

## **Case Study of Using the QI Toolkit for Pediatric Quality Improvement**

**What is the purpose of this tool?** This tool provides a case study from a children's hospital that participated in the field test and evaluation of the Pediatric QI Toolkit. It offers a description of the tools the hospital chose to use, which are all included in the QI Toolkit as well. It also describes several of the key actions the hospital took to improve performance on central line-associated bloodstream infections (CLABSIs).

**Who are the target audiences?** The primary audiences for this tool are senior hospital leaders and quality leaders.

**How can this tool help you?** You can use this tool to better understand how other hospitals have used the Toolkit.

**How does this tool relate to others?** This tool should be used together with the Introduction to the QI Toolkit (Tool A.1), which provides an overview of all the individual tools and can help in selecting the tools that best meet your hospital's needs.

## Children’s Hospital Uses AHRQ’s Pediatric QI Toolkit To Bring Physicians Together To Reduce CLABSIs

### Abstract

The Ann & Robert H. Lurie Children’s Hospital used the tools from the Pediatric QI Toolkit – which are all included in the QI Toolkit as well - to reduce central line-associated bloodstream infections (CLABSIs) in their hematology/oncology/stem cell transplant division. Within only 6 months of implementing changes to care processes, the hospital experienced a 50 percent decrease in their CLABSI count. Impressed with these early results, the hospital plans to extend the initiative to other units, and expand their efforts to improve timeliness of line removal.

### Hospital Context for Quality Improvement Focus

The nursing staff at Lurie Children’s Hospital had made some progress in the past by implementing CLABSI reduction programs, such as the use of central venous catheter maintenance bundles. This strategy was associated with a drop in CLABSIs, but by the end of 2014, CLABSI rates were rising in the hematology/oncology/stem cell transplant division. Dr. Sangeeta Schroeder and Dr. Lee Budin (medical director for the hospital’s Center for Excellence, the hospital’s group that works on patient safety and quality) recognized that the hospital had to take a closer look at what was contributing to this rise in CLABSIs. The Pediatric QI Toolkit gave them the support to make that happen.

### How the Pediatric QI Toolkit Was Used

Lurie Children’s Hospital used the improvement process laid out in the Pediatric QI Toolkit to gain a better understanding of the factors contributing to CLABSIs in their patients and identify workable solutions. Dr. Schroeder started the process with the “Getting Ready for Change Self-Assessment” (Tool A.3). This short survey is designed to gather input from a variety of staff members on how prepared the organization is to implement and sustain quality improvement initiatives. At Lurie Children’s Hospital, the survey was administered to about 20 staff members in the hospital’s Center for Excellence. The results helped to identify several opportunities to improve as an organization, such as enhancing communication about quality improvement work across divisions.

#### Hospital

Ann & Robert H. Lurie Children’s Hospital of Chicago, Illinois.

#### Lead staff for improvement project

Sangeeta Schroeder, M.D., hospitalist  
Lee Budin, M.D., medical director of the Center for Excellence (the hospital’s group that works on patient safety and quality)

#### Quality measure

Central line-associated bloodstream infections (CLABSI)—Centers for Disease Control and Prevention (CDC) National Healthcare Safety Network (NHSN)

#### Tools Used by Lurie Children’s Hospital

- Getting Ready for Change Self-Assessment (Tool A.3)
- Improvement Methods Overview (Tool D.1)
- Best Practices for Central Venous Catheter (CVC)-Related Bloodstream Infections (Tool D.4x)
- Gap Analysis (D.5)

In the spring of 2015, Drs. Schroeder and Budin pulled together a new multidisciplinary team to focus on reducing CLABSIs. This team was composed of Dr. Schroeder, two CLABSI physician task force leads (the stem cell transplant director and the medical director of the intensive care unit), and a patient safety analyst. In addition, the team's working members included representatives from hematology, oncology, stem cell transplant, pediatric intensive care, infection control, anesthesiology, surgery, interventional radiology, information management, and data analytics. A presentation by Dr. Schroeder that drew on materials from the Pediatric QI Toolkit, including the Improvement Methods Overview (Tool D.1), helped to get the team's buy-in early in the quality improvement process.

Two tools were critical to gaining physician support: Best Practices for Central Venous Catheter (CVC)-Related Bloodstream Infections (Tool D.4x) and the Gap Analysis (Tool D.5). The results of the gap analysis revealed the areas in which the hospital's practices diverged from recognized best practices. One specific problem was that physicians were ordering temporary lines such as peripherally inserted central catheter (PICC) lines, which had a higher rate of CLABSIs, when a more permanent line was needed. Highlighting this issue helped to get the necessary buy-in from the head of the hematology/oncology/stem cell transplant division and made it clear to everyone why physicians needed to take ownership of the problem and be part of the improvement process.

### **Implementing a Clinical Intervention**

In addition to engaging physicians, the gap analysis helped the improvement team identify the clinical intervention they needed to make in the care process and the barriers they needed to overcome. Drilling down to the root causes of the problem revealed a variety of issues. For example, by thinking through the barriers to and advantages of different kinds of lines, the team learned that physicians were more likely to order PICC lines than permanent lines in part because of communication and scheduling issues with the operating room, where permanent lines are placed. In contrast, PICC lines were being placed by interventional radiology, and scheduling placement was easier and faster. Resolving those issues required working with surgeons and interventional radiologists who had never been brought to the same table together with the ordering physicians before. This approach greatly improved communication across divisions.

By clarifying how the existing phone-based ordering process contributed to the problem, the improvement process also revealed the need for an algorithm that physicians could use to help identify the most appropriate line to order based on a child's diagnosis. The algorithm that the team developed was incorporated into the hospital's electronic medical record through smart order sets that hardwire the best practice and facilitate adherence. This approach also provides an easier way to assess whether physicians are following the newly developed line algorithm.

### **Impact**

Lurie Children's Hospital noticed positive changes in clinician behavior soon after kicking off its use of the Toolkit in June 2015. Use of permanent lines in the hematology/oncology/stem cell transplant division as a percentage of all lines increased. As a result, the CLABSI count decreased by 50 percent from the last quarter of 2014 to the last quarter of 2015. The physicians and other staff are also better able to successfully coordinate biopsies, imaging, and other procedures with the placement of permanent central lines.

Measure	Baseline	Status After 6 Months	Impact
Permanent line rate (number of line days/number of patient days)	0.49 as of project kickoff in June 2015	0.65 as of December 2015	33% increase in permanent line rate over period of 6 months
Temporary line rate (number of line days/number of patient days)	0.37 as of project kickoff in June 2015	0.16 as of December 2015	57% decrease in temporary line rate over period of 6 months

For Dr. Schroeder, another important result is that several hematologists on the faculty who were not part of the original initiative are now expressing interest in getting involved. She also regards improved communication with the pediatric surgery division as a positive outcome of this work.

Looking ahead, Dr. Schroeder and her colleagues are exploring how this approach could work in other clinical areas and as a way to improve practices related to timely line removal hospitalwide.

### Advice for New Users of the QI Toolkit

Based on the hospital's experience to date, Dr. Schroeder offered the following advice to her counterparts in other hospitals serving pediatric populations:

- **Feel free to use the Toolkit for improvement efforts related to any pediatric quality measure, not just the AHRQ PDIs.** While the Toolkit is part of a suite of resources designed to support use of the AHRQ QIs, most of the tools are equally useful for other measures. Lurie Children's Hospital was initially unsure as to whether the Toolkit could be easily used for a non-PDI quality measure. However, they successfully used many of the tools even though they used the Centers for Disease Control & Prevention National Healthcare Safety Network definition of CLABSI rather than the AHRQ specifications.
- **Adapt the tools to meet your needs.** Dr. Schroeder found that she was easily able to change the tools—such as the gap analysis and implementation plan—to meet the specific needs of her CLABSI reduction project. She was also able to modify the board presentation template so that it would support her need to educate clinicians and staff about the problem and the imperative to seek solutions.
- **Recognize that it will take time for everyone to embrace change.** Bringing team members on board and getting them to work together requires relationship building; even when everyone is invested in achieving the same end goal, they have not necessarily bought in to the process. Dr. Schroeder noted that a top-down approach would not have worked; the team needed time to band together, share their perspectives, and accept that the quality improvement process would work.