

Decatur Memorial Hospital Realizes the Full Potential of CPOE

Decatur Memorial Hospital (DMH) is a 365-bed, stand-alone not-for-profit community hospital in Decatur, Ill. With 13,000 discharges and more than 100,000 outpatient visits per year, DMH provides comprehensive care in stroke, cardiology and oncology. Minimally invasive surgery, including robotic surgery, is available on campus. DMH is a recent Lincoln Silver award-winner (Illinois Baldrige award) as well as a Thompson award-winner for Cardiology Care. DMH also has earned commendation from the Iowa Foundation for Quality Healthcare for Iowa and Illinois. DMH staff are committed to providing outstanding medical service to further its mission of improving the health of the people of Central Illinois.

Armed with the belief that the use of **computerized provider order entry (CPOE)** enables better, safer and more effective patient care, Decatur Memorial Hospital (DMH) completed an aggressive implementation. In just nine months, DMH deployed McKesson's CPOE solution and achieved universal adoption. The hospital also reduced transcription errors by 60%; decreased incomplete medication orders by 94%; and slashed medication errors by 78%.

However, the safety and efficiency benefits of CPOE were more apparent to other clinicians than physicians. So DMH customized the clinical capacities of CPOE to support best practices by physicians, including the appropriate use of blood products. Over a two-year period, blood use dropped from 290 to 245 units per month, and DMH realized an annual savings of \$126,000 to \$270,000. Most important, medical staff now have a new regard and enthusiasm for CPOE because of how it has improved patient care.

Challenges

Faced with ever-changing market forces – including meeting and reporting performance measures – DMH management believed that becoming a patient safety leader would create a competitive

advantage. DMH built a comprehensive electronic infrastructure using McKesson technology, including bar-code medication administration and pharmacy automation tools.

The next logical step was to use CPOE to help speed the care process and eliminate medication errors that stem from illegible handwriting. CPOE also encourages physicians to manage patient care within evidence-based guidelines when clinical decision support is built into the system by the hospital.

“We had already implemented other electronic means to help ensure safe medication delivery, so CPOE was fundamental to closing the loop on medication safety and preventing errors,” notes Michael J. Zia, M.D., chief medical officer, DMH.

Universal adoption of CPOE at DMH was achieved in just nine months — three months ahead of the original 12-month goal. Paper order sheets were completely removed from all patient care units. Today, 100% of routine rounding orders are placed electronically.

Decatur also achieved a number of measurable and sustained performance improvements, including a 78% decrease in errors that had a direct impact on patients.

At a Glance

Organization

Decatur Memorial Hospital
Decatur, Ill.

- 356 beds
- 12,800 inpatient admissions annually
- 225,000 outpatient visits

Solution Spotlight

- Horizon Clinicals®
- Horizon Expert Orders™

Critical Issues

- Patient safety
- Physician acceptance of CPOE
- Inappropriate use of blood
- Cost of care

Results

- Reduced transcription errors by 60% and medication errors by 78%
- Decreased blood use from 290 to 245 units per month
- Created financial savings of \$126,000 to \$270,000

One month following deployment, medication errors fell from a high of 16 to four before reaching a record low of zero errors. Transcription errors decreased by 60%; incomplete medication orders decreased by 94%; and incomplete radiology orders declined by 100%.

“We had great initial results with CPOE, but needed to deliver on our promise to physicians and evolve the clinical capacities of the computer into a higher level of guiding best practices,” says Dr. Zia. “We were already using processes and technology to consistently achieve a 95% to 98% compliance rate for Core Measures for congestive heart failure, pneumonia, acute myocardial infarction and surgical care. So we decided to revisit a project we conducted in 2006 around the appropriate utilization of blood.”

Answers

There is considerable variability among hospitals and physicians in when to transfuse a patient. Yet, there are compelling reasons to standardize the use of blood products. Data shows that the majority of blood transfusions occur in patients with initial red blood cell counts greater than what evidence-based medicine deems appropriate. Additionally, research indicates that blood transfusions may actually increase the risk of mortality.¹ Since blood is an expensive, precious and scarce commodity, patients who don't need blood transfusions shouldn't get them.

Establishing Best Practice

“During our 2006 project, we landed on evidence-based guidelines that indicate if a patient's hemoglobin is less than 7, then blood is needed and two units is reasonable,” explains Dr. Zia. “When a patient's hemoglobin is between 7 and 10, the need for transfusion depends on clinical condition and a variety of other factors. If hemoglobin is over 10, there's no clinical need for transfusion unless there's acute bleeding.

“Our goal was to reduce the use of blood in patients who had a pretransfusion hemoglobin of 8 or more,” Dr. Zia continues. “After transfusion, a patient's hemoglobin should not exceed 10. So, we implemented a paper-based transfusion order form. While we achieved some initial success, it was not sustained. Physicians didn't fill out the form, and we couldn't force them to. In the end, our pretransfusion mean value was 8.25, and the after transfusion mean value was 10.1. We had exceeded both targets.”

The ultimate loss of effectiveness for that project underscored the importance of creating better tools to guide physicians in the transfusion process. DMH's clinical leadership felt strongly that electronic systems – such as CPOE – would be the key to changing physician practice.

Changing Physician Behavior

Horizon Expert Orders™, the CPOE system from McKesson, was the keystone for DMH's revamped blood project. Initially, simple order sets for transfusion were created in the system. To help ensure that patients only received additional blood if needed, the order sets included the "option" to order one unit at a time and obtain new blood counts before ordering more.

Dr. Zia explains the challenges with that process: "Physicians could still order blood without using the order sets, so little change was achieved. So, we created an interactive iForm (a Web-based form for advanced ordering) embedded in the CPOE system. It was more appealing to physicians and also electronically captured critical information about the clinical reasons for transfusion."

DMH's informatics team set a threshold of 8 grams per deciliter to guide physician decisions around the need for transfusion.

Again, DMH's results were mixed. Physicians used the standard order form some of the time and the iForm other times. As a result, DMH captured only part of the data needed to drive substantial change in blood prescribing habits.

DMH's Medical Executive Committee made the use of the iForm for all blood transfusions mandatory. An added feature of the iForm was that it prompted laboratory orders to measure blood counts between units, eliminating the automatic

ordering of two units. In addition, it required physicians to explain the need for blood when the initial hemoglobin exceeded 8.

At first, some physicians worked around the system or simply indicated a hemoglobin value of less than 8. However, analysis of data pulled from the systems and McKesson's performance analytics solution showed otherwise. DMH's iForm designer then enabled automatically importing the most recent laboratory values into the iForm, giving the physician the most current information.

Results

With these changes, DMH achieved universal use of the transfusion iForm — a tool that provides physicians with decision support and easily retrievable lab data for clinical reasoning. According to Dr. Zia, the system has embedded logic with branch chain division to justify ordering blood. Additionally, DMH now has a feedback loop to determine if more units of blood are truly needed.

The number of inpatients transfused per month at DMH has dramatically decreased. Over a two-year period, blood use dropped from 290 to 245 units per month. In addition, the mean hemoglobin value dropped from 8.25 to 7.9. Hemoglobin after transfusion dropped from 10.1 to 9.7. DMH's data also shows patterns of blood usage by patient type and physician, which enables continuous process improvement.

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Chief Medical Officer

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DMH has also realized financial savings. “Some patients think blood is free, but our actual cost is \$240 per unit,” says Dr. Zia. “When you add in the associated costs (lab work, transport, IV supplies, nurse monitoring, etc.), the price to transfuse a unit of blood averages \$350 to \$650. With our new process, we estimate that we are saving \$126,000 to \$270,000 per year.”

Clinical IT has empowered DMH to monitor and improve the transfusion process. Caregivers now have timely, accurate, comprehensive and actionable information that was previously unavailable or too resource-intensive to gather. Finally, the use of CPOE has improved patient care and safety, and demonstrated measurable financial benefits.

“We’ve created real enthusiasm within the medical staff for CPOE,” says Dr. Zia. “Physicians now understand how technology can expedite and improve patient care in more sophisticated ways than ever possible before.”

¹ J. Rawn, *“The Silent Risks of Blood Transfusion,” Brigham and Women's Hospital, Boston, Mass., 2008.*

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