

CLABSI PREVENTION: WHAT'S NEW

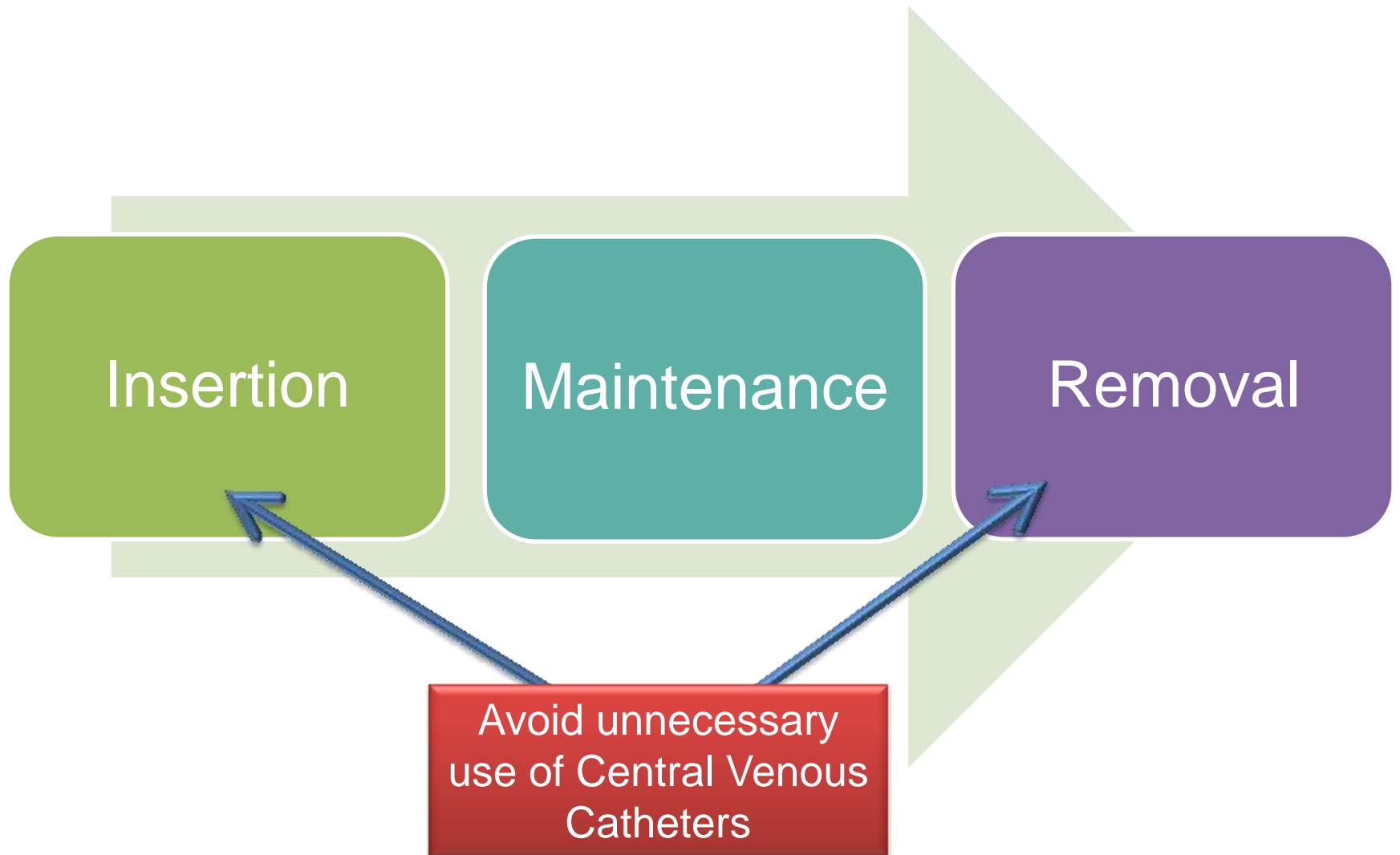
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Agenda

- Review the basic principles of central line insertion
- Special Approaches for CLABSI Prevention
- Strategies for hardwiring change
- PICC maintenance outside the ICU
- Questions

CLABSI Prevention

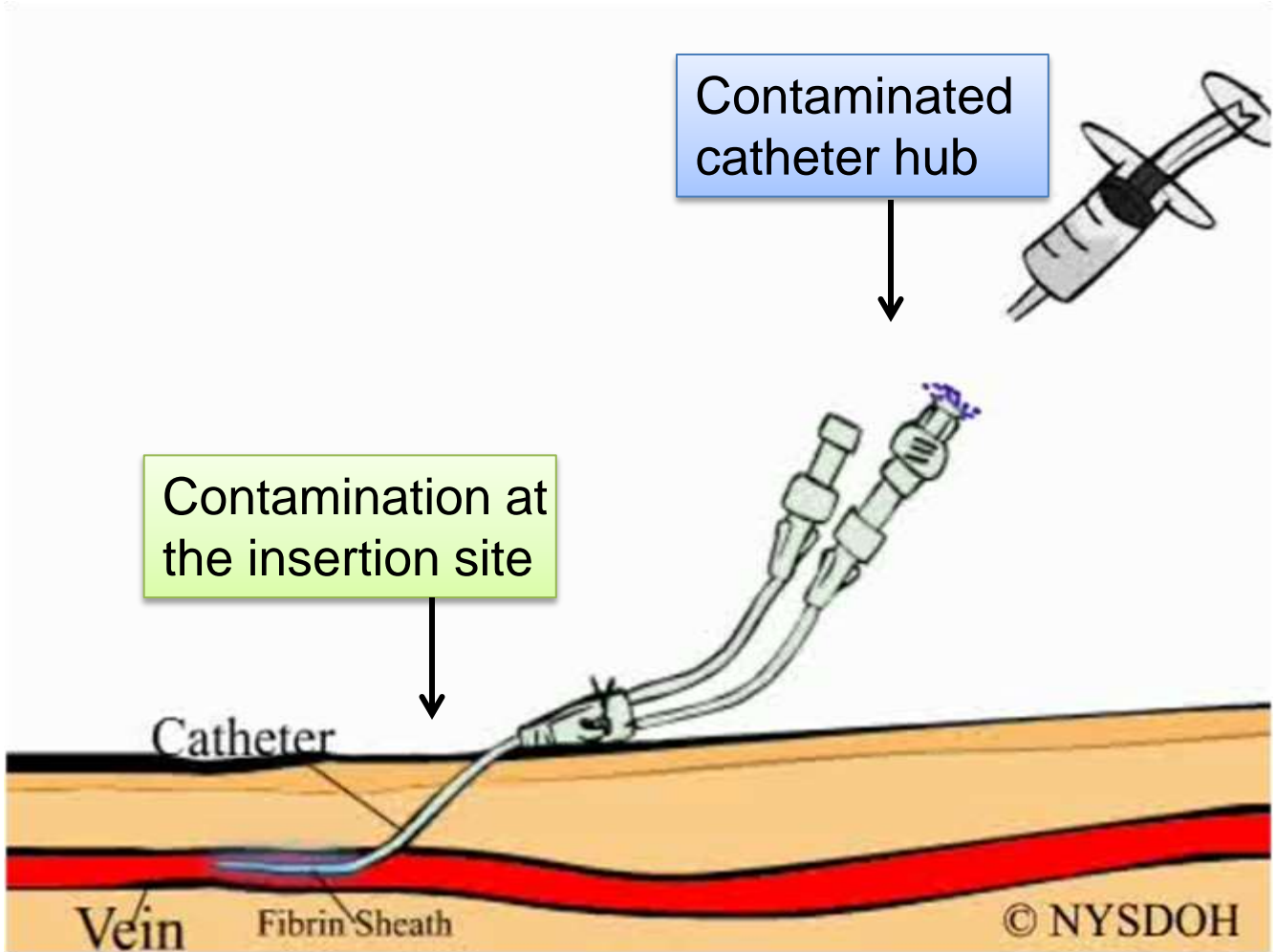


Central Venous Catheters Complications

Not Limited to infections!

- Occlusion/thrombosis of catheter
- Procedure related complications
 - Example: pneumothorax
- Deep venous thrombosis
 - Recent meta-analysis showed increased risk of **deep vein thrombosis in the arm** related to PICC and the potential for pulmonary embolism, especially in critically ill and oncology patients

CLABSI Prevention Focuses on Prevention of Bacterial Colonization of Insertion Site and Catheter Hub





CHICAGO JOURNALS



Strategies to Prevent Central Line—Associated Bloodstream Infections in Acute Care Hospitals: 2014 Update

Author(s): Jonas Marschall, MD; Leonard A. Mermel, DO, ScM; Mohamad Fakh, MD, MPH; Lynn Hadaway, MEd, RN, BC, CRNI; Alexander Kallen, MD, MPH; Naomi P. O'Grady, MD; Ann Marie Pettis, RN, BSN, CIC; Mark E. Rupp, MD; Thomas Sandora, MD, MPH; Lisa L. Maragakis, MD, MPH; Deborah S. Yokoe, MD, MPH

Source: *Infection Control and Hospital Epidemiology*, Vol. 35, No. 7 (July 2014), pp. 753-771

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Grade of Quality of Evidence

Grade	Description
I. High	Wide range of studies with no major limitations, little variation between studies and the summary estimate has a narrow confidence interval (CI)
II. Moderate	Only a few studies, some studies have limitations but no major flaws, some variation between studies, or CI of the summary estimate is wide
III. Low	Studies have major flaws, important variation between studies, CI of the summary estimate is very wide, no rigorous studies, or only expert opinion

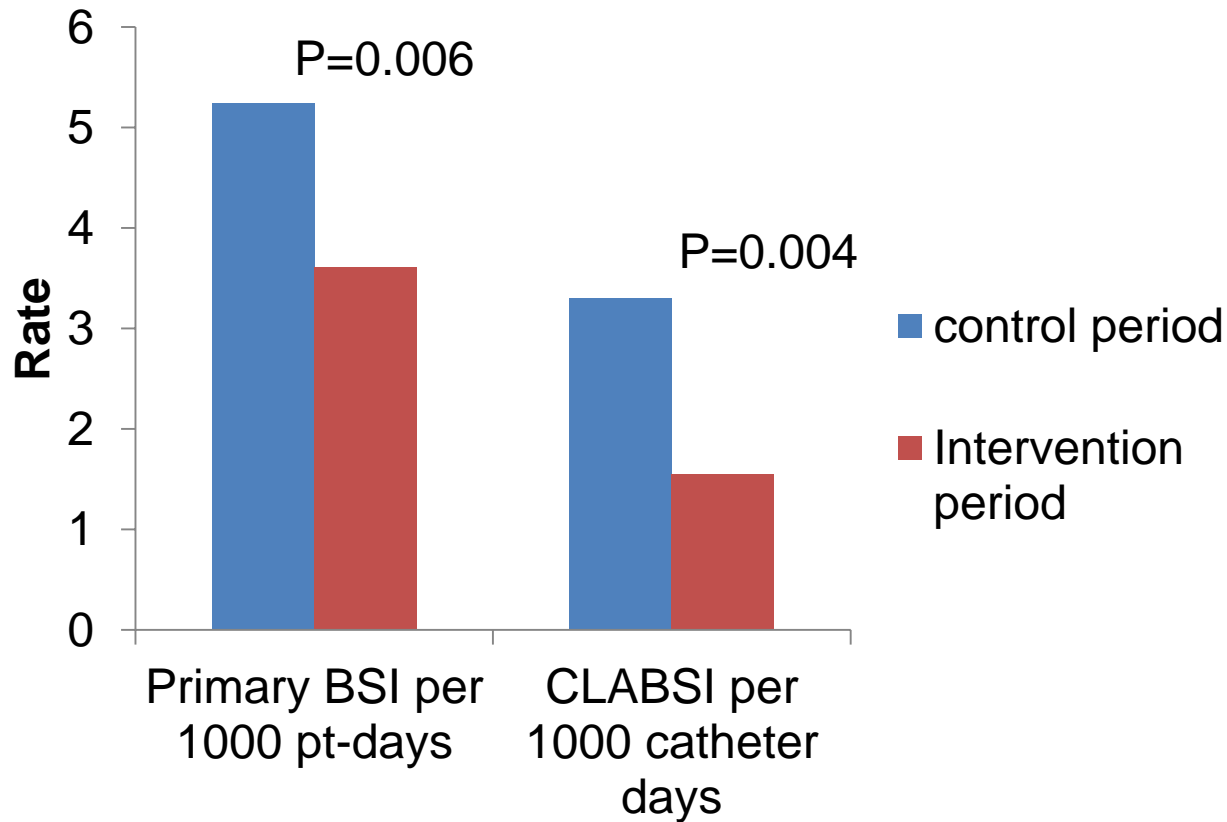
Pre-Insertion of Central Venous Catheter

- Minimize unnecessary placement for central venous catheter (CVC) use by providing a list of indications for a CVC (II)
- Education (II)
 - All healthcare workers that insert or maintain a CVC and assess competence in those procedures
- Bathing ICU patients (>2 months) with Chlorhexidine preparation on a daily basis (I)

Meta-analysis of CHG Bathing

- 12 studies performed in adult ICU mostly medical and 1 LTAC
- Reduced incidence of healthcare associated BSI (including CLABSI)
 - Pooled odds ratio: 0.44 (95%CI 0.33-0.59; $p < 0.0001$)
- Similar benefit for CHG cloth or liquid prep
- Evidence strongest in Medical ICU
- Side effects rare

Multicenter Study of CHG Bathing In ICU and BMT



CHG Bathing Hospital-Wide

- Compliance with bathing:
 - 90% in ICU
 - 58% in non-ICU
- Effect on CLABSI rates could not be demonstrated possibly due to
 - Low baseline rates
 - Enforcement of the CL insertion and maintenance bundles

Central Line Insertion

1. Hand hygiene (II)
2. Avoid femoral vein **in obese adult** patients in non emergent situation (I)
 - Assess risk of infectious and non-infectious complications
3. **Use ultrasound guidance for internal jugular insertion** (II)
4. Use maximal sterile barrier precautions (II)
5. Use $\geq 0.5\%$ chlorhexidine solution for skin preparation (I)



Central Line Insertion

1. Process in place to ensure adherence to aseptic technique (II)
 - Checklist
 - Observation of procedure by trained staff (nurse, physician, other healthcare personnel)
 - Empowering healthcare staff to stop procedure in case of breach in sterile technique
2. Use all inclusive catheter cart/kit (II)

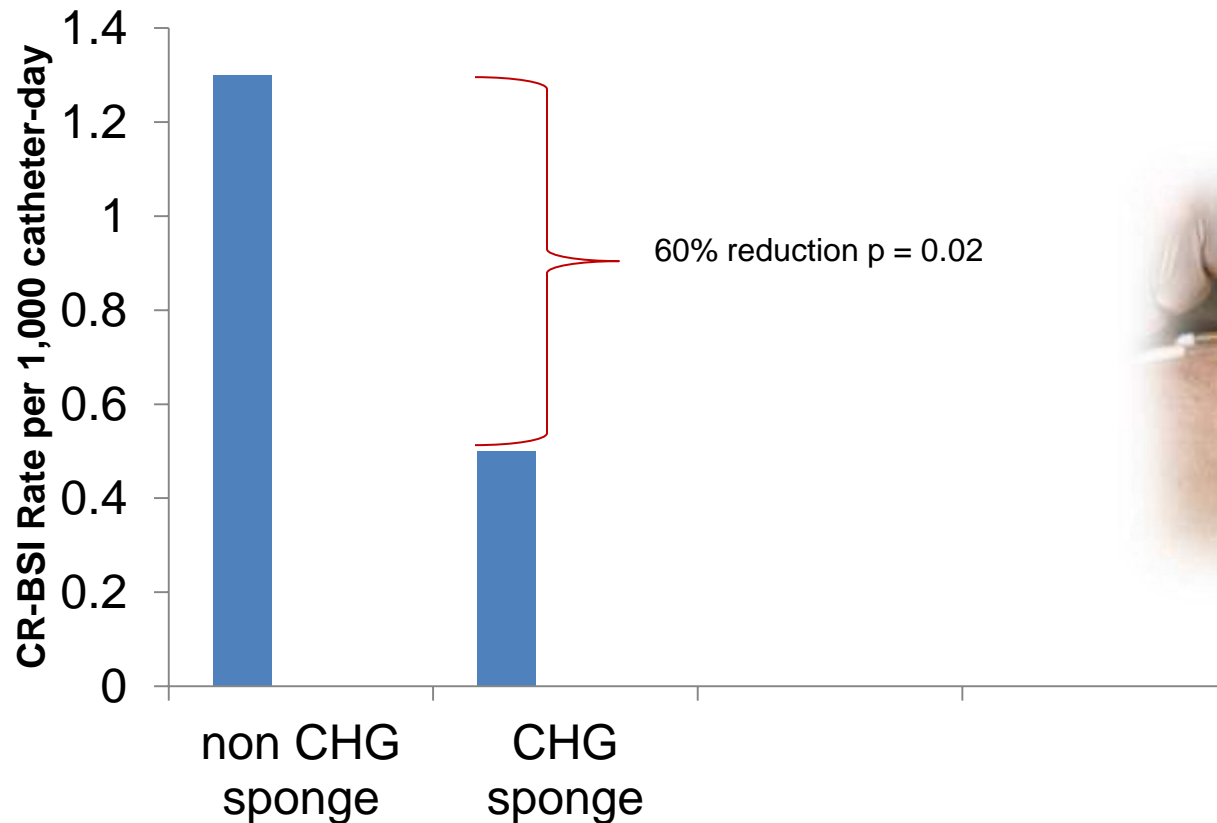
Special “Technical” Approaches for Preventing CLABSI

To be used if “basic” prevention unsuccessful in reducing CLABSI rate



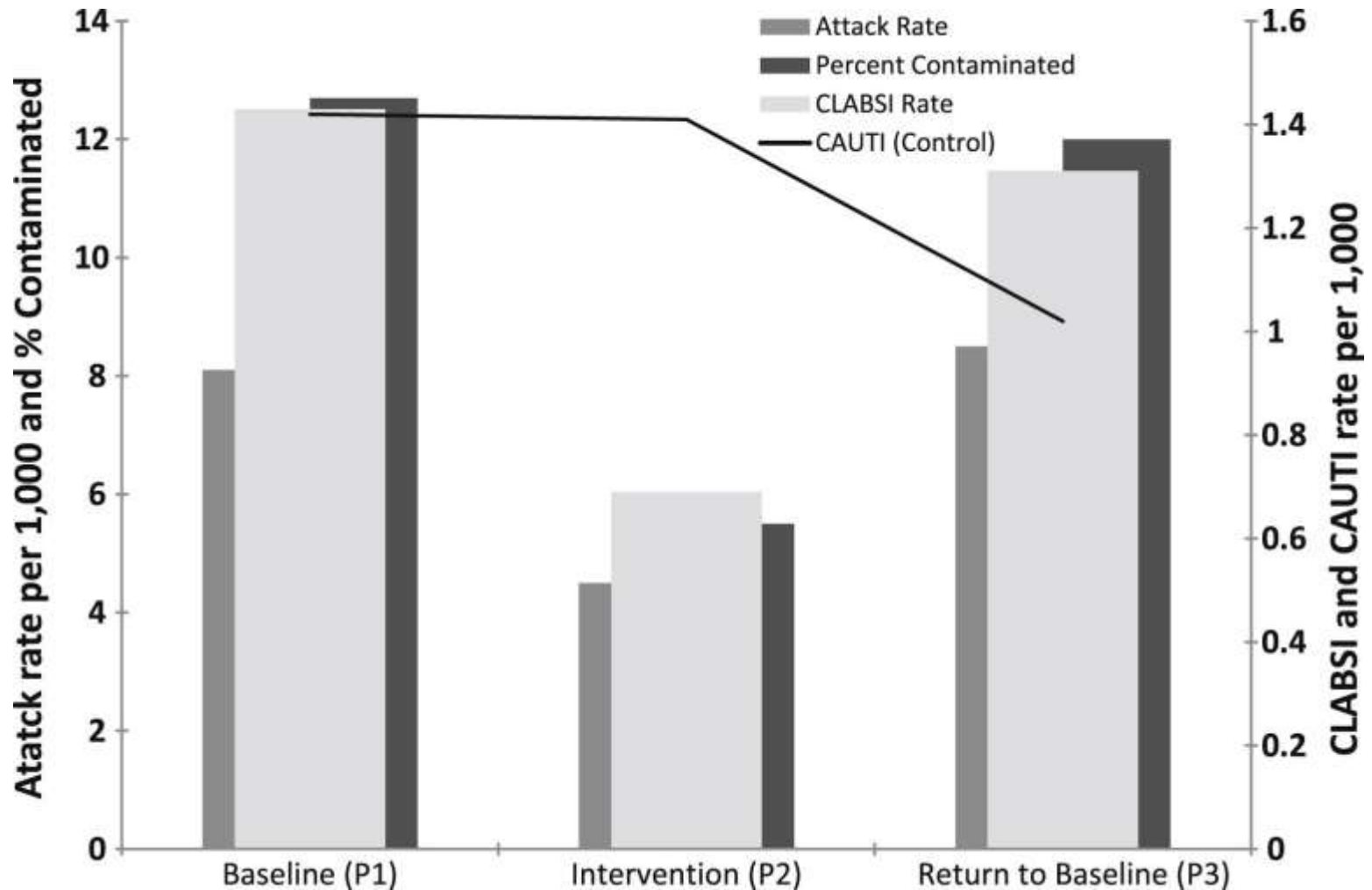
1. Antiseptic or antimicrobial-impregnated catheters (I)
2. Use **chlorhexidine-impregnated sponge** (I)
3. Use an antiseptic-containing hub/connector protector to cover needleless access device
4. Use antibiotic locks

Chlorhexidine-Containing Dressing



Timsit JF, et al Am J Respir Crit Care Med. 2012; 186(12):1272-1278
Meta-analysis: Safdar N, et al. Crit Care Med. 2014;42:1703–1713

Use of Antiseptic-Containing Hub Protector



Meta-analysis of Antimicrobial Lock Solution for Prevention of CLABSI

69% reduction in the risk of CLABSI

- Most studies are in dialysis patients
- Few oncology patients
- Various agents:
 - Citrate
 - Ethanol
 - Taurolidine
 - Vancomycin
 - Gentamicin
 - Cefazolin
 - Minocycline

Antimicrobial Lock

“Because of potential concerns regarding the potential for emergence of resistance in in exposed organisms use of antimicrobial locks as a preventive strategy limited to the following:

- Patients with long-term dialysis catheters
- Patients with limited venous access and history of recurrent CLABSI
- Patients who are at heightened risk of severe sequelae from a CLABSI (patients with recent implanted intravascular device)”

CLABSI Surveillance

- **NHSN definition**
 - CLABSI is different from CRBSI (catheter related bloodstream infection)
 - Issue with interrater reliability
- **Perform surveillance**
 - ICU
 - Non-ICU
- **Estimate of catheter-days¹**
 - Facilitate surveillance with limited workforce or lack of electronic data

CMS Hospital Inpatient Quality Reporting (IQR) Program

Healthcare Facility HAI Reporting Requirements to CMS via NHSN-- Current Requirements

CMS Reporting Program	HAI Event	Reporting Specifications	Reporting Start Date
Hospital Inpatient Quality Reporting (IQR) Program	CLABSI	Adult, Pediatric, and Neonatal ICUs	January 2011
	CAUTI	Adult and Pediatric ICUs	January 2012
	SSI: COLO	Inpatient COLO Procedures	January 2012
	SSI: HYST	Inpatient HYST Procedures	January 2012
	MRSA Bacteremia LabID Event	FacWideIN	January 2013
	<i>C. difficile</i> LabID Event	FacWideIN	January 2013
	Healthcare Personnel Influenza Vaccination	All Inpatient Healthcare Personnel	January 2013
	Medicare Beneficiary Number	All Medicare Patients Reported into NHSN	July 2014
	CLABSI	Adult & Pediatric Medical, Surgical, & Medical/Surgical Wards	January 2015
	CAUTI	Adult & Pediatric Medical, Surgical, & Medical/Surgical Wards	January 2015



ELSEVIER

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Major article

Sustained reduction of central line–associated bloodstream infections outside the intensive care unit with a multimodal intervention focusing on central line maintenance

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CLABSI Surveillance and Prevention Outside the ICU

LESSON LEARNED

ICU

Non-ICU

CVC

Temporary CVC lines used usually for a shorter duration

Focus on **CVC insertion**, maintenance

Mostly PICCs and Permanent CVC

Focus on **CVC maintenance**, insertion

Context

CLABSI rates
Publically reportable
Linked to payment

One of the major priorities: CLABSI prevention

Easier to engage staff and get buy-in

CLABSI rates
Not publically reportable

Other competing priorities: e.g. falls, pressure ulcers, CAUTI, etc...

More difficult to get buy-in

Culture

Homogeneous patient population
High nurse to patient ratio
Multidisciplinary team with **Physician champions** exist

Diversity of staff and patients
Low nurse to patient ratio
Multidisciplinary team includes **Nurse champions and IV team**