death. They can be taken by kids or young people who may obviously experience complications at lower doses than adults.

You note that people in prison may have a forced abstinence, and so may have a lower physiological tolerance when they come out and therefore have a higher risk of overdose. And that phenomenon applies to a number of settings. The part that’s complicated about this particular medication is the tolerance effects. Some of the strategies that we think are intuitive and would make sense for another drug don’t apply to this particular scenario, and that’s because if you suddenly cut someone off who’s addicted or dependent on opioids and they stop them, they have a period when they are not taking them. The problem there is that when [they] relapse—if they relapse—their risk of overdosing is very high.

Not only is prison time, in the absence of any treatment, risky after release, other interruptions in treatment are also risky. If you send someone to an abstinence-based detox center, for example, then those individuals, when they come out, are also at risk for overdose if they relapse. Or if somebody is hospitalized, and they don’t have access to the same amount of medication or opioid they might have been using before they were hospitalized, they also have a high risk of overdosing after they even come out of the hospital.

You talk about having publicly funded overdose education and distribution of anti-opioid programs to help reduce the risk of death for former prisoners. If you were to try to convince politicians why they should put money toward those kinds of programs, what would you say?

I think we can’t really ignore the problem of nonmedical opioid use, opioid dependence and overdose in our state. People are dying from this problem. Lives are being very negatively influenced by these problems, and I think we need a plan of action that would, in my opinion, include the whole spectrum of involvement with opioids and the complications of opioids, one of which is overdose.

If the plan is going to address those components, those different levels of involvement and complications, it would be nice if there was funding available for overdose education, prevention and naloxone distribution. The medication itself is very, very inexpensive and many of the educational programs that are currently being implemented are being done on a shoestring budget.

Would that be done through the community-based groups that try to help people with transition out of incarceration and into society again?

I think there are a number of sites where you might target these interventions. Some of the sites might be returning inmates in parole, or re-entry settings, or even before they come out of prison. You might also consider drug-treatment settings as a good opportunity to reach people at risk.

And what we’re working on in our research now is looking at prescribing this medication to people on high-dose opioids for pain. That’s a different population, but also a high-risk group that I think warrants being properly educated about safety and response in the event of something untoward happening.

It’s in all of our interests to have people successfully transition out of the criminal justice system. I want that as a community member and as a parent. I think the just and ethical thing to try to do is to enhance that transition.
If you could peek inside the teeming forest of microorganisms inhabiting the innards of two people, you’d likely find more differences than similarities. While all humans have roughly 99.9 percent of their DNA in common, they share only about 10 percent of the species in their “microbiota”—their vast collection of resident bugs—with the person sitting next to them. And that microbiota changes, not only in the species present but also in what proportion. Microbiota also changes with age, disease, diet and other factors.

“We have 10 times more microbial cells in our bodies than we have human cells, and 100 times more microbial genes in our bodies than we have human genes, and there is tremendous variability across people,” explains Catherine Lozupone, PhD, assistant professor of medicine in the School of Medicine’s newly formed Division of Personalized Medicine and Biomedical Informatics. “It is a big challenge, in the face of all this variability and diversity, to sort out just what the most important microbes related to health are.”

Over the past decade, Lozupone, a molecular biologist turned computational wizard, has taken up that formidable challenge, working with clinicians across a range of specialties—from HIV to graft-versus-host disease and from autism to obesity—to paint a clearer picture of what bugs people with certain diseases have in common and what function those bugs might serve. Using state-of-the-art, high-throughput gene sequencing and a groundbreaking algorithm she designed, the 39-year-old mother of two has already published more than 50 papers, laying a foundation for a nascent field believed to hold great promise for yielding more personalized treatments and prevention strategies.

“Early on, a lot of papers were saying ‘Wow. Look at all this new stuff we never knew about,’” she says. “There was a discovery period. Now we are moving beyond and asking, ‘How do microbial populations change in the context of disease, and what does that mean?’”

In one oft-cited review paper, “Diversity, stability and resilience of the human gut microbiota,” Lozupone, who was the lead author, elegantly lays out what the science suggests so far: Babies are born with a stark microbiota, much like a forest growing from scratch after a fire, with opportunistic “weedy” varieties taking hold first, followed by a diverse canopy of species which forms a complex system by about age 3.

Infectious Diseases who has been studying HIV for 22 years. “Catherine is the person sitting at the eyepiece of that new microscope.”

**The dot connector**

While growing up in New Jersey, and studying ecology at Villanova University in nearby Pennsylvania, Lozupone had visions of trekking through the rainforest someday, “searching for bird’s nests” as a conservation ecologist. But over time, she discovered her true talents lay in exploring an unseen world through a computer screen.

She earned her master’s in biology at Colorado State University and her PhD in molecular, cellular and developmental biology at CU-Boulder, where she taught herself how to code and served as postdoctoral fellow to Rob Knight, PhD, a pioneer in the field. In 2011, she developed UniFrac, a computer algorithm that now enables researchers across the globe to compare microbial communities. She joined the CU School of Medicine in 2013, bringing with her an encyclopedic knowledge of what’s been learned about the microbiome and an eagerness to start “connecting the dots.”

"These new tools are like getting a new microscope that allows us to study bacteria in ways we could never do before,” says Thomas Campbell, MD, a professor in the Division of Infectious Diseases who has been studying HIV for 22 years. “Catherine is the person sitting at the eyepiece of that new microscope.”

**How do microbial populations change in the context of disease, and what does that mean?**
In general, the more diversity the better. But illness, antibiotic use and poor diet can, like a forest fire, knock down that diversity and provide an opening for weedy species (good or bad) to grow. For instance, people who are obese or who have irritable bowel syndrome tend to harbor fewer types of microbes than those who are lean or healthy.

“Ultimately we could offer more personalized treatments by tailoring them to the type of bacteria you have,” she says.

**From probiotics to fecal transplants**

Vu Nguyen, MD, an assistant professor of medicine at the Charles C. Gates Center for Regenerative Medicine and Stem Cell Biology, hopes to manipulate the microbiota to prevent graft versus host disease (GVHD) in cancer patients undergoing stem cell transplants. The potentially lethal syndrome occurs in as many as 60 percent of patients when the stem cell graft launches an immune system attack against the patient.

Because GVHD occurs primarily in the gut, liver and skin, researchers have long suspected that the microbiota plays a key role, and so administered powerful antibiotics prior to surgery. The problem with that approach, says Nguyen, is that “by blindly eliminating every bacteria you can, you are potentially removing a lot of good bacteria important for immune development.”

He’s working with Lozupone to get a better handle on why some patients develop GVHD while others don’t. Preliminary research already shows that those going into surgery with a more diverse microbiota do better.

“Ultimately, if we could identify subsets of flora that are more pro-inflammatory and perhaps make people more prone to getting the disease, we could develop drugs to eliminate that subset of flora only,” he says. Next-generation...
probiotics could also be developed to promote growth of protective microbes prior to surgery. Or perhaps patients could have their microbiota screened—much like blood and DNA already are—to help doctors find a better donor match for them, or to determine, based on the state of their gut flora, the best time for surgery. Nguyen also is planning a clinical trial in stem cell transplant patients using fecal microbiota transplantation (i.e., transplanting fecal microbiota from a healthy donor, via enema, into a patient) to recalibrate his or her depleted flora, in hopes of preventing GVHD.

"Obviously, there is a psychological barrier in the general public about getting a fecal transplant, but in anyone who is experiencing a serious disease, it is quite a trivial intervention compared to what they have to go through," Nguyen says.

Lozupone's research with Campbell, screening the microbiota of people with HIV, is also yielding promising results. People with HIV, no matter what their diet is, seem to have an abundance of a type of bacteria called Prevotella and lack a type called Bacteroides. Interestingly, she notes, their guts look a lot like those of healthy people living in agrarian societies and of U.S. adults who eat little fat and protein and lots of carbs. If the microbiota forms, in part, to best metabolize what it is fed potential solution? "If they cannot change their microbiota because we are not there yet, perhaps they could change their diet to match the microbiota they have," she says.

The most common question she gets, whether from acquaintances at dinner parties or from reporters (The New York Times Magazine recently interviewed her for a cover story) is this: What if I’m already healthy and want to stay that way?

She does not respond with a specific gut-friendly diet or recommend one cure-all probiotic. Instead, she says, "Just eat real food."

"It is important to have a microbial community that is functioning well and producing the metabolites that your body, based on its evolutionary history, is expecting to see. If you eat all sugar and refined flour your body will digest it all before it gets to those microbes," she says.

"If you eat whole foods like fruits and vegetables, and complex carbs, and be sure to get enough fiber, it gives that bacteria something to chew on, allowing it to evolve into a complex, healthy ecosystem."

Lozupone's advice for a gut-friendly diet: "Just eat real food."

Health, University Physicians Inc., the School of Medicine, the Department of Medicine and the University of Colorado Anschutz Medical Campus.

The School has already attracted researchers Catherine Lozupone, PhD, Subhajyoti De, PhD, Anna Peljto, PhD, and Colleen Julian, PhD, who are all assistant professors in the new Division of Personalized Medicine and Bioinformatics.

With personalized genomic data, scientists and physicians hope to customize care so that it is designed to fit each individual patient. The use of electronic medical records and personalized genomic data allows researchers and clinicians to work together to select treatments that increase chances of a positive outcome.

"It will change the way we take care of patients, it will change the product the patients see and it should improve the quality of care patients get," Schwartz says.

With genetic information that is now available about patients and with advances in technology, the tools are available, but substantial effort is required to make the immense amount of data usable.

"We are at a unique crossroads in biomedical research that should allow us to move discoveries into patient care at an increasingly rapid rate," Schwartz says. "The vision for personalized medicine is clear and attainable, and the critical technology has been developed. Our ultimate success, however, will be determined by our ability to infuse this vision across the entire Anschutz Medical Campus."
When the University of Colorado School of Medicine branch in Colorado Springs opened earlier this year, it marked a milestone for the school and the state of Colorado. The Colorado Springs branch is the first of its kind for the medical school and will allow the school to increase its class size and train more physicians. Beginning this summer, the number of students admitted annually to pursue a medical degree at the School of Medicine will increase from the current 160 to 184.

Developing a branch is not as simple as hanging a sign on the door. The school developed an educational program that was reviewed by the Liaison Committee on Medical Education (LCME), the national accrediting body for medical schools. The LCME notified the School of Medicine last year that it could proceed with its plan for the branch.

In addition, significant funding support is provided by the University of Colorado Health (UC Health), which leases Memorial Hospital in Colorado Springs. UC Health has agreed to provide $3 million per year for 40 years to help cover costs of the branch. Student tuition also will be used to cover costs.

In December, Erik Wallace, MD, FACP, joined the school as associate dean for the Colorado Springs branch. Wallace had been an associate professor of internal medicine at the University of Oklahoma College of Medicine, Tulsa School of Community Medicine.

In February, the school joined the University of Colorado Board of Regents, President Bruce Benson and leaders from University of Colorado Colorado Springs (UCCS) and Peak Vista Community Health Centers to celebrate the grand opening of the Lane Center for Academic Health Sciences on the UCCS campus. The Lane Center will house the School of Medicine branch’s administrative offices.

Wallace says the school will collaborate with health care providers and other educators to develop a training program that addresses community needs while also preparing the next generation of physicians.

“I believe the Colorado Springs community has an amazing opportunity to embrace innovations in medical education,” Wallace says. “Through interprofessional education, team-based learning and team-based care, our students will learn to provide outstanding and compassionate care for all patients.”

Some CU medical students have long desired a branch in Colorado Springs.

Brian Specht, a fourth-year medical student from Colorado Springs, says he rented an apartment in Denver to attend classes while his wife and their child remained in Colorado Springs. Born and raised in Colorado, Specht graduated from UCCS in 2010 with degrees in biology and chemistry, and had his sights set on the “holy grail,” CU School of Medicine.

“Financially speaking, it would have made a huge difference,” Specht says. “I maxed out my loans out of necessity. As difficult as medical school is, it doesn’t help to be separated from your family.”

Jonathan Kark, also a fourth-year medical student, says he “slept in a twin-sized bunk bed for two years” at Specht’s apartment. Kark’s wife stayed in Colorado Springs to complete a master’s degree at UCCS. The Karks moved to Denver after she graduated.

Specht and Kark say they appreciated the uninterrupted study time, but they missed their families.

By expanding clinical training opportunities for medical students, the school can add more graduates to address the physician shortage facing the country and can also introduce students to areas of the state that need more doctors.

According to the Association of American Medical Colleges, there is a shortage of about 20,000 primary care physicians nationally. The number is expected to increase during the next decade because 50 percent of the country’s presently employed physicians are more than 50 years old.
Unanswered Questions

Marijuana use by epilepsy patients prompts call for research

By Amy Vaerewyck

Edward Maa, MD, noticed a trend when his epilepsy patients responded to a questionnaire about the use of complementary and alternative medicine: Many were using marijuana.

Maa, assistant professor of neurology at the CU School of Medicine and chief of the Denver Health Comprehensive Epilepsy Program, was hoping to gather evidence to support acupuncture as a popular complementary treatment for epilepsy. Instead, he learned that the No. 1 alternative medicine used by his epilepsy patients was marijuana.

Previous U.S.-based epilepsy questionnaires on complementary and alternative medicine had not included marijuana, because no states had legalized it. Now that medical marijuana is legal under Colorado law, Maa added it to his research survey. When it turned out to be the most popular complementary therapy among respondents, his interest was piqued.

“Thirty-four percent of my patients, unbeknownst to me, were using or had used marijuana to treat their epilepsy,” Maa says. “I was surprised.”

With Colorado’s evolving marijuana laws and policy, Maa and other scientists at the Anschutz Medical Campus are attempting to determine the benefits and risks of marijuana for some patients.

“A lot of our patients are using, so as a physician, I consider it my responsibility to educate myself on this subject,” he says. “I need to know the science behind the claims and the interactions with my seizure medications. If you’re afraid to address it, you may miss potential bad effects.”

Working together

Because university physicians are not directly involved with approving patients for the state registry of those allowed to purchase medical marijuana, Maa contacted Margaret Gedde, MD, a doctor affiliated with the Realm of Caring, a nonprofit organization in Colorado Springs, Colo. The organization is recently famous for its “Charlotte’s Web” strain of cannabis, which has been used for children with severe epilepsy—such as Dravet syndrome, Lennox-Gastaut syndrome and Doose syndrome—and sparked a mini-migration to Colorado of families struggling with epilepsy.

With Gedde’s help, Maa queried the Realm of Caring database and found that 13 of 30 patients with epilepsy had three or more months of experience using Charlotte’s Web. Gedde contacted these patients and received demographic and seizure frequency data from 11 of them. Of those, eight reported a dramatic response to the marijuana treatment.

Maa and Gedde presented their findings at the American Epilepsy Society in December 2013. Due to its patient sample size and methodologies, the study and its results were not without controversy, Maa says.

“Given the conflict between federal and state views of marijuana, this was the best that could be done under the circumstances,” Maa says. “However, for some of these kids to have such a dramatic reduction of seizures is unbelievable. At the very least we need to get to the bottom of this reported effect. Maybe Charlotte’s Web is affecting the drug levels of the other medications, maybe it is a true effect, maybe it is wishful thinking on the part of the parent—either way, we should know.”

Deeper study of medical marijuana is difficult, because the U.S. Food and Drug Administration labels marijuana a “Schedule I” controlled substance rating, declaring it as no medicinal use.

“It is unfortunate that marijuana has a Schedule I rating,” Maa says. “Cocaine doesn’t even have a Schedule I rating, because it is used in eye drops. Changing the rating for marijuana would do a lot to move things forward on people’s comfort level and trying to get more research.”

Limited research

Maa says research related to medical marijuana’s impact on calming seizures is limited.

“It’s a fascinating question worthy of investigation, if there weren’t the stigma,” he says. “With the legalization [in Colorado] of medical marijuana more than 10 years ago and the legalization of recreational marijuana starting this year, I hope physicians quickly engage in conversation about marijuana and that they educate themselves about it—because based on my survey, I suspect their patients are using it much more than they know.”

There are, however, those who suggest caution and express considerable concern about other effects of marijuana use. Classifying marijuana as a Schedule I drug, which ranks it among the “most dangerous” substances alongside heroin, LSD and methamphetamine, makes research “nearly impossible,” says Amy Brooks-Kayal, MD, professor of pediatrics and neurology and co-director of the Translational Epilepsy Research Program at the School of Medicine. The American Epilepsy Society and the Epilepsy Foundation of America are strongly encouraging federal officials to change the schedule of marijuana to reduce barriers to research.

“We do know from basic science studies that marijuana derivatives can completely stop the cellular mechanisms of learning and memory,” says Brooks-Kayal, who is also vice president of the American Epilepsy Society. “And right now, I don’t know the benefits, I don’t know the likelihood it’s going to help, and I know nothing about the risks.”

The pediatric neurologists at University of Colorado have seen more than 50 children who have received a marijuana derivative for treatment of their epilepsy, and of these patients less than 25 percent have a reduction in seizures reported by parents. The pediatric neurologists also report they have seen no clear evidence of improvement on objective testing such as prolonged EEG.
At the same time, they report seeing potentially serious side effects including changes in levels of other medications, sedation and worsening seizures in some patients in association with marijuana derivatives. “We also have no information about the potential long-term adverse effects on learning and memory in young children treated with marijuana products, and studies of adolescents who use marijuana recreationally suggest that this may be a very substantial concern,” Brooks-Kayal says. “We thus critically need well-controlled studies to better understand if these products are safe and effective for use in children or adults with epilepsy.”

Below, Heather Jackson says her son, Zaki, has had fewer seizures since she began giving him cannabidiol. Photo by Thomas Kimmell.

A mother’s call for more research

By Vicki Hildner

While there are no child neurologists on the School of Medicine faculty recommending that parents use marijuana to treat children with epilepsy, there are families in Colorado who are using the drug.

Even before Zaki Jackson turned 4 months old, his mother noticed that he seemed to be experiencing odd spasms. His pediatrician ordered an EEG.

“I thought he said ‘EKG,’” says Heather Jackson, Zaki’s mother. “I thought there was something wrong with his heart. Then I googled ‘EEG’ and realized, ‘Oh, it’s his brain.’”

The test showed that Zaki’s brain was experiencing abnormal electrical activity.

“His brain waves were a mess,” Jackson says.

The initial diagnosis was epilepsy of unknown origin and with each passing year, Jackson watched her son experience multiple types of seizures. Sometimes during a seizure, Zaki would lose all muscle function and crash to the floor. Other times, his body stiffened, and he stopped breathing so long his lips turned blue. Other seizures came so frequently—hundreds per day—that Zaki stopped eating for days.

“I was definitely helpless, but I was never hopeless,” Jackson says. “Our job as a parent is to protect our child, but with this, there is nothing you can do. It’s the worst feeling on the planet.”

Zaki did not walk until he turned 3 years old. He didn’t talk until he was 5 years old. By the time he turned 9 years old, he was developmentally a toddler with a diagnosis of Doose Syndrome. He had been on 17 different medications and his mother had tried countless additional therapies, including non-FDA approved treatments prescribed by physicians.

“It felt like they experimented on my child for nearly a decade,” Jackson says. “There were times I was ready to quit, but the next morning I picked myself up and said, ‘He is worth the fight.’”

In 2012, Zaki was receiving hospice palliative services when his mother heard about a father using cannabidiol (CBD), a non-psychoactive oil made from marijuana plants, to help reduce seizures in his child. She asked her hospice counselor about the oil.

“She said, ‘I can’t recommend it,’ Jackson says. “And then she gave me a phone number to call.”

That phone number led Jackson to the Stanley family, five Colorado brothers who were manufacturing CBD from a special strain of hemp. Jackson gave Zaki his first dose of the oil, administered by syringe, on July 19, 2012. “I remember that day as if it were yesterday,” she says. “The night before, Zaki had had 200 seizures. That night, I stayed awake and stared at him. He slept through the night for the first time in years.”

Zaki, who turns 11 in May, was the second child in the United States to try the oil, now named “Charlotte’s Web” after the first child to use it.
When James Hill, PhD, professor of pediatrics and medicine, and executive director of University of Colorado’s Anschutz Health and Wellness Center, was a newcomer to the state back in the 1990s he heard about a program that allowed any fifth-grader to ski free.

Kids that age can be insistent once excited about something. They’ll bug their parents to take them to the slopes, and the ski industry makes money off the whole family while hooking a future customer. But back then, Hill’s own kids were so young that he tucked the notion away while becoming one of the nation’s leading voices on pediatric nutrition.

A good idea, though, never really goes away.

More than a decade later, Hill dusted off his fascination with Colorado Ski Country’s successful 5th-Grade Passport program and used the thinking behind it to nudge another group of fifth-graders toward eating healthier and exercising more.

With so much scolding surrounding the problem of childhood obesity and inactive kids, Hill wondered if maybe the grown-ups had the wrong approach.

“Rather than us telling kids what to do, let’s let them make their own choices,” he says. “Let’s teach them the skills to make informed decisions and help them understand the consequences that if they supersize those french fries, it will take 8,000 steps to burn them off.”

With that empowering approach, 5th Gear Kids was born. After a pilot rollout last school year, the program this year reaches nearly 7,000 fifth-graders in 70 schools within two Denver suburban school districts. Students, who suggested the program’s name, learn in PE and science classes about nutrition and how that whole intake-versus-energy–expended thing works.

And just to drive the point home, there is a bribery component for those who sign up for a points program. (They are, after all, kids.) Points for prizes can be earned if they order a turkey sandwich on whole wheat at Subway or if mom buys almonds instead of cashews at the grocery store. They also earn points if they stay active, whether it be shooting hoops with friends, playing on sports teams or even playing a musical instrument. Pounding piano keys burns calories, too.

There are lots of ways to earn points. For 60 minutes of physical activity, the students earn 130 points. Signing up in participating fitness classes offers a chance for 150 points. Talking to a grocer’s dietician earns 50 points. Getting an annual well-child visit with a pediatrician provides 500 points.

Most prizes involve sports gear but the grand prize is a trip for two to Iceland, which happens to be the home country of Thrudur Gunnarsdotir, PhD, a postdoctoral fellow at CU who is involved in the program.

Last year’s winner, Franklin Carpenter of Aurora, started racking up points to get a bicycle but then he just kept going. In the end he compiled an astonishing 40,000 points, and in December traveled to Iceland for five days with his older sister.

What a brilliant marketing idea, he thought.
It was his first ride on a plane, and in fact his first trip out of Colorado—all for eating healthy food and playing a lot of soccer.

“It was cool,” he says in the typical understatement of a preteen. “I got to do a whole bunch of new stuff.” Cool first-time stuff like driving a snow-mobile, riding a horse and sampling Icelandic hamburgers and chocolate, which he declared were better than the plain old American versions.

This year, D'Shawn Burkes, another Aurora fifth-grader, has set his sights on Iceland. So far he has compiled tens of thousands of points by making healthy eating choices and playing outside more frequently. “I sleep better and have more energy,” he says.

His mother, Veronica Burkes, adds that her son's awareness has caused her to change her ways, too.

“He says, ‘Mom, do you have to fry that? Can’t you bake it?’”

She switched to whole grain noodles and from 2 percent milk to 1 percent; her three children barely noticed. With a family history of diabetes, heart disease and high blood pressure, she says she’s glad her son is creating healthier habits young.

And while the program purposely shuns weigh-ins and forbidden foods, Burkes says D'Shawn, who was overweight, has dropped 10 pounds since getting with the program.

Other parents joke that a quick trip to the grocery store now takes a half-hour or more, as the kids insist on reading labels to their parents before letting food into the cart.

There is child-development science behind targeting fifth-graders, says Debbie Carter, associate professor at CU Medical School’s Department of Psychiatry. Kids in the tween years are on the cusp of independence, she says. They are developing their own voices and opinions about the world around them before potentially falling victim to negative peer influences.

The two school districts where 5th Gear Kids started represent a wide diversity of race, culture and income. But what has surprised Hill is the unexpected generosity the program has inspired.

Some fifth-graders are giving away some of their earned prizes to kids less fortunate. “I figure we already have a lot of toys. If there’s any way I can help other kids, why not go for it?” asks Danijela Prizmie, 11, at Creekside Elementary School. She and some of her classmates have been using their points to buy toys for kids at Children’s Hospital Colorado.

Unlike some programs geared toward healthier food choices for children, Hill says his has received virtually no parental pushback. “It’s one of the best programs I’ve ever been involved in,” he says, “My goal is to have it in every school in Colorado. And then we’ll hit the universe.”

Below, Ellie Newman earned tickets to a Denver Broncos game, while Harrison Boushele and Molly Bazel each won bikes.
Jay Lemery, MD, compares his work in the emerging field of wilderness medicine to adding a room onto the ancient house of medicine.

Building that room looks like a long-term project for Lemery and fellow advocates because the dimensions of wilderness medicine are complex, encompassing much more than the predictable terrain of mountains, rivers, deserts and jungles.

Wilderness medicine also claims outer space, diving/hyperbaric medicine, extreme sports, climate change, and disaster and humanitarian assistance. By gathering together these disparate interests, wilderness medicine offers a way to keep people safe in unfamiliar or dangerous surroundings.

“So many things were pigeonholed,” says Lemery, an associate professor of emergency medicine. “Snake bites, bear attacks, hypothermia, hypoxia—no one place was owning all these things. And no one place was teaching situational awareness or how to come prepared or what to do if someone does get injured.”

Wilderness medicine has developed nationally as more people embrace adventure travel and sports, and as the field expands in new directions. Anchored in a smattering of departments of emergency medicine around the country, wilderness medicine includes such specialties as immunology, infectious disease, public health, pharmacology, pediatrics, sports medicine, physical medicine, traumatology, family medicine and internal medicine.

Richard Zane, MD, chair of the Department of Emergency Medicine, prefers an expanded name for the field: wilderness, austere, expedition and environmental medicine.

“It’s a mouthful, I know,” he says. “But the term wilderness medicine evokes images of Cub Scouts and campers. What we’re talking about is what happens when you take humans from one place and put them in another environment. Or it can be how to prepare the population when the environment around them is changing.”

The discipline has found a natural home at the University of Colorado School of Medicine in part because of state attraction to outdoor sports exploration and recreation enthusiasts—and the inevitable injuries and rescues that follow.

Lemery’s close ties to the Wilderness Medicine Society—he is president of the Salt Lake City-based organization—have put the field on a fast track at CU, with courses and trips for medical students and undergraduates, fellowships, a massive online open course (MOOC) and continuing medical education travel.

Most classroom experiences are held outdoors in locales as close as Estes Park and Moab, and as far-flung as Costa Rica and Alaska. Emergency scenarios are staged, but there have been real broken bones, extreme weather scares and cases of altitude-induced pulmonary edema.

Lessons vary by location and can include triage, building a litter, avalanche and fast water rescue, ropes work, insect and animal bites, hypothermia, frostbite and manufacturing medical equipment from ordinary items.

“It used to be that you could say you’re a doctor, sign onto a trip and go as the physician with no training at all,” says Tracy Cushing, MD, MPH, who volunteers with Colorado Outward Bound, teaching best practices to guides. “There’s more of an expectation now that you’ll be certified in travel medicine and have at least some level of advanced training.”

Continued on page 16
Climate change is a loaded term in medicine just as it is anywhere else these days, Jay Lemery, MD, learned when he issued an appeal for papers on the subject.

“Some guy called me a moron,” he says shaking his head. “It was just a call for papers. That’s about as boring as it gets.”

But if physicians are going to have an impact on the debate, they need to learn to take the heat, says Lemery, head of the Wilderness Medicine Society and a physician in the CU Department of Emergency Medicine. Doctors can have a big influence on prevention and preparedness by shedding light on the physiological effects of global warming: respiratory illnesses including asthma and allergies, cardiovascular disease, insect-borne illnesses, and injuries and illnesses caused by extreme weather.

“Clinicians,” he says, “are noticeably absent in the conversation.”

It’s in physicians’ interest to weigh in, says Richard Zane, MD, chair of the CU Department of Emergency Medicine.

“We have to think proactively about the population,” Zane says. “It’s similar to whether physicians should have an opinion about gun control or whether marijuana becomes legal. Climate change will most assuredly affect the health of the population. But it’s a quandary. Should you become political? I think the answer is yes. Think about it. There was little dispute when we endorsed seat belt laws or drunk-driving legislation.”

Wilderness medicine is a natural starting place for the conversation because its mission is to prevent and treat injury and illness in extreme environments. But you don’t have to travel to find such an environment, Zane points out. It can come to you.

“It includes how to prepare the population when the environment around them is changing,” Zane says.

Increasingly, extreme weather—droughts, hurricanes, floods, polar vortexes—could mean more people will depend on skills developed by wilderness medicine training, such as providing a basic physical exam when technology is not available.

“Here in the United States if you hear a heart murmur you order an echocardiogram,” says Lemery, section head of Wilderness and Environmental Medicine in the Department of Emergency Medicine. “In most of the world if you hear a heart murmur you just have to make a diagnosis. This is important, and we need to teach these things in the classroom and the field.”

Hoping to introduce the topic to medical schools, he co-edited Global Climate Change and Human Health, a textbook for medical students.

But the public needs to be educated as well. He points to the European heat wave of 2003 that officials estimate caused 30,000 deaths.

“They had no historical ability to deal with it,” Lemery says. “People didn’t know how to keep themselves cool. They didn’t know to go to cooling shelters. Young people didn’t know to check on elderly neighbors.”

He is considering starting a climate change organization modeled on International Physicians for the Prevention of Nuclear War, which advocated disarmament in the 1980s. The group, which won a Nobel Prize in 1985, issued the statement “Nuclear war would be the final epidemic, there would be no cure and no meaningful medical response.”

“They stuck with the science and they were unassailable,” Lemery says. “They said ‘This is a public health issue, and it’s bad.’ That’s what we need to do in wilderness medicine. Stick to the science. Elevate the discourse.”

Left, A group lesson in 2012 in Buckskin Gulch, Grand Staircase-Escalante National Monument, Ariz. CU sponsors continuing education trips through the Wilderness Medicine Society (WMS.org)

Far left, participants in a CU-sponsored educational trip this spring tend a simulated injury just below Cascada San Ramon, Ometepe Island in Nicaragua. Organizers prepare scenarios for students including falls, animal attacks, broken bones and other first-aid emergencies. Photos by Todd Miner, EdD, FAWN.
At the Wilderness Medicine Society, Cushing is on a committee establishing guidelines for wilderness medicine topics like prevention and/or treatment of frostbite, acute altitude illness, eye injury and illness, and epinephrine usage.

“Say that someone wants to climb Everest,” says Cushing, an assistant professor of emergency medicine. “Our hope is that they or their physician will pull up our guidelines and follow them.”

But Lemery and Cushing believe the work has just begun. With the boom in global health programs nationally, more people are traveling to remote parts of the globe, often unequipped and ill-prepared. Lemery was in Haiti following the 2010 earthquake and saw the problem firsthand.

“It was clear from being there and the stories we heard afterward that scores of the people had no business being there,” says Lemery. “You can’t just show up.”

Such basics as putting the right things in your backpack and keeping your feet dry often are ignored.

“You know what the biggest killer is in developing countries?” he asks. “Cars. You’re going to be in cars with no seatbelt, no airbags. So what do you do? First-time travelers who grew up in the OSHA world often don’t have situational awareness.”

Wilderness medicine training can prepare health practitioners and lay people alike.

“Everyone wants to be helpful in a disaster,” says Cushing, who relied on her wilderness medicine skills while working on the Hopi Reservation and in Nepal where patients were often hours away from a hospital. “You may go somewhere and plan on treating cholera and dengue, but do you know how to purify water or set up your own tent? You might deliver 100 babies a day, but if you can’t take care of yourself, you’ll just be another patient.”

Lemery predicts that increasingly destructive natural disasters will make wilderness medicine training pertinent even in large urban centers.

“For example, most of the world does not have MRIs and cat scans, so we emphasize the importance of the physical exam, which has eroded in U.S. medical school,” Lemery says.

During hurricanes, blackouts and other emergencies, urban physicians can find themselves making a diagnosis without technology.

“You need to think about ‘What if the hierarchal structure was gone and you had to deviate. What would you do then?’”

CU offers an array of wilderness medicine opportunities including continuing medical education trips around the world, fellowships, undergraduate and medical student electives and a massive open online course (MOOC). See the list of choices by clicking on the Wilderness Medicine story at MedSchool.UCDenver.Edu/CU/MedToday/features

TEAM clinic aids patients on the go

By Tonia Twichell

Thanks to improved access and technology, the most far-flung places on Earth are open to travelers with enough money and determination for adventure travel. But returning from those icy mountaintops, deep waters and dense jungles, intrepid, but unprepared, tourists can bring back ailments that are as difficult to diagnose as they can be to treat.

The CU Travel, Expedition and Altitude Medicine (TEAM) clinic, which opened in January, is designed to provide care and expertise for travelers before, during and after travel.

“The vast majority of travel clinics around the country deal almost exclusively with prevention against infectious disease, mainly vaccination and some prophylactic antibiotics,” says Richard Zane, MD, chair of the Department of Emergency Medicine. “But preparation should also look at the environment: Are you going to a place with extreme temperatures or altitude? Will you be in a place that has a lack of access to health care? If so, how do you plan on getting health care if you need it? There’s a second and third level of planning that is rarely addressed.”

Many travelers who historically avoided exotic locales—seniors, children, pregnant women, people with asthma and other health conditions—are now more likely to travel.

“It’s not like 100 years ago when people would usually stay in the same environment all their lives,” Zane says. “In less than a day you can go from sea level to Everest or from Denver to a cruise in the middle of the Mediterranean.”

An early consultation can make a difference between life or death.

“People already know that if they’re going to a place where there is malaria they should prepare for malaria, but this goes a step further,” Zane says. “If you are already on certain medications and you’re going to a place with extreme heat, how will that disease be affected by the potential physiologic stressors of travel, chronic disease and a very different environment – heat, cold, altitude, humidity, etc.?”

Primary care physicians don’t always know to ask for a travel history when a patient presents symptoms, plus they often don’t have the most up-to-date information about planning for a trip.

“For the most part, you can’t just go to an internist and say ‘I’m going to Africa,’” Jay Lemery, MD, associate professor of emergency medicine, says. “They’re not prepared for that. So there’s a real role for us to play.”

The clinic housed at University of Colorado Hospital Outpatient Pavilion incorporated an altitude clinic that has for years been the go-to place for advice on preventing and treating altitude related hypoxia. The altitude clinic has a hypobaric chamber—the only one in civilian use—where experts can measure a patient’s response to altitude before climbing to a mountaintop. Though in Colorado, there’s another option.

“You’ll get people in who say ‘I have COPD, and I want to go to the Andes,’” Tracy Cushing, MD, assistant professor of emergency medicine, says. “A lot of times I’ll say, ‘Why don’t you take a trek around Breckenridge and we’ll see how you do at 12,000 feet?’”
Altitude center climbing higher

By Tonia Twichell

Studies on the effect of altitude on humans have been going on in Colorado since the early 20th century when English researchers came to the Rocky Mountains looking for answers impossible to find in the low-slung hills of Britain.

Decades later, researchers from CU’s cardio-vascular-pulmonary lab (CVP) pioneered studies about how humans and animals adjust to high altitude, with research carried out on Pike’s Peak, in Leadville and on cattle ranches around the state.

Today, the University of Colorado Altitude Research Center, with an entire mountain range for a backyard laboratory, has taken a national lead in research, education and patient care.

“There is no other center that is focused on all aspects,” says Ben Honigman, MD, an emergency medicine professor. “This is a good place for it. Colorado has the most people who live above 5,000 feet and there are almost three-quarters of a million people who live above 6,000 or 7,000 feet. Twenty million tourists come here each year.”

Center Director Rob Roach, PhD, identifies two main missions.

“One is to research the fundamental medical and biological processes related to hypoxia,” he says. “The second is to connect health providers in isolated mountain towns with state-of-the-art research at CU.”

CU researchers and clinicians have historically been involved in altitude studies, but the university’s dominant role is recent.

In the 1980s, a Summit County center called Colorado Altitude Research Institute (CARI) began studying the effects of hypoxia on people traveling to moderate elevations. At CU, CVP researchers focused on people who lived in the Colorado’s high country, Honigman says.

“Up until then, most of the work done for altitude illness was done at very, very high elevations,” says Honigman. “There were a lot of studies in the Himalayas or South America.”

When CARI closed for lack of funding in the 1990s, the onus lay on CU to expand its work. In 2003, CU opened the Altitude Research Center.

“If any place in the country should be a great center for researching hypoxia, it should be the University of Colorado,” Roach, an associate professor at the School of Medicine, says.

Center researchers have studied the effects of altitude on exercise, blood flow to the brain, cardiovascular health in Colorado as well as on the higher peaks – most recently the Himalayas and the Andes.

Research has progressed from strictly physiological trials on the effects of hypoxia, to the molecular level of what genes protect the body from the effects of hypoxia and why certain people are more affected by oxygen deprivation.

All four CU campuses are engaged in hypoxia studies because oxygen deprivation affects a variety of diseases and processes. So the center has begun an outreach tour to learn how better to coordinate studies both in and outside the university system, Roach says.

For example, a recent partnership with a Summit County cardiologist who wanted help with patients suffering from pulmonary hypertension will benefit university clinicians and researchers as well as patients in mountain communities.

“We put him together with experts at CU,” he says. “They came up with ideas on how to do studies to better diagnose and treat his patients and provided opportunities for the CU researchers to have a unique patient research base. It’s a win-win for everyone.”

A scientist measures a research participant’s physical reaction to extreme altitude on Mount Chacaltaya near La Paz, Bolivia. Below, research participants hike Mount Chacaltaya, which is nearly 18,000 feet above sea level. Photos courtesy of Altitude Research Center.
On a windy spring day near East Colfax Avenue in Denver, Derek Enns passes a small girl in a purple flowered skirt who giggles a quick “Hello Derek” before dashing into a sprawling set of low apartment buildings where many recent immigrants from Asia and Africa live.

Enns, a second-year CU physical therapy (PT) student, is at home here—as he should be. He shares a one-bedroom basement apartment with three roommates: two from Myanmar, also known as Burma, and one from Rwanda.

“I was a little surprised when he said he wanted to live in the community,” says Frank Anello, executive director of Project Worthmore, where Enns is a volunteer. “But that’s Derek.”

Enns arrived in Denver two years ago with a reputation, Anello says. While volunteering with Partners Relief and Development on the Thai-Myanmar border the previous year, he lived in a home that had no furniture, mattress or basic comforts.

“He didn’t care about those things,” Anello says. “He wanted to be there and to be present and help the community.”

Most of his work in Myanmar involved health trainings and took place at a village near a rebel army base.

“Sometimes we’d have to sneak past the Thai border patrols and walk through land mine territory,” Enns says. “But that sounds more exciting than it actually was.”

He trained local health workers on basics, like how to read English labels on medicine. The camps were clean and comfortable, but many residents had physical and psychological injuries as a result of the decades-old civil war.

“Maybe I’m biased but I really liked the people,” he says.

The Denver area’s large Burmese population is what drew 29-year-old Enns to Colorado. He knew he wanted to work with immigrants while in graduate school and keep up his Chinese and Thai language skills. For a while, he considered becoming a physician assistant.

“I was trying to figure out how I could be useful. Then I stumbled upon PT and realized it would be very helpful in a third-world setting. You don’t need much equipment; you don’t need medicine. In areas where surgeries aren’t really available, PT can do a lot to maximize function and minimize pain.”

Until he graduates in 2015, he plans to stay in the community, where he is often a new family’s initial contact.

“We try to bridge the gap when they first get here and make sure they’re not starving to death or walking to school in flip-flops through the snow.”

At a nearby playground, boys swarm around Enns, begging him to throw a green-winged football. They give chase when he lobs it long and high.

“They usually take over from here,” he says, ocean-blue eyes sparkling.

No detail is too small. On that windy spring afternoon, he sat on the floor of a basement apartment occupied by a Burmese family that had arrived in Denver from Malaysia less than two weeks earlier. With half a dozen children wheeling around trying to get his attention—one little guy insisted on shoving smashed Pringles into Enns’ mouth—he quizzed the new family about their needs.
One of the children is old enough to have started school. Does he have a backpack? No. Paper, pencil? No. Enns pulls out a small piece of paper and a pen and writes down what they need. Do they have bus passes? Has the father signed up for English classes? Do they know how to use the washing machine? Do they have quarters? Do they have soap? No, no, no, no, no.

And how about Sophia, he says, nodding to a small girl with big eyes and short black hair. How old is she? The family does the math. Five. Old enough for kindergarten, he says, jotting that down.

Then he asks something, not in English, and everyone nods: Do you have bedbugs? "That’s one of the things I can say in Burmese," he says, sympathetic; he’s had them twice. They strategize how to get rid of them.

Despite the demands on his time and energy, Enns says he’s never regretted his decision to live here.

“You make friends really fast,” he says. “I knew that if I lived further away it would be more inconvenient to get all the way across town to see people. Like last night, I didn’t feel like going out, so I went up to some friends’ place on the third floor and hung out. It feels more natural. A lot of the problems in the community are solved less by us dumping money and more by friendship and relationship.”

By living among the immigrants, he can also keep an eye out for trouble. Neighborhood schools suffer from crime and gang influences.

“East Colfax is the only thing they experience and it’s not beneficial for most of them. The parents don’t know how to deal with it so we’re trying our best to tell them what to expect, how to keep kids out of these situations. The parents are very much out of their comfort zone. It’s sad because most of the parents didn’t move here for themselves; they did it for the kids.”

Enns does what he can to help, Anello says, including saving up money to take kids and their families on field trips.

“Derek will take them to the movies, or up to the mountains or ice skating. He took them to an Avalanche hockey game. On the Fourth of July he took a bunch downtown to the courthouse to watch the fireworks.

“Certain people have the heart and compassion to serve others. But I’ve never met anyone who does as much as Derek does.”

See a 9News video of Derek Enns, who was awarded a 9Who Cares award, by clicking on the Derek Enns story at MedSchool.UCDenver.EdCU.MedToday/Profiles.

Right, Enns holds a 3-year-old boy from the Karen ethnic group of Burma whose family moved to Denver in December. Below, Enns plays with children of new immigrants from Burma.

He wanted to be there and to be present and help the community.
Long-Distance Relationships
Telemedicine initiative delivers patient care closer to home

By Tyler Smith

Tight physician-patient bonds are generally a good thing. But a growing number of providers have found that long-distance relationships can be the most satisfying for patients.

The Colorado Fetal Care Center at the Colorado Institute for Maternal Fetal Health (CIMFH) is among those exploring the possibilities of telemedicine. In particular, they are looking to use it to connect echocardiography specialists with patients many miles away. Via a secure video and audio link, physicians can converse with patients and their community providers, and review fetal echocardiography images transmitted electronically.

The approach allows specialists to detect and monitor fetal abnormalities at regular intervals while sparing patients long trips to get the imaging procedures, says Bettina Cuneo, MD, visiting professor of pediatrics and director of Perinatal Cardiology and Fetal Echo Telemedicine at Children's Hospital Colorado. The CIMFH is a joint venture between Children's Hospital and University of Colorado Hospital.

“Where you live shouldn’t define the level of health care you receive,” Cuneo says. “With telemedicine, we can make sure that women who live in remote areas have the same access to care as those who live near major medical centers.”

Shrinking distances

Cuneo, who set up a telemedicine program with Advocate Hope Children's Hospital in Chicago, is leading a similar effort with the CIMFH. She is looking for opportunities at hospitals in Colorado, Wyoming, New Mexico, Idaho and Montana communities that are far away from medical subspecialists.

Aside from saving mothers the time, expense, and physical and emotional discomfort of travel, telemedicine can help specialists identify fetal cardiac abnormalities earlier, thereby potentially improving outcomes, notes Lisa Howley, MD, assistant professor of pediatrics and co-director of Perinatal Cardiology at Children's Colorado.

The earlier a diagnosis is made, the longer maternal fetal medicine specialists have to monitor the fetus and the mother. In turn, the mother can wait to make the trip to the CIMFH—which is equipped to handle deliveries and surgeries of infants with fetal abnormalities, and even fetal surgeries—until it is medically necessary, Howley says.

“Most babies with heart disease, for example, do not get into trouble until they are born,” she says. “At the time of birth, we strive to make sure that they are in the right place, with the right diagnosis.”

An earlier diagnosis also decreases the risk of a premature delivery, which often means an additional set of medical problems. For example, Howley explains, providers often can manage a slow fetal heart rate, which can be a sign of distress, without having to deliver the baby.

“A lot can be done in utero without having to also deal with the risks of prematurity,” Howley says.

Cardiac crisis

A telemedicine option would have benefited Erin and Zane Luttrell of Montrose, whose son Caleb was born Oct. 18 of last year. Erin, 34, was 20 weeks pregnant when her community obstetrician discovered that Caleb's fetal heart rate was 55 beats per minute. Normal is 140. The couple traveled to Grand Junction to consult a high-risk obstetrician who performed an ultrasound that revealed a heart block that was disrupting the electrical signals traveling from the upper chambers of Caleb's heart (the atrium) to the lower chambers (the ventricles).

The Grand Junction obstetrician referred the Luttrells to Howley to monitor the fetus in utero. The condition demanded close attention.

“The fetus struggled to maintain the cardiac output of an average heart,” says Howley, who prescribed for Erin medications that crossed the placenta and increased Caleb's in utero heart rate, but only to 62 beats per minute.

Howley’s most challenging recommendation, however, was that Erin return to Children's Colorado once a week so Howley could monitor Caleb’s heart function. That meant a six-hour drive or a flight to the Denver area, which was further complicated by the need to make sure there was care for the couple’s two other children, Cole, 7, and Conner, 4.

Perinatal cardiology specialists Lisa Howley, MD, (left) and Bettina Cuneo, MD, say telemedicine will help mothers with high-risk pregnancies in remote areas. Photos courtesy University of Colorado Hospital.
Beginning in July, Erin, accompanied by either Zane or her mother, made weekly trips to Aurora. She typically rented an apartment near the Anschutz Medical Campus, stayed overnight and saw Howley and CU Maternal Fetal Medicine Section Chief Henry Galan, MD, professor of obstetrics and gynecology.

Toward the end of September, Erin and Zane moved to Aurora and remained there until the October delivery, which took place by C-section two weeks earlier than planned because Caleb’s heart rate had gotten dangerously low. He arrived at 6 pounds, 3 ounces, was sent to the Cardiac Intensive Care Unit and received a pacemaker three days later. He is home in Montrose now, his incision healing and his heart rate continuing to increase, Erin says.

The Luttrells praised Howley and Galan for their close attention to detail and emphasis on explaining Caleb’s condition, how it would be treated and what they could expect during and after delivery. “We couldn’t have asked for better care,” Erin says.

**Dangerous distance**

But they also admit the expense and time demands of travel compounded an already stressful situation—one that could have been worse, Zane adds.

“We had a support system at home with Erin’s parents, aunts and uncles,” he says. The couple owns their own sand-and-gravel business, and their “employees stepped up. Without that, it would have been very difficult to be gone,” Zane adds. “We felt fortunate. There were families at Children’s who had been there longer than us.”

“Telemedicine would have helped,” Erin says. “We were under stress because we were in a situation where we didn’t know if our child was going to make it. It would have been different if we’d been able to stay here [at home].”

“The better your ability is to get cutting-edge technology and access to experts, the better you will be able to get great medical care,” Zane adds.

**Remote possibilities**

Cuneo aims to make that happen in Colorado and the region. While at Advocate Hope Children’s Hospital she built telemedicine partnerships with Sherman Hospital in Elgin, Ill., and with hospitals in Joliet and Hammond, Ind. She held “virtual clinics” several days a week for fetal echocardiograms, and was available to consult with the obstetricians at the hospitals if they had a fetal cardiac problem that couldn’t wait for the regularly scheduled clinic.

Two-way video inputs connected her Chicago office to the remote clinic, where she interacted in real time with a mother, obstetrician and sonographer. Cuneo took a history from the mother and explained the test to her before the camera switched to the echo machine, allowing Cuneo to look at the fetal images.

“It’s like standing over the shoulder of the sonographer,” Cuneo says. The audio on the system in Chicago was so good, she says, that the crunch of a bite from an apple while she worked could be disturbing. As she watched, Cuneo directed the sonographer to change the scale or position of the view, or to zoom in or out.

Cuneo examined the images live. If she detected an abnormality—a serious arrhythmia or structural cardiac defect for example—she made it her “personal credo” to see the patient face-to-face within 24 hours. She also discussed how to manage the abnormality with the mother’s obstetrician.

Telemedicine could help close a troubling fetal care gap in Colorado, Cuneo says. In Illinois, 80 percent of fetal abnormalities are detected before birth. The percentage in Colorado, she says, is half that.

Cuneo has been doing the legwork to close that gap since coming to Children’s Colorado last September, in part for a chance to work with Colorado Fetal Care Center Director Timothy Crombleholme, MD, MA, professor of surgery and a pioneer in fetal surgery. Most of her work, Cuneo says, has been “meet-and-greets” with obstetricians, some of whom express surprise that pediatric cardiologists image the fetal heart.

“Getting buy-in from the OBs, who will be the ones referring their patients, is crucial,” she says. With that, setup requires a video system with two inputs, computer screens, a dedicated DSL or T1 line, and a well-trained sonographer who has practice working with a perinatal cardiologist. She estimates the hardware for remote technology can pay for itself with 10 to 20 echocardiographies, while line charges, although minimal, are ongoing.

More importantly, telemedicine can extend the continuity of maternal fetal care, Cuneo adds. “It can provide a bridge from the fetus to the neonate. Patient care doesn’t start at birth.”

This article first appeared in the UCH Insider, the University of Colorado newsletter.
Guatemala Clinic Opens  
**CU physicians to provide care in Latin America**

*By David Kelly*

Standing in Guatemala before a gleaming new building rising from the surrounding ramshackle villages, Gustavo Bolaños delivers a simple yet powerful message to the assembled dignitaries and the banana plantation workers.

“Today we are making the dream of my father a reality,” the chief operating officer of major fruit producer AgroAmérica said in March. “My father Jose Fernando Bolaños believed in the dignity of work, in improving the lives of his employees and the welfare of the community. And this is the result.”

With that he opens the Center for Human Development, a multifaceted medical facility created by the University of Colorado School of Medicine and Children’s Hospital Colorado to serve some 4,500 banana workers and their families. There are plans to expand into neighboring communities in the future.

The center sits on 10 acres of AgroAmérica land and will be staffed by CU doctors, dentists, nurses, midwives, students and other health professionals rotating through the site. The first physician arrived April 1.

This is the university’s first permanent presence in a foreign country and a prime example of a successful public-private partnership. Gustavo and Fernando Bolaños donated $1 million to the University of Colorado Denver in 2012 to develop the center, whose initial design was drawn up by students from the CU Denver College of Architecture and Planning. Children’s stepped in to help fund the project.

“This is like a marriage between CU, Children’s and AgroAmérica,” says Stephen Berman, MD, professor of pediatrics and director of the Center for Global Health. “The center is part of the Colorado School of Public Health which has overseen most of the project. It’s a long-term partnership that will require give and take if it is to survive.”

Berman was joined at the grand opening by his wife Elaine; Edwin Asturias, MD, professor of pediatrics and director for Latin America at the Center for Global Health; Judith Albino, PhD, associate dean at the Colorado School of Public Health; Amy Casseri, chief strategy officer for Children’s Hospital Colorado; and Doug Jackson, PhD, CEO of Project C.U.R.E., which donated most of the center’s medical equipment.

“Few universities have this kind of comprehensive relationship in a foreign country,” Asturias says. “This isn’t medical tourism. We are here to stay.”

Asturias, who grew up in Guatemala, says the center represents the best of global health.

“It’s a huge challenge but the kind of challenge we strive for,” he says. “We dreamt big and look what’s been accomplished.”

The clinic includes laboratories, a dental office, exam rooms, a reception and a separate research building. Living quarters are planned for visiting health care workers.

The center sits in an impoverished corner of southwest Guatemala known as the Trifinio region. It’s a hot, humid place where residents often share homes with livestock, drink contaminated water and suffer all the manifestations of poverty.

With the nearest hospital an hour away in Coatepeque, the villages near the plantation have little in the way of health care. Infant mortality rates are high, children die from treatable conditions like diarrhea and pregnant women may never see a doctor.

The center hopes to change much of that. Banana workers and their families who normally pay up to $50 to see a doctor in Coatepeque will now pay just $5 at the facility.

“This is a big help because it’s so close to many communities,” Juan Carlos Cojulun, who lives nearby, says. “It’s much cheaper than going all the way to Coatepeque.”

It also means local health workers, called tecnicas, won’t spend as much time tracking down pregnant women and newborn babies.

That’s just what center director Marco Celada, MD, and two tecnicas,
Ada Velasquez, 23, and Sairya Lopez, 21, were doing hours before the grand opening.

They drove deep into a steamy banana grove until they found Sandy Mendez, 20, nine months pregnant and in dire need of a checkup.

She was living in a house of corrugated steel sheets propped precariously against each other. Ducks slumbered beneath a wood-burning stove. A box of chicks peeped nearby. Her husband David Garcia, 26, a banana worker who had been injured by a piece of flying metal, sat nearby with his leg propped up.

The tecnicas took Mendez into a room and listened for a fetal heartbeat. The rhythmic thump, thump, thump grew louder as they moved the probe around her abdomen. But there was a problem.

“The baby’s head is not in the right place,” Velasquez says.

They decided to return in a few days to see if anything changed.

“One of our big problems is getting to the babies within the first three days of birth,” Celada says. “Fifty percent of deaths occur in the first weeks of life.”

Hopefully the new center will bring the pregnant women to the tecnicas.

“One of the challenges is effective community engagement and recognizing community in the broadest sense,” Berman says. “The tecnicas understand that.”

Berman has had a storied career in global health. He’s set up immunization programs for Colorado children and designed care management systems for pneumonia for the World Health Organization. But this may be his most exciting venture yet.

“It’s rewarding in every possible way,” Berman says. “But you’re only as good as your team, and our team is remarkable.”

The center is already having an impact back home.

Berman recently interviewed a Stanford professor drawn to CU because of the Guatemala project. And two fellows came to work at the university for the same reason.

“I expect this to be a major magnet for new talent,” he says.

Back at the center, the Vatican’s representative in Guatemala, Archbishop Nicolas Thevenin, blesses the clinic and the gates are thrown open. More than 300 workers and their families rush in. They tour spotless rooms, marveling at a place that now belongs as much to them as anyone.

Albino, assistant dean of the School of Public Health, walks among the throng.

“I am absolutely amazed by what I’ve seen here,” she says. “I’m so thrilled that the Colorado School of Public Health can be a part of this. This is exactly what we stand for.”

Right, Tecnicas provide medical care to families living in the AgroAmérica banana grove.
Thursday, May 22
Welcome Breakfast
8:30–10 a.m.
Anschutz Medical Campus
Fulginiti Pavilion for Bioethics

Classroom Experience:
Cardiovascular Pulmonary Renal Case Analysis
10 a.m.–noon
Anschutz Medical Campus
Education Building 1

1883 Society Luncheon
Featuring Holly Wyatt, MD, associate professor of medicine, division of endocrinology, metabolism, and diabetes and co-author of “State of Slim”
noon–2:30 p.m.
Anschutz Medical Campus
Education 2 South

Silver & Gold Banquet: Honoring the Classes of 1964 and 2014
5:30–9:00 p.m.
Denver Center for the Performing Arts
Donald Seawell Grand Ballroom
1101 13th St., Denver, CO 80202

Friday, May 23
Class of 1964 Continental Breakfast and Hooding for Convocation Ceremony
8:30 – 9:30 a.m.
Anschutz Medical Campus
Education Building 1, room 3500

School of Medicine Oath and Convocation Ceremony
10 a.m.–noon
Anschutz Medical Campus
Boettcher Commons

Dinner and Dialogue: Cocktail Reception and Individual Class Dinners
The University Club
1673 Sherman St., Denver, CO 80203
5:30 p.m. Cocktail Reception
6:30 p.m. Dinner

Class of 1964 Dinner
Denver Country Club
The Colorado Room, 1700 E. 1st Ave., Denver, CO 80218
6 p.m. Cocktail Reception
7 p.m. Dinner

Class of 1969 Dinner
Denver Country Club
The Balcony Room, 1700 E. 1st Ave., Denver, CO 80218
6 p.m. Cocktail Reception
7 p.m. Dinner

Saturday, May 24
State of the School of Medicine and Breakfast with Dean Richard Krugman, MD
8–9:30 a.m.
Anschutz Medical Campus
Research Complex 2, Tri-visible Room

Doctor’s Note ...
Whether it has been just a couple of years or a few decades since you walked the halls of the School of Medicine, you have a story to tell:

Share your exciting career news and updates.
Recognize a colleague for achievements.
Tell us about your new medical treatments.
Let us know about outstanding accomplishments.

Sharing stories gives us pride in the School of Medicine and in each other. Our school has helped launch careers of an aspiring astronaut, world-renown researchers, leaders in academic medicine and physicians who provide great care every day. Whether it is pioneering cutting-edge research or joining a local board or commission, your life’s work is an essential and fundamental chapter in the School of Medicine’s history.

The Medical Alumni Association would like to hear from you. To share your updates or to suggest a story idea, visit www.ucdenver.edu/healthalumni or email healthalumni@ucdenver.edu.

Your story could be featured on the Medical Alumni Association website or in the next edition of CU Medicine Today. For more information, please call 303-724-2518.
A Year of Success

Dear Alumni,

The spring is always an exciting time for the University of Colorado’s Medical Alumni Association. It is when prospective medical students visit us on campus and are awestruck by the opportunities offered by this institution. Each spring, we join fourth-year medical students for Residency Match Day and celebrate their recent academic achievements. This is also the time of year when welcome many of you back to campus for reunion weekend.

As the academic year comes to a close, I want share a few additional highlights:

- Last August, we welcomed 160 first year medical students and presented each of them with a new stethoscope branded with the Medical Alumni Association seal.

- Our Association provided first- and second-year medical students with free, quarterly breakfasts—an added bonus to a busy, rigorous week of coursework.

- Through the HOST (Help Our Students Travel) program, alumni from across the United States provided travel and housing accommodations to fourth year medical students as they interviewed with some of the country’s best residency programs.

- The Association awarded its first $5,000 Medical Alumni Association Scholarship—recognizing a student for outstanding academic performance and commitment to the work of the Medical Alumni Association.

- Last fall, we were joined by more than 150 School of Medicine Alumni for a reception and exclusive tour of Denver’s stunning Clyfford Still Museum.

- We successfully secured more than $100,000 in much needed support for programs directly benefiting our student population—the Stethoscope Sponsorship Program, the Medical Alumni Association Scholarship Fund, just to name a couple.

Now, imagine what we can accomplish next year and beyond. The mission of our Association is to help advance and influence the interest of our beloved alma mater, to support current medical students on their journey to becoming physicians, and to provide programs and opportunities for alumni to connect with each other and the School of Medicine. This past year has been a testament to effectively meeting this charge, but we cannot do this important work without you!

There are countless ways to help advance the work of the Association and the School of Medicine, and our incredible network of alumni do so each and every day. Take a moment to contact us and share a recent, exciting achievement. If you graduated in year ending in a 0 or 5, consider becoming an ambassador and invite your classmates to Reunion Weekend 2015. Perhaps you would like to join our board of directors and help form the strategic direction of the Association. Your ongoing participation is paramount to the Association’s success.

If you would like to participate in any of our programs, support our efforts, or simply update your contact information, please contact our alumni office at healthalumni@ucdenver.edu or call 303.724.2518. We would love to hear from you!

For the art and science of medicine,

William Maniatis, MD ’65
President, Medical Alumni Association

MEDICAL ALUMNI ASSOCIATION

Thank you to our 2013–2014 donors!

Your contribution helps us accomplish our mission of preparing physicians who will serve the public by aspiring to excellence in patient care, research, education and community service. Find a list of our partners at http://medschool.ucdenver.edu/donors.

Membership in the Medical Alumni Association is based on fiscal-year giving to any School of Medicine fund. To find giving opportunities, visit http://medschool.ucdenver.edu/giving.

<table>
<thead>
<tr>
<th>Membership Type</th>
<th>Donation Level</th>
<th>Membership Benefit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Medical Student</td>
<td>$0 (students only)</td>
<td>Membership benefits letter, student events, and CU Football Game Discount</td>
</tr>
<tr>
<td>White Coat Member</td>
<td>$0–$99</td>
<td>CU Medicine Today</td>
</tr>
<tr>
<td>Stethoscope Society</td>
<td>$100–$249</td>
<td>CU Medicine Today, Membership Benefits Packet, and CU Football Game Discount</td>
</tr>
<tr>
<td>Century Club</td>
<td>$250–$499</td>
<td>Above, plus 2 tickets to the Century Club Cocktail Reception</td>
</tr>
<tr>
<td>Faculty Circle</td>
<td>$500–$999</td>
<td>Above, 2 tickets to the Dean’s Scholars Dinner</td>
</tr>
<tr>
<td>Dean’s Circle</td>
<td>$1000+</td>
<td>Above, plus 2 tickets to the Silver &amp; Gold Banquet</td>
</tr>
</tbody>
</table>
Gift bolsters melanoma research project

A five-year melanoma research project led by William Robinson, MD, PhD, professor of medicine, received a boost when the University of Colorado School of Medicine received a $5 million gift from an anonymous donor.

With the funding, investigators plan to conduct next-generation DNA sequencing of up to 3,000 tissues and blood cell samples housed at a melanoma biorepository on the Anschutz Medical Campus. Previous research had focused on a small number of genes involved in the development and treatment of melanoma. The new technique, made possible by this gift, will allow investigators to examine all 20,000 genes in each cancer.

“Melanoma has become the poster child for the development of new molecularly targeted therapies, due to the rapid advances that have been made recently in melanoma research,” Robinson, a 1962 graduate of the CU School of Medicine, says. “The information gained here will be made available to other research scientists around the world and will impact not only our understanding and treatment of melanoma, but other cancers as well.”

Public education in the U.S. about melanoma risk factors must continue, Robinson says.

“A majority of the sun exposure that leads to development of melanoma occurs during childhood and teenage years,” he says. “It’s not the sun you got last week. It’s the sun you got when you were young, when your skin is expanding or growing. Putting the suntan lotion on when you’re 60 is not likely to prevent you from getting melanoma.”

Building a Partnership with Aurora

A new partnership between the University of Colorado Anschutz Medical Campus and its neighbors in Aurora and Denver is designed to improve health and opportunity in the community.

The Community-Campus Partnership (CCP) will create a virtual and physical hub for convening and connecting efforts between the campus and community groups.

The partnership will receive start-up funding of about $1 million over three years from the chancellor’s office, the School of Medicine and the Denver Foundation. Other schools and departments across campus and the City of Aurora are providing various in-kind contributions to this effort.

“This is a win-win situation,” says Lilly Marks, University of Colorado’s vice president for health affairs and executive vice chancellor of the Anschutz Medical Campus. “Nurturing our relationship with our neighbors is one of the pillars of this campus.”

CCP Director Robert McGranaghan, MPH, senior instructor in the Department of Family Medicine, says the partnership is founded on qualities such as equity, mutual respect, sustainability and responsiveness to health-related problems.

“Working together with those around us, I believe we can improve the health of our community,” says McGranaghan. “But this effort also will make us better at the research, teaching and clinical care that are integral to our campus.”

CU and Duke awarded $10 million for palliative care work

The University of Colorado and Duke University schools of medicine have received a $10 million grant from the National Institute for Nursing Research (NINR) to continue developing the Palliative Care Research Cooperative Group (PCRC) during the next five years.

The PCRC was established in 2010 with startup funding from the NINR, which is part of the National Institutes of Health, with the goal of promoting research that leads to better ways of relieving suffering and improving the quality of life for patients with advanced, potentially life-limiting illnesses.

“We will develop key resources and infrastructure that nurture, enlist and harness investigator and site interest,” says Jean Kutner, MD, MSPH, professor of medicine and PCRC co-chair. “This will enable us to promote the conduct and translation of high-quality, collaborative, patient-centered palliative care and end-of-life research.”
“Cutting Edge MD” debuts on Fox Sports

“Cutting Edge MD,” a television program about sports injuries and the CU School of Medicine physicians who treat them, made its debut on Fox Sports networks in March.

Omer Mei-Dan, MD, assistant professor of orthopedics, developed the program, which features interviews with well-known athletes about a specific injury and their process of treatment and recovery.

The premiere episode featured Olympic snowboarder Lindsey Jacobellis as she described her recovery from a torn ACL. She then went snowboarding with Mei-Dan, an extreme sports enthusiast and former stuntman who is now a surgeon on the CU faculty.

The episode also showed University of Colorado wide receiver Paul Richardson discussing his treatment and recovery of a torn ACL with Eric McCarty, MD, associate professor of orthopedics. Richardson sat out the 2012 football season before returning in 2013 for a record-setting season.

Mei-Dan conceived the show as a way to promote better understanding of common sports injuries. The surgeries included in the program were filmed at University of Colorado Hospital and Children’s Hospital Colorado.

Drug for hepatitis C hailed as breakthrough treatment

A drug for hepatitis C, currently in clinical trials at the University of Colorado Hospital, was hailed in March as a cure for patients who previously have had to endure debilitating treatments.

“The word is cure. To me, the cure of hep C is one of the most significant medical developments of the last 50 years,” says Greg Everson, MD, professor of medicine and director of the section of hepatology. “We’ve been able to cure hep C since the early 1990s, but the older drug combinations had a much lower success rate. Sovaldi is the new backbone therapy.”

The drug, Sovaldi, is a daily dose pill that has cured about 90 percent of patients in 12 weeks when used with older drugs. Previously, patients took other pills and injections for up to a year and suffered from severe side effects.

Finding the Cause of a Runny Nose

A School of Medicine team of researchers led by Thomas Finger, PhD, has figured out what may cause so many people to have runny noses even when they are not having an allergic attack or an infection.

In an article published in April in the Proceedings of the National Academy of Sciences, Finger and his colleagues reported that they found cells lining the noses of mice that detect potential irritants and pass along an alert to pain-sensing nerve terminals.

The nerves then release a substance that triggers the body’s defenses, called an inflammatory response. The result, among other things, is a runny nose and difficulty breathing.

“Understanding how this works can help researchers try to figure out how to prevent this response,” Finger says. “What if we could deaden the pathway that the body takes to fight off an attack that, in this case, is not really threatening?”

It’s not yet certain that the process is identical in humans, Finger says. But if it is, and if some people are responding to substances or smells that appear to be a threat but actually are benign, then additional research could find a way to help millions of people to breathe easier.
“You know, he’s really upset with you for interrupting his sorbet earlier.”

I looked up from my computer and realized that the ICU nurse was addressing me.

“What? You mean, Mr. G?”

“Yeah, he's not happy about what you did this morning.”

I stared at her, somewhat dumbfounded.

Mr. G was the team “peach,” as my intern dubbed him, a man with disdain running through his veins and a tongue sharper than a razor’s edge. He was a long-term alcoholic with pitting edema, a belly more distended than the tightest of drums and a disposition like an icicle. He made no attempts to hide his dislike of our team, and of the hospital at large. He rolled his eyes, and spoke in terse utterances—complain, complain, complain. He was uncomfortable and angry. You did not have to be around Mr. G long to understand that this was a man with a lifetime of regrets. This was a man at his very end.

Of course, Mr. G was my patient. For some reason I thought that if I just treaded lightly, all would be well. I have always been easy to get along with, after all. I would smile and be courteous in my interactions and he would tolerate me, the annoying medical student who made him repeat exams when he didn’t feel like doing it. That sounded reasonable, right? Not too much to ask. For the first couple of days after his admission, all seemed to be going well. He grumbled at me when I came in during the mornings, but did nothing more.

But now he was upset with me? Because of sorbet? Because I had requested that he stop eating his lemon sorbet for a minute while I listen to his heart and lungs?

I pondered the situation for a minute. I hadn’t even thought twice about it when I made the request. I did my usual song and dance: smiled and said, “It’ll only be for a minute. I promise!” I did my exam and left the room, thinking nothing of it. Was I being insensitive? Was he being ridiculous? What was this? I’d never upset a patient before. I don’t upset people.

Then a resident approached me, “So I heard about Mr. G and the sorbet. You really shouldn’t worry about it. He’s an old, cranky man. I promise it’s not you. It’s him. Forget about it.”

And later that afternoon I read a note that Palliative Care had left after visiting Mr. G, halting when I saw the phrase ‘lemon sorbet’ toward the end. I moved in closer to the computer.

“The patient requests that he be allowed to eat his lemon sorbet without any interruptions from his health care team.”

I paused. Now the entire palliative care team knew about my lemon sorbet incident? Uninterrupted lemon sorbet was one of his final requests? I was embarrassed. I was angry. I was upset. Had I been pushy when requesting that he put down his sorbet? I suppose that I could have come back a few minutes after he had finished eating, but I was in a rush to get done with my pre-rounding.

I had sacrificed his comfort on behalf of my stubborn determination to accomplish my morning tasks. Efficiency, after all, is the name of the game in medicine. Succumbing to the lemon sorbet demand and sacrificing efficiency is not part of the list of competencies that traditionally earns you honors.

And yet…

There was something more to this. Mr. G was at the end of his life and simply wanted to be treated with respect. It had all seemed so silly to me, this big fuss over sorbet, of course that’s easy to think when you’re 26 and death isn’t nipping at your heels. Lemon sorbet is a thing to be had next summer, some other summer. Mr. G had no more summers. I dared to presume that I understood the value of lemon sorbet in a man’s life and equated it with my own. Who really knows what memories a lemon sorbet can hold? It could be an entire lifetime’s worth. All I had to do was ask and listen.

I stepped away from my computer. Humility is a big part of doctoring. Much bigger than I could have ever imagined. I strode over to Mr. G’s room. I paused. Swallowing my pride, I knocked on the door and walked into the room. I spotted the empty lemon sorbet carton out of the corner of my eye.

“Mr. G,” I began, “I’d like to apologize ….”

Lindsay Heuser is a member of the Class of 2015 at the School of Medicine. She is originally from Colorado Springs and earned a BA in chemistry from Bowdoin College. She plans to pursue a career in psychiatry. This essay originally appeared in The Human Touch, a journal of poetry, prose and visual art by students, faculty and staff on the Anschutz Medical Campus.
CU Denver biology student Luis Chavez often rereads text messages from his friend Alejandro Daniel Rodríguez-Prieto as a reminder of their pact to help each other get through medical school.

“You and I against the world conquering anything in the medical field,” reads one text.

Rodríguez became friends with Chavez while teaching a Spanish language class for medical students. They had been friends for two years when, on Aug. 10, 2013, Rodríguez crashed his motorcycle into a stalled car. He died from his injuries. He was 26 years old.

Alex was a determined and enthusiastic student, about to begin his second year at the School of Medicine. He wanted to become a trauma surgeon.

“It’s hard to imagine sometimes that Alex is gone,” says Vaughn Browne, MD, PhD, assistant professor at the department of emergency medicine, “how he was taken from us so quickly, so violently and so unexpectedly. I don’t think you’ll find anyone among his classmates and clinicians who would say that this man wasn’t a walking example of gratitude. He had tremendous promise and had he survived, he would have been quite an advocate for minority students.”

Rodríguez, the first person in his family to attend college and a native of Mexico, wanted to become a doctor since he was 3 years old. It wasn’t easy for him though. While he had experience as a certified paramedic working with emergency medical teams in metro Denver, he didn’t get accepted to medical school the first time he applied.

So Rodríguez completed the one-year School of Medicine post-baccalaureate premedical program on the University of Colorado Denver campus and reapplied. Browne, who serves on the School of Medicine’s admissions committee, recognized Rodríguez’s potential and became an advocate for him. Eventually, Browne became his preceptor at Children’s Hospital Colorado.

Rodríguez’s inspiration to others matched his aspirations for himself. In a ceremony earlier this year, the students in Rodríguez’s class honored him with the Eastlake Achievement Award for his exceptional motivation in helping others pursue their goals of becoming physicians.

Chavez, who expects to graduate from CU Denver this fall, was one of those friends. After the accident, Chavez started daily visits with Rodríguez’s parents, Jesus and Irma Reyes, and brother, Jesus Reyes. When Regina Richards, director of the Office of Diversity and Inclusion at the School of Medicine, stopped at Rodríguez’s parents’ house to offer condolences, Chavez opened the door. Richards had helped Rodríguez define his career goals while he applied to medical school.

Richards, together with Browne, Associate Dean Maureen Garrity, PhD, and Interim Assistant Dean for Student Affairs Terri Blevins, established a memorial fund in honor of Rodríguez. Individual gifts came from physicians on the School of Medicine admissions committee, including Browne. The initial goal was to raise $10,000 to provide scholarships for aspiring medical students.

Then Chavez helped spread the word about the fund, and cash gifts started coming in from Class of 2016 medical students. A foundation contributed $20,000 as well, which will allow scholarships to be awarded year after year.

So far more than $30,000 has been raised for the Alex Rodríguez-Prieto Memorial Fund. Beginning this spring, the endowed fund will award $1,000 to a CU student from an underrepresented background who demonstrates passion for community service and who is completing the post-baccalaureate premedical program.

Rodríguez wanted to serve as a medical volunteer in Africa for part of his career after graduating from medical school. Chavez gathers inspiration from his friend to reach his own dream of becoming an emergency room doctor.

“Alex said, ‘If I can change one person’s life on this planet, that’s my dream,’” Chavez says. “He changed my life.”
Dean Richard Krugman, MD, has presided over more than two decades of strategic growth at the University of Colorado School of Medicine.

To honor his accomplishments and to provide a permanent source of funding for future leaders of the school, the University has established the Richard D. Krugman, MD, School of Medicine Dean’s Endowed Chair with the goal of raising $5 million.

Please consider a gift that will ensure future deans have resources to make strategic funding choices to perpetuate our legacy of excellence. For more information about giving to the endowment, go to cufund.org/SOMDeanChair.