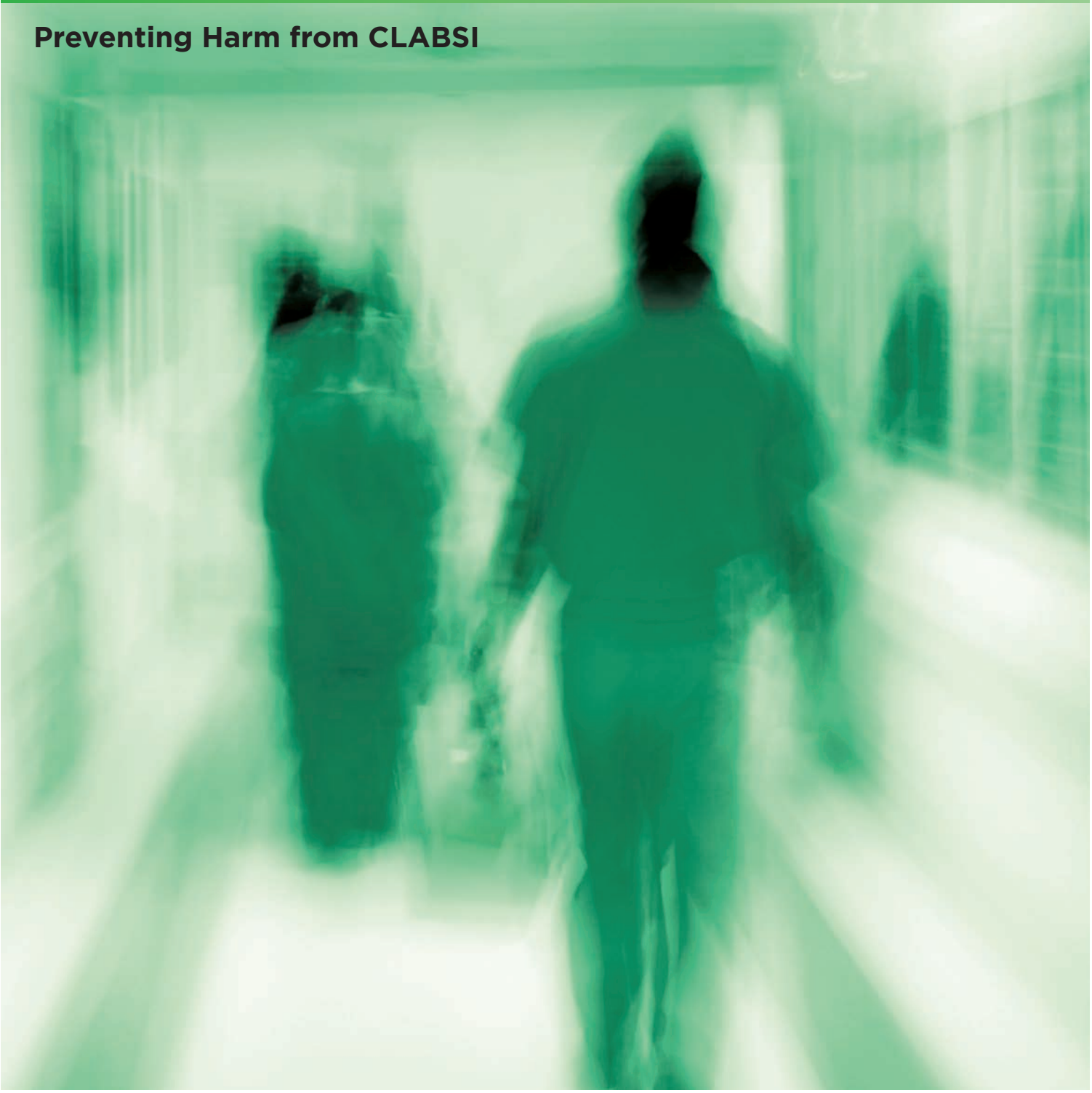
CENTRAL LINE-ASSOCIATED BLOOD STREAM INFECTIONS (CLABSI) CHANGE PACKAGE

Preventing Harm from CLABSI



American Hospital Association

U.S. DEPARTMENT OF HEALTH & HUMAN SERVICES
PARTNERSHIP FOR PATIENTS
HealthCare.gov

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HEALTH RESEARCH & EDUCATIONAL TRUST
In Partnership with AHA

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The AHA/HRET HEN would like to acknowledge our partner, Cynosure Health, for their work in developing the Central Line Associated Blood Stream Infection (CLABSI) Change Package.

OVERVIEW

Background

- Patients with any type of central line in any care area (Intensive Care Units and non-Intensive Care units) are at risk for Central Line Associated Blood Stream Infection (CLABSI).
- Hospital-acquired CLABSI has been associated with an increased length of hospital stay and increased costs.
- The cost of CLABSIs varies from $3,700 to $29,000 per episode.
- It is estimated that 41,000 central line-associated deaths occur each year in the United States.

Suggested AIM

- Decrease the rate of CLABSI by 40% in all tracked units by December 8, 2014.
- Reduce the mean CLABSI rate to less than 1 per 1,000 catheter days by December 8, 2014.

Potential Measures

Process: Central Line Insertion Bundle Compliance (individual bundle element compliance, all-or-none bundle element compliance) (EOM-CLABSI-22)

Compliance with the daily review of Central Line necessity. (EOM-CLABSI-127)

Central Line Maintenance Bundle Compliance (compliance with all individual bundle elements, all-or-none bundle element compliance) (EOM-CLABSI-129)

Outcome: CLABSI rate (number of CLABSIs per 1,000 central line days) for all tracked units (all inpatient locations). (EOM-CLABSI-24)

Outcome: CLABSI Rate - ICU (Device Days Denominator) (CDC NHSN). (EOM-CLABSI-25)

Outcome: Days Since Last CLABSI: Days Since Last CLABSI (Rural/CAH Data Collection Tool)

PRIMARY DRIVERS	IDEAS TO TEST
Standardize the Insertion Process	• Implement an insertion check list to promote compliance and monitoring. • Implement a "Stop the Line" approach to insertion if there is an observed violation of infection control practices. • Avoid use of the femoral vein for central venous access in adult patients. • Follow recommended practices for hand hygiene, asepstic technique, and maximal sterile barrier precautions. • Prep the skin with 2% chlorhexidine in patients older than 2 months of age.
Daily Review of Line Necessity	• Include a daily review of line necessity into daily rounds, with prompt removal of the catheter if a line is no longer medically indicated.
Standardize the Maintenance Process and Procedures	• Bundle together common care elements of dressing changes, administration line changes, and IV fluid changes. • Incorporate maintenance procedures into protocols for daily assessment and review. • Scrub the line access port or hub immediately prior to each use with the appropriate antiseptic.
Special Tactics – beyond the "bundles"	• Use chlorhexidine-containing dressings or sponges applied to the insertion site for central venous catheters (CVCs) in patients older than 2 months of age. • Use 2% chlorhexidine impregnated cloths for daily skin cleansing in patients older than 2 months of age. • Use a non-suture securement device. • Use antimicrobially-impregnated CVCs for adult patients. • Use ultra-sound guidance if the technology is available to place lines. • Do not routinely replace Central Venous Catheters (CVCs), including Centrally-Placed Central Lines, Peripherally-Placed Central Lines (PICCs), hemodialysis catheters, or pulmonary artery catheters. • Involve patients and families in the care process with education of infection prevention practices and how they can contribute to CLABSI prevention.

Making Changes

- This intervention is in the **Collaborative with Reducing Infections (Stay FIT Collaborative)**. National meetings, webinars, monthly coaching calls, change packages and other tools will augment state hospital association activities.

Key Resources

- IHI How To Guide: Prevent Central Line-Associated Blood Stream Infection http://www.ihi.org/knowledge/Pages/Tools/HowtoGuidePreventCentralLineAssociatedBloodstreamInfection.aspx
- On the CUSP: Stop BSI Manual, Released April 2009, National Implementation of the Comprehensive Unit-based Safety Program (CUSP) to reduce Central Line Associated Blood Stream Infections (CLABSI) in the ICU. Retrieved at: http://www.onthecuspstophai.org
- CDC Guidelines for the Prevention of Intravascular Catheter Related Infections – 2011. Retrieved at: http://www.cdc.gov/hicpac/pdf/guidelines/bsi-guidelines-2011.pdf
- July 2013 CDC/NHSN Protocol Clarifications. Retrieved at: http://www.cdc.gov/nhsn/PDFs/pscManual/4PSC_CLABScurrent.pdf
- IDSA and SHEA Compendium on CLABSI. Retrieved at: http://www.jstor.org/stable/10.1086/591059

PREVENTION OF CENTRAL LINE-ASSOCIATED BLOOD STREAM INFECTION DRIVER DIAGRAM

AIM: Decrease the rate of CLABSI by 40% in all tracked units by December 8, 2014.

Reduce the mean CLABSI rate to less than 1 per 1,000 catheter days by December 8, 2014.

PRIMARY DRIVERS	SECONDARY DRIVERS	CHANGE IDEAS
Standardize the Insertion Process	• Implement an insertion checklist to help promote compliance and monitoring. • Implement a "Stop the Line" approach to insertion if a violation of infection control practices is observed. • Optimal site selection – avoid the use of the femoral vein for central venous access in adult patients. • Follow recommended practices in hand hygiene, aseptic technique, and maximal sterile barrier precautions. • Prep skin with 2% chlorhexidine in patients older than 2 months of age.	• Have supplies and equipment easily available – e.g. a central line insertion kit with maximal barrier precaution supplies, central line dressing kits, administration sets, and an ultrasound machine. • Implement an insertion checklist to be completed by an observer, e.g. a nurse or a technician assisting. • Include hand hygiene on the insertion checklist. • Establish with staff how insertion will be stopped if there is an observed violation of infection control practices. Use tools such as scripting to assist observers with intervention.
Daily review of line necessity	• Include a daily review of line necessity into daily rounds, with prompt line removal if the catheter is no longer indicated.	• Combine daily review with other best practices review such as daily urinary catheter review. • Incorporate daily review into workflow, such as charge nurse rounds or daily multidisciplinary rounds. • If using an electronic practice management system, institute computer-based pop-up reminders to review.
Standardize the Maintenance Process and Procedures	• Bundle together care elements of dressing changes, administration line changes, and IV fluid changes. • Incorporate these elements into daily assessment and review. • Scrub the access port or hub immediately prior to each use with an appropriate antiseptic.	• Have supplies and equipment easily available – e.g. central line dressing kits, chlorhexidine dressings, IV fluid infusion bags, and administration sets. • Include maintenance bundle review along with the daily line necessity review. • Review central line care and maintenance with staff at least upon hire and annually assess competency. • Have supplies such as chlorhexidine for cleaning IV tubing and ports easily available.
Special Tactics – "Beyond the Bundles"	• Use chlorhexidine (CHG) containing dressings for central venous catheters (CVCs) in patients older than 2 months of age. • Use 2% chlorhexidine impregnated cloths for daily skin cleansing in patients older than 2 months of age. • Use a non-suture securement device. • Use antimicrobial-impregnated CVCs for adult patients. • Use ultrasound guidance to place lines if this technology is available. • Do not routinely replace Central Venous Catheters (CVCs), including Centrally Place Central Lines, Peripherally Placed Central Lines (PICCs), hemodialysis catheters, or pulmonary artery catheters. • Patient and Family Engagement: involve patient and families in infection prevention practices.	• Implement single-use wash basins or discontinue the use of wash basins. • Include chlorhexidine-containing sponges with central line dressing kits. • Incorporate the use of 2% chlorhexidine cloths for daily skin cleansing into the daily workflow e.g. nurses' aides' delivery of daily hygiene care. • Review CHG skin cleansing and CHG dressing sponge use compliance daily as part of the maintenance bundle. • Include non-suture securement devices with insertion kits. • Have ultrasound equipment readily available (and stored next to or near the insertion kit). • Educate patients and families on infection prevention practices related to central lines and how they can contribute to CLABSI prevention.

PREVENTION OF CENTRAL LINE-ASSOCIATED BLOOD STREAM INFECTIONS (CLABSI)

In recent years, significant decreases in the CLABSI rate have been accomplished through the adoption and implementation of evidence-based practices. For example, implementation of bundled central line insertion guidelines has been shown to reduce CLABSI.[1] However, harm to patients due to hospital acquired central line-associated blood stream infections is still occurring. In 2011, 18,113 CLABSIs at a breadth of care locations were reported to NHSN.[2] Although the numbers reveal a 41% reduction in CLABSI since 2008, additional improvement is necessary.[3]

Significant attention has been focused on reducing CLABSI in critical care settings. But, of the 18,113 CLABSIs reported in 2011, almost 32% occurred in non-critical care settings.[4] Patients outside the ICU with a Central Venous Catheter (CVC) are just as much at risk for a CLABSI as are ICU patients. Independent risk factors for CLABSI include: femoral catheterization, prolonged hospitalization before catheterization, prolonged duration of catheterization, heavy microbial colonization at the insertion site, heavy microbial colonization of the catheter hub, and internal jugular catheterization.[5,6,7] Fortunately, the same strategies used to prevent CLABSIs in critical care units have been shown to prevent them in non-critical care settings.[5,6,7,8,9] The goal of preventing CLABSI should lead to reduction or elimination of harm from CVCs in all patient care areas.

The CLABSI Central Venous Catheter (CVC) Insertion Bundle includes: procedural pause, hand hygiene, aseptic technique, optimal site selection, chlorhexidine for skin preparation, and maximal sterile (full-barrier) precautions. The CLABSI Maintenance Bundle includes central line site dressing changes, administration tubing changes, IV fluid changes, and daily review of line necessity with timely removal. This guide presents evidence-based practices to promote CLABSI reduction.

SUGGESTED AIMS

An AIM statement for CLABSI reduction efforts could include one of the following:

- Decrease the rate of CLABSI by 40% in all tracked units by December 8, 2014.
- Reduce the mean CLABSI rate to less than 1 per 1,000 catheter days by December 8, 2014.
- Decrease the rate of CLABSI by implementing all elements of the Central Line Maintenance Bundle for 95% or more of CVC patients in all areas by December 8, 2014.

STANDARDIZE INSERTION PROCESS (INSERTION BUNDLE)S

Following established guidelines for CVC insertion will decrease CLABSI rates.[8,9,10] All units should adopt and implement this evidence-based Insertion Bundle. The Insertion Bundle includes: indications for CVCs, prevention processes such as maximal sterile barrier precautions, aseptic technique hand hygiene, and proper skin prep, and correct insertion technique. An important component is the education of care providers about evidence-based practices that have been shown to decrease risk of infection. Care providers should also be aware of the potential risks of CLABSI such as significant morbidity, mortality, and costs.

- **Process Measure:** Audit of compliance with Insertion Bundle guidelines.

Secondary Driver: Implement an insertion checklist

An insertion checklist can help to ensure that all recommendations for insertion of a CVC are followed each and every time. The checklist includes a list of actions that should occur before (e.g. procedural pause), during (e.g. skin prep with 2% CHG), and after CVC insertion (e.g. appropriate site dressing). Use of a checklist is an effective approach to assess if patients are receiving appropriate care. See Appendix I for examples of CVC insertion checklists.

Change Ideas: Adopt and adapt a CVC insertion checklist

Engage staff nurses to adopt and adapt a CVC insertion checklist to promote patient safety. Standardizing care processes has been shown to increase compliance with recommended insertion practices.[11,12] A checklist allows a designated care provider to serve as an independent, redundant observer to ensure that the inserting physician adheres to evidence-based practices. Units should:

- Enlist the medical director or other provider champion to support the use of the checklist and to educate and mentor providers.
- Determine who will complete the insertion checklist at the time of insertion: the nurse assisting, an independent nurse observer, or a technician.
- Determine what is to be done with the paper or electronic checklist after it has been completed.
  - If using an electronic practice management system, a computer-based checklist may be used (not to be part of the medical record).
  - Bundle the paper checklist with the insertion kit.

Secondary Driver: Implement "Stop the Line"

A checklist ensures best practices for CLABSI prevention are followed only if accompanied by the expectation that, if a violation of infection control practices is observed, the procedure is halted and corrections made. The nurse or technician completing the checklist must be empowered to stop the procedure by communicating to the provider inserting the CVC that there has been a break in sterile procedure. Corrections could include changing a contaminated glove, replacing the guidewire, or using a full body drape instead of a short drape. Successful implementation of a checklist requires effective interpersonal communication skills and can give staff an opportunity to learn teamwork skills experientially.

Change Ideas: "Stop the Line"

- Adopt policies which combine individual accountability with a blame-free, patient-centered approach to errors.
- Use the medical director or another provider champion to support the "Stop the Line" approach and communicate its value to other providers.
- Work out with staff how to "Stop the Line." Scripting can be helpful. One hospital's staff adopted the phrase, "the sterile field has been contaminated" to be uttered by the nurse or technician auditing the process.[13]
- Determine with staff when to "Stop the Line", e.g. everyone in the room is not wearing maximal barrier precautions, there is a break in the sterile field, a full body drape is not being used, proper skin prep has not been done.
- Develop a strategy in your clinical area to support the bedside observer – what the observer should do if a violation is identified and if the provider fails to correct the violation. Possible options could include: paging the unit nursing director or medical director to intervene.
- Assure policies/processes are in place to reduce risk to observers advising colleagues about breaches and to facilitate reporting breaches or errors. Explicitly expressed senior level support for staff "stopping the line" is needed before and after breaches in policies occur.

Secondary Driver: Optimal site selection

Research data suggest that certain CVC sites may have a lower risk of infection.[14,15,16,17] For example, the current CDC/NHSN and SHA/IDSA practice recommendation is to avoid using the femoral vein for central venous access in adult patients. To reduce infection risk, insertion is recommended at the subclavian site, rather than at the femoral or jugular site in adult patients.[18,19,20,21]

Secondary Driver: Follow recommended practices for hand hygiene, aseptic technique, and maximal sterile barrier precautions

- Establish a process to ensure appropriate practices for hand hygiene, aseptic technique, and maximal sterile barrier precautions are followed. Hand hygiene continues to be an integral part of any infection prevention program.[22,23] Following aseptic technique for insertion and care is crucial to prevent central line-associated infections. Aseptic technique includes using maximal sterile barrier precautions such as a cap, mask, sterile gown, sterile gloves, and a sterile full body drape during insertions of CVCs and PICCs, or during guidewire exchange.[24,25,26]

Change Ideas: Hand hygiene, aseptic technique, and maximal sterile barrier precautions

- Have easy access to hand hygiene aids such as conventional soap and water or alcohol-based hand rubs to facilitate hand hygiene before and after each procedure.
- Include hand hygiene and maximal barrier precautions as part of your CVC insertion checklist.
- Have supplies and equipment easily available, e.g. a central line insertion kit with maximal barrier precaution supplies, central line dressing kits, and administration sets. Consider enlisting staff to help build an insertion kit or line cart, as well as to keep it stocked.
- Package CVC, skin antiseptic, and maximal barrier precautions in insertion kits to make it easier for providers to follow recommended guidelines.

Secondary Driver: Skin prep with 2% chlorhexidine (CHG)

The preferred agent for skin antisepsis before catheter insertion and during dressing changes is 2% chlorhexidine (2% chlorhexidine in 70% isopropyl alcohol) – unless the patient is allergic to chlorhexidine or under two months of age.[27,28]

Change Ideas: Skin prep with CHG

- Include 2% CHG swabs in with CVC insertion kits and on the CVC line cart.
- Include skin prep with 2% CHG as an item on insertion checklist.

"Hardwire" the Insertion Bundle in Improvement Plans: Hardwiring for the Central Line Insertion Bundle includes routine reminders to help the steps below become a part of daily care:

- Educate providers and staff on the existing evidence and how implementation and adherence to the insertion bundle guidelines has reduced CLABSI rates.
  - —In list a physician champion to help communicate the evidence and implementation, and mentor both providers and the improvement team.
- Engage staff and providers in the design and development of tools and support systems such as an insertion checklist and a CVC line cart.
- Implement the use of an insertion checklist and empower the designated observers to enforce use of the checklist and adherence to recommended insertion practices.
- Audit the checklists for compliance and provide feedback to providers regarding the audit results and recommendations for improvement to providers.

DAILY REVIEW OF LINE NECESSITY

One of the most effective strategies for preventing CLABSIs is to eliminate or reduce exposure to CVCs. The decision regarding the need for a catheter is complex, however, and difficult to standardize or incorporate into a practice guideline. Nevertheless, to reduce exposure to CVCs, the multidisciplinary team should adopt a strategy to systematically evaluate on a daily basis whether all catheters remain necessary or can be removed.[29,30]

- **Process Measure:** Compliance with daily review of the necessity for a central line.

Secondary Driver: Daily review of line necessity

Current CDC and SHEA/IDSA practice guidelines recommend daily review of line necessity and prompt removal of the line when no longer necessary.[31,32] Often central lines are kept for days after the need for them no longer exists simply because they are convenient to use. Line removal becomes easy to overlook; the line is perceived as "a part of the patient." Establishing a regular process to review line removal will ensure that CVCs are not kept in longer than needed for the patient.

Change Ideas: Daily review of line necessity

- Combine daily review of line necessity with other best practices reviews such as daily urinary catheter review.
- Incorporate daily review into routine workflow, such as charge nurse rounds or daily multi-disciplinary rounds. (See Appendix II for an example of a checklist for charge nurse rapid rounds, "Passport to Discharge").
- If using an electronic practice management system, institute computer-based pop-up reminders to review line necessity.

"Hardwiring" Daily review of line necessity into the Improvement Plan

To hardwire daily review of line necessity, make the process a part of the daily workflow. Do small tests of change with staff to determine the best implementation process. Methods for hardwiring include:

- Adding daily review of line necessity as a standing item in nurse-to-nurse hand-off reports.
- Auditing daily line review compliance and providing feedback to the care team. If compliance is low, ask "why," and engage staff in identifying problems and refining the process of daily review.

STANDARDIZE THE MAINTENANCE PROCESS

The bundle approach provides a means to incorporate evidence-based interventions into patient care. Adopt and embed evidence-based guidelines (bundle) for CVC maintenance after insertion across care settings. Because a significant proportion of central line-days and CLABSI occur in non-ICU settings, it is important to include them in the maintenance process implementation.[33] Implementation of a post-insertion care bundle in addition to an insertion bundle has been shown to be effective in reducing CLABSI.[34]

Current recommendations for most CVCs from CDC/NHSN guidelines and SHEA/IDSA practice recommendations include:

1. Use sterile, transparent, semi-permeable dressing (or sterile gauze) to cover the catheter site.
   a. Replace site dressing every 7 days (every 2 days if made of gauze) or if it becomes loose/soiled/damp
   b. Use of topical antibiotic ointment or creams is not recommended unless the line is a dialysis catheter.
2. Replace administration tubing not used for blood, blood products, or lipids at intervals not longer than 96 hours.
   a. See CDC Guidelines regarding blood products, fat emulsions, etc.
3. Establish and implement facility guidelines for intra-venous fluid administration bag changes.

(For further details, please see the actual guidelines referenced above as "Key Resources"):

- **Process Measure:** Monitor Central Line Maintenance Bundle Compliance; either individual bundle element compliance or all-or-none bundle element compliance. See Appendix III for an example of a CVC Maintenance Audit/Monitoring tool.

Secondary Driver: Bundle together elements

Bundling care practices and supplies together helps the caregiver to remember the evidence-based practices required and to comply with the guidelines.

Change Ideas: Bundle together elements

- Have supplies and equipment stored together and easily available, e.g. central line dressing kits, chlorhexidine dressings, IV fluid infusion bags, and administration sets.
- Have supplies for accessing IV tubing and ports together and easily available, e.g. chlorhexidine, povidone iodine, an iodophor, or 70% alcohol.

Secondary Driver: Incorporate into daily assessment and review

Incorporate a daily review of the maintenance bundle to ensure that dressings, adminstration tubing and IV fluid are current and not expired. If any element is found during the review to not be current, establish a process to replace that element.

Change Ideas: Incorporate into daily assessment and review

- Perform maintenance bundle review along with daily line necessity review. (See Appendix II).
  - Items to review can be included in the charge nurse's checklist. If the bedside nurse has not had time to change the dressing or administration tubing, for example, the charge nurse can delegate the task to another nurse.

"Hardwiring" Guidelines for catheter maintenance in Improvement Plans

Strategies to hardwire catheter maintenance and Maintenance Bundle compliance are similar to those used for Insertion Bundle and daily line necessity reviews. Making the implementation and review processes as routine as possible will assure that CLABSI prevention is addressed in every patient with a CVC in any care area.

- Incorporate daily Maintenance Bundle item review along with Line Necessity review into the daily workflow.
- Include bundle review as a standing item in nurse-to-nurse hand-off reports. Enlist all shifts (24/7) in reducing risk of harm by implementing the guidelines and performing necessary tasks such as dressing changes.
- Review central line care and maintenance with staff upon hire and at least annually and assess staff competency in this arena.
- Audit maintenance care compliance and provide feedback to the care team. If compliance is low, ask "why", and engage staff in identifying problems and refining the process of implementation and review.

SPECIAL TACTICS – ADDITIONAL STRATEGIES "BEYOND THE BUNDLES"

Additional strategies are recommended to further reduce CLABSI rates if the rates remain unacceptably high after implementation of basic CLABSI prevention strategies. More research has emerged on the use of CHG dressings and CHG-containing sponge dressings, CHG bathing, the use of non-suture securement devices, the use of antimicrobial-impregnated CVCs for adult patients, and ultrasound guidance to place lines. Both SHEA/IDSA and CDC/NHSN guidelines also recommend against routine replacement of CVCs.[35,36]

Secondary Driver: Use of chlorhexidine (CHG)-containing dressings

Apply CHG-containing sponge dressings directly to the insertion site of temporary short-term catheters under a transparent dressing.[37,38,39] Also emerging as a recommendation for catheter sites is the use of a transparent dressing with infused CHG.[40]

- **Process Measure:** Dressing Compliance – include assessment of compliance with dressing changes in the monitoring of Maintenance Bundle compliance.

Change Ideas: CHG dressings

- Include CHG dressing use in staff trainings on CVC site care and maintenance and assess staff understanding and competency.
- Include CHG-infused sponge dressings or CHG dressings in the dressing kit or supplies.
- Review the use of CHG dressing sponges daily as part of the maintenance bundle review.

Secondary Driver: CHG bathing

Daily bathing with CHG has been shown to reduce the incidence of healthcare–associated bloodstream infections and is now a recommended practice as an additional intervention.[41,42,43,44] CHG bathing reduces the bio-burden on the patient's skin, and thereby reduces the risk of CVC site infection and CLABSI. Bathe patients with CVCs older than 2 months of age daily with 2% CHG.[45,46]

Change Ideas: CHG bathing

- Include CHG bathing as part of staff central line care and maintenance training, and assess staff competency.
- Have 2% CHG saturated cloths easily available to staff.
- Incorporate use of 2% chlorhexidine cloths for daily skin cleansing into the daily workflow such as nurses' aides' delivery of daily hygiene care.
- Review CHG skin cleansing daily as part of the Maintenance Bundle review.

Secondary Driver: Use of a non-suture securement device

The use of a non-suture securement device reduces the risk of infection at the CVC site and is included in the CDC/NHSN guidelines.[47]

Change Ideas: Non-suture securement device use

- Include a non-suture device in the CVC insertion kits. Do not include sutures in the kit. If the use of sutures is determined to be necessary for a particular patient, the provider can select the appropriate suture from a storage site on the CVC cart.

Secondary Driver: Antimicrobially-impregnated CVCs for adult patients

Use a CVC impregnated with CHG/silver sulfadiazine or minocycline/rifampin in patients whose catheter is expected to remain in place for more than 5 days. Use of antimicrobially-integrated CVCs can also be an additional strategy to reduce CLABSI rate, if the rate does not decrease after the implementation of Insertion and Maintenance Bundles.[48,49] Consider the use of these CVCs in other situations, such as for inpatients with limited venous access and a history of recurrent CLABSI, and for patients who have increased risk for severe sequelae from a CLABSI (e.g. patients with recently implanted intravascular devices).[50]

Secondary Driver: Ultrasound guidance for line placement

The use of ultrasound (US) to guide insertion may reduce the risk of iatrogenic harm and increase accuracy of line placement. Studies have demonstrated that, as compared to the technique of using landmarks, US guidance in placement of CVC in adults and children decreases the number of anatomical sites utilized and decreases the number of attempts to achieve successful placement.[51,52,53] US guidance may therefore decrease patient discomfort, risk of harm, and time to successful CVC placement, and may increase compliance with insertion guidelines. US guidance may encourage the use of the subclavian or internal jugular entry site vs. the femoral site because US guidance reduces the risk of iatrogenic pnuomothorax and other complications.

Change Ideas: Ultrasound guidance for line placement

- Have the physician champion and other early adopters promote the use of ultrasound guidance.
- Ask the lead physician to host in-services which provide Continuing Medical Education credit (CME) on the use and benefit of using ultrasound for CVC placement. Include hands-on practice for physicians attending.

Secondary Driver: Do not routinely replace CVCs

Routine replacement of CVCs is NOT recommended by either CDC/NHSN guidelines or SHAE/IDSA. CVCs including PICCs should not be removed on the basis of fever alone. CDC/NHSN recommends that physicians use clinical judgment regarding the appropriateness of removing the CVC if infection is evidenced elsewhere or if a non-infectious cause of fever is suspected.[54] CDC/NHSN guidelines also caution against the use of routine guidewire exchanges to prevent infection and to replace a catheter suspected of infection

Change Ideas: Do not routinely replace CVCs

- Incorporate into policy the recommendation that CVCs are not to be replaced routinely.

Secondary Driver: Patient and Family Engagement: Involve patient and families in infection prevention practices

- Educate patients and families on steps being taken to prevent centeral line infections. Educate using teach back. Patients and family education should include purpose of a central line, why the patient has one, expected duration of use, why it is important remove it as soon as it is no longer needed. Also educate using teach back that the care team reviews need of the central line daily and the care the central line will receive. Invite the patient and the family to remind health care providers to wash their hands and to ask each day if the central line continues to be necessary.

Additional strategies to consider[55]:

- Increase focus on hand hygiene during maintenance care such as dressing changes. Studies have shown that hand hygiene non-compliance is a widespread problem in healthcare.
  - Wash hands with an alcohol-based waterless product or with antiseptic soap and water,
  - To support compliance, have the product readily available, e.g. in pumps at room entry or at the bedside.
  - One of the barriers to compliance may be the drying effect of a hand hygiene product on care giver skin, which may result in discomfort and skin breakdown. If possible, use a

hand hygiene product with an added emollient to help condition the skin, or add a moisturizer that is compatible with the hand hygiene product and does not diminish its antiseptic properties.

— Audit hand hygiene behavior and provide feedback to staff.

- Use of antimicrobial locks for CVCs
- Use of needle-less intravascular catheter systems
- Scrub the hub with a CHG preparation or 70% alcohol and use disinfection caps to reduce contamination. Disinfection of catheter hubs, needle-less connectors, and injection ports prior to accessing the catheter is recommended; clean them with alcoholic chlorhexidine preparation or 70% alcohol to reduce contamination. However, there is no single method for hub disinfection. "Scrub the Hub" is a recommendation to use an alcohol preparation as described above to scrub the hub with friction in a twisting motion. Length of scrub time recommendations range from 10 to 15 to 30 seconds. See Appendix V for "Scrub the Hub" poster examples.

— IHI general Scrub the Hub instructions :

- Perform hand hygiene.
- Put on clean gloves prior to accessing the line.
- Perform a 30-second "hub scrub " using alcohol and friction in a twisting motion on the hub (as if juicing an orange).
- Infuse medication or draw blood and label as per the policy.
- Discard gloves and perform hand hygiene.

POTENTIAL BARRIERS:

- Clinicians may believe that they are complying with these activities, especially if the CLABSI rate is low, but documentation of compliance with both insertion and maintenance bundles is critical to promote reliability and ensure the effectiveness of these interventions. Monitoring to confirm compliance includes:

— Do a spot check to determine bundle compliance for each element by checking 5 patients with CVCs (including PICCs).

- Were all of the insertion bundle elements completed?
- Is the site dressed according to the guidelines, is the dressing current, and is the CHG sponge applied correctly?
- Is the administration tubing current?
- Was staff documentation of ordering and administering medications for PUD and VTE prophylaxis appropriate?

- Recognize that many physicians will perceive these interventions as a change in their practice.

— Traditionally, CVC line insertion was solely the physician's responsibility, and did not include inter-dependent components such as ensuring insertion bundle compliance by non-physician staff. Protocols and "bundles" are perceived by some physicians as being "cookbook" medicine. To present, discuss, and implement these changes, select respected lead physicians to serve on the improvement team and advocate as champions with physician colleagues. The physician champion can re-frame these interventions as "best-recipe" medicine inspired by research findings to improve patient care options and reduce the risk of CLABSI.

— A provider inserting a CVC may resist following all the components of the Insertion Bundle if he or she must hunt and gather supplies such as items needed for maximal sterile barrier precautions. Promote compliance by developing a central line insertion cart and insertion kits that contain the equipment and supplies needed at the bedside and thereby reduce the effort needed for compliance. Engage both physician and nursing staff in designing the content and display of the cart and the insertion kits.

— Despite the research evidence showing benefits from these guidelines, some physicians may be reluctant to wear a cap or other items required for maximal barrier precautions. One hospital approached this challenge by discussing the research evidence and the pros and cons of the recommendations with the medical director of the ICU. The value of complying with the recommendations was emphasized. After the medical director and other early-adopter champions modeled the new practices, the rest of the medical staff agreed to adopt the evidence-based recommendations as well.

- Nurses may feel uncomfortable with "Stopping the Line" for an observed violation of infection control practices as outlined on the insertion checklist. The nurses may perceive that their job is not to "police" physicians, and physicians may perceive that their credibility and authority would be challenged if they were critiqued or corrected by nursing staff. To address these potential concerns…

— Both physician and nursing leadership need to be visible and to communicate the expectations of adherence to the Insertion Bundle. They can coach staff on the importance of consistency in procedure implementation, and on how to "Call a Halt" or "Stop the Line.[62]

— Have unit leadership meet with nursing and physician staff to emphasize that the focus should be on teamwork to promote patient safety and improve patient outcomes.

— Develop an algorithm for the observer to follow if a "Stop the Line" intervention is resisted. For example, the observer could page the unit director 24/7 to intervene.

— Audit the percentage of central venous catheter insertions that had the checklist properly completed. Calculate the rates of compliance with evidence-based practice and the number of corrections required. Make the results known to providers and enlist the providers in developing methods for improvement.

Use administrative leadership support to help remove or mitigate barriers

- Enlist an executive sponsor who recognizes the value of preventing CLABSI to the organization and its patients, and who can provide solutions and resources needed to facilitate implementation. An executive sponsor can help staff see the "big picture" i.e. how these changes can benefit the entire organization. A sponsor can also advocate for and obtain necessary funding, staffing, and supplies, overcome implementation barriers, and inform and educate relevant stakeholders and the governing board.
- Utilize respected senior physicians as "opinion leaders" who can trial these changes in their local units, and then advocate for organization-wide adoption of successful best practices.
- Begin implementation with early-adopter physicians who can lead and recruit other early-adopter champions from among specialty groups and intensivists.

Don't just change the practice, change the culture

- Instituting the CLABSI Insertion and Maintenance Bundles will require a change in culture, particularly among physicians, who will be asked to evolve their practice of individualizing management for each patient towards a more standardized, multi-disciplinary approach. Physicians may be concerned about the perceived risks of loss of control and shared responsibility; encourage physicians to actively monitor the effectiveness of these multi-disciplinary interventions to reduce CLABSI rates.
- Many physicians prefer to learn from peers rather than by following theoretical "expert advice." Use lead physicians as peer educators to advocate for the adoption of improvements such as a CVC insertion bundle and to model the new practices.
- Begin the trial with a small test-of-change in one unit or area and then disseminate successful results more widely across the organization. The ideal outcome is the development of team-based care wherein each member of the team (physician, nurse, technicians) contributes to improved quality of patient care.

TIPS FOR USING THE MODEL FOR IMPROVEMENT

- Implement the CVC Maintenance Bundle and Line Necessity Review one unit at a time.
  — Engage front line staff from the beginning on process design and on the adoption and adaptation of procedures.
- Testing Maintenance Bundle and Line Necessity (this can be done in any area not just critical care)
  — Step One: Plan –
    - Do not reinvent the wheel. Pick a daily review tool that has been successful at another hospital and adapt it for your facility. (See Appendix II and III for examples).
    - Test one step at a time. Design how the implementation process is supposed to happen, e.g. the day shift change nurse on morning rounds will review Maintenance Bundle items and Line Necessity with the bedside nurse.

  — **Step Two: Do –**
    - Ask a receptive, early-adopter bedside nurse and the charge nurse to trial these changes on their next patient with a CVC.
    - Test "small": Coordinate with the trial nurses to begin the daily review of the Maintenance Bundle and Line Necessity with one patient.

  — **Step Three: Study –**
    - Debrief as soon as possible after the test with those involved, asking:
    - What happened?
    - What went well?
    - What didn't go well?
    - What do we need to do differently next time?

  — **Step Four: Act –**
    - Do not wait for "the next committee meeting" to make changes. Revise the procedures and re-test as soon as possible with the same bedside nurse and charge nurse.

THESE STEPS WILL HELP TO PROMOTE RISK REDUCTION FOR CVC INSERTION AND MAINTENANCE AND IMPROVE QUALITY OF CARE AND PATIENT OUTCOMES.

Saint Thomas Hospital
CENTRAL LINE INSERTION PROCEDURAL CHECKLIST

(To be completed by RN assisting with procedure)

Date of Insertion _____ **Unit** _____

Physician Inserting Line _____ **RN Assisting** _____

Procedure: ☐ New Line ☐ Rewire ☐ Elective ☐ Emergency

Line Type*: (Non tunneled catheters only)

a) ☐ Double/Triple/Quad Lumen
b) ☐ Swan-Ganz Catheter
c) ☐ Hemodialysis Catheter
d) ☐ Other _____ (Document what type)

**Does not include arterial line insertions.

Location:

a) ☐ Subclavian (Preferred site)*
b) ☐ Internal Jugular
c) ☐ Femoral

* State reason if subclavian site not used:

Maximal Barrier Precautions to be used with ALL patients during insertion:

a)	Hand Hygiene performed before insertion?	☐ Yes	☐ No
b)	Mask and Hat worn by physician?	☐ Yes	☐ No
c)	Sterile Gown worn by physician?	☐ Yes	☐ No
d)	Large Sterile Drape used?	☐ Yes	☐ No
e)	Chloraprep Skin Prep used?	☐ Yes	☐ No
f)	Mask worn by other staff in room?	☐ Yes	☐ No
g)	Hand Hygiene performed after insertion?	☐ Yes	☐ No

Dressing:

a) Sterile Dressing applied to site? ☐ Yes ☐ No

Return this form to the Infection Prevention Department.

PATIENT LABEL

Central Line Procedural Checklist[63]

Indication: To document procedural practices in the CCU related to insertion technique for CVP lines, dialysis access ports, and central lines (including PICC).

Type of catheter:	☐ Central Line	Location:	_____
	☐ CVP	Location:	_____
	☐ Dialysis Catheter	Location:	_____
	☐ PICC Line	Location:	_____
Is this a NEW line:	☐ Yes	☐ No	
Is the procedure:	☐ Elective	☐ Emergent	☐ _____
	☐ Rewire	☐ Re-position	

Procedural Checklist

SAFETY PRACTICE	YES	YES (AFTER REMINDER)
Before procedure, did the provider:		
PERFORM PROCEDURAL PAUSE		
Perform patient ID x2	☐	☐
Announce the procedure to be performed	☐	☐
Mark/assess site	☐	☐
Position patient correctly for the procedure	☐	☐
Assemble equipment/verify supplies	☐	☐
Utilize relevant documents (chart/forms)	☐	☐
Order follow-up Radiology images (PRN)	☐	☐
Cleanse hands? (ASK, if unsure)	☐	☐
Prep procedure site with ChloraPrep? **30 seconds for dry site* ***2 minutes for moist site (esp. femoral)*	☐	☐
Use large drape to cover patient in sterile fashion?	☐	☐
During procedure, did the provider:		
Wear sterile gloves during catheter insertion?	☐	☐
Wear hat, mask, and sterile gown?	☐	☐
Maintain sterile field?	☐	☐
Use ultrasound/Sonasite if appropriate?	☐	☐
Did assisting physician follow the same precautions? (hand washing, mask, gloves, gown)	☐	☐
Did all staff and patient in the room wear a mask?	☐	☐
After the procedure:		
Was sterile technique maintained when applying dressing?	☐	☐
Was dressing dated?	☐	☐

NAME OF INTENSIVIST _____ NAME OF PROCEDURE MD _____

NAME OF ASSISTING MD _____ NAME OF RN (AUDITOR): _____

TODAY'S DATE _____ ROOM _____ CCU BED _____

Please Return Completed Form TO: "BSI FORMS" LABELED ENVELOPE IN CCU-7 CONFERENCE ROOM
PATIENT LABEL VIRGINIA MASON MEDICAL CENTER CENTRAL LINE PROCEDURAL CHECKLIST

Appendix II: Example of a Charge Nurse Rapid Rounds Checklist

PASSPORT TO DISCHARGE

Patient label

Arrived on unit on _____ at _____ from _____

Purposeful rounding done within 24 hours of admission by _____
on _____ at _____ .

"What is 'very good' care to you?"

"Very good care means: _____

Patient Safety/ Prevention Bundles Checklist

I. **Sepsis Screen completed** (first 2 hours of shift)

II. **Central line care**
- Next dressing change due
- IV fluid and tubing current
- Line necessity reviewed?

III. **DVT prophylaxis**
- Mechanical
- Medication
- Ambulation? If not, do we need PT?

IV. **Urinary Catheter: Does it meet criteria?**
- Obtain order for early removal

Patient/ Family Centered Care:

EMERGENCY CONTACT:

NAME:

NUMBER:

Notes from Rapid Rounds:

DATE	PLAN	RN

Appendix III: Example of a CVC Maintenance Audit/Monitoring Form

A — Central Venous Catheter Maintenance Observation Form (rev9/6/12)

1. Form completed on (MM/DD/YYYY): __ __/__ __/__ __ __ __
2. Name of data collector: _____
3. Unit ID: _____
4. Patient Date of Birth (MM/DD/YYYY): __ __/__ __/__ __ __ __
5. Name of patient: _____
6. Observation #: _____
7. Patient MRN: _____
8. Line type(s) (circle **one**): CVC other than port port both

B — Daily Goals

1. Was consolidation and/or elimination of catheter entries (blood draws, flushes, meds, etc.) **considered/discussed** with medical team? (circle) Yes No
2. Was the necessity of lines for this patient discussed on daily patient rounds? (circle) Yes No

C — Dressing/Site Assessment

1. **Clean, dry, intact**? (circle) Yes No
2. **Dressing** date clear? (circle) Yes No

D — All entries into catheter (via caps/tubing/extensions) during this shift

1. Proper **hand hygiene** performed prior to all catheter entries? (circle) Yes No N/A (no line entries during this shift)
2. **Site disinfected** for each entry? (circle) Yes No N/A (no line entries during this shift)

E — Cap (attached to hub of catheter) changed on this shift? *(Complete subsection 1 or 2)*

1. If **Yes**, choose one reason: *(answer 1a-1d)*
   - o For **blood/ blood products/ lipids/ propofol push**, has been changed within **24 hours** since exposure
   - o For **propofol infusion,** has been within **6-12 hours** (change with tubing)
   - o Cap changed for another reason & explain why: _____
   - o Has been **at least** 72 hours since last changed
   - o Per institutional policy, has been within 24 hours since blood drawn through the cap

1a. **Sterile gloves** and **mask** worn by provider/assistant? (circle) Yes No

1b. **Cap-CVC connection site scrubbed** with alcohol or CHG prior to removal of old cap? (circle) Yes No N/A (port needle change)

1c. **Old cap** date/time clear? (circle) Yes No

1d. **New cap** date/time clear? (circle) Yes No *(go to section F)*

2. If **No**, choose one reason: *(and answer 2a)*
   - o Did not meet criteria for change
   - o Cap change **due but not changed** & explain why: _____
   - o N/A (Don't use caps)

2a. **Current cap** date/time clear? (circle) Yes No N/A (Don't use caps)

F — Tubing change on the shift? *(Complete subsection 1 or 2)*

1. If **Yes**, choose one reason: *(answer 1a-1f)*
   - o For **crystalloid,** change no more frequently than **96 hours**
   - o For **TPN fluid** (not including lipids), change no more frequently than **96 hours**
   - o Tubing changed for another reason & explain why: _____
   - o For **blood/ blood products/ lipids** has been within **24 hours** since last changed? For **propofol infusion,** has been within **6-12 hours?**

1a. **Old tubing** date/time clear? (circle) Yes No

1b. **New tubing** date/time clear? (circle) Yes No

1c. Tubing change **included all connectors, extensions, and caps connected to tubing**? (circle) Yes No N/A (no add-ons)

1d. **Connection site scrubbed** with alcohol or CHG prior to removal of old tubing? (circle) Yes No NA (no cap)

1e. **Mask** worn for reconnection of new tubing to hub of catheter? (circle) Yes No N/A *(if reconnected to injection cap)*

1f. **Sterile gloves** worn for reconnection of new tubing to hub of the catheter? (circle) Yes No N/A *(if reconnected to injection cap)*

2. If **No**, choose one reason: *(and answer 2a)*
   - o **Did not meet criteria** for change
   - o Tubing change **due but not changed** & explain why: _____

2a. **Current tubing** date/time clear? (circle) Yes No N/A (No tubing)

G — External CVC Dressing change on this shift? *(Complete subsection 1 or 2)*

Appendix III: Example of a CVC Maintenance Audit/Monitoring Form

1. If **Yes**, choose one reason (and complete section H):
   - o **Has been 7 days** since last changed (**transparent** dressing)
   - o **Has been 2 days** since last changed (**gauze** dressing)
   - o Dressing was **soiled, loose, damp**
   - o Dressing changed for another reason & explain why: _____

2. If **No**, choose one reason: *(and skip section H)*
   - o Did not meet criteria for change
   - o Dressing change **due but not changed** & explain why: _____

H External CVC Dressing change procedure (complete this section if changed dressing on this shift)

1. **Hand hygiene** performed? (circle)	Yes	No hand	6. Site **scrubbed** with 2% CHG for **30 sec** (2 min groin) followed by **30-60 sec dry time**? (circle)	Yes	No scrdry
2. **Sterile gloves** worn? (circle)	Yes	No glove	7. If 2% chlorhexidine was **not used**, was **patient < 2 months of age**? (circle)	Yes	No ptage
3. **Mask** worn by **provider/assistant**? (circle)	Yes	No pamask	8. If 2% chlorhexidine was **not used**, was **patient allergic**? (circle)	Yes	No ptall
4. **Shield patient** face, ETT, or trach from dressing change site (i.e., mask, drape)? (circle)	Yes	No shieldpt			
5. **New Dressing** date clear? (circle)	Yes	No dress			

If an implanted port is in place and a needle/dressing was changed on this shift, complete Section I & J

I Indwelling CVC/Port Needle change on this shift? ***(Complete subsection 1 or 2)***

1. If **Yes**, choose reason (and complete section J):
   - o **Has been 7 days** since last changed
   - o Needle **dislodged or infiltrated**
   - o Needle changed since **dressing soiled/loosened**
   - o Needle change **past due** by ____# of days
   - o Needle changed for another reason & explain why: _____

2. If **No**, choose one reason: *(and answer 2a and skip section J)*
   - o **Did not meet criteria** for change
   - o Needle change **due but not changed** & explain why: _____

   2a. **Current needle** date clear? (circle) Yes No

J Indwelling CVC/Port Needle/Dressing change procedure (complete this section if changed needle/dressing on this shift)

1. **Hand hygiene** performed? (circle)	Yes	No hand	6. **New dressing** date clear? (circle)	Yes	No dress
2. **Sterile gloves** worn? (circle)	Yes	No glove	7. Site **scrubbed** with 2% CHG for **30 sec** (2 min groin) followed by **30-60 sec dry** time? (circle)	Yes	No scrdry
3. **Mask** worn by **provider/assistant**? (circle)	Yes	No pamask	8. If 2% chlorhexidine was **not used**, was **patient < 2 months of age**? (circle)	Yes	No ptage
4. **Shield patient** face, ETT, or trach from dressing change site (i.e., mask, drape)? (circle)	Yes	No shieldpt	9. If 2% chlorhexidine was **not used**, was **patient allergic**? (circle)	Yes	No ptall
5. **New needle** date clear? (circle) Yes No Needle change not done					

Appendix IV: Examples of Maintenance Bundle Checklists

SITUATION	CAP CHANGE	TUBING CHANGE	DRESSING CHANGE
ALL CENTRAL LINES — INCLUDES PAC, DIALYSIS CATH, PHERESIS CATH, BROVIACS, AND PICCS	EVERY 72 HOURS UNLESS NECESSARY SOONER BECAUSE OF ONE OF THE CIRCUMSTANCES BELOW	EVERY 72 HOURS UNLESS NECESSARY SOONER BECAUSE OF ONE OF THE CIRCUMSTANCES BELOW	MONDAYS AND AS NEEDED – REMEMBER TO INCLUDE NEEDLE LENGTH AND GAUGE FOR PAC DRESSINGS
Blood products (PRBCs, FFP, platelets, cryo)	WITHIN 4 HOURS	WITHIN 4 HOURS	
Propofol	EVERY 24 HOURS	EVERY 24 HOURS	
TPN, PPN, &/or Lipids	EVERY 24 HOURS	EVERY 24 HOURS	
Neutropenia	EVERY 24 HOURS	EVERY 24 HOURS	
Labs drawn through cap	Within 24h of lab draw		
Blood visible in cap	IMMEDIATELY		

Is your **dressing** occlusive and clean, dated and timed, marked with PAC needle gauge/length and initialed?
Is your **tubing** dated and timed for next change?
Are your **caps** non-bloody and dated/timed for next change?
Have you **documented** line necessity (q24hrs) in computer, discussed PO med conversion with the MD/PharmD, completed the NACHRI care and maintenance form, utilized the MAP (back of report sheet), and updated the family calendar?

Arkansas Children's Hospital
CVC MAINTENANCE CHECKLIST

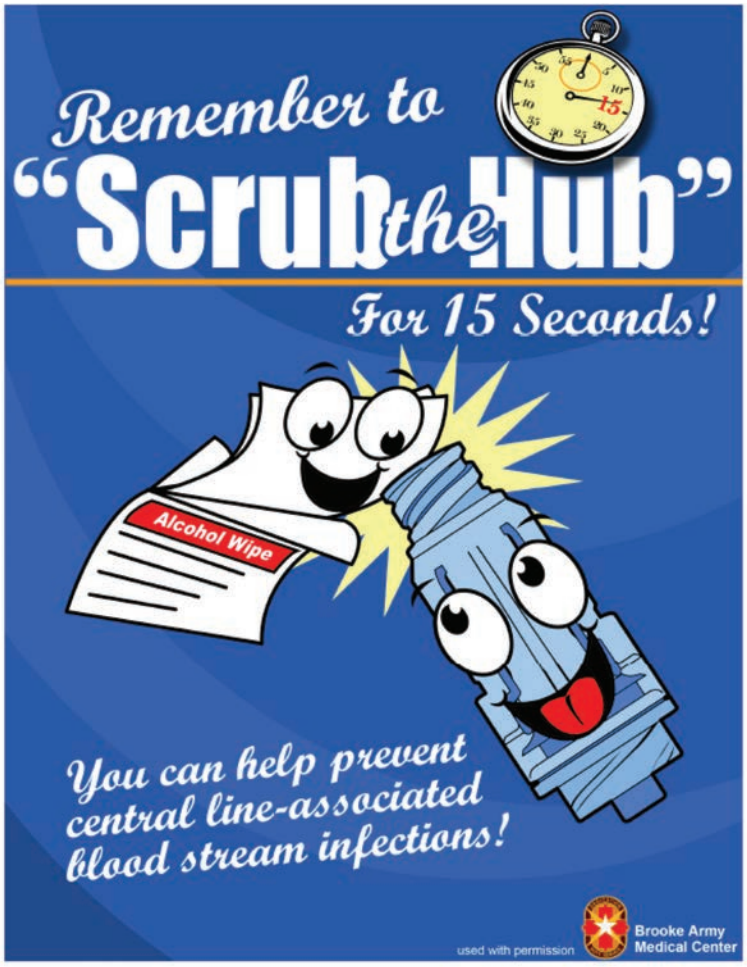
PLACE PATIENT LABEL HERE

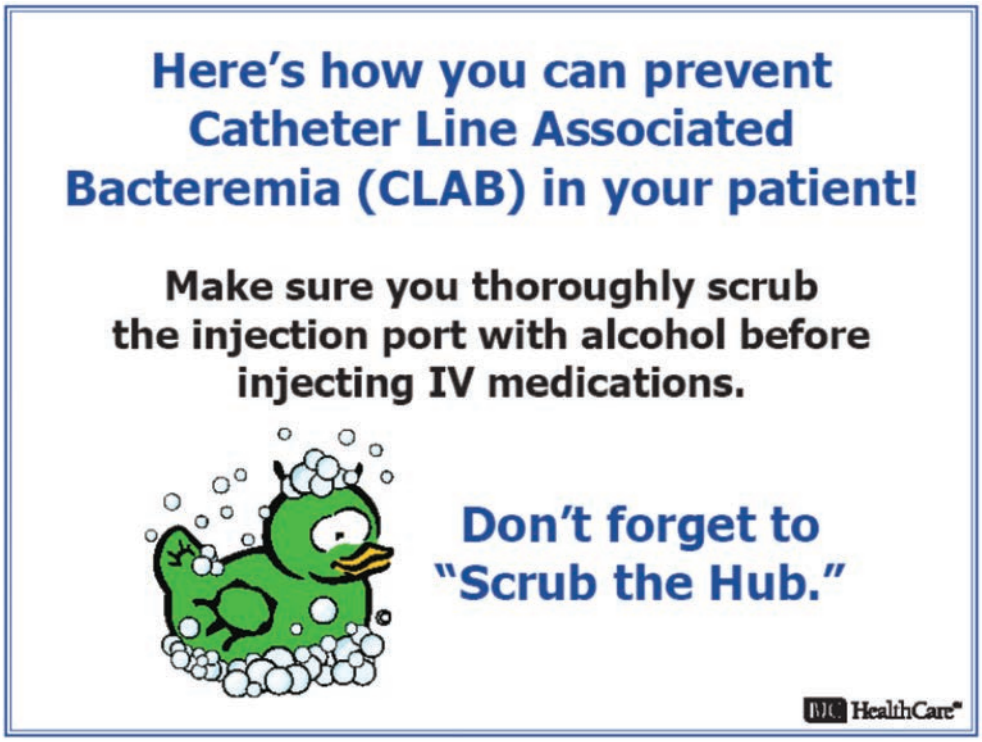
DATE _____ NAME OF STAFF _____

TYPE OF LINE: ☐ CVC ☐ PICC ☐ PORT ☐ BROVIAC ☐ DIALYSIS

PRACTICE	YES	NO	COMMENTS
Is CVC still required for this patient?	☐	☐	
If not, has removal been discussed with the medical team?	☐	☐	
DRESSING CHANGE			
CVC dressing clean, dry, and intact?	☐	☐	
Insertion site visible under transparent dressing (around biopatch)?	☐	☐	
Transparent dressing changed within the last 7 days, if necessary or applicable?	☐	☐	
Gauze and tape dressing changed within the last 2 days, if necessary or applicable?	☐	☐	
Label/document date dressing last changed or due to be changed?	☐	☐	
IF dressing was changed today, complete below			
• Hand hygiene performed?	☐	☐	
• Mask worn by all care providers during dressing change?	☐	☐	
• Sterile technique used?	☐	☐	
• Site scrubbed with CHG for 30 seconds followed by a 30-60 second drying time?	☐	☐	
• Catheter secured by a suture-free securement device?	☐	☐	
ACCESSING LINES: TUBING CHANGES			
All lines labeled with the date and time tubing was changed or is due to be changed?	☐	☐	
IF any tubing changed today, complete below			
• Hand hygiene performed?	☐	☐	
• Sterile technique used and mask worn?	☐	☐	
• All hubs and connections scrubbed with CHG for at least 30 seconds followed by a 30-60 drying time prior to disconnection?	☐	☐	

Appendix V: Scrub the Hub Poster Examples





Central Line Associated Blood Stream Infection (CLABSI) Top Ten Checklist

TOP TEN, EVIDENCE BASED INTERVENTIONS				
PROCESS CHANGE	IN PLACE	NOT DONE	WILL ADOPT	NOTES (RESPONSIBLE AND BY WHEN?)
Implement the Insertion Bundle: Procedural pause, hand hygiene, aseptic technique for insertion and care, site selection of subclavian (preferred) or internal jugular (acceptable), avoidance of femoral vein in adults, maximal sterile precautions, and skin prep with 2% chlorhexidine.	☐	☐	☐	
Implement an insertion checklist to promote compliance and monitoring.	☐	☐	☐	
Implement a "Stop the Line" approach to the insertion bundle. If there is an observed violation of infection control practices (e.g. maximal sterile barrier precautions, break in sterile technique), line placement should stop and the violation corrected.	☐	☐	☐	
Adopt the maintenance bundle with dressing changes (every 7 days for transparent dressings), line changes, and IV fluid changes. Incorporate dressing changes into daily assessment and review. Can be part of charge nurse's checklist along with the daily review of line necessity.	☐	☐	☐	
Incorporate a daily review of line necessity into workflow, e.g. charge nurse rounds. Use an electronic health care record prompt.	☐	☐	☐	
Use a chlorhexidine impregnated sponge dressing.	☐	☐	☐	
Use 2% chlorhexidine impregnated cloths for daily skin cleansing.	☐	☐	☐	
Do not routinely replace CVCs, PICCs, hemodialysis catheters, or pulmonary artery catheters.	☐	☐	☐	
Use a suture-less securement device.	☐	☐	☐	
Use ultrasound guidance to place lines if this technology is available.	☐	☐	☐	

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