Introduction
The Barbara Bush Children’s Hospital (BBCH) at Maine Medical Center (MMC) is comprised of a 50 bed mixed inpatient pediatric unit with seven Pediatric Short stay beds. The patient population is approximately 30% Oncology and other specialties some of which have a high infection risk such as Cystic Fibrosis and Short Bowel syndrome.

Despite many efforts, central line associated blood stream infections (CLABSI) increased in 2012 exceeding the national average (see Figure 1. below) [1]. In addition to the effect of CLABSI on the physical and emotional health of patients and families: the financial impact is just as critical. An average cost of a Pediatric CLABSI case is $55,646 and an average length of stay (LOS) to treat this infection is 19 days [2].

Chlorhexidine Baths
Chlorhexidine baths for all patients with a central line were initiated in June 2013. The bath order was added to the Central Line Order set to establish this practice. Nurses and support staff were instructed on the bathing procedure. This change required a vast amount of education for physicians, nurses, parents and patients. It is the only intervention which still has not quite been sustained.

In April of 2013, the pediatric unit started a multi-pronged approach to decrease CLABSI. The strategies included: product and policy changes regarding central line care and maintenance. A task force, composed of the Senior Executives and Infection prevention team, focused attention on units of occurrence with CLABSI above the national average. The task force invoked the Infection Prevention team’s expertise on evidenced-based and best practices when interventions were chosen. Both financial and human resources were dedicated to the efforts to decrease and prevent CLABSIs.

Central Line dressings:
Dressings were changed from a transparent film with a separate CHG impregnated disc to a dressing with an integrated CHG gel pad. This dressing type was evaluated by several nursing units with a feedback that the gel pad provided better contact than the disc with the skin surface. Immediate improvements were noted as well. Using one instead of two products (i.e. transparent dressing + CHG disc) was more cost-effective and also with an anticipation of less frequent need for changes.

Figure 2. Products

Alcohol impregnated caps:
Alcohol impregnated caps to cover all access points on central lines were instituted unanimously with the use of the new dressings. These caps act as a protective barrier making it less likely to contaminate a line when accessing to give medication or draw blood for laboratory tests. The addition of the caps resulted in cost approximately $60,000 annually.

Product (continued)

New products included: Chlorhexidine (CHG) central line dressings, Alcohol impregnated central line caps and CHG bats for patients with Central lines (see Figure 2). below.

Education
The BBCH unit based CLABSI prevention committee developed new, innovative and empowering education approach with supporting materials (see Figure 3 below) for the patients that go home with a central line. These patients have the highest risk of infection. The education materials teach patients and families the principles of aseptic, standard line care, and empower them to report observed differences in care practices between providers, hospital settings and home. The literature demonstrates success in collaborating with patients and families as infection prevention partners [2, 3].

1. Central Line Passport – a list of provider instructions tailored specifically towards the individual patient and his or her central line
2. Care education videos – a series of five videos outlining proper central line care
3. “Stop Sign” – a patient advocacy tool, possible to attach/hang on a line, to remind providers of proper care
4. Central Line reference documents – standardized basic information about central lines
5. CLABSI education document – information about the risks posed by central line infections
6. Home Care Collaboration – central line education materials to Home Health agencies to discuss MMC’s education processes and downstream implications for home care.

These materials provide a standardized way to educate and empower patients and families to advocate for proper line care.

Policy and Electronic Medical Record (EMR)
The MMC Vascular Access Quality team (VAQT) reviewed all of the institutional, unit and nursing practice policies that pertained insertion, care and maintenance of Central Lines for content, evidence and accessibility. Utilizing content experts from each discipline, the committee (VAQT) consolidated one Central Line Policy for neonates, pediatrics and adults. The policy is now accessible to everyone via the intranet on the hospital’s Policy site. The consolidation of policies allowed for more streamlined education and clarity of message to all providers.

The policy for limiting line access was revised and released with the expectation that providers collaborate with nursing to consolidate or eliminate line access for blood draws for labs. “Do not draw” “Pediatric and dial daily” orders were entered in the EMR for patients that had central lines. The expectation was that this would be discussed daily during patient rounds with the interdisciplinary team.

The pediatric unit-based CLABSI prevention team was consulted to provide pediatric-focused input to the policy. Order sets were created in the EMR to support a standard of practice among caregivers and physicians. A Vascular Access navigator was added to the EMR to allow the appointed physician to easily input information regarding the patient’s central line.

Outcomes
Initiating many changes in a short period of time added some confusion to these efforts. Sometimes the staff was confused about products in use and reasons for change. The rapid pace made it difficult to communicate the underlying values and motivation in a concise and effective way, therefore making culture change slower. Additionally, having an engaged physician/nurse dyad to lead this effort was essential to success and unique to our unit.

We continue to offer and refine our education for Home Health agencies. We have conducted Root Cause Analyses (RCA) at the unit level for all near misses or infections. We have also started to audit compliance with the limited access policy.

References

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Figure 3. Patient Education

Figure 4. CLABSI RATES

Opportunities and Challenges
Prior to this initiative, physician/nurse leader dyads were implemented at MMC, who also have pursued 2-3 infection efforts on the units. We are very fortunate to have truly passionate and motivated leaders who have also been inclusive and collaborative in their approach. Moreover, we have been able to make real changes in how the lines are cared for at home by developing partnerships with the office staff of the oncology practice and the Home Health Agencies.

The physician/nurse leaders have inspired and motivated the bedside clinicians, helping to implement the product changes and initiatives that eventually led to a culture change and a reduction in CLABSI’s.