EHRs Yield Modest Gains in Hospital Quality

BY DAMIAN McNAMARA

MIAMI BEACH — Adoption of an electronic health record system is associated with a consistent but modest increase in quality of hospital care, according to a survey of more than 4,800 acute care hospitals in the United States.

Acute myocardial infarction care and infection prevention improved significantly with electronic health records (EHRs), but the differences were small overall, Catherine DesRoches, Ph.D., said at the annual meeting of the Society of General Internal Medicine.

Electronic clinical reminders also had a significant but "extremely modest" effect.

Most previous studies of specific EHR functionalities and quality have focused on a small set of pioneering hospitals, said Dr. DesRoches, a survey scientist at the Institute for Health Policy at Massachusetts General Hospital and an instructor in medicine at Harvard Medical School, both in Boston.

She and her colleagues surveyed all 4,840 acute care general medical and surgical hospitals as part of the American Hospital Association 2008 Annual Survey. They received answers from 3,049 hospital administrators, for a response rate of 63%.

The investigators asked administrators if they had an EHR, and if so, whether it was basic or comprehensive, based on 24 key clinical functionalities. Using data from the Hospital Quality Alliance and the Medicare Provider Analysis and Review, they linked EHR status to 30-day mortality and readmission for acute MI, heart failure, pneumonia, and prevention of surgical infections.

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Hospitals with EHRs provided the right acute MI care 95.3% of the time, compared with 94.5% of the time for hospitals without a system. Also, acute MI mortality was modestly lower at EHR hospitals (14.9%) than at other institutions (15.8%). Mortality rates for heart failure and pneumonia were comparable between different hospital types, Dr. DesRoches said.

Similarly, hospitals with EHRs had modestly lower 30-day readmission rates for acute MI, heart failure, and pneumonia. The difference was significant only for patients with pneumonia (19.0% with EHRs versus 20.2% without).

"Our findings suggest EHR adoption is likely to be an important part of improving the efficiency and efficacy of our health care system, but just implementing [these] systems will not have a dramatic effect on care," she said. "Finding ways to ensure effective use of these systems will be critical if we are to realize the potential of EHRs to improve the health and health care of all Americans."

The $20 billion pledged by President Obama to improve health information technology "is a good start, and likely to get a good number of hospitals over the hump," but will not help all institutions, especially those that are not currently ready for an EHR, said Dr. Ashish K. Jha, who presented survey results in a separate talk at the meeting.

Fewer than 10% of U.S. hospitals have EHRs, largely because of inadequate capital, he said.

Physician resistance, an insufficient information technology department, and ongoing costs also were impediments cited in the survey, according to Dr. Jha, an attending physician at Brigham and Women's Hospital in Boston who is also on the medicine faculty at Harvard Medical School.

Dr. Jha and his colleagues found 1.5% of hospitals had a comprehensive EHR system, defined as 24 key clinical functionalities across all major units of the hospital. Another 7.6% had a basic EHR system, defined as having 12 such features or having the 24 features adopted in fewer areas of the institution. Individual EHR functions varied, with 76% of institutions reporting they had widespread viewing of laboratory test results electronically, and only 12% saying they had fully implemented electronic physician notes. ■

Memphis Database Delivers Major Public Health Benefits

BY JANE ANDERSON

Architects of a 3-year-old regional health information network in Memphis are finding the system has major public health implications.

So far, the network has allowed them to quickly identify and isolate a tuberculosis patient and pinpoint possible domestic violence cases.

The MidSouth eHealth Alliance database is funded with $12 million from federal and state programs to promote electronic connectivity between health databases. The database combines patient data from the region's major hospitals and safety net clinics. Because it's still in its formative stages, firm evidence on its effects aren't yet available. But anecdotal reports indicate the system is already having a positive effect.

"We've saved some lives—we know that," said Dr. Mark Frisse, professor and director of regional informatics at Vanderbilt University, Nashville, Tenn. For example, emergency department (ED) staff was able to intervene quickly in ectopic pregnancy because of the information retrieved from the database.

In addition, the database has improved care by enabling much faster exchange of clinical data between care centers, said Dr. Jerry Shenep, chief medical information officer at St. Jude Children's Research Hospital. "It's not an electronic medical record," said Dr. Shenep. "You don't use it to do order entry. But just to be able to look at the data for all the hospitals and clinics is an amazing step forward."

The system came online at the first site—the Regional Medical Center at Memphis—in May 2006 and has been gradually expanding its reach into the community, according to Dr. Frisse.

Users of the system now include all 14 emergency departments in the region, 15 ambulatory clinics, and hospitalists at four of the regional hospitals. The database covers about 1 million people and costs about $3 million a year to operate. That amounts to about $3 per person per year, said Dr. Frisse, who called it a bargain.

"The goal from the outset was to create a system that would make your information available wherever you sought care, independent of everything other than your consent," said Dr. Frisse, an internist by training. Very few people—about 2%-3% of those in the inner city, and 1% of those in the suburbs—have declined consent to participate, he said.

The system is designed to answer questions when medical histories are not enough, Dr. Frisse said. Thus, its architects do not expect 100% usage. For example, the system is used during fewer than 5% of visits to the ED, he explained, in large part because health care practitioners have less time there to consult the database. It's not clear yet whether that number optimally should be higher, he said. In at least one ED, usage has risen to 14% of all visits.

Primary care usage is increasing slightly, and now averages 5.6% of all visits. Usage generally is higher if the patient has been seen elsewhere within the past few days or weeks, he said.

The MidSouth eHealth Alliance is conducting analyses of database usage patterns and usability. Preliminary analyses indicate that the system is helping to avoid duplication of several common tests, including head CT, abdominal CT, ankle x-ray, and hemoglobin A_{1c}.

But the potential public health implications for the project are also very interesting, Dr. Frisse said.

For example, there have been a few instances of ED or clinic staff accessing the database and realizing that a patient may be a victim of domestic violence, he said.

In addition, the safety net clinic information in the database makes it possible to "basically track migratory patterns and usage patterns—to see where people go and where people cluster," he said. That could enable public health officials to see patterns of care and determine how to influence them. In the coming months, MidSouth eHealth Alliance will begin some of that analysis, he added.

With approximately 100,000 lab tests per day entered into the database, including some 2,000 white blood cell counts, the database can serve as a "thermometer for the city" to track the spread of influenza and other infectious diseases, Dr. Frisse explained.

Clinicians potentially could use the database to identify spikes in ED visits related to diseases such as West Nile virus or methicillin-resistant *Staphylococcus aureus* (MRSA), noted Dr. Kevin Johnson, a pediatrician and lead evaluator for the project. Clinicians also can use the database to provide better case management to patients with chronic illnesses and conditions, such as mental health disorders or hypertension.

Dr. Shenep recalled one case in which a patient presented at an ED with a fever, but failed to disclose—and never was asked directly—that he previously had been diagnosed with tuberculosis. Because the staff at the ED used the database to check the patient's history, they were able to remove the patient from the ED immediately and place him into isolation, preventing potential exposure of other patients, Dr. Shenep said.

"That's worth a lot of effort and a lot of expenditure right there, to avoid that one incident of exposure," he said. "How do you put a value on that?"

Other benefits are more mundane but just as potentially valuable, Dr. Shenep added.

For example, children with brain cancer often receive their surgery at one hospital center and their chemotherapy at another hospital center. Historically, there have been delays in having critical lab data faxed back and forth between the two hospitals, he said. Now, those culture results and the latest radiology reports are available in the database. "This has been a great benefit for those patients who get treated at both centers," he explained.

If one of those pediatric oncology patients is in an accident, ED staff could access those records as well, Dr. Shenep said. "They might see low hemoglobin and think the patient must be having a major bleed—but the hemoglobin may be low because of chemo," he added.

The Memphis database project has managed to combine data from hospitals that normally compete with one another, even though the data are in different formats and different standards. In addition, leaders of the project went into the community to describe what the project hoped to achieve and how privacy would be protected, Dr. Frisse explained.

To replicate Memphis' progress, a city would need "sustained leadership" that continued to press for change even through opposition, he said. "The real challenge here is culture." ■