

Concord Hospital leverages CPOE to improve diabetes care processes

(The following case study was generously provided by [McKesson Corporation](#))

Concord Hospital is a 230-bed regional hospital serving 395,000 residents in the Concord, N.H. area. As a result of the hospital's diligent efforts to select and implement the latest in technology to help improve patient outcomes, it has consistently been recognized as a leader in the application of medical science and technology.

In an effort to assess the care it provides, the quality of diabetes management shot to the top of the priority list when several patients voiced concerns about inpatient diabetes care.

The hospital's CEO and chief operating officer challenged chief medical information officer, Joel Berman, M.D., to fix the problem. Berman reached out to the hospital's technology vendor to implement a computerized physician order entry solution.

The intervention resulted in improvements in diabetes care processes and, specifically, prompted clinicians to achieve glycemic control in patients via the increased use of basal and prandial insulin. The use of basal insulin increased from about 20 percent to more than 90 percent; and the use of prandial insulin increased from 10 percent to almost 100 percent.

The improvement in the use of basal and prandial insulin enabled Concord Hospital to stay in compliance with [recommendations from the American College of Endocrinology and the American Diabetes Foundation](#).

Meanwhile, as the hospital expanded the use of CPOE to other units to improve diabetes care, the improved care processes are expected to further enhance patient outcomes. Concord's early results have proven that CPOE has not only been an effective tool to help reduce errors and improve patient safety, but the results also demonstrate that CPOE can support broader clinical care improvement initiatives.

Challenges

In 2004, a group of caregivers at Concord updated preprinted diabetes order forms in an effort to improve inpatient diabetes care and discourage the use of free-standing sliding scale insulin.

While utilization of the forms increased, at the end of the day, there was still a problem—the group could not tell whether use of the forms had actually resulted in improved care processes.

When several patients voiced concerns about inpatient diabetes care, it was time to take action.

Berman had quite a challenge on his hands, and he knew it would require moving beyond pedestrian solutions. His out-of-the-box idea was to leverage the power of CPOE, a solution Concord already was using to reduce medical errors.

He believed that the same solution could also improve the inpatient diabetes management process.

“We are addressing a level of complexity that is an order of magnitude greater than many traditional CPOE applications,” Berman says. “Most of the safety features of CPOE are single node decision points. You try to prescribe a medication and you get an alert that the patient is allergic. Managing diabetes, however, is a much more complex, multidisciplinary venture.”

Although he realized that using CPOE to improve diabetes care would be a complex undertaking, Berman also thought that the effort would be worth pursuing.

“We are doing this because it is the true CPOE payoff—the really good stuff,” says Berman. “We think we are one of the early movers in using CPOE for this type of care improvement and, while it might be a challenge, the clinical care benefits will truly be worth the effort. It is exciting to get beyond the adoption challenge and to actually focus on quality improvement.”

Answers

Utilizing CPOE to improve inpatient diabetes management, however, would require a herculean effort comprised of equal parts staff involvement, workflow re-engineering and CPOE optimization.

To start, Berman created a diabetes management task force to address the inpatient diabetes management issues. The task force included physician informaticists, nursing managers, diabetes educators, dieticians, pharmacists, nurses and others. Most importantly, the team members all shared a genuine passion for diabetes care improvement.

“When addressing an aspect of care that is so complex, you should leverage your strengths and go where your resources, commitment and passion are,” Berman says.

To get the performance improvement initiative off the ground, the task force conducted four focus groups. The goal was to develop a qualitative understanding of exactly what was contributing to the inpatient diabetes care shortcomings at Concord.

The team discovered the following obstacles:

- 1) Incomplete physician acceptance of the benefits associated with standardizing diabetes management;
- 2) Incomplete nursing knowledge of the principles of diabetes management; and
- 3) The complexity of preprinted orders.

More specifically:

- Physicians frequently forget to adjust daily basal insulin doses
- The lack of consensus surrounding diabetes care management breeds confusion among nurses regarding common diabetes care protocols
- Delays in the docking of glucometers make glucose values unavailable to physicians and nurses
- The hospital’s “on-demand” food delivery program makes it difficult for nurses to administer meal insulin in a timely manner

To address these problems, the team adopted a comprehensive performance improvement approach.

The first priority was to take a 360-degree look at inpatient diabetes care workflow and to identify where improvements could be implemented. The team specifically explored how CPOE could be used to streamline inpatient diabetes management.

“CPOE can change workflow by giving clinicians the ability to access information, perform drug dosing calculations and link to internal documents right at the point of care,” Berman explains.

At Concord Hospital, the diabetes team leveraged the technology to optimize workflow even more. For example, they created a CPOE care alert that notifies the dietary call center that a patient is carb counting. Such a notification helps streamline the communication process among hospital staff members.

Manageable chunks

After streamlining overall diabetes care workflow, the team then addressed one specific care management process at a time rather than trying to solve the whole problem at once.

“You have to break it up into small discrete components, so you can see progress as you go along,” Berman says.

The team zeroed in on the issue of glycemic control in inpatient diabetes patients. To guide the effort, the team focused on the following “gaps in the quality of diabetes care,” as cited in the American College of Endocrinology and American Diabetes Association consensus statement on glycemic control:

- Underutilization of insulin in patients with hyperglycemia
- Sliding scale (correction) insulin ordered without basal insulin
- Insulin doses not adjusted for variations in glucose levels, age, kidney and liver status, fluctuating steroid doses or food intake

To resolve these care issues, the team created an interactive web-based form within its CPOE system. The interactive form encourages providers to order insulin as a three-component bundle of basal, meal and correction doses. By doing so, it mimics the function of the normal pancreas.

More effective than paper protocols or text-based electronic orders, the interactive form goes beyond merely informing providers that insulin should be ordered as a three-component bundle and actually guides the clinicians’ ordering choices. In essence, it walks clinicians through the ordering process, making it easy for them to choose the preferred protocol.

“The CPOE interactive form has been designed to create a hard stop. If the clinician misses one of the components of insulin, he or she is confronted with a pop-up that says ‘You have not ordered your basal insulin,’” Berman says.

Results

With the program implemented in Concord’s progressive care unit, the intervention illustrates how CPOE is having a real impact on inpatient diabetes care management.

Diabetes care management has been streamlined considerably due, in part, to the implementation of CPOE. Furthermore, the use of the solution is proving popular, with clinicians reporting a high level of satisfaction with the clinical decision support made available through the interactive form.

In addition, the utilization of CPOE has resulted in the following care process improvements:

- Increased use of basal insulin from about 20 percent to more than 90 percent
- Increased use of prandial insulin from 10 percent to nearly 100 percent
- Reduced glucometer docking delays by more than 60 percent

With such results, Concord is demonstrating that care providers can effectively leverage the power of CPOE to improve the management of a complex problem such as inpatient diabetes management.

Perhaps most importantly, these early results are illustrating how CPOE can be used to not only catch mistakes, but actually improve care processes. As the program is rolled out to other units, the diabetes care team expects to collect enough data to prove that CPOE can also improve glucometrics.

“After demonstrating these intermediate care results, we expect that we will be able to demonstrate how the use of CPOE is leading to improved patient outcomes such as a reduction in diabetes complications,” Berman says.

“Improved patient outcomes are the vision and the goal, and what motivates us to keep plugging away at the very complex challenges associated with inpatient diabetes management.”

Organization

Concord (N.H.) Hospital

- 230-bed regional medical center
- 17,194 admissions
- 295 medical staff
- 2,631 employees

Critical Issues

- Physician acceptance of CPOE in diabetes management
- Optimal utilization of insulin
- Standardization of nurse and licensed nurse assistant training
- Glucometer docking efficiency

Results

- Obtained 80 percent physician satisfaction with CPOE/technology interactive form
- Increased use of basal insulin from about 20 percent to more than 90 percent
- Increased use of prandial insulin from 10 percent to nearly 100 percent
- 100 percent of nursing staff participated in standardized training and 100 percent passed a competency test
- Reduced glucometer docking delays by more than 60 percent

This case study was submitted May, 2013.