Reducing Adverse Drug Events through a Critical Care Collaborative

Nationwide Children’s Hospital (NCH) is a not-for-profit, 452 bed hospital located in Columbus, Ohio. NCH is a leader in the area for many specialties including neonatology, pulmonology, nephrology and cardiology/heart surgery.

NCH ranked in all 10 specialties in U.S. News & World Report’s 2013-14 Best Children’s Hospitals rankings. This is the eighth consecutive year Nationwide Children’s has been ranked in all 10 specialties, which includes nine out of ten specialties ranked in the top 15. In addition to its 25,000 inpatient admissions, Nationwide provides one million outpatient visits and sees over 85,000 patients in its emergency department each year.

Project Summary:

In the fall of 2008, the executive leadership of NCH set a goal to eliminate all preventable harm by December 31, 2013 and a program to transform the organization’s “culture of safety” was initiated. A multidisciplinary, internal adverse drug event quality improvement collaborative (ADEQC) comprised of medical, nursing and pharmacy leaders from units with high rates of harmful adverse drug events (ADEs) was established in fall of 2009. The initial goal was to reduce the number of ADEs that reach patients and cause harm by 90% by December 31, 2010. During this phase of the project, new techniques and procedures were tested via an internal quality collaborative in the critical care units of neonatal intensive care unit (NICU), pediatric intensive care unit (PICU), cardiothoracic intensive care unit (CTICU), and Hematology-Oncology. Data analysis revealed that key drivers for medication errors are medication administration, prescribing, and dispensing.

To achieve the goal, the position of a critical care nursing quality improvement coordinator (CCQIC) was established to coach, mentor, monitor, and audit critical functions related to the prevention of ADEs. To further minimize the human factor that contributes to medication errors, NCH utilized smart infusion pumps, expanded the use of the pneumatic tube system, initiated wireless voice communication for mobile personnel in the hospital and utilized the electronic medical records systems.

Leadership:
Steve Allen, MD, CEO

Primary Investigator(s):
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65.5% decrease in overall adverse drug events

$3,246,000 in savings from reducing unnecessary hospital costs in inpatient and outpatient units since February 2010

Nationwide Children's Hospital in Columbus, Ohio achieved these numbers from the implementation of medication reconciliation, infusion pump programming, and independent double checks.
Objectives:

1. Establish the critical care nursing quality improvement coordinator (CCQIC) position
2. Monitor and audit critical functions related to the prevention of ADEs, including medication administration, prescribing, and dispensing
3. Utilize smart infusion pumps, expand the use of the pneumatic tube system, initiate wireless voice communication for mobile personnel in the hospital and utilize the electronic medical records systems to minimize the human errors
4. Reduce preventable ADEs an additional 50% from the projected December 31, 2010 hospital-wide rate of 0.126 ADE per 1000 patient days
5. Reduce the number of harmful ADEs to 4 per month over the same time period on the CCQIC units

Results:

Harmful, preventable ADEs peaked in February 2010. By March 2011, the rate of ADEs per 1000 dispensed doses decreased to 0.08, a 52% reduction (P < 0.001). The rate decreased an additional 50% by December of 2012. Over all, ADEs decreased 76.5% from February 2010 high (P < 0.001). This decrease occurred despite spreading the quality improvement work to every inpatient care unit and outpatient clinic at Nationwide Children’s Hospital. Importantly, few ADEs caused serious harm (category F or higher) during the collaborative, and there were no deaths related to an ADE. At the present time, the most common medications associated with harmful, preventable ADEs were vaccines, analgesics and narcotics, insulin and intravenous fluids. Through these efforts, Nationwide Children’s Hospital avoided $3.3 million in ADE-related costs.

Project Continuation:

Nationwide Children’s continues to focus on ADEs related to medication reconciliation, insulin management, vaccine delivery, and computer-generated medication alert fatigue. The entire hospital system is engaged and actively working towards their goal of zero ADEs. They have eliminated the “low-hanging fruit” and now are focusing on some really difficult issues. The ambulatory care area presents some technological challenges that have been barriers to improvement. Their hope to find solutions that will keep them on the road to zero patient harm.

“The single most important factor in our success is the evolution of a culture of safety at Nationwide Children’s Hospital. This change led to increased reporting of medication errors by staff. As James Joyce said, ‘A man’s errors are his portals of discovery.’ By learning about “near miss” events, we can make changes in the system to prevent another person from making the same error.”

- Rick McClead MD, MHA; Medical Director, Quality Improvement Services

At Cardinal Health giving back is fundamental — a commitment focused on improving healthcare and building stronger and healthier communities. The E3 Patient Safety Grant Program was established in 2008 to reduce healthcare errors, save dollars and, most importantly, improve patient outcomes. In the past six years the Cardinal Health Foundation has invested $6.15M in E3 grants with the most recent grantees reporting an 11:1 return on our investment.

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