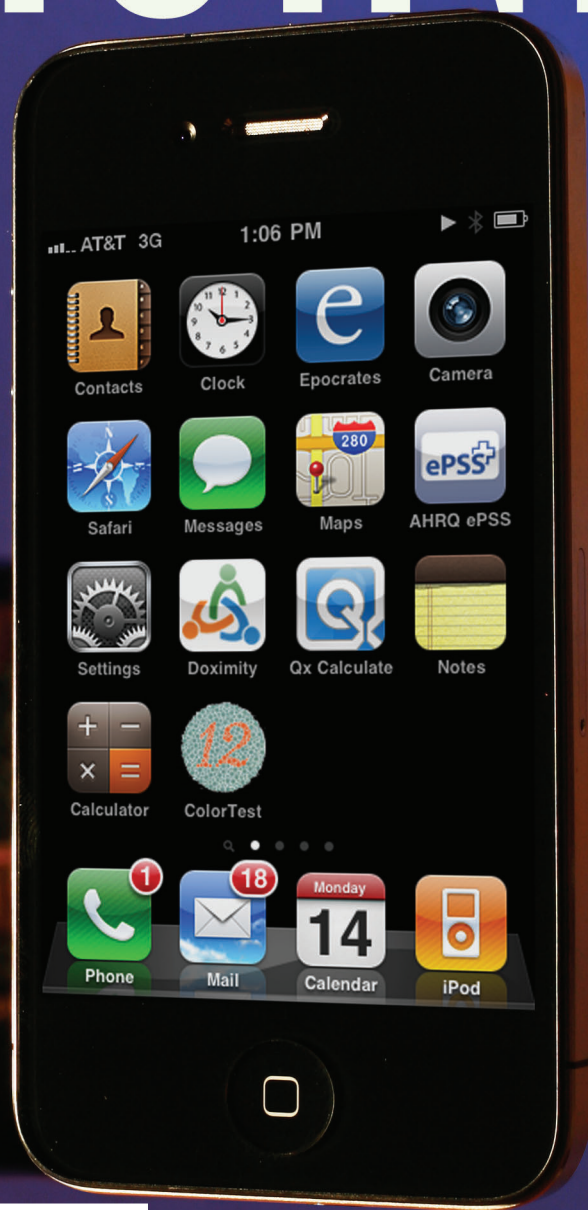


# minnesota MEDICINE

## 25 Ways to Use Your Smartphone

Physicians on their favorite apps



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Networking Savvy

Medical Scribes

Preparing for ICD-10





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Physicians need to be informed about how to use social media wisely.



With apps for everything from calculating risk of stroke and heart disease to translating medical phrases into Spanish, smartphones have become an essential tool for many physicians. | Photo by Clare Pix Photography • www.clarepix.com

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Photo by Scott Walker

# A Gadget Guy's Take on Technology

Technology continues to shake up medicine, and my prediction is that more temblors likely are ahead.

I come from a family of gadgeteers. My father, an MIT-trained engineer, easily transitioned from the “gadgets” of his childhood in the 1920s such as toy steam engines to ham radio transceivers in the 1960s to the first IBM PC in the early '80s. The last 20 years of his life saw a lengthening technology parade of computers, phones, fax machines, and cameras. My brother, a Stanford-trained electrical engineer, has been at the leading edge of technology since graduating from college, always staying two steps ahead of my dad and me with the latest nifty devices and serving as the Meyer family nerd. The genes traveled to my youngest son, Ramsey, a button-pusher from age 3 and now a savvy computer guy who sends me frequent technology updates and is gradually replacing my brother as the family Geek Squad agent.

Over the years, I have struggled to keep current, leaving a trail of computers, printers, PDAs, and cell phones as proof of that effort. I have tried to incorporate technology into my medical practice, but internal medicine is more high-touch than high-tech. When I joined my group in 1977, our sole piece of technology was a chest X-ray unit that was a slight upgrade from Roentgen's original. It now adorns a room devoted to chart storage. Our doctors type their office notes using Microsoft Word; but our migration to computerized medical records has been painfully glacial. Personally, I'm a Meyer techie, but professionally, I'm a frustrated wanna-have.

So this month's issue is a bit like window-shopping for me—electronic health records in full bloom showing their worth, smartphones finding their way into doctors' pockets, iPads getting tested

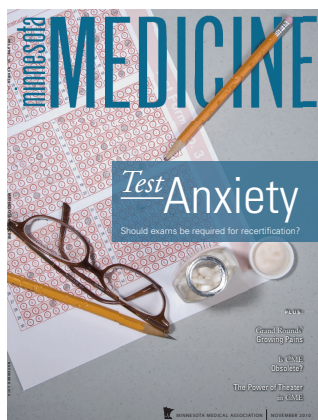
for their utility by medical students, “office” visits being done on the Internet, and spiffy portable ultrasounds adding quick, accurate diagnoses to medical office practice. Technology continues to shake up medicine, and my prediction is that more temblors likely are ahead.

What social media will do for or to medical practice is more difficult to predict. Clearly, Facebook and Twitter have inundated society nationally and globally, with an estimated 500 million people posting, friending, and liking on Facebook and tweeters sharing impressions from the inane to the inspired. Businesses have embraced social media, seeing them as a way to connect to potential customers, to draw them in to a virtual club so that they won't just buy, they'll belong. The Mayo Clinic thinks those media are important enough for medicine to have established a social media center. And when authors Colin Segovis and Melissa Rethlefsen say the “media are designed to be open, transparent, and easy to use,” it sounds like we all should sign up.

Yet social media are not for all providers and perhaps are not for most providers. A Facebooker's page is a digital billboard: Once you put it up, it's there for viewing, interpretation, and perhaps misinterpretation. Most docs I know prefer to make their impact one patient at a time.

So as a confirmed gadgeteer, I see myself getting a new smartphone, investing in computerized medical records, and dabbling with new office gadgets. But for now, I'll just friend the person in front of me.

.....  
Charles R. Meyer, M.D., editor in chief, can be reached at [cmeyer1@fairview.org](mailto:cmeyer1@fairview.org)



## New Twist on License Renewal

Since *Minnesota Medicine* published its article on specialty board recertification (November 2010, p. 24), the Minnesota Board of Medical Practice (BMP) has adopted a new policy regarding the requirements for renewal of a medical license in the state. In March of this year, the BMP decided that if a physician is participating in

Maintenance of Certification required by their certifying American Board of Medical Specialties or Royal College of Physicians and Surgeons of Canada board, or Osteopathic Continuous Certification required by the American Osteopathic Association's Bureau of Osteopathic Specialists, it should satisfy their continuing medical education requirements for renewal of licensure in Minnesota. Below is an excerpt from the BMP's official statement.

Mark Eggen, M.D.

Board member, Minnesota Board of Medical Practice

*The Board of Medical Practice has authority to accept and, indeed, has accepted certification or recertification by a specialty board in lieu of compliance with the continuing medical education (CME) requirements during the cycle in which certification or recertification is granted. Minn. Rule 5605.0700 gives the Board authority to do so. The Board recognizes that lifelong learning is important to keep up to date medical knowledge and skills. Maintenance of Certification (MOC) is available to physicians certified by American Board of Medical Specialties (ABMS) and Royal College of Physicians and Surgeons of Canada (RCPSC), regardless of whether their certificates are time-limited. Osteopathic Continuous Certification (OCC) is available to osteopathic physicians certified by the American Osteopathic Association's Bureau of Osteopathic Specialists, regardless of whether their certificates are time-limited. Government payers, private insurers, and the public want assurance that physicians have current knowledge and skills. In light of MOC and OCC, the Board has revisited the issue to determine whether MOC and OCC would be acceptable as meeting the rule requirements and has determined that it does. Physicians may need to do CME for reasons other than licensure.*



## Superb Issue

The January issue of *Minnesota Medicine*, which addressed the issue of burnout, was superb. Like those mentioned in your article "Scaling Back" (p. 12), I too am now working part time. For a variety of reasons, in August I cut my schedule back to three days a week. Keep up the great work.

Paul Waytz, M.D.

Rheumatologist, Edina

## World-Class Act

Lest I be accused of nepotism, I will refrain from commenting on the specifics of Dr. David Farley's fine article "A Well-Oiled Machine" (January, p. 32), but I think a more appropriate title would be "Coolness under Fire." Also, it failed to mention that outstanding aspect of the Mayo Clinic in Rochester, which is a ready cooperative attitude among world-class specialists. This is hard to quantify, but it exists there and should be lauded.

Harrison H. Farley, M.D.

Retired surgeon, St. Paul

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A problem in your practice?

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Photo by Janna Netland Lovar

Medical scribe Ann Konrardy in the emergency department at Abbott Northwestern Hospital with Suzanne MacDonald, M.D.

ics to help doctors meet new demands for real-time data and recordkeeping created by EHRs. Essentially, the scribes interact with the computer so the doctors can interact with the patients. “It’s really shifted our attention away from the screen or notes, or the pencil and paper, and focused our attention more toward the patients,” Obetz says.

### EHRs in the ED

Scribes have been used in a few hospitals since the mid-1990s, but there has been growing demand for their services in recent years as hospitals and clinics around the country transitioned to EHRs and physicians were suddenly expected to enter patient data into computerized systems. Physicians began complaining that the data-entry demands were reducing their productivity and that the computer was an unnecessary barrier between themselves and their patients. In the ED where he was working at the time, Andrew Topliff, M.D., says physicians saw a 30 percent drop in productivity when EHRs were introduced five years ago. He’s seen similar problems in other EDs since. The drop in productivity has created a problem for both hospital administrators and for physicians, whose incomes are based on the number of patients they see.

Hospitals tried to encourage physicians to dictate their notes using either speech-recognition software or tape recorders, but there were problems, especially in EDs. Emer-

#### ■ Medical Scribes

## Wingmen in the ED

*Medical scribes have found a niche in hospital emergency departments. There, these skilled transcriptionists attend to the electronic health record while physicians tend to patients.*

BY J. TROUT LOWEN

Christopher Obetz pulls back the curtain and steps into exam room 11 in Abbott Northwestern Hospital’s emergency department. Inside, a young woman lies on the bed fully clothed; the clear plastic brace encircling her neck is the only obvious indicator that something is wrong. Her chart says she has had a seizure and hit her head.

“Hi, I’m Dr. Obetz, one of the emergency physicians here. I’ll be helping you. And this is Ann, my scribe. What brings you to the emergency room

today?”

The woman explains that the last thing she remembers was being on the phone. “Then I just woke up on the floor.”

As the patient talks, Ann Konrardy begins to type on a laptop computer that sits on a desk she has wheeled into the room and tucked discretely into a corner: “29-year-old female with a recurrent history of seizures presents at the ED post seizure.”

While Obetz looks directly at the patient and asks questions about the seizure, medi-

cations she is taking, and her social history, Konrardy scrolls up and down the electronic health record (EHR), entering data in the appropriate fields and switching screens to check the patient’s past medical history for relevant information. Obetz finally recommends that the patient have a CT scan and neck X-ray. Over the next few hours, Konrardy will check her computer for the results of those tests and brief Obetz when they are in.

Konrardy is one of a growing cadre of medical scribes now working in hospitals and clin-

gency physicians move quickly from patient to patient, are frequently interrupted, and work in noisy places—all of which make dictation difficult. “There was clearly a problem,” says Topliff, who began looking into the use of medical scribes to help doctors challenged by the new EHRs.

Three years ago, Topliff founded Elite Medical Scribes with two business partners. Elite now supplies scribes to several emergency care facilities and a handful of clinics in the Twin Cities and to other clients nationwide.

Abbott was among the first Twin Cities hospitals to make use of scribes. Five years ago, a physician group from Texas that had a scribe program in place trained Abbott’s first scribes. After that, Obez’s physician group, Emergency Care Consultants, took over the management of the scribe program.

Emergency Care Consultants now employs about 35 scribes. They assist emergency physicians and nurse practitioners at Abbott in Minneapolis and at United Hospital in St. Paul. Within the last year, Obez and Konrardy have also trained scribes for Children’s Hospital and Clinics of Minnesota in Minneapolis and a physician group in Columbus, Ohio.

## Recruitment and Training

Elite Medical Scribes and Emergency Care Consultants recruit and, almost exclusively, hire premed students to work as scribes. Many are in the gap year or years between college and medical school. Both programs also consider students

# Scribes interact with the computer so the doctors can interact with the patients.

headed into nursing and physician assistant programs. But Konrardy, who supervises and trains Emergency Care Consultants’ scribes, says future doctors are the ideal candidates because they’re motivated, focused, and driven to do a good job.

Training starts with video and online curriculum to familiarize the future scribes with the ED environment, the format of medical records, medical terminology, and the basics of billing, coding, and HIPAA requirements. Then, scribes-in-training work on the floor with an experienced scribe. Elite’s scribes go through 80 to 100 hours of on-site training followed by an extensive examination process, as well as ongoing education that covers advanced medical topics and billing and coding. Emergency Care Consultants’ scribes train for eight shifts before they work on their own.

At its best, the scribe-physician relationship is a symbiotic one. Scribes not only record the physician’s findings in the medical note, they alert physicians to potential issues in the patient’s medical history, order and track tests, and help track and update the status of up to eight patients at a time. Physicians review all the notes, make corrections, and sign off

on them. A good scribe, says Konrardy, is five steps ahead of the provider. “They really think of you as kind of like a wingman,” she adds.

And while scribes earn little more than minimum wage, they receive other benefits. Working full time in an emergency department gives premed students an intensive introduction to their chosen profession. “Personally, I don’t think there’s anything really

to compare it to,” says Julian Hinson, a premed student who began working as a scribe at Abbott in July. “I’ve been shadowing doctors, doing all of the volunteering you could do all four years of undergrad, and it doesn’t even add up to two months of this.”

Working as a scribe also has changed Hinson’s view of medicine. Before he started, he was convinced he wanted to go into cardiology; but scribing has exposed him to so many different areas of medicine and medical issues that he is keeping his options open. And he is convinced that spending a year working as a scribe will give him a leg up when he heads off to Meharry Medical College in Tennessee in June. “It’s almost unfair,” he says. “I feel like I’m cheating.”



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Before scribes,  
Emergency Care  
Consultants' physicians  
spent 40 percent of their  
shift doing paperwork.  
That's down to about  
5 percent.

### Tangible Benefits

Both Obetz and Topliff expect the demand for scribes to grow as the use of EHRs increases—and as hospital administrators come to understand that scribes, which typically cost hospitals about \$20 per hour, offer a good return on investment. Although they're most often found in EDs today, some expect hospitals will find other uses for them, perhaps in operating rooms. "At the end of the day, you just ask them if it makes sense to have people at the higher end of the pay scale doing data entry instead of using specialized skills to see patients," Topliff says.

Scribes' value can be measured in multiple ways, Obetz says. Physicians are more efficient, they see more patients, and patient satisfaction improves. Before scribes, Emergency Care Consultants' physicians spent 40 percent of their shift doing paperwork, Obetz estimates. Since scribes joined the physicians in the ED, that's down to about 5 percent.

The quality of the medical note also has improved, which has led to more accurate cod-

ing and billing. A study conducted by researchers at the University of Virginia and published in the journal *Academic Emergency Medicine* in 2008 compared scribed and nonscribed data from 4,135 patient charts and found that billing based on documentation done by scribes increased by an average of \$42 per patient.

And then there are the intangibles, such as the fact that having scribes around allows for better communication among doctors, consultants, and even paramedics. At Abbott, Obetz says, the goal is for an ED doctor to meet the paramedics at the door as the patient arrives, and scribes have freed up physicians to do that.

Although scribes were a rarity in EDs just five years ago, they are quickly becoming accepted members of the team. And emergency physicians who have worked with them are unlikely to want to work any other way.

"Could I do it?" Obetz considers. "Yes."

"Would I want to?"

"No." ■



### ■ Online Diagnosis

## Virtual Visits

*Two Twin Cities-based online diagnostic services are bringing relief to patients—and providers.*

| BY JEANNE METTNER

It's nearly midnight and your hacking cough, chills, and sore throat are keeping you awake. You think about going to urgent care, but you feel terrible and it's snowing. Rather than call a nurse line and risk being put on hold, you boot up your computer and go online to access a virtual diagnostic service. You click on responses to questions about your symptoms, whether you are being treated for any other medical conditions, whether you are allergic to medications and which ones, and where you prefer to pick up your prescriptions. In just a few minutes, you finish the online patient interview and submit your payment information. Within a half hour, a nurse practitioner emails you a diagnosis and treatment plan, and sends a prescription to your pharmacy.

As recently as a decade ago, this may have sounded incredible, but today, online diagnostic services are realities. And they're catching on.

In May 2010, St. Louis Park-based Park Nicollet Health Services began a one-year pilot with Zipnosis, an online care provider. In October, HealthPartners in Bloomington rolled out its own online diagnostic offering, Virtuwell.

Both systems are web-based and were designed to diagnose approximately 30 straightforward conditions such as sinusitis, urinary tract infections, acne, and conjunctivitis that can be reliably identified through a medical history, rather than laboratory testing and/or a physical examination. Both use clinical algorithms built on evidence-based guidelines such as those developed





by the Institute for Clinical Systems Improvement and the American Academy of Family Physicians. And both lead users through a series of questions crafted to capture data required for effective clinical decision-making. After users submit their responses, the information is sent to a provider, who then generates a treatment plan. Virtuwel's diagnoses and treatment decisions are made by a nurse practitioner or physician assistant who works for HealthPartners. Zipnosis uses physician assistants and nurse practitioners who work for Park Nicollet's urgent care clinics.

"What led us to try this was basically a sign of the times," says Jon Bylander, M.D., chair of urgent care at Park Nicollet, who is the lead physician for the Zipnosis pilot project. He explains that people are looking for convenient, affordable ways to get care. A Zipnosis visit costs \$25; a Virtuwel one runs \$40—a fraction of the price of an urgent care or office visit, or even a visit to a

retail clinic (MinuteClinic, for example, charges \$60 to \$75 to see a patient with an upper respiratory illness.) Although he doesn't know of any similar services elsewhere in the country, Zipnosis co-founder Steve Claypool, M.D., expects he will start seeing them soon. "Patients want to be able to communicate with their providers electronically, so the market forces are right for change in this area; this isn't going to be a fad that fades," he says.

### Guarding against Risk

Critics have argued that online diagnostic systems could compromise patient safety. The creators of Virtuwel and Zipnosis strongly disagree, however, noting that there's little risk because the systems have built-in protocols.

Others have expressed concern about misdiagnosis. The systems' defenders say that's unlikely because the types of conditions these systems ad-

dress are common and easy to diagnose. In addition, duration of symptoms is used as safeguard. For example, a Virtuwel user who indicates he or she has had burning or frequent urination for more than seven days is prompted to halt their Virtuwel visit immediately and see their doctor. A box then comes up on the screen explaining that symptoms lasting more than seven days can be a sign of a more complicated infection and that they will need a urinalysis and examination of the abdomen and kidneys to make sure nothing serious is going on.

If a pediatric patient has a sore throat and no other symptoms, Virtuwel will stop the questioning and recommend a doctor's visit because the child may have strep, the diagnosis of which requires a throat culture.

Data from both systems are being monitored to ensure against overprescribing of antibiotics. Kevin Palattao, vice

president of patient care systems for HealthPartners and vice president of Virtuwel, says they monitor prescribing patterns on a weekly basis. "What we are finding is that we are not prescribing antibiotics for viral upper respiratory infection, and that is the standard metric in the community right now," he says.

Rebecca Hafner-Fogarty, M.D., chief medical officer of Zipnosis, and her colleagues reviewed providers' prescribing patterns around sinusitis, one of the most common conditions treated by their clinicians. "When we initially reviewed the Zipnosis sinusitis visits, we found that there were episodes where the clinician prescribed antibiotics outside the guidelines," she says. "We gathered this information and presented it in aggregate form to the clinicians. We also reviewed our guidelines with them and added reminders to our sinusitis pages." When

## Virtuwel versus Zipnosis

	<b>Zipnosis</b> www.zipnosis.com	<b>Virtuwel</b> www.virtuwel.com
<b>Cost per online visit</b>	\$25	\$40 or your copay
<b>Diagnosis made by</b>	Primarily physician assistants	Primarily nurse practitioners
<b>Time to diagnosis</b>	Within one hour but usually less than 30 minutes between 8 a.m. and 8 p.m.	Within 30 minutes but usually about 15 minutes 24/7
<b>Accepts insurance?</b>	No	CIGNA and HealthPartners
<b>Available to</b>	Anyone age 13 years and older who resides in Minnesota	Patients age 2 and older who reside in Minnesota or Wisconsin

## Providers Benefit, Too

Much like an urgent care center, online diagnostic services such as Zipnosis and Virtuwel can relieve the load of primary care physicians. “It serves as a solution to the problems that docs have at the front line—packed clinic schedules and busy staff trying to respond to questions on an ongoing basis,” says Patrick Courneya, M.D., HealthPartners’ medical director. HealthPartners began testing the Virtuwel system in October 2010. Courneya says he has heard from physicians who say it has freed them up to focus on patients with more complex needs.

Courneya says one of the things providers are enthusiastic about is that the system takes the best parts of a clinical interview, records the information, aligns it with a protocol, and provides patients with an answer. “It also gives us providers an opportunity to see how well we are doing with those clinical algorithms,” he says.—J.M.

they reviewed the data again four months later, they found compliance with the guidelines approached 100 percent.

Each Friday, Virtuwel holds a provider forum at which primary care physicians from HealthPartners Medical Group convene to discuss cases from that week and look for ways to improve the system. Throughout the week, team members also exchange emails about problems that arise. “This week, even before the meeting, we were able to solve some issues around how to improve our acne treatment protocols,” says Patrick Courneya, M.D., medical director for HealthPartners.

Courneya says they noticed that patients were not responding appropriately to questions about the appearance of their skin. So the Virtuwel team changed the questions and added sample images showing different types of lesions. They also added a feature that allows the patient to upload images

of their own skin to give the provider more information.

The fact that every element of the online experience is documented and audited is a key safeguard, says Jon Pearce, cofounder of Zipnosis. “So if and when a discrepancy arises, it’s easy to identify the failure point.”

### What the Data Say

Administrators of Virtuwel and Zipnosis are analyzing data to learn more about how the systems are being used and by whom, whether they are reducing providers’ workloads, and whether they are improving patients’ access to care.

Vituwel would not disclose the exact number of patients it has served but claims it is in the thousands. Zipnosis has treated 2,300—both Park Nicollet patients and others. Forty percent of its patients are from outside the Twin Cities, “showing a strong demand in rural areas, where it’s harder or more expensive to get medical

care,” Bylander says.

Of 423 Virtuwel patients who have completed satisfaction surveys since October, 99.3% indicated that they would recommend the service to friends or family, 99.1% said that Virtuwel addressed their health concern, and 97.4% said it was worth the cost.

Claypool says convenience is a factor. “If a patient has to take time off work, drive downtown, park in the parking ramp, pay for parking, sit in the patient waiting room for 15 or 20 minutes, then finally get to see the doctor, their attitude is, ‘I better get something from this,’” he says. “But if they do a quick Zip visit, and they get the message, ‘Good news, you have a cold, you don’t need antibiotics,’ they are likely to be much more accepting.” ■

### ■ Patient Privacy

## High-Stakes Mistakes

The Health Information Technology for Clinical Health Act of 2009, part of the economic stimulus package, raised the possible amount of fines for security breaches involving patient records to \$1.5 million per patient.

Source: Dolan PL. Carelessness behind many health data breaches. Amednews. March 21, 2011. Available at: [www.ama-assn.org/amednews/2011/03/21/bil20321.htm](http://www.ama-assn.org/amednews/2011/03/21/bil20321.htm).

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Photo courtesy of Children's Hospitals and Clinics of Minnesota

The Geek Squad "agents" at their precinct in Children's Hospital and Clinics of Minnesota's Minneapolis facility.

#### ■ Consumer Gadgets

## Hospital Geeks

*A unique Geek Squad precinct provides tech support for hospitalized children and their families.* | BY ALLISON CAMPBELL JENSEN

If patients, families, or visitors stop and peer into the narrow office just inside the skyway leading from the parking ramp at Children's Hospitals and Clinics of Minnesota in Minneapolis, they'll see two guys wearing black slacks, white shirts, narrow ties, and shiny badges. They're not security officers. They're technicians or "agents" in the country's first hospital-based Geek Squad precinct.

Their mission is "curing" the ills of the electronic gadgets patients and their families bring to the hospital. The Geek Squad is a subsidiary of Richfield-based Best Buy, which is donating the agents' services. "We take the badges

very seriously," says Matthew Wold, one of the agents assigned to Children's since the precinct opened in 2009.

Wold and his Geek Squad colleagues might assist families with charging a cell phone, setting up a CaringBridge site, uploading photographs, or connecting to the hospital's Wi-Fi network, among other things. They also lend out laptops, digital cameras, and camcorders. They soon hope to make GPS systems available for patients to check out as well.

### Roots of the Relationship

In the late 1990s, staff at Children's began noticing that

families increasingly relied on technology when their children were in the hospital. According to Kendall Munson, coordinator of the Family Resource Center, technology "is no longer an amenity. It's expected."

But when technology fails, it only compounds the frustration and inconvenience that goes along with having a child in the hospital for a prolonged period.

Karen Hohertz-Jacobs remembers feeling that frustration in 2007 when her 11-month-old daughter was undergoing treatment for cancer at Children's. After a long, stressful day of treatments and pain management attempts for

her daughter, Hohertz-Jacobs, Best Buy's senior director of retail operations, wanted an escape. "I just needed to watch 'American Idol,'" she says. But the screen on the outmoded television in her daughter's room displayed in only green and purple. Instead of the show, Hohertz-Jacobs saw a need. So she posted on her CaringBridge site that she wanted to help Children's move into the digital age.

She connected with another parent, Jeff Weness, who also was working for Best Buy at the time. His second child had been diagnosed with a congenital heart defect *in utero*. After she was born, he and his wife spent three months in the hospital while their daughter had a series of heart surgeries. "When you're in there, it feels like life stops," Weness says, "but really everything continues on around you. You still need to pay the bills and keep up with work and email and keep your friends and family updated."

To prepare for long hospital stays, he and his wife packed a technology bag with everything from a laptop capable of connecting to the Internet without using the hospital's then-unreliable wireless network to a mini DVD player. Other families were not as well-equipped, Weness noticed. And, if there were breakdowns, there was no one to help.

Weness joined a parent advisory council at Children's and after discussions with

Hohertz-Jacobs mentioned the tech challenges they and other parents experienced. Their feedback led hospital officials to approach Best Buy and several other vendors about purchasing updated televisions and Xboxes. The hospital also added a wireless network specifically for patients and families as part of an expansion project that was completed in November.

When Best Buy executives came to Children's to see the new flat-panel TVs and Xboxes in the patient rooms, Weness says, they asked a key question: "How are you going to keep all this working?" That was an 'aha' for us." With 330 rooms and no one on staff with expertise in con-

When technology fails, it only compounds the frustration and inconvenience that goes along with having a child in the hospital for a prolonged period.

sumer electronics, Children's could have a support problem. So two Best Buy executives, Chico Ford and Dean Kimberly, suggested donating Geek Squad support services and establishing the precinct inside the hospital.

### Serving Growing Techno Needs

When the Geek Squad agents first arrived at the hospital, they didn't know how they'd be received, Wold says, explaining that they were "coming into someone else's territory."

The Family Resource Center loaned out laptops to families, and members of the IT staff kept them running. But consumer electronics wasn't their area of expertise, nor did they have the time to tend to people's personal computers. "The hospital is fundamentally there to take care of your child and their health—not to make sure you have an Xbox that works in your room," says Weness, who is now senior director of corporate development for Children's.

The Geek Squad agents have been able to take pressure off the IT staff, and patients and families appreciate the fact that they're available from 10 a.m. to 7 p.m. six days a week (noon to 7 p.m. Sun-

### E-learning

## The iPad Project

*Will the iPad be the next learning tool for medical students?*

| BY KIM KISER

.....  
**J**ake Wagner is studying neuroanatomy. Rather than reading a textbook or looking at a PowerPoint slide, he is using an iPad to turn an electronic image of the spinothalamic tract of the midbrain into a flash card with "pins" pointing out different parts and a list of questions he can use to quiz himself. Creating the flash card is a learning experience in itself, and once he's finished with it, Wagner will review it while riding the

bus to and from school. "I can go through this two or three times and have it memorized," he says.

As a member of the first-year class at the University of Minnesota Medical School's Duluth campus, Wagner is taking part in a study of how the iPad, Apple's tablet that combines the functionality of a smartphone with the resolution of a laptop computer, can be used as a learning tool. The project was the idea of Jim Boulger, Ph.D., a professor of family medicine and community health and behavioral

Photo: University of Minnesota Duluth

Medical students Anna Lindsey and Jonathan Harvey test drive an iPad.



days). Posters and signs with the Geek Squad's phone number are plastered prominently around the hospital. Geek Squad agents respond quickly to requests for help. Along with charging cell phones and checking out laptops, they go to patients' rooms (gloving up, if necessary) to connect parents to the wireless network or to set up videoconferencing so patients can speak with siblings or teachers.

Pat Lang, a working single mother of a 13-year-old who has a rare, progressive disease, appreciated their assistance and expertise when she needed to sync her brand-new Blackberry and her laptop in order to take part in an important teleconference at work. She says she was

"freaking out" until she saw the sign for the Geek Squad and went in to ask for help. The agents walked her through the process, and she was able to take part in the meeting the next day. Lang says: "Nobody even knew where I was doing my teleconference."

Best Buy's Ford says the hospital-based Geek Squad idea may be catching on. The company is now in talks about providing such services to several other hospitals around the country. He notes the arrangements likely will be different than those Best Buy has with Children's.

Says Weness: "It makes our doctors' jobs easier when the kids and families are less stressed." ■

sciences, and a self-confessed Apple enthusiast.

Following the introduction of the iPad last year, Boulger started thinking about how it could be used for learning and for medical practice, and saw potential. "As an information holding and gathering device, there couldn't be anything simpler," he says. And with more than 65,000 apps now available, "it shows how quickly it's catching on." Boulger and Ruth Westra, D.O., M.P.H., who chairs the department of family medicine and com-

munity health on the Duluth campus, had received a \$2.3 million Health Resources and Services Administration grant to fund efforts to increase the use of electronic learning in the medical school curriculum. They decided to use money from the grant to provide all 62 first-year students and faculty members with iPads. (This year's class is the first of five to receive iPads.)

The idea is for faculty and students to experiment with how they can use the device for teaching and learning.



In addition to the University of Minnesota Duluth, Stanford Medical School and University of California Irvine School of Medicine require their first-year students to have iPads.

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“Rather than having students rely on textbooks, lectures, and PowerPoints, we’re trying to give them a tool that will en-

gage them and give them immediate hands-on reinforcement,” Westra says.

Currently, students are able to download portions of courses or electronic learning modules onto the iPad. Those studying histology, for example, can view electronic slides on the screen, rather than in the lab. “The resolution is much better than with a microscope, and you can blow it up in terms of size and not lose detail,” says Boulger.

Students are also encouraged to try out different medical apps. One of the goals, Boulger says, is for the students to develop a list of their favorites. “We are trying to find the best ones that are free,” he says.

Boulger and Westra will

survey students at the end of the year to find out how they are using the iPads. “This is an iterative process,” Boulger says.

For Wagner, whose iPad is his to keep, the device has become his primary tool for studying anatomy. (He considers it an adjunct to his laptop, which he prefers for looking up information because it’s faster.) In addition to creating his own flash cards, he purchased the Netter’s Anatomy Flash Cards app (it was \$40, he says, but has been “worth its weight in gold.”) “At first, I was struggling,” he says, explaining that he found the old ways of studying to not be as effective. Having the iPad “saves me a lot of time and mental duress. I’m lucky to have it.” ■

## Top Apps for Medical Students

The following are apps the first-year University of Minnesota Duluth medical students have found especially useful thus far:

Hello Baby – pregnancy calendar and neonatal development resource (free)

Epocrates – mobile drug reference (free)

Shots 2010 – the immunization schedule for children and adults (free)

Physical Exam Essentials HD – overview of patient physical exam (\$2.99)

Medscape – medical news digest, drug reference database, interaction checker, and more (free)

MediMath Medical Calculator – 135 medical calculators and scoring tools (\$4.99)

## ■ Ultrasound

# New Role for Old Technology

Reliable old technology, ultrasonography, appears to be making a comeback. Used in radiology, cardiology, and obstetrics for decades, ultrasound is now being performed and interpreted by clinicians at the bedside, thanks to smaller devices (even handheld ones) that generate high-resolution images.

A recent *New England Journal of Medicine* article points out that ultrasound is now being used to ensure accuracy in placement of central lines; thoracentesis, paracentesis, and arthrocentesis; regional anesthesia; incising and draining abscesses; and lumbar puncture and biopsies. It’s used to help diagnose patients with hypotension, chest pain, and dyspnea. And using an approach known as FAST (focused assessment with sonography for trauma), it can pinpoint hemorrhage quickly in trauma patients, including those with suspected stroke.

With the increased availability of handheld devices, usage is expected to increase. Some predict that handheld devices will be the stethoscope of the future. Medical schools have begun to provide their students with portable ultrasound equipment to use during rotations. Mayo Medical School and the University of Minnesota Medical School, Duluth, are among those experimenting with handheld devices.

Sources: Moore CL, Copel JA. Point-of-care ultrasonography. *N Engl J Med* 2011;364:749-57; Wittich CM, Montgomery SC, Neben MA, et al. Teaching cardiovascular anatomy to medical students by using a handheld ultrasound device. *JAMA*. 2002;288(9):1062-3.



Portable devices have made bedside ultrasonography a reality.

Photo courtesy of GE Healthcare

Photo courtesy of Mayo Clinic



Mayo Clinic's social media czar Lee Aase



■ Social Media

## Media Master

*Mayo Clinic has embraced social networking and is sharing what it has learned with others in health care.* | BY CARMEN PEOTA

Search for “Mayo Clinic” on YouTube and you’ll pull up 4,560 results. Topping the list is a video clip of an elderly couple playing a duet on a grand piano in a Mayo auditorium. You’ll also find a cardiac patient talking about shared decision making, Philadelphia Phillies outfielder Jayson Werth describing his experience as a patient, and Stephen Swenson, Mayo’s director of quality, previewing a conference. Like the rest of what’s on YouTube, Mayo’s shorts range from the silly to the sober to the scientific.

So what is the venerable health care system doing on YouTube?

Following a 100-year-old tradition, according to Lee Aase, director of Mayo Clinic’s Center for Social Media. “Our reputation, people’s preference for Mayo Clinic, has always come from word of mouth,” he says. “Social media is an extension or amplification of that word of mouth.”

Aase hadn’t yet realized that back in 2005, when Facebook was only two years old and YouTube had just been conceived. But the then-manager of media relations, did understand that new technologies offered him ways to do his job more efficiently. The clinic already was producing ready-for-broadcast audio and video

recordings. He decided the next step was to create an RSS feed, so patients and consumers could subscribe and have the files sent directly to them.

Whether it was his good

timing or luck, Aase isn’t sure. What he does know is that almost immediately one of the podcasts got featured in an iTunes directory, and downloads of Mayo Clinic podcasts spiked from 900 to about 74,000 in one month.

That led Aase and others to start blogging, create a Facebook page, and start using Twitter. By 2009, there was so much activity around social media at Mayo that it attracted the attention of incoming CEO John Noseworthy, M.D. He sent a note to leaders asking if Mayo ought to be doing something more formal with regard to social media. “That gave us license to dream a little bit,” Aase says. Over the next months, he put together a proposal to launch the Center for Social Media.

The center opened last July and now has a staff of 10, a 30-member advisory board that includes social media experts from around the world some of whom are also physicians, and a similar advisory group from throughout Mayo. Its purpose is twofold: to accelerate the pace of adoption of social media within Mayo and to help

### By the Numbers

43,020

people “like” Mayo’s Facebook page

140,000-plus

Mayo’s followers on Twitter

7,551,178

YouTube views of an elderly couple playing a piano duet in an atrium at Mayo

To learn more about the Mayo Clinic Center for Social Media, go to <http://socialmedia.mayoclinic.org/services-3/>. To join the Social Media Health network, call 507/538-0492 or email [socialmediacenter@mavo.edu](mailto:socialmediacenter@mavo.edu).

other health care organizations do so as well.

Staff now spend time not only creating the daily tweets, posts, and blogs from Mayo but also responding to the questions and comments they generate. On a day in mid-March, Facebook posts included one from a woman concerned about her father's liver cirrhosis and parents con-

cerned about their 5-year-old with food allergies. There were thank yous from satisfied patients and a complaint from a disgruntled one. Aase says responding to such posts makes a difference for patients. "[It's] getting them access to information that they couldn't get through traditional media."

Staff also are developing curriculum for Mayo employees on professional issues and the ethics of using social media in health care, and they've launched the Social Media Health Network to share what they're learning with outside organizations. The hospitals, clinics, and health-care-related associations that are members of the network pay a fee to join based on their size. In return, their employees get access to curriculum produced by Mayo,

online discussions, webinars, and conferences. In March, the center sponsored its first major event for members, a summit at its Jacksonville, Florida, campus that included a social media "bootcamp."

Aase's advice to anyone wading into the social media waters for the first time is simply to try it. He says he started blogging personally because he wanted to get a sense for what he calls "the social media ethos" and some practical experience. "With some of these things, you've just got to experiment with it. And you can experiment with them in a relatively low-risk way. The thing I've learned is that these tools aren't complicated. If they were, there wouldn't be half a billion people on Facebook." ■



#### ■ Twitter

## Tweeting MDs

A letter to the editor published in the February 9, 2011, issue of the *Journal of the American Medical Association* describes a study of physicians' Twitter use.

Researchers identified 260 English-speaking "tweeters," each of whom had 500 or more followers and identified themselves as physicians. Content analysis of more than 5,000 of their tweets found that about half were considered health- or medicine-related.

Three percent (144 of the tweets) were categorized as unprofessional—potentially violating patient privacy or containing profanity, sexually explicit content, discriminatory statements, or unsupported claims about a product they were selling or service that they were providing.

Source: Chretien C, Azar J, Kind T. *JAMA*. 2011;305(6):566-8.

#### ■ Professionalism

## AMA Weighs In on Social Media

With more and more doctors blogging, tweeting, and facebooking, concern about the appropriate use of these new ways of communicating with the public (patients included) has grown. That prompted the American Medical Association (AMA) to create a policy on social media last year. The policy acknowledges that social media outlets offer physicians new opportunities for personal expression and for educating the public about health matters. But it cautions that inappropriate use has serious professional consequences. To guide physicians through this brave new com-

munications world, the AMA recommends that they:

- Uphold patient privacy and confidentiality standards while using social media;
- Routinely monitor their own online presence to ensure that personal and professional information on their own sites and content posted about them by others is accurate and appropriate;
- Maintain appropriate boundaries with patients in online communications;
- Consider separating personal and professional content online;
- Inform colleagues when their content appears unpro-

fessional so that those individuals can take appropriate actions to remedy the situation. If the behavior significantly violates professional norms and is not stopped, the physician should report the matter to the appropriate authorities; and

- Recognize that content may negatively affect their reputations and undermine public trust in the medical profession.

The policy is online at: [www.ama-assn.org/ama/pub/meeting/professionalism-social-media.shtml](http://www.ama-assn.org/ama/pub/meeting/professionalism-social-media.shtml).





Photo by Steve Wewerka

**David C. Thorson, M.D.**  
**Chair, Board of Trustees**

By not taking a closer look at the information it used to rate its providers, Medica is doing a disservice to physicians and patients.

# Confessions of a One-Star Doc

According to Medica, I am a one-star physician. I earned my star by meeting the quality measures in its Premium Designation Program, the first program to rate individual physicians in Minnesota on quality and cost. I failed to earn a second star because I did not meet the cost targets.

Although my patients haven't mentioned this fact so far, it's demoralizing to receive such a rating. Even more, it's frustrating as Medica's rating system is flawed.

For one thing, it fails to account for variability in practices and patient populations. As a family physician with a subspecialty in sports medicine, my practice is very different from that of many of my peers. This could account for some of the variation between my practice costs and those of others.

My quality ratings have been high—both according to Medica and MN Community Measurement, an independent organization that has been doing annual reports regarding the extent to which clinics and practices are meeting quality targets. Sixty percent of my diabetic patients and 80 percent of my patients with vascular disease are meeting all of the measures MN Community Measurement considers necessary for optimal care. Does providing care that is considered optimal result in additional up-front patient care costs—thus affecting the cost rating? Does spending more on prevention and management of disease pay off in fewer hospitalizations for a patient 10 years from now?

Before Medica released its ratings to the public in January, the MMA retained a national expert to evaluate the program and found three key problems:

- The fact that Medica failed to include physicians from the community in its development;
- The fact that physicians did not have enough time to review their results and provide feedback on inaccura-

cies and errors before the ratings were published; and

- The fact that Medica did not test the reliability of the data used to determine physicians' scores.

Once the ratings were made public, the MMA heard from a number of physicians who found Medica had based its scores on inaccurate information about their practices. One physician reported that she was notified by Medica that she had received two stars when the website indicated she had only earned one; another who received two stars found five specific errors on his quality assessment; and a third who received two stars had actually been retired from clinical practice for 15 years.

This comes as no surprise. A study by the RAND Corporation found 22 percent of Massachusetts physicians in a similar rating program were likely to be rated incorrectly and that the current methods used to assess physician performance may produce misleading results. As a result, patients may think they're choosing a low-cost physician only to find out that their costs are actually much higher than expected.

By not taking a closer look at the information it used to rate its providers, Medica is doing a disservice both to the physicians in its provider network and patients. In releasing results that have not been thoroughly reviewed or that contain errors, Medica may be casting doubt on all data-reporting initiatives.

So what can we as physicians do about this? If you are a Medica provider who was included in the ratings, I would encourage you to look closely at your scores and contact the MMA at [MMA@mnmed.org](mailto:MMA@mnmed.org) if you notice inaccuracies or inconsistencies.

The MMA will continue to monitor this issue and press Medica to fix the flaws in its system. Our goal is to ensure patients have the accurate, reliable information they need to make informed decisions about their care.

## MMA Seeks Officer Candidates

The MMA is seeking nominations for officers. As a member, you are invited to nominate a colleague or yourself for the offices of president-elect, secretary-treasurer, speaker of the House, and vice speaker of the House, or to serve as an American Medical Association (AMA) delegate or alternate. The AMA delegation represents Minnesota physicians during AMA deliberations.

The MMA Nominating and Leadership Development Committee will provide a slate of candidates to the 2011 House of Delegates. The election will be held in September during the MMA Annual Meeting in Duluth.

The president-elect serves as a backup to the president and is inaugurated as president the following year. The secretary-treasurer manages the financial affairs of the association and chairs the Committee on Administration and Finance. The speaker presides over House of Delegates meetings and is assisted by the vice speaker.

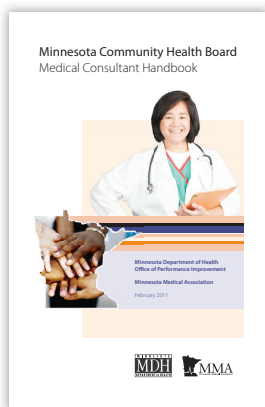
If you are interested in being considered for an office or if you would like to recommend a colleague, please contact Shari Nelson at [snelson@mnmed.org](mailto:snelson@mnmed.org). The deadline for nominations is May 10.

## New Handbook for M.D.s Advising Community Health Boards

The MMA, in conjunction with the Minnesota Department of Health, has created a handbook for physicians who act as medical consultants for the state's community health boards.

Medical consultants are tasked with providing appropriate medical advice and direction for local boards of health and assisting those boards in coordinating the delivery of community health services. Their crucial and varied duties include emergency preparedness, the review of standing orders and medical policies at the county level, and the provision of patient care.

In the interest of bridging the gap between medicine and public health, the MMA worked with the Department of Health for more than a year to explore ways to support the state's medical consultants. The handbook, which was one of the outcomes of that effort, is available at [www.mnmed.org/medicalconsultant](http://www.mnmed.org/medicalconsultant).



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## ■ Meet a Member

## Will Nicholson, M.D.

**W**ill Nicholson M.D., a family physician at St. John's Hospital in Maplewood, sees a connection between patient care and policy. "I'm a family doctor, and I treat a wide variety of undifferentiated illnesses, which really gives you perspective about the importance of looking upstream towards prevention to solve problems," he says. Because Nicholson believes strongly that physicians need to share their perspectives with those who make health policy, he joined MEDPAC, the MMA's political arm. He currently serves as its secretary/treasurer.

Involvement in MEDPAC is just the latest manifestation of Nicholson's interest in politics and health policy. While attending the University of Minnesota Medical School, he became interested in learning more about the 2004 presidential candidates' positions on health care. He spent the days leading up to the Iowa caucuses attending rallies and interviewing most of the candidates, including the eventual Democratic nominee Sen. John Kerry. "I was sick of listening to their sound bites, and I wanted to know more, and I got great access to the candidates and learned a lot," he says. He was disappointed, however, that neither the candidates nor the press were paying much attention to the issue of health care during that campaign, which was dominated by concern over countering terrorism and the Iraq War.

To raise the profile of health care during the campaign, Nicholson took nearly a semester off of medical school to work to get physicians in Minnesota more involved in shaping the health care debate. He approached both parties but ended up working with the DFL and independently formed the group Doctors for Kerry, which organized more than 300 doctors in Minnesota who supported Kerry's health care reform plan.

That experience taught him that doctors need to have sustained, long-term in-

volvement in politics in order to influence public policy and make changes that will benefit patients. He says being a part of MEDPAC and the MMA allows him to have that kind of involvement.

He also sees his work with MEDPAC as an opportunity to find common ground with colleagues who may disagree with him. "I still have more in common with them than anyone else in politics because we both share the vow to take care of patients and do no harm," he explains.

Nicholson has been impressed with the way MEDPAC's members transcend party lines and choose to support candidates who best align with medicine rather than their personal political views.

One of Nicholson's interests is reforming the health insurance market. After completing his residency in 2009, he decided to drop his employer's health insurance and enter the consumer market to better understand what his patients go through to get health insurance. Nicholson spent a year researching policies. He was interviewed by reporters from CNN and other media outlets about his decision to do this, and he started a blog,

Photo by Steve Weverka

MMA member Will Nicholson believes strongly that physicians need to play an active role in politics.

[agepolitics.com](http://www.triagepolitics.com), about it. Nicholson now uses his blog to share his musings on a variety of topics ranging from health care reform to electronic medical records.

As for his insurance status, he is back on his employer-sponsored plan and is writing up the results of his experiment. "I'm trying hard to offer constructive suggestions and not just another laundry list of complaints about the health insurance industry," he says.

### MMA Member at a Glance

**Name:** Will Nicholson, M.D.

**Specialty:** Family medicine

**Practice:** Inpatient hospital medicine, St. John's Hospital; associate professor, University of Minnesota department of family medicine and community health

**Medical School:** University of Minnesota, 2006

**Residency:** Family medicine, University of Minnesota, St. John's Hospital, 2006-2009

**MMA Involvement:** MEDPAC board member and secretary/treasurer

**Hobbies:** Health care policy, cross-country and water skiing, and blogging at [trriagepolitics.com](http://www.triagepolitics.com)



## MAPS Develops Model Informed- Consent Policy

The Minnesota Alliance for Patient Safety (MAPS), a group of organizations that includes the MMA, has developed a model policy that health care facilities can use to improve their informed consent process for surgeries and invasive procedures. The model policy complies with Centers for Medicare and Medicaid Services (CMS) conditions of participation for surgery and invasive procedures, which is required by providers who receive Medicare payments.

The MMA took the lead in developing the model policy after hospitals indicated that they were struggling to meet the CMS requirements. In 2004, CMS began requiring health care providers to have informed consent policies that foster shared decision-making and are patient-centered and sensitive to health literacy concerns. In 2007, MAPS members developed a model informed consent form written at a fourth-grade reading level that could be used by providers in Minnesota.

However, some facilities said they were still struggling. Rebecca Schierman, MMA manager of quality improvement, pulled together a 15-member work group composed of representatives from hospitals, clinics, and large health care systems to address questions such as Who on the care team was responsible for getting informed consent? Who could authorize informed consent if the patient could not? And what procedures required informed consent?

“We hope the MAPS model policy will send a clear message to all health care providers about their ethical and legal responsibilities in obtaining meaningful informed consent. Informed consent must

be patient-centered and allow patients to participate in medical decisions,” says Robert Meiches, M.D., chief executive officer of the MMA.

To download the new Model Policy for Informed Consent for Surgical and Invasive Procedures, go to [www.mnpatientsafety.org](http://www.mnpatientsafety.org). Also available on this site are model consent forms for Prospective Payment System Hospitals and Clinics and Critical Access Hospitals.



### What is MAPS?

The Minnesota Alliance for Patient Safety was founded in 2000 by the Minnesota Department of Health, the Minnesota Medical Association, and the Minnesota Hospital Association. Its mission is to promote patient safety through collaborative and supportive efforts among all members of the health care system in Minnesota.

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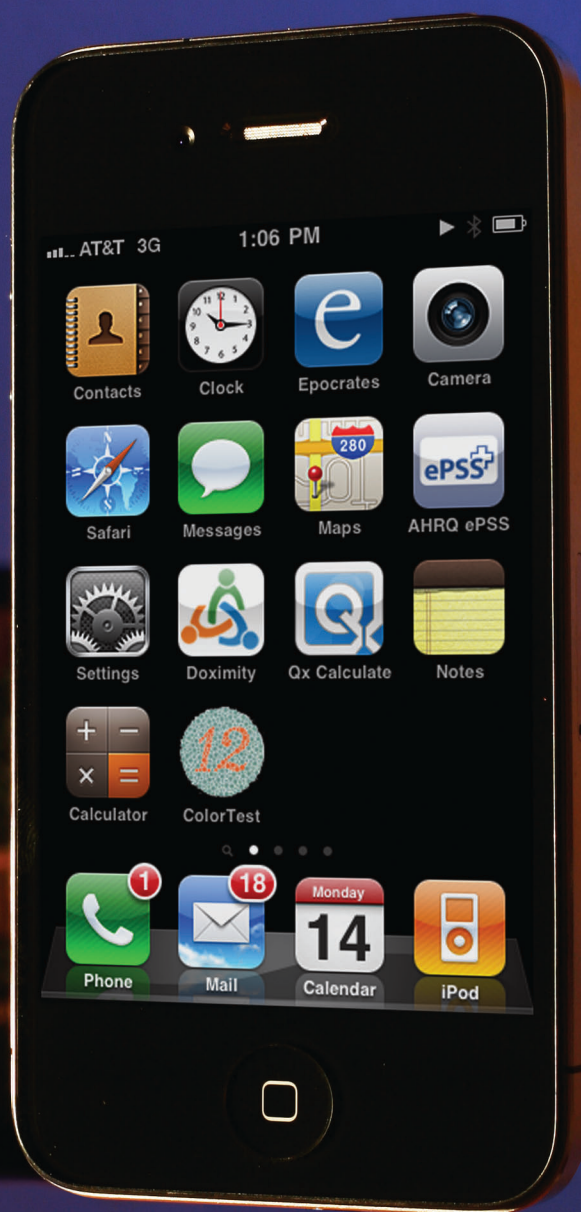
# 25 Ways *to Use Your* Smartphone

By Kim Kiser

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Physicians share their  
favorite uses and apps.

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**“Sent from my iPhone.”** Those words are appearing at the end of more and more emails from physicians. And that shouldn’t come as a surprise. According to Manhattan Research, a market research firm, 72 percent of U.S. physicians now use smartphones.

The firm predicts that by 2012, a full 81 percent will have them, especially as hospitals and clinics make it possible for physicians to use their phones to access patients’ electronic health records and as more apps for reference materials and guidelines become available.

With that in mind, we asked physicians in an online survey whether they were carrying smartphones and, if so, how they were using them in practice. The responses we received showed that those who have the devices find themselves increasingly depen-

dent them. (One respondent went so far as to say she would marry her iPhone.)

“The smartphone has been the big game-changer,” says Jason Eldrige, M.D., a Mayo Clinic anesthesiologist and pain medicine specialist who answered our survey questions. “It’s a convergence device so you no longer have to carry a cell phone and a PDA.”

Eldrige and others told us how they’re now using their smartphones in practice. Here are some of the things they mentioned.



1

**Replace your pager.** Family physician Heather Hamernick has been pager-free since graduating from residency. “We don’t have pagers in our clinic at all, so when I’m on call, I use my smartphone.” Even though she lives in a rural area and occasionally has trouble with the signal, the system works. And she doesn’t miss that “feeling of dread” she used to get when her pager would go off. “I don’t know why, but it’s not as bad with the phone. Maybe because you also associate it with positive things.”

2

**Screen the screenings.** Family medicine resident Maria Carrow uses a free app called AHRQ ePSS, which allows her to plug in a patient’s age, gender, and information about tobacco use, sexual activity, and other behaviors to determine the most important preventive screenings to do during that patient’s annual exam. “I use it every day,” she says.



3

**Access drug formularies.** Family physician Kari Rabie says she uses her iPhone to access insurers’ drug formularies, frequently the one for Metropolitan Health Plan, to find out which medications they cover. She also uses her phone to look up the cost of drugs for patients who are uninsured and frequently accesses a list that shows which generic drugs are available for \$4 at Target’s pharmacies.

## The Respondents

**Peter Bornstein, M.D.,** a physician with St. Paul Infectious Disease Associates

**Stuart Cameron, M.D.,** a pathologist with Hennepin Faculty Associates

**Maria Carrow, M.D.,** a first-year family medicine resident at Methodist Hospital

**Jason Eldrige, M.D.,** an anesthesiology and pain medicine physician at Mayo Clinic

**Heather Hamernick, M.D.,** a family physician at Parkview Medical Center in New Prague

**Amy Keppel, M.D.,** a family physician with North Memorial Medical Center’s Northeast Clinic

**Kari Rabie, M.D.,** a family physician and medical director of the Native American Community Clinic in Minneapolis

**Rosei Skipper, M.D.,** a Mayo Clinic psychiatry resident

**Gary Snead, D.O.,** a St. Cloud pediatrician

**Amit Sood, M.D.,** a Mayo Clinic integrative medicine physician

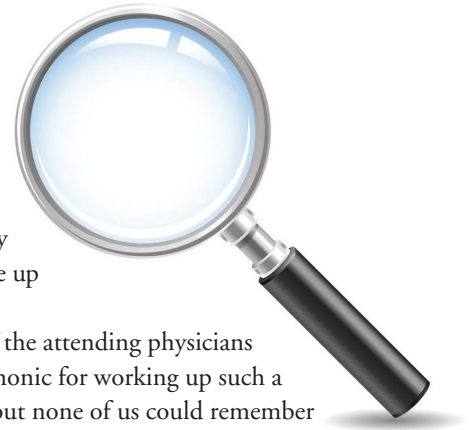
**Therese Zink, M.D.,** a family physician and associate director of the University of Minnesota’s Rural Physician Associate Program

**Alexander Zubkov, M.D.,** a neurologist who practices at Fairview Southdale Hospital

## 4

**Google on the fly.** Family physician and preceptor Therese Zink was talking to medical students recently about the case of a patient with urinary incontinence who could no longer afford the drug she had been prescribed. When they started discussing less-expensive alternatives, Zink pulled out her Droid 2 phone and Googled “urinary incontinence drugs.” Zink and her students were able to find cost information and come up with several options for the woman.

During a recent noon conference at Methodist Hospital, Maria Carrow says one of the attending physicians was talking about a patient with peripheral neuropathy. “He asked if we knew the mnemonic for working up such a patient. We all looked at each other knowing that we had learned it in medical school, but none of us could remember the answer. He pulled out his smartphone and Googled it: It’s DANG THERAPIST. It was great that he had that at his fingertips to aid in teaching,” she says.



## 5

**Check a patient's record.** Physicians at Mayo Clinic can access their patients’ electronic health records using their phones. Anesthesiologist and pain medicine specialist Jason Eldrige uses a mobile version of Mayo’s homegrown Synthesis software to remotely and securely access his patients’ records. He can review a patient’s medical history and vitals; check to see which drugs they are taking; look up lab values; access CT, MRI, and X-ray images; and create notes of his own. Eldrige says accessing the system from his iPhone is sometimes faster than using one of Mayo’s many workstations.

Infectious disease specialist Peter Bornstein says HealthEast’s hospitals use an EHR system from McKesson that has a portal for the iPhone. Although he can’t enter information into a patient’s record using the phone, he can see consultation notes, lab results, the patient’s medical history and physical exam findings, and discharge summaries.

Psychiatry resident Rosei Skipper says she uses her iPhone to access patients’ medical records before walking into the exam room. “I can talk to them, rather than spend time logging onto the computer in the room and looking back to see what was said about their imaging and test results,” she says.



## 6

**Identify drugs and determine dosages.** Family physician Amy Keppel says she finds her Droid-powered phone

especially helpful when she needs information about drugs, dosages, contraindications, and interactions. With the Epocrates app, “if you look up a drug and it says, for example, .5 mg to 1 mg per kilo per day and you click on that, it sends you to a dosing calculator. You can then enter the strength of the solution of an antibiotic, for example, and the weight of a pediatric patient, and it will calculate the amount you should give them.” Keppel says she also likes the fact that she can use the Epocrates app to look up drugs by class when a patient can’t remember the name of the drug he or she is taking.

Peter Bornstein says he finds Epocrates’ pill identification function useful, especially when a patient knows he or she is taking a certain medication but doesn’t remember the dosage. Through the Epocrates app, he can pull up pictures of the pill in different shapes and sizes and have the patient show him which one they’re taking.



7

**Find the right billing code.** Kari Rabie uses her phone to access the ICD-9 app. “I can look up codes and diagnostic guidelines,” she says. If she clicks on hypothyroidism, for example, it will provide her with a list of the diagnostic tests for it, general care guidelines and treatment options, and the billing codes for those tests and activities.

9

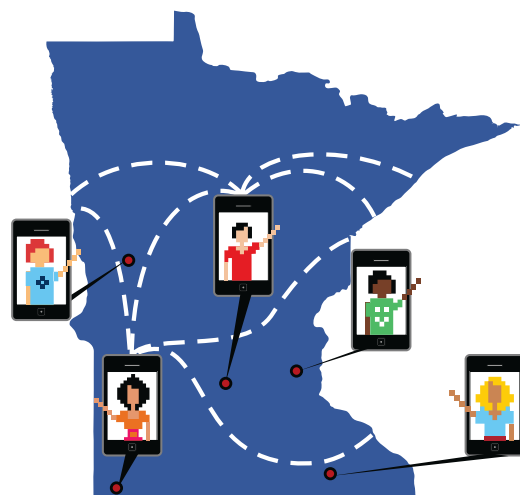
**Reach a colleague quickly.** Heather Hamernick says she still uses conventional methods (calling the hospital and having them call or page the doctor and having the

doctor call her back) for reaching many consultants, but when she needs to contact her colleagues from residency or some of her partners, she texts them from her iPhone. “I get an instant reply back,” she says. Hamernick adds that some of her colleagues have asked that she text them, rather than contact them any other way.

Alexander Zubkov recently was brought in to do a stroke evaluation at Fairview Southdale Hospital, where he practices. “The patient needed to see an interventional radiologist,” he says. Prior to having his iPhone, he would have had to page his colleague and wait for the physician to call him back. In this case, he was able to call the physician directly and let him know he was needed in the ER. “That alone probably saved five to 10 minutes, which makes a big difference for a stroke patient,” he says.

8

**Track hospitalized patients.** Neurologist Alexander Zubkov used HanDbase, a HIPAA-compliant software program, to build a database to track his hospitalized patients. He now uses his iPhone to access that database. (“We can’t access our EMR by phone yet,” he says.) The database tells him the location of his patients, their diagnoses, and what tests and treatments they’re having. It also contains billing information.



10

**Network with other docs.** Kari Rabie says she recently found an iPhone app for Doximity, a social networking site for physicians. Created by the founders of Epocrates, the site allows physicians to connect with colleagues from medical school and residency both professionally and socially. It also provides phone numbers for pharmacies, hospitals, and labs that are open 24/7; helps users find other physicians with similar interests; and allows physicians to send HIPAA-compliant text messages to colleagues (a credential check is required to do this). Rabie, who is new to Doximity, believes it has potential. “If you want to get in touch with another doc, you can find the information there pretty easily,” she says.

## Creating an App

As an integrative medicine physician at Mayo Clinic, Amit Sood, M.D., works with everyone from executives who need to learn to relax to stage IV cancer patients who are coping with pain and others with stress-related conditions such as chronic fatigue syndrome, irritable bowel syndrome, fibromyalgia, and chronic backaches. “Most don’t have the time to take off three or four days and go to a mountain and learn to meditate,” he says.

So in 2006, he created a meditation program that combines images, music, inspirational words, and breathing techniques to help patients learn to focus and relax. The program, Mayo Clinic Meditation, was initially taught by Sood in the clinic and then put onto DVD, so patients could take it with them and use it to reinforce what they learned.

In December 2009, Mayo worked with DoApps Inc., a Rochester app developer, to turn a portion of Sood’s program into an app for the iPhone. “Mayo was testing the waters with smartphones and creating apps and thought this program would be a good one to try,” Sood says.



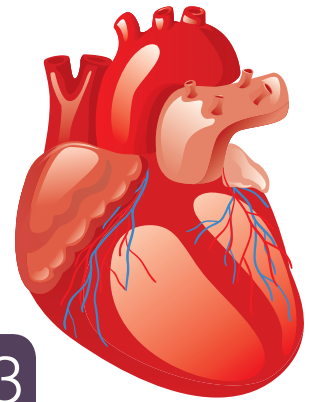
11

**Aid a vacationing patient.** Pediatrician Gary Snead says he allows the families of some patients with complex needs to text him if they have problems or questions. Sometimes, they even send him pictures over the phone, which can help him assess a situation. Last summer, he received a text from the parent of a patient who had developed a rash while vacationing at their cabin. Not knowing whether it needed attention, the parent sent Snead a photo of the rash, which he quickly determined was pityriasis rosea. “I was able to tell them what it was, that there was really no treatment for it, and that it would just take time to go away. The family didn’t have to go to the ER or come home to have it checked out, and sure enough it cleared up just the way we predicted it would.”



12

**Tame your schedule.** Jason Eldrige says his smartphone helps him keep track of meetings, professional and clinical obligations, and his call schedule. “We have the ability to sync our Outlook calendars so we can see our clinical assignments for the day,” he says, explaining that he might have two or three different assignments each day and that those can frequently change. “It gets to be very complicated,” he says. “I joke with my secretary that if I didn’t have my Outlook calendar, I would be lost on any given day.”



13

**Determine risk for stroke or heart disease.** Maria Carrow says she uses a free app called Calculate by QxMD for her Droid 2 phone to help her patients understand their risk for stroke or heart disease. She enters information about the patient’s age, smoking status, LDL cholesterol level, exercise habits, family history, and other risk factors into the app, which does the calculation. She then discusses the results with the patient and explains what he or she can do to lower their risk of disease. “Patients respond well,” Carrow says. “It’s visual, and they know I’m not just pulling this out of thin air.”

14

**Find information on unusual diseases.** As a family physician who encounters a wide variety of conditions, Amy Keppel says she likes being able to access information about diseases and their treatments using the Epocrates app. “Say someone has dengue fever, which was recently found in Florida. You can look it up and it will tell you basic information, tests you should run, treatment options, and follow up you should do,” she says. “This is especially helpful in family medicine, where you sometimes encounter diseases you don’t see often, and you want to make sure you’ve covered all the bases.” She also likes the fact that Epocrates’ disease and drug sections are cross-referenced.

## Is the iPad the Next Big Thing?

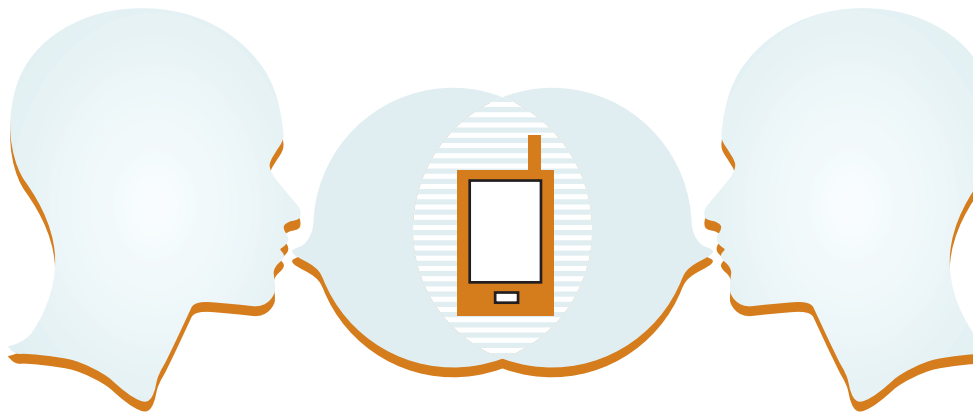
Alexander Zubkov, M.D., a neurologist who practices at Fairview Southdale Hospital, is a self-described technophile. Among the gadgets he’s carried with him over the years are a Sony Clie, several PalmTreas, a Windows phone, and now an iPhone and an iPad. “Between the iPhone and the iPad, I hardly ever use the computer to look up stuff,” he says.

Zubkov says he doesn’t use his iPad in clinical practice much. But he expects that will change soon. He sees the iPad 2, which was introduced in March and has a built-in camera, as a great tool for videoconferencing with patients and other providers.

Others see it having greater potential for patient education than the smartphone because of its larger screen. Amit Sood, M.D., a Mayo Clinic integrative medicine physician, has two iPads in his family. He believes both physicians and patients will rely increasingly on such devices. “I think they have tremendous potential. They may not replace the stethoscope, but they can definitely enhance our efficiency,” he says.

## Calling Patients

Many physicians interviewed for this story expressed concern about using their smartphones to call patients, as their personal phone number would show up on the patient's caller ID. Alexander Zubkov, M.D., a neurologist who practices at Fairview Southdale Hospital, says he has found a way around this by using Google Voice. It routes his calls through a central number, so he can call or text patients without having his private number show up.

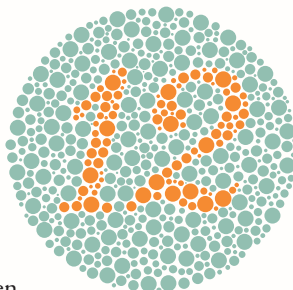


### 15

**Ask a question in Spanish.** Pediatrician Gary Snead recently found a free app called the Emergency Medical Spanish Guide for his Android phone. The guide has preloaded English and Spanish phrases that help medical personnel who don't speak Spanish quickly elicit "yes" and "no" answers to more than 250 questions about a patient's medical history, pain, medications, and physical symptoms. "You pick a phrase, and it speaks it out loud in Spanish," he says. Although the app is no substitute for a qualified interpreter, Snead says it can help when working with Spanish speakers who know some English.

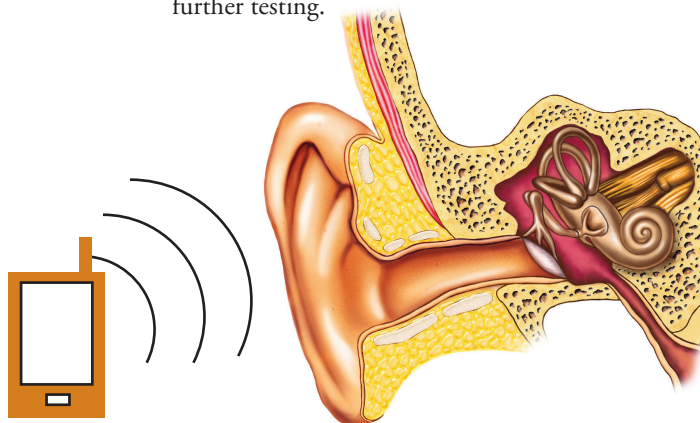
### 16

**Spot colorblindness.** Gary Snead uses a free app (the Color Blindness Test by JP TOMATO) to quickly screen teens for colorblindness. "Before I found this, I would have to send them to our lab and then hope they could find the one hard copy of the test that we had," he says, explaining that colorblindness isn't something that is often tested for. Now, he can do the test using the screen on his phone to quickly determine whether a young person may have a problem with color deficiency.



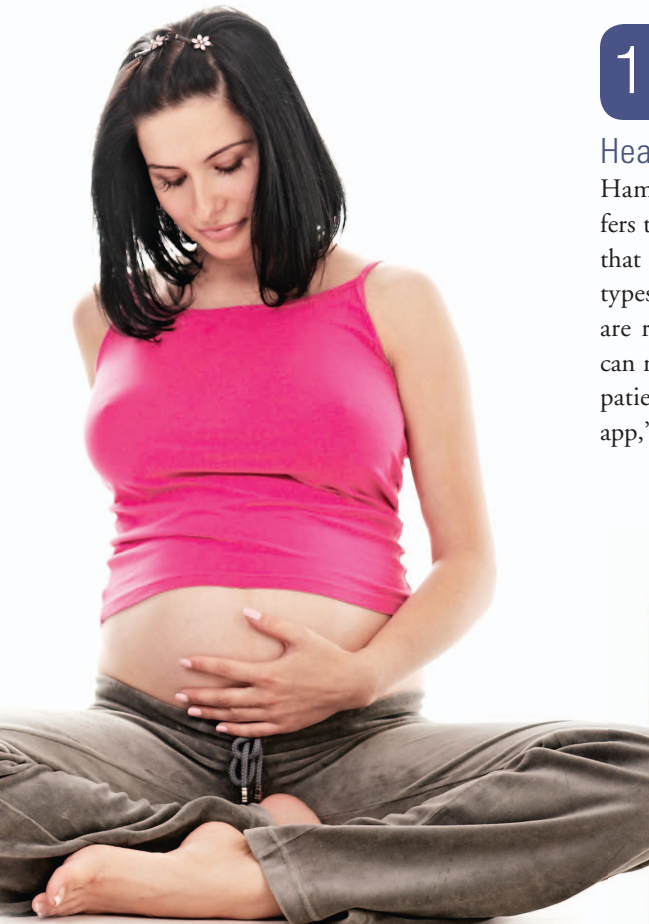
### 18

**Check for a hearing problem.** Gary Snead saw clinical promise in a dog whistle app his son was using to train their pooch. The free app, called the Dog Whistler (Mobeazio), has frequency settings that start at ranges dogs can hear well but humans cannot and drop to those that can be heard by humans. "I can quickly use it when a parent says 'I'm not sure my toddler can hear well,'" he says. He holds the phone up to the child's ears and adjusts the volume and frequency to quickly determine whether he or she might need further testing.



### 17

**Earn CME credit.** Amy Keppel uses her Epocrates app to download *The Medical Letter* to her smartphone. She says the *Letter's* expert reviewers provide summaries of studies, describe what they think the limitations are, and recommend how to interpret them. "They're not afraid to say it if they don't think a new drug is any better than an old one," she says. Physicians can earn CME credit by reading the articles and answering questions. Keppel gets an email reminder on her phone when the new issue is available. She then gets a message letting her know when the test is ready. If she chooses, she can take the test on her smartphone to earn credit.



19

**Hear a heart murmur.** Heather Hamernick says she occasionally refers to an app called iMurmur (\$4.99) that plays recordings of more than 20 types of heart murmurs. The sounds are recordings from real patients. “I can match up what I’m hearing in the patient with what I’m hearing on the app,” she says.



20

**Get medical news.** Rosei Skipper uses her smartphone to get updates on the latest medical news. In addition to using the *New England Journal of Medicine’s* app to read summaries of what’s in the current issue, she uses the app for MedPage Today, a service of the University of Pennsylvania School of Medicine, to listen to free podcasts about studies that have come out and reports from medical conferences.

21

**Determine a due date.** Heather Hamernick says she especially likes the \$1.99 Perfect OB Wheel app for her iPhone. “You can type in the date of the last period and find out how far along a patient is. When a patient has an ultrasound, you can determine how far along they are on that date and calculate their due date.” She says she finds the app to be more precise than paper OB wheels.

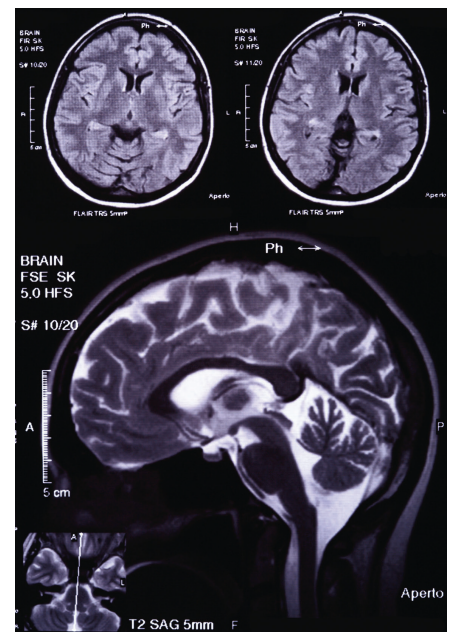


22

**Take pictures.** Pathologist Stuart Cameron says he uses the camera on his iPhone to take pictures of gross or microscopic pathology specimens. “I use them for personal reference or I can show them to a colleague and get their unofficial opinion of what they think they’re seeing,” he says of the images.

23

**View radiologic images.** Jason Eldrige reviews MRIs every day. Now, he can pull up an MRI and scroll through the axial and sagittal views on his iPhone. He says that although it is small, the screen of the current generation iPhone has such high resolution that it provides a good view of images. “The mobile device doesn’t replace dedicated devices with larger screens, but it is portable. I don’t have to be onsite or on a computer and have to log on to access them. And that’s important for patients who need answers right away.”



Share your ideas. If you’ve found a useful app or have a new way of using your smartphone in practice, please join our conversation at [www.minnesotamedicine.com](http://www.minnesotamedicine.com).

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24

**Dictate notes.** Jason Eldrige says he uses his iPhone to dictate notes into his patients' electronic health records. Because he always has his phone with him, he finds he can squeeze in dictation whenever he's in a private, secure location.

25

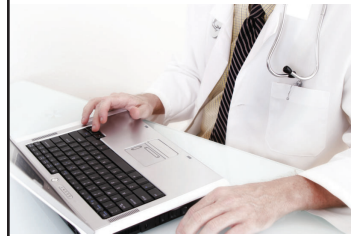
**Update your clinic's Facebook page.** Kari Rabie created a Facebook page for the Native American Community Clinic, where she practices. She uses her phone to update the page. She posts reminders about deadlines to help patients on public programs maintain their insurance coverage, tips for staying healthy, and notices about events. **MM**



Kim Kiser is associate editor of *Minnesota Medicine*.



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**Fall, 2011**

# Social Networking Savvy

By Colin M. Segovis and Melissa L. Rethlefsen

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Physicians need to be informed about how to use social media wisely.

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**W**hen we first wrote about social networking and social media in *Minnesota Medicine* in January 2009, they were still largely associated with students and technology buffs. During past two years, however, use of YouTube, Twitter, and Facebook has become mainstream even in health care.

Social media connect people and facilitate dialog between individuals and groups, allowing for the sharing of user-generated content. Want to share a picture? Post it. Want to tell the world what you are up to? Do a status update. Observe something interesting? Tweet about it. Social media are designed to be open, transparent, and easy to use, which makes them both extremely effective ways to communicate and a privacy nightmare.

For those reasons, physicians and other health care workers increasingly will need to know how these tools work and about the privacy issues they raise in order to counsel patients about using them safely, market their services and manage their reputations, and maintain their personal and professional relationships.

## Using Social Media in Health Care

The first step in using social media appropriately is to ask yourself: Who is my audience? If you are trying to deliver a message to a large number of people, then using social media is the way to go. For example, the Mayo Clinic uses YouTube, an online video-sharing community ([www.youtube.com/user/mayoclinic](http://www.youtube.com/user/mayoclinic)), and Twitter, an information network that allows people to share brief messages in real time (<http://twitter.com/mayoclinic>), to inform the public about clinic developments, to share patient stories, and to educate the public about medical conditions, procedures, and the clinic's offerings. Mayo is also using Facebook to develop an online community it can communicate with patients and patients can share their own stories and respond to others' stories of healing and hope ([www.facebook.com/MayoClinic](http://www.facebook.com/MayoClinic)).

Social media also can be appropriate when your audience is fellow health care providers. The Cleveland Clinic uses Facebook to share information about continuing medical education ([www.facebook.com/pages/Cleveland-Clinic-Center-for-Continuing-Education/78798950895?v=wall](http://www.facebook.com/pages/Cleveland-Clinic-Center-for-Continuing-Education/78798950895?v=wall)). Twitter can be like an extended group practice, where physicians all over the world share news, thoughts, and tips with other providers (see <http://twitterdoctors.net/> for a list of physicians who are avid Twitter users).

As for connecting with patients, the Health Insurance Portability and Accountability Act of 1996 spells out how health care providers should communicate with patients using electronic means.<sup>1</sup> Users of social media must adhere to these guidelines. You should not use social media tools to contact a patient regarding anything that could be considered confidential. You should not, for example, use the email tool in Facebook to send a note to a patient. Physicians also should be aware that their giving advice on social media sites may lead some patients to respond to them with questions and requests for prescription refills and even friendship.

## Practical Tips for Using Facebook

**1. CREATE A FACEBOOK PAGE FOR YOUR PRACTICE** • Distinguish between your personal and professional identities by creating a separate Facebook page for your practice. Use it to highlight news, photos, videos, and more. You can engage with patients and customers on these pages by allowing them to "like" the page. Make sure there is an appropriate disclaimer and discourage patients from posting personal information.

To find out more, go to [www.facebook.com/pages](http://www.facebook.com/pages).

**2. CHECK YOUR PERSONAL ACCOUNT'S PRIVACY SETTINGS** • Facebook's privacy settings are notoriously complicated; but there are a few things you can do to make your Facebook account more secure. In your account menu, go to "Privacy Settings." Select "Friends Only," or scale up your privacy settings by choosing the "Customize" settings option (this works best if you have lists of friends established—see next tip).

Next, go to "View Settings." Here, you can change who can search for you in Facebook (we suggest "Friends of Friends," or just "Friends"), who can see your Friends lists, who sees what you "like," and more.

Finally, from the main "Privacy Settings" page, edit your settings under "Apps and Websites." The key options to edit here are "Public Search" (so your Facebook profile doesn't show up in Google), "Instant Personalization," and, most importantly, "Info accessible through your friends." We recommend disabling all three.

To find out more, go to [www.facebook.com/settings/?tab=privacy](http://www.facebook.com/settings/?tab=privacy).

**3. UTILIZE FRIENDS LISTS** • Want to share news with your medical school friends but spare your high school buddies? Friends lists help you sort your Facebook friends into groups. All information you share in Facebook, whether photos, status updates, education and work information, or links, can be shared with one or more lists (or even only with certain people, if you choose). You can customize which lists can see what in your privacy settings, or any time you post something new to your profile (look for the lock icon below the update box).

To create Friends lists, in the account menu, choose "Edit Friends." Then click on "Create a List."

**4. USE SECRET GROUPS** • Facebook makes it easy to collaborate with small groups. You can create "secret" groups to help establish a private space for you and your friends. Groups allow you to create documents in the style of Google Docs, share materials, create events, and more. They are designed to be productivity tools for business but work equally well for any kind of small group.

Although they are not secure, they work well for support groups and other types of small-group communication.

Click on "Create Group" from the Facebook home page to start a new group.

## Social Media's Long Arm

Keep in mind that social media have taken office water cooler chat and opened it up to the world. Both practicing health care

providers and those in training need to be extremely careful when using them to connect not only with patients but also with colleagues, friends, and family members. ↪

Social media are designed to be open, transparent, and easy to use, which makes them both extremely effective ways to communicate and a privacy nightmare.

Health care providers and others who have been less-than-careful with what they post on social networking sites have learned that there can be major professional consequences. Students have been expelled, teachers have been fired, and one woman with depression even claims she lost her mental health benefits because she looked happy in her Facebook photos.<sup>2</sup> In several cases, physicians have been disciplined by their employers for what they've done online: posting photos showing themselves posing with guns while providing earthquake relief in Haiti, blogging about a malpractice case, posting patient photos, and playing Facebook's "lying down" game using hospital equipment. More examples of bad behavior and innocent mistakes gone awry are illustrated in the series "Friday Faux Pas," offered by Mayo Clinic's Center for Social Media.<sup>3</sup>

You also need to remember that once information is posted to one social media site, it can be distributed elsewhere easily and quickly—this is especially true with Twitter, Flickr, and YouTube, which have less strict privacy settings than Facebook. Furthermore, there are servers devoted to backing up the Internet ([www.archive.org/](http://www.archive.org/)). The Internet Archive doesn't back up content from Facebook. But the Library of Congress has archived tweets since the inception of Twitter, and any blogs that mention you may well be

backed up in many places. Erasing a photo or video from the Internet is extremely difficult, if not impossible. Therefore, one should be extremely careful when considering posting information online (see p. 31).

### The Personal Meets The Professional

Social media can blur the line between one's personal and professional life. Some social media advocates say that having only one online persona, where work and home interact, can help build camaraderie in the work place. But introducing colleagues to your inner sanctum of politics, jokes, musical taste, and even your friends can be risky, especially for those seeking employment or positions in training programs. Letting your colleagues see pictures of your Halloween costume on your Facebook page may merely be embarrassing. Letting a potential employer do the same may have real consequences.

In some ways, the trickiest audience for physicians to deal with is their friends. Even if a physician doesn't use social media, a friend might. And they may be posting photos or videos of you or quotes from a recent talk without your knowledge. Social media makes everyone a journalist, and even with the most stringent privacy settings, information shared online can be reshared across the web—all without your permission. The doctors posing with guns in Haiti did not mean to share their photos with the general populace; yet a simple Google search elicits a selection of the questionable photos. By using social media, you place a lot of trust in your connections.

Using social media can have a number of unintended consequences. If a patient stumbles across information about a physician engaging in risky behavior, that may erode the patient's respect for the physician and limit his or her effectiveness in counseling that patient about that same behavior.

This issue is especially relevant for younger physicians and medical students. Educational institutions and potential employers may look up candidates' on-

line profiles. Some disciplines, such as pharmacy, are now viewing applicants' Facebook pages during their residency selection process.<sup>4</sup> This will likely become common practice.

Concern about the implications of social media use for students and physicians has led organizations such as the American Medical Association, the New Zealand Medical Association, the Australian Medical Student Association, and the New Zealand Medical Student Association to develop policies on social media and guidelines for online professionalism.<sup>5,6</sup> Despite such policies and warnings, data suggest that medical students still post unprofessional content.<sup>7</sup>

Physicians can no longer ignore social media or use them cavalierly. They need to understand that these communication tools can enhance their ability to help patients and the public. But they also need to be vigilant about protecting the privacy of their patients and guarding their own reputations. **MM**

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# EHR Adoption and Use

## Results from the 2010 Minnesota Ambulatory Clinic Survey

By Kari Guida, M.P.H., and Martin LaVenture, Ph.D., M.P.H.

■ Use of an electronic health record (EHR) system is considered key to improving patient care. Hospitals and clinics around the country are in the process of adopting these systems as the federal government rolls out incentives for using them. This article summarizes the results of a 2010 survey of ambulatory clinics in Minnesota regarding their adoption and use of EHRs and their ability to electronically exchange information with other providers.

**E**ffective use of electronic health record (EHR) systems and other health information technologies holds great promise for improving the quality of the medical care patients receive. Today, hospitals and clinics throughout the United States are in the process of implementing EHR systems in part to become eligible for financial incentives from the federal government. The American Recovery and Reinvestment Act of 2009 authorized the Centers for Medicare and Medicaid Services (CMS) to create incentives for “meaningful use”—that is, using EHRs to aid with clinical decision-making at the point of care and for electronically exchanging information with other providers.

In order to gain a better understanding of the extent to which clinics in the state have used and are using EHRs, the Minnesota Department of Health surveyed area clinics in 2010. The survey was required by the Minnesota State-wide Quality Reporting and Measurement System (Minnesota Rules, Chapter 4654). The Department of Health contracted with MN Community Measurement, a quality-improvement collaborative, to develop and administer the survey. It consisted of 65 questions about clinics’ implementation and use

of EHRs, their progress toward meeting the measures required for receiving meaningful use incentives, their ability to exchange health information through them, and the barriers to adoption and meaningful use of EHRs.

### Methods

The 2010 Minnesota HIT Ambulatory Clinic Survey was emailed in February of that year to primary and specialty care clinics in Minnesota, Wisconsin, and Iowa that were registered with MN Community Measurement. The survey was resent to nonrespondents and newly registered clinics in May. In total, the survey went to 1,285 clinics in Minnesota and 97 in Wisconsin and Iowa. The Minnesota clinics had an 87% (1,121 of 1,285) response rate, while the Wisconsin

and Iowa clinics had a 79% (77 of 97) response rate. The results highlighted in this article apply only to the Minnesota clinics.

### Results

#### ■ EHR Adoption

Two-thirds of the clinics that responded to the survey (750 of 1,121) said they have an EHR system and are using it in all or some areas (Table 1). A majority (73%) of those clinics rely solely on electronic records; they do not maintain paper charts and describe themselves as being entirely paperless. There were 46 EHR vendors whose products were being used. Epic’s EHR system was the product most frequently used (245 of 750 clinics), followed by Allscripts (118 clinics), and Cerner (83 clinics) products.

Of the 371 clinics not using an EHR system, 101 have purchased and/or begun installation of one, and 270 have yet to buy a system. Of the clinics without an EHR system, 125 said they plan to implement one within the next year; 159 indicated that they plan to do so in the next three years. Thirty clinics said

Table 1

#### EHR Systems in Clinics (N =1,121)

EHR in use by all/some areas of the clinic	67% (750)
EHR purchased/installation begun	9% (101)
No EHR	24% (270)

Table 2

#### Use of Computerized Provider Order Entry (CPOE) (N=750)

Use CPOE for some or all provider orders	74% (555)
Have CPOE, but not in use	11% (83)
Do not have CPOE	13% (101)
No response	1% (11)



Table 3

**Use of Clinical Decision-Support Tools (N=750)**

Type of Decision Support	Used Routinely	Used Occasionally	Not Available/Not in Use/Did Not Answer
Clinical guidelines	29% (218)	34% (255)	37% (277)
High-tech diagnostic imaging	38% (284)	5% (38)	57% (428)
Medication guides/alerts	76% (570)	14% (105)	10% (75)
Chronic care plans and flow sheets	38% (283)	28% (211)	34% (256)
Patient-specific or condition-specific reminders	41% (305)	27% (200)	33% (245)
Preventative care services reminders	52% (391)	15% (114)	33% (245)

they have no plans to implement an EHR system in the next five years. Those clinics without an EHR system indicated the biggest obstacles to implementation are the cost, return-on-investment concerns, and limited access to knowledge or technical resources.

■ **EHR Use**

The survey asked a number of questions regarding how clinics use EHR systems. Respondents in 74% (555) of the clinics reported using computerized provider order entry (CPOE) for some or all provider orders including referrals, medication orders, and lab and diagnostic test orders (Table 2). Seventy-one percent of the clinics that use CPOE (393 of 555) said they use it for 80% to 100% of all provider orders. The most frequently identified barriers to using CPOE were the time required for staff training and the time it takes to build orders in the system. Less than 5% of the clinics without an EHR (18 of 371) use CPOE for providers' orders.

Eighty-six percent of clinics (645 of 750) said they routinely use some type of clinical decision-support tool. Medication guides or alerts were regularly used by 76% (570 of 750) of clinics (Table 3). Other decision-support tools used were reminders of when preventative care services are due (52% or 391 clinics) and patient- or condition-specific reminders (41% or 305 clinics). The two most frequently

identified obstacles to using clinical decision support at the point of care were the resources needed to build and implement the decision-support tools and the need to train staff and providers to use them.

Table 4 shows the prescribing practices of clinics with EHRs. Eighty-nine percent of clinics with EHRs (664 of 750) indicated that they order medication by entering prescriptions in the EHR. Sixty-seven clinics (9%) said they still use paper prescriptions. Some clinics (101 of 371) that do not have an EHR do e-prescribe. At clinics with EHRs, 60 percent (448 of 750) said they e-prescribe for more than 75% of prescriptions. Another 7% (56) use e-prescribing but for less than 75% of prescriptions. The remaining 167 clinics (22%) said their system either did not have an e-prescribing function or that function was turned off.

■ **Health Information Exchange**

The biggest benefit of EHRs will be realized when they are able to securely and meaningfully exchange information across the continuum of care. Several indicators were used to measure the interoperability of EHRs or the health information exchange activities of clinics.

Clinics report that routine electronic exchange of clinical information occurs most frequently with hospitals in the same system or that they are affiliated with and less frequently with nursing homes, home

Table 4

**Prescribing Practices (N=750)**

Prescribing Practice	Percentage of Clinics (N)
Entering prescription in EHR	89% (664)
Using prescription pads and paper	9% (67)
Entering prescriptions into a computer system separate from EHR	1% (4)
Entering prescriptions in a web-based system	0% (0)
No answer	2% (15)

health providers, and providers in other settings (Table 5). Thirty-four percent of clinics (257 of 750) report providing an electronic summary of care record for 80% or more of patients who are referred to other providers or transitioned to other settings.

Almost 71% of clinics (530) electronically exchange clinical and patient data with the Minnesota Immunization Information Connection. Thirty-two percent (227) electronically share data about reportable diseases with the Minnesota Department of Health. A smaller percentage (17% or 131 clinics) indicate that they routinely send and receive electronic information to and from patients. The most significant challenges to securing information exchange with outside organizations are HIPAA requirements, other privacy or legal concerns, competing priorities, and access to technical support or expertise.

More than half of the clinics with EHRs (56% or 418) have an agreement to exchange information with at least one other clinic, hospital, or health system. Of the remaining clinics, 35% (260) subscribe to an outside service to facilitate health information exchange and 8% (61) use a nonprofit health information organization.

Table 5

**Percentage of Clinics Electronically Exchanging Clinical and Patient Data with Providers (N = 750)**

	To/from hospitals in system/affiliated	To/from hospitals outside system	To/from providers outside system	To/from providers in other care settings
<b>Routinely send electronic data from EHR</b>	23%	17%	21%	11%
<b>Routinely receive electronic data</b>	6%	1%	1%	1%
<b>Routinely send and receive electronic data</b>	30%	2%	13%	2%
<b>Do not send or receive electronic data</b>	38%	77%	63%	83%
<b>No response</b>	3%	3%	2%	3%

■ **Application for CMS Meaningful Use Incentive**

Meaningful use involves the exchange and use of health information to best inform clinical decisions at the point of care. More than half of all clinics surveyed (54% or 603 of 1,121) anticipate their providers will apply for CMS meaningful use in-

centives. Twenty-three percent (227) do not expect their providers will apply for the incentives. The remaining 26% (291) were unsure or did not respond.

The criteria for achieving meaningful use include accomplishing all of the core measures and five of the menu measures (Table 6). To estimate a clinic's abil-

ity to achieve meaningful use, 14 of 15 core measures were assessed. Forty-three percent (325 of 750 clinics) were able to achieve five to nine core measures, another 45% (339) able to achieve 10 to 14. The remaining 11% (86) were able to achieve fewer than five core measures. The most challenging measures to meet were providing clinic summaries, collecting patient demographics, and providing the patient with their health information.

**Discussion**

The high rate of EHR adoption in Minnesota is the result of multiple factors including the commitment of providers and clinics to improve the quality of care they deliver and the work of the Minnesota e-Health Initiative, a public-private collaborative dedicated to supporting efforts to accelerate the adoption and use of HIT in the state.

The National Ambulatory Medical Care Survey, which included some Minnesota clinics in its sample, found that Minnesota had a significantly higher EHR adoption rate than the national average (50.7%).<sup>1</sup> According to the survey, Minnesota's EHR adoption rate of 80.2% is the highest in the nation. States bordering Minnesota also have high EHR adoption rates, with Wisconsin having a rate of 75.4% and North Dakota a rate of 74.9%.

The next step after adoption is incorporating the use of EHRs into the workflow and continuing to find ways to use the technology to improve care. One example of effective use is CPOE, which is associated with improved quality of care. It is encouraging to see not only a high percentage of clinics with EHRs using CPOE (74% of 750) but also to see that 70% of those clinics use it nearly all the time. Usage rates will grow as the EHR adoption rate increases and as clinics move toward achieving meaningful use, since CPOE use is a core measure of meaningful use.

Another meaningful use core measure is the implementation and use of clinical decision support tools other than medication alert. Sixty-four percent of clinics (480/750) are able to achieve this measure. As with CPOE use rates, the

**Resources for Clinics and Providers**

- The Minnesota Medical Association ([www.mnmed.org/](http://www.mnmed.org/)) provides education for and help to physicians wanting to take advantage of the Centers for Medicare and Medicaid Services incentive program.
- REACH ([www.khareach.org](http://www.khareach.org)), the Regional Extension Center for Health Information Technology, offers services to Minnesota provider groups of all types and sizes across the continuum of care. REACH offers meaningful use bootcamps and tool kits for EHR adoption.
- The MN e-Health Initiative ([www.health.state.mn.us/e-health/index.html](http://www.health.state.mn.us/e-health/index.html)) is a public/private collaborative dedicated to accelerating adoption and use of health information technology. Its website includes resources, tools, and on-line guides related to EHR implementation.
- The Minnesota Department of Human Services ([www.dhs.state.mn.us/ehrincentives](http://www.dhs.state.mn.us/ehrincentives)) is implementing the MN EHR Incentive Program for Medicaid. Its website includes the MN EHR Incentive Program information, eligibility criteria for providers and hospitals, and the hospital calculation spreadsheet.
- The Minnesota Department of Health's Office of Rural Health and Primary Care (ORHPC) ([www.health.state.mn.us/divs/orhpc/hit/index.html](http://www.health.state.mn.us/divs/orhpc/hit/index.html)) supports efforts to increase the adoption and use of health information technology, including telehealth, for rural and safety-net providers. ORHPC provides resources, tools, and an EHR loan program for eligible recipients.

Table 6

**Meaningful Use Measures (Stage 1)**

**Core Measures • Eligible providers must achieve all core measures.**

1. Use computerized provider order entry for medication orders directly entered by any licensed health care professional who can enter orders into the medical record per state, local, and professional guidelines.
2. Implement drug-drug and drug-allergy interaction checks.
3. Maintain an up-to-date problem list of current and active diagnoses.
4. Generate and transmit permissible prescriptions electronically.
5. Maintain active medication list.
6. Maintain active medication allergy list.
7. Record patient’s gender, race, ethnicity, preferred language, and date of birth.
8. Record and chart changes in height, weight, blood pressure. Calculate and display body mass index (BMI). Plot and display growth charts for patients 2 to 20 years of age; include BMI.
9. Record smoking status for patients 13 years of age and older.
10. Report ambulatory clinical quality measures to the Centers for Medicare and Medicaid Services or, in the case of Medicaid, the state.
11. Implement one clinical decision-support rule relevant to specialty or of high clinical priority and be able to track compliance with that rule.
12. Provide patients with an electronic copy of their health information (including diagnostics test results, problem list, medication lists, medication allergies) upon request.
13. Provide clinical summaries for patients for each office visit.
14. Be capable of electronically exchanging key clinical information (problem list, medication list, allergies, and diagnostic test results) among care providers and patient authorized-entities.
15. Protect electronic health information created or maintained by the certified EHR technology.

**Menu Measures • Eligible providers must achieve five menu measures including at least one measure from the public health menu measure set.**

1. Implement drug formulary checks.
2. Incorporate clinical lab test results into EHR as structured data.
3. Generate patient lists by condition to use for quality improvement, reduction of disparities, research, or outreach initiatives.
4. Send patient reminders per patient preference for preventive/follow-up care.
5. Provide patients with electronic access to their health information (including lab results, problem list, medication lists, and allergies) within four business days of the information becoming available.
6. Use certified EHR technology to identify patient-specific educational resources and provide those resources to the patient, if appropriate.
7. Perform medication reconciliation for a patient who comes from another care setting or care provider.
8. Provide summary care record for each patient transitioned or referred to another care setting or provider.
9. Ability to submit electronic data to immunization registries or immunization information systems according to applicable law and practice.\*
10. Ability to submit electronic syndromic surveillance data to public health agencies according to applicable law and practice.\* [Not an option in Minnesota for Stage 1]

\*Public health menu measure set

Source: U.S. Department of Health and Human Services, Center for Medicare and Medicaid Services, [www.cms.gov/EHRIncentivePrograms/Downloads/EP-MU-TOC.pdf](http://www.cms.gov/EHRIncentivePrograms/Downloads/EP-MU-TOC.pdf)

rates of clinical decision support use will increase as clinics make progress toward meaningful use.

When providers and facilities can exchange data through their EHR systems, information will follow the patient to wherever they access care and, therefore, enable providers to make the best possible clinical decisions. To make the most of this capability, clinics will not only need to continue exchanging data with other

clinics and hospitals but also with other providers such as nursing homes, home health care agencies, state and local health departments, and others. As more of these other providers adopt and use EHRs, the opportunities for exchange will increase.

The barriers to adoption and use of EHRs and data exchange can be grouped into four categories: lack of funding, lack of technical assistance/knowledge, the need for ongoing maintenance, and the

need for organizational change. Fortunately, Minnesota clinics have access to a number of resources and tools that can help them overcome these hurdles. They range from loans for rural providers that want to implement EHRs to tool kits to assist in implementation and data exchange (see “Resources for Clinics and Providers,” p. 35).

A number of clinics in Minnesota are interested in applying for federal incentives for meaningful use. As of last spring, more than half were anticipating their providers would apply for the incentives. Not only are the clinics expecting eligible providers to apply, but they also are close to achieving the core measures necessary to be eligible for incentive payments. The annual survey of EHR use among clinics in the state will continue to provide an updated picture of their intent and ability to achieve meaningful use.

**Conclusion**

The efforts of many have led to the high adoption rates and the increasing use of EHRs in Minnesota clinics. Although there are many more milestones to achieve, Minnesota clinics have made great progress in adopting and using EHRs effectively. As more clinics implement and take full advantage of the technology, it is likely that the quality of care and the health of all Minnesotans will improve accordingly. **MM**

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*The authors would like to thank MN Community Measurement and the Health Economics Program and Office of Health Information Technology at the Minnesota Department of Health, Division of Health Policy.*

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# What You Can Do Now to Prepare for ICD-10

By Patrice Kuppe

■ The United States is moving toward adoption of the 10th version of the World Health Organization's International Classification of Diseases (ICD) codes. Because the change will have a significant impact on electronic health record and billing systems, ICD-10 is being rolled out in phases over the next couple of years. Physicians will need to begin using the new diagnosis codes starting in October 2013. This article describes the differences between ICD-9 and ICD-10 and the steps physicians and clinics can take now to prepare for the implementation.

Big changes are underway in the realm of medical coding. Thanks to a mandate under the Health Insurance Portability and Accountability Act, hospitals, clinics, and health plans throughout the country are in the process of preparing for the implementation of the new International Classification of Diseases (ICD) 10 diagnosis and procedural codes for medical documentation and billing. The United States is one of the last countries in the world to adopt the 10th version of the codes, which was endorsed by the World Health Organization in 1990.

Because the change will have an enormous impact on electronic health record (EHR) and billing systems and the people who use them, it will take place in phases over the next several years. Billing and information technology personnel are already working to meet a January 1, 2012, deadline for upgrading systems to meet new standards for electronic claims and other revenue cycle transactions. But for most physicians, October 1, 2013, is the deadline to pay attention to, as that is

when they will have to begin using ICD-10-CM, the new diagnosis codes. (Physician services will continue to be coded using Current Procedural Terminology [CPT] codes.) By this same date, in addition to the ICD-10-CM codes, hospitals must start using ICD-10-PCS codes to report the resources and procedures used in inpatient cases (Table 1). There will be no grace period for implementation.

The ICD-10 code set replaces

ICD-9, which was adopted by the World Health Organization in 1975, the year Microsoft was founded and eight years before the virus that causes AIDS was identified. Obviously, much has changed with regard to computing and medicine since then.

Not only does ICD-9 no longer accurately describe the practice of medicine, it is inadequate for meeting the demands of medical record-keeping in the 21st century, which include tracking quality measures, monitoring potential public health risks, and submitting utilization data. In some cases, ICD-9 simply has no code for a condition. For example, it initially had no code for severe acute respiratory syndrome (SARS); a special update had to be made in 2003 to add

Table 1

## The New System

Current Code System	Code System after October 1, 2013 (on the date of service or discharge)	Purpose	Who Uses Them
ICD-9-CM	ICD-10-CM	For coding diagnoses of patients seen in both inpatient and ambulatory settings	Hospitals and physicians
ICD-9-PCS	ICD-10-PCS	For coding of hospital resources and procedures	Hospitals for inpatient services
CPT Codes	CPT Codes	For coding physician services	Physicians and other providers

codes for SARS. In other cases, terminology is outdated and inconsistent with current medical practice. Asthma is one example where ICD-10-CM is much more precise and accurate than ICD-9-CM. With ICD-10-CM, asthma is classified as mild intermittent, mild persistent, moderate, or severe. Current guidelines base diagnosis and treatment of asthma according to these categories. But ICD-9-CM classifies asthma as intrinsic and extrinsic, which is no longer relevant for treatment. Thus, using ICD-9-CM codes to analyze treatment outcomes, prevalence of asthma in their patient population, and occurrences of acute episodes of asthma would not yield good data. ICD-9 has simply outlasted its usefulness.

### ICD-10-CM versus ICD-9-CM

Physicians need to understand that the ICD-10-CM system is significantly different than the ICD-9-CM system. First, the number of codes will increase dramatically—from about 13,000 to 68,000. Second, the codes themselves are very different. The ICD-9-CM codes are only three to five characters long. The ICD-10-CM codes will be three to seven characters. In ICD-10-CM, the first character is alpha; characters 2 and 3 are numeric; characters 4 through 7 are alpha or numeric (Table 2).

The increased number of codes and the change in code length, combined with considerably more code granularity, allows for much greater specificity. For example, under ICD-9-CM, there is one code for a patient with a traumatic closed fracture of the shaft of the radius and ulna (813.23). Under ICD-10-CM, there are multiple possibilities, as the fourth character of the code will identify the type of fracture (eg, greenstick or transverse), the fifth and sixth characters the location and condition (right or left side and in some cases whether the fracture was considered displaced or nondisplaced), and the final character if the encounter was initial, subsequent, or sequela. The resulting code might look like this: A52.131A—indicating displaced fracture of neck of right radius, initial encounter for closed fracture.

Table 2

### Comparison of ICD-9-CM and ICD-10-CM Diagnosis Codes

ICD-9-CM	ICD-10-CM
Three to five characters in length	Three to seven characters in length
Approximately 13,000 codes in total	Approximately 68,000 codes in total, 55,000 of which are new
First character may be alpha or numeric; the second through fifth are numeric	First character is alpha; characters 2 and 3 are numeric; 4 through 7 are alpha or numeric
Limited space for adding new codes	Flexible for adding new codes
Lack of specificity makes records less useful for analysis	Specificity improves coding accuracy and richness of data for analysis
Codes are nonspecific and do not adequately define diagnoses needed for medical research	Detail improves the accuracy of data used for medical research
Does not support interoperability	Supports interoperability and the exchange of health data between the United States and other countries

### Implementing the Change

Given these differences, all provider organizations and health plans will need to engage in significant planning to make EHR and billing system modifications or upgrades. They also will need to provide training and ongoing support to staff.

The key for successful migration to ICD-10 is to establish an environment in which new and old technology, along with like and unlike data sets, can co-exist and where information exchange can occur while the re-engineering of existing workflow and software takes place. Each provider organization will need to review all of its processes, systems, and reports and document where ICD-9 codes are currently used. In addition, each organization should conduct a financial impact analysis to determine if the new levels of specificity will change the reimbursements they receive from the government or commercial health plans.

To navigate the challenges, the Center for Medicare and Medicaid Services is developing general equivalence mapping (GEM) tools to convert data from ICD-9-CM to ICD-10-CM and vice versa.<sup>1</sup> The GEMs will be like dictionaries that

will enable users to translate from one code set to the other. The mapping tools can be used to help you calculate reimbursement, format new provider-specific prompts, and update reports or forms. But the GEMs should be used with care for a number of reasons:

- There are new concepts in ICD-10-CM that are not present in ICD-9-CM;
- In a few cases, the GEMs may have no matching codes;
- There may be multiple ICD-9-CM codes for a single ICD-10-CM code; and
- There may be multiple ICD-10-CM codes for a single ICD-9-CM code.

Although these tools will aid during the transition period, organizations will still need to work with their EHR and billing-system vendors to ensure that the transition goes smoothly (see “Questions to Ask Your EHR and Billing System Vendors”). They will have to decide how long they will keep ICD-9 codes since the codes are attached to the date of service and not to the date the record or claim was created. And those organizations that do not use EHRs will need to update their charge

sheets and make sure their billing system is ready. Finally, no tool will be a substitute for learning the ICD-10 codes. Thus, all health care providers, coders, and support and billing staff will need to be trained.

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**Start Preparing Now**

Clearly, organizations should be getting ready for this change. A number of steps should be taken well before October 1, 2013:

1. Create a project team. Assign an executive to spearhead the work and to create awareness of the coming changes among both clinical and financial staff.
2. Conduct an assessment. List the places where codes are used and stored.
3. Talk to your software vendors about what the change could mean in terms of your systems. Successful conversion to ICD-10 will depend heavily on when your vendor has the upgrades completed and when they can be installed in your system.
4. Identify the changes that you need to make in your practice to convert to the ICD-10 code set. For example, your diagnosis coding tools, “super bills,” and public health reporting tools will need to be updated, and you will need to make it clear which code list to use based on the date of service.
5. Identify staff training needs and complete the necessary training.
6. Conduct internal testing to make sure

you can generate transactions with the ICD-10 codes.

7. Conduct external testing with your clearinghouses and payers to make sure you can send and receive transactions with the ICD-10 codes.
8. Conduct a financial assessment. The transition from ICD-9 to ICD-10 presents health care providers with a number of financial opportunities and risks, both during the transition period and over the long term. You should identify how the change could affect your organization in terms of financial performance, availability of working capital, and financial reporting.

We’ve handled changes in coding before. After an initial outcry over the conversion to the “new” CPT E/M code system in the early 1990s, we all adapted. In the end, the transition went relatively smoothly for those who took the time

**Resources**

**Centers for Medicare and Medicaid Services ICD-10 Overview**

<https://www.cms.gov/ICD10/>

**World Health Organization ICD-10 Training Tool**

<http://apps.who.int/classifications/apps/icd/ICD10Training/ICD-10%20training/Start/index.html>

to plan and prepare. The move to ICD-10-CM will also be smooth if we start preparing now. **MM**

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**Questions to Ask Your EHR and Billing System Vendors**

1. How will their application, business processes, or systems address your needs during implementation of ICD-10? Will they maintain tables for each code set? How long will ICD-9 be available for use? Some will propose an embedded or proprietary solution, while others will delegate the responsibility to the user organization.
2. What is the migration strategy for making the change to ICD-10? Will multiple upgrades be required? This may be a concern for organizations that are not using the latest release of a vendor-supported application.
3. Will they ensure you have the right tools in place to help you select the more specific diagnosis codes? Will they provide specific provider templates for each specialty?

# Health Care and the Environment

## Local Champions, Global Impact

By Jeanette Augustson, M.A., and Carl Patow, M.D., M.P.H., F.A.C.S.

■ Health care as a sector has recently become aware that it is a major user of energy and generator of waste. Now, many institutions are taking steps to curb their energy consumption, reduce waste, and design processes and facilities that are more environmentally friendly and, as a result, healthier. This article describes these trends as well as specific efforts underway in Minnesota that could serve as models for providers in other parts of the United States.

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Doctors, hospitals, and patients tend to embrace new technology. Blazing fast scanners, advanced therapeutic devices, and disposable single-use equipment have improved the experience of and outcomes for patients. But what happens to devices, gadgets, and machines when they become obsolete or can no longer be used? What happens to medical waste? How can hospitals and clinics minimize their impact on the environment? More and more, doctors, nurses, and health care administrators are considering the environmental impact of the choices they make related to technology and their facilities.

Health care as an industry has only recently begun to take its environmental responsibility seriously. This is the result of growing awareness that health care contributes significantly to environmental problems and that environmental problems, especially climate change, contribute significantly to health problems.<sup>1</sup> Thus, physicians have begun to broaden their understanding of their obligation to “do no harm” and see that it extends to the environment as well as to individual patients. As a result of this understanding, health care facilities have begun to implement programs and policies that minimize the impact of their activities on the environment. This article outlines how this often works and describes several initiatives underway in Minnesota that might serve as models for other institutions.

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### The Green Journey

Most organizations begin their efforts to decrease medical waste and minimize their environmental impact by tackling small and focused problems. For example, they find simple ways to

use less paper or stop buying single-use Styrofoam cups. In many cases, a local champion will step forward and energize the effort by leading a committee or study group. These groups often evolve into “green teams” that suggest other common-sense initiatives such as making recycling bins for paper waste and plastic bottles more accessible.

As organizational green teams become more sophisticated, they begin to include departments such as food service, engineering, purchasing, pharmacy, and surgical services. Pharmacies, for example, might be asked to keep medicines out of the waste stream and develop systems to shelve drugs according to their expiration date or refuse samples scheduled to expire soon. As departments pursue change, the organization’s efforts tend to become more comprehensive. They address bigger issues such as energy use, inefficiencies in processes and systems, and medical waste disposal.

The next step in the “green” journey is to incorporate sustainable thinking into the design of new and remodeled and renovated space. Architects and facility planners are becoming increasingly savvy about including environmental considerations in facility plans. They are using sustainable materials and those made from low-volatile compounds both to improve indoor air quality and to lessen the impact of the building on the environment. Many are incorporating outdoor features such as rain and rooftop gardens, sustainable landscapes, and healing gardens. And they are trying to reduce the use of toxic substances in cleaning and other products. The Center for Health, Environment, and Justice reports that hundreds of health care institutions in the United States are undertaking efforts to re-

duce their use of products that contain polyvinyl chloride (PVC) and/or Di(2-Ethylhexyl) Phthalate (DEHP).<sup>2</sup>

Health care facilities are also looking at generating energy and becoming more energy efficient in order to reduce fossil fuel consumption and save money. The U.S. Environmental Protection Agency estimates that 30% of the health care sector's current energy use—costing \$1.95 billion—could be reduced without sacrificing quality of care through a shift toward energy efficiency and use of renewable energy sources.<sup>3</sup> Construction practices such as increasing wall and ceiling insulation, using double-paned windows, and assuring proper ventilation can significantly contribute to lower fuel costs and energy savings.

Health care facilities are also becoming aware that disposal of equipment can cause the release of hazardous substances that may be toxic to humans. For example, there are chlorinated plastics in cable wiring, lead in cathode ray tube (CRT) monitors, brominated flame retardants in computers, and mercury in LCD displays.<sup>4</sup> Improper disposal poses significant threats to the environment and to people. Dumping medical technology into landfills may result in the release of heavy metals into the water table, contaminating groundwater and polluting the air. Incinerating it may foul the air. Incorrect disposal of equipment in developing countries has caused children and adults to be exposed to toxic and radioactive substances.

### What Area Hospitals and Clinics Are Doing

A number of clinics and hospitals in Minnesota and Wisconsin have launched programs to reduce the size of their environmental footprint and make their facilities healthier. In fact, many hospitals now have extensive programs. Here's a sampling of what some are doing:

Regions Hospital in St. Paul began recycling the blue wrap used in its OR to cover surgical instruments in 2009. Last year, this effort kept more than 10,000 pounds of the wrap out of landfills. Regions also reprocesses (cleans, tests, and sterilizes) single-use medical devices that in the past would have been thrown away, saving \$300,000 per year. Devices that can be recycled in this way include surgical instruments such as cutting tools, burrs, catheters, endoscopes, and cannula sets.

Minneapolis-based Fairview Health Services is decreasing the amount of recyclables in its waste stream. In early 2009, Minnesota Waste Wise ([www.mnwastewise.org](http://www.mnwastewise.org)), a nonprofit organization that assesses organizations' recycling practices, performed an environmental sustainability assessment and did waste-stream analyses at two Fairview locations. Although Fairview had recycling programs in place, items were going into the trash that could have been recycled such as cans, bottles, glass, and nonconfidential office paper. Fairview is now recycling 30 more tons each month than it was before doing the waste-stream analysis. Since 2009, Fairview has saved more than \$900,000 because of this and other waste-reduction projects and initiatives.

St. Luke's Hospital in Duluth purchases food from local sources whenever possible. Buying locally decreases transporta-

### Did You Know?

- Hospitals are the second most energy-intensive buildings in the United States.
- The nation's hospitals generate approximately 6,600 tons of waste per day.
- Pharmaceutical waste can be found in trace amounts in soil and groundwater throughout the world.
- Burning medical waste generates a number of hazardous gases and compounds including hydrochloric acid, dioxin/furan, and the toxic metals lead, cadmium, and mercury.

Source: Healthier Hospital Initiative ([www.healthierhospitals.org](http://www.healthierhospitals.org))

tion costs and fuel consumption, stimulates the local economy, and provides fresh food for patients and their families.

St. Luke's and Hennepin County Medical Center in Minneapolis both have rooftop gardens that produce fresh vegetables and herbs that are used in the hospitals' cafeterias, reducing transportation and storage costs.

In 2008, Bloomington-based HealthPartners began using recyclable vials for the more than 50,000 prescriptions its pharmacies fill every month.

The new University of Minnesota Amplatz Children's Hospital followed LEED (Leadership in Energy and Environmental Design) principles as it designed and built its new facility.<sup>5</sup> It used lumber from sustainable forests, low-volatile organic compound paints, sorghum wallboard, and a nonvinyl flooring made with linseed oil and backed with jute fibers. The terrazzo flooring in the lobby incorporates recycled glass and mirrors.

Ridgeview Medical Center in Waconia has been a champion of sustainability since 2001. When renovating a laboratory recently, Ridgeview officials chose nonvinyl wall coverings to improve indoor air quality and mobile furniture to make the workspace more flexible in hope of minimizing the need for future renovations.

The campus of Hudson Hospital and Clinics in Hudson, Wisconsin, has outdoor gardens featuring native, drought-resistant plants. The landscape design conserves water and is a source of comfort to patients and families.

Olmsted Medical Center in Rochester has adopted "green" cleaning policies that decrease staff and patient exposure to toxic and allergenic chemicals.

St. Cloud Hospital in St. Cloud reduced its natural gas costs by 38% per square foot between 2009 and 2010 by taking measures such as upgrading heating, cooling, and ventilation systems; installing energy-efficient motors, equipment, and lighting fixtures; installing compact fluorescent lamps (CFL) and light-emitting diode lamps (LED); using automated control systems that manage energy use; conducting annual comprehensive energy audits; and simply having employees turn off lights when leaving a room or turn off computers at the end of the day.<sup>6</sup> ➤



Gundersen Lutheran in La Crosse, Wisconsin, is developing its own energy infrastructure. Its goal is to meet 100% of its facilities' energy needs by 2014 through both conservation and power generation. Its renewable energy project takes waste biogas, primarily methane discharged from a local brewery's waste treatment facility, and turns it into 3 million kilowatt hours of electricity per year—enough electricity to power 299 homes. The initiative has the same positive impact on the environment as planting 490 acres of forest or removing 395 cars from the road.<sup>7</sup>

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**Beyond Buildings**

In addition to individual hospitals and clinics, entire communities need to take action to improve the health of their population and the health of their environment. One way they can do this is by avoiding unnecessary and wasteful duplication. Community leaders should be asking themselves a number of questions as they consider plans for hospital and clinic expansions: How many specialty hospitals are needed in a given area? How many MRI scanners and other high-tech devices and facilities are needed? How can care be made accessible (particularly in rural areas) without requiring people to drive great distances? Through coordination and planning, communities can find ways to decrease energy utilization, reduce unnecessary duplication of technology and resources, and maintain essential access to care.

The health care industry has a major stake in improving the environment, and doing so is increasingly a matter of health. A 2009 article in *The Lancet* called climate change the biggest global health threat of the 21st century.<sup>1</sup> The World Health Organization predicts that temperature shifts will lead to the spread of infectious diseases and an increase in deaths and injury from environmental disasters.<sup>8</sup> Extreme weather events such as floods and droughts already are having a dramatic effect on the health of people around the world, especially those living near rivers, in coastal areas, and on islands.

Only recently has the health care industry begun to take its environmental responsibility seriously. Leaders of Minnesota health care organizations are taking steps to improve the health of their facilities, their staff members, and the patients they serve. These efforts could serve as models for other organizations throughout the United States. **MM**

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**To Learn More**

**The Green Guide for Health Care** ([www.gghc.org](http://www.gghc.org)) is a comprehensive guide for those wishing to make their health care facility more sustainable. The guide provides detailed information about energy efficiency, water conservation, sustainable purchasing practices and operations, and waste management. It includes standards organizations can use to assess how their environmental initiatives are progressing.

**Health Care Without Harm** ([www.noharm.org](http://www.noharm.org)) is an international coalition of hospitals and health care systems, medical professionals, community groups, labor unions, environmental and environmental health organizations, religious groups, and other organizations dedicated to making health care more ecologically sustainable.

**Practice Greenhealth** ([practicegreenhealth.org](http://practicegreenhealth.org)) is a membership and networking organization for health care organizations that have made a commitment to sustainable, eco-friendly practices. Members include hospitals, health systems, businesses, and others engaged in improving the health of patients, staff, and the environment.

**Health Care That's Healthy: Advancing Sustainability in the Delivery of Care** a conference May 5-6 in St. Paul. Learn more and register at [www.healthcarethatshealthy.com](http://www.healthcarethatshealthy.com).

# Surrogate Decision-Making and the Need for Advance Care Planning

## Issues Raised by the Al Barnes Case

By Keith M. Swetz, M.D., Mark G. Kuczewski, Ph.D., and Paul S. Mueller, M.D., M.P.H.

■ Decisions regarding health care are increasingly difficult to make, especially as patients live longer and with more medical comorbidities. The case of Al Barnes, a man with advanced dementia who recently died in a Minnesota hospital despite months of aggressive care, illustrates the frequently encountered challenges that go along with making decisions about medical care for patients who lack the ability to do so themselves. These challenges can lead surrogates to opt for treatments that are efficacious but may be burdensome and inconsistent with the values, goals, or preferences the patient previously expressed either orally or in a written advance directive. In this article, we describe approaches that may help those who must make decisions for patients who cannot do so themselves and the merits and limitations of advance care planning.

**O**n February 14, 2011, Al Barnes, an 85-year-old man with advanced dementia, died at Methodist Hospital in St. Louis Park after several months of aggressive treatment. The ethical and legal aspects of his case were on display in the media during the months prior to his death. Because Mr. Barnes lacked decision-making capacity, the principle issue in his case was whether his wife, Lana Barnes, was acting appropriately as his surrogate decision-maker; that is, whether she was making decisions in accordance with his previously expressed wishes.

Mrs. Barnes requested continued aggressive medical treatments for her husband including hemodialysis and mechanical ventilation, stating that he would want such treatments if he had any chance of survival.<sup>1</sup> However, Mr. Barnes's sons from a previous marriage reported that Mrs. Barnes's request was inconsistent with their father's previously stated wishes.<sup>2</sup> Mr. Barnes had an advance directive, which was executed more than 15 years ago.

This discrepancy, as well as the behavior of Mrs. Barnes, which was perceived as intrusive and obstructionist by hospital staff, prompted a review of the case in Hennepin County Probate Court. There, matters were further complicated when evidence suggesting that Mrs. Barnes tampered with Mr. Barnes's

1993 health care directive surfaced.<sup>2</sup> As a result of this discovery, Mrs. Barnes was removed as Mr. Barnes's surrogate decision-maker and the court appointed a surrogate.<sup>3</sup> Ultimately, despite ongoing aggressive care, Mr. Barnes died without his court-appointed surrogate having to make the decision to withdraw life-sustaining treatments.<sup>1</sup>

### A Complex Process

Clinicians frequently care for patients who, like Mr. Barnes, have advanced illnesses that requires life-sustaining treatments and lack decision-making capacity. In these situations, physicians must work with and rely on others to make judgments regarding their patient's medical care. Given the fact that the population of the United States is aging and given that medical technologies are increasingly successful in prolonging life, it is likely that physicians will increasingly find themselves in situations where surrogates are making decisions about their loved ones' care.

Invariably, the issues raised by these situations are complex and difficult. Although aggressive treatments can be directed at most medical conditions, the potential benefits of those treatments may be marginal, and they often come with the risk of diminished quality of life. In addition, they may excessively

burden the patient and his or her family because of frequent hospitalizations, pain, and high costs.

Ideally, surrogates would weigh the benefits and downsides of those treatments in the context of the patient’s expressed desires before deciding how to proceed. But often, circumstances complicate this already-difficult task. In some situations, bereaved family members perceive that the quality of care being provided for their loved one is poor and understandably are frustrated.<sup>4</sup> In others, families tell health care providers to “do everything possible” to sustain life more because of the distress they feel than because they are attempting to articulate the patients’ health-care-related goals, values, and preferences.<sup>5,6</sup> As in the Barnes case, the appropriateness of the surrogate’s decisions may be questioned.

In all cases, reconciling the surrogate’s decisions with the perceived authentic wishes of the patient ought to be the goal of everyone involved. However, this is often challenging, as the process of surrogate decision-making is highly nuanced and the resulting judgments need to be contextually informed.<sup>6</sup> Here, we offer practical suggestions on how to approach and manage these situations.

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**Planning Ahead**

Research suggests that when patients’ values, goals, and wishes regarding medical treatment are respected, they receive better care, particularly at the end of life.<sup>7,8</sup> Respect for patient autonomy requires clinicians to make sure that patients are allowed to articulate their wishes regarding what they want in terms of care: Do they want their providers to do everything possible to keep them alive? Do they just want to be kept comfortable until the end? Patients should be encouraged not only to articulate but also to document their values, goals, and wishes and to share the resulting documents with appropriate parties (loved ones, clinicians, etc).<sup>9</sup> This process of advance care planning should be flexible and continuous as patients’ health and circumstances are ever-changing.

Advance directives are one component of advance care planning.<sup>9,10</sup> Both instructional directives (such as the living will) and proxy directives (such as the durable power of attorney for health care document) commonly include the appointment of a surrogate decision-maker.<sup>9</sup> This designated surrogate is charged with assuring that a patient’s wishes as articulated during the advance care planning process are carried out in the event the patient is incapable of expressing those wishes. In addition, Minnesota has a POLST (Physician/Provider Orders for Life-Sustaining Treatment) initiative to assist patients with life-limiting or life-threatening illnesses in making their end-of-life preferences clear to their surrogate.<sup>11</sup> More information and resources can be found at [www.polstmn.org](http://www.polstmn.org).

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**Options When Wishes Are Unclear**

Despite the potential benefits of having an advance directive and the related discussion, the number of people completing advance

Table

**Standards to Help Surrogate Decision-Makers**

<b>Substituted judgment</b>	What a surrogate believes the patient would want in a given situation. Surrogates should ask themselves: “If the patient could wake up for 15 minutes and understand his or her condition fully, what would he or she tell you to do?” <sup>1-3</sup>
<b>Best-interest standard</b>	What “reasonable persons of good will would consider acceptable in similar circumstances.” This may involve negotiating the overall goals of care. <sup>1,4,5</sup>
<b>Substituted interests</b>	Based on a surrogate’s knowledge of a patient’s values and interests as opposed to what an incapacitated patient might want in a given situation. <sup>6</sup>

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 directives remains low.<sup>9</sup> As a result, many patients’ preferences regarding aggressive and life-sustaining treatments may be unknown or unclear. Physicians, therefore, often find themselves working with surrogate decision-makers who must guess what the patient would want. Physicians should be aware of a number of concepts that may be useful in such situations.

One is “substituted judgment.” The idea is to have the surrogate articulate what he or she believes the patient would want in a given situation (Table). As suggested in the Quinlan decision<sup>12</sup> and by Quill,<sup>13</sup> surrogates should ask themselves, “If the patient could wake up for 15 minutes and understand his or her condition fully, what would he or she tell you to do?” This question can help a surrogate focus on the patient’s values, goals, and preferences—not theirs. It may be especially helpful when a surrogate’s decisions appear to be incongruent with how the patient, when he or she was capable of making decisions, lived his or her life or interpreted his or her illness and finitude.

Another approach is to apply the “best-interest standard,” which attempts to have the surrogate decision-maker focus on what a “rational being,” a group of knowledgeable or interested persons, or society would perceive as a good outcome for the patient.

Yet another useful concept is that of “substituted interests.”<sup>14</sup> With substituted interests, the patient’s story or narrative, as expressed by the surrogate, is emphasized. Clinicians ask the surrogate about the patient—their hopes, beliefs, interests—rather than about what the patient might do in a given medical situation. The

model presupposes that surrogates may not know details about patients' specific medical wishes but that they likely know much about the patient as a person. The substituted-interests approach is broadly applicable, evokes feelings of empathy in the surrogate, is less stressful for surrogates because it does not require them to focus on a menu of treatment options, and emphasizes shared decision-making between clinicians and surrogates. As a result, there is a higher likelihood of arriving at a care plan that truly reflects the patient's authentic wishes and not the surrogate's.<sup>14</sup>

### Preempting Conflict

The case of Al Barnes clearly illustrates that when patients are incapable of voicing their preferences and have not completed an advance directive or POLST form, there is a potential for conflict among possible surrogates. In the Barnes case, Lana Barnes, the patient's spouse and surrogate, expressed what she perceived as Mr. Barnes's wishes about his care. Mr. Barnes's sons, however, did not believe the decisions made by Mrs. Barnes reflected what their father would have wanted.<sup>2,3</sup> Recalling a patient's wishes and employing substituted judgment based on an interpretation of that recollection means the patient's best interests may vary among potential surrogates and interested persons.<sup>15</sup> Most states have laws establishing who becomes the surrogate decision-maker if the patient has no advance directive. But these laws vary. For example, Minnesota law does not specify a hierarchy, whereas Florida law does (eg, spouse followed by blood relatives). Furthermore, some states restrict surrogate decision-making regarding life-sustaining treatments such as artificial hydration and nutrition.

In cases where there is conflict among potential surrogates, help from social services or legal services, as well as consultations with members of a hospital's ethics committee may be helpful. It is a rare case in which court appointment of a guardian is sought as an option for clarifying what is in the patient's best interest and resolving the conflict.<sup>16,17</sup>

### The Case for Advance Care Planning

Studies have shown that patients who engage in advance care planning with their providers and surrogates are more likely to have decisions made in accordance with their preferences.<sup>7</sup> For example, cancer patients who discuss care preferences with their oncologists are more likely to receive end-of-life care that is congruent with their preferences,<sup>18</sup> whereas those who do not have such discussions receive "aggressive" care and report worse quality of life.<sup>19</sup> Nevertheless, clinicians should recognize that patients' readiness to engage in advance care planning will vary throughout the course of their illness.<sup>20</sup>

Although advance directives or POLST documents are a start, they are only one element of advance care planning. Ongoing communication among patients, clinicians, and loved ones is the critical piece, and discussion about goals of care needs to focus on the specific aspects of a patient's situation as opposed to theoretical situations.<sup>21</sup> Sudore and Fried recently articulated a

three-step process for preparing patients and surrogates for future decision-making. Rather than focusing on prematurely conceived or theoretical situations, they suggest working with patients to prepare for in-the-moment decision-making.<sup>22</sup> This involves 1) choosing an appropriate surrogate, 2) clearly articulating values and preferences, and 3) establishing some leeway in surrogate decision-making given the complexity of a situation. The focus of this approach is preparing patients and surrogates for decision-making rather than making decisions about theoretical scenarios in advance. Thus, Sudore and Fried's approach attempts to address criticisms of advance directives—that they utilize hypothetical situations that are unlikely to be encountered, are too obscure for patients to understand, or have little meaning given the patient's current situation.<sup>23</sup>

In contrast, a discussion among the patient, the surrogate, clinicians, and other persons interested in the patient's health-care-related values, goals, and preferences (and documenting the outcomes of that discussion) is superior to relying on a surrogate's interpretation of a patient's advance directive.<sup>24</sup> Furthermore, constructs such as the substituted interests model place greater emphasis on the patient's values as understood by the surrogate, than on what the surrogate thinks the patient would want in a given medical situation.<sup>14</sup>

Finally, advance directives are only as effective as the information they contain. Most advance directive forms are written in a way that patients cannot easily understand, which may impair their ability to complete the document.<sup>25,26</sup> In addition, evidence suggests that clinicians are more likely to adhere to treatment-specific statements than general statements.<sup>21</sup> Advance directives, therefore, may have limited use in promoting autonomy.<sup>27,28</sup> Nevertheless, we believe a surrogate's decisions are better trusted when the patient has an advance directive or POLST form, as these documents indicate the patient has thought about his or her health care-related values, goals, and preferences while capable of making decisions. This is consistent with common-sense notions about how one makes major decisions in a deliberative and respectful manner.<sup>28,29</sup>

Al Barnes succumbed to organ failure despite the best medical efforts. He died before there was a need for the court-appointed surrogate to have to make decisions about whether to withhold or withdraw life-sustaining treatments, which he may not have wanted. With an aging society and the ability of medicine to help people live longer, it is likely that clinicians will care for more and more patients who are candidates for life-sustaining treatments. In light of these developments, clinicians should encourage their patients to articulate and document their wishes and preferences. They also need to understand that completing an advance directive is only one piece of what needs to be an ongoing, deliberative, and reflective process.

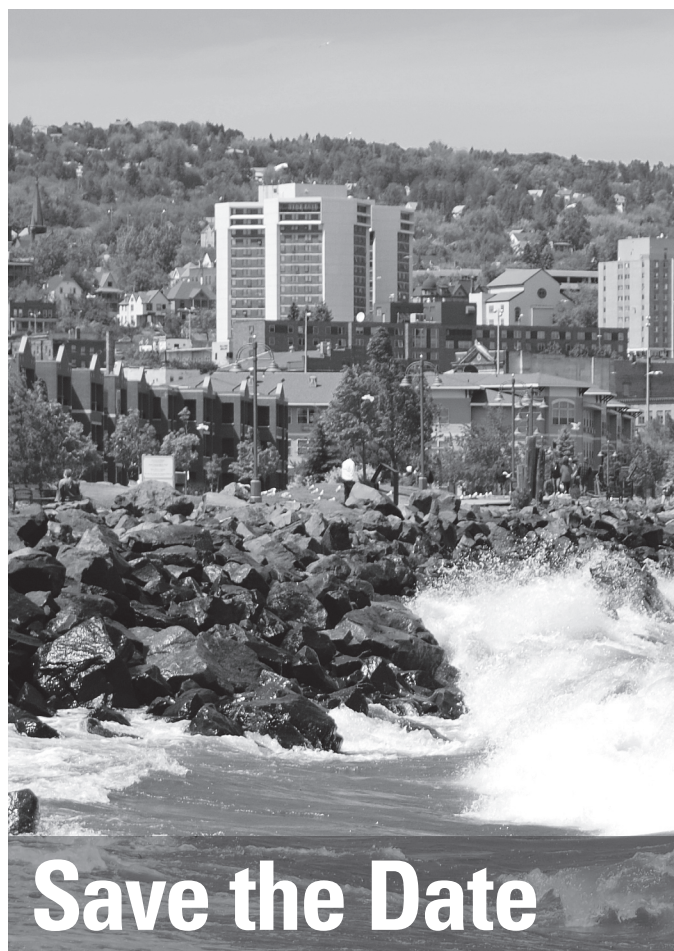
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# The *Lives* of My *Cells*

Musings on my phones.

By Charles R. Meyer, M.D.

I'm on the edge. I'm about to buy an iPhone. I've succumbed to the hype now that Verizon has cracked the AT&T monopoly. I'm not sure I really need the iPhone; but then I'm not sure how many of the trash-bin full of the latest cell phones that I've owned I've needed. All of them, starting with the Motorola car phone mounted on the dashboard of my VW Vanagon, made and received calls. The rest of their features have been icing. Well, maybe more than icing.

Each stage in the evolution of cell phones has brought a measure of added convenience. In the years BC (before cell phones), I would get a page on my digital pager and, if I was away from home or the hospital, would have to find that now-vanishing species, a payphone, to answer it. Payphones were frequently outside, and I'd hope that I could get by with only one call and one quarter. The Motorola allowed me to call from the Vanagon, but I was yoked to the car.

My next cell phone, a Motorola 3200 I fondly dubbed "the brick," no longer required the car antenna. But carrying around a brick of a phone with a six-inch antenna was embarrassing. These were the formative years of cell phones, before their price plummeted to almost nothing and before 80 percent of the people walking down the street were talking on them. When I talked on my brick in public, heads turned, people scowled, and the implied message was, "You are a rude, rich SOB who should take his expensive gadget elsewhere." I tried to keep my calls short and make them inconspicuously.

The usage fees were another reason to keep calls short in those days. Package rates with more monthly minutes than any nonmanic person could use hadn't arrived. You were charged for all the minutes and even fractions of minutes you used, and you were charged more for daytime minutes than nighttime ones. I would wait until I got home or to the office before returning pages from patients I knew to be loquacious in order to conserve minutes and dollars.

As cell phones shrank, I abandoned the brick for a Motorola flip phone. This was a Neanderthal precursor to today's flip phones. It had a "small" battery, so it fit in a pants pocket. But the obvious bulge it made made it look like you had a good-sized sarcoma in your thigh. The brick's rapier-like antenna was replaced by a retractable wire one. But that ponderous flip phone was a battery hog, quickly requiring me to switch to a fatter battery to truly make it effective. Reception was spotty even with the antenna extended, so "Can you hear me now?" was an almost regular part of

conversation during calls. Like all of my previous phones, it was just a phone—call in, call out.

That changed with my next phone, a light-weight, pocket-sized flip phone with a wafer-sized battery and retractable antenna. With this phone, came the era of the phone as entertainment. You could take pictures and view, store, and send them. Ring tones became a personal statement, and many people changed them as often as they did their hair color. They introduced texting, now a national pastime second only to baseball, although you had to press numeric keys multiple times to select the right letter. The flip phone's added conveniences were small steps forward—caller ID, a better and larger contact database, and the ability to call a highlighted telephone number in a text message.

My current Blackberry, with its larger screen, alphanumeric keyboard, email access, and Internet availability, was a giant step forward from the flip phone. I threw away my PDR when I put Epocrates on my Blackberry. I threw away my pager and started receiving pages as text messages (some of my more tech-savvy partners even send me text messages about patients they have admitted during the night). I didn't throw away my computer, but the Blackberry frequently is my preferred device for Google searches.

But now I realize my Blackberry is starting to seem old. Because of the limitations of its browser, I'm not able to perform tasks such as looking up my hospital patient list. And Internet access seems slow. And the device is starting to suddenly reboot for no reason. And ...

The Blackberry is OK, but it's not cool like the iPhone. I know typing on the iPhone won't be as fast as typing on my Blackberry, and I've read the complaints about dropped calls if you hold the phone the wrong way. But I can put up with that just to get that screen ... that browser ... those apps.

I'm on my way to the Verizon store right now. **MM**

Charles Meyer is a practicing internist and editor in chief of *Minnesota Medicine*.

