

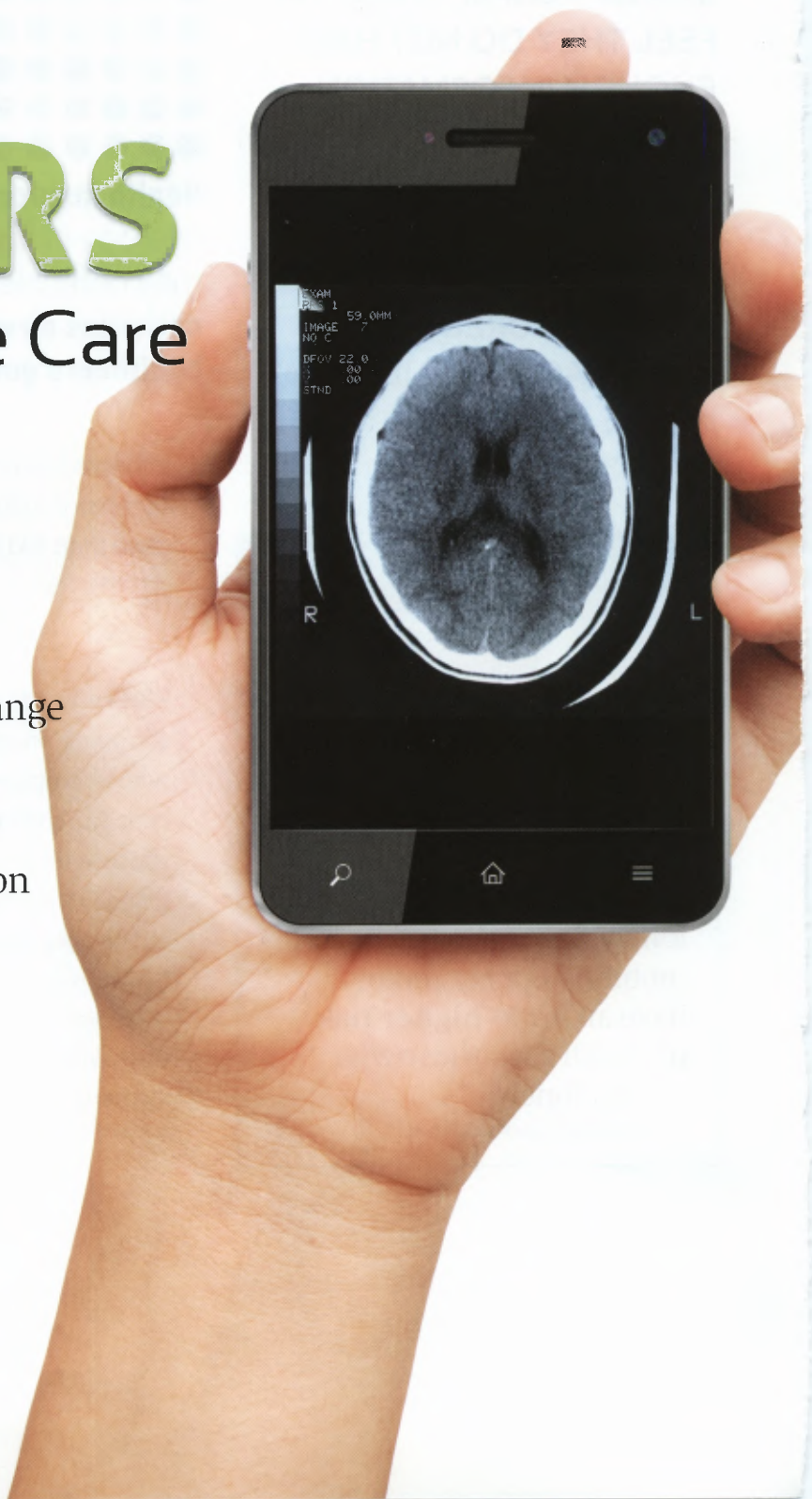
IT POWERS

Effective Stroke Care

INFORMATION TECHNOLOGY

offers a host of options to help clinicians provide better care for stroke victims, from rapid exchange of data and images, alerts and reminders to quick and effective decision support and coordination of follow-up care.

BY BETH WALSH



SMARTPHONES' CHANGING ROLE

Even a simple text message falls under stroke care innovation. The authors of a study published in *Archives of Neurology* coined the term "dystextia" to describe a confused text message that may indicate neurological dysfunction.

The Harvard researchers cited the case of a pregnant woman who sent her husband several confusing messages. He was concerned enough to rush her to the hospital where physicians diagnosed stroke and dysphasia. Fortunately, the woman quickly recovered. The doctors credit her texts as useful data that helped identify the type of stroke she experienced.

The authors wrote that they think there's a good chance text messages will play an increasing role in such detection. "The growing digital record will likely become an increasingly important means of identifying neurologic disease, particularly in patient populations that rely more heavily on written rather than spoken communication."

Meanwhile, David Albert, MD, has been working to dramatically increase the sophistication of smartphones and their role in health-care. Founder of AliveCor, Albert is the inventor of the 510(k)-approved ECG that attaches to a smartphone and produces high-quality ECGs. "It will soon be common practice to use this device (and his next generation device) to screen for undiagnosed atrial fibrillation," says John Mattison, MD, assistant medical director and CMIO of Kaiser Permanente, Southern California. "Undiagnosed atrial fibrillation is a common cause of thromboembolic stroke. Early detection will lead to anticoagulation and effective reduction of these preventable strokes."

This tool offers a significant opportunity to reduce the incidence and morbidity of stroke with a very simple and reliable technology, Mattison adds. Albert cites Professor Ben Freedman of the University of Sydney who published a pilot study of 1,000 patients. AliveCor devices were put in 10 community pharmacies in Sydney. When pharmacists identified cus-

tomers over age 65, they obtained informed consent and used the device for 30 seconds. Anyone detected to have A-fib was followed up. The researchers found 55 people with A-fib; 45 were previously diagnosed and already on medication. "Those 10 people the device detected represented 1 percent of everybody studied," says Albert. "That's a huge number. Imagine if we have our device in the big chains. Walmart and Walgreens have told us they have 100 million Americans go into their pharmacies every week. That's the potential ability to identify literally tens, if not hundreds, of thousands of seriously at risk potential stroke victims."

Albert started selling the device in January under prescription use and has sold thousands. He also just introduced the device in the U.K. and the rest of the European Union. The preliminary Sydney study can be radically extended, he says. For example, cardiologists in Scotland want to use AliveCor to test everyone over age 60. He also is in discussions with organizations such as Walgreen's to roll out pharmacy-based screening. "The ability to identify people in A-fib and make sure they are on appropriate anticoagulants should have a dramatic impact on the incidence of stroke. It's a very gratifying use of my technology."

TIME IS BRAIN

If stroke cannot be prevented, time is brain. Every second counts, which is why Seon-Kyu Lee, MD, PhD, director of neurointerventional radiology and Paul Chang, MD, vice chair of radiology informatics at the University of Chicago Medicine, have been working to streamline the time it takes to determine whether a patient is qualified for tPA or interventional stroke management. That means getting a head CT scan as fast as possible and then getting those images to the appropriate clinician, which Lee says primarily is a workflow issue.

Lee and Chang want to achieve a short cut by immediately transferring a CT order from the triage nurse directly to the CT scanner. The CT





technologist then will prepare the scanner and call to say he or she is ready for the patient rather than going through the resident on call. When the patient leaves the ED for the scanner room, the nurse enters a code into the EHR which automatically sends a text message to the stroke neurologist, interventional neuroradiologist, resident on call and the other technician on call so they all recognize that the patient is moving from the ED to the scanner. “They don’t have to wait for someone to call,” Lee says. As soon as the scan is done, the radiology information system will send another text message automatically and another text message lets the clinicians know that the scan is ready. “Dr. Chang’s and my next plan is to send those CT scan images to our shared website which automatically transfers to my iPad, laptop or smartphone so the stroke neurologist and I can see the images right away, thus can make a treatment decision without delay. That may save about 20 minutes which is a significant amount of time for acute stroke care.”

The biggest issue facing acute stroke care is making the window for treatment, Lee says. The recommended “door-to-needle” window is 60 minutes. “Based on our review, about 30 to 40 minutes is spent preparing a patient, examining the patient, sending the patient to the CT room, the patient getting the CT scan and then the clinician discussion about the images. If we can save 10 minutes by automating the workflow, I think we will get 10 to 20 percent more patients eligible for treatment [based on time].”

ENSURING BEST PRACTICES

Once a patient has been diagnosed, meeting best practice guidelines is the main goal as well as a requirement for designated stroke centers. Winthrop-University Hospital in Mineola, N.Y., has order sets for ischemic and hemorrhagic stroke built into all of the best practice guidelines for antiplatelet agents, lipid-lowering agents and more. The primary stroke center is working toward certification by the Joint Commission as a comprehensive stroke center.

For clinicians to place an order, the order set requires that they either order the recommended treatment or provide a reason for not doing so. The order sets help the hospital promote best practices, says Kerry L. O’Brien, MPH, RN,

associate director of clinical informatics.

The hospital’s stroke team initiates the order sets in most cases, she says. A critical event sheet prints out once a clinician selects the order set. This documentation tool contains all the key elements regarding stroke care, O’Brien explains. Nurses and ordering providers document such activities as patient education. In addition to being a requirement of being a primary stroke center, such documented care also is a quality measure for Meaningful Use (MU) Stage 1.

A stroke assessment tool helps nurse practitioners (NPs)—members of the stroke team—electronically document all the required data, O’Brien says. The data are used to create MU quality reports. The organization is about to embark on an electronic documentation pilot with its neuroscience division. The pilot is designed to automatically present the clinician with all the relevant questions once a patient has been diagnosed and admitted. Those questions also are built into the consultant history and physical (H&P).

All of these data feed into the hospital’s stroke assessment tool, says O’Brien. NPs will have that as their working tool to review all collected data. “They have the final say before data are submitted.” Based on all of these fields in the stroke assessment form, they send reports to Get with the Guidelines, the American Stroke Association’s best practice program for stroke. The process minimizes the NPs’ abstraction burden, she says, because the manual entry sometimes required is inefficient.

Upon discharge, the MU attestation screen also provides a series of questions, the answers to which populate the discharge order. For example, the recommended treatment for ischemic stroke is an antiplatelet agent. If the clinician is not prescribing that agent, he or she must document why not.

The information also attached to the discharge order ties into the continuity of care document so the hospital can share the patient’s data with his or her primary care provider. Because stroke quality measures were expanded in Stage 2, the discharge instructions now must include medications, diet, precautions, when to seek emergency care and more.

“What we’re going to be doing with hopping

up certain things in the documentation based on diagnosis is going to help with communication and with guiding people to ask the right questions," says O'Brien. "That's important because, right now, there is so much free text that people don't necessarily know what to ask."

Winthrop also uses core measure action committees who look at captured data to see how they can improve overall care. "When something is a core measure, you have to look at it," he says. "It's impacting our pay now."

Lastly, Winthrop has moved traditional abstraction duties from case management to clin-

ical informatics. "We're training abstractors to learn more and more about the system so that, in real-time fashion, we can make improvements," O'Brien says. For example, real-time feedback as they're doing abstraction can ensure proper discharge instructions. "That is very helpful. We want to make sure that where we're having issues, we are getting access to our data more quickly."

ELECTRONIC COORDINATION

Kaiser Permanente Redwood City Medical Center in California also is a certified primary stroke

Telestroke offers ongoing advances, growth

Several studies have indicated improved outcomes and cost savings for telemedicine, especially for stroke care. The telestroke program at Massachusetts General Hospital in Boston, started 13 years ago and has been working on improvements and advances ever since. The first pilot was launched in 2000 with Martha's Vineyard Hospital. "It took about two years for the program to really cement its processes and launch in other locations," says Juan Estrada, telestroke and tele-neurology program manager.

MGH was designated as an acute stroke center in 2006. As telemedicine became a means to obtain that certification and access critically needed expertise, the demand for the program's services grew significantly and has remained high ever since," says Estrada. Today, the program supports 31 hospitals in New England, some of them jointly with the Brigham and Women's Hospital.

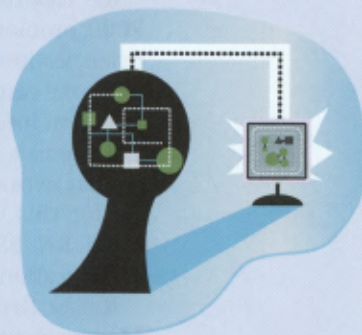
Also since the program's inception, technology has advanced. As part of a membership, MGH has developed a secure,

web-based stroke consultation software program that is used by other Telestroke Alliance Program hospitals and tele-neurology/telestroke networks. The encrypted, password-protected software application serves as a robust medical record system which accurately documents critical information on each clinical telemedicine interaction, including patient demographics, medical history, exam findings, lab values and care recommendations. The application contains embedded decision support tools including reminders, warnings, algorithms and calculators, which assist the telemedicine consultant in making the correct diagnosis and treatment decisions.

"Most importantly, the software serves as the glue between the academic centers in our network and the community spoke hospitals," says Estrada. The consulting physicians are able to log the consultations in this system and then it can be reviewed and information accessed by clinical teams in community hospitals along with the ability to pull reports to track


performance and see, for example, how many patients are getting tPA and how many are staying in the community. There is potential for systems like this to serve as a facilitator for the integration of different levels/types of stroke teams, he says. "Getting different teams to work together facilitated by this portal can be leveraged to coordinate care across an entire region."

Meanwhile, the shift toward cloud-based technology has resulted in easier, ubiquitous access to the technologies that support MGH's program. MGH operates its own videoconference infrastructure but videoconferencing no longer requires as large an investment. That "has really alleviated the technology burden brought upon telestroke networks. People are able to transfer medical information securely and compliantly and access the network from anywhere through mobile devices or computers," Estrada says. Additionally, equipment in general is now simpler, cheaper and more accessible



"which lowers the entry bar for a spoke hospital."

Going forward, Estrada says the plan is to expand the telestroke program outside of acute care. "We have started piloting programs to provide neurological care remotely outside of the acute care setting, working with inpatient floors and primary care providers. We also are working toward providing virtual visits to our own patients. And, we continue to make the expertise available in this department more accessible to communities in this region in a sustainable way. We are not limited to the emergency environment."



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center aiming for comprehensive stroke designation. The 213-bed hospital already is one of 36 Kaiser Foundation Hospitals recognized by HIMSS at Stage 7 on the EMR Adoption Model.

KP HealthConnect, deployed in December 2009, promotes improved patient outcomes, efficiencies in data collection and best practices in stroke care. A diagnostic code drives patient selection into a systems list obtained from patient census data. A daily review is conducted to ensure that patients selected meet the criteria for this Quality Stroke List, says Maxine Rand, RN, BSN, MPA, RN-BC, director of clinical education, practice and informatics.

Kaiser Redwood City uses a Stroke Patient Management Tool developed by the American Heart Association to collect data, allowing the facility to benchmark its performance with other Kaiser Permanente hospitals and national stroke centers.

The role of the stroke coordinator and nursing management teams changed drastically in 2009 because review of patient records using paper documentation and evaluation tools is no longer necessary.

The hospital's nurses use a professional exchange report and flowsheets to document where patients are in their day-to-day treatments. Nurses and physicians also use electronic handoffs to communicate care from one provider to the next. "The EHR has really promoted the use of these electronic bedside handoffs," says Rand. A clinician reviews a professional exchange report, medications, lab results and care plan at the patient's bedside. Nurses can use the handoff navigator and "run through the variables that need to be considered in providing safe care."

These handoffs have been in use since 2007 when the organization didn't have robust documentation. Now, "we're fortunate that we have extensive clinical documentation and we're able to capture elements of stroke care as it is ongoing." Programs recognized by the Joint Commission follow its stroke measures to ensure continuity of care and evidence-based outcomes.

Redwood City also does care planning with the use of disease-specific care plans. "We're able to individualize the care we provide by using care planning that incorporates clinical practice guidelines," Rand says.

As Kaiser is the biggest HMO in the U.S., the organization can transfer many patients to one of its own rehab facilities. The EHR documentation lets providers see exactly what happened during the inpatient stay. "In the past, it was very difficult to track outcomes because we did not have access to the comprehensive information required to track hospital outcome," says Rand. "You can build on those outcomes by continuing to follow up in the ambulatory setting. That's why we are called an 'integrated HMO.'"

Rand is doing research on an early mobility program. "In the past, we've had our challenges in getting patients up early in their hospital stay, sometimes because treatment regimens have subjected patients to prolonged bedrest. Now we're promoting early mobilization by individualizing care." But, Rand says the current trajectory of healthcare will require that "we continue to observe trends to define what attributes of stroke are specific to types of stroke populations. We need to target patient populations to ensure that we achieve the best outcomes. We can't treat everyone the same. We've got to individualize care to make a difference."

Clearly, facilities are innovating stroke care at every point in the continuum of care. As the third-leading cause of death in the U.S. and the leading cause of serious, long-term disability, advances that can trim the incidence rate is welcome news. **CHT**