

CHCA Clinical Improvement Collaborative: Reducing Central Venous Catheter-associated Bloodstream Infections CHANGE PACKAGE



Purpose of the Change Package:

The Change Package establishes recommended interventions, proven to bring about desired results. When implemented collectively, breakthrough improvement is most likely to be achieved. Participants will be expected to work in all areas of the Change Package, that is, all the different categories listed below such as “Patient Level Strategy”. This will allow sites to improve the entire care system, not just one specific element.

Recommended strategy for implementing changes:

Each participating site should review the change package to determine:

- Practices already in place at your hospital
- The first few key changes your team will tackle
- Other changes your team will undertake at a later time in the collaborative

Any individual team may not have the desire or the capability to make every change outlined in the change package. However, the intent of the collaborative is to achieve breakthrough improvement, as described above. To achieve this aim, you will need to make a number of significant improvements, both specific to bloodstream infections, and across your entire system. When reviewing your team’s plans, ask the question:

"If we make all the changes we have selected, will we achieve the aim?"

If the answer is "no" it is usually because there are other factors that are contributing to the problem. Continue to ask this question as you progress through the collaborative. If it seems likely you will fall short of the aim, review the change package again for additional changes that would reduce these infections.

Population:

The interventions were designed for patients in the Pediatric ICU who had a central venous catheter in place during his/her stay. The population will include both patients whose catheters were placed in the PICU and those who arrived at the unit with a catheter in place.

Definitions:

Central Line:

A vascular infusion device that terminates at or close to the heart or in one of the great vessels. The following are considered great vessels for the purpose of reporting central-line infections and counting central line days in the NHSN system: Aorta, pulmonary artery, superior vena cava, inferior vena cava, brachiocephalic veins, internal jugular veins, subclavian veins, external iliac veins, and common femoral veins.

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Catheter-Associated BSI:

A central line was in use during the 48-hour period before development of a BSI. If the time interval between onset of infection and device use is >48 hours, there should be compelling evidence that the infection is related to the central line.

Infections are determined to be catheter-related based on a positive culture. A catheter-associated infection is an infection in a child with a catheter; no positive culture required. Catheter-related infections are catheter-associated infections, but not all catheter-associated infections are catheter-related. Bloodstream infection + catheter = catheter-associated infection.

Sites may choose to track catheter-**related** infections (based on blood cultures) rather than or in addition to catheter-**associated** infections.

Maximum sterile barrier precautions:

- Cap
- Mask
- Sterile gown
- Sterile gloves
- Large sterile drape

Bundle:

A bundle is a group of precautionary steps with approximate time and space characteristics that, when executed collectively and reliably, have an enhanced effect on patient outcomes.

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Change Concepts:

PATIENT LEVEL Strategy	Key Change Concepts	Additional Information
Establish Daily Goals	<ul style="list-style-type: none"> • Establish appropriate, explicit daily goals for patients • Keep daily goal sheet at patient bedside • Include family in process • Use daily goal sheets to enhance communication among team members • Incorporate documented daily goals into rounds 	Suggestions of daily goals: <ul style="list-style-type: none"> • Wean from IV to oral meds • Introduce enteral feeding • Removal of the line • Minimizing number of line manipulations
Daily Review of Necessity	<ul style="list-style-type: none"> • Incorporate review of CVC lines into existing daily rounds • Utilize a checklist that includes all patients with CVCs and other information like how long the line has been in, etc. Provide the checklist to the physicians to be used on rounds • Engage physicians to raise awareness about the importance of daily review for necessity • Include family in rounds as appropriate • Include any other key care team members as needed • Use rounding sheet and prep sheets for clinical services • Reflect on patients' progress of attainment of daily goals 	By the end of rounds, the following should be clear: <ul style="list-style-type: none"> • the plan of care for each of the patient's issues • Daily review of necessity (does the child need IV meds or can it change to PO, change from temporary CVL to PICC, number of days the line has been in, is the placement of the line correct) • Early removal (checklist – education, prompts – embedding in computerized system – laminated card, daily reminder to individuals that will make the decision to remove) • Picture of the body updated by the nurses containing patient info displayed bedside – family involvement
CARE Process	Key Change Concepts	Additional Information
Establish Reliable Processes	<ul style="list-style-type: none"> • Make use of CVC insertion bundle 	Insertion Bundle Elements: <ul style="list-style-type: none"> • Hand hygiene • Use transparent semi-permeable dressings when possible / Use gauze only with bleeding/oozing • Maximum barrier protection (sterile technique maintained throughout) • Prepare skin with antiseptic/ detergent chlorhexidine 2%, except in those with a contra indication (e.g., patients less than 2 months of age)

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CARE Process	Key Change Concepts	Additional Information
Establish Reliable Processes	<ul style="list-style-type: none"> • Make use of CVC maintenance bundle (dressing change, cap change) 	Maintenance Bundle Elements: <ul style="list-style-type: none"> • Hand hygiene • Aseptic technique maintained throughout (sterile gloves, dressing) • Use transparent semi-permeable dressings when possible / Use gauze only with bleeding/oozing • Replace dressing if it becomes damp, loosened or visibly soiled • Prepare skin with antiseptic/ detergent chlorhexidine 2% (except in those with a contra indication)
	<ul style="list-style-type: none"> • Decrease the risk for infection - follow policies and procedures and evidence based best practices 	<ul style="list-style-type: none"> • Prep and dressing policy and procedure for management of CVCs • No routine replacement of CVCs • Standardized tubing change policy and procedure
	<ul style="list-style-type: none"> • Decrease the risk of infection - catheter insertion 	<ul style="list-style-type: none"> • Hand hygiene • Consider risk of infection when selecting insertion site • Use CVC carts for insertion process • Choose appropriate device – consider catheter type, number of lumens, length of therapy, site of insertion • CVCs, including PICCs should be secured • Optional if infection rates remain high: antibiotic/antiseptic impregnated catheters
	<ul style="list-style-type: none"> • Decrease the risk of infection - accessing the line and maintenance 	<ul style="list-style-type: none"> • Hand hygiene • Minimize catheter manipulation (minimize number of blood draws, number of intermittent infusions) • Aseptic processes should always be used

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CARE Process	Key Change Concepts	Additional Information
		<ul style="list-style-type: none"> • Hub disinfection should be done according to guidelines (30 second scrub and allow to dry) • Standardize line set ups when multiple agents are infused • 3 way stopcocks should be closed systems (syringes attached or end capped) • Use catheter manufacturer's guidelines for flushing - routinely use SASH (saline antibiotic/medication saline heparin) method for intermittent dosing • Change end caps at least every 7 days or at any sign of leaking
	<ul style="list-style-type: none"> • Decrease the risk of infection – dressing changes 	<ul style="list-style-type: none"> • Use CVC dressing change kits • Use transparent semi-permeable dressings when possible and change at least every 7 days • Always change a loose dressing • Use gauze only with bleeding/oozing-change gauze at least every 2 days • Replace dressing if it becomes damp, loosened or visibly soiled
Encourage Patient and Family Participation in Care	<ul style="list-style-type: none"> • Include family on rounds as appropriate • Include family in daily goals • Request families' support care by asking questions • Use grease boards to enhance communication between team and families • Develop/encourage open visiting for ICU families 	
Create Climate of Collaboration and Teamwork	<ul style="list-style-type: none"> • Train observers on appropriate line insertion techniques • Include an observer for all line insertions (to provide real-time intervention and training on appropriate technique) • Team training for physicians, nurses and observers about the role of the observers (e.g., the observer must intervene when appropriate technique is not used) 	Team training includes: <ul style="list-style-type: none"> • Maintaining aseptic/sterile technique • Barrier precautions for everyone in the field • Appropriate dressing

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CARE Process	Key Change Concepts	Additional Information
	<ul style="list-style-type: none"> • Use simulation of low frequency, high risk events and reenactments to maintain competency and enhance system capability • Empower staff through the use of simple rules and independent redundancies 	Providers placing and caring for CVCs should have appropriate education and periodic competency validation.
LEADERSHIP AND SYSTEM LEVEL Strategy	Key Change Concepts	Additional Information
Infrastructure	<ul style="list-style-type: none"> • Initiate intensivist-directed multidisciplinary team system for delivery of care • Design single system of care: regardless of the care provider, unit, patient or time of day, the care provided will always follow the same guidelines • Prepare and present monthly reports - use rounds as an opportunity to share PDSA cycles, data, and Senior Leader Reports • Request infection control practitioner to report CVC-BSI rates at least monthly, not quarterly 	
Measurement	<ul style="list-style-type: none"> • Use measures to learn and to assess whether interventions and tests of change followed team's prediction • Use measures to view outcomes over time 	
Financial Viability	<ul style="list-style-type: none"> • Engage CFO or a financial representative in ICU improvement work • Ask CFO to assist in developing the business case for reducing CVC-BSI 	