

HOSPITAL CHARACTERISTICS

CHILDREN'S  
HOSPITAL OF NEW  
JERSEY AT NEWARK  
BETH ISRAEL  
MEDICAL CENTER

- ▶ Newark, NJ
- ▶ 407 beds
- ▶ [www.saintbarnabas.com/hospitals/childrens\\_hospital](http://www.saintbarnabas.com/hospitals/childrens_hospital)

Children's Hospital of New Jersey offers comprehensive inpatient and outpatient pediatric services. It is located at Newark Beth Israel Medical Center and is an affiliate of Saint Barnabas Health Care System.

S.T.E.E.E.P.



EFFICIENT

The central line pack is carefully monitored so that all necessary supplies, including masks and drapes, are always readily available.



EFFECTIVE

The pediatric ICU has gone two years without a central-line infection, earning recognition from NACHRI as a top performer within its 62-hospital CLABSI initiative.



PATIENT-CENTERED

To maintain a sterile environment, clinicians wear gowns, gloves and masks in all interactions with a patient's central line.

# BEST PRACTICES FOR CENTRAL LINE USE

## The Problem

According to the Centers for Disease Control and Prevention, 248,000 bloodstream infections occur in U.S. hospitals each year, a large proportion of which are believed to be central line-associated bloodstream infections. In 2007, the national incidence rate for CLABSI

for pediatric ICUs was 3.7 per 1,000 central line days, down from 7.8 per 1,000 days in 1997 but still an area of concern. For the often critically ill patients at Children's Hospital, many of whom have multiple complications, any infection can pose life-threatening risks, according to Derrick McQueen, MD, acting director of pediatric critical care medicine at Children's Hospital.

## The Solution

In 2006, the hospital began participating in a pilot initiative of the National Association of Children's Hospitals and Related Institutions (NACHRI) to reduce CLABSI rates among its members. The pediatric intensive care unit at Children's Hospital subsequently adopted a comprehensive central line bundle designed to ensure central line sterilization, organize and monitor central line supplies, incorporate evolving practices for central line safety and standardize guidelines for the maintenance of patients' central line dressings.

## Results

The PICU at Children's Hospital of New Jersey has not experienced a CLABSI incident in more than two years.

## Background

While Children's Hospital of New Jersey did not keep track of CLABSI infections prior to 2006, hospital officials say they experienced roughly one central line infection in the

PICU every month. Because many of the children the hospital treats are already critically ill, the dangers of line infections increased. According to the Pediatric Critical Care journal, 16 percent of children spending time in PICUs acquire infections; the infections can increase their risk of death by 20 percent.

Mary Jean Kelly, RN, a pediatric research coordinator for Children's Hospital, notes that central line bloodstream infections are monitored as a core measure for quality by the Joint Commission; the Centers for Medicare & Medicaid Services included the condition in its 2008 list of hospital-acquired conditions it will no longer reimburse for. In 2006, the former chair of pediatrics for Children's Hospital attended a NACHRI meeting aimed at reducing CLABSI rates. The hospital then joined the group's bloodstream infection collaborative that brought together 62 hospitals to share ideas and mutually develop comprehensive central line guidelines.

Children's Hospital developed its own central line bundle of procedures to improve safety and incorporate best practices for central line use within the pediatric ICU. With the aim of maintaining a completely sterile environment, a checklist is used to ensure all clinicians are properly wearing gowns, gloves and masks prior to insertion of a central line. Each physician is required

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to scrub their hands for 15 seconds and the central line site for two minutes before insertion; nurses are instructed to stop the insertion procedure if any of the steps have not been properly followed.

“There was a mindset that we were focused on—that was making sure anyone who came near our sterile setup during time of insertion was gowned, gloved and masked,” Dr. McQueen says.

The effort also incorporated evolving best practices for central line use. In 2002, the CDC began recommending that hospitals use chlorhexidine gluconate to clean venous catheters, and in 2006, the CDC specifically recommended the use of the cleaning solution in ICUs. Nurses, wearing freshly cleaned gloves, now scrub the central line connections for 30 seconds, and allow them to dry for 30 seconds before changing a bag or syringe.

The new bundle also includes specific instructions for ensuring that the central line supplies kept in the ICU are being monitored to determine that proper equipment, including masks and drapes, are stored in proper quantities. Standardized instructions for catheter care when they are not in use are also incorporated.

Today, Children’s Hospital estimates that it has prevented 24 potential CLABSI occurrences and has saved \$600,000-\$1.2 million in associated costs since 2006. The hospital continues to stress the importance of the CLABSI bundle, with a daily flyer distributed to staff that keeps track of the number of days since the last central line infection in 2007.

“In addition to great quality, we’ve saved a significant amount of money,” says John

Brennan, MD, CEO of Children’s Hospital. “The trade-off was the commitment to education. The return was the decrease in infections.”

**Principles of  
Performance  
Excellence  
Eliminate Defects**

Prior to the NACHRI collaborative, nurses in the pediatric ICU changed patients’ central line dressings every day, believing that the practice kept patients clean and safe from infection. However, emerging research demonstrated that changing central line dressings, by exposing the point of insertion, actually increases the risk of infections. Children’s Hospital began mandating that central line dressings be changed weekly, using daily rounds to determine if the current line is clean, dry and intact. Kelly credits the change in part to the dialogue fostered by the NACHRI initiative. “Before, hospitals had their own standards for what they thought would reduce rates,” Kelly says. “We were able to compare data with other facilities.”

**Reduce Process Variation**

From the outset of the project, the CLABSI team emphasized the importance of disseminating the bundle and current best practices throughout the pediatric ICU. Sue Krauss, RN, a staff nurse in the pediatric ICU, says the education sessions were critical in teaching the steps of the bundle, from creating the sterile field around the central line to scrubbing the line before insertion. In order to ensure continuing compliance, every week, nurses fill out reports to demonstrate that each patient’s line has been maintained properly and that the central line dressing is still

intact. “It was a little difficult at first to keep straight what they wanted us to do,” Kelly says. “Now we do it automatically.”

### **Continual Improvement**

In 2008, a nursing research collaborator began holding individual educational sessions with the PICU staff to demonstrate up-to-date best practices for central line insertion. In addition, nurses who enter the

pediatric ICU from other units at Children’s Hospital must take educational courses about the central line bundle prior to joining the unit. Ongoing education is a critical component of keeping the initiative top of mind for staff, Kelly says. “We’re continually reeducating staff with different questions and scenarios,” Kelly says.

The program has also expanded beyond Children’s Hospital and throughout St.

Barnabas Health Care System. Dr. Brennan, who was formerly chief medical officer for the entire system, says the central line protocol developed at Children’s Hospital has been implemented throughout all six of the system’s acute care hospitals.