APPification of Practice

Physicians discover apps that help them provide better, more efficient care.

By Suzy Frisch
Medical apps on the rise

Roughly 97,000 health-related apps were available for smartphones and tablets as of the spring of 2013, according to a report by the market research firm Research2Guidance. Most of those are designed to help people improve their health or stay healthy by tracking their exercise or eating habits, reminding them to take their medications, or providing information about conditions and diseases.

But apps like Mayo’s for asthma that allow physicians to interact with or diagnose patients are starting to appear as well. In April, a Johns Hopkins University medical student made headlines at the TEDMED conference on medical innovation by doing a “smartphone physical,” using 10 apps that turned his smartphone into a medical device. The apps included one for doing an EKG, one that turned the phone into a pulse oximeter and one that enabled ultrasound imaging of the carotid arteries. Former Cleveland Clinic cardiologist Eric Topol, M.D., captured the public’s attention when he used the CellScope app on his smartphone to examine television host Stephen Colbert’s ear during an interview about Topol’s book The Creative Destruction of Medicine: How the Digital Revolution Will Create Better Health Care.

Topol, who is now with Scripps Health in San Diego, believes smartphones will become an integral part of medicine in the future. “These days I’m prescribing a lot more apps than medications,” he said in

“WE KNOW THAT THE TRADITIONAL WAY TO GET CARE IS TO EITHER COME TO THE CLINIC OR CALL SOMEONE. WHY NOT USE YOUR SMARTPHONE TO MANAGE YOUR DISEASE AND CONNECT WITH YOUR CARE TEAM?”

RAJEEV CHAUDHRY, M.D.
an NBC News interview earlier this year. “This is a powerful device.”

Most physicians don’t yet use apps beyond reference tools such as Epocrates and UpToDate, according to a March 2013 Kantar Media survey. But that hasn’t stopped doctors in Minnesota from designing mobile tools that help patients take better care of themselves or communicate with their doctor, or experimenting with those that turn their smartphones into medical devices. These innovators believe that apps are emerging tools that are here to stay.

With the proliferation of medical apps comes the question: Which ones are truly useful? A group of faculty, staff and students from Johns Hopkins University in Baltimore has launched an effort to evaluate them as part of its Global mHealth (mobile health) Initiative. They currently have 49 studies taking place around the world. In addition, apps that turn phones into medical devices have been subject to approval by the U.S. Food and Drug Administration since 2011. Earlier this year, the FDA clarified that it will regulate apps used for patient care such as those for mobile ultrasound or blood pressure monitoring to ensure they work as intended. About 75 apps have received FDA approval, and the agency has said it aims to review about 20 a year.

Some recently approved apps include AliveCor, which converts a smartphone into a heart monitor and mobile echocardiogram device, and MobileMIM, which helps physicians share diagnostic images and consult on challenging cases. The MyVisionTrack app, which requires a prescription, enables patients with retinal diseases to scan their eyes twice a week; the test results are then uploaded to a server in the physician’s office, where they are read and recorded.

Despite concern that the regulatory approval process might bog down development, that the data gleaned from monitoring patients or that patients submit themselves may not be secure, and that spotty cell phone service in certain areas may render apps unreliable, many believe the “appification” of medicine is inevitable. That’s because apps and mobile medicine truly could improve health care, says Stephen Parente, a professor in the Carlson School of Management at the University of Minnesota who specializes in health economics. Apps could even cut costs by eliminating some office visits or preventing some emergencies.

“I do think, in the end, they will help physicians and they will help consumers, because generationally people are getting more comfortable with these mobile technologies,” Parente says. “With chronic conditions, more surveillance and reminders are better than less, and mobile can help with that. Physicians will see that mobile will help them manage patients better because they are more engaged with them. It will be a win-win eventually; but there will be skepticism as they get used to the technology.”

PARDON THE DISRUPTION

Cardiologist Robert Schwartz, M.D., medical director for education at the Minneapolis Heart Institute and Foundation at Abbott Northwestern Hospital, has gotten used to the technology—and he likes it. Schwartz is an early adopter who regularly uses apps in his practice. He is especially enthusiastic about AliveCor’s mobile heart monitor and the AliveECG app.

They’re timesavers, for one thing. When a patient is experiencing an irregular heart rhythm, Schwartz snaps the $199 AliveCor device on his iPhone and does an electro-
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ROBERT SCHWARTZ, M.D.

cardiogram on the spot—no need to order the test and wait 20 minutes for a technician to do it.

He thinks the technology may have a future for monitoring patients with heart palpitations. Holter monitors, which must be worn for 24 to 72 hours, are bulky and uncomfortable and, thus, are often removed before the patient experiences palpitations. Schwartz envisions one day giving patients who have an iPhone an AliveCor case. They could clasp their phone to their chest when they feel palpitations, hit record, and it would instantly send him a report.

“It’s an excellent triage device,” Schwartz says, and one that he’s happy to have on flights in case someone is having a medical emergency and the plane lacks the right equipment. “Right now, it’s complementary, but I think it’s going to be disruptive. Cardiologists would no longer need large and expensive equipment in the hospital. The information could be stored in the cloud, and I could conceivably get direct communication from patients anywhere in the world, immediately.”

Although insurers don’t currently pay for AliveCor electrocardiograms, Schwartz believes it and other apps ultimately will lower the cost of care by making doctors more efficient and improving quality. He points to two free apps that are already online: one that allows patients to record their Electrocardiogram (ECG) and send it to a cardiologist, and another that sends a patient to the right hospital based on their symptoms.

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(All courses in the Twin Cities unless noted)

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  September 5-6, 2013
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  September 16, 2013
- Annual Minnesota Pediatric Hospital Medicine Conference  
  September 25, 2013
- Care Across the Continuum: A Trauma & Critical Care Conference  
  September 27, 2013
- NPHTI/Pediatric Clinical Hypnosis  
  October 3-5, 2013

**Twin Cities Sports Medicine**  
October 4-5, 2013

**Maintenance of Certification in Anesthesiology (MOCA) Training**  
October 5, 2013

**Psychiatry Review: New Directions in Diagnosis & Treatment**  
October 7-8, 2013

**Got Your Shots? 2013 Immunization Conference**  
October 10-11, 2013

**Transplant Immunosuppression 2013**  
October 16-19, 2013

**Practical Dermatology**  
October 25-26, 2013

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**STRONGER LINKS**

Physicians using Mayo’s asthma app, which garnered a silver Edison Award this spring for Innovative Services in Health Management, have found teens more willing to talk about their condition when they use text messaging. In the clinic, teens would often give one-word answers to questions or just say that things were fine, but “they’d go into all sorts of detail in a text,” Chaudhry says. The teens have noted that they like knowing there is a person on the other end of the texts. Care providers have indicated that they spend significantly less time playing phone tag to get information, which eliminates the need for appointments in some cases. And patients have reported that the app helps them remember to take their medication because it keeps their asthma top-of-mind.

“With this app, patients had easy access to their asthma action plan and, thus, were able to take care of themselves. That was very encouraging,” Chaudhry says. “We can stay connected with patients, providing care when they need it and where they need it, and not necessarily through the clinic.”

Improving communication between doctor and patient was a major reason Rajiv Shah, M.D., created an app called MyMeds. Shah sought to solve the thorny problem of medication nonadherence, which is estimated to cost the United States nearly $300 billion a year, according to the New England Healthcare Institute.

The app, which costs $9.99 for an annual subscription, helps doctors work with patients to make sure they take the right amount of their prescribed medications at the right time and at the right frequency.

“I have a philosophy that your patients are your partners and they have a vested interest in their own health. The more you can help them with tools they control, the better,” says Shah, a nephrologist at InterMed Consultants in Edina and CEO of Minneapolis-based MyMeds Inc. “It’s really empowering for patients, and it makes for a better health care experience.”

Inspired by the Institute of Medicine report “To Err is Human,” Shah first developed a computer program in 2003. About a year ago, he powered up the app for both Android and iPhones and tablets. It has been winning raves from pharmacists ever since. Researchers from the University of Arkansas who reviewed 160 medication adherence apps in the *Journal of the American Pharmacists Association* ranked MyMeds as one of the three most promising ones for tackling the problem.

Shah’s app addresses the major causes of nonadherence: forgetting to take the drug, forgetting to refill the drug, not having enough education/information about the purpose of the drug, cost and side effects.

Shah, who has a bachelor’s degree in psychology from Boston University, incorporated numerous principles from cognitive psychology into the app. Its WhyMeds feature strongly reiterates why patients need to take a medication, what it does (in plain English), and how it helps them stay healthy.

Patients on blood pressure medication, for example, see the name of a drug, a statement that it helps control high blood pressure, and an information explaining that controlling their blood pressure will prevent strokes or kidney failure.

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More than anything, they may influence the physician-patient relationship. “The future will see a subset of traditional physician/patient interactions that incorporate a mobile interface,” says David Tierney, M.D., assistant program director of Abbott Northwestern Hospital’s internal medicine residency, who developed an app to track resident training on bedside ultrasound (see “Teaching App”). “The person-to-person relationship between physician and patient is an essential component of what we do. The question is, Can telemedicine or mobilized medicine maintain the essential personal aspects of this interaction? There has to be a balance. You can’t be an internal medicine physician without being in front of patients, but there are rapidly changing expectations that will make mobile technology an important part of future interactions between health care providers and their patients.”

Suzy Frisch is a Twin Cities freelance writer.

**TEACHING APP**

**SOME MEDICAL APPS HELP PHYSICIANS THEMSELVES.**

One being used at Abbott Northwestern Hospital helps internal medicine residents track the exams they do in order to become certified in bedside ultrasound. Abbott started the bedside ultrasound program in 2011 and started developing the app six months in. The app has been in use for a little more than a year.

During their training, residents work on mastering a range of bedside ultrasound exam skills. To get credentialed, they must perform exams in more than 50 areas and document each one. The method they were using to do that was decidedly old-fashioned. Residents had to jot down information about each exam they did on a 5x7 note card. That is, if they had time, if they remembered, and if they had the cards on hand. That wasn’t always happening. David Tierney, M.D., assistant program director of Abbott’s internal medicine residency and director of its Internal Medicine Bedside Ultrasound (IMBUS) program, thought there had to be a better way. With all of their residents carrying smartphones as pagers, he thought, why not use them to keep track of residents’ progress in learning bedside ultrasound? Teaming with a local developer, he created the IMBUS app.

“We came up with an interface that was quick for them to use and that is auto-populated with the user, date and time,” he says. With just a few clicks, the physician enters information about the ultrasound exam they just performed. The ultrasound images and physician interpretation are then sent wirelessly to a central server, where Tierney can review the individual exam findings to see whether a resident is properly obtaining and interpreting ultrasound images. The app then updates the resident’s progress using color-coded bars. If, for example, the resident needs to do a minimum of 20 liver exams to be eligible for credentialing and they have completed eight, the bar code for that category shows red. If they have done 20, it’s yellow, and once they are felt to be competent in the technical and interpretation aspects of the exam, the bar turns green. At that point, the resident no longer needs to have a credentialed faculty member with him or her when doing bedside ultrasounds in that area. Tierney says the app makes getting credentialed simpler and faster for all involved. And as more physicians become credentialed in using bedside ultrasound, patients will ultimately benefit.

“Bedside ultrasound will help internal medicine physicians take better care of patients; but it takes a significant amount of time to safely and rigorously train physicians in this new technology. The IMBUS app has made one piece of that training process more efficient, which means a little more time for physicians to spend with their patients.”—S.F.