

Preventing Peripheral Intravenous Catheter-Related Bloodstream Infections:

A Bundle Approach



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Program Information

- This program is provided by HMP Education, an HMP Global company
- Supported by an educational grant from 3M Health Care, Medical Solutions Division

Learning Objectives

- Recognize the components of a bundle approach to prevent PIV-BSI
- Identify the importance of appropriate catheter insertion technique and site protection
- Discover strategies for dressing and cap selection and application to prevent PIV-BSI
- Explain the significance of the bundle approach in reducing PIV-BSI risk

IHI Bundle

Q: What is a bundle?

A: IHI developed the concept of “bundles” to help health care providers more reliably deliver the best possible care for patients undergoing particular treatments with inherent risks. A bundle is a structured way of improving the processes of care and patient outcomes: a small, straightforward set of evidence-based practices—generally three to five—that, when performed collectively and reliably, have been proven to improve patient outcomes.

IHI Bundle

Q: What makes a bundle so special?

A: The power of a bundle comes from the body of science behind it and the method of execution: with complete consistency. It's not that the changes in a bundle are new; they're well-established best practices, but they're often not performed uniformly, making treatment unreliable, at times idiosyncratic. A bundle ties the changes together into a package of interventions that people know must be followed for every patient, every single time.

IHI Bundle

Q: So a bundle is a list of the right things to do for a given patient?

A: It resembles a list, but a bundle is more than that. A bundle has specific elements that make it unique.

The changes are all necessary and all sufficient, so if you've got four changes in the bundle and you remove any one of them, you wouldn't get the same results—meaning: the patient won't have as high a chance of getting better. It's a cohesive unit of steps that must all be completed to succeed.

The changes are all based on randomized controlled trials, what we call level 1 evidence. They've been proven in scientific tests and are accepted, well-established. There should be no controversy involved, no debate or discussion of bundle elements.

IHI Bundle

Q: What's the difference between a bundle and a checklist?

A: A checklist can be very helpful and an important vehicle for ensuring safe and reliable care. The elements in a checklist are often a mixture of nice-to-do tasks or processes (useful and important but not evidence-based changes) and have-to-do processes (proven by randomized controlled trials). A checklist may also have many, many elements.

A bundle is a small but critical set of processes all determined by level 1 evidence. And it needs to meet all the criteria I described previously. Because some elements of a checklist are nice to do but not required, when they are not completed, there may be no effect on the patient. When a bundle element is missed, the patient is at much greater risk for serious complications.

PIVC Definitions



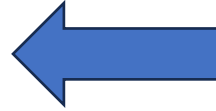
- Short peripheral catheter
 - Inserted in superficial veins
- Long peripheral catheter
 - Inserted in superficial or deep peripheral veins
 - Using traditional technique or MST/ AST techniques
- Midline catheter
 - Inserted in the peripheral veins of the upper arm with terminal tip location just distal to the axilla in adults
 - Pediatric patients may have midlines in the scalp or lower extremity as well

PIVC = peripheral intravenous catheter; MST = modified Seldinger technique; AST = accelerated Seldinger technique.

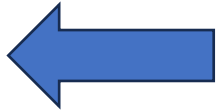
Gorski LA, et al. *J Infus Nurs.* 2021;44(1S Suppl 1):S1-S224.

Causes of Catheter Failure

Phlebitis



Infection



Skin injury

Dislodgement

Infiltration/extravasation

Leaking

Occlusion

Evidence-Based Bundle Interventions

Asepsis

- Skin antisepsis
- ANTT aseptic field/components

Device Securement

- Dressings
- Securement devices
- Site protection

Patency

- Flushing and locking

Key Concepts for Preventing PVC Complications

- Site selection and insertion
- Skin antisepsis
- Site protection and catheter securement
- Protection of the intraluminal space



Site Selection

Vascular visualization

Areas to avoid

- Radial wrist
- Brachial and basilic veins above the antecubital space
- Areas of flexion
- Extremities with axillary lymph node dissection
- Compromised skin
- Areas of infection
- Extremity with compromised blood flow or sensation (paralysis/hemiparesis)
- Visible veins on the chest, breast, or abdomen
- Lower extremity veins in adults
- Upper extremity vessels in patients with chronic renal failure









Site Selection Matters

Prospective sonographic evaluation of PIVC-associated thrombophlebitis by Mielke, et al. (2021), reported 68.18% of symptomatic and 90.63% of asymptomatic thrombus cases occurred with PIVC inserted at the antecubital fossa.

A prospective sonographic evaluation of peripheral intravenous catheter associated thrombophlebitis

Nicholas Mielke, Steven Johnson, et al., and Amit Bahi   [View all authors and affiliations](#)

Volume 23, Issue 5 | <https://doi.org/10.1177/11297298211009019>

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Abstract

Objective:

Thrombophlebitis associated with peripheral intravenous catheters (PIVCs) is a poorly described complication in the literature. Given limited accuracy of current assessment tools and poor documentation in the medical record, the true incidence and relevance of this complication is misrepresented. We aimed to identify risk factors in the development of thrombophlebitis using an objective methodology coupling serial diagnostic ultrasound and clinical assessment.

Methods:

We conducted a single-site, prospective observational cohort study. Adult patients presenting to the emergency department that underwent traditionally placed PIVC insertion and were being hospitalized with an anticipated length of stay greater than 2 days were eligible participants. Using serial, daily ultrasound evaluations and clinical assessments via the phlebitis scale, we identified patients with asymptomatic and symptomatic thrombosis. The primary goal was to identify demographic, clinical, and IV related risk factors associated with thrombophlebitis. Univariate and multivariate analyses were employed to identify risk factors for thrombophlebitis.

Results:

A total of 62 PIVCs were included between July and August 2020. About 54 (87.10%) developed catheter-related thrombosis with 22 (40.74%) of the thrombosed catheters were characterized as symptomatic. Multivariate cox regression demonstrated that catheter diameter relative to vein diameter greater than one-third [AHR = 5.41 (1.91, 15.4) $p = 0.0015$] and angle of distal tip of catheter against vein wall $\geq 5^\circ$ [AHR = 4.39 (1.39, 13.8) $p = 0.0116$] were associated with increased likelihood of thrombophlebitis.

Conclusions:

Our study found that the increased proportion of catheter relative to vein size and steeper catheter tip angle increased the risk of thrombophlebitis. Catheter size relative to vein size is a modifiable factor that should be considered when inserting PIVCs. Additional larger prospective investigations using objective methodologies are needed to further characterize complications in PIVCs.

Insertion Considerations

- Consider early referral to the vascular access specialist if patients have no palpable or visible veins
- Aseptic Non-Touch Technique
 - All components under the dressing must remain sterile
- Maximum sterile barriers for midline insertion



Skin Antisepsis

Use alcoholic chlorhexidine as the preferred skin antiseptic

- Single-use sterile applicator
- Dry time is key
- Manage sensitivities

Perform CHG bath treatments daily for all patients with central lines (in and out of ICU)

- Wiping six inches of the tubing and over the dressing

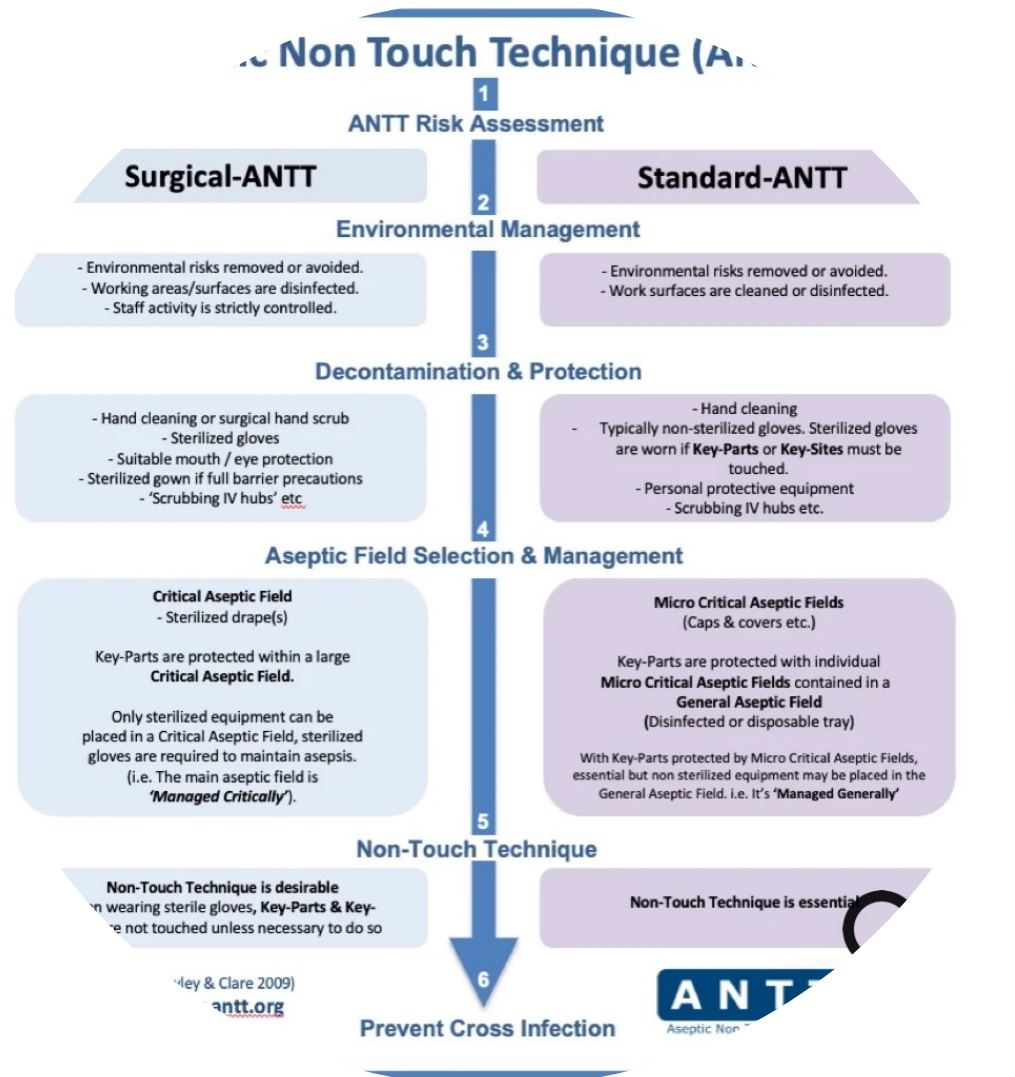
Current INS Guidelines for PIVC Management

- Implementation of a post-insertion bundle in conjunction with a culture of safety to reduce infection risk with daily care; dressings should provide site visibility, catheter securement, and a bacterial and viral barrier
- Multidisciplinary assessment of PVC need daily
- Assessment of the entire infusion system, bag to catheter, with each infusion intervention and at regularly established intervals
 - Patency
 - Site assessment visually and with palpation
- Dressing changes using aseptic technique at least every 7 days for transparent dressings and at least every 48 hours for gauze (neonatal exception)
- Use of sterile alcohol-free skin barrier to protect at-risk skin
- Use a securement method to stabilize all vascular access devices
- Protect the PVC when bathing or showering to prevent water contamination

Intraluminal Space Protection

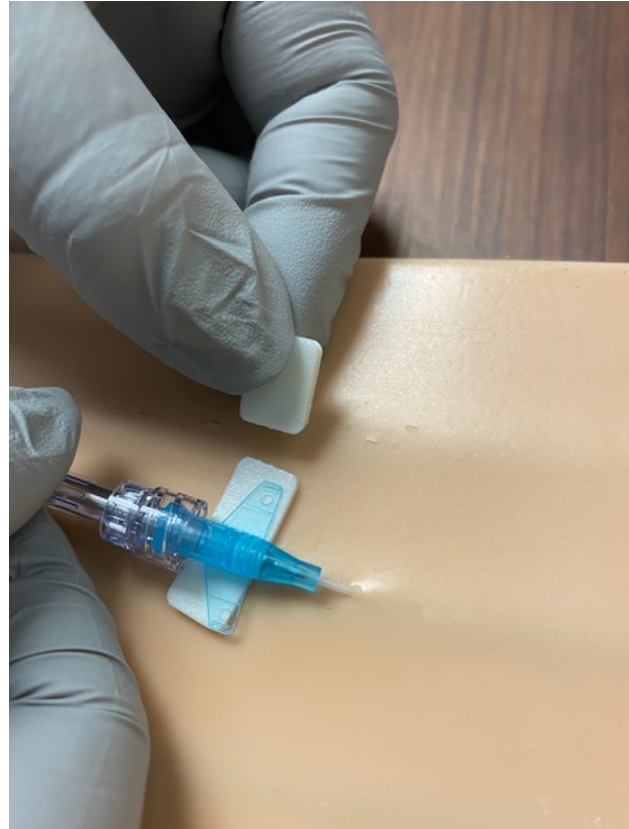
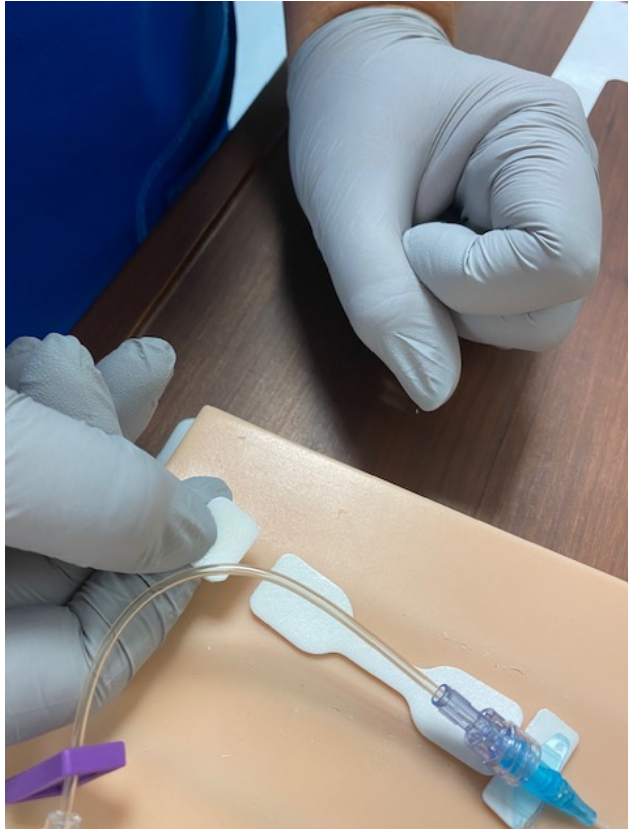
- Active or passive disinfection and proper changing of needleless connectors
 - Know how fluid is displaced by the connector
 - All connectors allow egress of microbes
 - Dry time is key
 - 5 seconds for alcohol
 - 20 seconds for CHG
 - Passive disinfection with devices provide a single-use physical barrier to contamination between accesses
- Adequate flushing
- Risk benefit assessment for blood withdrawal
- Appropriate tubing changes

ANTT



ANTT is critical for maintaining asepsis and preventing infections.

Practical Asepsis



All components under the dressing should be sterile.

Implementing the Aseptic Non Touch Technique (ANTT[®]) clinical practice framework for aseptic technique: a pragmatic evaluation using a mixed methods approach in two London hospitals

Simon Clare and Stephen Rowley

Abstract

Background: Aseptic technique is an important infection prevention competency for protecting patients from health-care-associated infection (HAI). Healthcare providers using the Aseptic Non Touch Technique (ANTT[®]) aseptic technique have demonstrated reduced variability and improved compliance with aseptic technique.

Objectives: The primary aim of this study is to determine whether standardizing aseptic technique for invasive IV procedures, using the ANTT[®] - Clinical Practice Framework (CPF), increases staff compliance with the infection prevention actions designed to achieve a safe and effective aseptic technique, and whether this is sustainable over time.

Methods: A pragmatic evaluation using a mixed-methods approach consisting of an observational audit of practice, a self-report survey and structured interviews with key stakeholders. Compliance with aseptic technique before and after the implementation of ANTT[®] was measured by observation of 49 registered healthcare professionals.

Results: Mean compliance with competencies was 94%; each component of practice was improved over baseline: hand hygiene = 63% ($P \leq 0.001$); glove use = 14% ($P \leq 0.037$); Key-Part protection = 54% ($P \leq 0.001$); a non-touch technique = 45% ($P \leq 0.001$); Key-Part cleaning = 82% ($P \leq 0.001$); and aseptic field management = 80% ($P \leq 0.001$).

Dressing Characteristics

- Breathable
- Adherent yet skin friendly
- Conform to catheter design
- Provide site visibility
- Easy to use for placement accuracy

Tape Strips Outside of the Transparent Window



Dressing Management

- Change TSM dressings at least q 7 days and whenever loose, soiled, or contaminated
- Change gauze dressings at least every 48 hours and whenever loose, soiled, or contaminated
- Change CHG gel dressings if blood fistulates outside of the dressing

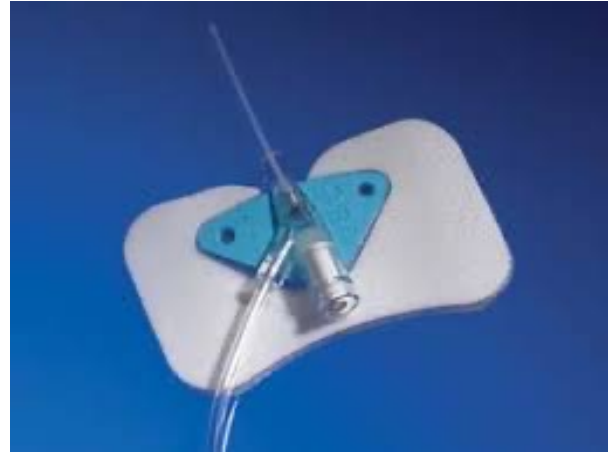
Site Protection and Securement

- Securement devices
 - Adhesive securement device (ASD)
 - The dressing and the ASD are replaced at routine intervals
 - Integrated securement devices
 - Proper application is key
 - Subcutaneous anchor systems
 - Doesn't have to be changed with the dressing
 - May carry risk of granulation tissue formation
 - Tissue adhesive
 - Medical-grade cyanoacrylate
 - Reapplied at dressing changes and will require adhesive remover if within 3 days of application

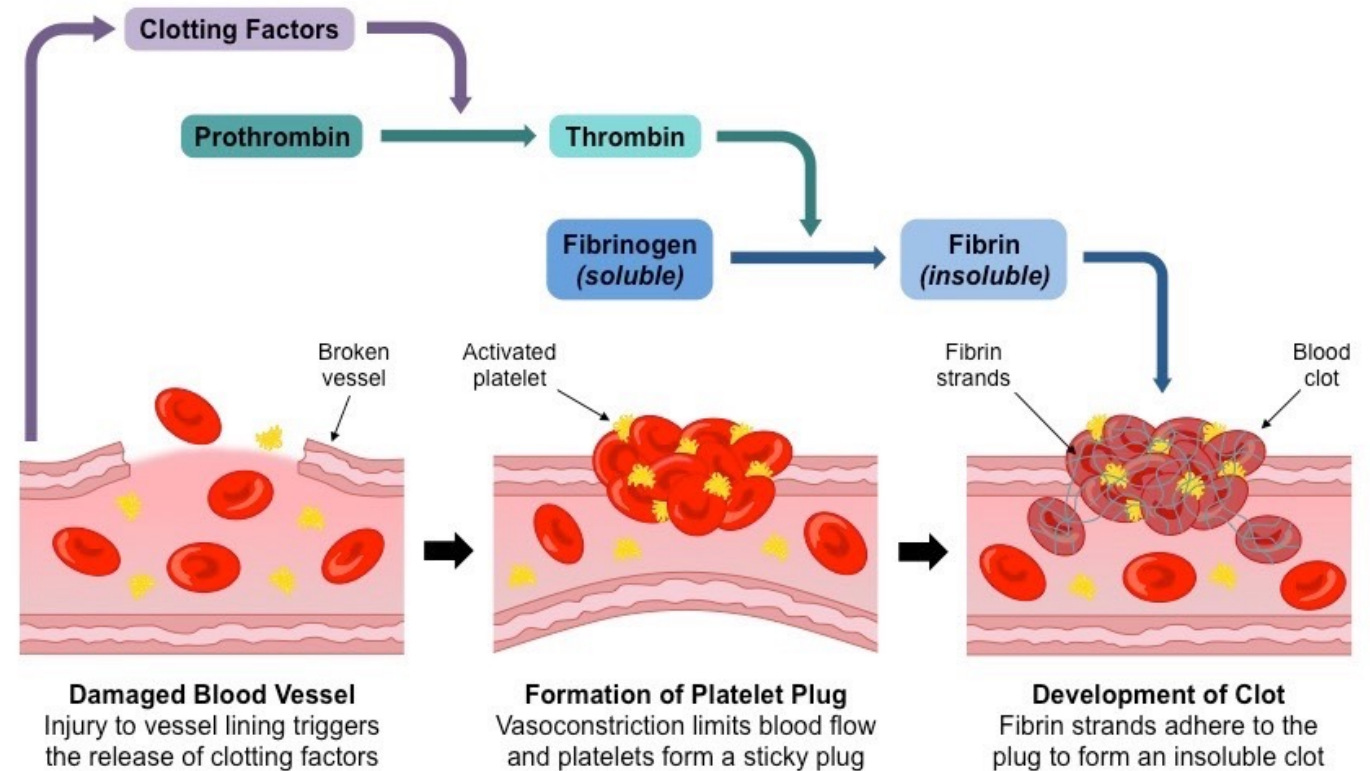
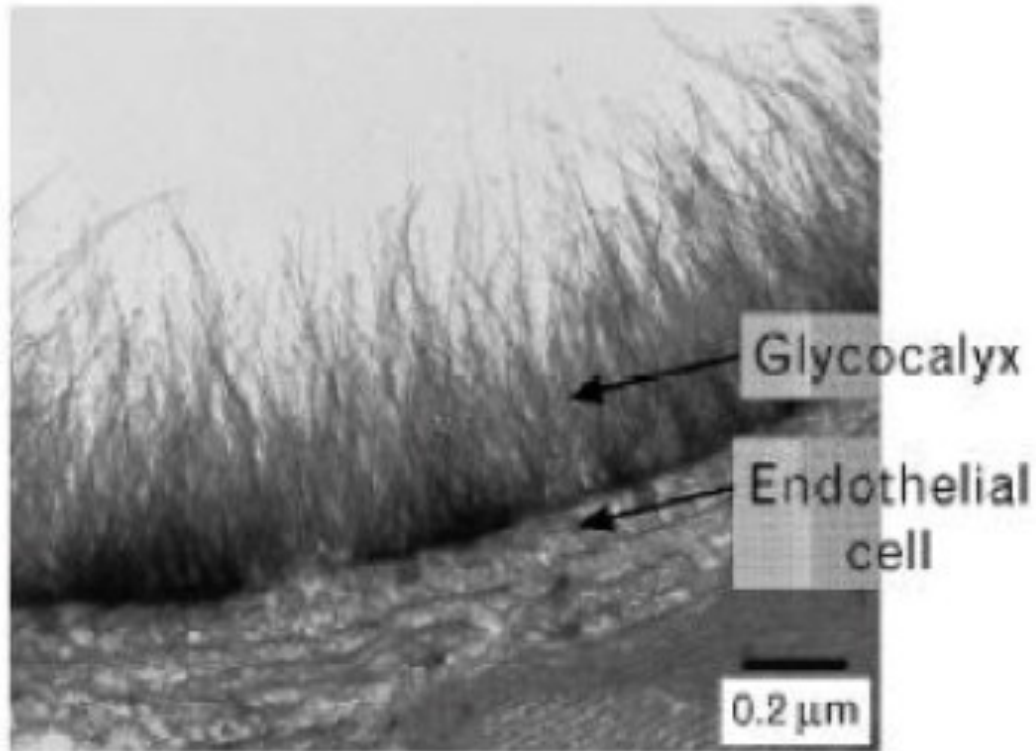
One-Handed Application Protects the Insertion Site



Engineered Securement Devices



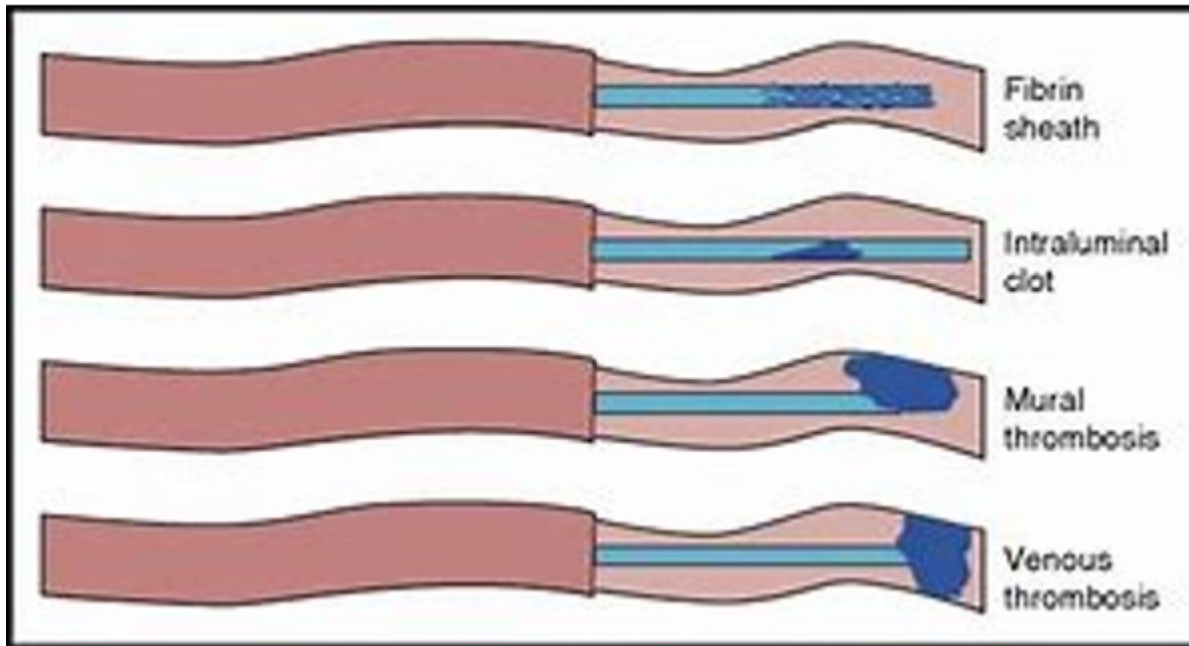
Catheter Pistoning Matters



Extravasation Injury



Patency

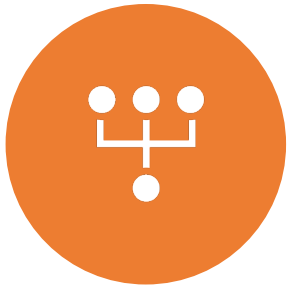


- 3289 CVCs
- 12% required alteplase
- Significant correlation between treatment of a CVC with alteplase and the development of a CRBSI
- The OR for getting a CRBSI when alteplase is needed is 2.87
- The average time for alteplase prior to the diagnosis of CRBSI was 2.3 days

CVC = central venous catheter; CRBSI = catheter-related bloodstream infection; OR = odds ratio.

Rowan CM, et al. *Pediatr Crit Care Med.* 2013;14(3):306-309.

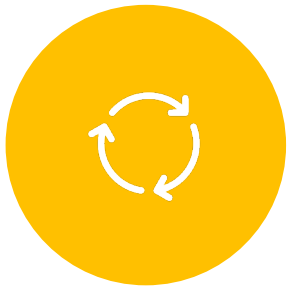
Standardization Is Key



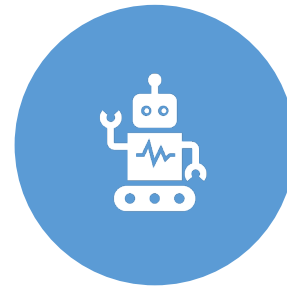
"If you can't describe what you are doing as a process, you don't know what you are doing."



"The emphasis should be on the why we do the job."



"Variation in process is the enemy of quality."



"Innovation comes from the producer, not the customer."

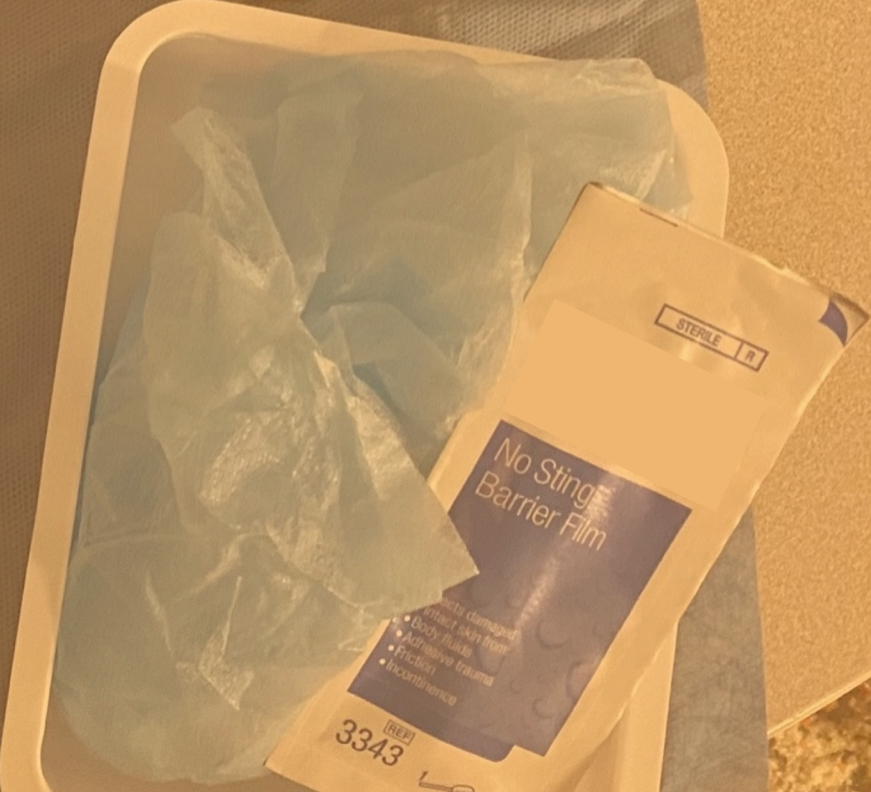
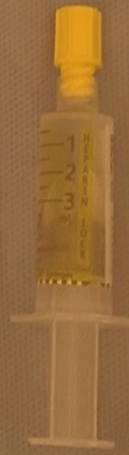
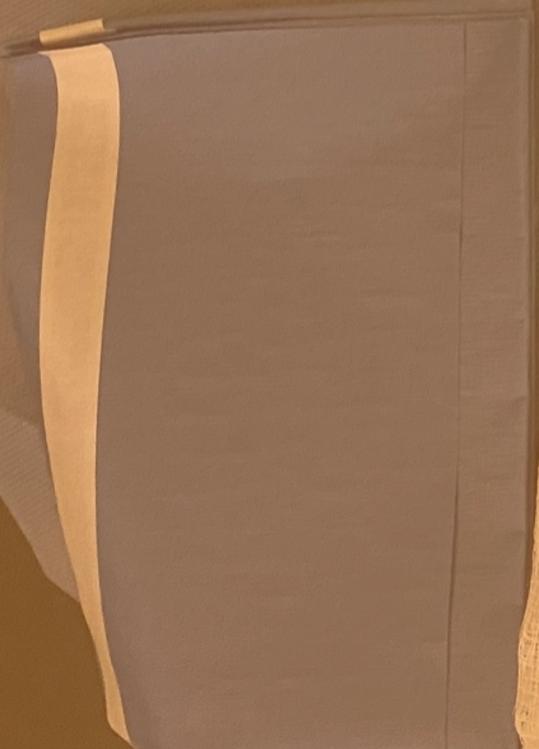
- Design of the kit will be determined by the elements of the bundle being implemented
- Promotes standard work
- Creates efficiency



CUFF END



THREE ALCOHOL SWABSTICKS
Three 4-inch saturated swabsticks
STERILE unless opened or damaged
Product Information
Use aids in the removal of oils and residue from the skin
Warnings
For external use only. If taken internally, nausea, gastric disturbances may result.
Reorder No. S-3105



Implementation Science

Fundamental question:

“How do we get ‘what works’ to the people who need it, with greater speed, fidelity, efficiency, quality, and relevant coverage?”

Translating evidence into practice by identifying barriers and facilitators, engaging key stakeholders, and measuring successes



Implementation vs Intervention?

Aim: To evaluate an implementation *strategy*

Intervention: Directed at clinician behavior and/or organizational practice change

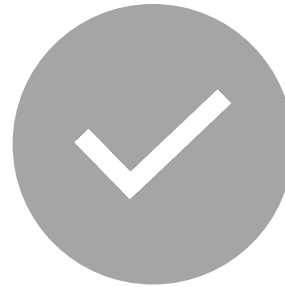
Outcomes: Acceptability, adoption, appropriateness, feasibility, fidelity, implementation cost, penetration, and sustainability

Unit of analysis and randomization: The clinician, team, facility, or organization

Sustaining Progress



Local ownership and
peer learning
communities



Common goals



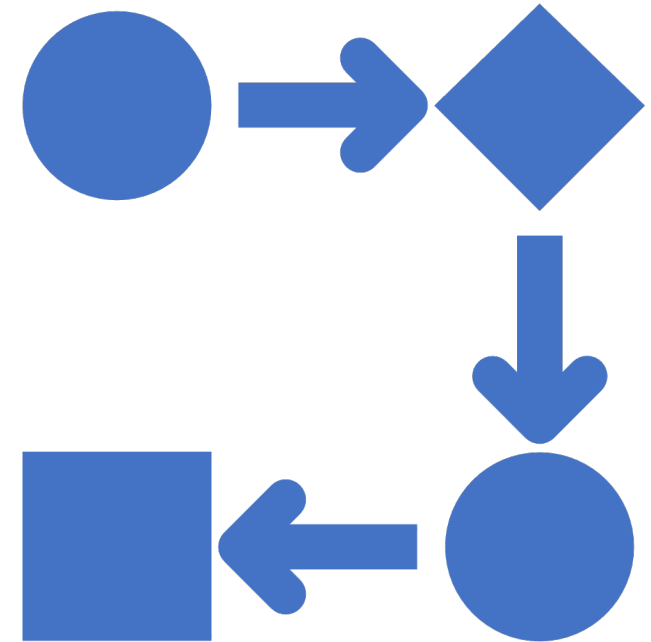
Valid, scalable, and
transparent measures



Creating a culture
where standard work is
the norm

What Is Standard Work?

- The one best way we know to perform a task at this moment in time
- Defined by the people who do that task at the point of care
- Aligned with the standards



What Are Standard Work Visual Aids?

- Step-by-step instructions for a specific task or procedure that are easily followed
- Examples might include
 - Central line dressing changes
 - Needleless connector changes
 - Blood draws
 - VAD flushing

Visual Aid Example

- Content
- Sequence
- Timing
- Location
- Expected outcomes
- Rationale

EXPLANATIONS / ANSWERS TO FAQs	
WHY DO WE...	REASON:
1. Gather supplies first?	To ensure all supplies are available when process starts To avoid the need to stop and search for supplies midway through
2. Perform hand hygiene, don clean gloves, other PPE as needed?	To ensure a contamination-free process
3. Don mask?	Prevents droplet contaminants from entering area
4. Flush new needleless connector with saline while still in packaging, keeping syringe attached post-flush?	To ensure the connector is functional before being attached
5. Keep saline syringe attached to connector?	There is no reason to detach it
6. Cleanse the junction of the needleless neutral connector and extension set (or catheter hub) FOR 15 SECONDS before removing old connector?	To ensure the site is decontaminated – it requires a minimum of 15 seconds to decontaminate! We don't want to touch contaminate the open lumen which is why we clean prior to removing the connector
7. Remove old needleless connector? DO NOT USE EXCESSIVE FORCE, hemostats, or any type of clamp to remove a stuck connector	Using excessive force will damage lumen area
8. Apply new needleless connector? Use care to NOT TOUCH the open end of the lumen or extension set	To ensure the lumen or extension set is contamination-free
9. Flush new needleless connector with attached saline flush?	Ensure patency
10. Repeat for each lumen?	Needleless connectors are changed at the same time to ensure the site is contamination-free

Document #: SW-Pol3454-001 Rev#: 0 Last Revision: 05/04/21 Owner: Britt Meyer

Needleless Connector Change

Excludes Dialysis Connectors
Standard Work


PURPOSE: Part of the appropriate vascular catheter maintenance (i.e., infection prevention, loss of blood return, connector damage, etc.)

WHEN: Change q96 hrs* with primary tubing change
**Exceptions noted in IV Therapy Policy: TPN, Propofol (refer to Policy standards)*



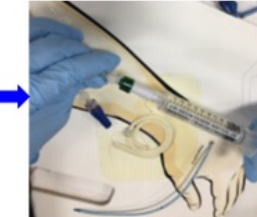
WHO: RNs, LPNs

LOCATION: In patient care area

EXPECTED TIME: 5 minutes or less per lumen



STEPS:

- Gather supplies
- Don mask
- Perform hand hygiene, don clean gloves, other PPE as needed
- Flush new needleless connector with saline while still in packaging, keeping syringe attached post-flush 
- Keep saline syringe attached to the connector
- Cleanse the junction of the needleless neutral connector and extension set (or catheter hub) **FOR 15 SECONDS** before removing old connector 
- Remove old needleless connector **DO NOT USE EXCESSIVE FORCE, hemostats, or any type of clamp to remove a stuck connector**
- Apply new needleless connector **Use care to NOT TOUCH the open end of the lumen or extension set**
- Flush new needleless connector with attached saline flush 
- Repeat for each lumen

SUPPLIES:

- 1 needleless connector for each catheter lumen
- 1 alcohol swab for each lumen
- 1 saline syringe for each lumen
- 1 pair gloves
- Mask
- 1 pair sterile gloves in patients with ANC <500

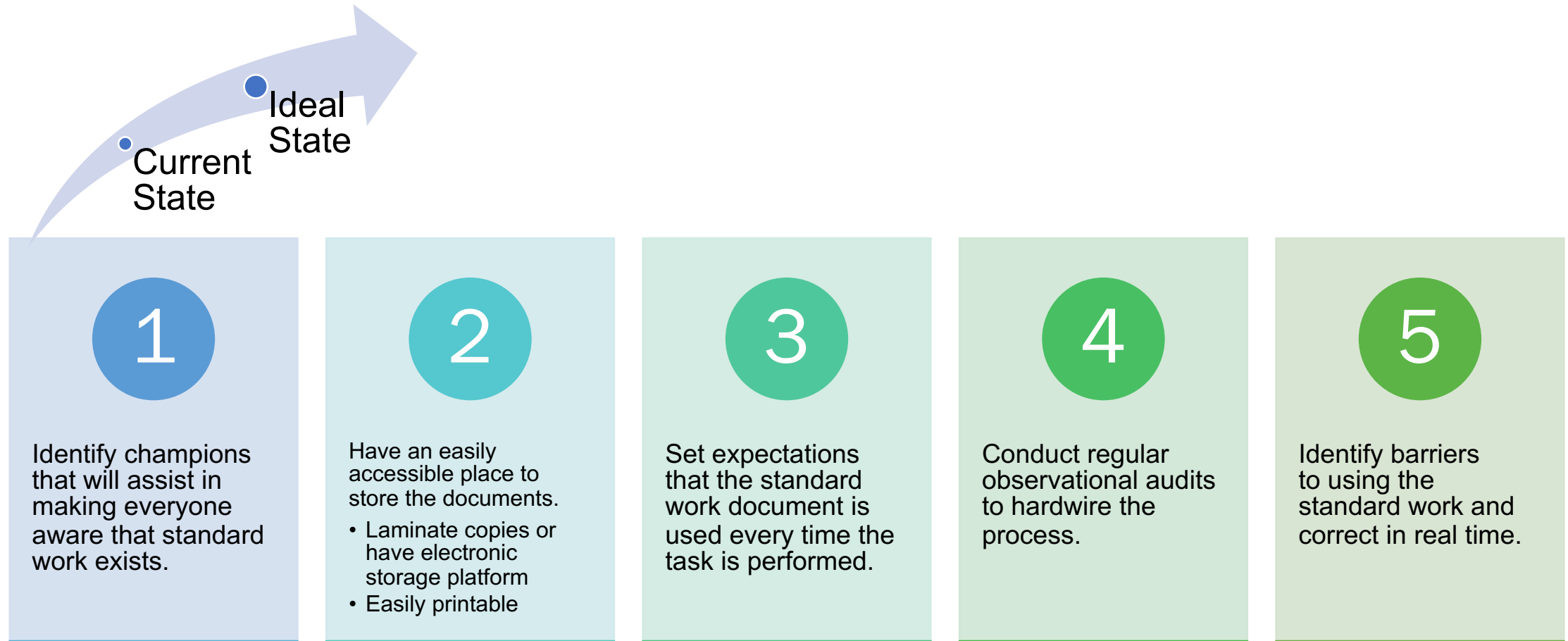
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Reducing Variation Using Standard Work

- Provides clear and concise direction on task performance
- Outlines everything needed for the task
 - Creates efficiency
- Eliminates the need to remember every step in a process
- Promotes training of new staff
- Provides the "why" for task steps
- Provides pictures of expected outcomes
- Facilitates improvement discussions



How to Implement Standard Work



**Tunneled and Non-Tunneled Central Vascular Access Device (CVAD)
Dressing Change
Standard Work**

PURPOSE: To have an uncontaminated clean, dry, intact dressing over a tunneled or non-tunneled CVAD

WHEN: Change transparent dressing every 7 days AND when loose, soiled, or no longer occlusive; gauze dressings to be changed at least every 48 hours

WHO: RN, LPN

LOCATION: Patient bedside

EXPECTED TIME: 15 min per dressing



STEPS:

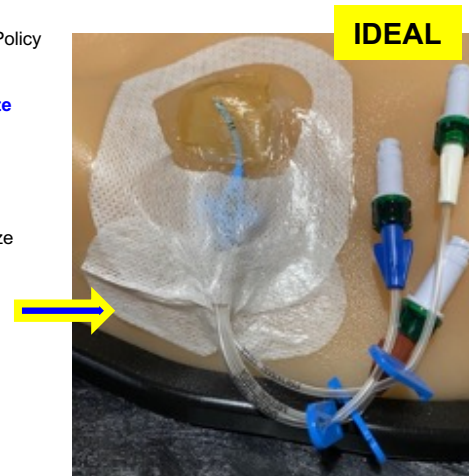
IMPORTANT: First review & verify the date that the dressing change is needed!

1. Gather supplies
2. Place supplies on clean workspace
3. Perform hand hygiene
4. Open dressing kit
5. Everyone in room don mask, including patient
6. Everyone within 3 feet of sterile field dons head covering
7. Perform hand hygiene and don clean gloves

8. Remove old dressing, starting from bottom up
 - Use a couple drops of sterile saline to facilitate dressing removal
9. Doff dirty gloves, perform hand hygiene
10. Don sterile gloves
11. Lightly scrub insertion site for 30 seconds with CHG swabstick, removing any adhesive-based securement device as part of cleansing process (see IV Therapy Policy for patients with CHG allergies)
12. Allow site to thoroughly air dry – at least one minute required
13. Replace securement device (if applicable) per mfg's instructions printed on back of packaging
14. Apply CHG impregnated transparent dressing, in a size appropriate to ensure an occlusive, secure dressing
15. Doff sterile gloves
16. Perform hand hygiene
17. Document procedure and site assessment in EHR

SUPPLIES:

- Saline syringe
- Masks for all in room
- Gloves
- Head coverings for everyone w/i 3 feet of sterile field
- Sterile central line dressing change tray kit



EXPLANATIONS / ANSWERS TO FAQs

WHY DO WE...	REASON:
1. Gather supplies first?	To ensure all supplies are available when process starts To avoid the need to stop and search for supplies midway through
2. Place supplies on clean workspace?	Contamination risk is lower when all components of a task are readily available and placed on a clean, dry surface Refer to manufacturer's guidelines for the cleaning product – ensure dry time is followed!
3. Perform hand hygiene?	To ensure a contamination-free process
5. Have everyone in room don a mask?	Masking prevents contamination of the insertion site with respiratory contaminants
6. Have everyone within 3 feet of sterile field don head covering	Covering hair prevents contamination of insertion sites with microbes that are prevalent in our hair; hair is constantly being shed
7. Perform hand hygiene and don clean gloves?	Clean gloves are needed for the next step and hand hygiene is always performed prior to donning clean gloves to ensure a contamination-free process
8. Remove old dressing, starting from bottom up...using saline to facilitate dressing removal?	Starting from bottom up prevents inadvertent catheter malposition and dislodgement Saline helps in the removal process of the old dressing
9. Doff dirty gloves and perform hand hygiene?	Gloves will have become contaminated, and hand hygiene is always performed after doffing dirty gloves to ensure hands are clean
10. Don sterile gloves?	The subsequent steps are performed in a sterile environment
11. Lightly scrub insertion site for 30 seconds with CHG swabstick, removing any adhesive-based securement device as part of cleansing process?	To ensure complete site decontamination Securement device, if one exists, will be replaced with a clean, new device
12. Allow site to thoroughly air dry – at least one minute required?	Fanning or drying with gauze can introduce organisms Air drying ensures complete site decontamination; failure to allow the skin cleanser to completely dry is a source of skin irritation and chemical burning
13. Replace securement device (if applicable) per mfg's instructions printed on back of packaging?	Prevents catheter malposition, dislodgement and pistoning Securement devices will be different, each manufacturer will have the best way to apply that device on the packaging
14. Apply CHG impregnated transparent dressing, in a size appropriate to ensure an occlusive, secure dressing?	CHG impregnated dressings provide persistent and cumulative protection against microbial growth on the skin around the insertion site for up to 7 days If a wrong size is used on the site, there is risk for the dressing to not be occlusive and secure
15. Doff sterile gloves? & 16. Perform hand hygiene?	Sterile part of process is complete; gloves will have become contaminated, and hand hygiene is always performed after doffing dirty gloves to ensure hands are clean
17. Document procedure and site assessment in EHR?	Procedures must be documented to demonstrate the procedure was performed

Barriers to Implementing Standard Work

- Comfort with the skill
- Belief in usefulness
- Knowledge
- Time
- Support after training
- Managerial support
- Not part of role
- Funding

Facilitators for Implementing Standard Work

- Receptivity to learning
- Staff attitude
- Intervention training
- Rapport

Provide Clinical Decision Support

- Algorithms for device placement
- Checklists for device appropriateness
- Audit tools for care and maintenance surveillance



Essential Elements for Auditing

Clinical Practice Component	Performance Measure	Data Collection
Daily VAD Assessment	Interprofessional team to assess:	Documentation of team assessment
	<input type="checkbox"/> Necessity <input type="checkbox"/> Appropriateness <input type="checkbox"/> Complications <input type="checkbox"/> Ongoing plan <input type="checkbox"/> Discontinuation VAD site inspection	<input type="checkbox"/> Date, time <input type="checkbox"/> Ongoing plan, necessity/appropriateness <input type="checkbox"/> Complications <input type="checkbox"/> Removal, reason for
VAD Discontinuation	VAD site inspection	Documentation of VAD assessment
	<input type="checkbox"/> Skin integrity, blisters, weeping <input type="checkbox"/> Redness, erythema <input type="checkbox"/> Pain with/without palpation, numbness <input type="checkbox"/> Skin temperature <input type="checkbox"/> Drainage from puncture site <input type="checkbox"/> Swelling or inflammation <input type="checkbox"/> CVAD/midline catheter external length Dressing and Securement <input type="checkbox"/> Components are clean, dry, intact (CDI) <input type="checkbox"/> VAD secure without micro-motion <input type="checkbox"/> Dressing is dated, not overdue for change	<input type="checkbox"/> Date, time <input type="checkbox"/> Changes in CVAD/midline catheter external length <input type="checkbox"/> Complications/interventions
Ongoing Infection Prevention Measures	Remove VAD immediately if	Documentation of dressing and securement assessment
	<input type="checkbox"/> Unresolved complication <input type="checkbox"/> Discontinuation of infusion therapy <input type="checkbox"/> No longer necessary for the plan of care	<input type="checkbox"/> Condition – dressing and securement <input type="checkbox"/> Documentation of discontinuation, reason, condition of patient and VAD
Dressing Change and Securement	<input type="checkbox"/> Hand hygiene performed before manipulation of infusion system <input type="checkbox"/> Disinfect need/less connectors with each entry into infusion system <input type="checkbox"/> Limit unnecessary entries into infusion system <input type="checkbox"/> Prevent disconnection of administration sets for continuous infusion <input type="checkbox"/> Alcohol caps are applied appropriately (if used) <input type="checkbox"/> VAD dressing CDI, dated, current	<input type="checkbox"/> Audit hand hygiene compliance <input type="checkbox"/> Surveillance <ul style="list-style-type: none"> o Disinfection of need/less connectors prior to access o Administration sets are connected, closed-system o Alcoholic caps applied where appropriate o Dressing CDI, current
	<input type="checkbox"/> Sterile dressings are applied and maintained on all VADs <input type="checkbox"/> Change dressing at established intervals according to dressing type <input type="checkbox"/> Change dressing immediately if soiled, damp, loose	Documentation of dressing and securement <input type="checkbox"/> Performance of procedure, date, type of antiseptic solution/type of dressing

Essential Elements for Auditing

Administration Set Change	<ul style="list-style-type: none"> <input type="checkbox"/> Administration sets, including add-on devices, are changed at established intervals depending on the type of administration and infusate <input type="checkbox"/> Change immediately when contamination is suspected or when product integrity is compromised <input type="checkbox"/> Minimize the number of manipulations and entries into the system. <input type="checkbox"/> Label administration sets date of initiation or date of change <input type="checkbox"/> Label administration sets used for medications that are administered via specialized access devices (intraspinal, intraosseous, subcutaneous) 	<p>Documentation of administration set change</p> <ul style="list-style-type: none"> <input type="checkbox"/> Date and time <input type="checkbox"/> Labels applied <input type="checkbox"/> Add-on devices placed including needleless connectors/alcohol caps <input type="checkbox"/> Restart of infusates, rates and programming checked <input type="checkbox"/> If contamination is suspected, document event/occurrence describing situation and prescriber notification
Patency, Flushing, Locking	<ul style="list-style-type: none"> <input type="checkbox"/> VADs are flushed and aspirated for a blood return prior to each intermittent infusion to assess catheter function and prevent complications <input type="checkbox"/> For continuous infusions, assess patency for any clinical indication that the device is no longer functional, or any complaint of discomfort <input type="checkbox"/> VADs are flushed after each infusion to clear the infused medication from the catheter lumen <input type="checkbox"/> VAD is locked after completion of the final flush to decrease the risk of intraluminal occlusion and CR-BSI <input type="checkbox"/> Single-use flushing and locking systems are used <input type="checkbox"/> VAD patency is assessed using a 10-mL syringe 	<p>Documentation of patency</p> <ul style="list-style-type: none"> <input type="checkbox"/> Date and time assessed <input type="checkbox"/> Rate blood return (e.g. brisk, sluggish) <input type="checkbox"/> Locking solution used and volume instilled <input type="checkbox"/> Catheter clearance performed/outcome of intervention
Blood Sampling via VAD	<ul style="list-style-type: none"> <input type="checkbox"/> Assess risk vs benefit prior to using VAD for blood sampling <input type="checkbox"/> Eliminate unnecessary laboratory tests <input type="checkbox"/> Reduce the frequency of obtaining blood samples <input type="checkbox"/> Draw blood samples based on clinical need rather than a routine schedule 	<p>Documentation of blood sampling</p> <ul style="list-style-type: none"> <input type="checkbox"/> Decision process for blood sampling via VAD

Indications for Vascular Access Devices

Peripheral IV Catheter
<p>Comment</p> <ul style="list-style-type: none"> Rotate when clinically indicated
<p>Indication</p> <ul style="list-style-type: none"> Non vesicant, non-irritant continuous medications of short duration (< 2 weeks) Intermittent vesicant administration
<p>Relative Contraindication</p> <ul style="list-style-type: none"> Upper extremities with ipsilateral axillary lymph node dissection Active or old A-V fistulas Patients who may need fistula formation in the future (CKD with creatinine > 2) Foot IVs contraindicated in patients with diabetes and PVD (need provider order) External jugular PIVs contraindicated for CT power injection

Midline Catheter
<p>Description</p> <ul style="list-style-type: none"> Not a central line Tip ends in the axillary vein near the axilla
<p>Indication</p> <ul style="list-style-type: none"> Non vesicant, non-irritant medications with a duration of 5-14 days History of multiple IV starts and poor vasculature
<p>Relative Contraindication</p> <ul style="list-style-type: none"> Do not use with irritants, such as vancomycin, that may cause phlebitis (vessel is deeper, and complications take longer to become visible) Unresolved venous thrombosis (occlusive or non-occlusive) of the arm, great vessels, or ipsilateral IJ veins Extremity fracture Non-intact skin preventing occlusive dressing Extremities with ipsilateral axillary lymph node dissection Active or old A-V fistulas Patients who may need fistula formation in the future (CKD with creatinine > 2)

Central Venous Access Devices including implanted ports and PICCs
<p>Description</p> <ul style="list-style-type: none"> Tip ends in the distal SVC near the right atrium
<p>Types</p> <ul style="list-style-type: none"> <i>TLC/Hohn</i> (temporary; non-tunneled) <i>Groshong</i> (permanent; tunneled) <i>Broviac</i> (pediatrics permanent; tunneled) <i>Power catheter</i> (permanent; tunneled) <i>Hickman</i> (permanent; tunneled)
<p>Indication</p> <ul style="list-style-type: none"> Continuous vesicant medications (ie, TPN) Long-term venous access > 2 weeks in duration Central venous pressure monitoring
<p>Relative Contraindication</p> <ul style="list-style-type: none"> Unresolved venous thrombosis (occlusive or non-occlusive) of the arm, great vessels, or ipsilateral IJ veins Pacer/AICD on the same side Extremities with ipsilateral axillary lymph node dissection Extremity fracture (PICC) Active or old A-V fistula (PICC) Patients who may need fistula formation in the future (CKD with creatinine > 2) Non-intact skin preventing occlusive dressing

Care and Maintenance of ALL Vascular Access Devices	
<ul style="list-style-type: none"> Perform hand hygiene prior to accessing SCRUB THE HUB for at least 15 seconds each access New line = new tubing Change primary tubing and needleless connector at the same time (Q96hrs) 	<ul style="list-style-type: none"> Change the dressing Q7 days and PRN Flush Q8hrs Ports: Change implanted port needle Q7 days and flush de-accessed ports Q30 days

A-V = arteriovenous; CKD = chronic kidney disease; PVD = peripheral vascular disease; CT = computed tomography; IJ = internal jugular; SVC = superior vena cava; TLC = triple lumen catheter; TPN = total parenteral nutrition; AICD = automatic implantable cardioverter defibrillator; PICC = peripherally inserted central catheter; PRN = as needed.

> [Am J Infect Control](#). 2021 May;49(5):536-541. doi: 10.1016/j.ajic.2020.09.001. Epub 2020 Sep 24.

Management practices for leaders to promote infection prevention: Lessons from a qualitative study

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PMID: 32980436 DOI: [10.1016/j.ajic.2020.09.001](#)

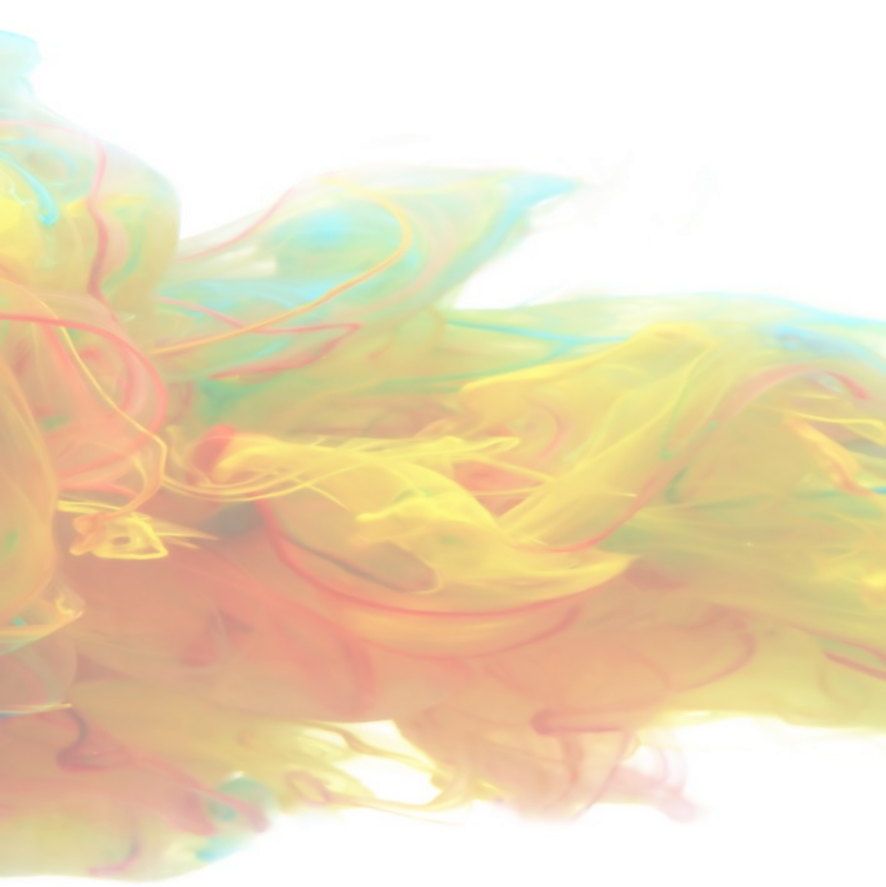
Leadership Is Key

- **Methods:** We conducted interviews with 420 key informants, including managers and frontline staff, in 18 hospitals across the United States. Interviewees were asked about management practices supporting HAI prevention. We analyzed interview transcripts using rigorous qualitative methods to understand how management practices were operationalized in infection prevention efforts.
- **Results:** Across hospitals and interviewees, three management practices were characterized as important facilitators of HAI prevention: (1) engagement of executive leadership; (2) information sharing; and (3) manager coaching. We found that visible executive leadership, efficient communication, and frequent opportunities to provide and promote learning from feedback were perceived to promote and sustain HAI prevention efforts.
- **Conclusions:** Our findings provide insight into management practices for leaders that support successful HAI prevention. In practice, these tactics may need to be adjusted to accommodate the current restrictions caused by the COVID-19 pandemic, in order to maintain HAI prevention efforts as a priority.

Case Study Knowledge Check

- 65 yo patient with a PIVC in the right forearm placed 7 days ago
 - Therapy needed for another 4 days
 - Site without symptoms of complications
1. Remove the PIVC and replace it
 2. Perform a dressing and connector change and monitor for complications
 3. Request a midline catheter

Everyone Needs a Mango!



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