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It's not just about
the MCAT

Minnesota's medical schools use a number of measures to find students who fit their missions—and who are likely to make excellent physicians.

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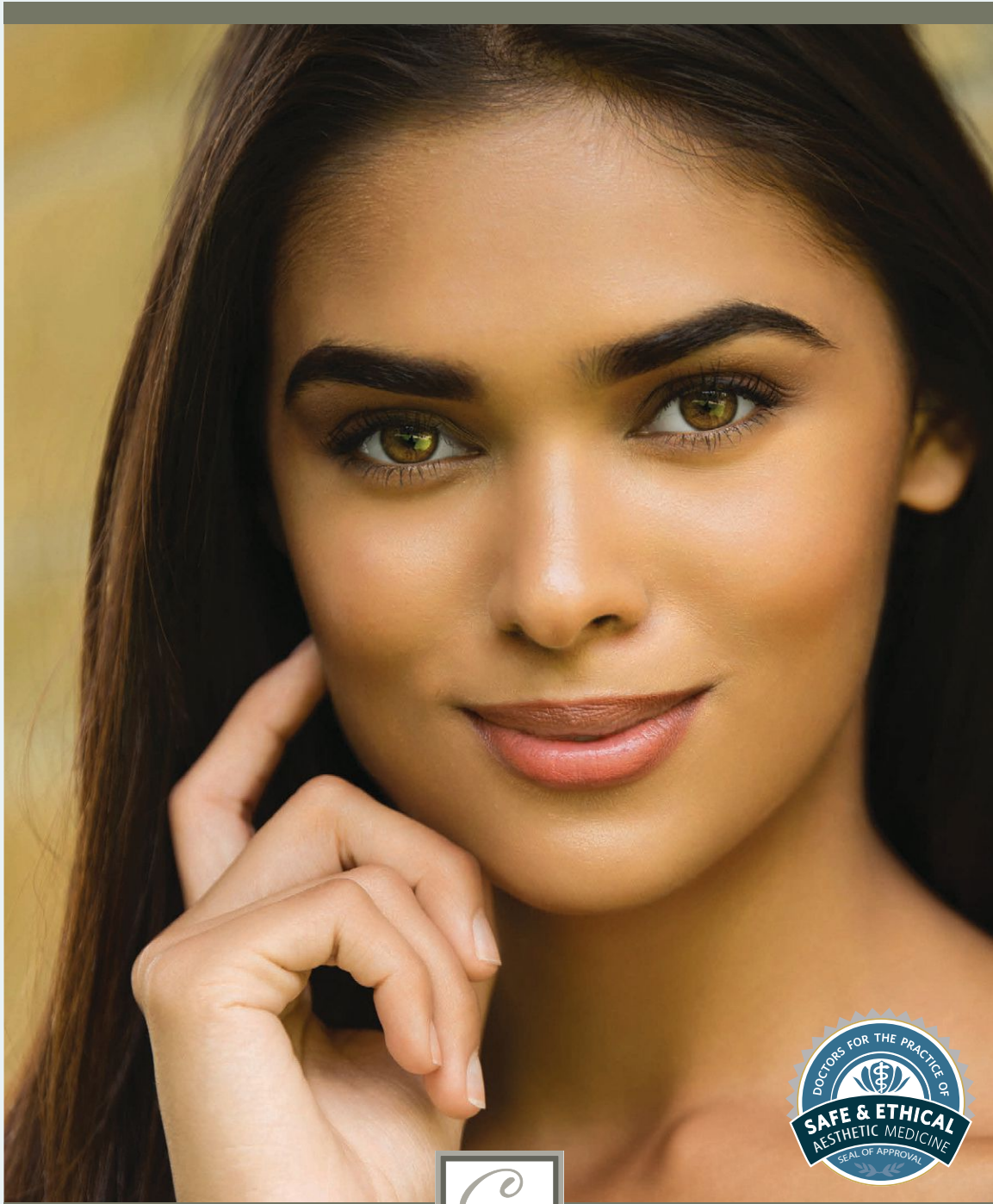
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Should an examination that doesn't represent our work be the basis of our professional certification?

The problem(s) with board exams

Medical board examinations profoundly impact our professional lives without necessarily adding discernable value.

Every occupational physician, like me, is tested on the facts that vanadium exposure can lead to a green tongue and that OSHA was (surprisingly) signed into law by President Richard Nixon. The former is exceedingly rare (I don't know anyone who has ever seen it) and the latter has no clinical application. Do these "pearls" of wisdom demonstrate acumen in my field?

Early in our careers, the USMLE Step 1 examination, which is not clinically relevant or correlative to clinical expertise, is used as the primary factor in selecting applicants for residency programs. Then come the specialty board certification examinations, which often do not reflect the complexities or commonalities of clinical practice.

These examinations require weeks upon weeks of study and thousands of dollars—and are unavoidable for licensure and if you want to demonstrate your expertise in specific clinical areas.

I'm not alone in having concerns over their value; there is a class-action lawsuit of more than 100,000 physicians against the management and control of certification from the American Board of Internal Medicine. (Full disclosure: I am not one of the physicians in the lawsuit.)

Both the format and content of these examinations seem inappropriate for measuring what matters. A multiple-choice question format, the most common form of medical certification testing, stifles the true spirit of clinical medicine, in which differential diagnoses are considered and a multifaceted plan is often implemented in order to narrow possible diagnoses to the most likely, based on actual findings.

Certification exam questions frequently fail to reflect the breadth of knowledge of clinical expertise or are too deep, present-

ing uncommon clinical conditions (the so-called "zebras") rarely encountered in clinical practice. Should an examination that doesn't represent our work be the basis of our professional certification?

Clinicians also dispute the high costs of these examinations. Large hospital system practices often include continuing medical education (CME) time as a benefit of employment, but this CME time is often limited and frequently used mostly or entirely to attend professional conferences, not for study, travel or sitting for examinations. Budgeted CME funding is also limited, except in those instances where an employer independently pays for certification examinations. The time spent and costs are amplified for physicians with multiple board certifications, who may already be paying for several professional memberships and conferences.

How do we fix this? First, we must work to increase the return-on-investment of certification examinations or to decrease the burden on individual clinicians. Personalized feedback from board examinations would create real value; currently, feedback is vague to avoid "giving away" proprietary test content.

Ultimately, clinicians must collectively decide how best to measure and communicate medical student or specialty competency and then advocate for certifying bodies that are serving their best interests.

Although I'm still a few years away from recertifying for my specialties, I'll continue entertaining at parties with my stories about the interesting history of OSHA. And the only green tongues I've seen so far are from candy ... but I'll keep looking. **MM**

Zeke J. McKinney, MD, MHI, MPH, is the chief medical editor of *Minnesota Medicine*.

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Deep in the reeds

BY CARMEN PEOTA

Mayo Clinic hand surgeon Allen Bishop, MD, has his twin brother to thank for the fact that he plays the oboe.

When the two were 11-year-olds choosing band instruments in their hometown of Milwaukee, Wis., Bishop's brother nabbed the flute. Their music teacher suggested that Allen try the oboe, explaining they sounded well together.

It wasn't long before Bishop was seriously studying the instrument, first with Milwaukee Symphony players and then, while a biology major at St. Olaf College in Northfield, with Rhadames Angelucci, former principal oboist for the Minnesota Orchestra. "It just turned out to be something that I had a talent for," he says. "And I loved the sound of the instrument and kind of kept it going all these years."

Actually, Bishop has more than "kind of kept it going." He has been a member of the Rochester Symphony since 1975. He



PHOTO BY NINA ALTMANN

Allen Bishop, MD, (second from right, middle row) plays the oboe both in the Rochester Symphony and in the World Doctors Orchestra.

assumed the principal oboe position in 1978, his first year at Mayo Medical School and has held it ever since. He also is a principal oboist for the World Doctors Orchestra, which performs benefit concerts for medical aid projects around the world. "I think I've reached a level of proficiency that allows me to play in an orchestral setting with a reasonable degree of success," he says humbly.

Playing with these orchestras is such a big part of Bishop's life that he lists his musical credentials—principal oboe, Roches-

ter Symphony and World Doctors Orchestra—next to his medical one—professor of orthopedic and neurosurgery, Mayo Clinic—at the top of his LinkedIn page. Further down the page, he calls oboe playing "My chief avocation!"

(And his twin brother, the kid who took the flute first? Today he is a pediatric gastroenterologist at the University of Iowa. "Nothing like identical genes," says Bishop.)

PHOTO BY CHRISTOPH MÜLLER



The World Doctors Orchestra, here playing in Berlin, performs benefit concerts for medical aid projects around the world.

Playing for joy

Although Bishop is a seriously good player and works hard at his instrument, he plays because he enjoys it. He practices several hours a week, typically at the end of the workday or on weekends. “I have to motivate myself if I’m too tired to go upstairs and do something musical,” he admits.

He spends as much (or more) time making reeds. It’s the aspect of being an oboist he finds most challenging. “It’s not that tough to play [the oboe],” he says. (Others might argue with that.) “The biggest problem is the reeds.” The oboe, along with the bassoon and English horn, is a double-reed instrument. Reeds consist of two pieces of cane cut or scraped a certain way and tied together. Get it wrong and you have squawks and hisses rather than a warm tone. “I have to really work at it,” Bishop says, noting that about one in five turns out well. Even so, he might have an edge on other oboists, as the fine motor skills he’s developed performing microsurgery are useful for reed making. “It’s a little technical—just like the [surgical] work that I do.”

Preparation pays off when Bishop takes his seat in the middle of the orchestra and begins to play. “I just enjoy it,” he says, explaining that it allows him to express himself. He also enjoys the camaraderie that comes from making music with others. “I try to make every time I go to either rehearse or play with the orchestra be almost a celebration for me,” he says.

And although oboe parts are among the most exposed in orchestral music, Bishop rarely gets nervous. “That’s the joy of playing a woodwind in an orchestra,” he says. “You’re the only person on a part, and you can express things and shine and play the solo parts,” he says. “After going to the surgery, invading people’s bodies with knives, arthroscopes, and the like, for me a musical performance is not at all daunting.”

Playing for good

A few years ago, Bishop’s musical career took a new turn. A colleague at Mayo Clinic, neurologist and cello player Shelby Cross, MD, told him about the World Doctors Orchestra. Bishop played his first concert with the orchestra in Yerevan, Armenia, in 2010. Since then, he’s been a regular, playing concerts one to two times a year. Most recently, he played with the orchestra in Cracow, Poland.

The World Doctors Orchestra was founded in 2008 by Stefan Willich, a German cardiologist and conductor, the idea being to bring physician-musicians from different countries together two to three times a year to perform music and raise money for various health care-related causes. The players cover their own expenses and pay a fee to cover some of the event’s expenses, such as the venue rental. All profits from ticket sales go to the charity.

Musicians get their parts in advance and are expected to know them by the time they arrive in the country where

they’re playing the concert. They generally arrive a few days in advance so they can practice together. “We need that time to gel and play as an ensemble,” Bishop says. Rehearsals are conducted in English, although players come from many parts of the world.

Most of the time, Bishop stays a few extra days in order to give a talk at a local medical school or hospital. At those, he shares about his research on bone and joint transplantation or his clinical expertise, for example, in repairing injuries to the brachial plexus. He also describes how Mayo Clinic specialists collaborate. Through these talks, he’s recruited fellows to Mayo and formed a network of colleagues around the world.

Musically, the World Doctors Orchestra has provided Bishop an opportunity to play the grand pieces, such as Mahler symphonies, that he otherwise wouldn’t get to play with the smaller Rochester Symphony. And it has offered him a chance to meet people who are doing what he’s always done—mixing music and medicine. “We are all musician-nerdy people who ... share the love of music and the commitment to providing the best possible health care that we can,” he says. “And to further that mission through the orchestra—that is something everyone is proud to be part of.” **MM**

Carmen Peota is a Twin Cities freelance writer and editor.

Idea to marketable device

BY LINDA PICONE

It's hard to be a good inventor, it's hard to be a good engineer and it's hard to be a good surgeon, says Alan W. Johnson, MD, MS.

But Johnson has managed to be—and to continue being—all three. He gives no small credit for that to the Innovation Fellowship Program at the University of Minnesota. “Really, the groundwork for everything was laid during the Innovation Fellowship,” he says.

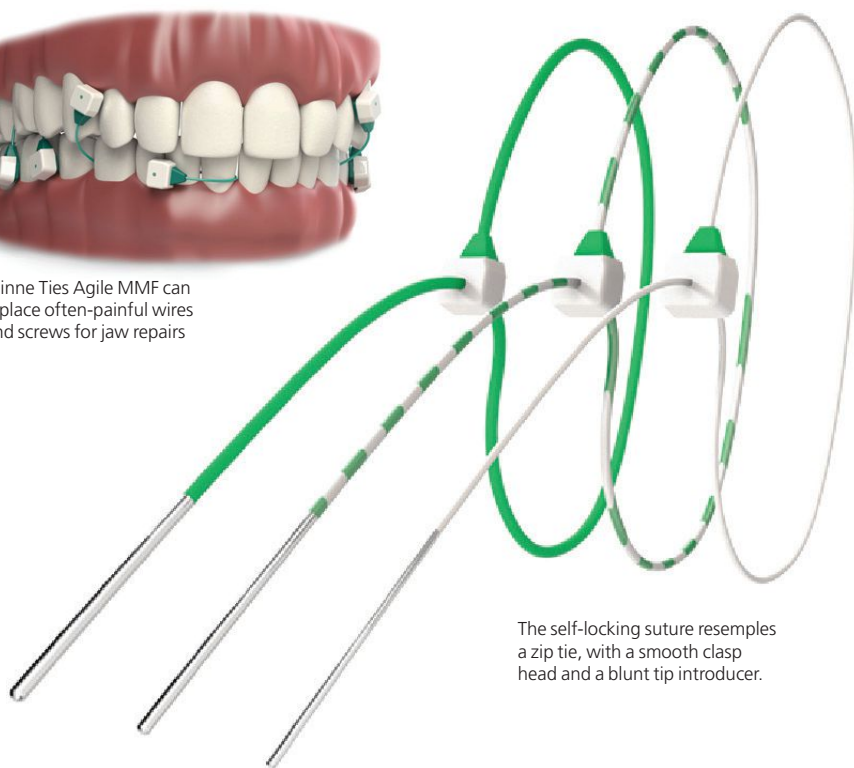
Johnson was a chemical engineering major at Northwestern University and, through the university's cooperative engineering program, he worked at Procter & Gamble's Health Care Research Center and assisted in consumer medical product development. Even while training as an engineer, Johnson says, he was thinking about ways to take that background into medicine.

He went to the University of Minnesota Medical School, earning not only his medical degree but also a master's in otolaryngology. He did his residency in head and neck surgery at the University, and then looked for a way to synthesize the medicine and the engineering and his entrepreneurial spirit in a formal program: The Innovation Fellowship.

“It's a one-year program that didn't exist when I started medical school,” Johnson says. “But I knew that Stanford had one and I was looking for opportunities. When



Minne Ties Agile MMF can replace often-painful wires and screws for jaw repairs



The self-locking suture resembles a zip tie, with a smooth clasp head and a blunt tip introducer.

the program started at Minnesota, I was excited—and I was able to get into the fifth-year class. You get to be paid to dream and create.”

The Innovation Fellows Program, part of the Earl E. Bakken Medical Devices Center, was started with four fellows in 2008-2009 to offer a more structured approach to designing medical devices, says Joseph Hale, PhD, director of the Fellows Program. Hale was himself a member of the first class of fellows.

Today, between four and eight fellows are chosen each year from roughly 60 applicants, Hale says.



Alan W. Johnson, MD, MS, got the time and support he needed to develop Minne Ties during his year in the Innovation Fellowship Program at the University of Minnesota.

“We are looking for people who are entrepreneurs, with a creative, innovative spirit.” Although a medical degree or doctorate is preferred, some fellows have had bachelor's degrees—with experience in the medical device industry. The goal is to put together a group of people with diverse backgrounds who will stimulate and support each other. At least one of the fellows will be a physician but fellows have included attorneys, a veterinarian, even someone with experience in fashion design. “We are very intentional about creating diverse teams,” Hale says. “That's

where the fun and creativity come in.” Although a product may be developed by one fellow, the interaction and support of the group is important throughout the process.

Physicians who apply tend to be in the early stages of their career, Hale says. The relatively modest stipend for fellows is similar to that of any post-doctoral fellowship, which means it can be difficult for an established physician to give up a practice, even for a year, for a reduced income.

Since its beginning in 2008, the fellowship has resulted in more than 100 patent applications, at least nine patents issued, at least nine start-up companies created and 26 products that were licensed, optioned and/or donated.

The patents for products developed through the fellowship are held by the University of Minnesota. If successfully marketed, the company that develops the product would pay royalties to the University; the University gets a third of that compensation, the department gets a third and the inventor(s) get a third.

Minne Ties

A zip tie for fractured jaws was one of Johnson’s first ideas when he started his fellowship in 2013 and he kept coming back to it as he tried out others and worked with the other fellows in the group. “It’s simple enough to be manufactured, and the other technology out there isn’t that good,” he says. Once he had the idea, he spent most of his fellowship time and almost all his free time trying to figure out how to prototype the idea of zip ties, how to make them in the lab, “how to put them on cadavers and test dimensions.”

By the end of the fellowship year, he had the devices refined enough to try them on himself: “I spent all my Saturdays making these things, deburring them, using zip ties I bought at Home Depot. I used cuticle scissors to deburr them so I wouldn’t tear up my own gums.

“I went into the call room on campus and sat in front of mirror and put them on. And they worked.”

The next year, 2014, Johnson pitched the product to potential partners. He talked with venture capitalists in Silicon Valley. And he pitched it to Summit Medical in St. Paul. “Summit was gracious enough and ambitious enough to take on the project,” he says. “Since then, I’ve been able to work closely with them. They did some excellent work.”

The product, Minne Ties Agile MMF, got FDA approval in April 2017 and has been marketed not just in the United States but also in Europe and Canada. It was awarded a silver award in the 2018 Annual Medical Design Excellence Awards, an awards program for the med-tech industry.

Minne Ties resemble typical zip ties, with a smooth clasp head on one end and a stainless steel blunt tip introducer on the other. The self-locking ties are applied through the interdental space to provide a secure bite. The benefits include:

- No sharp wires or screws.
- The self-locking sutures allow for quick and easy procedures in either a surgical or non-surgical setting.
- Each Minne Ties suture takes less space in the mouth than standard wires and screws, so there’s better access for the physician.
- The blunt introducer is trimmed after the Minne Ties suture has been done, leaving only the smooth clasp head; the patient is more comfortable.

“A way to think of this is that surgeons doing facial trauma are craftsmen with a toolbox,” says Johnson. “We’ve had the hammers, the drills, the wires, but never anything like a zip tie. They come in really handy for a lot of reasons.”

Minne Ties are definitely in Johnson’s toolbox: He is an otolaryngologist, more commonly known as an ear, nose and throat surgeon, at Altru Health System in Grand Forks, North Dakota, his home town. “It’s fun for me to be able to use these things clinically for my own patients,” he says. “I have one patient I used them on recently and they’re holding his occlusion in perfect position.”

Hale says Minne Ties are not the only successful product to come out of the fellowship, but Johnson’s success was unusual because he was able to develop the concept and license it shortly after the year of the fellowship. Another successful product developed through the fellowship is the cell phone app Soundly, developed by Brian Krohn. The app is essentially “pushups for the tongue,” Hale says, to help strengthen upper airway muscles and reduce snoring. Like Minne Ties, Soundly is generating revenue now. “But 90 percent of medical product concepts never end up being commercially successful.”

What’s next

“I’m still enjoying being a practicing surgeon,” Johnson says. “Looking forward, this project is probably at the end of what I can contribute to, although I’d like to help train people in it.”

“The next step is to try to run the gauntlet again, with a new invention,” he says. “But this is such a consuming process that if you try to do more than one at a time, you’re unlikely to put the time in that it needs.”

It’s not as if he has a lot of time on his hands right now; besides his surgical practice, Johnson and his wife have three young sons and the two of them train for and run triathlons, most recently in the half-Ironman world championships in South Africa. “Every minute of the day is spoken for,” he says.

Because inventing and then marketing a medical device takes enormous time, Johnson says. “Expect that if you’re going to pursue this, it’s going to take a half decade and lots of your time and energy to get consensus from all the stakeholders involved, from insurance companies, from a company that might license and develop it, from attorneys ... and most important, from patients.

“Innovation isn’t about wonderful ideas that no one else has thought of; it’s really about consensus building.” **MM**

Linda Picone is editor of *Minnesota Medicine*

From fellow to attending physician

BY PRABHJOT S. NIJJAR, MD

It doesn't matter whether you are transitioning to a private or an academic practice; you face a quantum leap in responsibilities and an entirely new job description.

Much has been written about this vulnerable period, with many specialties taking steps to address the issues of transition. This period can be especially challenging when you transition from additional years of sub-specialty training or research beyond the typical three years of specialty/ fellowship training.

I completed an advanced cardiac imaging (ACI) fellowship that consisted solely of training in cardiovascular computed tomography (CCT) and cardiovascular magnetic resonance (CMR). My early job also involved echocardiography and seeing patients in the clinic, duties that would be considered common practice for a cardiac imager. I found those duties to be a much harder transition than those involving reading CCT and CMR. Even though I had spent nine months in my general cardiology fellowship training in echo and had the requisite board certification, I felt ill-prepared to tackle the complexities of diastology or to get the perfect left atrial appendage view on trans-esophageal echocardiogram (TEE). Clinic visits felt awkward, as

All the knowledge and procedural skills gained in my general fellowship training were still at a delicate stage.

Taking a break from those skills so early on, when you haven't developed adequate muscle and nerve memory, is perilous.

I had not had any direct patient contact over the previous year and it took a while to establish a comfortable rhythm. It made me realize that all the knowledge and procedural skills gained in my general fellowship training were still at a delicate stage. Taking a break from those skills so early on, when you haven't developed adequate muscle and nerve memory, is perilous. Contrast this with a senior clinician who goes on a sabbatical and may find it relatively easy to return to clinical duties because they had flexed those muscles for many years before the time away.

This, of course, is a relatively common scenario: an interventional or electrophysiology graduate may be expected to use clinical skills they trained in—but haven't practiced for one or two years. Similarly, those doing dedicated research training often have to take on clinical duties after a long hiatus. This transition can be especially abrupt with imaging fellowships. Accreditation Council for Graduate Medical Education (ACGME) accredited fellowships (adult congenital heart disease, advanced heart failure and transplant cardiology, clinical cardiac electrophysiology and interventional cardiology) have continuity clinic built in as a requirement. But since cardiac imaging fellowships are not ACGME-accredited, they don't have to follow the same rules. These fellowships tend to be more flexible in their structure. Most training sites have multi-modality imaging available (some combination of echo, structural TEE, CCT, CMR and nuclear, including Positron Emission Tomography) and trainees have a lot of freedom to design their fellowships to meet their interests. Of the 55 clinical imaging fellowships listed on the ACC Advanced Imaging Training Program Database, 39 offer multi-modality training and 17 explicitly endorse flexibility in design. Many ACI trainees use this flexibility to focus on and master a specific imaging modality, often neglecting other essential imaging modalities. There is an urgent need to address this gap in practice of clinical skills for early career (EC) cardiologists.

Steps to avoid losing touch with clinical skills

- **Echocardiography/nuclear cardiology reading embedded in advanced training:** Many advanced imaging fellowship programs have echo/nuclear training as part of a multi-modality platform, but a significant number of imaging fellowships focus exclusively on CT or MRI or both. This is understandable; a trainee may wish to gain deep expertise in a specific modality. One option is to have the trainee read echo/nuclear one half or full day a week. Many applicants going into an imaging program will have the requisite training for echocardiography/nuclear cardiology and can get hospital credentials for independent reading. Board certification in the required modality can be helpful to document competency. This serves the additional purpose of paying for a portion of the trainee's salary.
- **Direct patient care:** Most sub-specialty fellowship trainees are board-eligible general cardiologists and can provide independent patient care. This can be set up as occasional weekend rounding on the in-patient general cardiology service so it doesn't interfere with fellowship training that takes place during weekdays. Since cardiac imaging fellowships are not

ACGME-accredited, specific ACGME duty-hour restrictions don't apply. However, imaging programs should strive to follow best practices and adhere to duty-hour restrictions so as not to impact patient care. If weekend work is available, trainees can pro-actively apply for state medical licensure and hospital credentials—these processes are both slow and can take many months. Direct patient care also serves the additional purpose of paying for a portion of the trainee's salary.

- **Moonlighting:** Many of us have practiced moonlighting at some point to supplement our relatively meager trainee salaries. Many cardiology practices offer opportunities for senior cardiology trainees to do weekend rounds. Duty-hour restrictions should be adhered to by trainees. Moonlighting can be especially beneficial to those involved in dedicated research, with limited options for clinical care.
- **CME courses:** Modality-specific societies conduct regular review courses that are very popular. These can be timed to provide a refresher in the desired modality before starting a job.
- **Mentored transition:** Mentorship is critical during training and it remains critical during the early career period as well. It is common practice to be assigned a research mentor on starting an academic job. It is equally important to have a clinical mentor in your field. On starting my first job, my echo lab director scheduled me to work in the echo lab on the same days he worked there. Having mentored many EC cardiologists over decades, he honed his skills at providing help in a way

that boosts confidence. I knew that if I struggled during a TEE with intubation or a particular view, help was close by. With this nurturing, my confidence grew quickly and I was ready to operate independently soon.

- **Gradual transition:** Practices should be mindful of the early career cardiologist's recent training history. Skills that have not been recently used can be put to use gradually. For example, clinic/inpatient duties can be postponed or kept light until the physician's lab skills are up to speed. The first few months are the most crucial, so it should not be a big burden on the practice's master schedule. Allowing a new cardiologist to gradually acclimatize can be a rewarding long-term investment. **MM**

Prabhjot S Nijjar, MD, is an assistant professor and cardiology specialist at the University of Minnesota Medical School

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University of Minnesota medical students Ally Fuher and Zac Novaczyk examine models of the heart in the Visible Heart Lab on the Twin Cities campus.

PHOTO BY RICH RYAN PHOTOGRAPHY

Minnesota's medical schools use a number of measures to find students who fit their missions—and who are likely to make excellent physicians.

*It's not
just
about
the
MCAT*

Today's first-year medical students tend to be different than medical students of previous generations. They're more female, less white, older and with more varied experiences than was once the case.

Once, medical schools relied almost exclusively on academic success to sort applicants. Today, the task is more complex as they look for students who show that they can not only succeed academically but also relate to patients—and maybe make a difference in the way and the places where medicine is practiced.

The three medical schools in Minnesota use somewhat different methods to determine which applicants to admit, and their student bodies reflect missions that are unique to each school. University of Minnesota Medical School-Duluth, for example, is a leader in training physicians who will work in Native American communities. Mayo Clinic Alix School of Medicine, with a relatively small student body in Rochester, measures factors that may include socioeconomic disadvantage, military service and/or unusual paths into medicine. University of Minnesota Medical School-Twin Cities, with the largest student body, looks for future physicians who will maintain the high quality of health care in Minnesota.

Choosing medical students for admission to the University of Minnesota is a multi-step process

BY DIMPLE PATEL, MS;
JACQUELINE L. GAUER, MA;
AND CLAUDIO VIOLATO, PHD

Modern admissions procedures feature varied tools and techniques for evaluating applicants to medical school. The evaluation processes are designed to select the candidates from a large pool of applicants who will be successful students and the best possible doctors. The University of Minnesota Medical School Twin Cities (UMN TC) MD program is continuously reviewing and revising its admissions process to reflect the evolving needs of Minnesota's physician workforce, and to implement innovative state-of-the-art methods for selecting prospective medical students.

Historically, this was not always the case. The American medical schools of the past typically focused narrowly on applicants' academic profile components, such as grade point average (GPA) and scores on the Medical College Admission Test (MCAT), as the primary criteria for admission. This made it relatively easy to reduce the large numbers of applications schools receive to manageable numbers for later stages of the selection process, which is likely to include interviews, biographical information, information about personal and professional pursuits

like volunteerism and research and statements of interest.

But in recent decades, concerns have grown that this general process may not be achieving its intended goal of selecting the best potential doctors. The preliminary criteria (academic achievement, MCAT scores) are important, but they may overemphasize candidates' ability to score high on exams and deemphasize other characteristics important to physician success, such as the ability to communicate effectively with patients or to work in an integrated healthcare team. Many believe that it is time for American medical schools to shift their views on what constitutes good candidates from an overemphasis on academic characteristics to other important key personal characteristics.

Is it possible, however, to identify admissions characteristics such as predisposition for direct clinical care, motivation to work in underserved regions or with underserved populations, or ethical and moral reasoning capabilities? The UMN TC MD program is continuously considering such questions and exploring modern admissions methods to address these needs.

Twin Cities admissions committee review process

The MD admissions process at UMN TC consists of nine steps. Applicants begin by completing a national common application through the American Medical College Application Service (AMCAS), followed by a UMN TC MD program-specific supplemental application. Once complete, this application is reviewed by two or three members of the admissions committee to determine whether the applicant should receive an interview. When the interview is complete, the application file, including the interview scores, is returned to the Admissions Committee for a final review and vote. Ultimately, candidates for acceptance are reviewed one final time for approval by the Admissions Executive Committee before an acceptance offer is issued.

Holistic review process

Like many medical schools, the UMN TC MD program employs a holistic review process: "flexible, individualized way for schools to consider an applicant's capabilities, providing balanced consideration to experiences, attributes, and academic metrics. These factors are considered in combination with how the individual might contribute value not only as a medical student, but as a physician, as well." (<https://www.aamc.org/initiatives/holisticreview/>).

For every application cycle, the UMN TC MD program receives more than 4,000 applications, and conducts holistic review for applications that meet a minimum MCAT threshold. Selection criteria beyond the MCAT and grade point average (GPA) are set based on an individual school's mission and priorities. For the UMN TC MD program, those additional criteria primarily include contributions to diversity, human service, medically related experience and research experience.

In 2013, the Association of American Medical Colleges (AAMC) conducted a survey of medical school admissions officers, asking them to weight the importance of various application factors utilized in the decision-making process. Within the academic domain, the MCAT, cumulative grade point average, trends in academic performance and post-baccalaureate performance were all rated as important or very important. Within the domain of experiences, admissions officers rated health care experience, community service, experience with underserved populations, demonstration of cultural awareness and leadership activities as important or very important. Public medical school admissions officers rated U.S. citizenship and state of residency as important or very important; for private schools, these two attributes were rated as medium and lowest importance respectively. Both public and private medical schools rated first-generation college status, race/ethnicity and socioeconomic status as of medium importance.

In 2017, a similar survey was conducted with the UMN TC MD Admissions Committee. Overall, the admissions committee gives almost equal weight to an applicant's experiences, attributes and metrics. When considering an applicant for an interview, MCAT score and medically related community service are given the strongest weight, followed by the applicant's demonstration of cultural awareness, GPA and non-medical community service. The committee also places weight on an applicant's state of legal residency, giving MN residents preference. Other important factors include an applicant's responses to ad-

STEP 1

Candidate completes and submits common application through AMCAS.

STEP 2

Initial screen of application. Candidate offered UMN TC supplemental application.

STEP 3

Candidate completes and submits supplemental application.

STEP 4

First review by 20-3 committee members to determine whether candidate receives an interview.

STEP 5

Candidate participates in multiple mini interview (MMI) program on campus.

STEP 6

Candidate's complete file, including MMI rating, reviewed by three committee members.

STEP 7

Committee vote

STEP 8

Final decision of accept, waitlist or deny

STEP 9

Final application review and decision approved by Admissions Executive Committee (AEC).

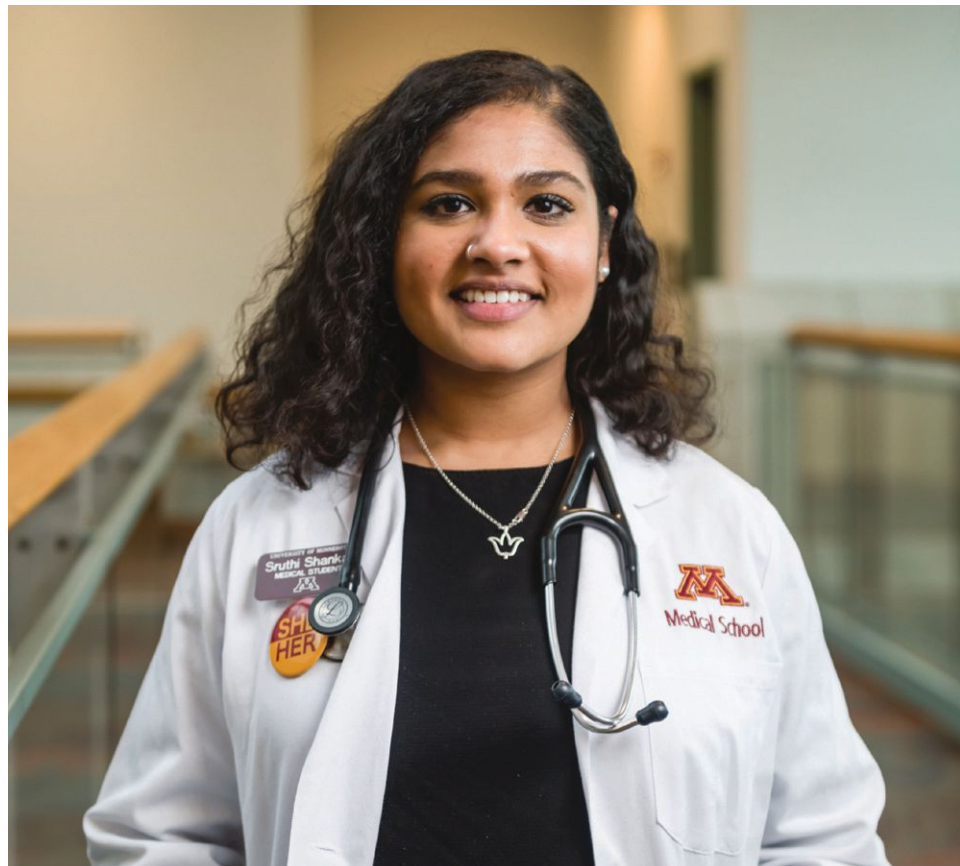


PHOTO BY RICH RYAN PHOTOGRAPHY

MEDICAL STUDENT PROFILE

SRUTHI SHANKAR

*FIRST-YEAR STUDENT AT UNIVERSITY OF MINNESOTA
MEDICAL STUDENT-TWIN CITIES CAMPUS*

From a very young age, Sruthi Shankar knew she wanted to be a doctor. When her family moved from India to Singapore without any other family nearby, their physicians provided support and medical care during impactful moments of their lives. Shankar spent middle school and high school in St. Cloud, where she earned a bachelor's degree in biomedical science and biochemistry from St. Cloud State University.

What drew you to medicine?

My maternal grandmother was passing away from breast cancer while my mother was having my sister. Her OB/GYN was someone who really was there for her and helped her through that. She still talks about that experience to this day. I also had an amazing pediatrician in Singapore. I just remember his presence and warmth. And I was always really drawn to science. There were many times when I tried to do other things that weren't medicine, but then I would know it wasn't for me.

What was appealing about the University of Minnesota?

Science is science, so medical schools distinguish themselves through the programs and avenues students can take. University of Minnesota has the rural medicine program and the metro program, where you do rotations in urban areas, and a lot of strong support for student success.

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ditional application questions that focus on contributions to diversity, overcoming challenges and demonstrating resilience. Post-interview, the Admissions Committee weights the interview performance and score the strongest, followed by

MCAT and medically related community service. Other factors (e.g., cultural awareness, non-medical community service and research) are also considered in the context of holistic review.

The new MCAT

The MCAT has a long history of use as one component of the application process at the majority of U.S. and Canadian medical schools, but it has evolved over those 90 years. Since the MCAT was first developed, it has undergone five major revisions, with the sixth and current version (the “New MCAT”) launching in 2015. Prior to this, the MCAT had been last updated in 1991. The subsections of the New MCAT include Biological and Biochemical Foundations of Living Systems (BBFL), Chemical and Physical Foundations of Biological Systems (CPBS), Psychological, Social and Biological Foundations of Behavior (PSBB) and Critical Analysis and Reasoning Skills (CARS).

The New MCAT reflects changes across premedical and medical education, and the increasing diversity of patient populations and health care delivery. Like the old MCAT, the New MCAT is designed to test basic science competencies, reasoning and critical thinking skills, but it also includes a new section testing sociocultural and behavioral concepts that influence patient outcomes. The New MCAT also serves as a tool to influence the cur-

PHOTO BY RICH RYAN PHOTOGRAPHY



Med student Ally Fuher in the Visible Heart Lab at the University of Minnesota.

TABLE 1 Multiple Mini Interview stations utilized by the University of Minnesota Medical School Twin Cities MD program for the Admissions Cycle 2018.

STATION	FACTORS MEASURED	2018 MEAN (1-10)	2018 STANDARD DEVIATION
1	Teamwork; Problem Solving; Communication Skills	7.37	1.78
2	Self-Awareness; Management Skill	7.32	1.70
3	Communication Skills; Ethical and Moral Judgment; Responsibility	7.46	1.83
4	Teamwork; Self-Awareness; Ethical and Moral Judgment; Responsibility	7.15	1.93
5	Communication Skills; Ethical and Moral Judgment; Responsibility	7.53	1.70
6	Self-Awareness; Problem Solving; Ethical and Moral Judgment; Responsibility	7.38	1.73
7	Responsibility; Ethical and Moral Judgment; Self-Awareness	7.61	1.70
8	Teamwork; Problem Solving; Communication Skills	7.49	1.61

ricular and co-curricular experiences of premedical students.

The early MCAT exams (1920s–1960s) focused on memory and scientific vocabulary. Later versions also tested scientific problem-solving and then concepts in the behavioral and social sciences. The New MCAT shifts the focus from testing what students know to testing how well they use what they know. The New MCAT represents an attempt to assess the highest levels of problem-solving and scientific thinking.

Multiple Mini Interviews (MMI)

The UMN TC MD program has implemented new admissions methods assessing communication skills, cultural awareness and teamwork. U.S. and Canadian medical schools have increasingly adopted the multiple mini-interviews (MMI) method, in which applicants work through a series of brief, semi-structured stations and are assessed by trained raters. As the use of the MMI has expanded, research evidence indicates that the MMI has adequate reliability and evidence of validity as a medical school selection criterion. Researchers have generally found that the MMI demonstrates good job relatedness and acceptability, particularly among candidates. The evidence also indicates that MMI scores are not biased by gender, socioeconomic status, race or other characteristics.

Beginning with the admissions cycle for the matriculating class of 2017, the UMN TC MD program implemented this new format for interviewing applicants. Previously, the UMN TC MD program had followed a traditional interview model, conducting two hour-long interviews for each candidate. In the new MMI model, applicants rotate through a circuit of eight seven-minute stations, each designed to measure certain important factors that are theoretically determined to be valuable for success in medical school and as a physician.

The stations used by the UMN TC MD program were developed by a company called ProFitHR. They were selected through an iterative process and evalu-

SRUTHI SHANKAR *(continued from page 15)*

Were there other factors?

It was important to me that the school articulated its commitment to provide good health care to people of all kinds, despite their socio-economic, racial and gender background, and to provide an education to those students. Not a lot of schools do that. It might be in their mission statement, but they don't always have programs to help students be successful physicians. Minnesota's secondary application asks how we will increase and promote diversity and inclusion in medical school and outside of school as physicians. It was a pretty direct example of how they were recruiting students who are committed to that mission.

How did your application process go?

I wasn't going to apply to the U because I was dealing with a crisis in the middle of applying to medical school. I'm technically an international student, and I wasn't sure how that was going to be viewed. My family hadn't finished the process of becoming permanent residents by the time I was 21. Because I am now a legal adult, I needed to go back to Singapore in the middle of my last semester at St. Cloud State to get a student visa. When I applied, I explained the whole situation to the University by email—that I grew up in Minnesota and had strong ties to the state.

[Associate Dean of Admissions] Dimple Patel took the time to get back to me and explained that as long as I got my visa situation sorted out, they would consider my application. It was very encouraging. Eventually I interviewed here and got in, and they called to tell me. They gave me an acceptance letter from the U that showed I had a reason to go back to Minnesota. I found it to be such a positive atmosphere. It was really amazing, and it pointed to the fact that they are looking for any and all resources to support students.

What did you think of the interview process?

Lots of schools are doing the MMI (multiple mini-interview) format now, but I really enjoyed the format the U has. It does a much better job with the stations, having different scenarios where you're interacting with the physicians or answering questions. I enjoyed it compared to a traditional hour-long interview, which can feel very repetitive to the applicant. We did have a 30-minute interview with a faculty member who had never seen our file, so I got to showcase my talents in other ways. It was a more holistic approach.

Were there other things that attracted you to University of Minnesota, Twin Cities?

It's a huge research institution and I like being able to access different research opportunities, whether it's clinical or basic science. You can tailor your medical education to how you want it and experience so many different settings. There are also a lot of dual degree programs like MD/PhD or MD/MBA, and the flexibility to take time off to do that, or to get married and have kids.

Any thoughts on the direction of your medical career?

I find all aspects of health care to be really intriguing. I really like procedures and I think surgery is a strong possibility. I'm interested in rural, or a setting like St. Cloud where you practice rurally but can come back to the hospital setting. I'm really interested in research, health care inequities and the laws and ethics regarding health care, so I'm thinking about how to fit in all of those interests. There is a lot of opportunity, to the point where it can be overwhelming. But it shows how diverse a career in medicine can be.



PHOTO BY MATTHEW DENNEY

MEDICAL STUDENT PROFILE

WHITNEY LLOYD

FIRST-YEAR STUDENT AT UNIVERSITY OF MINNESOTA
MEDICAL SCHOOL, DULUTH CAMPUS

Whitney Lloyd returned to her small-town roots by opting for University of Minnesota Medical School's more intimate Duluth campus. A native of Stewartville, near Rochester, Lloyd majored in biochemistry at the University of St. Thomas, where she was an All-America volleyball player. Though she was interested in engineering and other STEM fields, Lloyd decided to follow her parents into medicine to use science to help people.

What interested you in the University of Minnesota Medical School in Duluth?

I'm Native American and I appreciate the emphasis on that, as well as the focus on rural medicine. I was really excited to learn more about medicine and Native Americans and some of the health disparities, and how I could maybe help with that. That appealed to me. When I came up here, it was a really tight-knit commu-

(continued on next page)

ated by 80 faculty members and physicians via a validation survey. For Cycle 2017, a final battery of seven stations was selected based on that feedback (an eighth station was added beginning with Cycle 2018). For each station, the rater determines a rating of the candidate's performance on a scale from 1 = below average to 10 = above average. The factors measured by each station, along with that station's mean and standard deviation scores for Cycle 2018, can be found in Table 1.

Although the MMI model is more complicated logistically than the traditional model (each interview season involves the coordination of more than 100 volunteer staff, faculty and student raters), the evidence supports the use of the MMI in order to provide a well-rounded view of the applicants. Additionally, the increased volume of raters evaluating each candidate decreases the likelihood of the bias of one rater having a disproportionate effect on an applicant's chances of admission. Statistically, the scores from the MMI are normally distributed compared to those from the traditional interview method, which are highly skewed. Finally, the MMI provides a wider range and greater standard deviation than traditional interview scores. In the traditional model, most applicants' scores were clustered towards the top of the range, making it very difficult to distinguish between average and outstanding candidates.

Table 1. Multiple Mini Interview stations utilized by the University of Minnesota Medical School Twin Cities MD program for the Admissions Cycle 2018.

The MMI model has been very well received overall by the Admissions Committee, interview raters and applicants. In Cycle 2017, 66 percent of all interviewed applicants completed a post-interview day evaluation of their interview day experience. Of those, 30.2 percent found their interview experience for the UMN TC MD program to be more favorable than their experience interviewing at other medical schools; 39.7 percent found their experience to be just as

favorable as other schools, and only 7.0 percent found their experience to be less favorable than other schools (23.2 percent indicated that this question did not apply to them, likely because UMN TC MD was the only program at which they interviewed).

Focus on diversity and inclusion

A total of 51,680 people applied to medical school in the United States in 2017, according to the AAMC. That year, 21,338 applicants matriculated to a medical school and, for the first time, the percentage of women was slightly higher than that of men: 50.7 percent. The UMN TC MD Program has seen a higher percentage of women in the matriculating class on and off since 2007. The 2017 matriculating class saw the highest percentage of women—60 percent—in recent years. Increasing the number of medical students from broadly diverse backgrounds is vital to meeting the Medical School's mission and serving an increasingly diverse patient population. The UMN TC campus has seen an increase in representational diversity since 2013 and continues to develop unique mechanisms to ensure the enrollment of students who demonstrate cultural awareness from personal lived experiences and intentionally secured professional experiences.

Characteristics of the classes of 2021 and 2022

The classes of 2021 and 2022 include 175 students each, with 167 of them MD students. The eight other students in each class are students in the UMN TC joint MD/PhD program. Minnesota residents make up 83 percent of each class, while nonresident students represent 10-15 other states across the United States. Women are 60 percent and 54 percent of the classes of 2021 and 2022 respectively. Approximately 35 percent of each class was made up of students from different multicultural backgrounds. Only 11 percent of the class of 2022 identify as first-generation college students, a decline from 19 percent in the previous class. The average age for both classes is 24 years.

WHITNEY LLOYD *(continued from previous page)*

nity—there are only 65 people in the class—so I felt right away that it had a sense of community. To me, that was really important.

How did you approach applying for medical school?

I looked at a lot of different schools and it was difficult to choose where to apply. I'd be happy to go to a lot of different places. But I got it narrowed down. I applied to 18 schools for my primary application and 12 for my secondary, then I had four schools where I interviewed and three acceptances. It was really nice to be able to have a choice.

What was it like to go through the admissions process?

You always feel like you're being evaluated and doubting yourself. But it's having the confidence that what you want to do is go into medicine. You have to believe in yourself and believe in your application. It's nice that we have great schools in Minnesota and you can't make a wrong choice. It's finding something that's a good fit for you. I feel like I did and I'm really happy about it.

What about the interviews?

When I interviewed at the University of Minnesota-Twin Cities, we had a one-on-one for half an hour with a professor and mini-interviews with 10 people. It was sometimes difficult because I didn't know if they got to know things about me during five minutes. I liked the one-on-one interview. For the Duluth interview I had two hour-long interviews with a family physician and a professor who is Native American, and I had lunch with some of the first-year students. Then, when I got accepted, I got a phone call, which was really nice.

How has your first year gone so far?

It's been really good. I was pretty nervous at first. You hear it's like drinking from a firehose. But I can say that everyone is here to help you and students collaborate. They really do encourage the rural part. We'll have different lectures on chemistry and then a family physician comes in to talk about agriculture and farm accidents. We have clinical half-days, and then eight weeks where we get to stay with a rural family physician. I think I'm going to the White Earth Reservation, so that's really nice.

Any idea what you'd like to do as a doctor?

I really like working with kids. They have a lot of resilience and it's a really fun environment. You can't be too serious. But I'm open-minded because there are different areas of medicine that I haven't been involved with. I'm excited about the experiences we have here. We get to work with Native Americans. Since my mom's side of the family is from Alderville, a First Nation in Canada, they have universal health care and don't have a lot of the same struggles people have here. That will be interesting to learn about.

Conclusions

Many factors can help in the selection of a potentially successful medical student and future physician, including intellectual ability, demonstrated by test scores and grades, and personal attributes, like communication and teamwork skills, cultural awareness, resilience, leadership, ethical and moral decision-making and critical thinking abilities. A medical school admissions process should aim to assess all of these factors and others through diverse means. These factors potentially can predict the success of a future medical student and physician; an admissions process that includes the assessment of these attributes produces a much needed diverse student population and subsequent workforce that will serve the demands of an increasingly diverse patient population in Minnesota and beyond. **MM**

Dimple Patel, MS, is associate dean of admissions at the University of Minnesota Medical School-Twin Cities. Jacqueline L. Gauer, MA, is a research and data analyst. Claudio Violato, PhD, is professor and assistant dean of assessment and evaluation.

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Admissions process at UM-Duluth reflects its mission

BY SUZY FRISCH

At the University of Minnesota Medical School-Duluth campus, the admissions process is rooted in its mission to improve health care access and outcomes in rural Minnesota and Native American/Alaska Native communities. This objective gets woven into its selection decisions, with consideration of these additional factors for candidates:

- Potential for practicing in rural Minnesota.
- Potential for serving Native American communities.
- Potential for practicing in family medicine.

Overall, the admissions process in Duluth works to evaluate applicants' commitment to delivering compassionate and quality patient care, a high degree of personal integrity, and skill in communicating with diverse groups.

Candidates must be able to demonstrate their motivation to practice family medicine in rural Minnesota or provide health care to Native American communities. In addition, the admissions committee assesses candidates' qualifications through recommendations, on-site interviews, undergraduate achievements, and other post-secondary experiences.

This focus results in a medical school campus that is flush with students who are from hometowns smaller than 20,000 people (81 percent) and students who are underrepresented in medicine, such as Na-

tive Americans (11 percent). In fact, the campus ranks number-two in the nation for graduating Native American physicians. Other emphases for the medical school include first-generation college students and those from economically disadvantaged backgrounds.

Students may apply to both University of Minnesota Medical School campuses, but they pay two separate application fees. They fill out the American Medical College Application Service (AMCAS) application, similar to the common application for undergraduate programs. Each campus has its own supplemental application. At Duluth, the supplemental application includes additional questions to answer and a request for three letters of recommendation.

The committee uses the recommendations to evaluate candidates' academic capabilities and potential to become a family medicine physician in rural Minnesota or for Native American communities. Duluth suggests a mix of letters such as those from a science faculty member, a supervisor from a work or volunteer experience, and a someone who represents applicants' interests in rural or family medicine.

Next, the admission committee reviews the applications and determines who will receive one-on-one interviews with two members of the admissions committee. That committee includes medical school faculty, staff, and community representatives. Ultimately the committee makes its decision six to eight weeks after a candidate's interviews.

This keen focus on training future primary care physicians and providing care in rural communities has borne fruit for the Duluth campus. To date, 47 percent of its graduates matched into family medicine residencies, compared with 9 percent nationally, and 67 percent matched into primary care medicine. In addition, 44 percent of alumni practice in communities with populations under 20,000—compared with about 8 percent of physicians nationally. In addition, 66 percent of alumni practice medicine in Minnesota.

Mayo Clinic looks for different kinds of diversity

BY SUZY FRISCH

The Mayo Clinic Alix School of Medicine admissions process reflects the Mayo Clinic's deep commitment to providing the best care to every patient, through integrated clinical practice, education, and research. It aims to create holistic classes that embody diversity of all kinds to better serve patients who mirror that diversity.

The variation Mayo seeks is itself diverse, encompassing applicants from wide-ranging backgrounds. It includes groups that are underrepresented in medicine, geographic variation, military service, the path someone took to medical school, socioeconomic disadvantages or first-generation college students.

In general, Mayo values very high academic achievement and test scores, a depth and breadth of activities covering the gamut of interests, and a significant commitment to serving people, says J. Michael Bostwick, MD, a psychiatry professor and senior associate dean of admissions. Those interests can entail leadership, research, artistic or athletic endeavors, an exploration of medicine or work experiences.

"It's highly selective. We start with 8,000 applications—5,000 to the Minnesota campus and 3,000 to the Arizona campus," he says. "At many stages and as they get interviews, I tell students that no matter what happens, they already have been chosen from among a large group of initial applications and they should be pleased and encouraged."

Students use AMCAS to apply to one or both campuses, paying application fees for each. Those who are selected



PHOTO PROVIDED BY VIVEK SOMASUNDARAM

MEDICAL STUDENT PROFILE

VIVEK SOMASUNDARAM

FIRST-YEAR STUDENT AT MAYO CLINIC ALIX SCHOOL OF MEDICINE, MINNESOTA CAMPUS

Vivek Somasundaram wanted to pursue a career that would allow him to improve the quality of people's lives. After majoring in biomedical engineering at University of North Carolina–Chapel Hill, he realized that he would rather administer treatments to patients as a physician than develop devices as an engineer. Somasundaram sought a smaller program with a collaborative sensibility, and he moved to Minnesota from his native North Carolina to obtain it.

Did you go right from college to medical school?

Following college, I went on to complete a post-baccalaureate program at Virginia Commonwealth University, where I took graduate-level courses. I did not get much exposure to many biology courses as an engineering major, so this program allowed me an opportunity to see if I enjoyed the content covered in medical school while gaining more clinical exposure. Then I returned to work as program administrator for the same organization.

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VIVEK SOMASUNDARAM *(continued from previous page)*

How did you approach applying to medical school?

Rather than casting a wide net, I focused on applying to medical schools that I had a strong interest in attending. This could stem from the mission of the school, the culture and environment, availability of research opportunities and/or its location and proximity to my family. I applied to 12 schools in total, interviewed at five, and was accepted to four.

Why were you interested in Mayo medical school?

I wanted a medical school that had an environment of collaboration, teamwork and frequent interaction with faculty. This, combined with the opportunity to work with and learn from world-renowned clinicians and unparalleled research opportunities, made Mayo Clinic School of Medicine a place where I felt that I could thrive.

What stood out to you about Mayo's admissions process?

Mayo Clinic made it very clear that they wanted us to let the admissions office know if we were very interested in attending Mayo through a "letter of intent." This was something that other schools did not encourage or even accept during the admissions cycle.

What was the interviewing process like at Mayo?

One thing I remember vividly about my interview day was that I had a question that my interviewer, Dr. [Phil] Fischer, said he would research and get back to me about. I was expecting an email from him in the days or weeks after the interview because I knew he had a very busy schedule. During my afternoon interview, my second interviewer had been in communication with Dr. Fischer and already had an answer for me. Dr. Fischer's actions showed how much he cared and were indicative to me of the level of involvement of the faculty and staff in helping medical students achieve their goals.

What has the first year been like so far?

It's been great! The people in my class along with my M2 and M3 "med sib" mentors really have formed a strong support system. My interactions with faculty have also greatly enhanced my learning experiences, particularly in anatomy. During dissection, we would often have clinicians in the lab showing us the clinical applications of the structures we were covering that day. This gave me perspective on why we were learning the structures and made the material more exciting. The faculty have also been helpful outside the class. When I first moved in, my professor's husband helped me put up blinds in my apartment because I did not have any power tools. Little actions like these have helped me adjust to life in Minnesota and made me feel a part of the Mayo community.

What plans do you have so far for your medical career?

I think I want to pursue a specialty with a procedural component but I'm still keeping an open mind because it's still early!

for the secondary application also may consider applying to Mayo's Florida Focus (2+2) program in Jacksonville. For that option, students start their medical education in Minnesota or Arizona and complete their studies in Florida.

To find the ideal class of roughly 100 students, Mayo first selects 300 to 350 candidates for interviews on each of its campuses in Rochester and Phoenix, plus another 80 in Jacksonville. It's a time for interviews and for applicants, physicians, staff and students at Mayo to get to know each other.

"We're going for a group of people who ultimately are interesting people who can get along with one another," Bostwick says. "It's not a perfect science, but we get a sense of them from their recommendation letters and activities and interviews and how they interact with everyone. We get a sense of how they will do as a class."

Applicants have two interviews each, with a faculty member and either a staff member, medical student or community member. The interviewers report to the full committee of about 15-25 people. Then the committee gives each applicant a composite score. After benchmarking students and having ample discussion about candidates throughout the process, the committee makes decisions about its first group of admitted students. All the while, Bostwick says, they work toward the goal of creating a balanced class that reflects Mayo's goals. **MM**

Student work in the Visible Heart Lab at the University of Minnesota.



PHOTO BY RICH RYAN PHOTOGRAPHY

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Parents' hesitance about HPV vaccine

Using the CASE approach to address their concerns

BY ROBERT M. JACOBSON, MD, AND LILA J. FINNEY RUTTEN, PHD, MPH

Clinicians, particularly primary care clinicians, often ask how to approach vaccine hesitancy or outright vaccine refusal, especially with the human papillomavirus (HPV) vaccine. The Advisory Committee on Immunization Practices recommends HPV vaccination for males and females at 11 to 12 years of age, giving clinicians permission to vaccinate as early as 9 or 10 years of age and recommenda-

tions for catch-up through age 21 years for males and 26 years for females.

Population acceptance of the HPV vaccine remains poor relative to our success with other vaccines due at age 11 to 12 years—the tetanus-diphtheria-acellular pertussis (Tdap) and the quadrivalent conjugated meningococcal (MenACWY) vaccines. The National Immunization Survey NIS-TEEN measured the uptake of these

vaccines among 13- to 17-year-old adolescents in 2017. For those living in Minnesota, 87.5 percent had received a Tdap and MenACWY vaccine but only 46.9 percent had completed the HPV vaccine series. Parents of adolescents in this age group have reported a number of reasons why they don't plan to vaccinate their teens against HPV, including their provider not recommending the vaccine, the belief

The CASE approach to responding to patient concerns

CORROBORATE

Express the shared value that underlies the concern.

ABOUT ME

Make an about me statement with an “and” rather than a “but” that emphasizes your professional standing and expertise relevant to the shared value.

SCIENCE

Summarize the science, referring to science that supports your take on the concern, with regard to the shared value.

EXPLAIN ADVICE

Explain why you're giving this advice and restate your strong recommendation to vaccinate today in terms of the shared belief and the science.

that their child is too young and concerns about vaccine safety.

Published studies show that clinicians should make strong recommendations for HPV vaccination—and should persist when they meet resistance. How can a clinician preserve the relationship to the parent and patient, address the basis for the hesitation and confirm the strong recommendation?

In previous articles in this journal, we have written about the use of the CASE approach first developed by Alison Tepper Singer to address vaccine hesitancy. With the CASE approach, the clinician frames a response to the vaccine hesitant parent that *Corroborates* awareness of the parent's hesitancy while identifying a shared underlying value. Next, the clinician makes an *About me* statement, summarizing how the clinician, through professional development, obtained their understanding of the vaccine in terms of this underlying shared belief, summarizing the *Science* that supports the clinician's recommendation and leading the clinician to *Explain* the clinician's *Advice*.

We have identified eight common concerns parents express regarding the HPV vaccine and created scripts for how you might address parents' questions and vaccine hesitancy using the CASE approach.

1 “The HPV vaccine’s too new. We don’t know yet if it really works or if it is really safe.”

CORROBORATE

“I agree with you that many treatments are too new and unstudied to prescribe.”

ABOUT ME

“And, as one of your health care team’s clinicians, I wouldn’t want to recommend a vaccine until we have well-established effectiveness and safety data.”

SCIENCE

“In the United States, vaccines are tested for safety long before they are licensed or recommended, and these tests are performed in very large clinical trials involving tens of thousands of patients the same age as your child.”

EXPLAIN ADVICE

“That’s why I’m recommending your child get the HPV vaccine, in part because of my confidence in its well-established, long-standing effectiveness and safety record.”

2 “I am concerned about the HPV vaccine causing long-lasting health problems.”

CORROBORATE

“I share your concern that we must avoid preventive measures like vaccines if they can cause long-lasting health problems in even a small percentage of patients.”

ABOUT ME

“And, I have learned in my studies as a clinician that vaccines must meet a much higher standard for safety and avoidance of side effects than medicines used to treat disease once the disease is present. This is because they are given to so many more people simply to prevent illness.”

SCIENCE

“Both the very large trials before licensure and the even larger studies conducted since licensure in 2006 show that HPV vaccines don’t cause chronic disease or long-lasting injury.”

EXPLAIN ADVICE

“That’s why I am confident to recommend this vaccine to all of my patients who are your child’s age.”

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3 “HPV vaccine’s not one of the required vaccines.”

CORROBORATE

“It’s true that the schools do not require the HPV vaccine series—or the yearly flu vaccines, for that matter.”

ABOUT ME

“And, as a member of your child’s health care team, I need you to know that we don’t make our decision to recommend a vaccine or not based on school requirements. Important vaccines like HPV and influenza weren’t included in the school requirements

because the number of doses and the timing of those doses would overwhelm school nurses in monitoring vaccination.”

SCIENCE

“Rather than recommend a vaccine because it is required, we recommend a vaccine because the studies show the vaccine is effective in preventing disease, safe to receive at the age to be given, and needed, given the risk of the disease otherwise. Not all vaccines meet these standards; we only recommend the ones that do.”

EXPLAIN ADVICE

“That’s why I am recommending the HPV vaccine for your child today; the vaccine is proven effective, safe and necessary.”

4 “My child’s too young to get the HPV vaccine.”

CORROBORATE

“I agree with you that we wouldn’t want to give this vaccine—or any vaccine—to a person if the preventive effects would wear off before the person needed it.”

ABOUT ME

“And, as a healthcare professional, I’m committed to prescribing only things that would be of lasting benefit to your child.”

SCIENCE

“This particular vaccine’s protection does not weaken or go away in time. Children ages 9 through 14 have a much better response to this vaccine than older teens. Vaccinating now means having to receive only two doses. Waiting for even a few more years would mean needing three doses because a teen’s immune system is no longer as responsive as that of a younger child.”

EXPLAIN ADVICE

“That’s why I’m recommending this vaccine today when your child is young and will have a strong immune response with a vaccine whose protection does not fade away.”

5 “Because of our family values, my child will never be at risk for the disease and does not need the vaccine.”

CORROBORATE

“I think you will find that you and I have a lot of family values in common ...”

ABOUT ME

“... and, as a clinician, I believe that completing this vaccine series does not compromise your values but rather provides future protection that all people deserve. While we don’t like to think about it, not all sex is consensual and by vaccinating today you are protecting your child for a lifetime of risks and situations we cannot foresee today.”

SCIENCE

“Studies show that completing the HPV vaccine series does not influence sexual behaviors or choices for teenagers. We know now that the infection is so common that HPV will infect nearly 80 percent of U.S. adults by the time they are 50. The infection is invisible, undiagnosed and without symptoms in most people. The vaccine prevents the infection that causes cancer.”

EXPLAIN ADVICE

“That’s why I’m recommending this vaccine to every one of my patients—because *all* of my patients are at risk for this infection.”

6 “It’s too expensive. We can’t afford it.”

CORROBORATE

“I agree that we have to avoid expensive treatments and reduce the burden of healthcare costs.”

ABOUT ME

“And, I’m glad you raised the question of affordability. Many of my patients’ parents don’t realize that these recommended vaccines are covered 100 percent by insurance, with no copay or deductible. I’ve learned in my role as a health care professional ...”

SCIENCE

“...that with current insurance-coverage laws, my patients’ parents have no out-of-pocket expenses with vaccines, including the HPV vaccine.”

EXPLAIN ADVICE

“While things may change in the future, for now, this vaccine, while expensive, is covered completely. That’s one of the reasons why I am recommending the vaccination now with the first dose today.”

7 “My child’s not sexually active. My child doesn’t need the HPV vaccine yet.”

CORROBORATE

“I understand what you are saying. Your child is not going to be exposed to this infection for years and years to come.”

ABOUT ME

“And, as your child’s health care provider, I don’t want to do anything that is could be done at a later time and work just as well.”

SCIENCE

"I know from my readings and the conferences that I attend that we just don't see teens and young adults in our offices regularly and we can't depend on waiting until a checkup several years from now that most of the time will not happen. We want to complete the series before a person is exposed and when completing the series isn't such a big disruption. Vaccinating now means having to receive only two doses. Waiting for even a few more years would mean needing three doses because a teen's immune system is no longer as responsive. Studies show that the vaccine works best after you complete the series, but it does not wane or lose its protection. Studies also show that people who wait to start the vaccine series often fail to finish it because life, school, sports and other activities get in the way."

EXPLAIN ADVICE

"That's why I'm recommending we start the series today and finish it in six months while your child's young enough to need only two doses and have the best response to the vaccine."

8 "We are just here for the acne/ankle sprain/ADHD and nothing else. We can deal with the vaccines due another time."

CORROBORATE

"I share your concern that we definitely need to focus on why you and your daughter are here today."

ABOUT ME

"And, I know from my experience as a health care professional, how hard it is to get in and get your concerns taken care of, especially with an adolescent with so many demands on her time with school, work, athletics, music, friends and family life."

SCIENCE

"It turns out that in Minnesota, no matter what the insurance and despite full insurance coverage for preventive care, most teens do not stick to the schedule of regular preventive care visits."

EXPLAIN ADVICE

"That's why my colleagues and I have agreed to use every opportunity to bring our teens up to speed with their preventive care at any of the visits they make with anyone of us, rather than wait, and that's why I'm recommending your teen get the HPV vaccine due today."

When the nurse lets you know a parent has indicated he or she plans to decline the HPV vaccine.

The examples we've used address the most common expressions of parental vaccine hesitancy primary care clinicians face when we recommend the HPV vaccine. But you can respond to any concern using the CASE approach.

You might start the conversation saying, "The nurse noted that you indicated you were declining the HPV vaccine. I would like to learn from you why you wish to defer so that I can better understand your plans." Then proceed with CASE approach. **MM**

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MAINTAINING CERTIFICATION

Medical specialties modify board exams to be less of a burden

BY NANCY CROTTI

Some physicians in practice today can recall the good old days, when they only had to take and pass one exam after residency in order to be certified.

For many, that ended in 2000.

That year, the American Board of Medical Specialties (ABMS) proposed that a physician's certification be renewed every 10 years. After some initial pushback, the 24 boards that make up ABMS agreed and

began requiring diplomates to complete four sets of activities—including taking and passing an exam every 10 years—in order to renew their board certification.

The pushback never stopped, however, and today, some specialties have changed their approach to the maintenance of certification (MOC) exams to make them less onerous for the physicians taking them and, more important, a better measurement of a physician's knowledge and ability.

Years of controversy over MOC exams and fees have yielded myriad studies, articles, surveys, state laws and alternative professional boards with their own certification standards. A 2016 survey published in the *Annals of the Mayo Clinic* showed that of the 988 physician respondents, 40 percent or less agreed that MOC activities contribute to their professional development. Only 24 percent (200 of 842) found that MOC activities are relevant to their patients and 15 percent (122 of 824) felt they are worth the time and effort. A full 81 percent said MOC activities are a burden and only 9 percent said that patients care about their MOC status.

Lead researcher David Cook, MD, MHPE, a Mayo Clinic physician, doesn't find the results particularly surprising, based on the responses of focus groups of Minnesota and Wisconsin physicians and sentiments expressed at informal and formal public forums.

"Part of the problem is that MOC is an add-on to the already-overwhelming workflow of a physician," Cook says. "Physicians are feeling burned out, and MOC is just one more thing on a physician's to-do list. To the extent that MOC becomes integrated with physicians' workflows, and offers tangible benefits (e.g. help to identify and remedy gaps in knowledge and skill), the cost-benefit ratio will probably change."

Some physicians opted to retire rather than take one more once-a-decade, multiple-choice exam, often in a location that meant time off work and travel expenses. A few refused to take the exam or pay the fees and moved to positions that didn't require re-certification. Most did what they need to in order to stay in their positions—some through gritted teeth.

Faced with continuing complaints, some of the boards that make up the ABMS have begun changing recertification requirements. One by one, they've taken the physician's workload into consideration, breaking down the tests into more manageable chunks to be completed on a laptop or even a smartphone over a few years. Some allow short periods of time during a test for physicians to look up information, and offer limited flexibility for them to choose categories that best reflect their current practice. Some provide immediate feedback on responses and more information on the topics.

The American Board of Anesthesiology was the first to pilot an alternative to the once-a-decade exam in 2014. The anesthesia board applied adult-learning theory, which posits that cramming for a once-a-decade exam might help adults pass a test, but doesn't help them retain that knowledge.

"What our board has done is, it said, 'Look, we want to make this fun. We want it to be educational. We don't want it to be punitive. Let's set this up for adult learners,'" says Mike Wall, MD, a MOCA Minute Committee member and head of the anesthesiology department at the University of Minnesota Medical School.

The longitudinal assessment, known as MOCA Minute, requires anesthesiologists to answer 30 questions each quarter and allows one minute to answer each question. Anesthesiologists in subspecialties receive a percentage of questions geared toward those subspecialties.

The questions have evolved, too, with "a boatload of new questions every year," Wall says. Many are topical and change as guidelines are updated. "The cool thing is, as new guidelines come out, we can get the questions out to every anesthesiologist across the country, and if they get it wrong, they'll get it again. It's not minutiae; it's good stuff."

The anesthesiology board gave the ABMS the results of its pilot in hopes of having the MOCA Minute replace a high-stakes exam taken every 10 years. When ABMS approved transitioning the pilot to a permanent part of the ABA's MOCA pro-

gram, “that was huge,” Wall says. “They’re a very conservative group, the ABMS. It was touch-and-go. We weren’t sure they were going to do it.”

Diplomates who’ve participated in MOCA Minute for recertification have given the board positive feedback, according to Wall and Deborah Culley, MD, a neuroanesthesiologist and secretary of the American Board of Anesthesiology. Diplomates have told the board that they enjoy the MOCA Minute much more, it’s relevant to their practice and they’re able to learn as they go, Culley says.

“People love it,” says Wall. “You can do it on your computer. You can do it on your laptop at home. You can do it on your phone.”

The American Board of Family Medicine (ABFM), which includes more than 92,000 diplomates, was among the boards that watched the anesthesiology board’s efforts. It had received complaints from diplomates that the 10-year exam was too broad and asked questions about areas of medicine they no longer practiced.

“An individual family physician may not see much pediatrics in their practice or they may not see OB patients, but because family medicine includes many areas of practice, the recertification exam was likewise broad-based and included those areas of medical practice,” says Keith Stelter, MD, a former ABFM chair who is the associate program director of the University of Minnesota’s Mankato Family Medicine Residency Program. “We have those topics and questions in there, to ensure that a board-certified family physician is able to personally provide high-quality comprehensive care or appropriately refer, anyone who seeks care from them.”

While he chaired the board, most of Stelter’s work involved carefully reviewing the exam questions along with other physicians who practice in very broad areas. “If we saw a question that was very far out on the fringe or out of the normal scope of practice that only a few physicians might know about, we would generally throw that question out,” he says.

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“The ABFM has offered a customizable exam for many years because we know many family physicians have particular clinical areas of more expertise,” says Stelter.

Going forward, the ABFM has begun a pilot of longitudinal assessment that will deliver 25 questions online every quarter to family physicians scheduled to take the examination in 2019. This new approach provides the ability to engage in ongoing assessment any time that is convenient and that can be done from the physician’s home or office on a computer or tablet, eliminating the need for time-consuming advanced preparation or travel to a test center for an all-day examination. The longitudinal nature of the alternative assessment also promotes ongoing learning and retention to a greater extent than the 10-year examination, Stelter says. To fulfill the full examination requirement, participants have four years to complete 300 questions.

Changes for pediatricians

The American Board of Pediatrics (ABP) also followed in the anesthesiology board’s footsteps after hearing about the new model at their 2015 Future of Testing

conference. One of their main complaints was that the closed-book, highly secure exam did not reflect their daily practice, in which physicians frequently look up information about particular conditions and treatments on their smartphones and computers.

Like many other specialists, the pediatricians also complained that the 10-year exams were inconvenient, time-consuming and ineffective for learning. The two-year pilot of MOCA-Peds launched in 2017 and the official version begins this year.

ABP’s MOC cycle runs every five years, but the board does not expect its diplomates to answer questions every year for five years, according to Linda Althouse, PhD, vice president of assessments for the board. Instead, the ABP scores each diplomate’s answers at the end of their fourth year. Those who are not passing after four years do not lose their certification but must take the proctored exam. Under the old system, diplomates who didn’t pass lost their credentials and had to wait to retake the exam. Those who pass after four years have the fifth year “free,” with no required questions to answer.

“You’ll know how you’re doing as you’re going along,” Althouse says. “We are also dropping the lowest four quarters for diplomates each cycle, since this is an ongoing activity and we know that there can be life interruptions.” If a diplomate is performing high enough at the end of three years, they can drop all of the fourth year. ABMS also developed CertLink, a platform to help seven of its smaller boards develop and provide a longitudinal assessment program, according to Mira Irons, MD, senior vice president for academic affairs at ABMS. Physicians receive questions online two to four times a year with references to more information.

“It addresses the relevance concern that physicians have had and addresses the burden concern,” Irons says. “It’s convenient. People can take it at their home, on their laptop.”

As an alternative to the once-a-decade exam, other boards have opted for a once-a-year assessment that physicians can

take at home. Still others, including the American Board of Obstetrics and Gynecology, have asked their physicians to read a specified number of articles that relate to their specialty and answer questions based on those articles.

While taking MOC exams is getting easier, some physicians chafe at the notion that their employment may be tied to recertification. A family medicine physician for 34 years, Joe Van Kirk has taken the MOC exam five times since 1984. He'll be 70 when his next 10-year exam comes around and would rather retire than take the test again. That would mean losing clinic privileges at his workplace, Ridgeview Clinic Chanhausen. "It is a roadblock because it does require more time and effort and preparation and money," he says.

Why certification matters

Maintaining certification is crucial for most physicians; Without it, hospitals and clinics may cut off a physician's privileges, payers may cease covering the care they provide, potential patients could decide to go elsewhere and current patients might change to other physicians.

Recertification shows patients, hospitals, clinics and payers that physicians have exceeded the standard and are up-to-date with clinical and evidence-based knowledge, says Rahul Koranne, MD, MBA, FACP, chief medical officer for the Minnesota Hospital Association. He considers Minnesota physicians to be high-achieving and exacting when it comes to standards.

"Whether patients are looking or not looking, physicians in Minnesota are looking at ourselves," Koranne says. "We take this responsibility of always exceeding the current knowledge base, knowing the evidence base, very seriously. I believe patients are looking, and being board-certified is on everybody's website."

Fairview Health Services acknowledges that using the MOC process as a require-



ment of employment is not perfect, according to Beth Thomas, DO, Fairview's chief quality officer. And while board certification doesn't necessarily correlate with providing excellent patient care, "it's the only real proxy we have at this time that's objective to say, 'Yeah, you're qualified,'" she says.

Blue Cross Blue Shield Minnesota requires in-network providers to be board-certified, with some exceptions. For example, if a provider is serving an underserved population or in the process of securing board certification, the credentialing committee may include that provider in the Blue Cross network following the application and credentialing process.

HealthPartners requires continuous board certification of the physicians and other clinicians who work within its care delivery system. For non-employed physicians and other clinicians whose care is covered by the HealthPartners health plan, board certification is one of the criteria the health system's credentials committee reviews when a practitioner applies for credentialing and re-credentialing.

Most health systems in Minnesota require board certification for employment, according to Stelter, who says that's not the ABFM's fault. "Board certification was never meant to be a surrogate marker for professional credentialing or employment," he says. "It's actually for mastery of the individual physician to prove that they are staying up-to-date in the field of family medicine.

"There should be ways for a health system to assess a physician other than board certification," he says. "We never sold it to the health plans or the large health systems in the country as the means to credential physicians for employment."

The ABFM resisted having its certification made a condition of employment, Stelter says, "but health systems said, 'It's here, so let's use it.'"

Stelter says there should be another pathway for potential employment and in-

surance credentialing for those physicians who choose not to participate in ABMS Board Certification, a pathway created by insurers and employers. "They could also come up with their own measure of physician competence for those who aren't board-certified," he says.

"They've not done that part, and board certification is rigorous—it's meant to be that way," he says. "It is a good surrogate marker if you can keep up with it, but it shouldn't be the only way. You shouldn't be denied employment based on that. That was not our intent."

The American Medical Association (AMA) agrees. "The MOC program should not be a mandated requirement for licensure, credentialing, recredentialing, privileging, reimbursement, network participation, employment, or insurance panel participation," the AMA states on its website.

The AMA's State MOC Legislation Tracker shows that four state legislatures have passed what it calls full MOC laws, which mandate that a physician's MOC status must not affect licensure, employment or insurance coverage. Seven other states have banned MOC ties to medical licensure. Legislators in 18 more states, including Wisconsin and Iowa, have introduced MOC legislation. Minnesota could be among the next, according to State Rep. Scott Jensen, MD, who is considering introducing a bill in the 2019 legislative session.

Jensen has been a family medicine physician for 34 years. In private practice in Carver County, he treats adults but gave up offering OB/GYN care in the 1990s and does not work in hospitals. He calls the 10-year MOC exam "outmoded" and "onerous." Jensen's proposed legislation would ban denying credentials to a physician who is in good standing and maintains the requisite CME credits.

As MOC exams are changing, Althouse of the American Board of Pediatrics sees resistance to taking them beginning to ease. "People are more hopeful," she says. "They want to give this a shot. The mood has definitely swung." **MM**

Nancy Crotti is a Twin Cities freelance writer.

LEGISLATIVE PREVIEW

Provider tax replacement likely to dominate debate

When the 2019 legislative session begins January 8, it will include twice as many physician legislators as last year and a shift in power in the House of Representatives.

That doesn't mean getting pro-physician legislation passed will be easy, though. Although the DFL now controls the House and maintains power in the governor's office, Republicans still lead the Senate. Optimists hope this will lead to compromise and coalition-building; pessimists see more split government and inaction.

"Our legislative work is always about presenting best-case scenarios on how to make Minnesota the best place to practice medicine and ensuring Minnesotans are the healthiest in the nation, regardless of who is in power," says Dave Renner, MMA's director of advocacy.

It should certainly help to have two more physicians at the Capitol.

Kelly Morrison, MD, (DFL-Deephaven), an obstetrician-gynecologist and MMA member, defeated incumbent Cindy Pugh in the western Hennepin County district. Alice Mann, MD, (DFL-Apple Valley), a family physician, defeated incumbent Roz Peterson in the Dakota County district.

"Two new physicians in the Minnesota House is a great addition," Renner says. "They will bring the perspective of front-line care givers who are focused on ensuring that public policy serves patients." Morrison and Mann join two other physicians currently serving in the Minnesota Senate: Sen. Scott Jensen, MD, (R-Chaska) and Sen. Matt Klein, MD, (DFL-Mendota Heights).



Hot potato – provider tax

One hot issue during the session likely will be the 2 percent provider tax, which is scheduled to sunset at the end of 2019.

At its November meeting, the MMA Board of Trustees voted to support an alternate funding source to replace the tax to ensure the state's health care programs remain economically viable. The new funding mechanism, a claims expenditure assessment (CEA), would be applied to adjudicated claims processed by health plans and third-party administrators (TPAs).

Passed in 1992 as the mechanism to fund MinnesotaCare, the provider tax is a levy on the gross revenue generated by various types of providers of health care

goods and services. In addition to physician services, revenue from services provided by dentists, chiropractors, physical therapists, optometrists, psychologists and most other health care providers is subject to the tax, as is revenue for health care services provided at hospitals and ambulatory surgery centers. The provider tax raises significant amounts of revenue; in 2019, it will generate more than \$690 million.

In response to changes in federal health care financing under the Affordable Care Act, the GOP-controlled Legislature and Gov. Mark Dayton, in a 2011 agreement, set the provider tax's repeal for December 31, 2019. Absent replacement funding, however, ongoing funding for Minneso-



Day at the Capitol is February 13

The MMA's annual Day at the Capitol is Wednesday, February 13, from 12:30 to 5:30. The day begins with registration at 12:30 in the L'Etoile du Nord Vault Room in the tunnel level of the Capitol. The program begins promptly at 1 p.m. with special guests from state government. MMA staff will provide background information on top priorities and then physicians, medical students, residents and fellows will meet with their legislators. The day will conclude with a reception at the historic Commodore Bar & Restaurant in St. Paul.

The MMA's annual Day at the Capitol is a great opportunity for physicians to meet with their legislators in-person and to advocate for MMA's top legislative priorities.

For more information, visit www.mnmed.org/DAC19.

taCare, Medical Assistance and other programs faces an uncertain future. Various efforts to simply repeal the sunset have not been successful but similar proposals are expected during the 2019 session.

“The 2019 Legislature needs to take action to maintain funding for programs that provide access to care for low-income Minnesotans,” says MMA President Doug Wood, MD. “The MMA has sponsored independent analysis and financial modeling to identify a long-term, sustainable source of revenue that we believe better reflects the realities of today’s health care marketplace and addresses the flaws in the current provider tax.”

Because the proposed CEA is tied directly to health care expenditures, it will be a stable source of needed funds to ensure the vitality of MinnesotaCare, Medical Assistance and the other health care access programs. The CEA is applied only to health care for which there is a claim, so patients who are uninsured or who are paying out of pocket for health care will not be assessed.

The CEA will be easier for the state to administer because there will be fewer entities that pay the assessment, as opposed to thousands of entities that pay the provider tax. The collecting and verification of the CEA will be significantly simpler for the Department of Revenue.

Priorities are set

Preserving MinnesotaCare and Medical Assistance coverage by adopting ongoing, stable funding is just one of the priorities set by the board.

Others include:

- Ensuring continuation of drug therapy for patients with chronic medication needs by limiting the ability of health plans or pharmacy benefit managers to change their formularies or preferred drug lists during a patient’s contract year.
- Supporting legislation that creates a community solution ensuring that prescribers are provided real-time notifications related to formulary changes and alternative covered drugs.

- Supporting dedicated funding to address the opioid crisis, including funds to ensure Prescription Monitoring Program access through the EHR and to address addiction treatment, prevention and education.
- Supporting changes to the Minnesota Health Records Act to align with federal HIPAA laws to improve efforts to better coordinate patient care and reduce duplication of services.

In addition to these priorities, the MMA will partner with other health care advocacy organizations on such issues as strengthening the state’s immunization laws, ensuring access to needed mental health services and working to reduce gun violence.

“Many issues affect Minnesota physicians,” Wood says. “Our staff will focus on those that wouldn’t move forward without our leadership and assist on others that already have advocates in place. Doing so allows us to maximize our influence with elected officials.”

DAY AT THE CAPITOL 2019

WEDNESDAY FEB 13 12:30-6:00 PM

RAISE YOUR VOICE.

Advocate for medicine at MMA’s Day at the Capitol!

Physician participation is an integral piece of the MMA’s ability to influence legislators. Why? Because legislators listen to physicians and want your opinion. Plus, the decisions made by legislators at the Capitol affect your practice, profession and patients.

For more information: www.mnmed.org/DAC19

News Briefs



MMA to host workshop on gun violence prevention January 31

The MMA will host a workshop on gun violence prevention for physicians on Thursday, January 31, from 5 to 8 p.m. at the Inter-Continental Saint Paul Riverfront (11 Kellogg Boulevard East).

The event will include a 45-minute panel discussion featuring a legislator, a physician and an expert on gun violence data. The panel will discuss: gun violence as a public health issue, how to talk to patients and family about guns in the home and how to be an advocate on gun safety in the community. The panel also will review gun legislation at the Capitol.

The second half of the event will include table discussions in which attendees will have the opportunity to discuss how to talk to legislators about gun violence, the value of physicians sharing their stories and the importance of demonstrating why physician advocacy on this issue is important for patients and the community.

Physicians increasingly are speaking out regarding gun violence as a public health epidemic. In March 2018, the MMA issued a statement calling for: criminal background checks on all

purchases and transfers/exchanges of firearms; enforcement of laws that will hold sellers accountable when they sell firearms to prohibited purchasers; investment in improved data collection, analysis, and research on firearm injury prevention; and a renewal and strengthening of the ban on military-style weapons, including banning high-capacity magazines.

In November 2018, the National Rifle Association reacted to a new gun violence study in the *Annals of Internal Medicine*, tweeting that physicians pushing for gun control should “stay in their lane.” This led to significant push-back by physicians on social media and the creation of the hashtags: #ThisIsOurLane and #ThisIsMyLane.

“This discussion will be an excellent opportunity to engage Minnesota physicians and help teach them how to counsel their patients and advocate with lawmakers,” said MMA President Doug Wood, MD.



Governor declares January 2019 Health Equity Month

In November, outgoing Gov. Mark Dayton proclaimed January 2019 as Health Equity Month in Minnesota. As part of the month, the MMA, the Minnesota Academy of Family Physicians (MAFP) and the Minnesota Chapter of the American Academy of Pediatrics (MNAAP) will host a Facebook Live event on January 22 to raise awareness of health disparities in Minnesota.

The January 22 event will cover health disparities within the Native American community. A second equity event on February 20 will cover structural racism and other barriers to health equity.

Here are details:

Addressing health disparities within the Native American community | January 22, noon–1 p.m.

The event will examine the health disparities that are seen in the Native American community, and how physicians can address these disparities. The speakers will share some practical takeaways that physicians (and other providers) can implement immediately.

On the calendar

Event	Date	Location
“Addressing health disparities within the Native American community”	January 22	Facebook Live
Gun Violence Prevention Workshop	January 31	St. Paul
MMA Day at the Capitol	February 13	St. Paul
“Structural racism and other barriers to health equity”	February 20	Facebook Live
2019 Annual Conference	September 20-21	Duluth

Speakers include:

- Angela Erdrich, MD, member of the Turtle Mountain Chipewewa (Ojibwe) from Wahpeton, North Dakota and a pediatrician with the Indian Health Board of Minneapolis.
- Mary J. Owen, MD, director, Center of American Indian and Minority Health at the University of Minnesota Medical School-Duluth campus who spends her clinical time at the Cass Lake Indian Health Service.
- Jackie Dionne, director of American Indian Health, Minnesota Department of Health, will moderate the panel.

Structural racism and other barriers to health equity
February 20, noon–1 p.m.

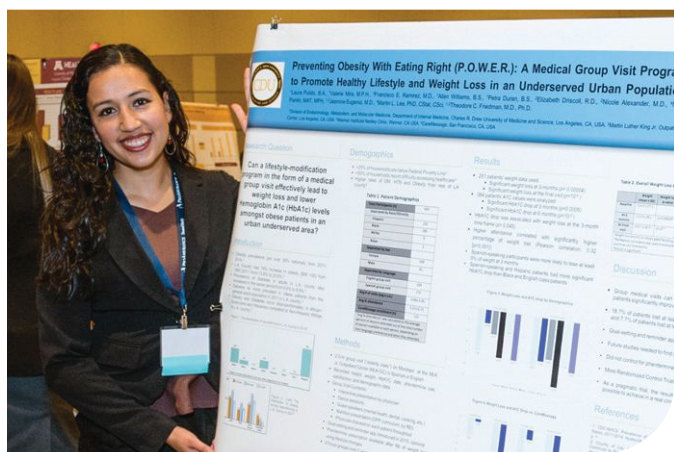
The event will focus on structural racism, historical trauma and other barriers that stand between our minority communities and their ability to achieve equitable health.

Speakers include:

- Brooke Cunningham, MD, PhD, University of Minnesota, Department of Family Medicine and Community Health.
- Lisa Skjefte, Health Equity Specialist and American Indian Community Liaison, Children’s Minnesota.
- Maria Veronica Svetaz, MD, MPH, Hennepin Healthcare.
- Christopher Reif, MD, MPH, Community University Health Care Clinic, will moderate the panel.

Additional partners for January 2019 Health Equity Month and the two events include the Minnesota Chapter of the American Academy of Pediatrics and the Minnesota Academy of Family Physicians.

These activities have been approved for *AMA PRA Category 1 Credit™*.



Medical students, residents and fellows: shine a spotlight on your research

Minnesota Medicine is inviting medical students, residents and fellows to submit abstracts of original research or clinical vignettes by February 28, 2019. The submissions demonstrating appropriate quality will be selected for publication in this magazine and authors will be invited to present their work in a poster session at the MMA’s 2019 Annual Conference in Duluth in September. Submissions should be no longer than 500 words plus references. Research abstracts should include a brief description of the re-

search problem, methodology and results, and a discussion of the findings. Clinical vignettes should include a description of the case, the diagnosis and treatment approach, and a discussion of the implications of the case. Submit your abstracts and vignettes at www.mnmed.org/posterprogram.

Minnesota POLST program receives national recognition

The National POLST Paradigm, which endorses programs that demonstrate development of a form and program that meet national standards, has endorsed Minnesota’s program. Minnesota joins 23 other endorsed states.

The Provider Orders for Life Sustaining Treatment (POLST) form is a portable medical order that gives patients with advanced serious illness the option to exercise increased control over the treatment they do and do not want to receive at the end of life. It helps ensure a patient’s wishes are conveyed to emergency services and other medical providers. The POLST form is used and recognized by hospital systems, long-term care facilities, medical professionals and emergency medical services throughout Minnesota.

The MMA first developed a standardized POLST form in 2010 and it has since been widely adopted across Minnesota. The POLST Minnesota Steering Committee, led by co-Chairs Vic Sandler, MD, and Thaddeus Pope, MD, provides overall management and direction of POLST Minnesota, including POLST form maintenance, implementation, education and outreach.

AMA supports drug importation resolution originated by MN delegates

At its interim meeting of the House of Delegates (HOD) in Maryland in November, the AMA voted to support a measure on drug importation that originated as a Minnesota resolution.

In 2017, Minnesota introduced a resolution asking that the AMA support the importation of drugs for patients who purchase directly from Canadian pharmacies for personal use, as one way to provide more affordable medications. At that time, the resolution was referred to the AMA board for more study.

In mid-November, the report of that study was presented with a recommendation that the AMA change its position to support this limited importation of Canadian drugs. That recommendation was adopted with overwhelming support.

The HOD reviewed and acted on 41 different board and counsel reports and more than 110 resolutions introduced by state and specialty societies. The AMA strengthened its position on gun violence by opposing the manufacture and importation of 3D printed firearms; strongly opposed laws that lead to the detention or separation of immigrant children entering the country; supported adequate Medicare payments that don’t differentiate based on the site of the service; and more.

Members of the Minnesota delegation included: Paul Matson, MD; David Estrin, MD; David Luehr, MD; Cindy Firkins Smith, MD; Andrea Hillerud, MD; Kathryn Lombardo, MD; David

Thorson, MD; Mike Tedford, MD; and MMA President Doug Wood, MD. Other Minnesota physicians in attendance were: Courtney Moors, MD; Peter Amadio, MD; Dionne Hart, MD; and Gary Bryant, MD, as well as medical students Abby Solom, David Finkel and Nathan Rockey.

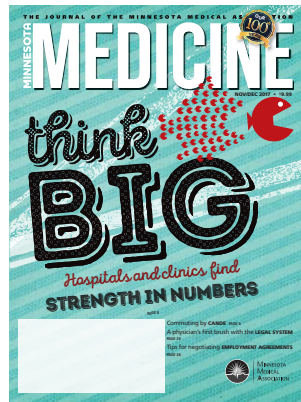
During the opening session of the HOD, former MMA Board Chair and CEO Paul Sanders, MD, received one of six AMA Medical Executive Lifetime Achievement Awards. Sanders has been involved in organized medicine for more than 45 years, serving as MMA CEO for 13 years. He retired as the executive director of the North Central Medical Conference last year.

At the meeting of the AMA Medical Student Section, held in conjunction with the HOD, third-year medical student Abby Solom was elected as a regional delegate to the AMA House of Delegates and will serve with the Minnesota delegation in 2019.

Minnesota Medicine wins two excellence awards

Minnesota Medicine won two awards at the 22nd annual Minnesota Publishing Excellence Awards in November in Minneapolis:

- Gold – Feature Article – Association, Under 30,000. This was for the “Think Big” story by Howard Bell in the November/December 2017 issue, about the changing practice landscape in health care.
- Silver – Use of Data Visualization/Infographic – Association. This was for an infographic comparing data from 1918 and 2018 in the January/February 2018 issue on the magazine’s 100th anniversary.



MN Community Measurement releases study on depression in state

MN Community Measurement (MNCM) released a report in late October that highlights progress that has been made in identifying and caring for depression among adults and adolescents in Minnesota.

The outcome measures in the report, “Depression Care in Minnesota,” reflect more than 110,000 adult patients in Minnesota whose depression screening indicated the need for treatment.

Key report findings were:

- Depression remission and response rates remain relatively low, and improvement has been slow. Analysts point out that one reason for this is that many patients with depression aren’t receiving the necessary follow-up assessment; missed follow-up affects the rates for all outcome measures.
- For adolescents, mental health and/or depression screening rates have significantly improved since 2015 and have shown considerable improvement every year. Most medical groups in Minnesota are now administering a depression screening tool to their adolescent patients at well-child visits.

The report shines a light on the work that is being done to identify and treat depression, and illustrates the need for improvement in care. The full report can be viewed at www.mncm.org/depressionreport2018.

MMA in Action

In late November, CEO **Janet Silver-smith** and **Dave Renner**, director of advocacy, met with Governor-elect Tim Walz’s transition team to discuss potential commissioner candidates for the departments of health and human services. Renner and **Eric Dick**, manager of state legislative affairs, also met with the transition team to discuss MMA’s legislative priorities.

In early December, Renner met with Representative-elect Alice Mann, MD, to discuss the MMA’s provider tax alternative proposal.

Renner and Dick addressed a meeting of state health care lobbyists and policy analysts organized by the American Cancer Society Cancer Action Network (ACS CAN) to discuss health care financing issues. Dick and Renner presented the MMA’s proposal to ensure stable financing for critical programs that provide health care to low-income Minnesotans once the provider tax is repealed at the end of 2019.

Scott Wilson, manager of physician outreach, Annie Krapek of the Twin Cities Medical Society, and Pete Dehnel, MD, conducted a presentation on vaping at the University of Minnesota Medical School-Duluth campus. The trio also presented at HealthPartners Family Medicine in Inver Grove Heights and HealthPartners Family Medicine in Woodbury.

Wilson, **Juliana Milhofer**, policy analyst, and **Lindsey Schneider**, education and events coordinator, attended *Resilience Conference 2018: Moving from Surviving to Thriving* in Plymouth in December.



Janet Silver-smith



Dave Renner



Eric Dick



Scott Wilson



Juliana Milhofer

VIEWPOINT

It's go time

The physicians of Minnesota have been waiting a long time for 2019, the year the provider tax will be repealed. Assuming legislators don't vote to rescind the repeal, physicians across the state will finally be done with the regressive tax. While this is good news, it's also a bit concerning because the Legislature has not succeeded in identifying replacement funds for the nearly \$600 million needed to fund critical health care programs.

Since the tax was enacted in 1992, the MMA has consistently made the repeal of it a high priority on our legislative agenda. We led the call for its repeal, which legislators passed in 2011 (with a Dec. 31, 2019, effective date) in a bipartisan fashion.

While we have opposed the tax, we have supported the safety net programs it funds. MinnesotaCare, Medical Assistance, SHIP, rural health and primary care initiatives, and more are all important programs that impact thousands of Minnesotans and need financial support. That's why this summer the MMA worked with SHADAC, a health policy research center affiliated with the University of Minnesota School of Public Health, and Harbage Consulting, a Sacramento, Calif.-based health policy and communications consulting firm, to scrutinize several options that could aptly serve as replacements for the provider tax.

After analysis and financial modeling, we arrived on an alternative funding mechanism, a claims expenditure assessment (CEA), that would be applied to adjudicated claims processed by health plans and third-party administrators (TPAs).

This will be an improvement for several reasons: It is fairer and less regressive because it would not apply to patient out-of-pocket spending, patients who pay cash or charity care; it's modernized to reflect current (post-ACA) federal and state health care financing realities; it improves the competitive advantage of the state's health-care providers who serve patients from out

of state by removing the provider tax from the cost of their care; and it reduces administrative costs for both the state and all providers of care. Our plan also provides support for public health-related activities currently funded out of the Health Care Access Fund, including programs to support rural health care, smoking cessation, obesity prevention and health data analytics.

Convincing legislators to adopt this new form of financing won't be easy. The MMA's legislative team has already held several meetings with potential allies. They've been receptive, but they've also said that it will be a tough sell, if for no other reason than that change is hard. There are many legislators who believe the easy, and more viable, option is to just rescind the provider tax repeal. Other legislators are certain to insist that the provider tax be repealed without replacing the revenue. In that case, these programs may simply cease to exist as we currently know them.

That's where you come in. We need an army of physicians calling, writing and meeting one-on-one with their legislators. Let them know that replacing the provider tax with a more modern funding source is the right thing to do. You will have an ideal opportunity to do just that on Feb. 13 during the MMA's annual Day at the Capitol. Your presence is critical to helping us convince lawmakers that replacing the provider tax is the best way to ensure the safety net programs' financial security, and that the claims expenditure assessment is the way to do it.

We feel strongly that this assessment is an innovative, sustainable way to ensure access to care while preserving the repeal of the provider tax. Please help us make our case during the legislative session and Day at the Capitol. Let's raise our voices and advocate together for improved practice and healthier Minnesotans!



Randy Rice, MD
MMA Board Chair

We need an army
of physicians calling,
writing and meeting
one-on-one with their
legislators.

One physician's fight for science over politics

What the Eyes Don't See: A Story of Crisis, Resistance, and Hope in an American City

REVIEW BY CHARLES R. MEYER, MD

The diminutive woman's bespectacled face could barely be seen above the lectern at Minneapolis' Westminster Presbyterian Church. She spoke evenly and precisely, telling her story of misplaced public frugality, lying leadership and factual denial. After 20 minutes, even the restful, wood-lined walls of the glorious church reverberated with anger and frustration at the injustices that had endangered the health of children in Flint, Mich. The standing ovation for Mona Hanna-Attisha, MD, lasted way beyond the standards of Minnesota polite.

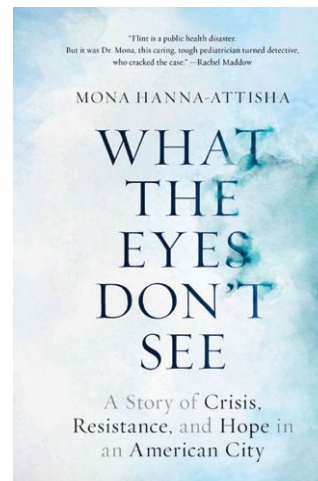
An Iraqi-American whose family immigrated to the United States during the terror of Saddam Hussein's regime, Hanna-Attisha became a practicing pediatrician and currently serves as head of the pediatric residency program at Hurley Hospital in Flint. Deriving its name from the D.H. Lawrence quote, "what the eye doesn't see and the mind doesn't know, doesn't exist," *What the Eyes Don't See: A Story of Crisis, Resistance, and Hope in an American City* recounts the saga of the lead contamination of Flint's water and Hanna-Attisha's critical role in uncovering the attempts to hide it.

Flint was a sick city before its water had excess lead, with household income at half the U.S. median, crime-riddled streets that led Navy Seals to train there because it so resembled a war zone and a life expectancy 15 years less than the national average for children born in Flint. Facing bankruptcy, Flint was involuntarily declared an economic emergency by the Michigan governor and placed under the direction of an emergency manager, who supplanted the mayor. As a cost-saving measure, the emergency manager stopped purchasing Lake Huron water from Detroit's water management department and started drawing water from the Flint River instead. Shortly after this move in 2014,

residents began noticing brown, smelly water issuing from their taps. In the first of the cover-ups, an Environmental Protection Agency investigator examined a Flint home in 2015 and found that the pipes serving the home were leaching lead, that the Michigan Department of Environmental Quality was using faulty testing procedures and that Flint wasn't using corrosion control, which caused the leaching. When he submitted his report, the investigator was reprimanded and referred to an ethics committee.

Hanna-Attisha learned about this and the previous Washington, DC, water crisis from a high school friend who worked as an environmental engineer. In 2002, Washington DC, had switched from chlorine to chloramine to better suppress bacteria in drinking water. The dangerous side effect of this was increased corrosion of lead pipes and leaching of lead into the drinking water. In a nauseating foreshadowing of the Flint scandal, officials at the Centers for Disease Control denied the facts of drinking water lead contamination presented in a report and waited until 2010 to acknowledge their mistake.

Gathering data about children's blood lead levels before and after the change in source of Flint water, Hanna-Attisha battered first Flint and Michigan officials, then the news media, with proof that the change had caused elevated lead levels in a substantial number of Flint's children. She persisted through official denials and ad hominem attacks made even when authorities had not examined the data: "Even before bothering to analyze my findings, the



What the Eyes Don't See: A Story of Crisis, Resistance, and Hope in an American City. By Mona Hanna-Attisha. Published in June 2018 by One World.

governor's office and the state agencies launched a systematic effort to undermine and discredit me." She prevailed and some of the officials who tried to stymie her ended up with criminal charges against them.

According to Hanna-Attisha, the story of Flint's water is "the story of a government poisoning its own citizens, and then lying about it. It is a story about what happens when the very people

responsible for keeping us safe care more about money and power than they care about us, or our children." Interwoven with humanizing details about Hanna-Attisha's personal and profession life, *What the Eyes Don't See* is also the inspiring story of a physician who martialed her science to overcome the dysfunctional and dangerous side of politics.

As I write this, there are reports about lead in the water of Newark and the prolonged public denials from New Jersey authorities that the drinking water was anything but safe. "Déjà vu," that bespectacled, diminutive, fire-breathing physician from Flint is likely saying. **MM**

Charles R. Meyer, MD, is the former executive editor of *Minnesota Medicine*.

HPV vaccination among young adults in Minnesota

Findings from a cross-sectional statewide survey

BY RIDA SHAIKH, BA; RACHEL I. VOGEL, PHD; REBEKAH H. NAGLER, PHD; ABIGAIL SCHNAITH, BA; EMIL LOU, MD, PHD; ANNIE-LAURIE MCREE, DRPH; AND DEANNA TEOH, MD, MS

Catch-up vaccination against human papillomavirus (HPV) has been recommended for older adolescents and young adults to age 26. We sought to describe HPV vaccination coverage among young adults using data from a statewide sample.

This IRB-approved, anonymous, cross-sectional survey was conducted at the 2017 Minnesota State Fair. Fair attendees 18-26 years of age were invited to participate. We used Chi-squared tests to identify demographic variables associated with HPV vaccine initiation (≥ 1 dose) and series completion (3 doses).

Of 1,037 respondents, 637 (61%) had received at least 1 dose of HPV vaccine, and 303 (29%) had completed the series. HPV vaccine initiation was higher among respondents who were younger (age 18-22 vs. age 23-26 years-old; 63% vs. 59%, $p=0.0002$); female (73% vs. 43%, $p<0.0001$); and white race (vs. non-white; 62% vs. 55%; $p=0.006$). Series completion was higher among females (54% vs. 30%; $p<0.0001$). The most common reasons for not being vaccinated were not receiving a provider recommendation (35%), lack of information (34%), and being in a monogamous relationship (30%).

Our findings show that HPV vaccination coverage remains suboptimal among young adults in Minnesota. Efforts are needed to support effective provider recommendations to 18-26-year-olds, especially to non-white men, who are the least likely to report HPV vaccination.

Introduction

Human papillomavirus (HPV) causes more than 500 new cancer diagnoses each year in Minnesota, including cervical, vaginal, vulvar, penile, and increasing numbers of anal and oropharyngeal cancers¹. A preventive HPV vaccine has been commercially available since 2006, and regions with high HPV vaccination rates are predicted to decrease the incidence of HPV-related cancers by 90% in the next two decades². The Advisory Committee on Immunization Practices advocates for HPV vaccination for males and females 11-12 years of age, but the vaccine can be administered to adolescents as young as 9

years old and is recommended for young adults up to 26 years old³; on Oct. 5, 2018, the FDA granted approval to extend the upper age limit to 45 years. In Minnesota, only 59% of adolescents age 13-17 years have initiated the HPV vaccine series, and only 44% have been adequately vaccinated with two doses (if <15 years of age at vaccine initiation) or three doses (if >15 years of age at vaccine initiation)⁴.

Since 2006, young adults ages 18-26 have been eligible for HPV vaccination if not previously vaccinated. The primary objective of this study was to describe self-reported HPV vaccination rates among young adults using data from a statewide

CME credit

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To receive CME credit, complete and submit the online evaluation form <http://mnmed.org/magCME>. Upon successful completion, you will be emailed a certificate of completion within two weeks. You may contact the MMA with questions at cme@mnmed.org. Participants must complete all necessary activity components to be eligible to claim CME credit.

This activity has been planned and implemented in accordance with the accreditation requirements and policies of the Accreditation Council for Continuing Medical Education (ACCME) through the Minnesota Medical Association. The Minnesota Medical Association (MMA) is accredited by the ACCME to provide continuing medical education for physicians.

The Minnesota Medical Association designates this activity for a maximum of .5 AMA PRA Category 1 Credit(s)TM. Physicians should claim only the credit commensurate with the extent of their participation in the activity.

sample. The secondary objectives were to identify populations who have especially low vaccination rates, and to identify reasons for not receiving the HPV vaccine.

Methods

The study and the survey were approved by the University of Minnesota Institutional Review Board. The study was a cross-sectional survey conducted at the Minnesota State Fair during four 7-hour shifts between Aug. 25 and Sept. 4, 2017. Young adults 18-26 years of age were

recruited at the University of Minnesota Driven to Discover building. The Driven to Discover program provides resources for University of Minnesota researchers to conduct studies at the State Fair, including space within a designated Driven to Discover building, wireless internet connections, and electronic tablets for participants to complete surveys. State Fair attendees were eligible to participate in the study if they were between 18 and 26 years old (per self-report), able to read and write in English, and able to provide consent. The survey data were collected and managed via electronic tablets using Research Electronic Data Capture (REDCap)⁵ hosted by the University of Minnesota National Center for Advancing Translational Sciences. Participants received a University of Minnesota drawstring backpack for completion of the survey.

All participants provided informed consent prior to initiating the anonymous survey. Eighteen multiple-choice questions covered the following topics:

- Current HPV vaccination status: (vaccinated, unvaccinated, unknown), number of vaccine doses received, reasons for not vaccinating, receipt of healthcare provider recommendation.
- Demographic data: age, sex, gender, race, sexual orientation, partner status, highest level of education, household income, zip code of residence.
- Health information: history of sexually transmitted infection(s), history of cancer.

The survey also included questions regarding eHealth literacy and social media use, and assessed advertising appeal of social media graphics promoting HPV vaccination.

Survey responses were summarized using descriptive statistics. HPV vaccination status was compared by demographic variables, including gender, age (18-22, 23-26 years), race (white, other), and education (high school graduate or less vs. at least some post-secondary education) using Chi-squared tests. Statistical analyses were performed using SAS 9.4 (Cary, NC) and p-values less than 0.05 were considered statistically significant.

TABLE 1

Participant demographics (N=1,037)

VARIABLE	N	(%)
Age		
18-22 years	571	(55.1)
23-26 years	466	(44.9)
Sex		
Male	374	(36.1)
Female	648	(62.5)
Prefer not to answer	15	(1.5)
Transgender, gender-queer, gender-fluid or gender unsure		
Yes	32	(3.1)
No	979	(94.4)
Prefer not to answer	26	(2.5)
Race (Check all that apply)		
Asian/Pacific Islander	118	(11.4)
Black/African/African American	48	(4.6)
Hispanic/Latino	51	(4.9)
Native American/Alaskan Native	29	(2.8)
White	847	(81.7)
Other	27	(2.6)
Highest Education Level		
≤High school graduate or GED	196	(18.9)
Post-secondary school (college, technical school)	726	(70.0)
Graduate school	94	(9.1)
Prefer not to answer	21	(2.0)
Current Health Insurance Status		
No insurance	35	(3.4)
Coverage by parent/guardian's insurance	590	(56.9)
Coverage by spouse's/partner's insurance	29	(2.8)
Independent private insurance	258	(24.9)
Government insurance	61	(5.9)
Unsure	26	(2.5)
Prefer not to answer	38	(3.7)
Sexual Identity		
Straight or heterosexual	866	(83.5)
Gay or homosexual	50	(4.8)
Bisexual	44	(4.2)
Something else	27	(2.6)
Unsure	18	(1.7)
Prefer not to answer	32	(3.1)
History of sexually transmitted infection		
	72	(7.0)
History of genital warts		
	15	(1.5)
History of cancer		
	12	(1.2)

Results

A total of 1,114 Minnesota State Fair attendees participated in the study. After excluding participants outside the target age range, 1,037 eligible participants formed the study sample. The median age of study participants was 22. Sixty-three percent were women, and a majority (82%) reported white race. The participants were highly educated, with 79% reporting at least some post-secondary education (i.e. college or technical school) or more. Ninety percent of the study population reported having insurance and 85% had private insurance [Table 1].

Among the eligible respondents, 637 (61%) had received at least one dose of HPV vaccine, and 303 (29%; 48% of those initiating vaccination) reported receiving all three doses [Table 2]. Respondents 18-22 years of age were more likely to have initiated HPV vaccination (63%) compared to respondents 23-26 years of age (59%; p=0.0001). Females were also more likely to report initiating vaccination (73%) compared to males (43%; p<0.0001). White respondents were more likely to be vaccinated (62%) compared to non-white respondents (55%; p=0.006).

HPV vaccine series completion, defined as receiving three doses in this older population, was higher among females (54%) compared to males (30%; p<0.0001), and among older respondents (58% vs. 40%; p>0.0001), but did not differ by race [Table 2]. Initial analysis showed higher education level to be associated with both HPV vaccine initiation and completion, however, differences were driven by a higher proportion of individuals with a high school education or less reporting unknown vaccination status. Education level was no longer significant when controlling for age.

Among unvaccinated respondents, only 31% recalled a healthcare provider recommendation for the HPV vaccine (Table 3), with recommendations reported more commonly by females (50% vs. 14%; p<0.0001) and white individuals (38% vs. 13%; p=0.02). Respondents 18-22 years of age were more likely to report having received a healthcare provider recommen-

TABLE 2

HPV vaccination

VARIABLE	RECEIVED 1+ DOSE OF HPV VACCINE						
	n	(%)	n	(%)	n	(%)	
All	637	(61.4)	211	(20.4)	189	(18.2)	--
Sex							<0.0001
Male	159	(42.5)	108	(28.9)	107	(28.6)	
Female	471	(72.7)	100	(15.4)	77	(11.9)	
Age							0.0002
18-22 y/o	362	(63.4)	91	(15.9)	118	(20.7)	
23-26 y/o	275	(59.0)	120	(25.8)	71	(15.2)	
Race							0.0006
White	408	(62.3)	128	(20.5)	89	(14.2)	
Non-white	110	(55.0)	38	(19.0)	52	(26.0)	
Education*							0.004
≤High School	119	(60.7)	28	(14.3)	49	(25.0)	
Post-secondary	510	(62.2)	177	(21.6)	133	(16.2)	

*Education no longer a significant variable for initiation or completion of vaccine series when controlled for age of the participant

dation (37%) than respondents 23-26 years of age (27%; p=0.005).

Among unvaccinated participants, reasons for not being vaccinated are listed in Table 4. The most common reasons reported were lack of a healthcare provider recommendation (17%), lack of information about the HPV vaccine (16%), and being in a monogamous relationship

(14%). Only 11% of respondents reported that their parents did not want them to receive the HPV vaccine; 15% had no particular reason for not being vaccinated.

Discussion

HPV vaccination continues to be an underutilized primary prevention strategy

TABLE 3

Healthcare provider recommendation for HPV vaccination among unvaccinated participants (N=211)

	Yes		No		Unsure		p-value
	n	(%)	n	(%)	n	(%)	
All	66	(31.3)	130	(61.6)	15	(7.1)	--
Sex							<0.0001
Male	15	(13.9)	86	(79.6)	7	(6.5)	
Female	50	(50.0)	42	(42.0)	8	(8.0)	
Age (in years)							0.005
18-22	34	(37.4)	46	(50.6)	11	(12.1)	
23-26	32	(26.7)	84	(70.0)	4	(3.3)	
Race							0.02
White	48	(37.5)	73	(57.0)	7	(5.5)	
Non-white	5	(13.2)	30	(79.0)	3	(7.9)	
Education							0.03
≤High school	11	(39.3)	12	(42.9)	5	(17.9)	
Post-secondary	54	(30.5)	113	(63.8)	10	(5.7)	

NUMBER OF DOSES RECEIVED								
n	(%)	n	(%)	n	(%)	n	(%)	
72	(11.3)	95	(14.9)	303	(47.6)	166	(26.1)	--
								<0.0001
24	(15.2)	20	(12.7)	47	(29.8)	67	(42.4)	
45	(9.6)	74	(15.7)	256	(54.4)	96	(20.4)	
								<0.0001
37	(10.2)	61	(16.9)	143	(39.5)	121	(33.4)	
35	(12.8)	34	(12.4)	160	(58.4)	45	(16.4)	
								0.72
39	(9.6)	52	(12.8)	201	(49.3)	116	(28.4)	
12	(10.9)	18	(16.4)	52	(47.3)	28	(25.5)	
								0.02
15	(12.6)	21	(17.7)	42	(35.3)	41	(34.5)	
56	(11.0)	73	(14.3)	259	(50.9)	121	(23.8)	

in Minnesota, with vaccine initiation and series completion rates similar to the national rates⁶. The HPV vaccine initiation and completion rates reported in our study are similar to the objective rates reported by the Minnesota Department of Health⁴, and suggest that our study population may be representative of the Minnesota population. The higher proportion of young adults 18-22 years of age reporting vaccine initiation suggests an encouraging trend toward increased vaccination. Even among unvaccinated participants, younger participants were more likely to recall a healthcare provider recommendation for HPV vaccination, suggesting a change in healthcare provider HPV vaccine recommendation practices over time. However, the fact that reported vaccine series completion rate is lower in 18- to 22-year-olds than 23- to 26-year-olds suggests that either these young adults are still receiving the vaccine series as part of the “catch-up” vaccine program, rather than at a younger age (i.e., 11-12 years) when the vaccine is more effective, or that while we are improving vaccine initiation rates, we need to devise more strategies to increase vaccine series completion.

The Minnesota Department of Health has reported that women of color in Min-

nesota are 2-3 times more likely to be diagnosed with or to die from invasive cervical cancer than non-Hispanic white women, primarily due to inadequate

screening⁷. The Minnesota Department of Health also found education level to be a predictor of screening, with higher education associated with a higher likelihood of being screened. Similarly, the results of our study highlight disparities in HPV vaccination status by gender and race. Males and individuals reporting non-white race were less likely to be vaccinated, and were less likely to recall receiving a healthcare provider recommendation for vaccination. While these data were not standardized by number of healthcare visits, it does show that greater efforts are needed to encourage vaccination in these populations. Multiple studies have shown healthcare provider recommendation to be the best strategy to increase HPV vaccine uptake⁸⁻¹⁰. Unfortunately, young adults rarely present for routine healthcare maintenance visits^{11,12}; incorporating opportunistic HPV vaccine recommendation and even vaccination during illness visits (e.g. health provider visits for evaluation of a rash, back pain, upper respiratory infection, etc.) is essential¹³.

TABLE 4

Reasons for not receiving the HPV vaccine—check all that apply (N=211)

REASON	N	(%)
I have never heard of the vaccine	26	(12.3)
I don't know enough about it yet	34	(16.1)
I am too old	14	(6.6)
It costs too much	6	(2.8)
It might be unsafe	18	(8.5)
I don't like shots	21	(10.0)
I thought the vaccine was only for females	19	(9.0)
My parents don't want me to get the vaccine	24	(11.4)
I don't know where to get the vaccine	5	(2.4)
I haven't been to a doctor recently	27	(12.8)
My doctor didn't recommend getting the vaccine	35	(16.6)
I'm not sexually active	29	(13.7)
I only have sex with one partner who does not have HPV	30	(14.2)
I've already had a lot of sexual partners	2	(0.9)
I already have HPV	2	(0.9)
Other	14	(6.6)
No particular reason	32	(15.2)

The strengths of our study include the large number of young adult participants from across the state, including 374 males. Although we could not verify HPV vaccination status of participants, the similarities in number of participants reporting initiation and completion of the vaccine series to the objective state data suggest that our sample was representative of the state population, and that participants are aware of their vaccination status. Limitations of our study include the convenience sample selected from attendees of the Minnesota state fair: a majority of participants were white, female, highly educated, and insured, which limits the generalizability of our results. Data on reasons for not being vaccinated may be limited, since unvaccinated participants represent a minority of our study population. All data were collected by anonymous self-report, and are subject to recall bias. We need to improve HPV vaccine initiation and completion rates among Minnesota young adults before they are no longer eligible for the vaccine. Our study highlighted disparities in health care provider recommendations for the vaccine, and associated lower vaccination rates in male and non-white race participants. Additional efforts are needed to ensure appropriate HPV vaccination recommendations are being made to all patients, and to encourage and provide HPV vaccination to these individuals outside of the routine healthcare visit.

All of the authors were at the University of Minnesota at the time the study was conducted: Rida Shaikh, BA, was a research assistant in the Department of Obstetrics, Gynecology & Women's Health and is now a medical student at Des Moines University. Rachel I. Vogel, PhD, is an assistant professor in the Department of Obstetrics, Gynecology & Women's Health, Division of Gynecologic Oncology. Rebekah H. Nagler, PhD, is an assistant professor in the Hubbard School of Journalism and Mass Communication. Abigail Schnaith, BA, is a medical student at the University of Minnesota Medical School. Emil Lou, MD, PhD, is an assistant professor in the Division of Hematology, Oncology and Transplantation. Annie-Laurie McRee, DrPH, is an assistant professor in the Department of Pediatrics, Division of General Pediatrics and Adolescent Health. Deanna Teoh, MD, MS, is an assistant professor in the Division of Gynecologic Oncology, Department of Obstetrics & Gynecology.

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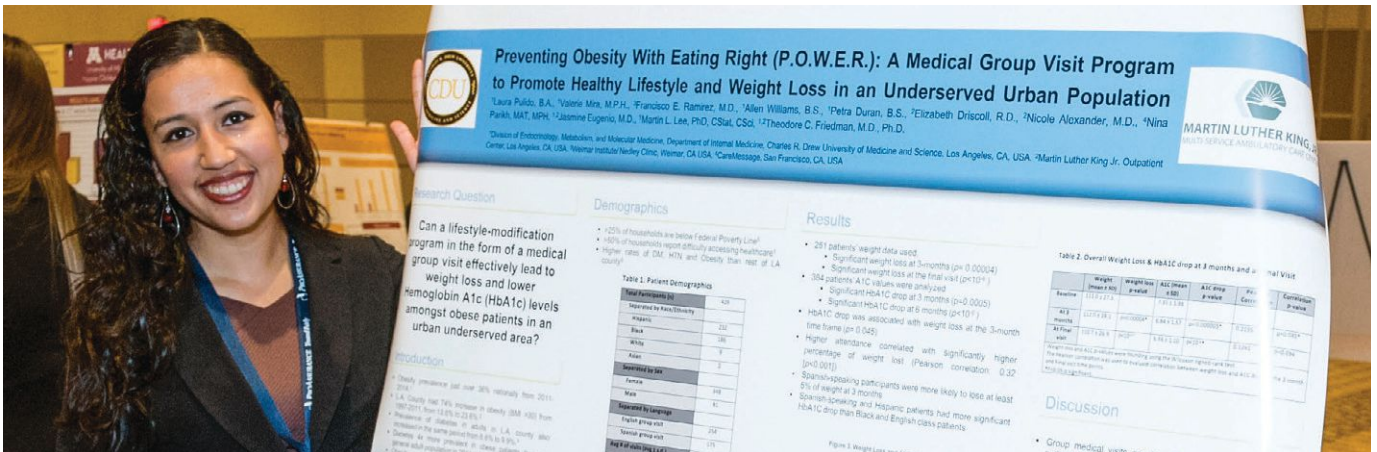
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- Husband, Scott, and three daughters: Margaret, Clara and Harriet. Household includes a Russian desert tortoise, Lombardi, and a Maltipoo puppy, Lola.

Became a physician because ...

I wanted to be able to improve the health of others in a constantly changing field. You never have to stop learning!

Greatest challenge facing medicine today ...

The greatest challenge I see is adequate health care coverage. Often women have limited access to care for chronic illnesses (e.g. diabetes, hypertension) before becoming pregnant, which makes managing these conditions in early pregnancy much more challenging. Women with medical conditions often lack access to reliable contraception.

Favorite fictional physician ...

Dr. John Carter from ER, one of my favorite shows as a young adult.

If I weren't a physician ...

I'd be a French professor—my undergraduate major was French.

WILL NICHOLSON, MD

- Family physician
- Hospitalist and chief of staff at St. John's Hospital, St. Paul
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- From White Bear Lake and now works at the hospital about four miles from where he grew up. Graduated from the University of Minnesota and the University of Minnesota Medical School. Faculty Development fellowship at the University of Minnesota Department of Family Medicine and Community Health.
- Married to Leah with daughter, Vyla, and son, Konrad. Household includes two King Charles spaniels.

Became a physician because ...

I get to help sick people feel better every day. There cannot be a better job!

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Favorite fictional physician ...

I've always been partial to non-fictional physicians: how about Anton Chekhov, a real physician who wrote fiction? Medical practice informed his deep understanding of humanity.

If I weren't a physician ...

I'd do something else on the health care team helping sick people feel better. I know plenty of people who make a fine living but don't like what they do. I don't ever want to be in that boat.



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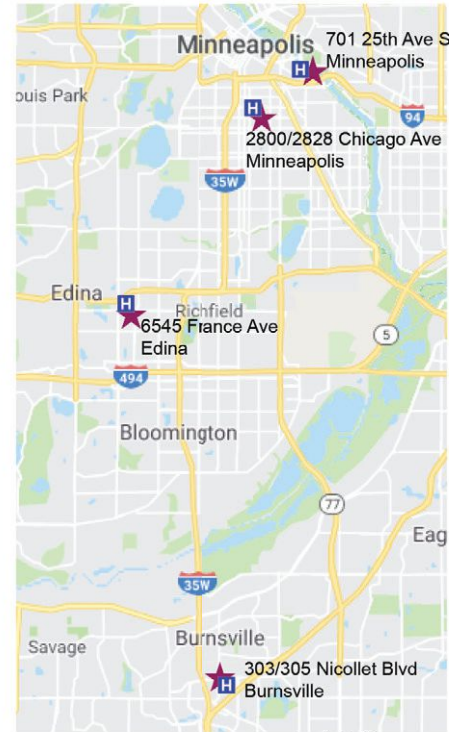
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