

# MINNESOTA MEDICINE



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## Extreme Measures

Doctors are suffering

**QUALITY  
MEASUREMENT  
FATIGUE**

Is relief on the way?

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Learning to work with **BIG DATA** PAGE 8

A doctor ponders **CYBERCHONDRIASIS** PAGE 18

**PHYSICIAN AID-IN-DYING** reconsidered PAGE 31



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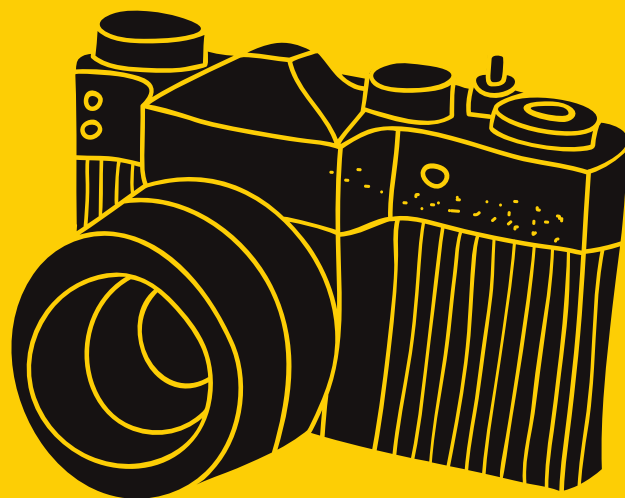
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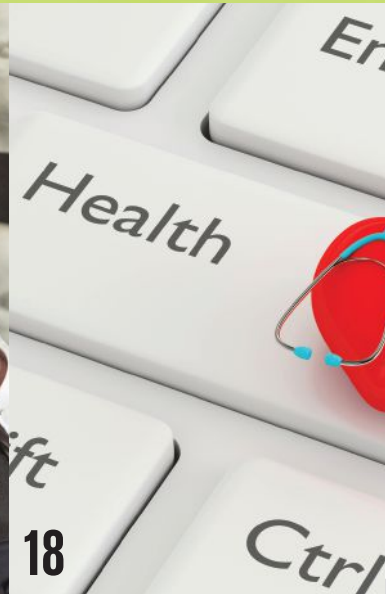
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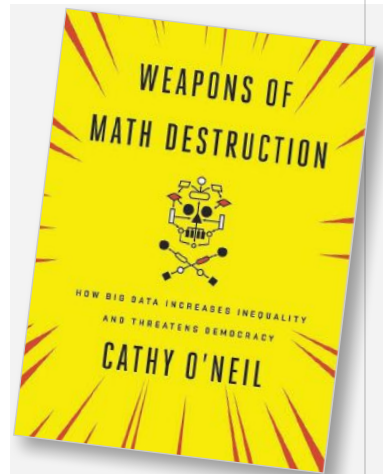
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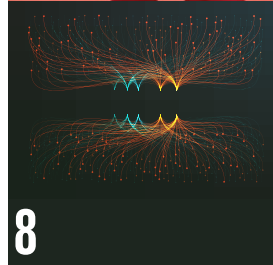
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PHOTO BY SCOTT WALKER

Charles R. Meyer, MD, Editor in Chief

Flexing our modern digital muscles, we can unravel the mysteries of the genome. And yet: For many physicians, the call of the analog persists.

## Embracing the analog

On my computer at home are hundreds of musical albums, ripped from CDs that now languish in a downstairs drawer. The music sounds crisp and clean, with only an occasional transcription glitch, and it's easy to locate songs with the media player database. Like most hip guys, I consume my music digitally. Yet calling to me from a distant corner of the basement are all my old LPs. Recently, I answered their call. I slipped a long-forgotten recording of Rossini overtures out of the sleeve and put it lovingly on the turntable. The sound seemed somehow richer, the experience deeper than punching in a selection on a remote. The uncomfortable conflict between my digital and analog self rumbled in my innards.

For most practicing physicians, that conflict is familiar. The analog world of penned orders and notes is a hazy piece of nostalgia that's been replaced by the keyboards, monitors and data of today's computerized medical field. We're inundated by so much information, the real reasons we practice medicine often seem lost. Sure, with our electronic instruments we can measure more, we can write more clearly, and we can store everything. Troves of captured "big data" can be plumbed for new revelations. Flexing our modern digital muscles, we can unravel the mysteries of the genome. And yet: For many physicians, the call of the analog persists.

In his recent book, *The Revenge of Analog: Real Things and Why They Matter*, journalist David Sax investigates a movement that is sweeping society. Burgeoning vinyl record sales, popular Moleskine notebooks, sprouting board game cafes, and renascent film photography are symptoms of a thirst for more tangible experiences and a realization that our shiny digital world has its limitations and drawbacks. Observing a board game cafe called Snakes

& Lattes, Sax acknowledges that most of the games there could be played online, free of personal contact with any opponent. But Sax notes, "Playing a board game in a neutral environment, such as Snakes & Lattes, transforms the way its players relate to one another. They engage. They speak. They laugh. They embrace vulnerability. They are human." Sax even contends that the efficiency and productivity advantages of digital commerce are overplayed. "For all its wealth creation and gains, the digital economy, as it stands, has not delivered any substantive gains in employment and wages," he writes.

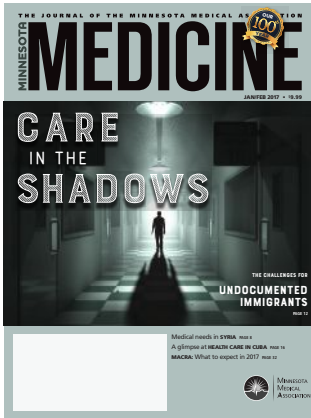
Sax refutes that he is a neo-Luddite—a hopeless romantic yearning for the age of transistor radios and Bobby Vee. He fully acknowledges certain benefits that digital technology grants our lives. But he also highlights what we're missing when we fully embrace a universe of ones and zeros, and he sees large numbers of people reclaiming items and connections that have, for a while now, seemed lost.

My daily life is heavily digital. I live with my iPhone and feel naked when it's not there. I interact with an EHR all day, documenting visits, phone calls and refills. I don't pine for the time when I drained Bic pens performing the same tasks. And I see the value in many of the quality measures I'm asked to do, even though they seem to be metastasizing.

Yet I don't want the data to drown out the analog qualities in which the joy of medical practice is rooted. Like the Snakes & Lattes competitions, my professional day is more than what's on my screen. Talking to my colleagues is analog. Talking to my patients is analog.

My advice is: Keep your LPs.

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### Where would immigrant physicians be most effective?

The article “A New Way Up” in the January/February issue pointed out some important and essential concerns regarding international medical graduates. Making residency positions—and necessary funding—available are critical issues, and I am pleased that a program exists to do those things.

I hope that it will continue to grow

and be successful. However, I have a major question regarding graduates being required to serve for five years in an underserved part of the state. Are these newly trained physicians going to be displaced, yet again, to areas where there are none of their countrypeople? I can understand having them serve in urban areas, where the majority of their fellow immigrants—the people who would most benefit from their presence, for a number of reasons—reside. But forcing these physicians to go to rural—albeit needy—Minnesota, where the majority of residents are certainly not of similar ethnicities, makes no sense to me whatsoever and seems as though it would be exceptionally challenging. Can someone enlighten?

Paul Waytz, MD



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# The good fight

They don booties, gloves and shiny black helmets. They pad their torsos. They pop in mouthguards. Then, the dozen people gathered on this snowy Friday evening await word from their teacher.

“Find a partner,” Master Allan Kunstmann instructs. The students comply, pairing up based on size and age—kids with kids, teens with teens, and adults with adults.

“Salute!” Kunstmann commands. “Karate stance. Begin.”

With fists raised, family medicine resident Kyrstin Ball, DO, begins hopping from side to side. She jabs at her partner, flips around, kicks him in the shoulder, and then, again, in the back.

“Sorry,” Ball says, breathlessly. The combatants dance around each other a few seconds more before Ball’s counterpart punches. She punches in return. He kicks; she kicks back; and the round is up. “Thanks,” Ball says, giving her classmate a half-hug before springing away to square off against someone else.

During sparring night at USA Karate, housed in a Maple Grove, Minnesota, strip-mall studio, Ball is in her glory, laughing and grunting as she works up a sweat. “It’s a time that you can take everything that you’ve learned throughout the week, put it to a test, and see how it works,” she says.



PHOTO BY MIKE KRIVIT

After years of study, Kyrstin Ball, DO, has a leg up on many of her fellow students at USA Karate in Maple Grove, Minnesota.

After studying karate for 14 years, she has plenty to put into practice. One of the most skilled participants in the room, Ball sometimes plays the part of coach, encouraging her partners even as they attempt to land their blows. She allows one opponent to put his foot on her hip, push off, spin around, and kick her on the side of the head. “That was nice,” she tells him. Within the culture surrounding karate, Ball explains, individuals who have more experience help those who have less.

Ball has been coming to this studio since she “dove in, headfirst” to begin practicing the martial art at age 15. Attending classes six times a week, she earned a black belt in less than a year (a

school record only recently broken). She continued classes while playing three sports a year in high school and while attending the University of Minnesota as an undergrad. She’s competed in tournaments and taught at the studio. The only time karate took a back seat in her life was when she went off to Lake Erie College of Osteopathic Medicine in Erie, Pennsylvania.

Ball says karate has made her strong (she can break two boards with her hands—and three with her feet); limber (she can do horizontal splits); and able to defend herself against nearly anyone. It’s also helped build confidence and focus, two traits she needed when trying to get into medical school. As the first in her



family to pursue a health care career, she found the application process to be “a huge learning curve,” she recalls.

Now married, a mother, and in her first year of the St. John’s Hospital family medicine residency program at the University of Minnesota, Ball makes the 25-mile trek, two or three times a week, back to the karate school she loves. For her, the place is home. It’s not only where she’s chalked up many accomplishments (Ball is now a fourth-degree black belt); it’s also where she maintains connections with friends and family. “There was one point where it was me, my little sister, my older brother, my dad and two of my cousins who all went to karate there,” she says. Today, Ball is often accompanied by her husband and son. “It’s kind of like my constant,” she says. “It’s my time that I can do something I love and relax at the end of the day. It’s with people I’ve known for a long time, and it makes me feel more connected with the world.” – CARMEN PEOTA

PHOTO BY MIKE KRIVIT



DOWNTIME

SHORT TAKES ←

Ball suits up for a Friday night sparring session.



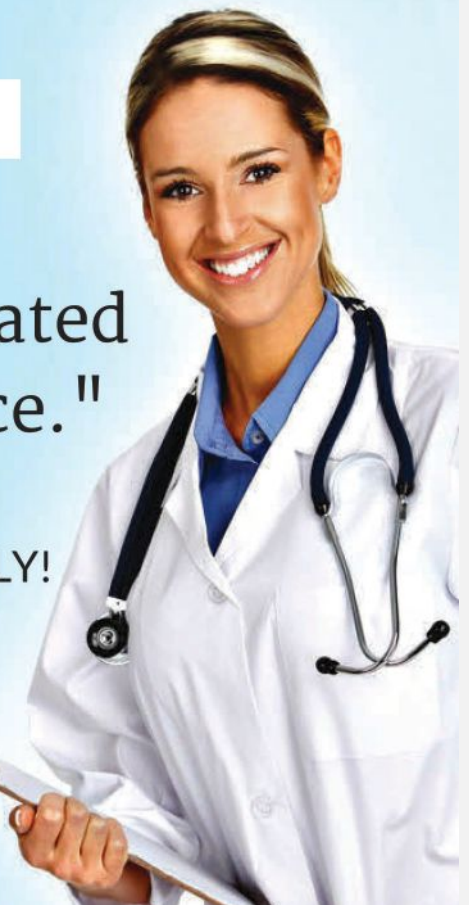
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# Big Data Boot Camp

## *Crash course invites experts from multiple fields to mingle in the world of **medical data***

In July, a group of mathematicians, physicians and computer scientists will head off to boot camp. They won't be marching in formation, but they'll get their feet wet poring over such topics as natural language processing, visualization analytics and data mining. This boot camp is a primer on medical research in the era of big data.

The four-day Big Data Coursework for Computational Medicine (BDC4CM) is the brainchild of three researchers with Minnesota connections. They responded when the National Institutes of Health (NIH) asked for help getting people up to speed using massive amounts of information generated by such sources as gene sequencing machines, electronic health records (EHRs) and even smartphones. The NIH was offering grants as part of its Big Data to Knowledge (BD2K) initiative, launched with the Obama administration in 2013. The initiative's aims include increasing integration of data science into biomedical research.

### **Collaborative coursework**

When the NIH grants first became available, three Mayo Clinic colleagues—Christopher Chute, MD, DrPH; Claudia Neuhauser, PhD; and Jyotishman Pathak, PhD—came up with the idea of bringing together “fellows” from various fields for a crash course in computational medicine.

“We thought, between Mayo Clinic and the University of Minnesota, and with the computational side and the clinical side, we could put together a strong training program,” says Neuhauser, a mathematician who now directs graduate studies in bioinformatics and computational biology at the University of Minnesota. Chute is currently at Johns Hopkins University in Baltimore, and Pathak is at Weill Cornell Medicine in New York.

The NIH responded to the trio's proposal with funding for three annual big data boot camps, the first of which took place in Rochester, Minnesota, in 2015. The second occurred last year in New York, where this year's event also is scheduled.

Neuhauser says her team's goal is to introduce

participants to concepts and tools, and to make them aware of ethical issues that methods like data mining and gene sequencing raise. BDC4CM is not aimed at the small group of people who want to go “deep into the field,” she emphasizes. “That's a whole degree program.” Instead, this experience is geared toward those—including physicians—within a much larger group of people, who need to understand what the smaller group is doing.

### **Data mining insights**

Attendees at last year's BDC4CM included Nishant Sahni, MD, MS, an assistant professor of medicine at the University of Minnesota and a hospitalist at University of Minnesota Medical Center (UMMC). Sahni says it was eye-opening to see how individuals from different fields, coming from different perspectives, think about the potential of big data. “It was almost like the five blind men with the elephant in the room, with everybody trying to feel what the field was about,” he says.

Sahni was drawn to the program by his interest in mining EHRs for information that can be used to improve clinical care. “All this data is sitting there and nobody is using it,” he says. Sahni has already tapped UMMC's EHR for information about care of patients diagnosed with sepsis in the emergency room. He was

able to determine the proportion of patients who immediately received life-saving antibiotics, which has an impact on outcomes.

Sahni says data mining is very different from traditional research, where the goal is to generate data. “This is the other way [around],” he says, explaining that the researcher’s task is to look for what might be found in data that already exists. “This is almost like dumpster diving.”

Individuals typically can’t do that work on their own, as it requires not only a clinical question but also the ability to query a database; organize data once it’s pulled; and then analyze it. “You typically won’t find single-author papers,” Neuhauser says. “It’s usually a group of people with different skill sets investigating something.”

### Language lessons

The BDC4CM goals include bridging gaps in understanding between those who approach projects from the biomedical side and those who come from the computational side. Neuhauser says that when representatives from both groups attend the workshops together, it helps people from one group learn the “language” and understand the concerns of those in the other.

There’s evidence that such cross-communication is happening out in the field, as well. “Increasingly, people on the computation side have quite a bit of knowledge about the biomedical side,” Neuhauser says, noting that she’s learned a lot about cancer genomics, for example. Meanwhile, some clinicians are educating themselves about computers. Count Sahni among that group: He’s taught himself how to code.

Sahni believes that stepping outside of one’s professional silo will be important to those who wish to leverage big data in the future. “Increasingly,” he says, “this is a field that is going to be driven by people reaching out to the other side.” – CARMEN PEOTA

## Big Data Boot Camp fellowships

The National Institutes of Health funds 20 fellows a year to attend Big Data Coursework for Computational Medicine (BDC4CM), defraying the costs of travel, meals and registration. The 2017 BDC4CM registration deadline is March 15.

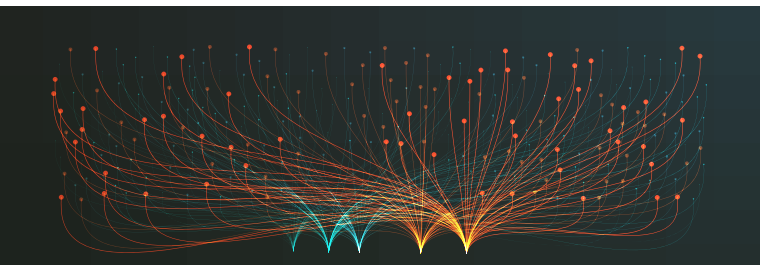
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ON THE COVER

# Extreme measures



# Doctors are suffering

# QUALITY MEASUREMENT FATIGUE

## Is relief on the way?

BY HOWARD BELL

**S**taff at the Mankato Clinic are concerned.

The time it takes them to collect and report quality data has grown exponentially, according to Julie Gerndt, MD, a psychiatrist and the clinic's chief medical officer. "The pace at which payers are asking us to report measures has reached a fevered pitch," she says. "We've doubled our IT, quality resource and electronic health record staff, and changed workflows in every department. Different payers want different measures reported in different ways, to be used for different reasons—and new measures keep coming. It's fueling burnout and stress for our providers. Smaller clinics can't afford to

handle this—which is unfortunate and ironic, since studies show smaller clinics often provide higher-value care."

Large clinics are suffering measurement fatigue, too. "It's confusing and resource-intensive," says Paula Santrach, MD, chief quality officer at Mayo Clinic. "Our department has more than 200 employees. Most of them work on measures."

### **Many, many measures**

In 2001, the Institute of Medicine's *Crossing the Quality Chasm*<sup>1</sup> identified significant variations in health care outcomes and recommended that the U.S. health care industry enact fundamental changes in the way it measures and reports its

performance. In the wake of the highly influential report, MN Community Measurement (MNCM) opened its doors four years later, driven by the notion that you can't improve what you don't measure. The Minneapolis-based nonprofit collects data about health care quality from clinics, hospitals and payers, and makes the information available to all who want it, including the public. MNCM's goal is to generate findings that fuel positive change—in people's health, health care costs, and equity of care throughout Minnesota.

To acquire various types of meaningful data, MNCM uses individual "measures" to assess particular aspects of health care.



# *Fair measurement means accounting for attribution*

Paula Santrach, MD, chief quality officer at Mayo Clinic, acknowledges that alignment and other means of measurement simplification are important; but she cautions that simplification could create problems if taken too far. She points to diabetes care as an example.

Mayo endocrinologists often provide short-term, episodic diabetes consultations for patients whose condition is poorly controlled. Looking only at measure adherence, outcomes for these brief visits can appear to be very different than those for ongoing diabetes care.

“Our endocrinologists may not perform all five of the D5 optimal diabetes care measures because some of them may have been performed elsewhere,” Santrach explains. “But if you don’t do all five, or have record of them being done, you don’t get credit for providing optimal diabetes care. I question whether these patients and providers should even be included in the measure since the outcome of the visit is a set of care recommendations for the ongoing care provider at home.”

When an outcome measure cohort includes patients receiving short-term care, that’s a complication—one that must be factored in when designing outcome measures, Santrach says. As medicine moves toward value-based payment, she stresses, it’s important to consider attribution—the designation of who a patient belongs to for quality measurement purposes.

According to Santrach, more than 150 attribution methodologies exist for quality measures. “The choice of the attribution methodology and its accuracy is just as important as the outcome measure itself,” she says. Last year, the National Quality Forum, which endorses measures, published a report acknowledging the need to start endorsing attribution methods as well.

As she anticipates increased national discussion about the topic, Santrach believes attribution must be factored into the measurement process in order to fairly reimburse providers across different types of practices. “When it comes to measures,” she says, “one size does not fit all.”

MNCM routinely develops and tests new measures, and retires ineffective ones.

Currently, MNCM has 42 quality improvement measures for medical groups or clinics. Twenty-eight of those measures use data reported by clinics, and 14 use data reported by health plans. Some of the MNCM measures are also part of the Minnesota Department of Health’s State-wide Quality Reporting and Measurement System (SQRMS), which MNCM manages. Since 2010, clinics and hospitals have been required by law to report data for the SQRMS measures. [See sidebar, page 13.]

Along with collecting data for SQRMS and MNCM measures, clinics and health plans must provide data for Medicare and Medicaid measures. In addition, clinics often must report data for private payers’ own measure sets—and provide more data that health plans must report to stay accredited.

Many health plan measures are part of the Healthcare Effectiveness Data and Information Set (HEDIS), a widely used national set of 81 measures. Companies offering Medicare Advantage plans must also report on 53 “star rating” measures that can earn them bonuses and be used as a marketing tool to attract enrollees. Insurers rely on physician practices to provide much of that data.

On January 1, the measurement burden increased with the launch of Medicare’s new quality payment program, which includes the Merit-Based Incentive Payment System (MIPS). Part of the Medicare Access and CHIP Reauthorization Act of 2015, MIPS offers financial incentives for reporting on measures, and calls upon clinics to conduct quality improvement projects. MIPS creates financial incentives for the reporting of measures not only by primary care physicians but by specialists as well.

So there’s MNCM, SQRMS, HEDIS, star ratings, MIPS and more measures, including those required by Medicaid. Although there’s some overlap in the information they ask for, each of these measure sets is quite different from the rest. Adding to the

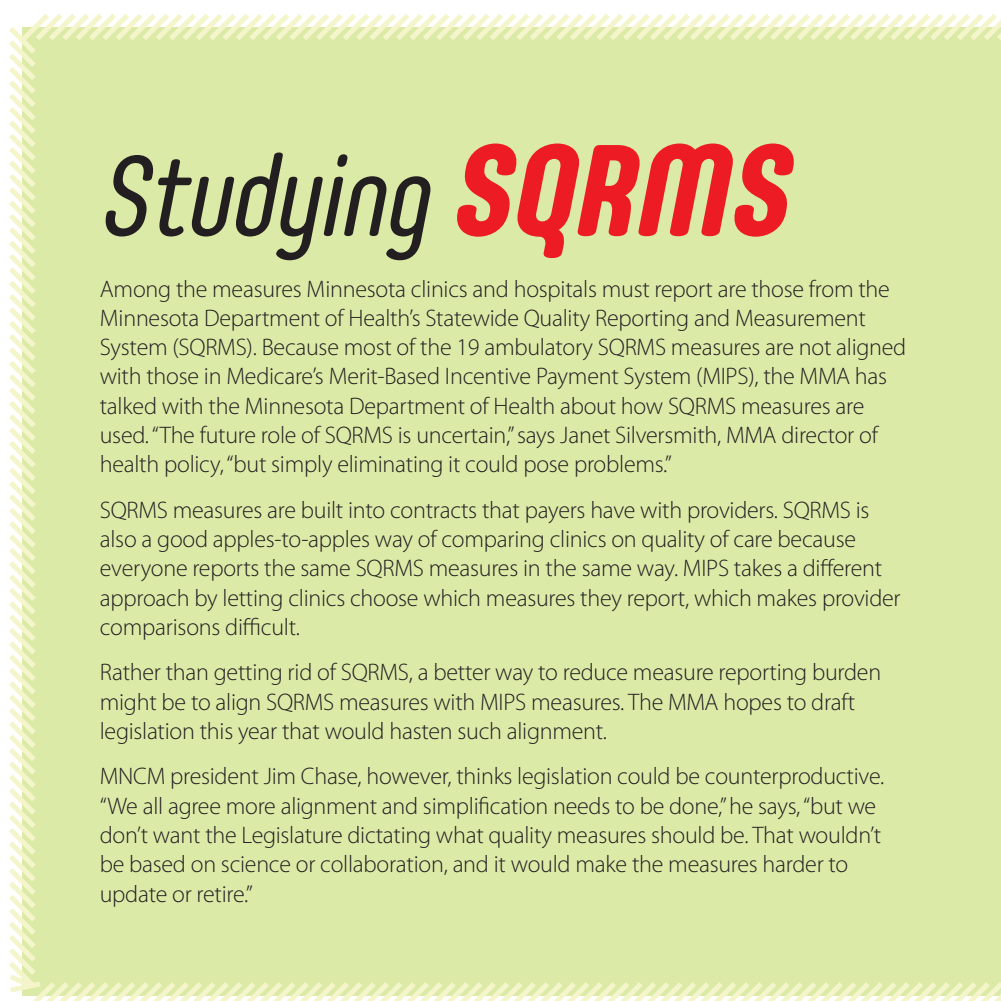
complexity are benchmarks that underlie each measure but often differ for the same measure, depending on whether the measure is being used to determine payment, improve quality of care, or report information to the public to help patients “shop” for quality.

### Trying times

Quality reporting has become more time-consuming in recent years, not only due to increasing numbers of measures required but also because fewer of those measures are process measures that can be gleaned from insurance claims data. Process measures pose questions about specific actions taken while providing care—for example, “Has the right test been ordered for the patient?” Increasingly, today’s measure sets include more outcome measures, which ask questions about a specific aspect of a patient’s health after receiving care—for example, “Has the patient’s depression improved?” Outcome measures are more useful for improving quality, but they take more time to conduct, as clinics must retrieve data from medical records, interview patients or ask patients to complete surveys.

Mankato Clinic reports various types of measures to multiple entities, including MNMCM, the Centers for Medicare and Medicaid Services (CMS), and six different health plans, few of whose measures align with each other. “One payer wants us to measure depression remission at six months; another wants 12 months,” says Gerndt. “One payer wants us to measure diabetes care by whether patients are taking their medications, which is a process measure. Another wants us to measure it by how many patients have A1cs of seven or less, which is an outcome measure. One payer wants us to measure vascular care by whether patients are on statins. CMS wants us to measure asthma care using the process measure related to medication compliance. MNMCM wants us to measure the outcome—is the patient better?”

“There are measures and more measures, without enough focus on which ones are really helpful for patients and physicians,” says Janet Silversmith, MMA



# Studying **SQRMS**

Among the measures Minnesota clinics and hospitals must report are those from the Minnesota Department of Health’s Statewide Quality Reporting and Measurement System (SQRMS). Because most of the 19 ambulatory SQRMS measures are not aligned with those in Medicare’s Merit-Based Incentive Payment System (MIPS), the MMA has talked with the Minnesota Department of Health about how SQRMS measures are used. “The future role of SQRMS is uncertain,” says Janet Silversmith, MMA director of health policy, “but simply eliminating it could pose problems.”

SQRMS measures are built into contracts that payers have with providers. SQRMS is also a good apples-to-apples way of comparing clinics on quality of care because everyone reports the same SQRMS measures in the same way. MIPS takes a different approach by letting clinics choose which measures they report, which makes provider comparisons difficult.

Rather than getting rid of SQRMS, a better way to reduce measure reporting burden might be to align SQRMS measures with MIPS measures. The MMA hopes to draft legislation this year that would hasten such alignment.

MNCM president Jim Chase, however, thinks legislation could be counterproductive. “We all agree more alignment and simplification needs to be done,” he says, “but we don’t want the Legislature dictating what quality measures should be. That wouldn’t be based on science or collaboration, and it would make the measures harder to update or retire.”

director of health policy. “Over the years, measures have gotten better and are used in better ways, so we’re making progress, but physicians sometimes struggle to see the value and to justify the time spent on all these measurements.”

Nevertheless, they may continue to see that time commitment grow, as CMS and private payers are moving away from fee-based physician compensation to value-based compensation. Instead of paying doctors for procedures and services they provide, payers will compensate them based on how well they meet measures for providing the best care at the lowest cost.

### Signs of change?

In 2015, the Institute of Medicine acknowledged how complex and burdensome quality reporting has become, and released its *Vital Signs*<sup>2</sup> report, which con-

cluded that there are too many measures that often don’t improve patient health. To address the issue, *Vital Signs* recommended universal adoption of 15 core quality measures. [See sidebar, page 14.]

The *Vital Signs* report, together with growing concerns from physicians about measurement burden, prompted the MMA to call for a moratorium on any new measures in Minnesota until some measures are retired and it can be decided how the state’s existing measures meet the standards suggested in *Vital Signs*. “The MMA supports measurement and improvement,” says Silversmith. “But it’s time to hit the pause button, step back, revisit what we want to accomplish, and determine what measures will be most effective at supporting that goal.”



**Alignment efforts**

One tactic that may offer ample opportunities for improvement is alignment—using the same measures to satisfy multiple reporting requirements. Aligning

measure sets poses a huge challenge. It requires not only using the same measures but reporting them in the same way too.

Physicians might find it hard to believe, but Minnesota has already done more than

most states to align measures, according to Jim Chase, MNCM president and vice chair of the National Quality Forum, which endorses measures for use across the country. “Getting payers, clinics and hospitals at one table to collaborate on measures and agree on which measures to use, and how to use them, is what we’ve always done at MNCM,” he says.

For example, MNCM and SQRMS measures are already aligned, except in cases where reporting formats differ. MNCM measures for health plans are aligned with 14 HEDIS measures and 13 star-ratings measures. And, Chase says, Medical Assistance (Minnesota’s Medicaid program) measures are “pretty well aligned” with MCMN measures. Medical Assistance, in fact, uses several MNCM measures.

For many physicians, the priority now is to align Minnesota measures with those that Medicare uses to pay physicians. To avoid payment penalties, most physicians must report six quality measures they choose from a list of 271 MIPS measures. Those quality measures represent 60 percent of physicians’ MIPS scores in 2017, which affects how much they’ll be paid in 2019.

“The good news is, primary care providers can use MNCM measures to meet MIPS measure requirements,” says Chase. That’s because some MNCM measures are also on the lengthier MIPS measure list. A big exception is the patient experience measure, for which Medicare requires a very different format. “Aligning the patient experience measure should be a priority,” Chase says. “Otherwise, when it comes to primary care, we’re well aligned with MIPS. Not too many other states can say that.”

MNCM must now decide whether aligning more of its measures with MIPS includes adopting additional measures already included in the federal set. “If we do,” says Chase, “it’ll increase provider burden. If we don’t, it may jeopardize physician compensation.”

For example, MNCM hasn’t used the MIPS measure for osteoporosis screening because Minnesota providers are concerned it might lead to overuse of screen-

# Vital Signs calls for 15 key measures

In April 2015, the *Vital Signs*<sup>2</sup> report from the Institute of Medicine called for decreasing physician burden and increasing measure alignment by having the U.S. health care system universally adopt 15 core measures for improving health and health care:

- ◆ Life expectancy
- ◆ Well-being
- ◆ Overweight and obesity
- ◆ Addictive behavior
- ◆ Unintended pregnancy
- ◆ Healthy communities
- ◆ Preventive services
- ◆ Access to care
- ◆ Patient safety
- ◆ Evidence-based care
- ◆ Care that matches patient goals
- ◆ Personal spending burden
- ◆ Population spending burden
- ◆ Individual engagement
- ◆ Community engagement



The measures are general, and some people say universal adoption of them is unachievable. Nevertheless, the report serves as a roadmap and starting point—one that prompted the MMA to call for a moratorium on creating more measures. The *Vital Signs* report also prompted Minnesota’s Department of Human Services to call for a “transformation” of measures by focusing on what matters most for improving patient outcomes.



ing. “But Minnesota providers may lose money on this if we don’t adopt it and improve our rates of performance,” Chase says. “One approach to the dilemma is to go ahead and adopt the MIPS measure, then encourage CMS to change it in a way that avoids overuse.”

Another example: MNMCM’s optimal diabetes care measure is widely used by Minnesota clinics, but it doesn’t include the MIPS measure requirement for having patients get dilated retinal exams. Adopting this sub-measure would cost time and money, but it has to be done, according to MNMCM board chair Tim Hernandez, MD, a family physician and chief quality officer for Entira Family Clinics in St. Paul. “This will require a different relationship with eye doctors that’s going to take work and time for us,” he says. “It also requires a different approach to data collection and workflow. But we’ll give it priority because it determines our CMS payments.”

MNMCM is also considering adopting several other MIPS measures, including the osteoporosis measure for women following a fracture, an asthma medications ratio measure, and measures for 30-day all-cause hospital readmission, medication reconciliation within 30 days of discharge, and use of high-risk medications with the elderly.

Meanwhile, alignment is a two-way street. As MNMCM has explored adopting some MIPS measures, CMS has adopted seven MNMCM measures and sub-measures—many of them outcome measures—regarding depression, asthma, colorectal cancer screening and diabetes. MNMCM is the national “measure steward” for all of these measures, meaning the Minnesota organization developed and tested them, and will update them as needed.

Minnesota is already a leader in using outcome measures. They can require more work than process measures do, but once it’s determined whether a patient is better, Chase says, “you can sometimes eliminate looking at test scores or other aspects of care. CMS has told us they want more of what Minnesota is using—more outcome measures.”

But CMS will probably never be able to use as many outcome measures as Minnesota does, according to Chase. Some insurers and providers elsewhere in the country resist using them, he says, because they take more work—and because many states don’t have the collaborative culture it takes to create, agree upon and use them. “Minnesota doctors appreciate that we’ve moved toward more useful outcome measures, even though they do increase burden,” Chase says. “Now we need to balance that by eliminating other measures that don’t provide as much value.”

### **Alignment dilemma**

So, will Minnesota keep using all its outcome measures? Or, to simplify its efforts and maximize CMS payments received, will the state adopt some MIPS process measures?

“It’s a dilemma,” says Silversmith. “We need to align our measures with CMS measures so there are not parallel data-collection burdens. But we don’t want to lose the high-value measures we have.”

It’s probably not an either/or situation, Silversmith says. CMS wants more outcome measures, and Minnesota is in a position to provide those. But lots of other groups have outcome measures they’d like CMS to adopt, too.

“There’s only so much we can do here in Minnesota to align our measures with MIPS measures,” says Chase. “A lot of it is up to CMS.” He says CMS may delegate that alignment task to state Medicaid agencies. That might be a good thing for Minnesota, he says, “because we’re already ahead of others on measurement alignment, and we’d be in a better position to keep using our high-quality outcome measures, rather than converting to a federal measure set of mostly process measures that’s likely to add burden with less benefit for patient health.”

Santrach worries that state and federal efforts to align measures “will just make things more complicated,” she says. “I don’t think we’ve found the right answer yet.” Gerndt says that if federal measures were imposed on Minnesota, “It would be a big step backward.” Hernandez says

it’s happening already. “We’re seeing a gradual, intentional shift from state measures to federal measures that’s not good for medicine in Minnesota,” he says. “Outcome measures are more valuable than process measures. We’ve worked hard in Minnesota to refine, align and innovate useful measures. But I’m afraid we’re going to have a lot less say in what measures we use here.”

Regardless of who’s adopting whose measures, alignment alone won’t be enough, according to Jeff Schiff, MD, MBA, medical director for Minnesota’s Department of Human Services, which runs Medical Assistance. “We need a major change of focus with four goals in mind,” he says. They are:

- Measure what matters most.
- Measure outcomes rather than processes, whenever possible.
- Link measures to clinical opportunities to improve.
- Make clinical relevancy a higher priority than administrative relevancy.

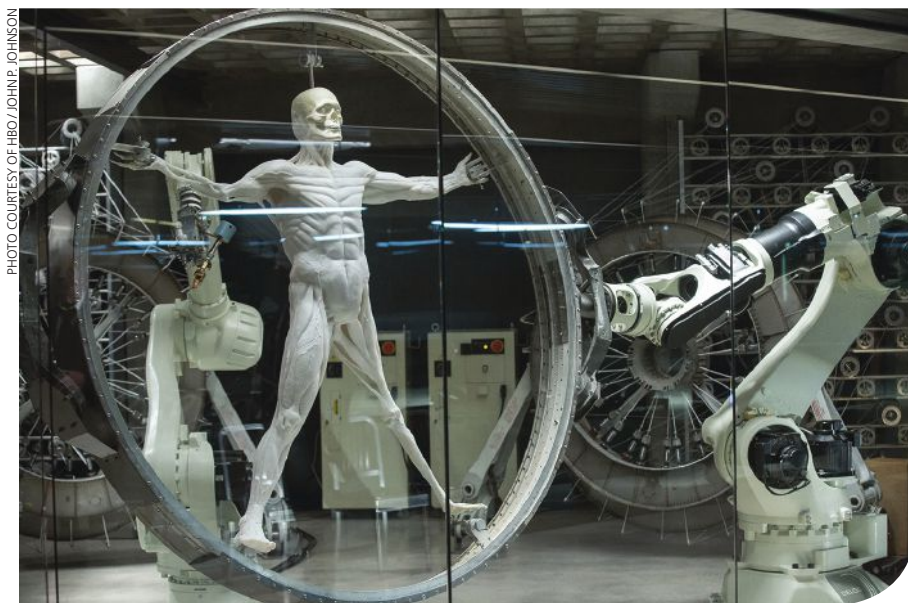
Meeting those goals will be no easy task, Schiff admits. “Measurement transformation is a quest. It doesn’t happen overnight. The measurement system needs to be linked closer to practice transformation, because right now measurement’s purpose to improve health and well-being is accomplished too intermittently and too slowly.”

Whatever happens, says Silversmith, “The goal is to reduce measure burden on our doctors. That’s critical.” **MM**

Howard Bell is a medical writer and frequent contributor to *Minnesota Medicine*.

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HBO's *Westworld* imagines how artificial intelligence could have dire costs. Should health care professionals take note?

WHERE WILL AI TAKE US?

## *Westworld* triggers reflections about radiology's future

BY JOSHUA T. OLSON

When the Radiological Society of North America (RSNA) hosted its 2016 annual meeting in Chicago, among the chief subjects discussed was the evolution of machine learning and its impact on radiology. Session topics touched on key developments in artificial intelligence (AI), including the use of computing technology to model the neural networks of the human brain—a technique labelled “deep learning.” Through deep learning, computers have demonstrated an ability to surpass humans in competitions measuring accuracy of visual recognition.

Not unexpectedly, the infusion of this technology into radiology work has already begun. For example, computer-assisted identification of breast lesions now plays a major role in mammographic screening for breast cancer.<sup>1</sup> At the RSNA meeting, attendees discussed possible

future AI applications, including the use of machine learning to correlate imaging findings with clinical data in electronic medical records, as well as with relevant scientific literature—an innovation that would usher in a new era of precision medicine.

Last fall, as a medical student circling the Midwest on the residency interview trail in pursuit of a position in the radiology field, I found myself splitting time between virtually attending the RSNA meeting, preparing for upcoming interviews, and (like many of my colleagues) binge-watching HBO's new hit TV series *Westworld*. In this remake of Michael Crichton's 1973 science fiction thriller, theme-park robots revolt and begin killing park visitors. The show's scenic western vistas, juxtaposed with the workings of a futuristic android produc-

tion facility, were likely enough to hook many viewers. As a budding physician with a passion for anatomy, I was further enthralled with how the show depicted the engineering of the androids' human-like physiques from artificial primordial elements. The onscreen procedure was equal parts fascinating and disturbing, invoking Vesalius' grisly dissections, which founded our modern understanding of the human body. However, my strongest personal response to the show has been an unexpected realization that the ethical issues AI poses in *Westworld* will likely be the foremost issues the field of radiology faces during my career.

In *Westworld*, the AI incorporated into “host” robots has advanced to the point of passing the famed Turing test. Visitors to the titular theme park cannot distinguish these artificial beings from actual humans. Today, in the real world, advancements in deep learning are allowing AI to accumulate new information and understanding at a rate that humans cannot match. According to Keith J. Dreyer, DO, PhD, and vice chairman of Radiology Computer and Information Sciences at Massachusetts General Hospital, the “point of singularity”—a time at which machine intelligence surpasses that of all humans combined—could be just over a decade away, occurring as soon as 2029.<sup>2</sup> Given Dreyer's prediction, perhaps some elements of *Westworld* are not so far-fetched—but instead of playing out in an antiquated western theme park, they'll be set within the modern American health care system.

Putting aside the plausibility of such a scenario, I find myself pondering the implications AI poses for radiology. Given recent advances in visual recognition software, will deep learning reach a point where the technology doesn't merely augment the work of radiologists, but fully replace it? Will other humans' health care

roles become obsolete, as well? Will technology we employ while serving patients ever be able to “think” in a manner we consider “conscious”? If so, where will the responsibility lie if machine error leads to faulty or missed diagnoses—say, for example, a missed lung nodule that leads to metastatic cancer? What will be our threshold of tolerance for such mistakes?

Most importantly, to what degree will radiologists incorporate AI into the processes of making life-or-death health care management decisions?

Undoubtedly, these are questions we’ll grapple with in the coming years. Until then, I find myself ruminating on a foreboding statement made by Dr. Robert Ford, *Westworld*’s park designer (played by Anthony Hopkins), in this season’s final episode: “Wasn’t it Oppenheimer who said, ‘Any man whose mistakes take 10 years to correct is quite the man?’ Well, mine took 35.”<sup>3</sup> This character didn’t anticipate that his earlier decisions surrounding AI would, decades later, have dire consequences. As we now prepare to implement a profoundly disruptive technology

that carries with it the potential to harm humans, it will be the responsibility of radiologists—along with the creators of AI solutions deployed within the radiology field—to avoid such a grave mistake. We must address possible ramifications beforehand, so the evolution of machine learning will strengthen our work—and not hurt those who depend upon us. **MM**

Joshua T. Olson is an MD candidate (class of 2017) at the University of Minnesota Medical School.

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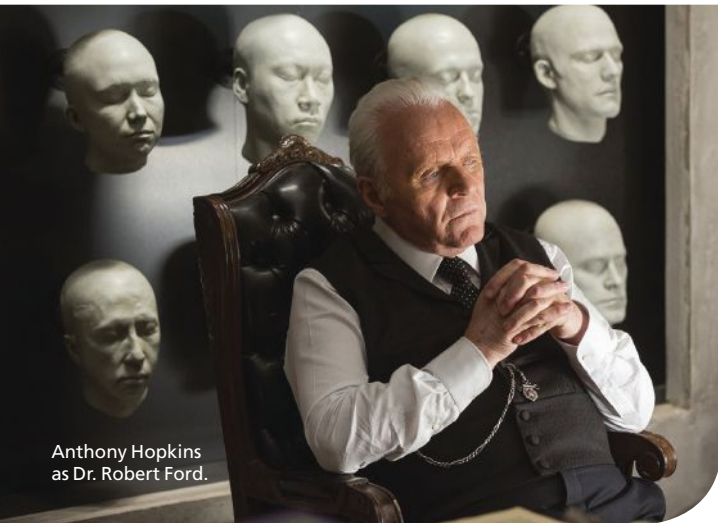


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Anthony Hopkins as Dr. Robert Ford.

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PAGING DR. GOOGLE

# A patient's cyberchondriasis causes a physician to rethink her relationship with the web

BY JULIE ANDERSON, MD, FAAFP

The woman came to me complaining that she had started having paresthesias in her arms and legs. The sensations would come and go, and—as she had previously been bothered by hand numbness—she didn't pay it much attention. However, after a few weeks she had begun to feel seriously ill. She was experiencing not only worsening paresthesias but also fatigue, muscle weakness, muscle twitching, balance problems and decreased appetite. She feared a worst-case scenario—her mind immediately racing to ALS and MS, and then to cancer.

She had spent days worrying and hours searching the internet about each and every symptom before she finally saw me. Only after lots of normal results from imaging, labs and EMGs, and an exam with a neurologist, was she reassured that her worries were unsupported. Her symptoms appeared to be the result of a viral syndrome, perhaps brought on by stress. Yet although she felt better with time and encouragement, she continued to have new symptoms, and she returned to the web to research them. It seemed that with every search, another symptom would emerge and a new diagnosis would need to be considered, sparking further searches and more angst.

Given the access to information we have on the internet, it is no wonder that some of us compulsively search the web for information about our real or imagined symptoms of illness. In fact, roughly 5 percent of all Google searches—millions



daily—are medical in nature. Hits on health-oriented sites are second in volume only to pornography. The range of results from an online query about a medical concern is enough to turn the most rational person into a raging hypochondriac. There is actually a dictionary term for this: cyberchondriasis.

Those who are already anxious about their health are particularly prone to this condition. Research published in 2012 in the *Journal of Anxiety Disorders* found that people with high levels of health anxiety sought information online more frequently, spent more time searching, and found searching more distressing and anxiety-provoking than did those with lower levels of health anxiety. The research results further showed that online health information searches worsen underlying anxiety.

A recent Pew Research Center survey noted that one in three U.S. adults (and nearly half of college students) use the

internet to diagnose themselves, most using a search engine to reach their result. (Interestingly, only 10 percent of people link to a health site first.) Caucasians, females, the college-educated, and people who make more than \$75,000 annually are more likely than others to go online for medical advice. Nearly half of those who conduct such searches say that what they found online prompted them to see a physician. Probably most important: When they saw their physician, 41 percent said that their internet diagnosis was confirmed.

There are certainly pros to patients going online for medical information. The internet can privately, conveniently and inexpensively provide advice and education. Yet many sites offer information that is not medically sound, and individuals may be led to believe they have a much more—or much less—serious condition than they really do. Probably the

most important concern is whether internet searching leads people to avoid seeking professional medical attention. Relying on the internet for a diagnosis, rather than seeking medical attention, can be dangerous and potentially life-threatening.

## Working with the web

The reality is, Dr. Google is here to stay. And while some believe she is encroaching on our practice of medicine, I think there's room for both of us. Two British doctors, who looked at 26 complex patient case histories and used Google to diagnose the causes, found the search engine to be correct about 60 percent of the time. We human physicians are more accurate than that; and we have the capacity to have a more nuanced understanding of complex diagnoses—and of patients themselves. There is still value in the one-on-one contact between us and those who seek care.

I surmise that many of us are already working with Dr. Google. We have become masters of medical internet searches, tailoring them to our patients' needs. As a family physician, I see a plethora of patients with complaints ranging from pyloric stenosis to atrial fibrillation. Although I know what I know, I can very efficiently find a proper website to verify that my logic is sound and current. I can Google a picture of the eustachian tube to instruct parents on why their child's ear aches, or pull up a physical therapy video to demonstrate best stretches for tennis elbow.

We need to recognize that there's value for patients as well. Search engines have beefed up the quality of their symptom-checkers over the past few years. Recently, Google announced a new mobile health symptom checker that supposedly provides improved, medically accurate information. IBM's Watson computer spent just 10 minutes "studying" a leukemia patient's medical information and was able to cross-reference her condition against 20



## Worry often gives a small thing a big shadow"

— Swedish proverb

million oncological records uploaded to its system by doctors from the University of Tokyo's Institute of Medical Science. Watson discovered that the patient had a form of leukemia different than that previously considered, and prescribed a treatment option that proved far more effective than original methods. Perhaps online search tools are not being used *enough* in medicine.

### Pointing patients to reliable resources

As physicians, we spend much of our time reassuring patients about their symptoms, including those found on the internet. Perhaps we need to do more than simply tell them not to search online. (For one

thing, they won't listen to us, as web access is too easy and too tempting.) We need to educate our patients about where to search, and explain that some sites may have hidden agendas that prey on the fears of readers in order to sell a medication or service. I now send patients to specific websites, such as [uptodate.com](http://uptodate.com) and [familydoctor.org](http://familydoctor.org), which offer accurate information.

While we accept that many of our patients will access the internet for medical advice, we need to be on the lookout for signs that they have been misinformed, are over-searching, or meet the criteria for cyberchondriasis, as it's an under-recognized condition that will likely become more prevalent with time. We physicians need to start viewing the web not as a threat or a disruptor, but as simply another factor affecting patients today. They are buried in information. We need to help them sift through it. **MM**

Julie Anderson is a family physician at Saint Cloud Medical Group.



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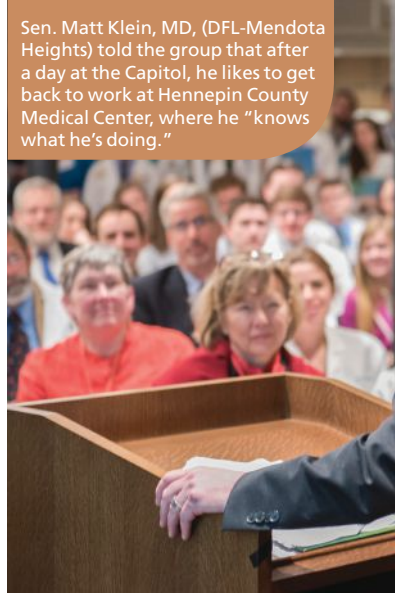


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More than 150 physicians, residents and medical students attended, making it the largest Day at the Capitol in 20 years.



Sen. Matt Klein, MD, (DFL-Mendota Heights) told the group that after a day at the Capitol, he likes to get back to work at Hennepin County Medical Center, where he "knows what he's doing."

## 2017 DAY AT THE CAPITOL

# Physicians, students and residents lobby for health care reform

PHOTOGRAPHY BY KATHRYN FORSS

**M**ore than 150 physicians, medical students and residents spoke out on behalf of health care reform at MMA's annual Day at the Capitol on February 15 in St. Paul.

In addition to health care reform, topics attendees discussed with lawmakers included reforming medication prior authorization; ensuring the sunset of the provider tax; aligning quality measures; and fighting the opioid epidemic in Minnesota.

"Now more than ever, physicians, medical students and residents need to band together and speak out on behalf of their patients and their professions," says MMA President David Agerter, MD. "All signs point to a lot of uncertainty ahead in St. Paul and Washington, DC, regarding health care reform. When decisions affecting physicians are made, we need to be at the table."



Paul Matson, MD, (left) and Keith Stelter, MD, talk with Sen. Nick Frentz. All three are based in the Mankato area.



The scaffolding is down; Day at the Capitol attendees were treated to the sight of a newly refurbished building.



There was a line out the door before the event began.



Sen. Michelle Benson (R-Ham Lake) addressed Day at the Capitol attendees, urging them to share real-life stories with their legislators.



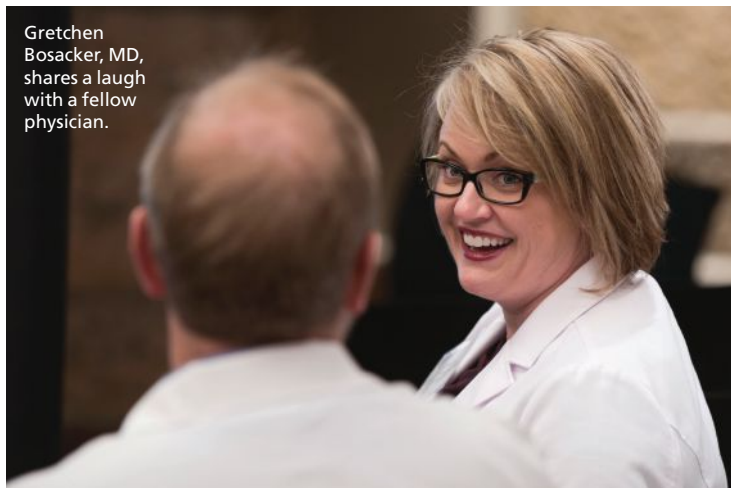
Janette Strathy, MD, meets with Rep. Dario Anselmo (R-Edina) in his office at the State Office Building.



University of Minnesota medical students have an informal discussion with Rep. Ilhan Omar (DFL-Minneapolis). Omar is the country's first Somali-American, Muslim woman to hold an office at this level.



Gretchen Bosacker, MD, shares a laugh with a fellow physician.



# Major health care bill kicks off 2017 session

Given the number of new legislators coming to the Capitol, seasoned observers expected a slow start to this year's session. They miscalculated. The first legislation in the House and the Senate was a large health care bill that Gov. Mark Dayton quickly passed and signed.

In the last week of January, lawmakers approved \$326 million in premium relief to Minnesotans who buy coverage on the individual market.

"This is an example of the Legislature working together to get needed relief quickly to Minnesotans who are hurting," says MMA President David Agerter, MD. "Republicans and Democrats put their differences aside to get this done."

Along with premium relief, the law included the following:

- For care provided at an in-network facility, patients will not have to pay out-of-network rates when they receive care from a non-network physician or other provider without the patient's advance understanding or ability to choose.

This is expected to affect specialists like anesthesiologists, pathologists and radiologists who are not part of a patient's insurance network but practice in an in-network hospital or surgery center.

- A disclosure provision applies to specimens collected by a physician and referred to an external lab, pathologist or other testing facility. The MMA, concerned that this would hurt physicians' ability to get fairly compensated for their work, lobbied lawmakers to revise the original language. The law, as passed, directs physicians and health plans to negotiate the out-of-network rate. If they can't reach an agreement, either side can seek review by an independent arbitrator. Arbitrators will reference a number of sources, including a national database gathered by an independent nonprofit that tracks all payers to determine a usual, customary and reasonable payment for physicians.
- Minnesota will now allow for-profit HMOs to operate in the state. During

floor debate, Senate Democrats tried to get this issue removed but didn't have enough votes.

- Language permitting the creation of an agricultural cooperative program was included. This allows farmers and others in the agriculture industry to pool together and purchase health insurance as a group in an effort to lower their costs. To address increasing concerns about narrow networks, the law allows physicians and other providers the ability to appeal a waiver of network adequacy requirements granted to a health plan by the health department. Under current law, the health department may grant waivers of network requirements, including access within 30 minutes/30 miles to primary care physicians, general hospital, and mental health services, if the health plan demonstrates with specific data that the network requirements are not feasible in a particular area. For 2017, appeals must be filed within 60 days of enactment of the law (by approximately March 26). Appeals

## News Briefs

### Governor proposes extending provider tax

As part of his budget for 2018-2019, Gov. Mark Dayton proposed continuing the provider tax beyond its scheduled 2019 repeal. He also proposed creating a "public option" for Minnesotans who buy their insurance through MNsure.

The MMA has fought against the provider tax for more than 20 years. It remains a top priority for this legislative session. The MMA sent out an Action Alert to physicians two days after Dayton's State of the State speech, encouraging them to contact their state representative and senator to oppose Dayton's provider tax recommendation.



Gov. Mark Dayton

Dayton also proposed shifting more than \$700 million in Medical Assistance costs onto the provider tax, which is deposited in the Health Care Access Fund. The General Fund has historically financed Medical Assistance. Currently, it has a surplus of \$1.4 billion.

Dayton's other ambitious health care proposal suggested a "public option" for those who buy their health coverage on the individual market. This new option would be "modeled on the current MinnesotaCare program, which would continue to provide high-quality coverage to low-income Minnesotans."

As proposed, MinnesotaCare would continue in its current form for people with incomes below 200 percent of the federal poverty level. For those purchasing coverage on MNsure, MinnesotaCare would be available as an option they could purchase. For those with incomes between 200 and 400 percent of the federal poverty level, federal tax credits would be available to subsidize the cost of MinnesotaCare—assuming Congress retains the tax credits, which are part of the Affordable Care Act. If the Legisla-





- Pregnancy beyond the first trimester of pregnancy
- A physical or mental disability defined as an inability to engage in one or more major life activities—provided the disability has lasted or can be expected to last for at least one year or can be expected to result in death. (Enrollees also can be covered for the rest of their life if a physician certifies that the patient has an expected lifetime of 180 days or fewer.)

During debate on the bill, the MMA worked to remove a House amendment that would have allowed insurers to sell bare-bones coverage in Minnesota. This proposal would have allowed insurers to sell policies that would not have to cover, for example, preventive care, immunizations, mental health care and maternity care.

Also, a proposal to reinstate a high-risk pool, similar to the former Minnesota Comprehensive Health Association, was removed from the legislation. The issue of risk pooling and reinsurance may come up in a separate bill.

will take place before an administrative law judge.

The law also provides some limited continuity-of-care coverage to individuals who purchase coverage on their own on the individual market, if their health plan pulled out of the market in 2017. Physicians and other providers who had been

treating a patient but are no longer in the patient's new health plan network can provide—at in-network rates—up to 120 days of care if the patient was being treated for:

- An acute condition
- A life-threatening mental or physical illness

ture passes this proposal, the state will need to secure federal approval to implement the public option.

MinnesotaCare would be an attractive product for anyone purchasing coverage on MNsure because the cost would be much lower than that of other commercial insurance products. That's because the state has set very low payment rates to physicians and other providers. Many physician practices would face significant financial challenges if MinnesotaCare was expanded beyond its currently served low-income populations.

### MMA joins national coalition seeking to reform prior authorization

The MMA has joined a 17-member national coalition urging health plans, pharmacy benefit managers and others to reform prior authorization (PA) requirements imposed on medical tests, procedures, devices and drugs.

The coalition, led by the AMA, is urging an industry-wide re-assessment of PA programs to align with a newly created set of 21 principles.



According to a new AMA survey, physicians and their staff process an average of 37 PA requests per week. It takes an average of 16 hours—the equivalent of two business days—to process the weekly load of PA requests.

The survey also found:

- 75 percent of surveyed physicians described PA burdens as high or extremely high.
- More than one-third of surveyed physicians reported having staff who work exclusively on PA.
- 25 percent of physicians said they wait three business days or longer for PA decisions.

The MMA continues to make reforming medication prior authorization in Minnesota a top legislative priority. The MMA is part of a Minnesota-based coalition of 45 entities called Fix PA Now (FixPANow.com) that has similar goals.



### MMA leads collaboration on advanced serious illness

Chief medical officers from several large health systems gathered at the MMA office in mid-January to review progress on the Advanced Serious Illness Collaborative (previously the End-of-Life Collaborative).

Last year, representatives from 10 systems gathered to discuss end-of-life care. The group’s emphasis soon evolved to advanced serious illness.

Participating systems include: Allina Health, CentraCare Health, Children’s Hospitals and Clinics of Minnesota, Essentia Health, Fairview Health Services, Hennepin County Medical Center, M Health, Mayo Clinic, North Memorial Health Care and Sanford Health.

The group’s goals are:

- Identifying all people with “serious” illness
- Growth of primary palliative care capacity (toolkit, how-to conversations, expectations, etc.)
- Early education and training for physicians and other clinicians.

### On the calendar

Event	Date	Location
St. Paul Physicians’ Social	May 23	Lake Monster Brewing Company
Rochester Physicians’ Social	May 24	Bleu Duck Kitchen
St. Cloud Physicians’ Social	June 1	Beaver Island Brewing Company
Duluth Physicians’ Social	June 1	Fitger’s
Annual Conference	Sept. 22	Rochester – Mayo Civic Center

Check the MMA’s website ([www.mnmed.org/events](http://www.mnmed.org/events)) for more information and to register.

### MMA petitions Congressional delegation to stand up for patients

The MMA sent a letter to Minnesota’s Congressional delegation in January urging them to take a strong leadership role in ensuring that Minnesota patients remain at the center of all discussions regarding the future of health care reform.

“The current effort to repeal the Affordable Care Act (ACA), without clear guidance as to what a replacement plan will encompass, is reckless,” says the letter signed by MMA President David Agerter, MD.

“The ACA warrants scrutiny so that it can be improved,” the letter continues. “But a wholesale repeal of the ACA—without a defined and understandable path forward—will cause significant uncertainty, and potentially real harm. Patients with serious illnesses and chronic disease will likely experience stress and confusion about their insurance coverage and its effect on treatment plans. Physician practices will face uncertainty with respect to uncompensated care, which could limit investment in care delivery and practice redesign, and will certainly distract from the day-to-day needs of patients.”

The letter, which also suggests that any future proposals must ensure that patients covered today are able to maintain coverage, was emailed to: Sens. Amy Klobuchar and Al Franken and Reps. Timothy Walz (MN - District 1), Jason Lewis (MN - District 2), Erik Paulsen (MN - District 3), Betty McCollum (MN - District 4), Keith Ellison (MN - District 5), Tom Emmer (MN - District 6), Collin Peterson (MN - District 7) and Rick Nolan (MN - District 8).



### Report confirms health inequities in state

Gaps in health coverage between white Minnesotans and other populations continue to exist, says a report released in early February by MN Community Measurement (MNCM).

The 2016 *Health Equity of Care Report* shows that some racial, ethnic, language and country-of-origin groups have consistently poorer measures of health than other groups. The report also shows, for the first time, how charged rates on those measures vary by medical group across the state, and it gives examples of

what groups are doing to improve outcomes for their patients.

“Minnesota is one of the healthiest states in the nation,” says Jim Chase, MNMCM president. “At the same time, we have some clear and persistent inequities in health status. Patients from specific geographic regions and populations—including those in Greater Minnesota, people of color, people who identify as Hispanic, immigrants, and people who do not speak proficient English—are less likely to receive preventive screenings and more likely to suffer from negative health outcomes.”

“Race is an independent factor contributing to health inequities,” says Fatima Jiwa, MBChB, who served as chair of the MMA’s Health Disparities Work Group. “Access to health care, socioeconomic status, education level, etc., are often cited as the reasons for these disparities. Structural racism in all institutions, in particular, is pervasive and particularly challenging to discover and call out.”

The measures of health reflected in the report are adolescent mental health and/or depression screening, adolescent overweight counseling, colorectal cancer screening, optimal asthma control for adults, optimal asthma control for children, optimal diabetes care, and optimal vascular care.



Robert Meiches, MD



Janet Silversmith



Dan Hauser

## MMA in Action

MMA Board Chair **Douglas Wood, MD**, CEO **Robert Meiches, MD**, **Janet Silversmith**, director of health policy, and **Dan Hauser**, director of communications, education and events, met with the *Minneapolis Star Tribune*’s editorial board in February to discuss a variety of issues regarding health care reform.

**Eric Dick**, manager of state legislative affairs, joined the Minnesota Academy of Otolaryngology’s annual Winter Conference in late January. In addition to providing an overview of the legislative session, Dick addressed several legislative issues of specific concern to many otolaryngologists, including scope of practice for allied health professionals, tobacco control, the provider tax and prior authorization reform.



**SAVE THE DATE  
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# Physicians’ Socials

## FOUR SOCIALS

- TWIN CITIES** **Tuesday, May 23**  
Lake Monster Brewing Company
- ROCHESTER** **Wednesday, May 24**  
Bleu Duck Kitchen
- ST. CLOUD** **Thursday, June 1**  
Beaver Island Brewing Company
- DULUTH** **Wednesday, June 7**  
Fitger’s Brewhouse

**Watch for details in MMA News Now.**



## VIEWPOINT

# Repeal without replacement is reckless

**A**t a time of great uncertainty about the future of health insurance, the MMA has released a set of principles to guide legislators and others in policy deliberations.

For physicians, it is important to remember that the ACA, which appears on the road to repeal, was successful in reducing the number of uninsured Americans. However, the act has done little to make health insurance more affordable.

Keeping the ban on exclusion of pre-existing conditions, limiting caps on coverage, and making sure that the benefit package is adequate, as well as covering young adults on their parents' policies, are features that need to be retained in any new solution. Our recommendation is that Congress should not repeal the ACA without maintaining these protections. After all, patients should not face financial ruin because they are faced with a costly illness.

About 10 years ago, the MMA released a set of principles to guide health reform in Minnesota. Many of these principles were included in legislation adopted in the state in 2008. These same principles remain relevant today. We recently shared them with the *Minneapolis Star Tribune* editorial board and hope that legislators and other policy makers at both the state and federal levels will consider these principles as new reform proposals are developed.

The principles include:

- Insurance coverage for all Minnesotans
- Preserving patient-physician relationship
- Ensuring access to appropriate care for all Minnesotans
- Improving affordability of care
- Investing in public health and prevention
- Promoting health equity
- Supporting innovation in care delivery and payment

- Advocating for broad-based, stable and adequate financing

In the 2008 Minnesota reform, there was a strong emphasis on the investment needed to sustain a healing patient-physician relationship, including payment for coordination of care and steps to sustain primary care.

We are working to address disparities that might interfere with equitable access. The MMA's Minnesota Action to Reduce Costs of Healthcare (MARCH) initiative has focused on costs of prescription drugs as its first effort.

Physicians must take the lead in making care more affordable by eliminating clinical waste (unneeded documentation and prior authorization; unnecessary visits, tests and procedures; duplication of care; missed prevention opportunities; and unnecessary costs related to opioid abuse). We must also advocate for improvement in care processes as well as better care coordination; better mental health care; and broad-based, stable and adequate financing, which is needed to support necessary financial subsidies for Minnesotans of limited financial means. This will make health insurance more affordable regardless of the model adopted—whether it's expanded Medicaid, benefit changes to create equity in coverage for drugs and surgery, or refundable tax credits (just to name a few).

We will work on creating tools for physicians to use in communication with elected representatives, members of the media, and the communities in which we live and work. Stay tuned for details about these tools.

Now is our opportunity to lead Minnesota in the next phase of reform, to build new solutions on a base of principled design components, and to restore Minnesota's reputation as the leading state for health and health care in the nation.



Douglas Wood, MD  
MMA Board Chair

Patients should not face financial ruin because they are faced with a costly illness.

# Power in numbers

A math whiz explores big data's dark side.

REVIEW BY CHARLES R. MEYER, MD

Three years ago, with interest rates bottoming out, my wife and I decided to refinance our mortgage. We submitted all the requisite forms detailing our assets and income, and we expected smooth sailing, given how financially upright we thought we were. A week or so into the process, our banker called to say he needed to talk to us about the lien on our property from the IRS.

After visiting the dictionary to verify what a lien was, I assured the banker that we had no such encumbrance. On the property statement he'd sent, my wife and I—Charles and Carolyn Meyer—were appropriately listed as deed holders. But the section entitled “Lien Information” stated that *Dean* and Carolyn Meyer owed the IRS thousands of dollars.

I was told that title searches spit back all potentially important information, even if the address of the property and the first name don't match. After verifying in writing that I wasn't now—nor ever had been—Dean Meyer, we got our mortgage.

My wife and I were victims of big data, the moniker applied to the scads of information accumulating in our digital universe, which is expanding at Big Bang speed. According to a 2012 estimate, 2.5 exabytes (2.5 x 10<sup>18</sup> bytes) of data are generated daily. As that occurs, networks of computers troll the cybersphere looking for patterns, trends and warning signs.

Our title search was a rudimentary search of names, addresses and bank names across numerous databases. As information generated by social media, mobile devices and web surfing patterns proliferates, the possibilities for causal connections, revelations and errors multiply, creating a virtual goldmine for math geeks looking to wield their skills.

Cathy O'Neil, author of *Weapons of Math Destruction: How Big Data Increases Inequality and Threatens Democracy*, was

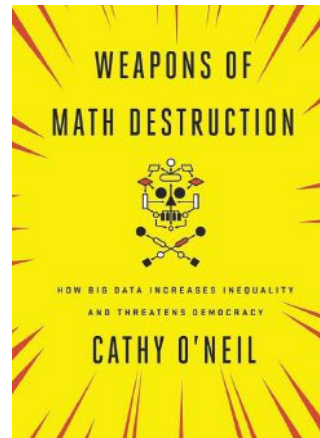
just such a geek. When she came to see the danger of big data—and the algorithms that plumb that data—she wrote a book to expose the perils.

Earlier, armed with a Harvard PhD and experience during a stint as a math professor, O'Neil went to work at a hedge fund, where she applied her number skills toward shifting trillions of dollars in the “right”

direction. Then came the 2008 economic crash and, with it, her revelation that the mathematical tricks she was employing had significant, terrifying real-world consequences.

“The crash made it all too clear that mathematics, once my refuge, was not only deeply entangled in the world's problems but also fueling many of them,” she recounts in her book. “New mathematical techniques ... churned 24/7 through petabytes of information, much of it scraped from social media or e-commerce websites. ... Mathematicians and statisticians were studying our desires, movements, and spending power. They were predicting our trustworthiness and calculating our potential as students, workers, lovers, criminals.”

O'Neil analyzes college rankings, credit ratings and wellness scores, and concludes that any algorithm is only as good as the people who construct it—and is vulnerable to the biases of its creators. One example she gives is a system used by credit card companies that accesses not only data on web browsing and purchasing patterns, but also the location of the surfing computer, which its algorithm uses as a proxy for wealth. If you connect from a seedier area with a high default rate, you are likely to



*Weapons of Math Destruction: How Big Data Increases Inequality and Threatens Democracy*, Cathy O'Neil, Crown, 2016

find less available credit and higher interest rates. So, those already financially struggling are liable to struggle some more.

O'Neil tries to prove that biases inherent in some algorithms potentially generate results that favor the already favored of society, while the poor who associate with the poor are relegated to staying poor because of conclusions formulated

by allegedly unbiased formulas. Some of the author's examples stretch to make her point about social biases, but her general warning holds: that statistics and the algorithms they drive can foster unfair and unfounded consequences. The sentiment expressed by the famous quip (favored by Mark Twain, among others) about “lies, damned lies and statistics” lives on.

As millions of doctors' computers amass EHR data daily, the medical field is an obvious target for big data trolling. Although the only health care-related example in O'Neil's book is a set of wellness scores produced by company screening programs and occasionally used in making hiring decisions, it's clear that physicians and medical organizations are—and will continue to be—judged by the results of big data algorithms. *Weapons of Math Destruction* gives readers a start at understanding that process and its foibles.

We'll always need computers and their computing power, and the data explosion will continue, unabated. We'll be judged by the analysis of that data. Whether we can make those conclusions more accurate, smarter and fairer remains to be seen. **MM**

Charles R. Meyer, MD, is editor in chief of *Minnesota Medicine*.

# The Pokemon Go effect



To motivate healthy behavior changes, take some cues from Pikachu and co.

BY SIU-HIN WAN, MD

In 1973—a time when color televisions were replacing black and white sets, and drivers were beginning to embrace automobile seat belts—Motorola engineer Martin Cooper made the world's first call from a handheld mobile phone. The prototype weighed about 2.5 pounds and proved to be revolutionary. Since then, the cellular phone has evolved from a tool for remote communication to a personal multimedia entertainment device.

For some users, mobile phones have also contributed to improvements in health and fitness. That's largely been accomplished with natural extensions of previous technologies, achieved through miniaturization and new integrations of sensors and processors—for example, using phones to track speed and distance while walking or biking, or to monitor heart rhythms. But other, more novel (and perhaps unforeseen) applications have also had an impact, providing not only tools, but also insights and ideas we physicians can use to promote successful behavioral change among our patients.

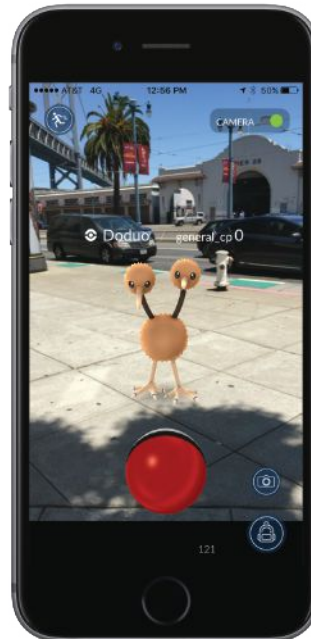
At a time when obesity is becoming an epidemic and heart disease is a leading cause of mortality and morbidity in this country, that's important. According to the National Health and Nutrition Examination Survey, 35 to 40 percent of American adults are obese, a figure that's been trending upward since the 1990s.

Addressing such health concerns often requires significant lifestyle modifications that are only feasible when bolstered by an underlying foundation of motivation,

feedback and social support. Clinicians aren't likely to adequately satisfy each of these needs during short outpatient visits. So perhaps it's not surprising that only about 10 percent of patients counseled to increase exercise and lose weight are successful. Can mobile technology help better those odds? Maybe after a physician sends a patient home, it's time for Pikachu to step in and assist.

## Video game changers

Video games have long had a bad rap among health and fitness advocates, perhaps with good reason. Dating back to the arrival of Pong in the 1970s, video games have offered some mental and emotional stimulation but rarely called for any physical activity beyond minimal movement of the hands and thumbs. Rather than inspire children to go outdoors, explore, and pursue fitness, video games have commonly been viewed as the anathema to exercise. The correlations have been constant: What's fun isn't healthy; and vice versa.



Pokemon Go uses augmented reality to pull fantasy creatures into players' real-world surroundings.

But as technology has advanced in recent years, the integration of accelerometers, gyroscopes and smart cameras into video game consoles has altered the way humans interact with gaming systems. Instead of playing tennis by moving a joystick, one now must swing an arm. Onscreen dancing is no longer powered by a series of keystrokes, but through full-body movements. Nintendo's Wii Fit, introduced in 2007, is a suite of strength-training, balance and aerobics activities. Such paradigm-changing products have allowed exercise to permeate many new settings, from day care centers to nursing homes.

## Augmented reality arrives

Technology's influence on health is taking a further step forward with the advent of augmented reality. Historically, video games have relied on elements of virtual reality—using visuals, sound and other stimuli to simulate imaginary environments. Virtual reality can transport us to

new worlds of imagination and adventure. But often, our time there is highly sedentary. When we enter a virtual world, we leave our actual surroundings behind and we disregard our bodies.

Augmented reality is different. By integrating a camera, a processor and a video display, an augmented reality system can introduce digitally created elements into real-world settings. Augmented reality has been present for years, initially appearing in aerospace and other high-tech industries to empower head-up navigational systems, which superimpose information onto a windshield or other transparent surface within the user's field of view. But augmented reality did not become widely popular or utilized until the gaming industry got ahold of it—perhaps best illustrated by the worldwide sensation launched last year: *Pokemon Go*.

For the uninitiated, *Pokemon Go* literally takes a 20-year-old video game franchise into new, uncharted directions. Inspired by insect collecting, past *Pokemon* iterations ran on game consoles and computers. Players sought hidden fantasy characters within a virtual world. Gamers never had to move; just press buttons while their avatars walked around.

*Pokemon Go*, however, marries mobile technology with augmented reality. Instead of sitting on a couch operating a joystick, a player ventures outdoors, moving from place to place, seeking fictional monsters that seem to appear within real-life surroundings. A smartphone's GPS system tracks its user's location while the onboard camera captures live images. The creatures that players covet only appear onscreen when the device is in close proximity to a particular landmark, public place or other physical location.

Clearly, the approach has been popular. Within three weeks of *Pokemon Go*'s release, 50 million people downloaded the game to their mobile devices. News outlets buzzed with reports of people gathering in parks and other common spaces, walking for miles, daily, drawn by the prospect of

catching nonexistent animated critters. This scenario counters traditional perceptions that video games are detrimental to players' health. A cultural craze that leads people to run around outdoors and explore one's surroundings? It is, in many ways, a dream for clinicians trying to encourage youth to get up from the couch and exercise.

*Pokemon Go* accomplishes what often seems impossible: It makes fitness fun. The game encourages people to exercise, without appearing to do so—or, at least, without offering overt instruction. The lesson here is that nobody wants to be told they need to exercise any more than they want to be told to eat more vegetables or brush their teeth. The appeal of *Pokemon Go* is its promise of a fun distraction. The exercise that's integral to the experience? That happens to be a healthy side effect.

### Clear goals and reliable feedback

Among the most important tenets of behavior modification are active involvement and willing participation. For physicians to secure such buy-in from patients, it's important to establish goals and plans that are as specific as possible.

Measuring success, then, requires feedback. But how much do patients really know about themselves when it comes to their health? We've all heard, "I exercise," "I eat healthy," etc. But what do such vague statements mean? How much do you exercise? Over what time period? Such details are often unknown.

To help improve documentation, we might ask patients to keep a health diary, where they can record daily amounts of activity and food intake. But even this strategy is not foolproof, as there is often reporter bias—especially if the patient feels interrogated. What the patient and



clinician both need is an accurate tool that provides reliable data.

One of the most intriguing aspects of *Pokemon Go* is its integration of travel within game play. By walking a certain distance, a player can hatch a *Pokemon* egg or earn *Pokemon* candy. This exchange not only provides incentive for exercise and clear goals for the player; it also requires tracking of the player's movements, thereby generating precise, objective feedback.

Similar tactics are also employed by more conventional mobile fitness applications. Activity trackers built into phones, watches, wristbands and even jewelry provide real-time data for a number of parameters, including steps taken, miles traveled, amount of sleep per day, and calories consumed and expended. The lesson here is that when sophisticated technology is applied in a user-friendly fashion that reports measurable, easy-to-digest results, patients become empowered. Motivating people with goals, and keeping them apprised of their progress toward those goals, makes healthy behavior more appealing—and meaningful change more likely.

### Social support

Finally, another important tenet of lasting behavioral modification is social support. No matter how strong one's internal motivation might be, it can be difficult to negotiate a change when outside forces seem to push in the opposite direction.

*Pokemon Go* has shined at tackling this challenge. The game created a social phenomenon in which exercise and outdoor activity are not only accepted, but encouraged. Certain game play elements, such as gym battles waged between char-

acters, encourage group coordination. This has driven people to pursue more physical activity because they've been within a community of like-minded individuals all striving to achieve similar goals.

**New challenges arise**

Augmented reality applications aren't without their own challenges. New technological approaches to promoting healthy behavior can, in fact, create new health hazards. For example, Pokemon Go has been implicated in automobile and pedestrian accidents that occurred when players were more focused on their screens than on the road. (Given the game's potential for distracting drivers—which raises a public health concern—it's not surprising that Pokemon Go now disables some elements of gameplay when it detects the device it's loaded on has exceeded a certain speed.)

There are also significant questions about the long-term impacts Pokemon Go will have on exercise habits. Given the

game's breakthrough nature when it debuted in July 2016, the initial enthusiasm it engendered was understandable. But three months later, news outlets were already issuing stories about waning interest. Pokemon Go's fad status probably ensured usage would drop. That meant many related health gains were soon lost, as well.

**Lessons to learn**

Regardless of Pokemon Go's staying power, however, the game can have a lasting impact if we heed the lessons it highlights.

*First, find ways to make exercise enjoyable, not a chore.* Instead of prescribing a certain amount of exercise, point patients to fun, innovative activities that draw interest for reasons other than physical fitness—but improve health, nonetheless.

*Second, seek ways to capture and provide accurate, objective feedback about physical activity.* This builds motivation through positive reinforcement, empowering people by educating them about progress they've made toward meeting personal

goals. The feedback also equips physicians with valuable information that can support our work as care providers.

*Finally, when attempting behavioral modification related to fitness or other health needs, pursue social support.* Success is more likely within a community that values such traits as perseverance and teamwork—where a healthy lifestyle is the norm rather than the exception.

Capitalizing on the possibilities that mobile technology presents might require physicians to make some adjustments of our own. But if we explore new technological frontiers, challenge our preconceptions that video games are inherently sedentary, and take some cues from popular cultural phenomena such as Pokemon Go, we might land on new ways to help our patients make healthy behavioral changes. **MM**

Siu-Hin Wan is a fellow in cardiovascular diseases at Mayo Clinic in Rochester, Minnesota.



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# Reconsidering physician aid-in-dying

As public opinion evolves, physicians and lawmakers should take note.

BY DAVID B. PLIMPTON, MD

**Editor's Note:** *Last March, Minnesota Medicine published the commentary "Compassionate care? What are we getting into?" by Cory Ingram, MD, a piece expressing opposition to legalizing physician aid-in-dying. The article was prompted by legislation introduced in Minnesota during the 2015 session. You can read that commentary here: [www.mnmed.org/ingramcommentary](http://www.mnmed.org/ingramcommentary).*

*The following commentary provides a counterpoint. The MMA has long opposed physician aid-in-dying. However, given changing opinion across the county, the MMA convened a nine-physician committee to discuss the topic in 2016. At last year's Annual Conference, the MMA held a policy forum to solicit member feedback. This spring, the MMA will send out a survey on the topic before the May Board of Trustees meeting, where the subject will be discussed further. For additional background information, visit [www.mnmed.org/education-and-events/Annual-Conference/Physician-Aid-in-Dying-Policy-Forum-\(PAID\)](http://www.mnmed.org/education-and-events/Annual-Conference/Physician-Aid-in-Dying-Policy-Forum-(PAID)).*

It is time for the citizens of Minnesota to have access to physician aid-in-dying (self-administration of a lethal dose of medication). According to 10 years of reputable polling data, a majority of American citizens, and presumably of Minnesotans, want this option to be available to them at the end of life.<sup>1</sup> My belief is that decriminalizing physician aid-in-dying is essential if physicians are to fully honor the rights of patients with mental capacity; truly embrace patient-centered and family-focused care; acknowledge our unintended contribution to patient suffer-

ing; and provide a complete range of options to relieve intractable suffering.

I believe physician aid-in-dying reflects ethical principles and values we embrace in the Hippocratic Oath and elsewhere.

- **Autonomy:** Competent, terminally ill people who are suffering should have the right to choose the timing and manner of their death.
- **Justice:** Justice requires that we "treat like cases alike." A competent, suffering, terminally ill person requiring life-sustaining treatment can shorten their dying process by refusing or withdrawing from that support, but a competent, suffering, terminally ill person not requiring life-support has no medical option to shorten their dying process.
- **Beneficence:** Death can be good when it is the only means by which intractable suffering can be relieved.
- **Nonmaleficence:** Accelerating the dying process in a terminally ill, suffering person does not always represent harm.
- **Compassion:** Suffering encompasses more than physical pain; existential suffering cannot always be relieved. Physician aid-in-dying is a compassionate response to such unremitting suffering.
- **Individual liberty:** The state should have minimal interest in prolonging the life of a competent, terminally ill patient for whom continued living has become "a fate worse than death."
- **Honesty and transparency:** Legalization of physician aid-in-dying would promote an open discussion between a trusted physician and a fully informed patient. It would also encourage public discourse so we can identify what gives

meaning to our lives and what aspects of our physical, cognitive and spiritual existence we need to maintain our identity. The availability of physician aid-in-dying appears to increase physician referral to—and utilization of—palliative care and hospice services.<sup>1</sup>

## A look back

History reflects incremental changes in the views of medical professionals about physician aid-in-dying. In 1991, the American Medical Association issued the following opinion: "It is understandable, though tragic, that some patients in extreme distress—such as those suffering from a terminal, painful, debilitating illness—may come to decide that death is preferable to life. However, allowing physicians to participate in assisted suicide would cause more harm than good. Physician-assisted suicide is fundamentally incompatible with the physician's role as healer, would be difficult or impossible to control, and would pose serious societal risks."<sup>2</sup> State medical societies promptly followed with their own statements of opposition.

These moves were understandable, given the context. At that time, acts by several individual physicians were viewed as threats to the integrity of medicine. In 1991, Dr. Timothy Quill, an internist/oncologist in Rochester, New York, published a case report in the *New England Journal of Medicine* in which he described helping his 45-year-old-patient, who was terminally ill with acute leukemia and without remaining chemotherapeutic treatment options, and who had declined a bone marrow transplant, to die peacefully

but alone. Dr. Quill provided a lethal dose of self-administered oral barbiturate.<sup>3</sup> A grand jury failed to indict him.

Also during the 1990s, Dr. Jack Kevorkian, a pathologist in Michigan, achieved notoriety as “Doctor Death” by enabling suffering individuals, who were not necessarily terminally ill, to self-administer a combination of lethal drugs intravenously, resulting in, by Kevorkian’s estimation, the deaths of 130 human beings. At around that time, advocates for death with dignity made strong efforts in California and Washington to pass laws allowing physician aid-in-dying, but bills in both states were narrowly defeated.

Much has changed since then. In 1994, the state of Oregon passed its Death with Dignity Act by public referendum, with 51.3 percent in favor and 48.7 percent opposed. The law was not enacted until late 1997, however, because of court challenges and an attempt by the Oregon Legislature, through a second public referendum, to repeal the law. That latter initiative was defeated 60 percent to 40 percent. In 1997, the U.S. Supreme Court judged that while the right to die was not guaranteed by the U.S. Constitution, the Oregon Death with Dignity Act could stand, and that other states had the right to enact similar laws.

The Oregon law states that a competent adult who is terminally ill (estimated to have less than six months to live) and suffering intolerably may legally request from their physician a prescription for a lethal dose of medication (usually a barbiturate), which, when self-administered, would result in a peaceful death. The patient must voluntarily make this request and show no evidence of coercion or of impairment of decision-making ability. The patient cannot request physician aid-in-dying in a health care directive or through a health care agent. There is no mandate for participation, so any physician, hospital, health care system, pharmacist or pharmacy may decline to honor the patient’s request—but medical ethics do not allow abandonment of a patient.

In 2008, the state of Washington, using Oregon’s law as its template, passed its own Death with Dignity Act, also by public referendum, 57.8 percent to 42.2 percent. A 2009 Montana Supreme Court decision confirmed a patient’s right to physician aid-in-dying, but provided no guidelines, and subsequent legislative attempts in that state to pass an act similar to Oregon’s have failed.

In 2013, Vermont became the first state to pass a law through legislation that legalized physician aid-in-dying. In October 2015, California followed with its End of Life Option Act. Both state legislatures based their laws on the Oregon Death with Dignity Act with only minor variations. Unique to California’s effort was a vote by the California Medical Association, prior to the legislative debate, to withdraw its long-standing opposition to physician aid-in-dying. In announcing the change, the association’s president, Luther F. Cobb, MD, stated, “As physicians, we want to provide the best care possible for our patients. However, despite the remarkable medical breakthroughs we have made and world-class hospice or palliative care we can provide, it isn’t always enough. The decision to participate in the End of Life Option Act is a very personal one between the doctor and their patient, which is why the California Medical Association has removed policy that outright objects to physicians aiding terminally ill patients in the End of Life Option Act. We believe it is up to the individual physician and their patient to decide voluntarily whether the End of Life Option Act is something in which they want to engage. Protecting that physician-patient relationship is essential.”

Internationally, physician aid-in-dying has also garnered attention. In 1942, Switzerland decriminalized physician aid-in-dying with a stipulation that there must be no selfish motive for the request. The patient need not be terminally ill or even a Swiss citizen; however, the request must be voluntary, and the lethal dose must be self-administered. In 2002, Belgium and the Netherlands legalized physician aid-in-dying and voluntary euthanasia for patient suffering; both forms had been accepted as common practice, and considered morally

equal, since the 1980s. Luxembourg took a similar action in 2009. Germany, Colombia and Japan have also moved to legalize physician aid-in-dying.

In 2016, the Parliament of Canada passed landmark legislation allowing both physician aid-in-dying and voluntary euthanasia for the competent, terminally ill patient who is suffering. Like those who advocated for physician aid-in-dying laws in several U.S. states, Canadian lawmakers wrote their law using Oregon’s Death with Dignity criteria for patient qualification—and that state’s 18 years of data confirming their safe use.

### Recent U.S. news

On June 9, 2016, when California’s End of Life Option Act went into effect, a sixth of the U.S. population had legal access to physician aid-in-dying. In 2016, according to reports from Compassion & Choices, the largest nonprofit advocating for physician aid-in-dying, 20 states, including Minnesota, and the District of Columbia had proposals before their legislatures supporting physician aid-in-dying. On Nov 8, 2016, Colorado citizens, by public referendum, voted to pass an End of Life Options Act (physician aid-in-dying), with 65 percent voting in favor. Before the 2016 election, the Colorado Medical Society Council on Ethical and Judicial Affairs, charged with reevaluation of the organization’s policy on physician-assisted suicide, recommended that it should be “amended in a manner that neither formally takes a strong position for or against physician-assisted suicide but rather infers a position of thoughtful, studied neutrality that promotes end-of-life care, patient discussions, physician education, promotion of access to appropriate care, and ethical and clinical guidelines/parameters/safeguards that should guide physicians and patients where adults in Colorado could obtain and use prescriptions from their physicians for self-administered, lethal doses of medications should the law be amended to permit this patient option.” The Colorado Medical Society’s Board of Trustees supported this recommendation.

In March 2016, the Minnesota Compassionate Care Act (SF 1880-physician aid-in-dying) was heard by the Minnesota Senate subcommittee on Health, Human Services and Housing, followed by testimony from proponents and opponents. When it became clear that the bill would not pass out of committee, lead author Sen. Chris Eaton (DFL-Brooklyn Center/Brooklyn Park) withdrew it, eliminating a roll-call vote. Her plans to have the bill heard during the 2017 legislative session have been compromised by the DFL losing majority control of the Senate.

### Changing views

Opposition to physician aid-in-dying appears to come from three main sources: religion; organized medicine and individual physicians; and advocates for the disabled. Although each group is composed of people with honest, deeply held beliefs, these groups represent a minority opinion. In August 2016, Compassion & Choices funded a survey of 509 likely Minnesota voters. Responses showed broad and deep support for physician aid-in-dying among all demographic groups sampled, including men, women, Democrats, Independents, Republicans, people under and over age 50, residents of Greater Minnesota and metropolitan areas, Christians, and those with no religious affiliation.

In addition, it should be noted that fears surrounding physician aid-in-dying among those who advocate for the vulnerable (i.e., physically or cognitively disabled, poor, uninsured, frail elderly, or minorities) have not been realized. Disability Rights Oregon, the organization charged with monitoring the Oregon law's compliance with the rights of the disabled, has received no complaints of exploitation or coercion of an individual with disabilities relative to Oregon's Death with Dignity Act. Also, fears that allowing physician aid-in-dying (self-administration of the lethal dose) will create a "slippery slope" which will lead to voluntary or involuntary euthanasia (physician administration of the lethal dose) have not been realized. In the U.S., euthanasia remains illegal in all 50 states, even those that have decriminalized physician aid-in-dying. In

no jurisdiction which has allowed physician aid-in-dying alone has there been progression to include both physician aid-in-dying and euthanasia.

Our thinking about death as it relates to the practice of medicine needs to change. For physicians, that will require that we honestly face our own fears about the dying process and death; that we be aware of our potential for maintaining moral overconfidence; and that we initially reframe and, ultimately, reclassify physician aid-in-dying of a suffering, terminally ill person as something very different from the suicide of a person with a potentially treatable mental illness.

We doctors define ourselves by—and take great pride in—our ability to prevent illness, sustain life while having the patient maintain functional capacity, delay death, and “do no harm.” But we may, in fact, be inappropriately prolonging the dying process, in denial about the harm we are doing, and only superficially aware of what informs our thoughts, motives and behaviors. Although we acknowledge that death is inevitable, it is a deeply held belief that death is bad and represents failure. Ironically, we have established standards in which death is acceptable to us as physicians—for example, the Principle of Double Effect or Palliative Sedation, by which we can accelerate the dying process to relieve intolerable suffering in the terminally ill—but we are unwilling to relinquish that control to the patient. We fail to accept the dying, suffering person as our moral equal who has the right to be empowered with self-determination and choose to seek relief from moral and physical distress.

So often we fail to ask dying patients important questions: “When is death acceptable to you?” “What are your fears and your goals?” “Under what circumstances will you have lost your identity, your sense of self?” “Under what circumstances would life be a fate worse than death?” Instead, we impose our own belief system on them. If the dying human being has mental capacity, and can state without evidence of coercion that they wish to end their suffering by death, we as physicians should be able to legally provide the medi-

cal means to safely accelerate the dying process and allow the patient to achieve comfort.

On October 10, 2015, California Gov. Jerry Brown, a former Jesuit seminarian, signed into law the End of Life Option Act. At that time, he issued a statement outlining the process through which he reached his decision and describing the counsel he sought from proponents and opponents of the bill. He concluded as follows: “In the end, I was left to reflect on what I would want in the face of my own death. I do not know what I would do if I were dying and in prolonged and excruciating pain. I am certain, however, it would be a comfort to be able to consider the options afforded by this bill, and I wouldn't want to deny that right to others.”

It is time to recognize that the role of medicine has expanded far beyond “healing.” The Oregon experience has proven that control of physician aid-in-dying is possible with appropriate restrictions, guidelines and monitoring, and that there has been no demonstrable harm to society or the medical profession. We must strengthen the doctor-patient relationship with our commitment to create an environment of trust and communication based on our deep understanding of the patient's beliefs, values and goals. We do so by no longer defining ourselves as healers; we can't focus just on life but on the reality of the individual's life experiences in the context of the human life cycle, which includes death. If the suffering, terminally ill person has mental capacity and finds their life to be no longer meaningful, we physicians should be legally allowed to medically help them achieve a gentle death. **MM**

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# ACA's fate will affect community health centers

Repealing the Affordable Care Act would create repercussions for a significant component of Minnesota's health care safety net.

BY WILLIAM E. CONROY, MD, AND JONATHAN WATSON, MPA

The Neighborhood Involvement Program (NIP), a community clinic in Minneapolis, was founded in 1968. On one evening each month for more than 20 years, one of this article's authors (Conroy) joined physicians and other health care volunteers there to provide free or low-cost medical care and other services to people with limited or no health insurance. Starting in 2010, as more NIP patients became eligible for health insurance under the Patient Protection and Affordable Care Act (ACA), many were able to seek care at conventional clinics. Patient volumes at NIP diminished, ultimately leading to the clinic's closure in 2014.<sup>1</sup> The sadness NIP volunteers and staff experienced in losing this neighborhood fixture was offset by the reassurance that positive changes in health care availability had obviated the need for our services.

Enacted by the 111th U.S. Congress, the ACA was signed into law by President Barack Obama on March 23, 2010. Nationally, the number of people without health insurance fell from 16.0 percent in 2010 to 8.9 percent in the January-June period of 2016.<sup>2</sup> Now, with single-party control of the U.S. presidency, Senate, and House of Representatives, full or partial repeal of the ACA by the 115th Congress seems possible.

## The ACA in MN

The Minnesota Department of Human Services estimates that the ACA has allowed 300,000 Minnesotans to secure insurance coverage; delivered \$2 billion per year in federal funding; spurred improvements in care delivery; supported efforts to reduce waste, fraud and abuse in public programs; and driven initiatives to improve efficiency, quality and technology—all while lowering members' monthly costs by 15 percent among the state's largest group of public health care program enrollees.<sup>3</sup>

In Minnesota, 17 community health centers comprise an important segment of the state's health care safety net. The organizations provide primary medical, dental and behavioral health care services to low-income residents at more than 70 locations in underserved urban and rural areas. The ACA's impact on these centers has been dramatic. In 2010, 42.3 percent of people served by Minnesota's community health centers were uninsured; by 2016, 29.1 percent were uninsured. Patient volumes at Minnesota

community health centers grew from 168,750 patients in 2010 to 173,751 patients in 2015.<sup>4,5</sup>

In addition, the ACA's expansion of Medicaid has accelerated improvements in the care that community health centers provide. After ACA enactment, community health centers in states that expanded Medicaid—when compared to centers in states that did not—improved treatment and outcomes for patients with chronic diseases. Specific improvements included increased quality of asthma treatment, Pap testing, body mass index assessment and hypertension control.<sup>6</sup>

## Consequences of repeal

An ominous warning from the Minnesota Department of Human Services suggests that ACA repeal would place Minnesota in a situation far worse than it was in before the law was enacted. The ACA prohibits denial of coverage based on pre-existing conditions; its repeal would threaten the insurability of an estimated 744,000 state residents who have such conditions, adding to the pool of uninsured people who require safety-net health care.<sup>7-9</sup> Medicaid expansion has also been a key driver in providing health insurance to many people who were uninsured before the ACA's enactment. If the law is repealed, nearly 300,000 Minnesotans will lose that coverage. The projected risk of so many people losing health care coverage would threaten the stability of the state's safety net system—and drive up providers' costs of providing uncompensated care.<sup>3</sup>

Based solely on the changes in patient volumes and on the numbers of uninsured patients at community health centers since the ACA was enacted,<sup>4,5</sup> an estimate suggests that if the ACA is repealed and the rate of uninsured patients approaches the level seen before the law's enactment, Minnesota's remaining community health centers will be forced to absorb nearly 23,000 additional uninsured patients.

Compounding that threat is the possible shift to fixed funding of Medicaid, accomplished either through block grants to states or per-capita funding caps.<sup>10,11</sup> Because these funding approaches would no longer adjust to swings in the economy, states would become responsible for larger coverage shortfalls. To reconcile these ballooning gaps in funding, states would be forced to consider

a number of options, including reducing the number of people eligible for Medicaid, limiting coverage for those remaining enrolled, imposing additional cost-sharing on low-income residents, raising taxes, or lowering payments to physicians and other health care providers.<sup>10-12</sup> Lower Medicaid payments would reduce access to health care—especially specialty care.<sup>12,13</sup> That could “result in adverse medical outcomes and potentially higher costs from avoidable emergency department visits and hospitalizations.”<sup>14</sup>

In addition to potentially having to endure the repercussions of ACA repeal and Medicaid changes, community health centers also face a looming loss of direct support. Currently, the nation’s 1,200 community health centers receive a mix of discretionary and mandatory federal funding. The mandatory portion—making up 70 percent of the centers’ grant funding—is slated to expire on September 30, 2017. If that expiration occurs as scheduled, Minnesota’s community health centers will lose \$20 million in federal grants. That would force the centers to dramatically scale back their services.

In the absence of an adequate health care safety net, people are likely to defer preventive services and postpone evaluation of illness<sup>15</sup>—behaviors linked to poorer health outcomes and additional costs. Since NIP closed, Minnesota’s remaining community health centers have served increasing numbers of patients, many of whom receive care funded by various programs of the ACA.<sup>14,16</sup> Repealing the act would carry the potential to strike community health centers with a combination of burgeoning patient demand and diminishing resources. At the very moment these centers would be most needed to deliver quality care in a cost-effective manner, the overwhelming burden of ACA repeal could render this reliable system incapable of providing adequate health care for the underserved. **MM**

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# Allergy, Asthma and Immunology Training in Internal Medicine Residents

BY MOLLIE ALPERN, MD, QI WANG, MS, AND MEGHAN ROTHENBERGER, MD

Common allergic conditions such as allergic rhinitis, asthma and antibiotic allergies are frequently encountered by internal medicine physicians. These conditions are a significant source of health care utilization and morbidity. However, many internal medicine residency programs offer limited training in allergy and immunology. Internal medicine residents' significant knowledge deficits regarding allergy-related content have been previously identified. We conducted a survey-based study to examine the knowledge and self-assessed clinical competency of residents at an academic medical center to determine the need for further education in allergy and immunology. Our study revealed that the majority of these residents did not feel adequately prepared to treat allergic rhinitis, urticaria, contact dermatitis, antibiotic/drug allergies or anaphylaxis; and only half felt adequately trained to treat asthma. We believe that internal medicine residency programs should provide trainees with additional education in allergy and immunology in order to improve their knowledge and clinical competency. ➔

## COMMENTARY: DON'T BLOW OFF AR

### Physicians should help patients with the Rodney Dangerfield of respiratory diseases.

BY BARBARA P. YAWN, MD, MSC, FAAFP

The above article, "Allergy, Asthma and Immunology Training in Internal Medicine Residents," shines a light on an interesting issue: Many primary care physicians feel unprepared to address some of the most common respiratory concerns of patients. Allergic rhinitis (AR) is one of these.

Many of us view AR as a "nuisance" condition. Really, how much of a problem is a little runny nose? Well, it is a "big deal" to the 30 to 60 million Americans who suffer from AR and seasonal AR—up to one in four adults and more than one in three children.<sup>1</sup> Even with all of the effective over-the-counter therapies for AR, it remains the most common primary diagnosis for office visits in the United States and the most common chronic condition in children, surpassing asthma.<sup>2,3</sup> That means if you are a primary care physician, you are likely dealing with AR on a daily basis.

Patients or parents usually try—often successfully—to diagnose and self-treat mild or seasonal AR with OTC medications.<sup>4,5</sup> For those with moderate to severe AR, the burden is not trivial. AR, especially in its more symptomatic forms, is often associated with asthma and has a significant impact on quality of life, productivity, and functional status. The loss of productivity and decrement in quality of life is, on

average, greater than that for diabetes.<sup>6,7</sup> The very common symptom of nasal congestion affects sleep in people of all ages, and in children has been shown to interfere with school performance.<sup>8</sup>

Physicians still have an important role to play in the management of most cases of AR, whether it is evaluating and monitoring success of OTC treatment or providing supplemental support, advice and treatment when OTC isn't enough. For instance, we can offer guidance with regard to use of intranasal steroids (INS). Although INS first moved to OTC status in 2013, many patients still do not know the medications are the first-line therapy, and/or they don't know how to combine INS with antihistamines or decongestants for maximum relief when INS therapy alone is not sufficient.<sup>9</sup> In addition, many patients don't read the package insert that guides proper intranasal use—inserting the tip into nares using right hand for left side of the nose and left hand for right side of the nose, and directing the "squirts" of medication toward the outside of the nose (up toward the ear rather than straight into the nasal spectrum).<sup>10</sup> Other patients, and especially parents of children and adolescents, may avoid INS for fear of the "steroid effect" or the possible rebound when they stop

Internal medicine (IM) physicians commonly encounter allergic and immunologic conditions such as asthma, allergic rhinitis and antibiotic allergies. Allergic rhinitis accounts for 14 million office visits per year in the United States,<sup>1</sup> and 19.1 million Americans are diagnosed with allergic rhinitis annually.<sup>2</sup> Asthma results in 439,000 hospitalizations annually and accounts for 3,600 deaths per year.<sup>3</sup> Patients with a listed penicillin allergy have longer hospital stays (by 0.59 days) and have 23.4% more *C difficile*, 14.1% more MRSA and 30.1% more VRE infections compared with matched controls.<sup>4</sup> Additionally, many patients are placed at risk when they are listed inaccurately as having a penicillin allergy.<sup>5</sup> Proper diagnosis and management of these common allergic conditions has enormous clinical implications for the IM physician.

Despite the clinical importance, many IM residency programs offer limited training in allergy and immunology. A recent study by Stukus et al revealed significant knowledge deficits in allergy-

related content in IM physicians at academic medical centers across all levels of training and specialties.<sup>6</sup> Further, this study found that residents and attending physicians who completed an elective rotation in allergy and immunology had better knowledge of diagnostic testing and management of common allergic conditions compared with those who did not complete an elective rotation.<sup>6</sup>

Training in basic allergic and immunologic conditions should be an important part of all IM residency programs. However, that is not widely available. In the United States there are 421 IM training programs and only 75 allergy and immunology fellowship programs.<sup>7</sup> Therefore, the vast majority of residency programs are not associated with an allergy and immunology department or fellowship training program.<sup>7</sup> Given concerns that residency training in allergy and immunology may be limited, we conducted a study of the issue at the University of Minnesota, a tertiary care center with an academic IM residency program and

treatment.<sup>11,12</sup> It is unlikely that we will even know about these concerns unless we ask.

Primary care physicians can also help identify allergens, some of which might be avoided. Conversely, knowing about specific seasonal allergens can guide timing of INS and other OTC therapy so they begin before allergy season starts.<sup>13,14</sup>

Patients often fail to tell us about this bothersome condition because they are reluctant to take up our time with such a minor, although very irritating, condition. It does not take long to include questions about recurrent or chronic bouts of stuffy or runny nose and itchy or watery eyes in a respiratory review of symptoms. Taking a little time to outline appropriate OTC treatment options—and following up at the next visit—may be enough to provide patients with opportunities for significant improvements in their daily lives, helping them with a not-so-trivial condition. **MM**

Barbara Yawn is a family physician with a special interest and extensive research experience in respiratory diseases. She is a member of the *Minnesota Medicine* advisory committee.

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no associated allergy and immunology fellowship. Our goal was to evaluate IM residents' attitudes, knowledge and self-assessed clinical competency in treating common allergic conditions, in order to determine the need for further education in allergy and immunology.

**Methods**

We conducted a survey-based study of University of Minnesota IM, medicine-pediatrics and medicine-dermatology residents. Participation was voluntary. The anonymous survey was offered to all residents during routine educational conferences. The survey included questions about the resident's attitude, knowledge and self-assessed clinical competency in treating common allergic conditions including rhinitis, urticaria, contact dermatitis, antibiotic/drug allergies, anaphylaxis and asthma. We collected data on whether residents had received any formal training in allergy and immunology in medical school or residency, and whether or not they were aware that allergy and immunology questions are included on the American Board of Internal Medicine (ABIM) Internal Medicine Certification Exam. The survey also included questions about the resident's interest in additional clinical and/or didactic training in allergy and immunology.

Survey responses were dichotomized. Chi-square tests (or Fisher's exact tests if frequency of any response was less than 5)

were performed to compare responses between groups (IM vs medicine-pediatrics and medicine-dermatology residents). Analyses were performed using Statistical Analysis Software (version 9.3, SAS Institute Inc., Cary, NC). A two-sided *P*-value<0.05 was considered statistically significant.

**Results**

There were 67 total participants (n=67) in the study, including 48 IM, 14 medicine-pediatrics and 5 medicine-dermatology residents. The survey response rate was 47.9% (67/140) of current residents. All levels of training were included. Of the participants, 59.7% (40/67) were in their PGY1/PGY2 year of training and 40.3% (27/67) were PGY3/PGY4/PGY5. 79.1% (53/67) had received no formal training in allergy and immunology in medical school, and 86.6% (58/67) had not received any formal training during residency. This lack of residency training was more pronounced in the IM residents, at 91.7% (44/48), than in the medicine-pediatrics/medicine-dermatology residents, at 73.7% (14/19) (*P*=0.10).

Only 38.8% (26/67) of all residents felt very prepared to treat allergic rhinitis. Similarly, only 14.9% (10/67) felt very prepared to treat urticaria, 20.9% (14/67) felt very prepared to treat contact

TABLE

**Resident self-assessed preparedness for treating common allergic conditions**

		IM RESIDENTS (N=48) NO. (%)	MEDICINE-PEDIATRICS/ MEDICINE-DERMATOLOGY RESIDENTS (N=19) NO. (%)	TOTAL (N=67) NO. (%)
Allergic rhinitis	Not at all/slightly/moderately prepared	29 (60.4%)	12 (63.1%)	41 (61.2%)
	Very/extremely prepared	19 (39.6%)	7 (36.84%)	26 (38.8%)
Urticaria	Not at all/slightly/moderately prepared	42 (87.5%)	15 (79.0%)	57 (85.1%)
	Very/extremely prepared	6 (12.5%)	4 (21.05%)	10 (14.9%)
Contact dermatitis/ skin allergies	Not at all/slightly/moderately prepared	39 (81.3%)	14 (73.7%)	53 (79.1%)
	Very/extremely prepared	9 (18.75%)	5 (26.3%)	14 (20.9%)
Antibiotic/ drug allergies	Not at all/slightly/moderately prepared	40 (83.3%)	14 (73.68%)	54 (80.6%)
	Very/extremely prepared	8 (16.7%)	5 (26.3%)	13 (19.4%)
Anaphylaxis	Not at all/slightly/moderately prepared	38 (79.2%)	7 (36.8%)	45 (67.2%)
	Very/extremely prepared	10 (20.8%)	12 (63.2%)	22 (32.84%)

There was no statistically significant (*P*<0.05) difference between IM residents and medicine-pediatrics/medicine-dermatology residents, except for anaphylaxis with *P*=0.0009.



dermatitis/skin allergies, 19.4% (13/67) felt very prepared to treat antibiotic/drug allergies, and 32.8% (22/67) felt very prepared to treat anaphylaxis (Table). Regarding asthma, 56.7% (38/67) of residents felt very comfortable treating asthma in the inpatient setting, and 52.2% (35/67) felt very comfortable treating asthma in the outpatient setting. There was no statistically significant difference in preparedness for treating allergic rhinitis, urticaria, contact dermatitis/skin allergies, antibiotic/drug allergies, or asthma between the IM and the medicine-pediatrics and medicine-dermatology residents ( $P>0.05$ ).

Of the 67 residents, only 36 (53.7%) knew there were allergy and immunology questions on the ABIM Internal Medicine Certification Exam. Most of the residents, 98.5% (66/67), thought education in allergy and immunology was an important part of IM training, and 80.6% (54/67) were interested in an elective rotation. Nearly all, 97.0% (65/67), were interested in a didactic curriculum.

## Discussion

This study revealed a significant lack of knowledge and clinical competency among IM residents regarding the management of common allergic conditions: allergic rhinitis, urticaria, contact dermatitis, antibiotic/drug allergies and anaphylaxis. Only approximately half of the residents felt adequately trained to treat asthma. Our findings support what has been previously identified: that there's a knowledge deficit among IM physicians regarding common allergic conditions.<sup>6</sup>

In our study, residents believed training in allergy and immunology is important during an IM residency. Further, almost all residents in our study would be interested in an allergy and immunology elective rotation and a didactic curriculum if they were available. This is an important and promising finding, in that residents are aware of this knowledge deficit and are interested in addressing it.

## Conclusion

Our residents reported low levels of preparedness for managing common immunologic and allergic conditions, a finding that is consistent with previously published work.<sup>6</sup> These results suggest that IM residency programs should provide additional education in allergy and immunology in order to expand the knowledge and improve the clinical competency of their trainees. **MM**

Mollie Alpern practices hospital medicine at HealthPartners. Qi Wang is part of the Clinical and Translational Science Institute at the University of Minnesota. Meghan Rothenberger is an assistant professor of medicine and Internal Medicine Residency associate program director at the University of Minnesota.

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# Hospital-Treated Falls and Comorbidities Among Older Adults in Minnesota, 2010-2014

BY NAKO ONIZUKA, MD, PHD, MPH, ANNA GAICHAS, MS, AND JON ROESLER, MS

Falls are a serious concern for older adults as they frequently result in injury, disability and even death. In older adults in Minnesota, the number and rate of hospital-treated falls have been increasing, for both males and females. The purpose of this study was to estimate trends in falls among older adults in Minnesota, and to examine whether there is an association between severe outcomes of falls and predictors. We investigated hospital-treated (both emergency department treatment and hospitalizations) falls among adults 65 years and older in Minnesota between 2010 and 2014, using hospital discharge data from the Minnesota Hospital Association. In total, 199,364 cases were identified; this represents a rate of 5,281.4/100,000 during the five-year period. We found the number of hospital-treated falls increased each year by 1,820 cases on average, for an average rate increase of 108.3/100,000 per year. The rate for falls with no comorbidities decreased, while the rate for falls with one or more comorbidities increased. Also, comorbidities were more likely among hospitalized and/or fatal cases than among nonhospitalized and/or nonfatal cases. The most frequent principal injury diagnoses associated with falls included fractures (31.7% of total hospital-treated falls), superficial wounds/contusions (14.7%), open wounds (10.9%) and traumatic brain injuries (TBIs) (3.9%). The most frequent type of fracture was hip fracture (29.1%). Additional complications commonly occurring during hospital treatment of injury resulting from a fall included urinary tract infection (7.2%), pneumonia (2.2%), pressure ulcer (1.2%) and sepsis (0.9%). Among these, sepsis had the highest odds ratio of 9.9 for death. These data show the burden of falls is greatest among those who are 85 and older and/or who have one or more comorbidities.

Falls are a serious and common health concern for older adults. In the United States, 34% of people 65 years of age or older, 50% of community-dwelling people 80 to 89 years old, 26% of hospital inpatients and 43% of people living in nursing homes experience at least one fall a year.<sup>1</sup> A previous study reported that the annual

prevalence of having fallen in the last 12 months in community-dwelling patients older than 65 is between 28% and 35%; it reaches 40% for people 75 years of age or older.<sup>2</sup> Falls are responsible for 56% of the hospitalizations for trauma and for 6% of urgent hospitalizations in patients older than 65 years of age.<sup>3</sup>

Falls not only result in injury, disability, hospitalization and inability to live

independently; they also result in death. According to a previous report, the rate of fall mortality in those 65 years and older is increasing every year.<sup>4</sup> The rate for that age group is higher in Minnesota (at 110/100,000) than in the nation as a whole (48/100,000). The rate of fatal falls is climbing faster in Minnesota than in the

United States as a whole as well. It doubled between 2000 and 2013. The rate of hospitalization for nonfatal falls increased by 450/100,000 from 2004 through 2008, and the rate of emergency department (ED) visits for falls doubled from 1999 to 2013. This stands in contrast to the overall decrease in mortality<sup>5</sup> and to the noted decreases in the number of preventable deaths due to heart disease, cancer and cerebrovascular disease.<sup>6</sup>

In this study, we investigated hospital-treated (both ED treatment and hospitalization) falls in the 65 and older population in Minnesota during the 2010 to 2014 period. This study's main aims were four-fold: 1) to describe the five-year trend in hospital-treated falls among older adults in Minnesota by various characteristics (eg, age group, treatment location); 2) to analyze whether there has been an increase in the percentage of comorbidities among those receiving hospital treatment for a fall; 3) to investigate whether having comorbidities is independently associated with the odds of hospitalization (vs ED treatment only) or death during hospital treatment for a fall; and 4) to investigate the consequences of falls and the relationship of each consequence with subsequent mortality from any cause during the hospital treatment.

## Methods

We analyzed Minnesota Hospital Association (MHA) hospital discharge data on adults who were treated in the ED or hospitalized for falls in Minnesota during the 2010 to 2014 period. We used the following inclusion criteria:

- ICD-9-CM External Cause Codes: E880.0-E886.9, E888(.0-.9) – Accidental Falls
- Treated in acute care hospitals
- Date of discharge occurring from January 1, 2010 to December 31, 2014
- Minnesota residents
- Patient age 65 or older
- Emergency department-treated or admitted as an inpatient

- Discharged from hospitals reporting to MHA continuously throughout the period (There are 147 hospitals in the state, including nonacute-care facilities; 137 are members of MHA; 135 are included in the all-age injury hospital discharge database at MDH; 130 hospitals reported older adult fall cases; 127 of these hospitals reported continuously throughout the period.)
- All ED visits and hospitalizations for the same injury event were linked and analyzed together as one unique case. Multiple injury dates within the same month were treated as one injury event. Multiple injury events occurring in separate months were analyzed as separate cases.

## Comorbidities

Hospital discharge data does not contain a direct measure of frailty, although frailty has been found to be predictive of hospitalized fall injury.<sup>7</sup> Comorbidity does overlap with frailty,<sup>8,9</sup> and comorbidities are included with hospital discharge data. Thus, we used the number of comorbidities in each patient as a proxy for frailty. We identified a set of commonly occurring comorbidities in the study population.<sup>10,11</sup> These included hypertension, hyperlipidemia, diabetes, dementia, osteoporosis, osteoarthritis, depression, ischemic heart disease, asthma, rheumatoid arthritis, cerebral infarction, COPD and chronic renal failure.

## Consequences

We identified both injury and noninjury consequences of falls. We categorized the injury consequences by type using the Barell Injury Diagnosis Matrix.<sup>12</sup> We identified the noninjury consequences of falls using the most frequent noninjury complications during hospital treatment after falls in the elderly: urinary tract infection (UTI), pneumonia, pressure ulcer and sepsis.<sup>13</sup>

## Statistical Analysis

Rates were age-adjusted to the U.S. 2000 Standard Population for those 65 and older (age groups: 65 to 69, 70 to 74, 75 to 79, 80 to 84, and 85+).<sup>14</sup> A multiple logistic regression model (Model 1) was fitted twice to examine the strength and direction of the association between certain outcomes (fatal vs nonfatal, hospitalized vs ED-treated) and factors that predicted the outcomes; indicator variables for 0 comorbidities, 1 comorbidity, 2 comorbidities, and 3 or more comorbidities; and for age groups. For all models, p is the probability of poor outcome (fatal or hospitalized).

$$\text{Model 1: } \text{logit}(p) = \beta_0 + \beta_1 * \text{comorbidities} + \beta_2 * \text{age-group}$$

A subsequent multiple logistic regression model (Model 2) was applied to assess the odds of death for specific comorbidities and consequences of fall injury, adjusting for age group. Variables univariately associated with death were included in a multivariate logistic model. A final model with six parameters was chosen on the basis of univariate analysis and clinical knowledge. The predictors were hip fractures, pneumonia, sepsis, age group, an interaction term of hip fractures and age group, and an interaction term of pneumonia and age group. We decided not to include TBI, UTI and pressure ulcer in the final model because they were not statistically significant in the preliminary multivariate models.

$$\text{Model 2: } \text{logit}(p) = \beta_0 + \beta_1 * \text{hip-fracture} + \beta_2 * \text{pneumonia} + \beta_3 * \text{sepsis} + \beta_4 * \text{age-group} + \beta_5 * (\text{hip-fracture} * \text{age-group}) + \beta_6 * (\text{pneumonia} * \text{age-group})$$

Odds ratios and 95% confidence intervals were computed. All analyses were performed using SAS 9.4 (SAS Institute, Cary, NC, USA).

FIGURE 1

### Rates for Hospital-Treated Falls by Year

Hospitalized, ED-Treated and Overall  
Minnesota, Age 65+, 2010-2014

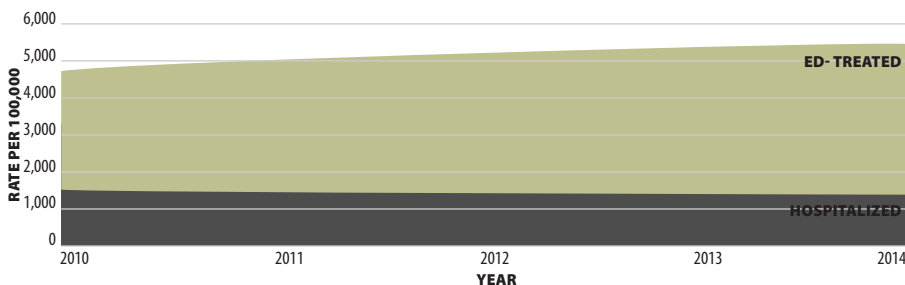


FIGURE 2

### Rates for Hospital-Treated Falls by Age Group

Minnesota, Age 65+, 2010-2014

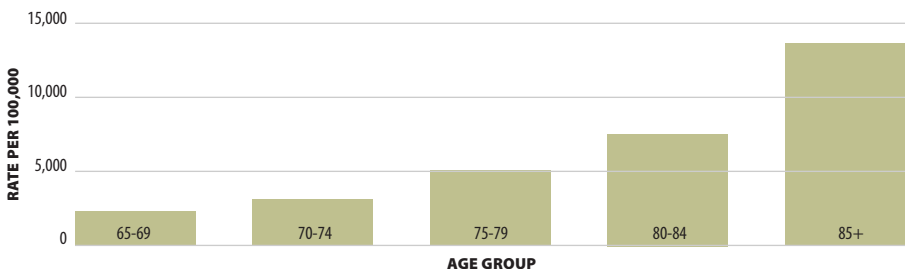
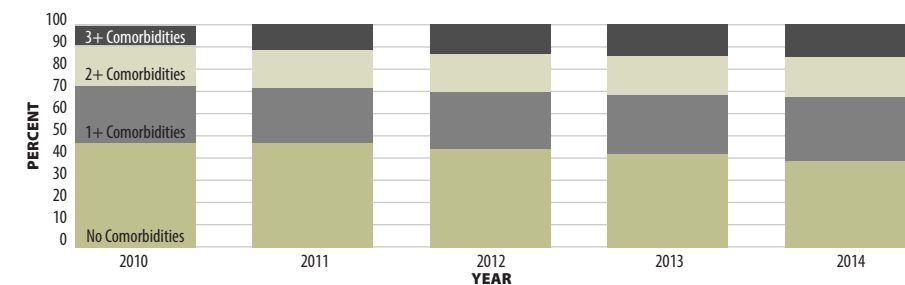


FIGURE 3

### Percentage of Hospital-Treated Falls Having 0, 1, 2 or 3+ Comorbidities by Year

Minnesota, Age 65+, 2010-2014



## Results

### Trends

The total number of hospital-treated falls (fatal and nonfatal, hospitalized and ED-treated) in Minnesotans over 65 years of age was 199,364 for the entire study period; this represents a five-year annualized rate of 5,281.4/100,000. The annual number has been increasing. (For example, there were 7,283 more cases in 2014 than in 2010.) Since 2010, the average annual increase has been 178.8/100,000 (Figure 1). In these patients, 72% of total cases were treated in the ED, and 28% of total cases were hospitalizations. The rate of ED-treated falls increased by 810.2/100,000 over the study period, while the rate of hospitalizations for falls decreased by 94.6/100,000.

Ninety-nine percent of hospital-treated falls were nonfatal. The number and rate of fall injury cases increased with each age group. The rate of falls among people age 85+ years (13,698/100,000) was the highest of any age group; this is 1.8 times the rate in 80- to 84-year-olds, 2.8 times the rate in 75- to 79-year-olds, 4.2 times the rate in 70- to 74-year-olds, and 5.8 times the rate in 65- to 69-year-olds (Figure 2). Women represent two-thirds of total fall cases. Rates in women are higher than rates in men across all age groups.

### Comorbidities

Among hospital-treated fall cases, the percentage having one or more comorbidities has been increasing, while the percentage having no comorbidities has decreased (Figure 3). Notably, the percentage having 3 or more comorbidities among cases of hospital-treated falls has increased 37%.

Using the first logistic model, having comorbidities was strongly associated with increased odds of hospitalization (vs ED treatment) and death among fall cases. Having 3 or more comorbidities had an odds ratio of 3.8 for death among cases, and an odds ratio of 24.1 for hospitalization (vs treatment in the ED). Age group was not statistically significant in this model.

### Consequences

Among total hospital-treated falls, 25.8% did not have a principal (first listed) diagnosis of injury. Fractures were the principal diagnosis in 31.7% of cases, followed by superficial wounds/contusions (14.7%), open wounds (10.9%) and traumatic brain injury (TBI) (3.9%) (Figure 4). Among those with fractures, hip fracture was the most frequent, accounting for 29.1% of total fractures, followed by fracture of upper extremities (27.3%).

We assessed the frequency of UTI, pneumonia, pressure ulcer and sepsis.<sup>10</sup> Among those, UTI was the noninjury consequence seen most frequently (in 7.2% of cases), followed by pneumonia (2.2%), pressure ulcer (1.2%), and sepsis (0.9%) (Figure 5).

Using the second logistic model, we found patients with sepsis had the greatest risk of death (odds ratio of 9.9 for death in those with hospital-treated falls). The patient's age was also significantly associated with risk of death after a fall.

### Discussion

Our findings on hospital-treated falls for older adults in Minnesota are consistent with previous reports that found the rate of falls and the risk of fall mortality increase with age,<sup>4</sup> and the rate of hospital-treated falls is higher in women compared to men.<sup>15</sup> We showed that the rate of falls is double in women compared to men and, after age 70 years, the rate increases rapidly for every five years of age, with those aged 85+ years having the highest rate of fall mortality. The rate of ED-treated falls has been increasing, while the rate of hospitalized cases has been decreasing. One possible reason for this is that Medicare encourages hospitals to hold patients for observation, often for more than 48 hours;<sup>16</sup> as a result, there may be a shift in how patients are being classified. Also, hospitals may be reluctant to admit patients a second time following a fall, as they can incur penalties for readmissions.<sup>17</sup>

FIGURE 4

### Percent of Falls by Most Frequent Principal Injuries

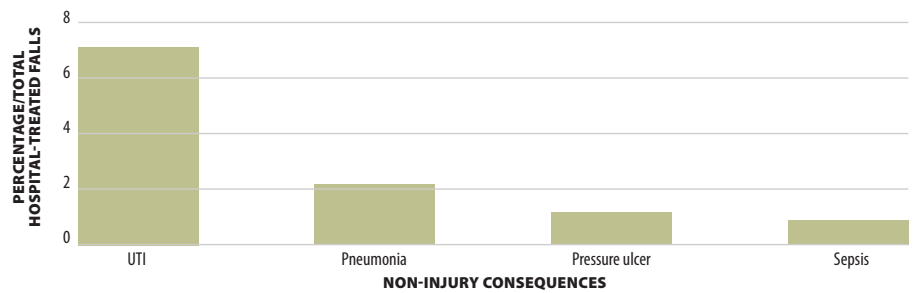
Minnesota, Age 65+, 2010-2014



FIGURE 5

### Percent of Falls by Most Frequent Non-Injury Consequences

Minnesota, Age 65+, 2010-2014



Among those treated in the hospital for falls, our results showed that the percentage of those with at least one comorbidity increased, while the percentage of those with no comorbidity decreased during the study period. Having one or more comorbidities was associated with more severe falls. A larger number of comorbidities was strongly associated with being hospitalized (vs treated in the ED) and/or fatality. This may be related to the fact that hospitalized patients tend to have more diagnoses on hospital discharge than do ED-treated patients. Nonetheless, clinicians should consider the number of comorbidities in their fall risk assessment of seniors as a proxy for frailty. As mentioned above, this is consistent with a previous study looking at frailty as a predictor of fall injury.<sup>7</sup>

Our results show that the major injury consequences of falls were fractures, superficial wounds/contusions, open wounds and TBI. The most frequent non-

injury consequences were UTI, pneumonia, pressure ulcer and sepsis. Pneumonia, pressure ulcer and UTI often develop because of prolonged immobility after a fall-related injury and can result in sepsis. TBIs and hip fractures are also associated with high rates of morbidity because of prolonged immobility, surgical risk and functional disability, and can result in pneumonia or other conditions as well as death. Age-related changes and comorbidities are associated with the risk of falls, and result in immobilization and severe outcomes. Among those consequences, sepsis had the highest odds (9.9) for death, followed by pneumonia.

#### Evidence-Based Fall Prevention

The American Academy of Family Physicians<sup>18</sup> recommends home hazard assess-

ment (the MDH has an assessment tool available online<sup>19</sup>), home modification for patients with a history of falls, assessment of multiple risk factors for falls, and providing medical and social care to address factors identified during the assessment. Regular exercise or physical therapy, including balance, gait and strength training, and vitamin D supplementation are also recommended to prevent falls in community-dwelling older adults. It is recommended that older adults get at least 150 minutes per week of moderate-intensity or 75 minutes per week of vigorous-intensity aerobic physical activity, as well as muscle-strengthening activities twice per week.<sup>20,21</sup>

### Study Limitations

There are several limitations of this study. First, we could not directly measure the relationship between frailty and falls incidence. A cohort study or case control study would be necessary to further evaluate the relationship between falls and frailty. Furthermore, while we used three or more comorbidities as a proxy for frailty, this relationship has not been widely established for public health surveillance. Second, we could not distinguish between deaths directly attributable to a fall and those attributed to another cause. In a future study, the MHA data could be linked to death certificate data to determine which deaths were caused by falls. Third, fall victims who did not present to the hospital and Minnesota residents who fell outside of the state were not included. This would result in an underestimate of fall rates. Finally, the rates reported in this paper are likely conservative because we excluded the hospitals that were not present in the data consistently throughout the five years. Submission of hospital discharge data is voluntary, and not all hospitals did so constantly from 2010 to 2014. For example, 16 North Dakota hospitals treating Minnesota patients began reporting to the MHA after the beginning

of the study period and are not included in the analysis.

### Conclusion

The rapid increase in hospital-treated falls is very concerning. The increase in falls was seen among older adults with one or more comorbidities. Moreover, having comorbidities is a predictor of the severity of falls for adults 65 years of age and older. As noted, having a larger number of comorbidities is associated with a greater odds of hospitalization (vs ED treatment) and/or death. To the extent that three or more comorbidities can be used as a proxy for frailty, our analysis suggests that the increase in fall rates may be due to the increasing frailty among elders; older adults may not be dying from heart disease, diabetes or other conditions but rather living with these conditions and becoming increasingly frail. Finally, because sepsis, hip fractures and pneumonia were associated with higher mortality after falls, they provide a potential basis for clinical mortality risk assessment. **MM**

Naoko Onizuka is an orthopedic surgeon from Japan who received her MPH in epidemiology from the University of Minnesota in 2016. Anna Gaichas is a biostatistician at the Minnesota Department of Health. Jon Roesler is an epidemiologist supervisor at the Minnesota Department of Health.

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[www.sioxfalls.va.gov](http://www.sioxfalls.va.gov)

## St. Cloud VA Health Care System

### OPPORTUNITY ANNOUNCEMENT

Opportunities for full-time and part-time staff are available in the following positions:

- Internal Medicine/Family Practice
- Physician (Extended Care & Rehabilitation)
- Physician (Pain Clinic)/Outpatient Primary Care
- Psychiatrist
- Urgent Care

US Citizenship required or candidates must have proper authorization to work in the US. Physician applicants should be BC/BE. Education Dept Reduction Program funding may be authorized for the health professional education that was required for the position. Possible recruitment bonus.  
EEO Employer



Since 1924, the St. Cloud VA Health Care System has delivered excellence in health care and compassionate service to central Minnesota Veterans in an inviting and welcoming environment close to home. We serve over 38,000 Veterans per year at the medical center in St. Cloud, and at three Community Based Outpatient Clinics located in Alexandria, Brainerd, and Montevideo.

Competitive salary and benefits with recruitment/relocation incentive and performance pay possible.

For more information:

Visit [www.USAJobs.gov](http://www.USAJobs.gov) or contact  
Nola Mattson (STC.HR@VA.GOV)  
Human Resources  
4801 Veterans Drive  
St. Cloud, MN 56303  
(320) 255-6301  
EEO Employer



Located sixty-five miles northwest of the twin cities of Minneapolis and St. Paul, the City of St. Cloud and adjoining communities have a population of more than 100,000 people. The area is one of the fastest growing areas in Minnesota, and serves as the regional center for education and medicine.

Enjoy a superb quality of life here—nearly 100 area parks; sparkling lakes; the Mississippi River; friendly, safe cities and neighborhoods; hundreds of restaurants and shops; a vibrant and thriving medical community; a wide variety of recreational, cultural and educational opportunities; a refreshing four-season climate; a reasonable cost of living; and a robust regional economy!





## The perfect match of career and lifestyle.

ACMC Health is a physician-owned multispecialty health network in west central and southwestern Minnesota. ACMC is the perfect match for healthcare providers who are looking for an exceptional practice opportunity and a high quality of life. Current opportunities available for BE/BC physicians in the following specialties:

- Anesthesiology
- Dermatology
- ENT
- Family Medicine
- Gastroenterology
- General Surgery
- Geriatrician
- Hospitalist
- Internal Medicine
- Neurology
- OB/GYN
- Oncology
- Orthopedic Surgery
- Pediatrics
- Psychiatry
- Psychology
- Pulmonary/Critical Care
- Rheumatology
- Urgent Care
- Urology

Loan repayment assistance available.

**FOR MORE INFORMATION:**

Shana Zahrbock, Physician Recruitment  
shanaz@acmc.com | (320) 231-6353

[www.acmc.com](http://www.acmc.com) | [discoveracmc.com](http://discoveracmc.com)

## BEYOND TREATING, THERE'S CARING

WELL AND BEYOND

Fairview Health Services seeks physicians with an unwavering focus on delivering the best clinical care and a passion for providing outstanding patient experience.

**We currently have opportunities in the following areas:**

- Dermatology
- Emergency Medicine
- Endocrinology
- Family Medicine
- Geriatric Medicine
- Hospitalist
- Infectious Disease
- Internal Medicine
- Med/Peds
- Neurology
- OB/GYN
- Pain Medicine
- Pediatrics
- Psychiatry
- Pulmonary Medicine
- Rheumatology
- Urgent Care
- Urology

To learn more, visit [fairview.org/physicians](http://fairview.org/physicians), call 800-842-6469 or email [recruit1@fairview.org](mailto:recruit1@fairview.org)

TTY 612-672-7300

EEO/AA Employer

Sorry, no J1 opportunities.



You focus on taking care of patients. We'll take care of the rest.

To learn more, visit [physicianjobs.allinahealth.org](http://physicianjobs.allinahealth.org)



### MMA Online Physician Career Center

A one-stop online job site for physicians looking for a new position and clinics looking for a new colleague.



### Why use MMA Physician Career Center?

- **No cost** for job searchers
- **Post your resume**, receive job alerts
- **Dozens** of Minnesota positions, all practice types
- **Thousands** of positions nationwide
- Part of **National Healthcare Career Network**, a group of more than 200 medical associations nationwide
- Post positions **for your clinic**
- Posting seen by **1,200 visitors a month**
- **Online** for your convenience

Be sure to see *Minnesota Medicine* magazine for printed job openings

For more information, go to [www.mnmed.org/careercenter](http://www.mnmed.org/careercenter)



## Barriers

separate the self  
from the messy business of blood and vomit.

Curtail contamination ...  
provide impunity ...  
confer safety ...  
or so we pray.

Closely mimic the cocoon  
we learned to spin in medical school  
to keep emotions at bay  
patient after dying patient.

But  
Mongols breached the Great Wall  
Ebola penetrated the epidermis  
and  
the rogue teardrop blindsides  
even the flintiest of docs.

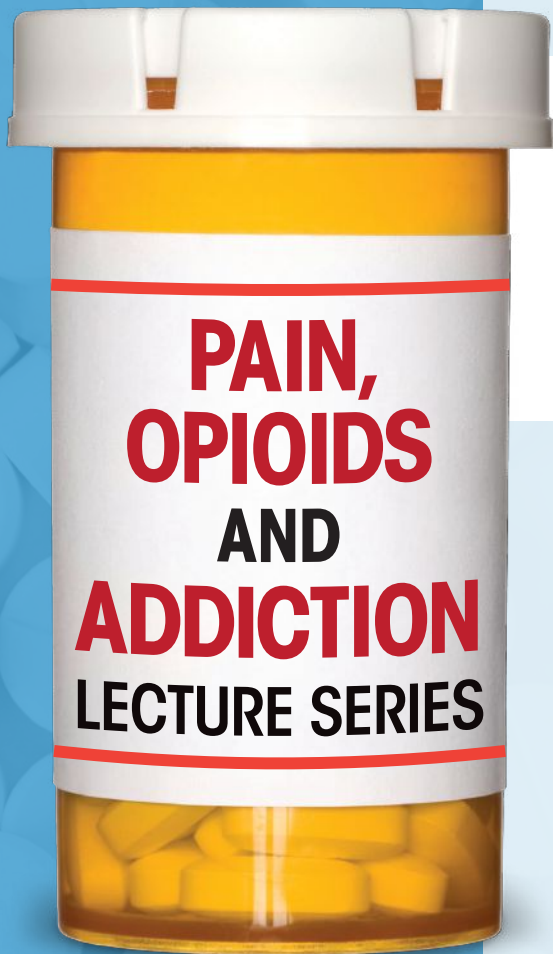
– MARILYN ASCHOFF MELLOR, MD



Marilyn Aschoff Mellor is a retired pediatric emergency medicine physician who blogs at [marilynmellorintothefray.blogspot.com](http://marilynmellorintothefray.blogspot.com).

#### ABOUT THIS PIECE




Mellor gives two sources of inspiration for this poem:  
“The barriers we all erect for self-preservation. And a gruff trauma surgeon.”



## The Pain, Opioids and Addiction lecture series

will provide physicians and other providers with valuable information on topics related to pain management, opioid prescribing and addiction.

Through this lecture series, learn how to:

-  Assess a patient's pain and function
-  Make informed treatment decisions
-  Recognize and manage addiction

### ALL LECTURES ARE FREE

Want to make this lecture series available within your organization?

Contact us at [CME@MNMED.ORG](mailto:CME@MNMED.ORG) to discuss the options available.

For more information on each lecture, visit [MNMED.ORG/PAINSERIES](http://MNMED.ORG/PAINSERIES)



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



MINNESOTA  
MEDICAL  
ASSOCIATION



Steve Rummeler  
**HOPE FOUNDATION**  
Providing HOPE for those with Chronic Pain and Addiction

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

# A TRUSTED PARTNER WITH PROVEN EXPERIENCE

COPIC is a better option for medical professional liability coverage that offers more. Our industry-leading programs support physicians, health care professionals, group practices, hospitals and other medical facilities to deliver improved patient care. And having a proven partner means you can focus on what matters most—better medicine and better lives.

COPIC benefits include:

- **On-site reviews that identify high-risk areas** and best practices to address these.
- **A 24/7 risk management hotline staffed by physicians** for guidance in urgent situations.
- **An array of educational activities** that include in-person seminars, on-demand courses, and multi-day conferences.
- **Frequency of claims among COPIC insureds is 30% less than the national average.**
- **10+ years of experience with communication and resolution programs** that address patients' needs and work toward a resolution after an unexpected outcome.
- **Year-round legislative advocacy** that supports a stable medical liability environment.



Better Medicine • Better Lives

[www.callcopic.com](http://www.callcopic.com)

For more information, please contact Kristin Stepien at [kstepien@copic.com](mailto:kstepien@copic.com) or (800) 421-1834 ext. 6186.

*COPIC is exclusively endorsed by the Colorado Medical Society, Colorado Hospital Association, and Nebraska Medical Association*

