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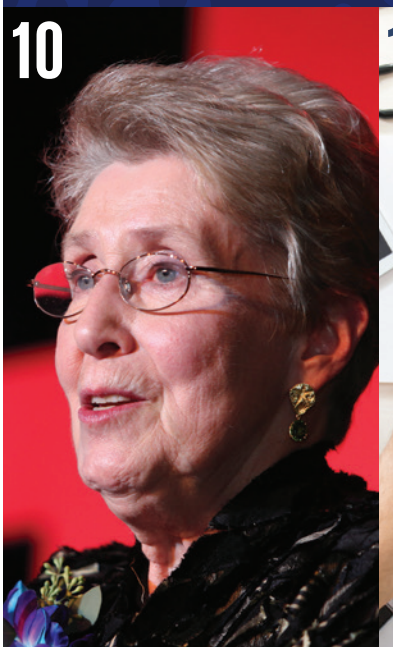

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PHOTO BY SCOTT WALKER

Charles R. Meyer, MD, Editor in Chief

Missing medical school

I miss medical school. This statement may provoke charges of mental instability or at least the diagnosis of a bizarre case of distorted nostalgia. After all, who could possibly yearn for the overwhelming formaldehyde odor of anatomy lab, the contorted chemical pathways of biochemistry, the mind-numbing slide review of histology lab, and the gluteus-fatiguing, cephalgia-inducing concatenation of lectures? And the stress. Could I possibly want to repeat the memory overload, the constant pressure to perform, or the recurrent feelings of insecurity? Some would describe medical school's four years as monastic, complete with isolation, self-denial and perhaps even self-flagellation.

Never before or since have I learned so much in such a short period of time. It was exhausting, exasperating and exhilarating.

Despite the obvious downsides, it was an unprecedented time of learning. Entering medical school, I had a bottomless curiosity about the human body. So the anatomy lab, no matter how odiferous, was a geography lesson with twists and turns and nooks and crannies to explore. Biochemistry was a tutorial in code-breaking, unlocking the reactions that made a human function and finally discovering why I learned all that organic chemistry in college. Lectures could be dull, but the occasional teacher who could capsulize a topic in 50 minutes was worth the wait. Never before or since have I learned so much in such a short period of time. It was exhausting, exasperating and exhilarating.

The first two years were solid basic science. I used to say the closest I got to clinical medicine during those years was the medical section of *Time* magazine. Our anatomy text occasionally included token clinical references such as the effect of recurrent laryngeal lesions on laryngeal function. To a medical student starved for some mention of the practice of medicine toward which he was headed, this little clinical *amuse-bouche* solidified the anatomical details better than hours of study could. Recent innovations at the University of Minnesota and elsewhere acknowledge the need for clinical correlations to basic science and serve first-year medical students a larger meal of clinical exposure.

From the arid basic science years, devoid of patient contact, we vaulted into the third and fourth years of clinical rotations. Books became a backup reference rather than a full-time occupation as patients became our textbooks. We were judged not only on our answers on tests but also on our performance on the wards. Interns, residents and attendings were our judges, and sometimes the rule of those judges could be harsh.

During my training, the practice of "pimping" was alive and well. Those on the lower rungs of the ward hierarchy could be subjected to intense, sometimes cruel grilling about their knowledge—or lack of it—leaving the grilled quaking and demeaned. It was and is no way to educate, and new programs to school teachers in how to educate should help speed the demise of this unfortunate vestige of the past.

Obviously, I can't go back to medical school and I do fear that my geriatric brain would balk at the deluge of information and my well-honed social self would hesitate to once again don a monk's garb. But it might be fun. **MM**

Charles Meyer can be reached at meyer073@gmail.com.

We should be ashamed

Your fluff piece on picking top doctors was a missed opportunity to enhance our professionalism, which I believe is one of the MMA's stated duties. Although I know the feature was about the mechanics of these surveys, I think we should be ashamed of ourselves for dignifying these publications with such an article, just as we should also be ashamed for responding to these surveys in the first place.

Whenever I'm asked "Who's the best doctor?" my immediate response is, "What are you looking for in a doctor?" And, guess what? No one has ever said that they would like to go to a doctor who was a favorite among those doctors and nurses who were foolish enough to respond to a magazine survey. Maybe that's just outstate medicine for you, but I rather doubt it.

"Top Doctors" ... "Best Doctors" ... What a bunch of hooey, and we had better know it. Yet no one eligible for such an "honor" dares to say anything, lest it be seen as sour grapes if they don't get elected. Those elected speak of the benefits to referring doctors, to patients, to their institutions and to "awareness," "validation," and to who knows what else. Yet we see our fellow professionals touting themselves, using these self-generated accolades.

Oh yes, we should be ashamed. And it's time for us to start acting like the professionals we are.

What if they did a survey and no one voted?

Steven Bell, MD
Willmar

Like an article? Hate it? Let us know!

We love to hear from readers.
Send your letter to Dr. Charles Meyer at mm@mnmed.org.

Roots musician

Walk past Carroll Galvin's office in Mankato, and you'll likely hear the sounds of classical music wafting from his radio. "I listen to MPR frequently and have it turned on at my desk much of the time," says the University of Minnesota faculty member who works with physicians-in-training in the Mankato family medicine residency program.

PHOTO BY MIKE KRIVIT

Carroll Galvin with his mandolin.

Get in the car with him for the 25-mile commute to his home in Waseca, though, and the sounds you'll hear are bluegrass. "I have my car phone set on the satellite station Bluegrass Junction," he says, explaining it plays American roots music 24/7. As he drives, Galvin hopes to hear a new song or a segment of a familiar one that he hasn't noticed before—something he can learn to play on his mandolin.

Music has always been a big part of Galvin's life. He studied classical piano for more than 12 years, starting at age 7, added organ and a few other instruments along the way, and sang in small groups and choirs. But he came late to bluegrass, and even later to the mandolin. And now he's trying to immerse himself in them.

He blames (or thanks) his wife for his newfound interest. "She was accustomed to it," he says, explaining that she grew up in Indiana, where mandolin player Bill Monroe, often called the father of bluegrass, lived much of his life. (Monroe bought property in a town called Bean Blossom.) Galvin says that as he and his wife worked together in the church and community, "we kind of got a bluegrass mentality." About a dozen years ago, when he was already in his 50s, his wife bought him a mandolin for Christmas. That's when Galvin really got into bluegrass, which is a subset of country but draws from gospel, jazz and other forms of music.

Galvin taught himself the instrument and started playing with a small group of musicians at his church. "We kind of fed off of each other and encouraged each other," he says. "We spent more and more time listening to bluegrass music and coming across new songs and new ways to play something, and we'd say, 'Let's try this. See how it works.'" Eventually they formed the band Northern Drawl ("as opposed to Southern drawl"). The band performs at community events and festivals in southern Minnesota. Their next gigs are a church social this spring and a festival in Waseca on July 4.

One of the things Galvin likes about the mandolin is its size. "It's easy to carry," he notes. He also likes that it has a fairly wide range (its strings match those of a violin), and it can function as a rhythm or lead instrument.

Galvin tries to practice every day. "I kind of leave my instrument out, so that I can just walk by and grab it and play one, two or three songs," he says. He writes down the mandolin parts for songs he hears on the radio on staff paper and then memorizes them. And although he says he's not entirely comfortable improvising, he finds he's a little freer on the mandolin than he ever has been on the piano. "Sometimes, you just let your fingers go and … " He laughs as the sentence trails off.

Playing music is a good counter-balance to his work in medicine. "It's a way of expressing emotion," he says. "Sometimes if you're upset or tense, you can really let it out if you play hard and fast and loud." And he says he's often inspired by song lyrics. "Even if someone else is singing, they're in the back of mind."

Galvin knows people might think it's "weird" that he listens to classical music at work and bluegrass the rest of the time. But he says he's always had wide appreciations. To him, music of any genre is music. "It's a big part of my life," he says. "Everyday, if I'm not playing, I'm listening to a *lot* of music." – CARMEN PEOTA

Improving the workplace reduces physician burnout

If there's a simple take-away from the latest research by Mark Linzer, MD, of Hennepin County Medical Center, it's that clinics and hospitals can do something about physician burnout.

Linzer has been systematically studying the issue for years. He was part of early studies demonstrating the high prevalence of stress and burnout among physicians, especially those in primary care specialties. He's also been involved in studies that have shown that adverse working conditions are associated with stress, burnout, dissatisfaction and intent to leave the profession. In his latest study, he and his colleagues set out to discover if workplace improvements could begin to turn things around.

An article about Mark Linzer's latest study on physician burnout, "A Cluster Randomized Trial of Interventions to Improve Work Conditions and Clinician Burnout in Primary Care: Results from the Healthy Work Place (HWP) Study," was published in the *Journal of General Internal Medicine* in March.

In the study funded by the Agency for Healthcare Research and Quality, 34 clinics were randomized to either an intervention or a control arm. The clinics in the intervention arm tried approaches to improving working conditions such as having monthly meetings focused on patient care (rather than administrative) issues and off-loading nonessential tasks to other staff. Those in the control arm didn't. The physicians in the study completed a survey assessing their burnout, stress, satisfaction and intent to leave practice before the intervention period and 12 and 18 months afterward.

Linzer explains that although they didn't identify which specific interventions had the most effect, they found that efforts around such things as workflow redesign, improving communication and quality improvement (when a physician's concern is addressed) do make a difference.

Linzer says he's now sharing what he's learned with organizations around the country, including the American Medical Association and American College of Physicians. "I'd say, most health care leaders know we need methods to reduce burnout and improve retention," he says. "This study gives us a way to begin."
– CARMEN PEOTA

Grading the med schools

From the moment they first apply, medical students are evaluated by medical schools. Some students are now turning the tables on the schools. Each year, students involved with the American Medical Student Association's (AMSA) Just Medicine Campaign grade the nation's schools on their conflict-of-interest policies and practices and issue a scorecard.

The idea for the scorecard emerged about eight years ago following an AMSA conference on conflict of interest in medicine. Students who attended wondered which medical schools had policies on how faculty and students should interact with drug and device companies. They began asking and reported their first results in 2007.

The next year, with help from The Pew Charitable Trusts, the students developed criteria for assessing the policies: What do medical schools allow with regard to gifts, CME or speaking relationships, for example? The schools could earn a "model," "good," or "poor/absent" rating in about a dozen categories and an overall letter grade of A through F.

In 2013, after leaders from academic medical centers created a new set of recommendations regarding conflict-of-interest policies and practices, AMSA set out to revise its methodology and criteria again, this time to reflect many of those recommendations.

Its 2014 scorecard, the most recent iteration of the annual rating, reflects those changes. And with the bar set higher, some schools' grades are lower.

University of Minnesota medical student Ted Fagrelius played a big part in generating that report. In 2013-14, he did a yearlong Just Medicine fellowship at AMSA headquarters in Washington, DC. As part of his work, he helped rewrite the methods for assessing medical school policies and collected data. "We really wanted to encourage policies that protected the integrity of medical care and research," he says.

Fagrelius became interested in the conflict of interest issue during his third year of medical school, while attending an AMSA conference on the relationship between the pharmaceutical industry and health care. "I knew some basic stuff about the industry as a whole, but I didn't know much," he says. "We learned about how the drug industry influences doctors' prescribing, clinical guidelines and research. And we also started to learn a little about the industry's influence on trade agreements in order to protect intellectual property rights and profits at the expense of international access to life-saving medicines. It was this whole expansive world of money and influence and commercialization of health care. I had never known about it, and I wasn't comfortable with it." Afterward, another student told him about the Just Medicine fellowship, and Fagrelius decided to apply (he did the fellowship between his third and fourth years of medical school).

In addition to working on the scorecard during his fellowship year, Fagrelius spoke about conflict of interest at about 20 medical schools and conferences. As he did, he discovered most medical students are where he once was—they know a little, but not much. And he understands why. "So few medical schools have adequate curriculum on conflict of interest," he explains.

Fagrelius admits medical schools have a lot of ground to cover. But he thinks they need to help the next generation of doctors learn how best to handle themselves in their relationships with industry. "Some medical schools say, 'We have a lecture on it, and that's enough.' But when I talk to students, they aren't aware of the influence that drug companies have on prescribing practices or clinical guidelines. They don't know, and these influences can affect patient care in adverse ways." – CARMEN PEOTA

PHOTO COURTESY OF TED FAGRELIUS

Ted Fagrelius speaking about medical schools' conflict of interest policies during his yearlong AMSA Just Medicine fellowship.

Above average

The University of Minnesota and Mayo medical schools both earned Bs for their conflict-of-interest policies and practices in 2014. To see the full 2014 AMSA Scorecard, go to www.amsascorecard.org.

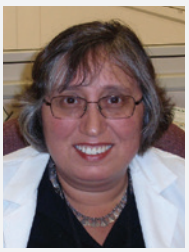
VALUE-able experience

Starting in August, 10 third-year medical students from the University of Minnesota will follow patients at the Minneapolis VA Health Care Center for 10 months. During that time, they will go through the rotations third-year medical students typically do (but simultaneously rather than in the traditional block pattern) and they'll learn about quality improvement, patient safety and playing on an interdisciplinary team.

Those students will be the first to take part in the VA Longitudinal Undergraduate Medical Education Program or VALUE—a new longitudinal clerkship created by the University of Minnesota Medical School. It's the third offered through the university. The first, the Rural Physician Associate Program (RPAP), is one of the oldest in the United States. Participating students spend nine months working in a community in greater Minnesota under the guidance of a family medicine preceptor. They are exposed to rural practice in hope that some of them may one day choose to work in such a setting. More than 1,300 students have gone through RPAP since it was created in 1971. In 2010, the medical school added the Metropolitan Physician Associate Program (MetroPAP), which is similar but exposes students to practice in urban areas of need.

What distinguishes VALUE from the other longitudinal clerkships is its emphasis on quality improvement. "We hope the students will one day be leaders in doing quality improvement initiatives," says Nacide Ercan-Fang, MD, director of the program.

Those who participate in VALUE will complete simultaneous rotations in medicine, psychiatry, neurology, internal medicine, general surgery, urology and otolaryngology. Each will be paired with an internal medicine preceptor and assigned a panel of 50 patients whom they'll follow throughout the 10 months. "These will be patients with multiple problems and chronic conditions," Ercan-Fang says. "Their care usually requires going to multiple clinics and specialists."



Nacide Ercan-Fang, MD

Amy Candy Heinlein, MD

Students will follow patients who come into the emergency department and are referred to a specialty clinic or admitted to the hospital. "The point of following them isn't only to learn about medicine but more to learn the process of care. Where are the holes in the process of taking care of patients?" says Amy Candy Heinlein, MD, a staff physician at the VA who helps lead the program.

The students will use those experiences to design a project aimed at improving patient care or operations within the medical center.

Candy Heinlein says the VA is ideal for such an experience because all specialties are under one roof. In addition, the VA has long had an interoperable electronic health record, so students will be able to access data on the patients in their panel to see how many of them have uncontrolled diabetes or high blood pressure, for example, and target a special intervention toward those patients.

Ercan-Fang says they were pleased to have 20 students apply to the program. "We didn't know how much interest this would generate," she says. "We were pleasantly surprised." She adds that one student has already expressed interest in post-traumatic stress disorder. "I was able to connect him with a mentor," she says. "So already he will be able to get going on a project with this patient population."

– KIM KISER

Deborah Powell is excited to see the University of Minnesota test a new idea for educating medical students planning careers in pediatrics.

PHOTOS BY ROBERTA SONNINO

THE Game Changer

Deborah Powell, MD, wants to make the transition between medical school and residency seamless.

BY KIM KISER

Although she no longer heads a medical school, Deborah Powell is making a mark on medical education. She's trying to break down the wall between medical school and residency and wants to see students trained in a way that's practical, efficient and better reflects the way medicine is practiced today. "Medicine has evolved so far that the idea that was prevalent 30 to 40 years ago of training a generalist physician who could go down any pathway is probably not so reasonable anymore," says the former University of Minnesota Medical School dean.

Specifically, she would like to see the curriculum redesigned in a way that starts moving students into their chosen specialty earlier. "The idea is to be more purposeful in putting undergraduate and graduate medical education together in a single pathway and to advance students based on their achievement of competencies, rather than time in training," she explains.

Powell, who is known for being an innovator (she created the Flex MD program at the University of Minnesota while she was dean and won the Association of American Medical Colleges' 2013 Abraham Flexner Distinguished Service to Medical Education award) and a champion for competency-based education, started sharing her idea more than a decade ago. "I talked about it nationally in speeches at meetings and with friends from the education community," she says. "Everyone said it was a great idea, but it couldn't be done."

Nevertheless, she persisted, tapping her connections at medical schools and in organizations such as the AAMC, the Accreditation Council for Graduate Medical Education and the American Board of Pediatrics. Powell eventually won support for a pilot of a new model for training medical students wanting to go into pediatrics. The model will be tested in four U.S. medical schools, including the University of Minnesota's, over the next four years.

Called Education for Pediatrics Across the Continuum (EPAC), it allows students who have finished their first two years of medical school to progress through a specially designed curriculum, most of which will be focused on pediatrics. For example, they'll do their emergency medicine, surgery and psychiatry rotations in a children's hospital. They also will work with a preceptor in a pediatrics clinic and build a panel of patients, whom they will care for over the course of their training.

Once the students have proved they are competent in certain areas—for example, that they can do a physical exam, take a complete history from a child's parent or develop a treatment plan that makes good sense to their preceptor—they can begin residency. (The participating schools have guaranteed those students slots in their pediatrics residency programs.)

"It will all be done without a time boundary," says Powell, who currently teaches in the medical schools' laboratory medicine and pathology program.

Four students are in the University of Minnesota's EPAC program now, and four more will be selected for next year. Two more groups will be chosen after that.

Powell admits the idea is radical and that she and the program directors at the other schools testing it (the University of Utah, University of California-San Francisco, and University of Colorado) will no doubt adapt the model as they go along. But she's optimistic about its future. "I think this is just the beginning," she says.

We asked Powell why she feels medical education needs to change and how EPAC might serve as a model for the future.

When you started talking about this, you were dean of the University of Minnesota Medical School. What were you seeing that made you think something needed to change?

Everyone was talking about the continuum of medical education. For those of us in medical education, we knew that meant premed, medical school, residency and fellowship. But students didn't know what it meant; they viewed these as disconnected segments.

Why the disconnect?

We've been designing programs in a vacuum. In the medical schools, we have people who oversee the clinical clerkships, and in the same departments, we have residency program directors who oversee the residencies. They don't talk to each other. It's crazy. Why don't they ask "How can we take these medical students and prepare them better for residency?"

Why has it been so difficult to break down these walls?

The problem when we try to put parts together is that there are so many regulatory bodies that oversee the various stages of medical education. You need to get them to buy in.

How did you manage to get these groups on board?

About five or six years ago, I was talking to a friend, Dr. Carol Carraccio, a pediatrician who was at the University of Maryland and then went to the American Board of Pediatrics. The board was interested in medical education innovation. So she said we should try doing something about this and we should do it in pediatrics. The AAMC agreed to host a "what if" meeting. We invited a number of people from the organizations that accredit or oversee the different parts of medical education (the Liaison Council for Medical Education, which accredits medical schools; the ACGME, which runs the residency programs, for example). It was really a laying out of the idea—saying, "If we tried to design a pilot like this, would you agree to look at it?" It was a very tentative ask. Everyone said, yes.

Then I had to get schools to buy in. They had to agree that if the students met the competencies, they would get

their MD early. Those schools then had to convince their state licensure boards, and that was especially challenging. One of the schools considering the program was University of California-San Francisco. California's board was very rigid in terms of requiring four years of medical school down to the month. We talked to the Federation of State Medical Boards, and they were excited about this idea. They talked to some of the people on the California board, and they finally agreed to change their requirements. Then, the AAMC agreed to sponsor the pilot and got a three-year grant from the Josiah Macy Jr. Foundation to help support the schools involved. The grant was symbolically important—having a national medical education group like the Macy Foundation endorse this was huge.

Where are the four schools in terms of implementing the program?

All four schools are adding new courses or elements to their curriculum. Minnesota is designing an entirely new main clinical experience based in pediatrics. Others are modifying existing clinical experiences but adding courses that are oriented toward pediatrics or modifying others to include more experiences with children.

Colorado chose its four students at the end of last year, so they've been doing this for more than half a year now. Minnesota just chose its four (they are finishing their second year); Utah and San Francisco have yet to choose their first students.

How do you know if a student who just finished their second year of medical school is a good candidate for pediatrics?

Each school has certain activities to introduce students to pediatrics. In Minnesota, all students do a four-week summer internship in pediatrics after their first year. They can also join a pediatrics interest group. Then they have to write a formal application to the EPAC program and be interviewed.

What happens if, once they get into the program, they decide they don't want to go into pediatrics?

They will have an opportunity to opt out and enter the residency match in a different specialty. It will be interesting to see how many do that. EPAC is not about pediatrics as much as it's about a model: to see how early medical students can decide on a specialty. If they can decide earlier, you can design a more tailored curriculum to move them toward residency.

Given the fact that so many students graduate with significant educational debt, is this a way to take away some of the financial pain?

It's a great side benefit, but it wasn't the fundamental principle behind this. Rather, it seemed like we were doing things in medical education because we had done them this way for a long time. We have these sacred clerkships in the third year and dogma that you have no less than four and no more than eight weeks in obstetrics, in psychiatry, etc. We never asked ourselves "Is there a better way to do this?"

Haven't we tried to make education more efficient with three-year medical schools?

That was tried in the '70s, and it wasn't very successful. They just crammed everything into a shorter time period. I'm more in favor of the idea of training students in a way that will fit into their advanced training more efficiently.

How will you assess whether students are ready for residency?

Evaluation is a major issue. We have a committee with members from each school working with a national evaluation and assessment consultant to develop an assessment plan for transition to residency that will be used by all schools. Certainly, a large component of this will be to have small groups of faculty observe students doing specific types of activities over time.

"EPAC is not about pediatrics as much as it's about a model: to see how early medical students can decide on a specialty."

Are other schools watching this? What about other specialties?

We have had a lot of interest from other schools and from other specialties. Surgery is interested, so is family medicine. But we won't be adding schools or specialties until we see how this is working and publish some of our results.

This has been a long time coming. Did you ever feel like giving up?

I sometimes have felt like giving up on EPAC and other educational projects that I've wanted to enact. But I feel that education of physicians is a really important activity. We've been at it a long time, and, like almost everything we do whether it's in education or health care, it can always get better. **MM**

Kim Kiser is an editor of *Minnesota Medicine*.

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THE FIRST YEAR

A look at the experience of STUDENTS in the STATE'S MEDICAL SCHOOLS

BY SUZY FRISCH

Medical schools are a place where change is a constant. Students transform into physicians, and programs evolve to reflect changes in health care and new thinking about education. One ever-present fact is that the first year of medical school is stressful, fast-paced and arduous, with scads of information to memorize and master.

Although there's no getting around the need to learn the building blocks of medicine, educators are finding fresh approaches to this first year. They're teaching traditional topics in creative ways while weaving in new ones and adding clinical experiences.

These changes reflect national trends: Medical schools are requiring students to master core competencies in areas such as scientific inquiry and interprofessional collaboration. They're striving to make their curricula relevant to a health care system in flux and to prepare medical students to become good doctors no matter the setting in which they practice.

This particular making over of medical education has been underway for some time. In 1996, the Association of American Medical Colleges (AAMC) launched an initiative to help medical schools revise their programs to improve quality and better prepare students for their careers. Two years later, it released guidelines to help them get the ball rolling. In 2010, a century after Abraham Flexner published his evaluation of American medical schools, 128 medical schools in the United States and Canada reported retooling their programs, says Maryellen Gusic, MD, chief medical education officer for the AAMC.

"They are adhering to a new paradigm for how we think about building curricula, that is, defining the outcomes we are trying to achieve to ensure students are ready for the next stage of training. And schools are using new teaching strategies so that we make learning relevant and so students remember what they learned and can apply it in the care of patients," she says.

Many schools have moved away from the traditional format of two years of science/two years of clinical training, bringing clinical experiences to the forefront and adding content on pressing concerns such as the social and behavioral determinants of health, geriatric medicine and palliative care. "They're developing students' inquiry skills and guiding them to be lifelong learners," Gusic says.

At Minnesota's medical schools—Mayo and the University of Minnesota—these national trends are playing out. And the changes are evident as early as the first year. Read on to learn what the first year is like.

MAYO MEDICAL SCHOOL

Mayo Medical School takes a block approach to its curriculum, which means students focus intensely on one topic at a time for three to seven weeks. During the first year, they concentrate on scientific and clinical foundations, and the curriculum is designed to help them see the clinical application of the scientific principles they're learning. For example, in the Basic Structure block, students study histology, biochemistry and genetics and hear from patients who have had the diseases they're learning about. In the Principles of Disease block, they take microbiology and pharmacology and study the clinical presentations of infectious diseases and the corresponding therapies. Students also take a year-long course called "Basic Doctoring," in which they learn how to take a history and do a physical exam.

In between blocks, they can take selectives, during which they can do such things as focus on developing skills (surgical techniques, for example), shadow clinicians to explore a specialty, do research or engage in service abroad or closer to home.

The selectives, which usually last a week, have been a highlight for first-year student Maggie Cupit, who is originally from Mississippi. As a former cancer patient, she intends to become a pediatric oncologist. To that end, she used one selective to shadow doctors in the pediatric hematology/oncology department at St. Jude Children's Research Hospital, where she was treated for Ewing's sarcoma as a teenager. Cupit spent another alongside a radiation oncologist at Mayo and another working on clinical research. She also did one at Cardinal Glennon Children's Hospital in St. Louis, where she shadowed an adolescent medicine specialist who worked with girls with severe eating disorders.

"I think Mayo's intent is to put students in the mindset that we can do anything. I didn't know I was capable of learning so much in such a short period of time, and surprisingly, much of what I've learned has stuck with me."

– Maggie Cupit

"The selectives have been great," she says, explaining that they have allowed her to see and do things students at other medical schools may not see or do until their third or fourth year. "I know what I want to do with my career and what inspires me to practice medicine, so I am able to pursue that now," she says. "For my classmates who are undecided, it allows them to figure out what they want to do sooner rather than later."

The scheduling format, as well as Mayo's pass/fail system, has benefited Cupit in another way, too. She hasn't felt the constant pressure she expected to feel during her first year of medical school. "Some [blocks] have been stressful and some have not been stressful," she says. Anatomy was one of those high-pressure times. Students had seven weeks to master the material, which some programs spend a semester or year teaching. To Cupit, it felt like boot camp: "It was a very formative experience. I think Mayo's intent is to put students in the mindset that we can do anything. I didn't know I was capable of learning so much in such a short period of time, and surprisingly, much of what I learned has stuck with me."

In addition to clinical experiences outside of Mayo, Cupit has gotten some patient experience in Rochester as well. She's learned how to take medical histories and do physical exams on patients and helped out in a smoking-cessation clinic. That was eye-opening, she says, because it offered her insight into caring for people with addictions.

Mayo recently added coursework in leadership and wellness, says Dean Sherine Gabriel, MD. The 14-session wellness curriculum aims to prevent stress and burnout—a problem that plagues both students and practicing physicians. Gabriel says they are striving to teach students how to better manage their stress so they can enjoy long careers in medicine. They also learn about varying leadership styles and assess and develop their personal approach.

Mayo also is partnering with Arizona State University on several initiatives. One is aimed at educating students in the science of health care delivery. The two schools are developing a four-year curriculum that will culminate in a certificate. First-year medical students will go through two blocks that will cover topics such as health policy, health law, health care economics, social determinants of health, population health and interdisciplinary teamwork.

In addition, Mayo is working with Arizona State to create online modules that cover material typically included in a foundations class such as biochemistry or microbiology. Students will learn the core content online, then apply the material during small-group discussions in the

classroom and in the clinics. Mayo is moving toward a more longitudinal approach to medical education as well, so students will work at their own pace to master core competencies.

"Our goal is to train the physician leaders of tomorrow, not only to heal their patients but also to help heal our ailing health care system," Gabriel says.

> "Being able to tell if your patient is stressed is a procedure in itself, and it takes as much practice as suturing or doing a biopsy."
>
> – Augie Lindmark

UNIVERSITY OF MINNESOTA MEDICAL SCHOOL DULUTH

A block system is also used at the University of Minnesota Medical School's Duluth campus. Students begin the first year with a foundations block designed to help them acquire core knowledge about topics such as biochemistry, histology and genetics, which they need in order to be successful in subsequent courses.

In the next blocks, in-depth teaching about an organ system is integrated with foundational subjects like anatomy, physiology and pathology. This way, students get the big picture of each system, says Alan Johns, MD, interim regional campus dean and assistant dean for medical education and curriculum. (Instructors used to teach separate courses on these topics. Then the 60-student class would go on to learn about each organ system.) "We found that the best way is to understand the whole system rather than bits and pieces at a time," he says.

A block might be followed by a clinical experience or a two-week session on a topic such as behavioral health, population health, or biostatistics and epidemiology. The clinical training generally takes place in a rural community (Duluth is known for its focus on rural medicine). First-year students take a two-week introduction to rural family medicine that includes a community visit, exploration of issues in rural medicine, and lessons in taking patient histories and physical exams. Throughout their first two years, they spend a total of eight weeks in a rural preceptorship, where they work one-on-one with family physicians in a variety of settings.

The biggest shift underway in Duluth is related to teaching. Faculty have been transforming their teaching style from "death by Power Point" to active learning. Now, half of the subject matter is presented in livelier formats. In neuroscience, for example, students studied the case of a patient with metastatic prostate cancer and chronic pain. They worked in small groups to discuss and research the patient's physiology, psychology and pathology, then developed a treatment plan. "Students need to be engaged so learning can occur. Sitting in a lecture is a teacher-centered process; students hear but they don't really learn," Johns says. "But if they are actively involved in small groups and discussions, they will retain the knowledge better."

The new approach is bearing fruit, as Duluth students' scores on the national board exam have increased 11 percent in the past four years and are now above the national average. "It's because of the way we're teaching," Johns notes. "Guided learning is more effective than me just telling you something."

Instructors are encouraged to innovate. In one class covering embryonic development, students used clay to create models of the brain and brain stem. "There are so many different ways to teach a topic, and you can see the creativity of the faculty come out in that," says first-year student Augie Lindmark.

Lindmark, who is originally from Red Wing, chose Duluth because of its emphasis on rural medicine. During one of his clinical experiences, he spent a week at CentraCare Health in St. Cloud, where he previously worked with immigrant and refugee populations while serving as an AmeriCorps volunteer. By the end of the week he was taking histories, doing physical exams and presenting patients' cases to his preceptor.

Lindmark says learning the clinical side of medicine is considered a core part of the curriculum. "Being able to tell if your patient is stressed is a procedure in itself, and it takes as much practice as suturing or doing a biopsy," he says. "I feel lucky to learn these skills concurrently while learning the science and art of medicine."

UNIVERSITY OF MINNESOTA MEDICAL SCHOOL TWIN CITIES

Transitioning from student to doctor is top of mind at the University of Minnesota Medical School, Twin Cities, and it starts on the first day of orientation. Faculty prompt first-year medical students to change their personal outlook—from that of a student to that of a physician—and to think about what kind of physician they want to be. Together, the 170 students in the class write a class oath, which they read at their white coat ceremony. It's a

powerful moment and a declaration of commitment, says Kathy Watson, MD, senior associate dean for undergraduate medical education.

Students spend their first semester taking three courses that address both the scientific and clinical sides of medicine. In Human Structure and Function, the Science of Medical Practice and Essentials of Clinical Medicine, the students delve into the micro (histology and molecular biology) as well as the macro (public health and translational research). By second semester, they go deeper into various subjects.

Clinical experiences used to start in the second year; but now first-year students take a three-part Process of Care clerkship, where they work with primary care physicians in inpatient, outpatient and long-term care settings.

Leaders at the U have been working on changing their program for the past six years in response to both national trends and student pleas for more emphasis on such things as public health, quality improvement and patient safety. They've launched initiatives focused on the students' learning environment, how and what is taught, and using technology for teaching, Watson says.

Throughout years 1 and 2, students meet in small groups to discuss patient cases that are related to the scientific courses they are taking. They also participate in a faculty advisor group, which meets periodically throughout all four years. These groups can serve as a sounding board—a place where they can share how they felt, for example, when their first patient died. "We knew that students felt adrift," says Watson of the reason for creating the small groups. "We wanted to select faculty who are active clinicians and can develop long-term relationships with students. They can connect with them on career advice or on resources or research."

Because students have stressed they want more emphasis on team practice, first-year students on both the Duluth and Twin Cities campuses now take a course called Foundations of Interprofessional Communication and Collaboration, along with nursing, dentistry, pharmacy, and public health students. The course teaches them about teamwork and collaboration, as well as professional roles and responsibilities, ethics, decision-making and communication.

"In anatomy, when we learned about the shoulder, they set it up so we were doing physical exams of the shoulder at the same time. It helped because it was fresh in my mind to look at the exterior of a living body and then go into the anatomy lab and see what it looks like internally."

– Sameena Ahmed

Another shift underway on the Twin Cities campus is related to teaching. Instructors now use more small-group learning and flipped classroom experiences. Instead of a professor lecturing, class time might be used to dissect clinical scenarios or gauge the students' mastery of information with an audience response system.

The school also is incorporating more team teaching, pairing basic scientists and clinicians, says Jeffrey Chipman, MD, assistant dean for curriculum. "The basic scientist can explain why a concept matters and the clinician can explain how to apply the concept in clinical practice," he says. "It keeps students engaged, and it explains why they are learning what might seem to be an obscure biochemical pathway."

First-year student Sameena Ahmed, who is from Savage, Minnesota, has appreciated this approach. "They try to connect the classes with each other. In anatomy, when we learned about the shoulder, they set it up so we were doing physical exams of the shoulder at the same time," she says. "It helped because it was fresh in my mind to look at the exterior of a living body and then go into the anatomy lab and see what it looks like internally."

Ahmed says the Essentials of Clinical Medicine course—which she calls the "How to be a Doctor" class—has been especially valuable to her. In small groups led by a physician facilitator, they discuss bioethical issues and learn how to interview patients and do physical exams.

Ahmed has put some of that learning into practice while volunteering at the student-run Phillips Neighborhood Clinic in Minneapolis. There, she works as a Spanish language interpreter. "It's easy to get involved in many things," she says. "There are a lot of resources to do worthwhile work right now and people willing to work with us and cultivate our interests." **MM**

Suzy Frisch is a freelance writer from Apple Valley.

8 PRACTICAL TIPS FOR PRECEPTORS

BY JEANNE METTNER

When Mark Eggen, MD, decided to retire from private practice and accept a part-time position as an assistant professor in the University of Minnesota Medical School's department of anesthesiology, he was both excited and intimidated.

A flexible schedule meant he could enjoy free time not afforded him during his 20 years working at Mercy Hospital in Coon Rapids and Unity Hospital in Fridley. But he felt intimidated and inexperienced taking on the role of preceptor for medical students and residents.

"For 20 years, my practice was taking care of patients. That's it. I didn't do any research. I didn't do any teaching. Then I show up at the university last summer with residents in anesthesiology and medical students on rotation," Eggen explains. "I had this immediate reaction of, 'Whoa. Here I am.' I have this experience practicing anesthesiology, but I have no experience in understanding what the needs are of students and residents." In order to figure out how to be a good preceptor, Eggen shadowed as many seasoned instructors as he could.

Teaching has always been an integral part of what it means to be a physician. "See one, do one, teach one," remains a common maxim in medicine, and the word "doctor" itself comes from the Latin word *docere*, meaning "to teach." From the first year of medical school, students learn that one of their duties will be to help mentor those who come after them. "You are learning how to teach by supervising people one year behind you in the academic learning order," explains James Boulger, PhD, director of the family medicine preceptor program at the University of Minnesota Medical School's Duluth campus. "Second-year medical students teach first years, third years teach second years, senior residents teach junior residents, fellows teach senior residents and attending physicians teach all of them. You gain a lot of teaching experience simply by choosing to become a doctor."

Boulger points out that just because teaching is expected, it doesn't mean that it comes naturally. Although there's not much formal training for physicians who want to be preceptors, there are things you can learn that will make you a better at it. The following advice comes from seasoned preceptors.

1 Know yourself and your student

Ask experienced preceptors, What makes a good preceptor? and the answers they give sound uncannily similar: They must be able to understand where a student is along the trajectory of his or her educational development and then tailor their teaching to help the student reach his or her goal. They must be comfortable in their own skin. And they must be able to admit they don't have all the answers. "Some of the best learning happens in cases where you as a preceptor honestly don't know," says Richard Wehseler, MD, who coordinates rotations at Affiliated Community Medical Center's clinics in southwestern Minnesota. "A bad preceptor would be one who is not comfortable with that situation—or who is not open to different ideas or approaches a student might discuss."

2 Be positive

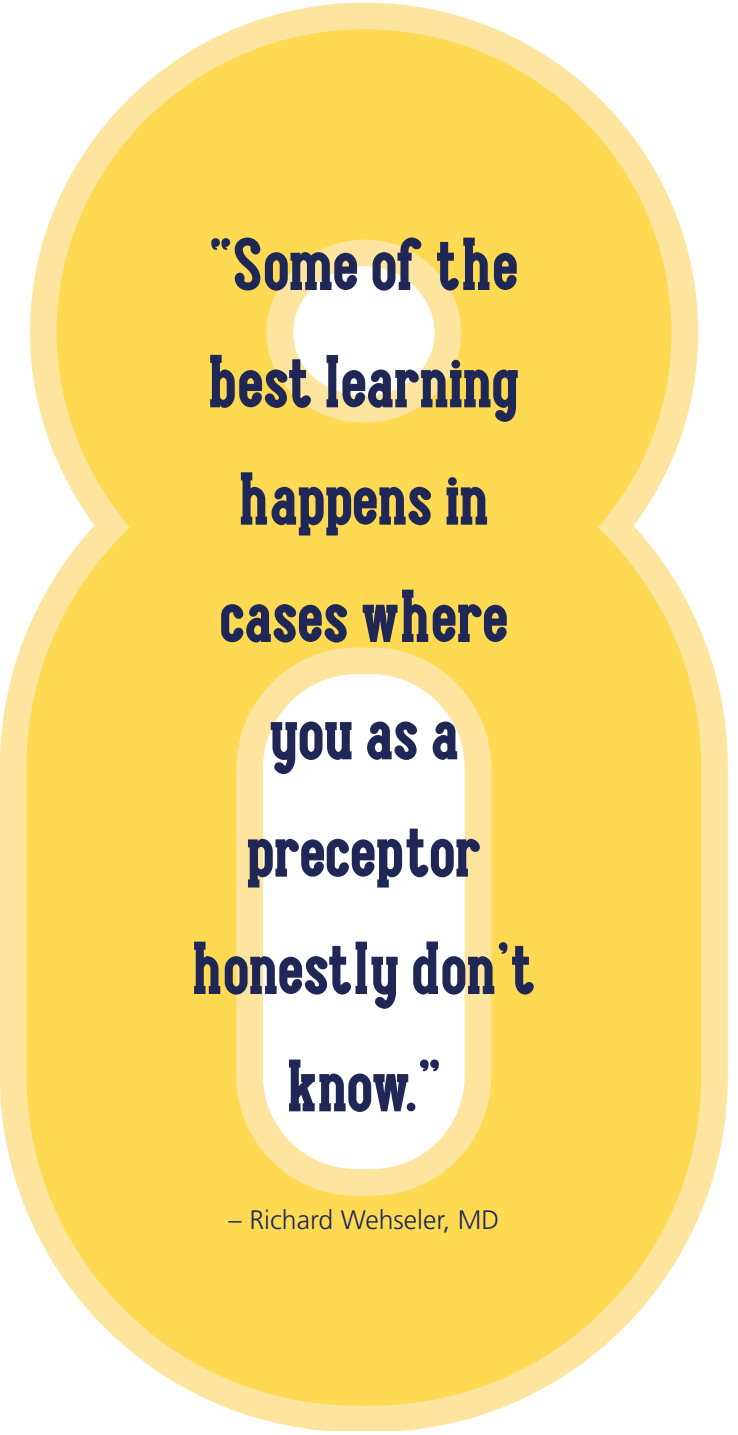
Having a positive attitude is paramount. "A good preceptor is someone who is enthusiastic about having a student with him or her, is engaged and aware of what students need, and is able to ask students exactly what they want to get out of their clinical experience," says Anne Pereira, MD, assistant dean for clinical education at the University of Minnesota.

Although he's new to the role, Eggen says he has already learned that liking it is perhaps the most essential aspect of succeeding at teaching. And he's seen some situations in which a student or resident has been reassigned because the preceptor's heart wasn't in the job. "Being a preceptor is hard work, but if you are consistently cranky and no longer enjoying it, it's best just to realize that it's someone else's turn," he says.

3 Give the student space

Giving the student enough autonomy is important to ensuring that he or she gets the most out of their clinical encounters.

As a self-professed "neophyte preceptor," Eggen says his greatest challenge is making sure he backs away enough to ensure the student is thinking and working at a level appropriate to his or her experience. He laughs when he recalls the advice he received from a fellow preceptor, who said his job as a preceptor was to "give [students and residents] just enough rope to



hang themselves but not so much that they can hang themselves and the patient." "In a very broad sense, that sums it up," Eggen says. "I never want bad patient outcomes, certainly, but if I don't give them enough leeway relative to their experience and comfort, what are they learning?"

4 Set expectations

Ideally, at the beginning of each rotation, preceptors and students take time to establish expectations and learning goals. "It can be very informal, asking them, 'Are there certain skills you want to hone? Do you want to see as many patients as possible? Are there certain things that, upon leaving this rotation, you would be disappointed not having learned?'" Wehseler says. "And then at the same time, I tell them, 'Here are the things I want you to know by the end of this rotation. These are the things that are important to know and be comfortable with at this time in your education.'"

Having that discussion gives both student and preceptor a basis for subsequent evaluations and reviews. Eggen says knowing what to expect from trainees at different levels is one of the biggest hurdles for new preceptors to overcome, particularly when they are working with residents. "I've been doing this almost a year now, and I still don't have the experience base yet to be able to say, for example, 'Third-year anesthesiology residents should know X but maybe won't know Y,'" he says. "Sometimes, I don't connect as well as I think I should with a resident because I didn't personally understand the level of knowledge they had coming in. I didn't challenge them to think at their level."

RESOURCES FOR PRECEPTORS

Most preceptors are too time-pressed to devote hours to learning the ins and outs of the job. But when they do feel they need or want to develop their teaching skills, help is available.

Preceptors working with students at the University of Minnesota Medical School Duluth receive a complimentary subscription to "Teaching Physician," a web-based resource for community preceptors offered by the Society of Teachers of Family Medicine. "Built into the site are resources for learning how to problem solve, how to provide appropriate feedback, how to identify negative behaviors that might be impairing students' learning environment—and it provides all this information in a confidential way," says Emily Onello, MD, assistant professor of family medicine and community health on the Duluth campus. "Physicians can even get CME credit for using it."

James Nixon, MD, vice chair for education in the University of Minnesota's department of medicine, offers seminars on SNAPPS and the One-Minute Preceptor, approaches for presenting cases. Other offerings are listed on the Medical Office for Medical Educator Development and Scholarship website (www.meded.umn.edu/meds/).

Kathleen Brooks, MD, director of the University of Minnesota's Rural Physician Associate Program (RPAP), a nine-month clerkship for third-year medical students, says RPAP preceptors are given a 40-page guidebook that's updated annually as well as laminated cards with reminders about SNAPPS and the One-Minute Preceptor.

For the past several years, the Minnesota Academy of Family Physicians has worked with RPAP faculty to present an educational session on precepting at its annual Spring Refresher. The goal is "to provide general information that would be helpful to any physician or health care professional who has a teaching role," says MAFP Executive Vice President Virginia Barzan. Last year's session focused on "truth-telling when evaluating student learners." This year's session, called "How your tablet or smartphone can make you a smarter doctor," is on using digital resources in simulated precepting encounters. –JM

5 Have a plan for how you'll share information

In a traditional classroom setting, the learner and teacher interact around the curriculum—be it in a textbook or lecture. For preceptors, the focus is the patient. "Clinical teachers are working and teaching students in their workplaces—where they are caring for patients," explains Kathleen Brooks, MD, director of the University of Minnesota's Rural Physician Associate Program, a nine-month, community-based experience for third-year medical students. "That's much different than having a white board in a classroom setting."

"There are some real challenges when you are talking about having physicians who are in community practices be your teaching faculty, just in terms of workload and time," Boulger says. "These are not people waiting for students to enter a lecture hall. These are active clinicians serving strong patient cohorts. We have to make sure they are meeting the needs of their patients while addressing the educational goals of the student."

Agreeing on a framework for sharing information and learning can make the experience go more smoothly for the preceptor and help the student advance more quickly. One approach, SNAPPS, is a six-step process that students can follow as they review and analyze a patient case. First, the student *summarizes* the history and findings, then *narrows* the differential diagnosis to two or three possibilities, *analyzes* those differential diagnoses, *probes* (asks questions of) the preceptor, *plans* management of the medical issue, and *selects* a case-related issue for further self-directed study. "We introduce the SNAPPS model in year one of medical school, and it's our expectation that the students will learn to do presentations that way across their training," explains James Nixon, MD, associate professor of internal medicine and pediatrics and vice chair for education in the department of medicine. To help community-based physicians, Nixon hosts a seminar on SNAPPS, as well as one on the One-Minute Preceptor—a similar model that is preceptor-directed rather than student-directed.

"Having these models has proved to be a time-efficient, quality way to direct the clinical encounter," Nixon says. "It allows the preceptor to take care of the patient while helping students learn in a more consistent, even standardized way as they move from site to site and rotation to rotation."

6 Be aware of the hidden curriculum

Students are always watching. Therefore, preceptors need to pay attention not only to what they are saying and teaching but also to what they are doing. "The hidden curriculum is the difference between what we say and overtly teach and what the students learn by observing us," notes Nixon. "It's important to role model the professionalism, the appropriate interaction with our patients. Strive to create good habits so your students are absorbing those—rather than bad habits."

7 Consider feedback your friend

Each time a student completes a rotation, he or she evaluates the experience. They provide feedback on how the rotation was organized and their overall experience, then they evaluate the individual preceptors they worked with. In some cases, feedback is submitted anonymously through an online questionnaire. In others, such as with rural medicine rotations, students and preceptors complete short surveys and then talk in person. This system of checks and balances ensures that clerkship directors can resolve problems effectively. "In cases where there are 'outlier' rotations or sites that did not meet student expectations, it's important to discuss plans for remediation so that the concerns are addressed," Pereira says.

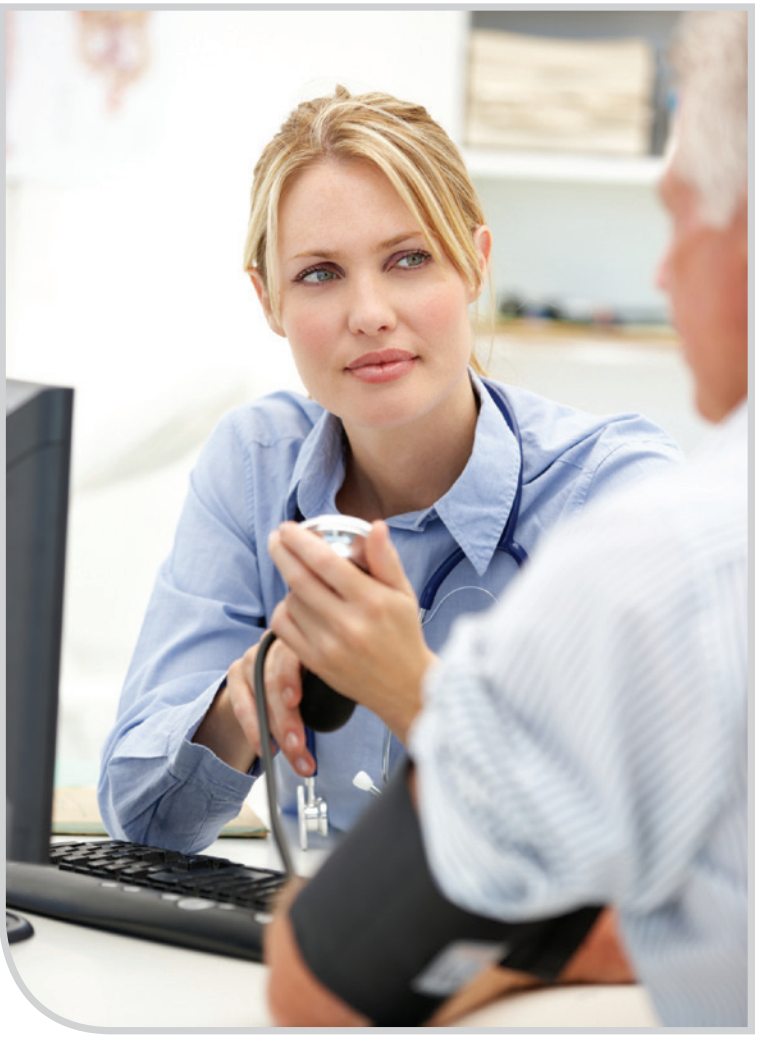
"Evaluations also help the preceptor refine their approach," Nixon says. Ideally, less-than-glowing feedback should serve as a springboard for further preceptor development. "We may, for instance, need to talk with a preceptor because the students are saying he or she is not defining expectations on Day 1 of the rotation," Nixon says. "That helps us educate the preceptor about why setting goals is important to the learning process."

8 Find your best style

Nearly a year after taking the job at the university, Eggen has discovered for himself what works and what doesn't with his preceptor approach. He's found he prefers the Socratic method of teaching—asking learners questions and then using their answers to stimulate further discussion and critical thinking. "I have learned that being a preceptor is an art more than a science," he says. "I certainly am still new at this, but I have definitely discovered I can do it. And I'm also having fun." MM

Jeanne Mettner is a frequent contributor to *Minnesota Medicine*.

Threats TO THE physician-patient relationship



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Looking into the chasm

A student reflects on the disconnect between the classroom and the exam room.

BY DOMINIC DECKER

The gap between the second and third years of medical school felt like a chasm. On one side were the preclinical years, filled with innumerable lectures and labs about health and disease. On the other were the clinical years, when learning takes place in patient-care settings. Ideally, the first half of medical school should segue nicely into the second. In reality, the transition is difficult, as students confront the complexity of managing patients who exist outside the confines of clinical vignettes. As I near the end of my third year, I've been reflecting on this critical time in my education with a greater awareness of what transpired as my passive, hypothetical learning became very active and real.

Dominic Decker

PHOTO BY KATHRYN FORSS

Last April, as my second-year courses in hematology and gastroenterology ended, I anticipated the next milestone in my training: Step 1 of the United States Medical Licensing Exam (USMLE). The six weeks during which I prepared for this exam were a hypercondensed version of the first two years of medical school. Studying involved reviewing material and doing practice questions for 10 hours a day, six days a week. I made extensive charts, drew elaborate diagrams and committed obscure details to memory in the event they would help me answer a single challenging question. Rote memorization became my full-time job.

During this intensive study period, I sealed myself off in the back bedroom of my apartment, the extra space I had made mandatory on my list of requirements when I had been apartment hunting, precisely because of the USMLE. An hour-long break in the middle of the day to exercise was my respite from attempts to categorize important pathogens and, thus, determine their clinical significance and treatment. In conversations with my boyfriend at the dinner table, I allowed my mind to momentarily drift from the causes of micro-, normo- and macrocytic anemia. I visited my parents occasionally, rarely saw friends and did not speak to fellow classmates because I felt commiserating during this time was unproductive.

My mantra during exam preparation was: "This will make you a good doctor." In trying to convince myself that I was studying for the benefit of my future patients, I sought to imbue Step 1 with meaning. That may have worked because I truly believed it, or it may have been that I was too busy memorizing to question the value of the test.

On the morning of May 29, I went into the testing center feeling simultaneously prepared and unprepared. I was fingerprinted, photographed and placed at a workstation to answer hundreds of questions over eight hours. For me, the reward at the end of the exam was not being done with it, nor was it getting my score. It was the conclusion of the preclinical years and the beginning of my practical, hands-on training. It was my gateway to patient care.

I had one weekend off between Step 1 and the first day of my third-year rotations. And it was during a single moment

in one of those first rotations that I realized how little the test had prepared me for the art of doctoring.

That moment brought me face-to-face with a man my age who had returned to the clinic for the results of a testicular ultrasound. He had noticed a painful mass on one of his testes several weeks earlier but had been reluctant to have it evaluated. Intense discomfort finally brought him in. After reviewing his chart, I knew that the growth was likely cancerous and that treatment would mean removing the affected testicle. I walked into the room, trailing behind the doctor and resident who gently delivered the news. Then I was left alone with the patient to arrange for follow-up.

Sitting next to the exam table upon which my patient sat, I looked into his eyes as he began to cry. Over and over, he questioned what had caused his cancer and whether his testicle would have to be removed. He was concerned about his fertility, a problem that rarely if ever crosses the mind of an otherwise healthy man in his 20s. I knew then that being a good doctor meant *not* telling my patient about the cells that made up his cancer or about the tumor markers used to identify those cells. I knew that he was trapped in a room in which the word "cancer" had just been released like a noxious gas. I knew it was suffocating him. And in all of this, I knew that my role was simply to listen and be present.

Suddenly, I saw things clearly. So much of my studying was meant to elicit an automatic response when I heard a phrase like "muddy brown casts" or "Reed-Sternberg cells." It had conditioned me to think that even the most complicated question had a single best answer. As I thought inside the box, I ignored the nuances inherent in the patient as a person.

In health care today, we are rejecting a one-size-fits-all approach in favor of advances in genomics and individualized medicine, or what President Barack Obama called "precision medicine" in his State of the Union address. So why are tests written as if one 45-year-old woman with hypertension is the same as another 45-year-old woman with the same diagnosis?

Before I entered medical school, I studied narrative medicine at Columbia University. This discipline recognizes that the central act of connection between doctor and patient is the story that is exchanged and constructed by both parties. It trains health care workers—not just physicians, but nurses, social workers, chaplains and others—to skillfully listen to, interpret and act on the illness narrative. We students honed and refined those skills as we analyzed how messages were presented in a variety of media, from literature to music to film. Learning how to critically think about art and to appreciate the diverse reactions it inspires has helped me better understand complexity, concordance and contradiction in my patients.

My training in narrative medicine, elsewhere referred to as medical humanities, has completed my medical education, allowing me to step outside of an overly formulaic approach to patient care and instead try to gather information that is meaningful both to myself and the patient. Such training is the exception rather than the norm in medical schools and residency programs in the United States, but it is growing.

As I started my third year, I remarked to several friends and family members that it feels like I'm not in the same program anymore. In many ways, I'm not. My classes are held at the bedside or in staff workrooms. My instructors are doctors, nurses, technicians and, especially, patients. My answers to questions are not A, B, C or D. Incorporating the humanities into medical training starting in the preclinical years would bring the art and science of medicine into balance. It would also help students bridge the divide between the patient on the exam paper and the one on the exam table. MM

Dominic Decker is a third-year medical student at the University of Minnesota. He earned a master's degree in narrative medicine at Columbia University.

Physicians and medical students had a beautiful March day to meet with their legislators.

White coats descend on Capitol to fix prior authorization

Students Elizabeth Fracica and Ricky Cui met before heading off to the Capitol.

PHOTOGRAPHY BY KATHRYN FORSS

More than 80 physicians and physicians-in-training attended the MMA's annual Day at the Capitol on March 11 with one major goal—to fix the medication prior authorization mess.

Members in attendance had meetings with 51 senators and representatives during the course of the day in a broad-based effort to alleviate the administrative burdens that plague Minnesota practices.

Sen. Melisa Franzen (DFL-Edina) served as keynote speaker for the event's luncheon, discussing her bill (SF 934) that deals with prior authorization. Rep. Nick Zerwas (R-Elk River) also attended the reception at the end of the event.

Because of the renovations taking place at the Capitol, the MMA held the event at the DoubleTree by Hilton Downtown St. Paul.

❶ Sogand Ghassemi, MD, meets with Sen. Dave Senjem. ❷ Not much of the Capitol was accessible due to construction work. ❸ Sen. Melisa Franzen, author of the Fix PA Now bill, spoke during the luncheon. ❹ Fixing the prior authorization mess was a top priority for the physicians and medical students in attendance. ❺ Rep. Nick Zerwas shared his passion for health care legislation with physicians and medical students at the end-of-the-day reception.

News Briefs

State medical cannabis survey results released

More than 1,300 Minnesotans have expressed interest in participating in the state's medical cannabis program, according to results of a Minnesota Department of Health online survey that were released in February. A little more than half of the respondents identified their qualifying condition as multiple sclerosis (MS) or severe muscle spasms. The next most common conditions were epilepsy and cancer. The health department reported that 70 percent of the respondents said they were likely to register for the program, 24 percent said they might register, and 7 percent said they were not planning on registering. Residents from approximately 92 percent of the state's counties participated in the survey. Medical cannabis distribution sites are planned for Eagan, Hibbing, Maple Grove, Minneapolis, Moorhead, Rochester, St. Cloud and St. Paul.

Prescription monitoring program expands scope

Minnesota is now sharing data from its prescription monitoring program (PMP) with 21 states in an effort to prevent drug diversion and abuse in the United States. The PMP contains information provided by Minnesota pharmacies and prescriber dispensers about all Schedule II, III, IV and V controlled substances and butalbital-containing products dispensed in or into the state. An electronic exchange permits approved users in other states to query the Minnesota PMP about drugs dispensed to patients in Minnesota; in return, prescribers and pharmacists from Minnesota can perform similar queries in those states. Because of differences in laws, some states do not allow "delegates" (those designated by a physician or pharmacist to perform a patient query) from Minnesota to access their data. The National Association of Boards of Pharmacy's PMP InterConnect hub is being used to link PMPs in participating states and allow them to securely exchange prescription information. Minnesota now shares information with: Arkansas*; Arizona*; Colorado; Connecticut*; Delaware; Idaho; Illinois*; Indiana; Kansas*; Kentucky; Michigan*; Mississippi; Nevada*; New Mexico; North Dakota; Ohio*; South Carolina; South Dakota*; Virginia*; West Virginia; and Wisconsin.*

*Do not allow Minnesota delegates to access information.

At the Capitol

MMA Legislative Priority	Status at the Capitol
Fix prior authorization	Bills were introduced in both the Senate (SF 934) and House (HF 1060) on Feb. 19.
Reinstate higher Medicaid payments	The MMA has testified before various committees, requesting that lawmakers fund Medicaid payments at Medicare levels. Bills to reinstate the bump (SF 1576 and HF 1729) were introduced in March.
Primary care loan forgiveness	Bills have been introduced (SF 3 and HF 211) and are working their way through committee hearings.
Interstate licensure	Bills have been introduced (SF 253 and HF 321) and are working their way through committee hearings.
Reducing nicotine's harm	A House bill (HF 1253) that would place more restrictions on e-cigarettes was introduced in early March. It doesn't appear that it will move this session.
Provider tax repeal	No legislation has been proposed so far this session that would derail the scheduled repeal.

MMA goes to Washington to discuss SGR

MMA leaders and staff traveled to Washington, DC, in February to urge Minnesota lawmakers to repeal and replace the flawed Medicare sustainable growth rate (SGR) payment system.

MMA President Donald Jacobs, MD, President-Elect Dave Thorson, MD, Maya Babu, MD, and Dave Renner, MMA director of state and federal legislation, met with Sen. Amy Klobuchar, Sen. Al Franken and Rep. Betty McCollum to discuss the issue. They also met with representatives for Rep. Erik Paulsen and Rep. Tom Emmer. The MMA group was in the nation's capital to attend the AMA's National Advocacy Conference.

On the calendar

Event	Date	Location
Policy Council day-long health policy conference	April 25, 9 am to 4 pm	DoubleTree by Hilton Hotel Bloomington-Minneapolis South
Annual Conference	Sept. 25-26	DoubleTree by Hilton, St. Louis Park

Check the MMA's website (www.mnmed.org/events) for more information and to register.

Cindy Firkins Smith, MD

Donald Jacobs, MD

Dave Thorson, MD

Robert Meiches, MD

Janet Silversmith

Juliana Milhofer

MMA in Action

In February, Immediate Past President **Cindy Firkins Smith**, MD, gave a presentation, "Tanning and Teens," at the University of Minnesota's pediatric dermatology conference.

MMA President **Donald Jacobs**, MD, took part in a conference call with physician CEOs and CMOs from Minnesota's largest health care provider organizations.

MMA President-Elect **Dave Thorson**, MD, attended the Minnesota Academy of Ophthalmology monthly board meeting in early March.

Robert Meiches, MD, MMA CEO, **Keith Stelter**, MD, and **Janet Silversmith**, MMA director of health policy, attended a dinner meeting with University of Minnesota President **Eric Kaler** and U of M Medical School Dean **Brooks Jackson**, MD, in late February to hear more about the university's 2015 legislative asks and the governor's initiative on the medical school.

Juliana Milhofer, MMA policy analyst, represented the MMA on an age-related hearing loss and healthy aging task force, a group convened by the Commission of Deaf, Blind & Hard of Hearing Minnesotans.

Brian Strub and **Kathleen Baumbach**, MMA managers of physician outreach, **Terry Ruane,** director of membership, marketing and communications, and **Scott Wilson**, MMA sponsorship manager attended the Minnesota Medical Group Management Association's 2015 winter conference in early March.

Mandy Rubenstein, MMA manager of physician outreach, represented the MMA at the Central Minnesota Prescribing Coalition in St. Cloud in late February. She also attended the Clay Becker Medical Society annual meeting in early March.

Eric Dick, MMA manager of legislative affairs, traveled to Olmsted Medical Center in late February to provide an update on the 2015 legislative session to clinic staff. While in Rochester, Dick also visited with pediatric residents at the Mayo Clinic in preparation for the Pediatricians' Day at the Capitol in mid-March.

VIEWPOINT

A new way of engaging

Donald Jacobs, MD

In the February issue of *Minnesota Medicine*, the cover story "New Jobs for New Times" (p. 13) explored some of the roles physicians are playing in today's health care environment.

Although some of the new titles (total-cost-of-care medical director and medical director of recruitment and retention, to name two) may take some getting used to, I don't see these roles as a negative. Rather, I see them as a sign we physicians have new opportunities to help create a stronger, healthier health care system.

In order to meet the needs of our patients and communities, physicians have to play an active role in health care redesign. We are the ones who best understand our patients. We listen to them, counsel them, heal them and alleviate their suffering. We have their best interest top of mind.

Our ability to interact with patients and provide them with the best care possible, however, is undermined by overbearing regulation and administrative burdens, many of which have been instituted without physician input. The current, needlessly wasteful and cumbersome medication prior authorization process is one example of this that quickly comes to mind. Our payment system, which is out of sync with the outcomes we are trying to achieve, is another. Electronic health record systems that add to our workload and do not deliver information in a convenient way are another.

Physicians are in the best position to help create systems that are good for patients and that are more in step with the realities of medicine. So, in my view, physicians need to take the lead in creating them. We should seek out roles in which we can play an active part in retooling aspects of the health care system in ways that will work for both patients *and* physicians.

We have many problems, large and small, in our health care system. We also have lofty goals. Surely, we need physicians leading the way and working with all stakeholders as we solve problems and work to make Minnesota the healthiest state and the best place to practice medicine.

Physicians are in the best position to help create systems that are good for patients and that are more in step with the realities of medicine.

A Community-Centered Disability Curriculum for Medical Students

BY JULIE M.G. ROGERS, PHD, AND RACHEL D.A. HAVYER, MD

Although disabilities are prevalent, many medical professionals lack knowledge about them. Many haven't been trained to care for patients who have them and have negative attitudes about disabilities and those who have them. Their attitudes can affect health care and patient outcomes. Despite recommendations by U.S. surgeons general to include disability curricula in medical education, only a small minority of medical schools have done so. In 2011, Mayo Medical School developed a new disability curriculum for its first-year students. The aim was that they might gain insight into their potential biases and understand how those biases could affect the care they provide to persons with disabilities. Here we describe Mayo Medical School's experience with its disability-awareness curriculum.

More than half a million Minnesotans live with a disability,[1] and this number is expected to rise because of the aging of the population and the prevalence of chronic conditions.[2] Although people with disabilities often interact with the health care system, they may not receive hig-quality health care. In fact, there are substantial disparities in the quality of care and outcomes between those with and without disabilities.[3-10] People with disabilities report that physicians' lack of knowledge about disability and negative biases are substantial contributors to those disparities.[11,12] Narratives about their negative experiences with the health care system are common.[13-15]

Studies have found physicians and medical students do indeed have negative attitudes toward disability.[16,17] For example, one study found that only 18% of emergency department workers said they would want to live if they had a spinal cord injury; that compares with 92% of those who actually have a spinal cord injury.[18] Furthermore, 41% of these health care workers believed that resuscitation is too aggressive for patients with acute spinal cord injuries.[18] Another study of physicians, psychologists, social workers and special education teachers found that physicians had significantly lower expectations of and more negative attitudes toward people with intellectual disabilities than those in the other professions.[19]

The negative attitudes of health care professionals have an effect on patient outcomes.[20,21] Compared with their non-disabled peers, people with disabilities are less likely to receive preventive care[3-5] including counseling about contraception, smoking cessation and weight loss.[7] They also are less likely to receive treatment for an acute condition or a terminal illness[8,9] and to receive desired end-of-life care.[10] Aware of such disparities, U.S. surgeons general have urged that the health needs of persons with disabilities be addressed.[22,23] One of their suggestions: train health professionals on the needs of this population.

Incorporating Disability Education into Mayo Medical School's Curriculum

Education about disabilities has been shown to positively affect health professionals' views of people who live with disabilities.[17,24,25] Yet such training is rarely provided in medical school. In fact, fewer than one in five medical schools currently address disability anywhere in their curriculum.[26,27] Often, the only way medical students learn about disability is by observing the way people with disabilities are treated by preceptors, mentors or others within their institution.

Mayo Medical School recognized the need to better train medical students to care for patients with disabilities after hearing concerns from students who had previous experience with the disability community. Those students believed the curriculum then espoused the view that the role of medicine was to "fix" the individual with the disability and failed to include information about the experiences and perceptions of persons who have disabilities. The faculty agreed, and in 2011 they began working with the students and members of the local disability community to develop and implement a new curriculum for first-year medical students (Table).

Now students begin to learn about disability during their genetics course, which

includes four two-hour sessions on disability. During these sessions, students hear from speakers who have a disability and participate in small-group discussions facilitated by a person with a disability. The public health course includes a didactic session in which students learn about disability definitions, history, ethics and health disparities between people with and without disabilities. Students discuss their personal experiences with disability and medicine's role in caring for people with disabilities, including the difference between the medical model (that the person with a disability should be "fixed") and the social model of disability (that society should be "fixed" to include those with disabilities). The session concludes with a panel of individuals who have disabilities fielding questions from the medical students.

TABLE

Mayo Medical School Integrated Disability Curriculum

GENETICS COURSE	PUBLIC HEALTH COURSE
Occurs during weeks 4 through 8 of the first year of medical school	Occurs during week 22 of the first academic year
Four sessions on disability experience (two hours each/eight hours total) • Speakers with disabilities present,(eg individuals with Down syndrome, William's syndrome, achondroplasia) • Small-group discussions facilitated by community members with disabilities	Didactic session (five hours) • Disability definitions • Review of disability history, ethics and disparities Panel discussion with community members who have disabilities (one hour)
Organized with community input (ARC Southeastern Minnesota, Down Syndrome Association of Minnesota, William's Syndrome Association)	Organized with community input (ARC Southeastern Minnesota, Minnesota Governor's Council on Developmental Disabilities, Office of Ombudsman for Mental Health and Developmental Disabilities, Mayo Clinic Disability Employee Resource Group)

The Most Influential Teachers

There is a large experiential gap between those who do and do not have disabilities. In fact, scholars contend that it is difficult for outsiders to understand what they call the "disability culture."[27] Hearing from people with disabilities can help bridge that gap.

In the sessions in which people with disabilities teach the medical students, the students gain insight into what it's like for a person with a disability to navigate the health care system. For example, when one man whose daughter has an intellectual disability was asked whether he was happy with her medical care, here's how he responded:

> *Yes and no. We have to be vigilant because not every doctor knows how to work with someone with a disability. We have to be plugged in to the community to know which doctor to take Amelia* to and also who might not treat her well. People talk. If we stay with the doctors who have experience with disability and have a good reputation, her health care is great. If she needs care from other providers, however, it can be scary.*

* Not her real name

> *One time Amelia was admitted to the hospital by a doctor who told us she wasn't able to eat or drink anything, and she needed an IV and antibiotics. But another doctor came in shortly after saying she didn't need the medication anymore and could go home. When I asked why the change in recommendation, the new doctor could not give me a reason except for "It wouldn't help Amelia." When I explained that we wanted her treated, the doctor conceded. Amelia was in the hospital for several days, until she could drink on her own, and is now doing very well. According to the doctor who saw her in the clinic, she did need to stay in the hospital. I think everyone is well-intended, but I shudder to think that some doctors might not value Amelia's life.*

After hearing this man's story, the students easily understood why he might be wary of medical professionals. In these sessions, students also have an opportunity to ask questions they may not be able to ask in a clinical setting such as: How does disability contribute to your personal identity? What do you think the term "disability" refers to? How does your impairment affect your life?

On surveys, the students have rated the sessions in which they interacted with people with disabilities above average in terms of their relevance to future clinical practice. When asked to comment on what they liked most about the genetics course as a whole, two-thirds said they thought the discussions with community members with disabilities were the most helpful part.

Our hope is that medical students will be more likely to understand why, for example, a woman with a spinal cord injury might be glad she was resuscitated after her injury and why she might benefit from counseling about smoking cessation and contraception. We also hope that as understanding grows, attitudes will change and we will begin to address the health disparities between those with and without disabilities.

Conclusion

At Mayo Medical School, we have learned that it is feasible to integrate a disability curriculum into medical training. We also have learned that it is essential to involve community members who have disabilities in teaching, as that enables students to learn about their very diverse lived experiences, allowing them to gain valuable insight into the disability culture. By hearing their stories, students begin to understand the depth of discrimination experienced by people with disabilities and the factors causing the disparities in health care and outcomes between those with and without

disabilities. We believe that through our disability curriculum, students' assumptions and biases are being challenged and that attitudes toward this population will improve. MM

Julie Rogers is a student at Mayo Medical School. Rachel Havyer is an assistant professor of medicine at Mayo Medical School.

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Essentials of Ambulatory Care

A Postgraduate-Level, Interdisciplinary, Interprofessional Curriculum at the University of Minnesota

BY HEATHER THOMPSON BUUM, MD, TAJ MUSTAPHA, MD, EMILY BORMAN-SHOAP, MD, PATRICIA ADAM, MD, MARY DIERICH, PHD, CNP, AND KERI HAGER, PHARMD

Team-based care is a cornerstone of primary care. However, in medical school and residency, trainees get little formal education on this as a concept and how it works in an outpatient setting. Faculty members from the University of Minnesota created a one-day workshop, "Essentials of Ambulatory Care," to help residents in primary care specialties as well as pharmacy and nursing students pursuing advanced degrees better understand the roles and responsibilities of members of the primary care team. The workshop also helped them develop new skills for doing patient-centered visits. This article describes the workshop and what we learned from those who participated in the first session.

We are entering a period in health care when day-to-day practice is changing more rapidly than the training of doctors, nurses, physician assistants, pharmacists and other providers. Although team-based care is now a cornerstone of outpatient primary care practice, there still is little formal education about teamwork or team-based care in medical school. The same is true in residency programs for the primary care specialties and midlevel provider programs, both of which require trainees to master such competencies.[1,2] Also, many of the clinical faculty who teach in these programs have not been trained in the concepts of systems, outcomes measurement, population management and the patient-centered health care home.

As health care organizations are beginning to recognize the benefits of robust primary care,[3,4] demand for primary care is growing. Increased access to health care as a result of more people having insurance because of the Affordable Care Act and the aging of the population also have increased the need for primary care at a time when many physicians are retiring and graduating medical students are choosing more lucrative specialties.

In an effort to address deficiencies in medical education, the three primary care boards (American Board of Pediatrics, American Board of Internal Medicine and American Board of Family Medicine) together with the federal Health Resources and Services Administration and the Josiah Macy Jr. Foundation launched the Primary Care Faculty Development Initiative.[5] The goal of this initiative is to train faculty so they can transform their primary care training programs and better prepare residents for practice. A secondary goal is to improve trainees' experiences in continuity clinics in order to attract more of them to primary care careers. In 2013, the University of Minnesota was one of four institutions that received a grant from the Macy Foundation to institute such changes.

That year, nine faculty physicians from the university's pediatrics, internal medicine and family medicine residency programs as well as educators from the College of Pharmacy and School of Nursing formed the Minnesota Primary Care Transformation Collaborative. Members participated in national train-the-trainer sessions offered by the Primary Care Faculty Development Initiative in April of 2013 and May of 2014. Those sessions covered topics such as the Triple Aim, the patient-centered medical home, population management, systems thinking, leadership and change management. The intent was that participants would incorporate those concepts into their training programs.

Upon returning to Minnesota, members of the Minnesota collaborative developed "Essentials of Ambulatory Care," a workshop to help residents in primary care specialties (family medicine, pediatrics and internal medicine), first-year ambulatory care pharmacy residents, and registered nurses earning their nurse practitioner

credentials or clinical doctorate better understand the roles and responsibilities of various members of the health care team and develop new techniques for efficient, patient-centered visits. The plan was to offer the one-day workshop three times during the academic year. In this article, we describe our experience with the first one.

About the Workshop

In designing the workshop, we decided to include a combination of didactic and interactive experiences that would provide participants with a better understanding of key principles such as patient-centeredness and team-based care delivery, introduce them to the components of the patient-centered medical home and teach them useful skills they could apply in practice. The goals and objectives are further articulated in the Table.

The first session was held in October 2014 at Smiley's Family Medicine Clinic in Minneapolis. Forty-six trainees attended. Twenty-four of the participants were pharmacy residents, seven were internal medicine residents, four were pediatrics residents, three were family medicine residents and eight were nurse practitioner students. Eight faculty members presented on various topics and/or facilitated small-group activities.

The morning was divided into two sessions. The first was devoted to team-based care and included a general discussion of the need for teamwork in primary care, the roles and responsibilities of various team members, and the background, training and scope of practice of each of those team members. The second was devoted to the patient-centered medical home and included discussions about what patient-centeredness means, how the medical home helps meet the Triple Aim's goals, and the components of a patient-centered medical home. The morning ended with a session on systems theory, in which we introduced concepts and then had the attendees apply systems thinking to the design of a medical office exam room.

TABLE

Workshop Goals and Objectives

- Articulate the value of working in interprofessional and interdisciplinary teams.
- Reflect on own values, personal and professional, and respect those of other team members, patients and families.
- Be able to describe the roles, training and responsibilities of other team members.
- Place the interest of patients and populations at the center of care.
- Respect the unique cultures, values, roles/responsibilities and expertise of other health professions.
- Develop a trusting relationship with patients, families and other team members.
- Choose effective communication tools and techniques, including information systems and communication technologies, to facilitate discussions and interactions that enhance team function.
- Engage diverse health care professionals who complement one's own professional expertise, as well as associated resources, to develop strategies to meet specific patient care needs.
- Define the Triple Aim as a guiding principle behind health care improvement.
- Describe the working components of the patient-centered health care home.
- Learn about the role of systems in the context of health care delivery.
- Utilizing the exam room as a model, apply systems thinking to health care delivery and improvement.
- Describe agenda-setting as a technique to improve the patient experience during the office visit.
- Become familiar with the Patient-Centered Observation Form as a tool for observation and feedback regarding patient centeredness during the office visit.
- Learn about transitions of care and important factors for successful transitions.

The afternoon began with a session on patient-centered interviewing. We introduced participants to the Patient-Centered Observation Form, a tool that outlines discrete behaviors that will enhance a clinic encounter.[6,7] It emphasizes the importance of establishing rapport, agenda-setting, discussing behavior change and co-creating care plans with patients. Participants reviewed recorded interactions between providers and patients and used the form to rate each encounter. Then in small groups they discussed how the providers could have improved on the interaction. The remainder of the afternoon was devoted to care transitions—defining when they occur, describing the different components of a transition, reviewing evidence for effective transitions and discussing how teams can facilitate care transitions.

Lessons Learned

Overall, the workshop was deemed a successful first effort by both teaching faculty and trainees alike. We also learned a number of things through the experience. Logistics proved to be a challenge; it was difficult to find a date that would work for residents and students in multiple training programs and to find a space that was large enough to accommodate the group. We originally had called the workshop "Primary Care Essentials" but changed the name to "Essentials of Ambulatory Care" when we recognized that not every internal medicine or pediatrics resident would pursue a primary care career. We believe the workshop is applicable to those going into subspecialties as well as primary care, and we eventually hope to engage more learners heading toward more professions.

We used pre- and post-workshop surveys as well as a debriefing with faculty presenters to identify what worked well and what needed improvement. Participants said one of the highlights of the workshop was an exercise in which each of them was asked to play a specific role during a team huddle. The learners were given certain personality traits and responses to questions. The exercise proved to be both entertaining and educational and drew many positive comments. Learn-

ers reflected on the frustration of being ignored or interrupted by team members, and on how the team did not effectively develop a care plan because of poor communication.

Participants were mostly positive about the afternoon session, which involved viewing videotaped patient encounters and working through the Patient-Centered Observation Form. One noted that it was a "very useful strategy for learning about agenda setting," as the providers and the patients in the videotaped visits had multiple questions and concerns. However, a few thought the session was redundant ("We've already been taught how to take a history in medical school," one said). With such feedback in mind, we plan to build on content presented in other portions of the training and introduce new ideas for structuring a patient visit.

Throughout the workshop, we incorporated training on specific content as well as skills that trainees could readily put into use in a primary care setting. In doing so, we also hope to influence attitudes regarding primary care. One result that surprised us on our post-workshop survey was that there was a slight decrease in interest in primary care (80% post-workshop versus 85% pre-workshop). Although the numbers are small, it led us to speculate that we may have presented primary care in too negative a light. Videos showing "difficult" patient interactions, slides outlining the time pressures in primary care and discussion about the challenges in care coordination, particularly around transitions of care, may have negatively influenced some participants.

In the future, we will strive to emphasize the positives—the fact that primary care physicians have continuity with their patients, work in high-functioning teams and know that their patients are getting the best care at the lowest cost possible. We plan to introduce narratives from patients, families, physicians and other team members that illustrate these positives. The concept of provider satisfaction has been recently dubbed the "fourth arm of the quadruple aim"[8] and has direct relation to the ability to provide care that advances the Triple Aim.

Ultimately, the goal of the workshop is not only to teach residents and other health care students about being members of a primary care team but also to attract more trainees to this career path. Given the changes in our health care system and the pressing need for more primary care providers, we hope the next iteration of our workshop will enable us to do just that. **MM**

Heather Thompson Buum is a faculty member and continuity clinic preceptor in the department of medicine; Taj Mustapha is an associate program director for the internal medicine-pediatrics residency program; Emily Borman-Shoap is director of the pediatrics residency program; Patricia Adam is director of the Smiley's family medicine residency program; Mary Dierich is a clinical associate professor and coordinator of the AGNP program in the School of Nursing; and Keri Hager is a member of the clinical faculty in the School of Pharmacy. All are at the University of Minnesota.

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About this Section

Each year, *Minnesota Medicine* highlights research and clinical work undertaken by Minnesota medical students, residents and fellows. The goal is to not only showcase the good work these medical trainees are doing but also to inform readers about pertinent topics.

This year, 22 trainees submitted brief papers describing original research or interesting cases. These were evaluated with regard to these and other questions: Did the authors provide an adequate description of the case or the problem? Was their methodology sound? Did they conduct an adequte review of relevant scientific literature? Do the findings or does the case have implications for practice or further research? The reviewers selected five submissions for publication in this issue. Others will be published in future issues.

We thank both those who submitted their work and our reviewers Peter Kernahan, MD, PhD; Barb Elliott, PhD; Barbara Yawn, MD; and Angie Buffington, PhD.

Allergic Contact Dermatitis to a Hemodialysis Catheter: Epoxy is an Occult Allergen in Medical Devices

BY JAMIE HANSON, KATIE WARD, MD, JENNA VAN BECK AND ERIN WARSHAW MD, MS, UNIVERSITY OF MINNESOTA MEDICAL SCHOOL, UNIVERSITY OF MINNESOTA MEDICAL SCHOOL DEPARTMENT OF DERMATOLOGY, AND MINNEAPOLIS VETERANS AFFAIRS MEDICAL CENTER

Figure 1: Photo of a pink eczematous plaque overlying the patient's fistula site located on his left upper arm.

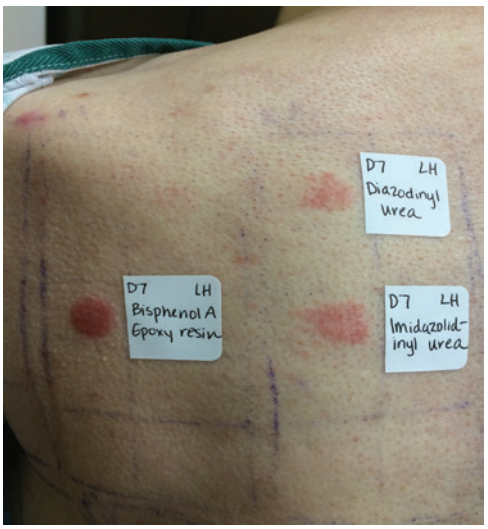

Figure 2: Photo of patch test results on Day 7 depicting a strong (2+) reaction to bisphenol A epoxy resin.

An elderly Caucasian male with hemodialysis-dependent end-stage renal disease since 2008 was referred to dermatology for a chronic eczematous dermatitis overlying his fistula site that was partially responsive to topical triamcinolone ointment 0.1% (Figure 1). Given the likelihood for allergic contact dermatitis (ACD), the patient was patch-tested for allergens using the North American Contact Dermatitis Group standard, auxiliary, corticosteroid and rubber series, as well as for substances (including chlorhexidine and betadine) in his personal care products, alcohol swabs, wound dressings and dialysis equipment. Positive reactions from the final reading are shown in the Table. The patient's reaction to bisphenol A epoxy resin was found to be clinically relevant (Figure 2). A literature search found other case reports of ACD caused by epoxy resins in hemodialysis patients. Authors confirmed that epoxy resins were used in the manufacture of select hemodialysis catheters, including the brand used by the patient (Medisystems—Seattle). A barrier was used to protect the skin until an alternative nonepoxy-containing catheter could be obtained (Togo Medikit—Tokyo).

Given that the patient did not have dermatitis on other parts of his body, clinical relevance for the remaining reactions was doubtful.

TABLE

Patch Test Results, Day 7

STRENGTH OF REACTION	ALLERGEN
Strong (2+)	bisphenol A epoxy resin imidazolidinyl urea
Mild (1+)	diazolidinyl urea
Doubtful (+/-)	ethylhexylglycerin diphenylguanidine

Discussion

Epoxy resin systems consist of epoxy monomers, which are cured with the addition of a hardener. The most common epoxy resin is derived from bisphenol A, which also happens to be the most common sensitizer.[1] Contact sensitization to other epoxy resins as well as the diluents, hardeners and accelerators used in epoxy resin systems have also been reported.[1,2] Most ACD caused by epoxy resins develops during the production of plastics. However, up to 25% of epoxy monomers remain unhardened after production and are capable of eliciting a contact allergy.[1]

Our patient developed an allergic reaction to epoxy, which was used to connect the needle to the plastic tubing in his hemodialysis catheter, despite the fact that the glue was "cured." We found four other case reports describing six patients who also developed an allergy to epoxy resins in hemodialysis catheters.[3-6] In all of these patients, the dermatitis resolved after either switching to a catheter that did not contain epoxy or avoiding direct skin contact with the component of the catheter containing the epoxy.

Interestingly, Haussmann et al. detected peripheral eosinophilia in both of their patients, which was later attributed to ACD after negative work-up for other causes.[5] The peripheral eosinophilia resolved in the patient who changed to a catheter that did not contain epoxy but persisted in the patient who implemented a barrier system. The authors hypothesized that direct allergen delivery through the bloodstream was responsible for this finding, although uncharacteristic for ACD. Retrospective analysis showed that our patient had eosinophilia since 2009 and that it has been improving since implementation of a barrier.

There are other case reports of epoxy allergy developing after using various medical devices including hearing aids,[7] ostomy bags[8] and cardiac pacemakers.[9] Our case and these highlight the importance of patch-testing for substances in such products. MM

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An Unexpected Cause of Gastrointestinal Symptoms after Initiation of HAART for HIV

BY LINNEA SMITH, MD, UNIVERSITY OF MINNESOTA INTERNAL MEDICINE-PEDIATRICS RESIDENCY PROGRAM

A 43-year-old female with HIV/AIDS (CD4 count 35 cells/mm^3) presented with one week of crampy abdominal pain and four days of melena. She was found to be anemic with hemoglobin 8.3 g/dL, down from 9.5 g/dL two months prior. She had restarted HAART medications one month before onset of symptoms after going without treatment for the previous five years. One month prior, her CD4 count was 35 cells/mm^3 and her HIV viral load was 296,878 copies/mL. In addition to HAART, she was started on azithromycin, TMP/SMX and acyclovir for opportunistic infection prophylaxis.

The patient underwent upper GI endoscopy, which showed normal esophagus and stomach but proximal duodenum with patchy whitish mucosa with diffuse flattening of villi. Biopsies were obtained. She then underwent colonoscopy, which found sessile polyps and granular mucosa in the distal transverse colon, all of which were biopsied. Pathology results from duodenum, transverse colon mucosa and polyps showed mucosal expansion by foamy macrophages laden with numerous acid-fast mycobacteria on AFB stain, consistent with *Mycobacterium avium* complex (MAC). The patient was started on clarithromycin, ethambutol and rifabutin, with plans for a prolonged course of at least one year. Her HAART medications were continued.

Discussion

This case illustrates the importance of considering MAC infection of the GI tract, along with other opportunistic infections in HIV-infected patients with low CD4 cell counts and GI symptoms or GI bleeding.[1,2] Diagnosis of MAC infection may require upper endoscopy and/or colonoscopy with multiple biopsies.[2] Microscopically, the tissue is filled with distended histiocytes packed with acid-fast organisms.[2] The macrophages are unable to lyse or digest the bacilli because of the CD4 T-cell immunodeficiency of HIV/AIDS.[1,3]

Disseminated MAC appears to result from primary acquisition of the pathogen, in contrast to tuberculosis in AIDS, which results from reactivation of previously contained infection. The patients at highest risk of disseminated MAC are those with CD4 counts <50 cells/mm,[3] with infections rare with CD4 >100 cells/mm.[3,4] In patients receiving HAART, the risk of developing MAC (and other opportunistic infections) is highest during the initial months of therapy, with low CD4 counts being the best predictor.[4] Since the introduction of HAART, MAC infections of the GI tract are rare except in patients who progress to advanced HIV/AIDS.[2]

First-line treatment for MAC consists of clarithromycin and ethambutol, with many clinicians adding rifabutin for associated decreased resistance and improved survival. Amikacin or streptomycin may be added for patients at high risk of death from MAC. Although the optimal duration of therapy remains unclear, IDSA guidelines suggest at least 12 months plus six months of immune reconstitution with HAART.[5,6] MM

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Pott Disease: When TB Thinks Outside the Lungs

BY ISTIAQ MIAN, MD, AND DAN PEASE, MD, HENNEPIN COUNTY MEDICAL CENTER, INTERNAL MEDICINE RESIDENCY PROGRAM

A 27-year-old Kenyan woman arrived in the United States and immediately presented to the emergency department with an eight-month history of progressive back pain, intermittent fever and bilateral leg weakness. She had undergone MRI imaging in Kenya and been diagnosed with Pott disease shortly after symptom onset. Despite completing six months of antitubercular therapy in Kenya, her weakness progressed to paraplegia. On presentation, she had 0/5 strength in her lower extremities bilaterally.

MRI imaging on the day of hospital admission revealed an extensive paraspinal abscess extending from T4 to T9, compressing the mediastinum, as well as multiple lytic lesions (Figure) from T3 to T9. Her thoracic spine was collapsed at T7 and T8, with spinal cord compression and kyphosis of 45 degrees. An interventional radiologist drained the abscess, which yielded immediate improvement in her lower extremity strength; she was able to passively flex and extend her legs. Thereafter, neurosurgeons performed a T8 laminectomy and T1 to T12 spinal fusion. With concern for resistant tuberculosis (TB), medical therapy was initiated (a six-drug regimen). Molecular testing of abscess fluid detected TB rRNA as sensitive to isoniazid and rifampin. The patient underwent two weeks of intense inpatient rehab and eventually regained the ability to ambulate on her own.

Figure: MRI showing extensive paraspinal abscess, severe spinal cord compression and associated kyphosis.

Discussion

This case demonstrates successful treatment of tuberculous spondylitis, also known as Pott disease. This is a rare manifestation, affecting only 2% of TB cases. Extrapulmonary TB of the spine typically spreads to the thoracic and upper lumbar area. Once two adjacent vertebrae are affected, infection can enter the intervertebral disc space, causing necrosis, vertebral collapse and kyphosis (the Gibbus deformity). The clinical presentation from symptom onset to diagnosis includes back pain and stiffness potentially progressing to neurologic compromise from spinal cord compression. Active pulmonary disease is not present in most cases, so a lack of pulmonary symptoms is not helpful in ruling out the diagnosis.[1]

The approach to medical treatment for Pott disease is similar to that for pulmonary TB. Although duration of treatment is still uncertain, at least six months of first-line agents is recommended. A longer treatment period of nine to 12 months should be considered if rifampin is contraindicated or if the patient has extensive disease.[1]

Although antimicrobial therapy is recommended for all patients, routine surgery for spinal tuberculosis is not. Currently, randomized controlled trials investigating indications for surgery are lacking; however, most experts agree that surgical intervention should be undertaken in the presence of neurological deficits, spinal instability, large paraspinal abscess or inadequate response to antimicrobial therapy.[2] MM

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Intracranial Hemorrhage Due to ANCA-Associated Isolated Cerebral Vasculitis

BY SHEIPHALI GANDHI, MD, AND PARASTOO FAZELI, MD, UNIVERSITY OF MINNESOTA, DEPARTMENT OF MEDICINE

Because of its rarity, cerebral vasculitis may seem like a medical zebra. Early diagnosis of this rare, but treatable, cause of neurologic symptoms improves chances of survival. For that reason, vasculitis should be included in the differential diagnosis for stroke patients presenting with evidence of systemic inflammation such as myalgias, joint pains or constitutional symptoms.[1]

Case

A 64-year-old healthy female presented with a three-hour history of right-sided hemiparesis. Three weeks prior to presentation, the patient had developed myalgias and difficulty controlling her left ankle. One week prior to admission, she had noted painless vision loss in her right eye.

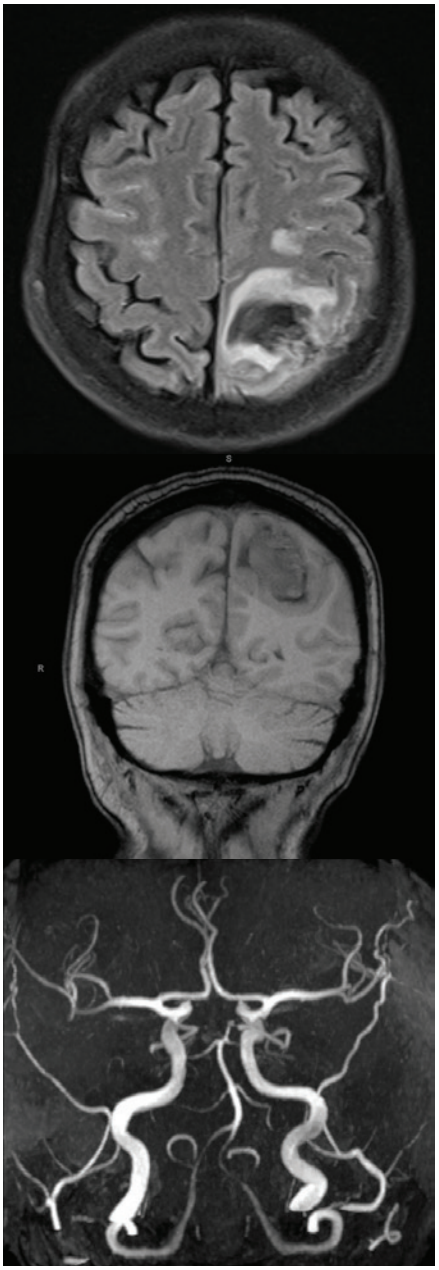
Pertinent physical exam findings included a right eye without pupillary reflex, left foot drop, right upper and lower extremity weakness, and right up-going Babinski reflex. The patient was noted to be lethargic and was becoming progressively more confused.

MRI showed a large left parietal parenchyma hemorrhage, a small hemorrhage in the left temporal subcortical area and a small basal ganglia infarct. Additionally, there was mild reactive meningeal enhancement. On presentation, she had leukocytosis at 31.7, and her c-reactive protein was 185.8 mg/L. Infectious work-up was negative. Rheumatologic work-up resulted in a very high titer for cANCA/PR3 with final diagnosis being granulomatosis with polyangiitis (formally known as Wegener's granulomatosis) with isolated cerebral vasculitis.

Once inflammatory markers and MRI findings were apparent, systemic corticosteroids were initiated. At discharge, the patient had recovered almost full function of her right arm and leg. Arrangements were made for outpatient rituximab infusions.

Discussion

The major symptoms of cerebral vasculitis are stroke, headache and encephalopathy. When evaluating a patient with a new neurologic deficit, the diagnosis is broad and includes embolic disease, coagulation disorders and degenerative vasopathies. Vasculitis should be included in the differential diagnosis for stroke patients presenting with evidence of systemic inflammation such as myalgias, joint pain or constitutional symptoms.[2]



Figures: Acute large left parietal parenchyma hemorrhage, small hemorrhage in the left temporal subcortical area, with mild-to-moderate severity PRES. Small acute left basal ganglia infarct and mild meningeal enhancement.

About 25% of patients with ANCA-associated vasculitis will develop nervous system involvement.[3] Their symptoms generally present in the form of peripheral or cranial mononeuropathies.[2] However, 2% to 8% of patients will have involvement of the brain or meninges, presenting with infarctions or seizures.[3]

For the past 40 years, cyclophosphamide has been used to successfully treat ANCA-positive vasculitis. However, recent work suggests rituximab may be superior in preventing disease relapse. In a recent randomized control trial, induction therapy with one month of weekly rituximab was not inferior to six months of daily cyclophosphamide. Furthermore, rituximab is better tolerated.[2,4]

This case demonstrates the importance of fully reviewing systems in patients presenting with common disorders such as a stroke. Early diagnosis is vital in these cases because ANCA-associated vasculitis is highly treatable. Remission can occur with current treatment strategies, improving both survival and neurologic outcomes. MM

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Online Pre-race Education Improves Test Scores for Volunteers at a Marathon

BY SHANE MAXWELL, DO, TRENT CHRISTENSEN, MD, LUKE WIDSTROM, DO, NIRUPA GALAGEDERA, BENJAMIN D. NELSON, MD, ROBBY SIKKA, MD, AND DAVID OLSON, MD, UNIVERSITY OF MINNESOTA/NORTH MEMORIAL FAMILY MEDICINE RESIDENCY PROGRAM, UNIVERSITY OF PENNSYLVANIA, ESSENTIA HEALTH, TRIA ORTHOPAEDIC CENTER

Physicians, nurses physician assistants, certified athletic trainers and physical therapists who volunteer to provide medical care for race participants during a marathon may be unfamiliar with the types of injuries and diseases they will encounter. Although pre-race lectures are offered, these may be poorly attended. This study examined whether an online course might be better received and lead to increased knowledge about the medical issues clinicians might encounter during a marathon.

Materials and Methods

IRB approval was obtained prior to initiation of this study. Health care professionals who had volunteered to provide medical coverage for an annual marathon were eligible to participate. A 17-question test regarding the most pertinent medical issues encountered during a marathon was created by the authors and administered before and after the online course. The course took approximately 20 to 30 minutes to complete.

Demographic information about the medical volunteers including their profession, specialty, education level and number of marathons they had participated in were collected. Questions about medical issues were categorized into five groups: general, heat illness, exertional hyponatremia, orthopedic and cardiac. Descriptive data were described by means and standard deviations. A student t-test was used for comparison between level of education, specialty, experience and each of the question categories when data were normally distributed. For data that were not normally distributed, a Mann-Whitney U test was performed. *P* value for significance was set at <0.05.

Results

Sixty-five subjects were included in the final analysis (volunteers who took the course and did both the pre- and post-test). The overall average score for the pre-test 10.33 (+/-2.95) and for the post-test was 12.63 (+/-3.67) ($p<.0001$). Participants who had never previously provided medical coverage during a marathon scored the lowest (8.86 +/-2.96) compared with those who had provided coverage before (in one to five races [11.91+/-2.25] and six to 10 [10.92 +/-1.65] [$p<.0001$]). Their scores even after taking the course were still lower by an average of 20% ($p=.03$) than those of the participants who had previously provided coverage. However, subjects who had never participated and those with less experience had an average improvement of 13% compared with those who had volunteered at more than 10 marathons ($p=.013$). The greatest improvement was noted in nurses and physician assistants (average 18%). Physicians had higher average pre-test scores than nurses and physician assistants by 1.5%. Their scores were lower than those of certified athletic trainers by 1%. Physicians showed the least improvement on the test scores (2.5%), and their scores on the post-test were lower than those of all the other groups by 11% ($p<.0001$). Primary care physicians who did not have sports medicine fellowship training scored lower than physicians from all other specialties on both the pre-test and the post-test (7% and 17%, respectively). The topics with the greatest improvement in scores were exertional hyponatremia and heat illness (average improvement of 50% for each topic).

Conclusion

Online pre-race education improved test scores for volunteers who provide medical coverage at marathons. Physicians who are not sports fellowship trained, those with less marathon coverage experience, and nonphysicians are most likely to see improvement in post-test scores. Exertional hyponatremia and heat illness were the subjects that yielded the greatest improvement in scores. Future studies should focus on identifying optimal times and strategies for pre-race education. MM

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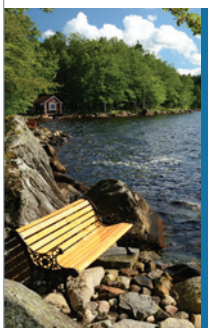

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Our true teachers

Paying tribute to those who touch us deeply.

BY KELSEY SCHUETTE

Sometimes, when no one else could hear us in the resident workroom, we called you "grandmother." Visiting you every morning was my favorite job. You would tell me that you didn't sleep well, sternly glaring at the machines and alarms that surrounded you, scolding them to be quiet in your most formidable librarian voice. You would tell me stories about being a librarian and complain that we had nothing good to read. When I went to the patient library and brought you Jane Austin, you recited the beginning of *Pride and Prejudice* to me by heart. You told me, over and over again, to send you home because you had too many things to do. You asked me every morning, in that same formidable voice, if we had finally figured out what was wrong with you. It was my job, every morning, to tell you "no."

I took my rotation exam the morning you transitioned to comfort care. I stupidly ran from my test to your room. When I got there, I was out of breath and didn't know what to say. I wasn't your family or your friend or your pastor. I was a medical student. I was the person who annoyingly woke you every morning, quizzed you and poked you, and memorized everything I could about you. Now I wondered, what significance did that hold?

So, I told you that I had talked to someone about your rent check being late because I knew you were worried. You had never been late for anything. I told you that we had finally listened and turned off all the alarms so you could sleep. And then, because you were sleeping, and working very hard to breathe, and I knew this was our last conversation, I thanked you for being a better teacher than all the books in the world.

You were the first patient of mine to die.

I am not an important character in your long and storied life, but you are in mine. When I went home that night after we said goodbye, I opened my dog-eared copy of *Pride and Prejudice* and slowly underlined the first sentence as your voice read it to me in my mind. *"It is a truth universally acknowledged, that a single man in possession of a good fortune, must be in want of a wife."* Please forgive me that sentimentality. MM

Kelsey Schuette is a fourth-year medical student at the University of Minnesota, pursuing a career in pediatrics. This is derived from a talk she gave on behalf of the Gold Humanism Honor Society at the medical school's white coat ceremony last fall.

Pain, Opioids and Addiction
LECTURE SERIES

The Minnesota Medical Association (MMA), the Steve Rummler Hope Foundation (SRHF), and the University of Minnesota Medical School began a collaboration to bring medical education on the topic of opioids to medical students, residents, and practicing doctors. The lectures are recorded live at the University of Minnesota Medical School and made available for CME on the MMA website, with underwriting by the SRHF. The hope of the series is to create a medical curriculum on pain, opioids, and addiction, as it should be in a medical school setting: balanced, practical, evidence-based information free of commercial bias.

Lectures:

VIDEO 1: "Opioid Addiction and Pain, A Quagmire for Healthcare Professionals"
Marvin D. Seppala, MD, Chief Medical Officer, Hazelden Betty Ford Foundation

VIDEO 2: "An Editorial on Pain"
Bret Haake, MD, MBA, HealthPartners Medical Group, Regions Hospital

VIDEO 3: "Pain Psychology, Mental Status Exam, and Non-Opioid Options for High Risk Patients"
Charles Reznikoff, MD, Division of Addiction Medicine, Hennepin County Medical Center, Assistant Professor of Medicine, University of Minnesota Medical School

Adeya Richmond, PhD, LP, Senior Clinical Psychologist, Psychology Department, Hennepin County Medical Center

Sebastian Ksionski, MD, Pain Program/CMC Director, Hennepin County Medical Center

VIDEO 4: "Pain Management in the Emergency Department"
James R. Miner, MD, FACEP, Chief of Emergency Medicine, Hennepin County Medical Center, Professor of Emergency Medicine, University of Minnesota Medical School

All lectures are free of cost.

CME Available: This activity has been planned and implemented in accordance with the Essential Areas and Policies of the Accreditation Council for Continuing Medical Education through the joint providership of the Minnesota Medical Association and The Steve Rummler Hope Foundation. The Minnesota Medical Association (MMA) is accredited by the Accreditation Council for Continuing Medical Education to provide continuing medical education for physicians.

The Minnesota Medical Association designates this enduring material for a maximum of *1 AMA PRA Category 1 Credit(s)™*. Physicians should claim only the credit commensurate with the extent of their participation in the activity.

For more information or to register:

mnmed.org/painseries

Minnesota Medical Association

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