Central Line Associated Bloodstream Infection Prevention

The ART of CLABSI Prevention
Central Line Associated Bloodstream Infection (CLABSI)

- CLABSI is preventable.
- Goal Zero CLABSI.
- It is a “Nurse Sensitive Indicator”.
- Performance Improvement
  - Adherence to EBP to prevent CLABSI.
  - Bundle approach – All or nothing.
  - Everyone all the time.
Reward Good Performance

• Audit for CLABSI preventive measures during daily rounds.
• Communicate with physicians and **actively promote the discontinuation of unnecessary foreign devices.**
• Share your success stories.
• Passion drives change…and it is contagious.
Share your Success Stories

ICU > 365 days without a CLABSI
Central Line-Associated Bloodstream Infections (CLABSI) in Non-Intensive Care Unit (non-ICU) Settings Toolkit

Activity C: ELC Prevention Collaboratives
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Draft - 1/22555/09 --- Disclaimer: The findings and conclusions in this presentation are those of the authors and do not necessarily represent the official position of the Centers for Disease Control and Prevention.
Background: Impact

- Bloodstream infections (BSIs) are a major cause of healthcare-associated morbidity and mortality
  - Up to 35% attributable mortality.
  - BSI leads to excess hospital length of stay of 24 days.
- Central Line (CL) use is a major risk factor for BSI.
- More than 250,000 central line-associated BSIs (CLABSI) in US yearly.
- Rates of CLABSI appear to vary by type of catheter.

Background: Impact
Outside the ICU

• Most work aimed at reducing CLABSIs in the hospital has been done in ICUs.
• Many CLs are found outside ICUs
  – In one study 55% of ICU patients had CL; 24% of non-ICU patients had CL.
  – However, as more patients are located outside of the ICU, 70% of hospitalized patients with CLs were outside the ICU.

Climo et al. ICHE 2003; 24:942-5.
Background: Pathogenesis CLABSI

More Common Mechanisms
1. Pathogen migration along external surface
   - more common early (<7 days)
2. Hub contamination with intraluminal colonization
   - more common >10 days

Less Common Mechanisms
1. Hematogenous seeding from another source.
2. Contaminated infusates.

HICPAC. Guideline for Prevention of Intravascular Device-Related Infections. 1996
# Background: Epidemiology

## Modifiable Risk Factors

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Risk Factor Hierarchy</th>
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<tbody>
<tr>
<td>Insertion circumstances</td>
<td>Emergency &gt; elective</td>
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<tr>
<td>Skill of inserter</td>
<td>General &gt; specialized</td>
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<tr>
<td>Insertion site</td>
<td>Femoral &gt; subclavian</td>
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<tr>
<td>Skin antisepsis</td>
<td>70% alcohol, 10% povidone-iodine &gt; 2% chlorhexidine</td>
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<tr>
<td>Catheter lumens</td>
<td>Multilumen &gt; single lumen</td>
</tr>
<tr>
<td>Duration of catheter use</td>
<td>Longer duration of use greater risk</td>
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<tr>
<td>Barrier precautions</td>
<td>Submaximal &gt; maximal</td>
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Background: Prevention Strategies

Interventions

• Pittsburgh Regional Health Initiative – Decrease in CLABSIs in 66 ICUs (68% decrease)
  • Interventions:
    – Promotion of best practices -
      » Maximal barrier precautions.
      » Use of chlorhexidine for skin cleansing prior to insertion.
      » Avoidance of femoral site for CL.
      » Use of recommended insertion-site dressing practices.
      » Removal of CL when no longer needed.
    – Educational module about BSI prevention.
    – Engagement of leadership and clinicians.
    – Standard tools for recording adherence to best practices.
    – Standardizing catheter insertion kits.
    – Measurement of CLABSI and reporting of rates back to facilities.

Prevention Strategies: Core

- Removing unnecessary CL.
- Following proper insertion practices - *(Use a full drape, inserter wear sterile gown, gloves and cap).*
- Facilitating proper insertion practices*.
- Complying with hand hygiene recommendations.
- Adequate skin antisepsis.
- Choosing proper CL insertion sites.
- Performing adequate hub/access port disinfection *(15 seconds of scrubbing with alcohol).*
- Providing education on CL maintenance and insertion.

* Not part of 2002 HICPAC Guidelines for the Prevention of Intravascular Catheter-Related Infections
Prevention Strategies: Core
Proper Insertion Practices

• Ensure utilization of insertion bundle:
  – Chlorhexidine for skin antisepsis.
  – Maximal sterile barrier precautions (e.g., mask, cap [i.e., similar to those worn in the O.R.], gown, sterile gloves, and large sterile drape).
  – Hand hygiene.

• Many CLs in patients on non-ICU hospital wards are placed outside those wards (Emergency room, ICU, Operating room, or Pre-operative areas).

• In one study, 49% of CLs were present on admission to the ward. Rates of BSI in this study were higher in CLs placed in Emergency Room.

• Define where placement occurs and review technique in those areas.

Prevention Strategies: Core Hand Hygiene

• **Hand hygiene** should be a cornerstone of CLABSI prevention efforts:
  – For both insertion and maintenance.

• As part of a hand hygiene intervention, consider:
  – Ensuring easy access to soap and water and alcohol-based hand gels.
  – Education for HCP and patients.
  – Observation of practices - particularly around high-risk procedures (before and after contact with CL).
  – Feedback – “Just in time” feedback if failure to perform hand hygiene observed.
Prevention Strategies: Core
Chlorhexidine Skin Cleansing

• Chlorhexidine is the preferred agent for skin cleansing for both CL insertion and maintenance.
  – Tincture of iodine, an iodophor, or 70% alcohol are alternatives.
  – Recommended application methods and contact time should be followed for maximal effect.
• Prior to use, you should ensure agent is compatible with catheter.
  – Alcohol may interact with some polyurethane catheters.
  – Some iodine-based compounds may interact with silicone catheters.
Prevention Strategies: Core

CL Site Choice

• For adult patients receiving non-tunneled CL, femoral site should be avoided due to an increased risk of infection and deep venous thrombosis.

• Note:
  – In patients with renal failure, subclavian site should be avoided to minimize stenosis which may limit future vascular access options.
Prevention Strategies: Core
Hub/access port cleansing

- BSI “outbreaks” have been associated with failure to adequately decontaminate catheter hubs or failure to change them at appropriate intervals.

- **Cleanse hubs prior to use with an appropriate antiseptic (e.g., 70% alcohol).**

- Manufacturer recommendations regarding cleansing and changing connectors should be followed.

**Scrubbing the hub scrubbing the hub ….15 seconds.**
Prevention Strategies: Supplemental Chlorhexidine Dressings*

- Chlorhexidine-impregnated sponge dressings have been shown to decrease rates of CLABSIs in some studies and not in others.

- These dressings may be an option when Core interventions have not decreased rates of CLABSI to established goals.

* Not part of 2002 HICPAC Guidelines for the Prevention of Intravascular Catheter-Related Infections
BC Collection Steps

- Check equipment, bottles and expiration dates.
- **ID patient.**
- Prep top of bottles with alcohol-sterile inside.
- **Prep site using CHG alcohol sponge 30 sec apply 30 & sec dry time.**
- **Butterfly set c adaptor –draw aerobic first.**
- **From Syringe or Line** (not preferred) draw anaerobic first –if drawing from a central line discard first 3 cc.
Skin Prep for BC

Prep the puncture site with chlorhexidine:
• Using aseptic technique, remove the applicator from its package.
• Holding the applicator downward, gently squeeze the wings to release the solution.
• Scrub with a back & forth motion using friction for 30 seconds on dry skin.
• Do not wipe the site after cleansing the skin with chlorhexidine & allow to dry for 30 seconds.
### BC volume & other tips

<table>
<thead>
<tr>
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<th>Aerobic</th>
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<tbody>
<tr>
<td>Adult</td>
<td>8-10 ml</td>
<td>8-10 ml</td>
</tr>
<tr>
<td>Pediatric</td>
<td>2.5-10ml</td>
<td>2.5 to 10 ml</td>
</tr>
<tr>
<td>Infant</td>
<td>0.5-1 ml</td>
<td>0.5-1 ml</td>
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• Volume is critical- **There is a direct relationship between the volume of blood obtained and the yield of a blood culture set.**

• Check expiration, mark level and keep the bottles upright during the collection.

• Do not overfill bottles (Do not add more than 10 ml of blood to each bottle).

• Gently rotate the bottles to mix the blood & the broth (do not shake vigorously).

• Label in the **presence of the patient** and promptly transport to the laboratory.

• Remember to date/sign & include site of collection.
Congratulations!

You have successfully completed this portion of this course and are ready to take the quiz.

Before you exit, you may review the content once more. Take the quiz and score at least 80% to successfully complete the quiz. After passing the quiz, provide us with your valuable feedback in the brief evaluation so that we may continue to improve our courses. The evaluation is not required for successful completion of this course.

Thank you!

HR Learning Management