

# Implementation of the Central Line Checklist in the Operating Rooms at Johns Hopkins Hospital

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## I Background

The Central Line Checklist, originally developed by Dr. Peter Pronovost to decrease the number of central line associated blood stream infections (CLABSI), experienced great success in the Intensive Care Unit settings (ICUs) (Berenholtz et al., 2004). The Joint Commission requires that use of evidence-based practice to prevent central line-associated bloodstream infection (CLABSI) (TJC, 2010). After reviewing the workflow processes in the operating room (OR), a human factors study concluded that circulating nurses would be the best personnel to act as independent observer because they cover a wider area in the operating theatre.

Before proceeding with the project, multiple frameworks were considered on how to introduce the Central Line Checklist in the operating room. The Systems Engineering Initiative for Patient Safety (SEIPS) model incorporated not only the workflow processes but took into account the interactions amongst all the system components that would integrate steps to make the implementation of the checklist in the operating room a success: as technologies/tools (checklist in paper and electronic form), the organization (leadership support), tasks (communicating planned central line insertions among anesthesia, nursing and surgery), environment (operating room setting), and the person (patient) (Carayon et al., 2013).

## 2 Phase I – The Checklist in Cardiac/Vascular/Transplant Surgery OR: a pilot

- Trials were established on both the cardiac and vascular/transplant services. The cardiac service used an electronic form (anesthesia providers performed the checklist) and the vascular/transplant service used the paper version.
- The pilot was done for three months. Performing the checklist in electronic format had better compliance (90%): documentation was done in Metavision's (anesthesia's electronic record) which was added as a prompt on the screen; an extra member of the anesthesia team performed the checklist. Compliance for the paper form was 70%: forms were located on a binder and had to be pulled out when needed. However, as long as communication and cooperation amongst surgical team members occurred, no delays in surgical start time occurred.

## 3 Phase 2: Preparation for GO LIVE!

- Collaborated with Supply Chain to determine the contents of central line bundle kit (review cost, availability of supplies, forms)
- Personal discussions with Adult and Pediatric Neurosurgery and Orthopedic Physician champions to present the implementation of the Central Line Checklist for all operating rooms throughout Johns Hopkins Hospital
- Standardizing the operating room checklist by combining the adult and pediatric checklist.
- Approximately two weeks prior to going live the following were done: educational in-service, completing the online "My Learning" tool: "Preventing CLABSI", one-on-one review of the paper form with surgical nursing
- Binders were placed in all the operating rooms with the contents:
  - Central Line Checklist (adult and pediatric)
  - Chain-of-command
  - The Joint Commission Goals
  - Learning Resources
- The paper version was used initially for about a month and half while the electronic version in Operating Room Management Information Software (ORMIS) and Metavision version was being developed. The electronic version Central Line Checklist was made available in ORMIS on May 19, 2013.
- The Central Line Checklist in ORMIS allowed for an electronic record to become part of the permanent record. It became user friendly based on the following:
  - Color coded check boxes for each step of the central line checklist ( Green - " yes", Yellow - "Yes, reminder", Red - " Corrected")
  - No free text was necessary except in the "corrected" boxes.
  - It was created as forced function so staff had to complete it in its entirety before moving on in their clinical documentation.

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## Phase 3: GO LIVE!

The ORMIS Electronic form

Yes	With Reminder	Critical Steps	Corrected	Comment
<input type="checkbox"/>	<input type="checkbox"/>	1. Perform a time out using the informed consent form - Patient name, Laterality, Location, and Procedure.	<input type="checkbox"/>	
<input type="checkbox"/>	<input type="checkbox"/>	2. Clean Hands (with Purell/Avegant hand sanitizer or soap and water)	<input type="checkbox"/>	
<input type="checkbox"/>	<input type="checkbox"/>	3. Wear cap, mask, sterile gown/gloves and eye protection if in contact with or crossing the sterile field at any time during the procedure. All others entering the room during the procedure must wear cap and mask.	<input type="checkbox"/>	
<input type="checkbox"/>	<input type="checkbox"/>	4. Prep site with chlorhexidine and let air dry. For patients with Chlorhexidine allergy or Cultural/religious Autografts: Was 1% tincture of iodine used as an alternate? NICU (at 6 weeks gestational age): Was povidone iodine used as a skin prep alternative?	<input type="checkbox"/>	
<input type="checkbox"/>	<input type="checkbox"/>	5. Drape patient from head to toe using sterile technique	<input type="checkbox"/>	
<input type="checkbox"/>	<input type="checkbox"/>	6. Prepare catheter by pre-flushing and clamping all lumens not in use during the procedure.	<input type="checkbox"/>	
<input type="checkbox"/>	<input type="checkbox"/>	7. Place patient in head/neck position unless contraindicated (e.g. increased ICP) or if femoral/ICC (place supine and flat)	<input type="checkbox"/>	
<input type="checkbox"/>	<input type="checkbox"/>	8. Maintain sterile field	<input type="checkbox"/>	
<input type="checkbox"/>	<input type="checkbox"/>	9. Ensure grasp on guide wire is maintained throughout procedure and removed post procedure.	<input type="checkbox"/>	
<input type="checkbox"/>	<input type="checkbox"/>	10. Aspirate blood from all lumens, flush, and apply sterile caps.	<input type="checkbox"/>	
<input type="checkbox"/>	<input type="checkbox"/>	11. Ensure venous placement	<input type="checkbox"/>	
<input type="checkbox"/>	<input type="checkbox"/>	12. Clean site with chlorhexidine, apply sterile dressing, and apply sterile caps on all hubs	<input type="checkbox"/>	

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## Phase 4 Sustaining the Effort

- Chart audits were done for the paper form.
- Electronic reports will be generated through the ORMIS version.
- Surgical staff was visited by a safety officer in the operating room to verify compliance with the central line checklist and address any questions regarding the implementation.

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