

INSIDE EDGE

Using IT to Prevent HACs and Readmissions

EXECUTIVE SUMMARY

If hospitals and health systems ran a classified ad to hire someone to prevent hospital acquired conditions, or HACs, and avoidable readmissions to their inpatient facilities, they might word it thusly: *Must have EHR. Heavy lifting required.* HACs—a subset of which are hospital acquired infections, or HAIs—and readmissions are preventable only with the enabling tool of IT. Of course, IT is necessary but insufficient, and the heavy lifting involves integrating IT with the complex patchwork of people and processes that are key to the prevention effort.

We talked to several leading health systems to get their take on this daunting yet ultimately transformative effort because it requires such intelligent integration of often discrete clinical threads both within and without the hospital. Those institutions include Northwestern Memorial in Chicago, Banner Health in Phoenix, Intermountain Healthcare in Salt Lake City and Memorial Hermann in Houston.

It's clear that in helping prevent HACs and readmissions, the EHR is being called on to revolutionize healthcare one patient at a time.

Northwestern Memorial

"Most of our work has been with DVT [deep vein thrombosis]," says Stephanie

Kitt, RN, MSN, director of quality and informatics at Northwestern Memorial Hospital in Chicago, which has 854 beds, 1,600 affiliated physicians and about 48,000 inpatient visits annually. Northwestern has begun working on a program for preventing readmissions, but that is much less advanced.

"We've been leveraging our EHR in real time to do surveillance of what patients are not receiving prophylaxis," she says. A prime example: in the efforts to reduce DVT, Northwestern has developed a report within its EHR that lists all the patients who are not receiving preventive therapy like blood thinners, support hose or even a device applied to the skin that pulsates to encourage adequate circulation.

Pharmacists use the report as a tool to target interventions for those patients. "If a patient is already on Coumadin and sufficiently anticoagulated, they would not be on the list. Anyone who is admitted to the hospital should be on prophylaxis unless there's a contraindication," says Kitt. "What we found prior to implementing the IT tool was that there wasn't any consistency in screening people coming into the hospital."

Bird's-eye view

Northwestern's DVT initiative is part of the larger quality agenda and moni-

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CONGRATS

Advocate Good Samaritan Hospital, Downers Grove, Ill., was awarded the 2010 Malcolm Baldrige National Quality Award by U.S. Commerce Secretary Gary Locke. This is the nation's highest presidential honor for performance excellence through innovation, improvement and visionary leadership.

toring of the organization's overall performance via reports generated in its enterprise data warehouse. These reports are displayed on a special executive dashboard for clinicians and quality executives. A DVT report, for example, documents the compliance with the prevention protocol for the hospital's entire population.

M Northwestern Memorial Hospital



Stephanie Kitt, RN,
Director, Quality
& Informatics,
Northwestern
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"The EHR has helped us make quality data accessible," says Kitt. "In the old days we'd get paper reports with data that was weeks to months old. In the last year we've really begun to leverage the

EHR to make us smarter by allowing us to do real-time interventions. Having to rely on month-old retrospective reports as we did in the past was ineffective."

Because reporting requires an "owner" to be effective, Northwestern has tagged pharmacists to manage the DVT report. "You have to have a system. Initially we just put the report out, but found we needed to establish a structure that facilitates education of the clinician users as to how to improve performance based on the results," she says.

It's only been about a year since first publishing that report, which has been tweaked in the ensuing months "to make it as helpful as possible," says Kitt.

Changed culture

So far, the results have been quite positive. Northwestern has, for example, reduced the incidence of observed-to-expected post-operative DVT/PE by more than half. Amy Halverson, MD, Department of Surgery, Hiren Shah, MD, Division of Hospital Medicine, Noelle Chapman, MD, Pharmacy, and Jennifer Van Dyke, Process Improvement, Northwestern Memorial Hospital presented these findings in a Dec. 15 SI teleconference. Visit www.scottsdaleinstitute.org and click on "Teleconferences.]"

Kitt says leveraging the EHR for near real-time [one-day old] clinical performance data has changed Northwestern's culture. "As I look at HACs, we've really been able to use the enterprise data warehouse to deliver believable data. With central-line associated blood-borne infections, for example, we have process measures collected from our EHR continually. Those reports are used daily. We've really started to access the data in a way that helps us change," she says.

"We have a fabulous unit snapshot report, used by the interdisciplinary team for rounds. It helps to identify elements of care or patient characteristics that should be discussed such as removing tubes and lines to reduce the chance of infection or whether the patient needs to be on a blood thinner to prevent blood clots," Kitt says.

Banner effort

"Sepsis has been one of our strategic initiatives for the past year and will continue this year," says Robert Groves, Jr., MD, system medical director for critical care at Phoenix-based Banner Health.

“We have a fairly comprehensive program that leverages our IT to identify sepsis early using our EHR.”



Robert Groves, MD,
Medical Director,
Critical Care,
Banner Health



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The software scans the records of all patients in the ED, med/surg units and the ICU.

Specifically, the system identifies patients exhibiting two factors: systemic inflammatory response syndrome, or SIRS, and organ dysfunction. Once the alert fires for nurses caring for those patients the clock starts ticking.

What kicks in is a “bundle,” the Institute for Healthcare Improvement (IHI) concept of a structured set of evidence-based practices—typically three to five—proven to improve patient outcomes. The sepsis bundle includes such steps as ensuring that blood cultures are taken, appropriate antibiotics are started promptly and the patient has adequate fluid volume.

Dropping mortality

“A number of folks around the country follow these and mortality drops,” says Groves, adding that IT helps achieve three key objectives: 1) Early identification of patients at risk for sepsis; 2) Rapid evidence-based resuscitation and treatment; and 3) Tracking of outcomes. “We use our electronic system to do all that,” he says.

“We are also using our IT system to influence our culture and encourage a

safe-choices approach to care. If someone misses a bundle element, an IT driven algorithm guides a team leader who determines whether this was human error, at-risk behavior, or reckless behavior,” says Groves. The guide is based on David Marx’s “Just Culture” concept and could apply to anyone on the healthcare team. Use of the algorithm enables the organization to understand what remedial course to take if any such as counseling, training or more serious intervention if the behavior is truly reckless.

“We track our results based on Peter Pronovost’s framework for patient safety improvement,” he says. This modified version of the Donabedian model assesses care via four domains which are defined as follows for this project:

- Structure—Do we have the electronic structures in place for real-time or near-real-time accurate information to drive behavior and track outcomes?
- Process—What’s our process for meeting evidence-based care? What percentage of the time do we complete the entire bundle on each patient?
- Outcomes—How many of our sepsis patients survive?
- Context—Does our safe-choices approach to errors in process lead to an improved culture of safety? Are our AHRQ scores improving with this approach?

Increasingly accurate

Banner began measuring its sepsis prevention program in July. “We are still only scratching the surface of what’s possible,” says Groves. Still, there are lots of lessons learned. It took some tweaking

“We’ve got electronic systems, so let’s learn how to use them. You can’t do this well without real-time clinical IT at the point of care—not retrospectively.”

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- Erica Drazen managing partner, Emerging Practices, CSC
- Jason Fortin, senior research analyst, CSC

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SI-Cerner Users Collaborative No. 28: Driving Change and Value with Dragon Medical

- Adem Arslani, BSN, MS, director, Information Systems & Clinical Informatics, Advocate Illinois Masonic Medical Center
- Joel Shoolin, DO, VP, Clinical Informatics, Advocate Health Care

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Building Advocate's Health Information Exchange with Community Physicians

- John Norenberg, VP, Physician Services, Information Systems, Advocate Health Care

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Impact of 2010 Elections on Healthcare Reform

- Steve Burrill, principal, Deloitte & Touche LLP

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of the SIRS/organ dysfunction alert, for example, because of the high number of false positives. "We know we're developing an increasingly accurate alert," he says.

Banner has reason to feel confident it's on the right track. The sepsis initiative is based on the Surviving Sepsis Campaign, an international initiative involving a multidisciplinary strategy for reducing mortality from sepsis. "One of our hospitals and several of our team members have been working on sepsis for some time. Leveraging their considerable experience and the electronic tools provided by IT, we now show sepsis mortality of around 15 to 17% for our entire ICU system compared to rates of 30% or higher in the international benchmark data," says Groves.

"We've done a lot of work on critical care," he says, "because that's where 30 percent of the dollars flow in inpatient healthcare."

The initiative to leverage IT to prevent HACs and re-admissions requires an enterprise-level commitment.

"It's a big, big project," says Groves of the sepsis initiative alone, but he adds that Banner is taking a similar approach to central-line infections "because we need to know how to do this with everything. We've got electronic systems, so let's learn how to use them. You can't do this well without real-time clinical IT at the point of care--not retrospectively. I want to know right now if I'm off track. This is really leveraging the technology to capture information created during the process of delivering care and feeding

it back to physicians, nurses and other caregivers.

"We're learning how to realize the promise of IT at the point of care. The whole point of this for Banner is to become a high-performance, industry-leading clinical organization. We are out to really make a difference in people's lives. Oh yeah, and when we do this well, it costs a lot less. That's a win for everybody."

Intermountain Healthcare

Disease-related venous thromboembolisms (VTEs) are increasingly becoming an imperative for industry groups like the Joint Commission, the Agency Healthcare Research and Quality (AHRQ) and the American Hospital Association.

"VTE is among the most costly preventable diseases," says Scott Woller, MD, assistant professor of internal medicine at the University of Utah and medical director of anticoagulation management at Salt Lake City-based Intermountain Healthcare. Specifically, pulmonary embolisms are the biggest cause of preventable hospital deaths, he says.

"That's because to date when we look at rates of appropriate medication prophylaxis, we do poorly as an industry. We've looked at the application of appropriate prophylaxis to reduce the burden of this largely preventable disease," says Woller. Only 40 percent of medical patients at risk receive the prophylaxis and between 50 percent and 55 percent of surgical patients do.

"It's a challenging disease process because patients are a heterogeneous group, especially when they come in through the ED.

We need mechanisms to evaluate risk,” he says.

Collaborating with The Brigham

That’s why Intermountain has developed an electronic tool for identifying patients using criteria published by and validated through a collaborative with the Brigham and Women’s Hospital. “We participated in research looking at protecting patients at risk for VTE against developing blood clots,” says Woller.



Scott Woller, MD,
Medical Director,
Anticoagulation
Mgmt., Intermountain
Healthcare

The VTE risk-scoring tool, first published by Nils Kucher in 2005 in the *New England Journal of Medicine*, involves a list of risk factors to which it assigns points. For example patients with cancer receive three points; patients who have undergone major surgery in the past two days score two points, and so on for factors like bed rest, age, height and weight. The computerized tool looks in the EHR for patients, and calculates each patient’s score: if it’s above four, she is considered to be at risk for VTE.

Used at each of Intermountain’s 24 institutions, the system sends its report each morning to clinical pharmacists who can then buttonhole physicians doing rounds on the floor to let them know which of their patients are at elevated risk and not receiving chemoprophylaxis. “We’ve

identified VTE risk-reduction champions at each hospital,” says Woller.

For example, a 75-year-old woman with a history of breast cancer might be admitted to the hospital floor with pneumonia. The risk tool would first identify her as an inpatient, over 70 with a prior history of cancer. The next morning a computer-generated alert would be transmitted to the risk-reduction champion on the floor, most likely the clinical pharmacist, who would tell the rounding doctor, “She’s not getting any enoxaparin [low-molecular weight heparin, which is effective against blood clots].”

No more middleman

Intermountain’s VTE tool has been in place for three years. “We have had the enviable challenge of being able to send out these alerts before we had the software to look at outcomes,” says Woller. That shouldn’t be the case for long. Woller has just received a grant to study the application’s effectiveness if alerts are sent directly to physicians combined with a CME module, cutting out the middleman clinical pharmacist while providing relevant education to the doctor.

“The hypothesis is that by coupling direct alerts with a CME module we’ll see an improvement in chemoprophylaxis and a decrease in 90-day VTE,” says Woller. The CME modules will be customized for doctors based on how sophisticated they are in complying with the VTE bundle. And to reduce alert fatigue, the hospitalists who are conducting the rounds only receive alerts for their patients, and only if the at-risk patient is not receiving appropriate chemoprophylaxis.

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- Annette Fox, director, Clinical Systems, Dean Health System and SSM of Wisconsin

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ICD-10: Lessons Learned from the Field

- Christine Armstrong, principal, Deloitte Consulting, LLP

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Meaningful Use: A Roadmap to Safe, Efficient and Effective Care

- David Classen, MD, VP, CSC, and Associate Professor of Medicine Infectious Diseases, University of Utah
- Robert Reese, Global Health Solutions Group, CSC

February 28

SI-Cerner Users Collaborative No. 29

- Debbie Carter, RN, BSTM, director, Clinical Decision Support, Banner Health
- Joel Shoolin, DO, VP, Clinical Information, Advocate Healthcare

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“The challenge of hospital acquired conditions is the portfolio of tools required to help prevent them.”

Once the study commences in January, at the end of each month physicians will receive a link to a website that will show their performance compared to their Hospitalist peers within Intermountain—“You complied 40 percent of the time,” for example. The goal is to raise the level of overall compliance with VTE prophylaxis steadily over time as shown in 12 regular snapshots. This work represents a collaborative effort between Twine LLC, a consultancy organization with an emphasis to enhance the application of evidence-based approaches through EMR techniques, and a grant through the Deseret Foundation, Salt Lake City.

Memorial Hermann

“The challenge of hospital acquired conditions,” says Robert Murphy, MD, CMIO at Houston-based Memorial Hermann Healthcare, “is the portfolio of tools required to help prevent them.” HACs involve a complex interplay of multi-step processes that are not always amenable to single points of impact like interventions at the point of care.

Consistent with that understanding, Memorial Hermann has leveraged its Cerner EHR to wield a litany of HAC-associated initiatives. The health system aims to prevent patient falls and other trauma, for example, through an IT-enabled patient assessment for that risk, bolstered by CDS and clinical documentation. Specifically, the EHR automatically calculates a Morse Fall Risk score for patients based on nursing documentation and populates it with steps for nurses to take.

“The workflow used to be based on the paper chart. So, first you’d have to

remember, then you’d have to search and find the paper, complete the form, interpret the form, transcribe all the new tests. Now this is built into the automated workflow. By simply performing clinical documentation the assessment automatically fires and sends an alert to the nursing informaticist,” he says.

MEMORIAL HERMANN



**Robert Murphy, MD,
CMIO, Memorial
Hermann Healthcare**

Memorial Hermann has implemented a nursing dashboard that reports on compliance with such systems on the level of the individual hospital, nursing unit and nurse. The reports document process compliance, a great advance over a paper-based system in which it was impossible to audit every chart. “It’s easy to electronically chart every patient and know with certainty that we’re in the 90th percentile with compliance with our falls-prevention program,” says Murphy.

Hunter-gatherers no more

The organization takes a similar approach to pressure ulcer stages III and IV using the automated Braden skin score calculation with conditional nursing tasks. To prevent catheter-associated urinary tract infection (UTI), often caused by leaving Foley catheters in longer than they need to be, the health system has implemented an automated order set to assess and remove the Foley. “If you

go into the OR, that's an order set and rule that can help make nurses aware. Instead of the cumbersome paper process of having to remember, search-and-find, interpret and action, this is a technique to create highly reliable processes to prevent HACs," he says.

Even before its current HAC initiative, Memorial Hermann had a good track record keeping infections to near-zero in its 45 ICUs. But taking a not-resting-on-your-laurels attitude has led the organization to attack vascular catheter-associated infection using prevention bundle documentation developed by Peter Pronovost, MD, at Johns Hopkins. Pronovost found that if certain sterile procedures were followed it was possible to prevent 100 percent of such catheter-associated infections.

The bundled checklist—which includes such basic tasks as prepping the skin, handwashing and draping—is automated in the EHR. Other Memorial Hermann EHR-based initiatives to prevent HACs include:

- Manifestations of poor glycemic control—computerized calculations that help adjust insulin rates for patients based on their glucose results with continuous feedback;
- Surgical-site infections—standardized CPOE order sets incorporating the World Health Organization's sur-

gical safety checklist focused on the three elements of ordering, administration of antibiotics and safety list;

- Automated VTE Advisor—CDS intervention and post-operative orthopedic order set that fires based on risk factors outlined by the American College of Clinical Pharmacy (ACCP);
- Blood incompatibility—barcode blood-specimen collection and blood administration.

Finally, Memorial Hermann is aiming to prevent readmissions using an automated report in its registration system that flags patients with certain diagnoses and risk factors. It involves geographically-based, care-management teams that ensure those patients obtain and take their medications and then follow up to check on their health status. While IT-enabled, Murphy says once the computer raises the awareness, "It's just phone calls and human conversation."

Conclusion

The federal government's refusal to pay for HACs makes the prevention of HACs and readmissions a form of pay for performance (P4P). Hospitals and health systems must perform in order to not lose revenue. Using IT to prevent HACs and readmissions is a critical element in helping health systems not only survive but thrive as high-performing clinical organizations.

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