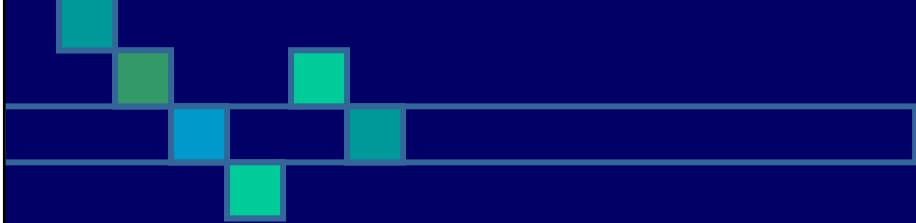




## Implementing the Central-Line Bundle





# Implementing the Central Line Bundle

Presented by  
*Alfonso Torres-Cook, Dr.P.H.*  
*Hospital Epidemiologist*




Ideas for Today and Tomorrow



## A General Overview

- 48% of ICU patients have central venous catheters, accounting for 15 million central catheter-days per year in ICUs
- The case fatality rate for catheter-related blood stream infections approaches 20%.
- Attributable mortality ranges from 12-25% but was 3% in one meta-analysis.



## Blood Stream Infections are Costly & Prolongs Care

- Attributable cost per blood stream infection is estimated to be \$25,000 to \$56,000.
- Hospital acquired blood-stream infections prolong hospitalization by a mean of 7 days

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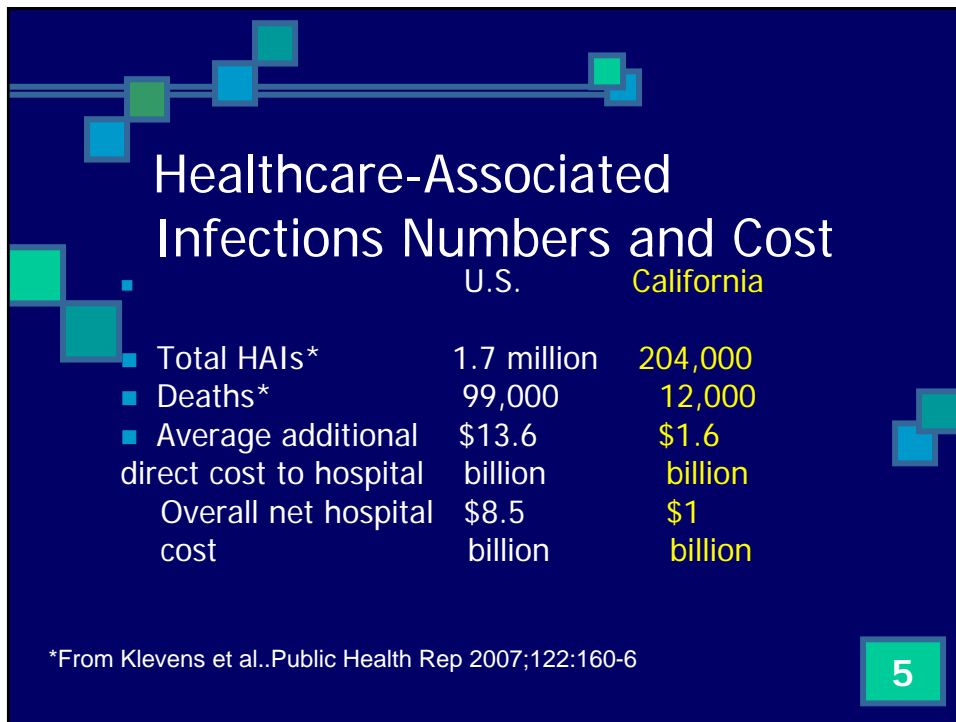
## AHRQ – Sponsored evidence Summary

- Attributable mortality 4-20%
- Routine replacement does not reduce risk
- Maximum barrier precautions reduce risk
- CVCs coated with antiseptics or antibiotics might reduce risk but are expensive
- Use of Chlorhexidine skin pre reduces risk more than povidone-iodine

Saint S. <http://www.ehrq.gov>

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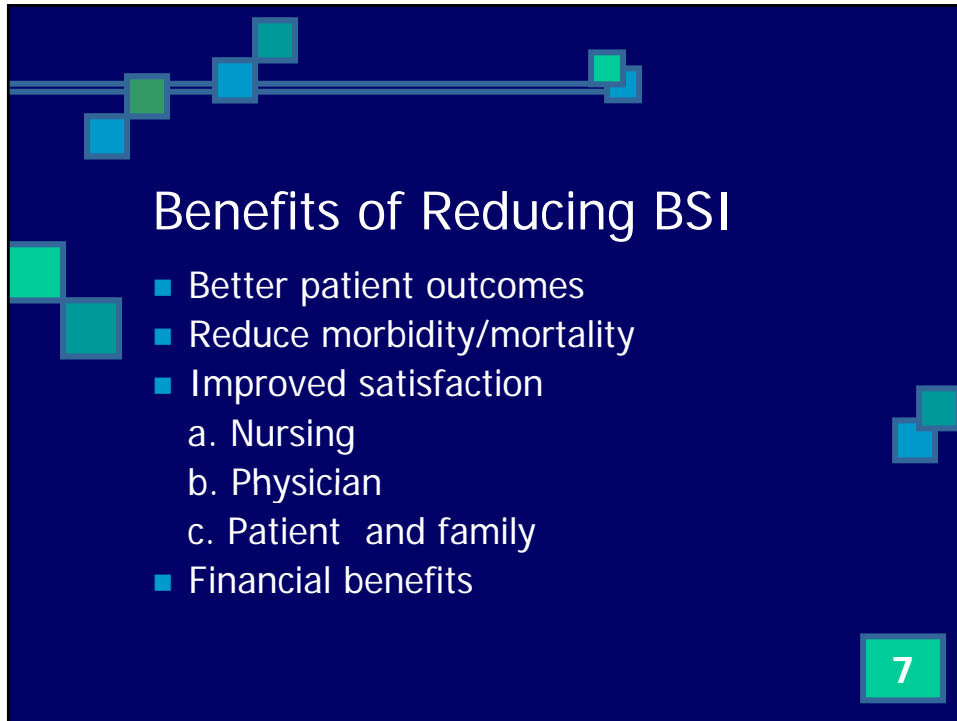
## Implementing the Central-Line Bundle



### Opportunity Knocks

- What if a series of interventions could markedly reduce the risk of BSI ?
- What if those interventions were already readily available in hospitals ?
- What if all of those interventions were done all the time on each patient ?

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## Benefits of Reducing BSI

- Better patient outcomes
- Reduce morbidity/mortality
- Improved satisfaction
  - a. Nursing
  - b. Physician
  - c. Patient and family
- Financial benefits

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## The Way We Were at PHLB

- In year's past, it was generally accepted that a well designed Infection Control Program could prevent about 30% of infections acquired in the hospital.
- We change by harnessing new modalities, and implementing practical guidelines.

“Because we’ve always done it that way”

**“The times they are a changing.....” Bob Dylan**

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## Our Approach [Simplicity]

- Our vision: Our patients will not acquired infections as a results of the care delivered at our hospital

Aims: Staff members will no longer view infections as inevitable. Our healthcare workers will use proven strategies to prevent hospital acquired infections.

**It takes a great deal of courage to stand up to your enemies, but even more to stand up to your friends.....J.K. Rowling**

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## Implementing the Central-Line Bundle

### Strategies: Transforming the Environment

- Just because there is not direct evidence linking surface level hygiene and bacteria acquisition, does not mean to say that there is not any.
- There is evidence for every stage of bacterial transmission cycle between the patient and his environment.
- A. U.V. Light
- B. New flooring (Microban)
- C. Implementation of the Bundle Protocols

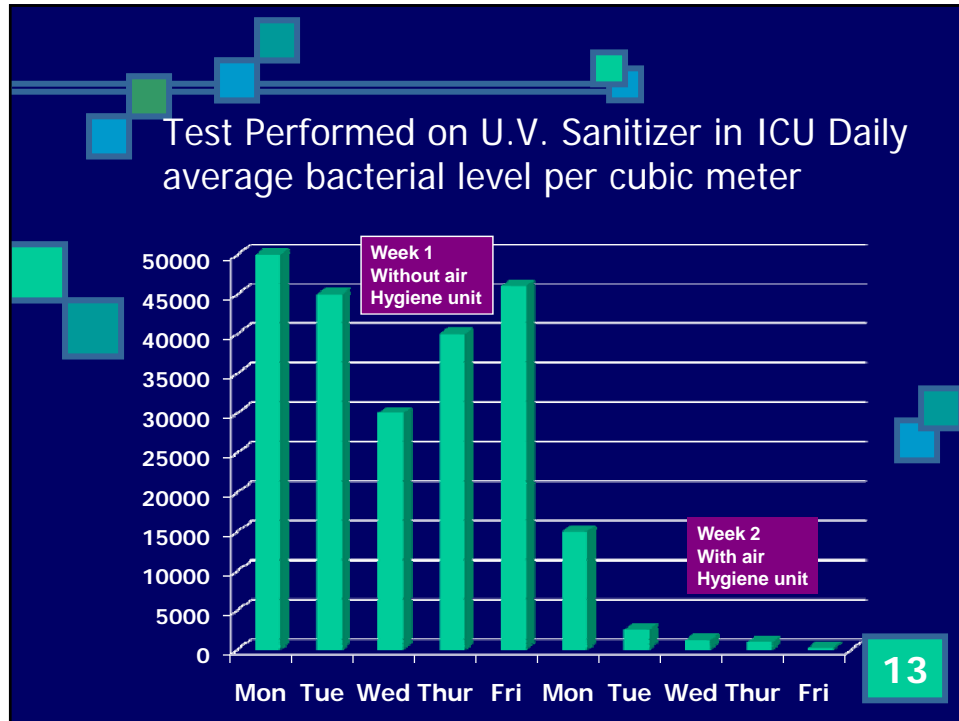
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### Ultra Violet Light [Air Sanitation]



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[The Environment] is the source

- Frequently used hand-contact surfaces are high-risk e.g., door handles, toilet handles, waste bin lids, telephone handsets, nurse – call button, infusion pumps switch and computer keyboards
- The closer the surface is to the patient, the more critical it is likely to be.

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**The Inanimate Environment Can Facilitate Transmission**

X represents VRE culture positive sites



~ Contaminated surfaces increase cross-transmission ~

Abstract: The Risk of Hand and Glove Contamination after Contact with a VRE (+) Patient Environment. Hayden M, ICAAC, 2001, Chicago, IL.

## Implementing the Central-Line Bundle

The most frequently implicated micro-organisms include

- Coagulase-negative staphylococci (particular staphylococcus epidermidis)
- Staphylococcus aureus (MRSA)
- Candida species
- Enterococci (VRE – faecalis and faecium)

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## The Central Line Bundle

- Is a group of interventions related to patients with intravascular central catheters that, when implemented together, result in better outcomes than when implemented individually

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## Central Line Bundle Elements

1. Set your protocol (Check List, Procedures)
2. Select your tray
3. Maintain patient hygiene (Biguanide)
4. Hand hygiene (Biguanide)
5. Maximal barrier precautions (during insertion)
6. Chlorhexidine skin antisepsis
7. Optimal catheter site selection with subclavian vein as the preferred site for non-tunneled catheter or PICC's.
8. Daily review of line necessity with prompt removal.

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## Types of Central Venous Catheters

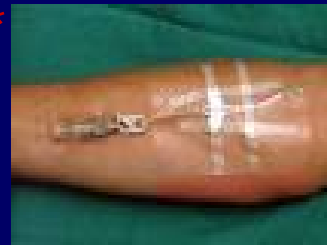
- Tunneled lines
- Implantable ports
- Non—tunneled percutaneous lines.
- PICC



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## Peripherally Inserted Central Catheter – PICC\*

- \*It is a central line
- \*Bedside placement
- \*Lower risk of infection
- \*No risk of: Haemothorax/Pneumothorax
- \*However can have problems getting access.



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## Me and What Army?



- Form... a team (include a diverse staff)
- Identify... a project champion
- Identify... a process owner

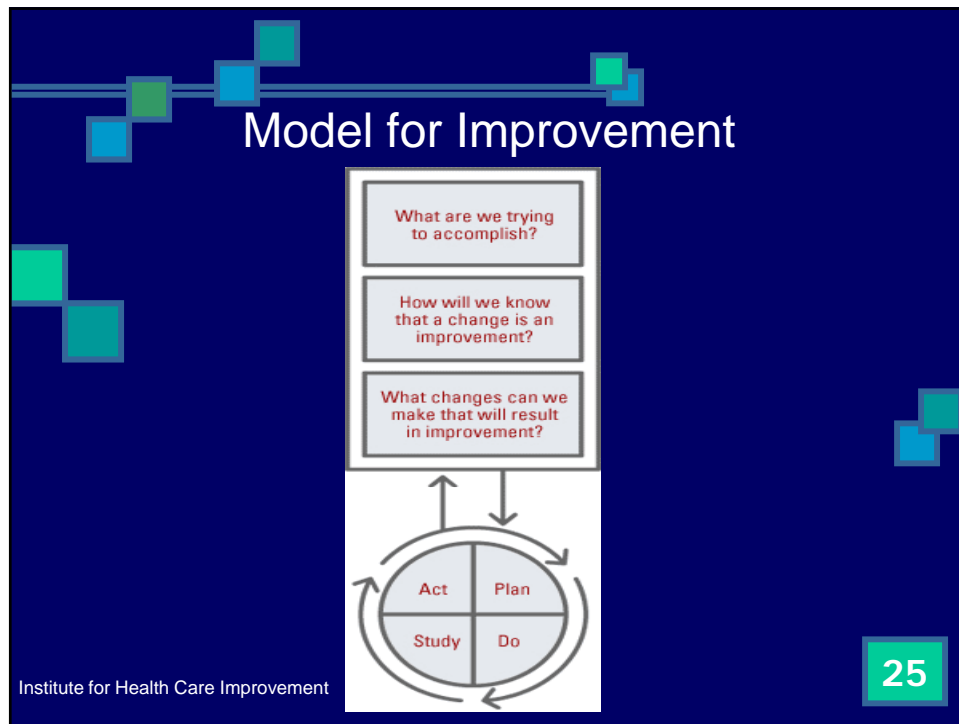
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## Central Line Checklist

- Have the nurse document compliance with the insertion criteria at the time of insertion
- Create a culture of safety and prevention
- Instruct nurses in use of critical communication strategies to facilitate important exchanges

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### Role of Leadership

- Committed: staff cannot improve without supportive leadership.

Set the standard: "This is how we will practice"

Resources: make time to work on testing

Share data: to motivate staff for change

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## Implementing the Central-Line Bundle

### Poorly Designating Areas of Focus

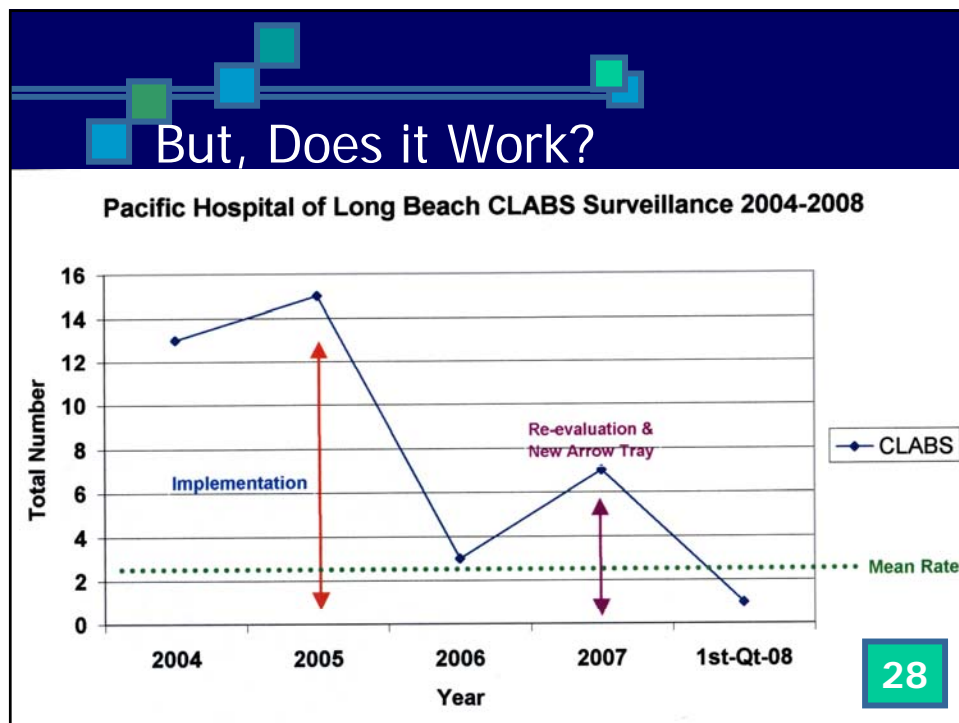
“We’re focusing efforts around reporting requirements because those are the ones we know we have to do, regardless of the other opportunities.”  
Infection Control Practitioner  
500-bed Academic Medical Center

“We didn’t really have a reason except we wanted to be able to say we were participating in an IHI campaign.”  
Director, Clinical Effectiveness  
300-bed Community Hospital

“Our patients are very concerned with MRSA and the public awareness is driving us to prioritize that, even though our MRSA infection rate is actually below benchmark.”  
Chief Medical Officer  
400-bed Regional Referral Center

Advisory Board Company . 15096 S . 090607

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## Outcome and Cost Impact

- Prevented annually (estimated):
- 12 CLABS (central line associated blood stream infections)
- 6 deaths
- 156 ICU days saved
- Estimated savings = \$348,000.00

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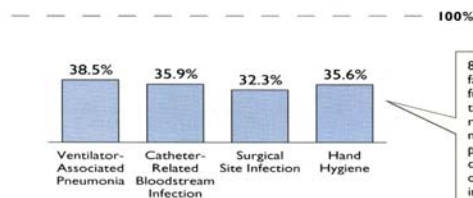
## Leapfrog Report 09/18/07

- 87% hospitals (n=1256) do not take all recommended steps to prevent HAI's

### Falling Short on Performance

Percentage of Hospitals Fully Complying with Leapfrog Infection Prevention Policies

n=1,256

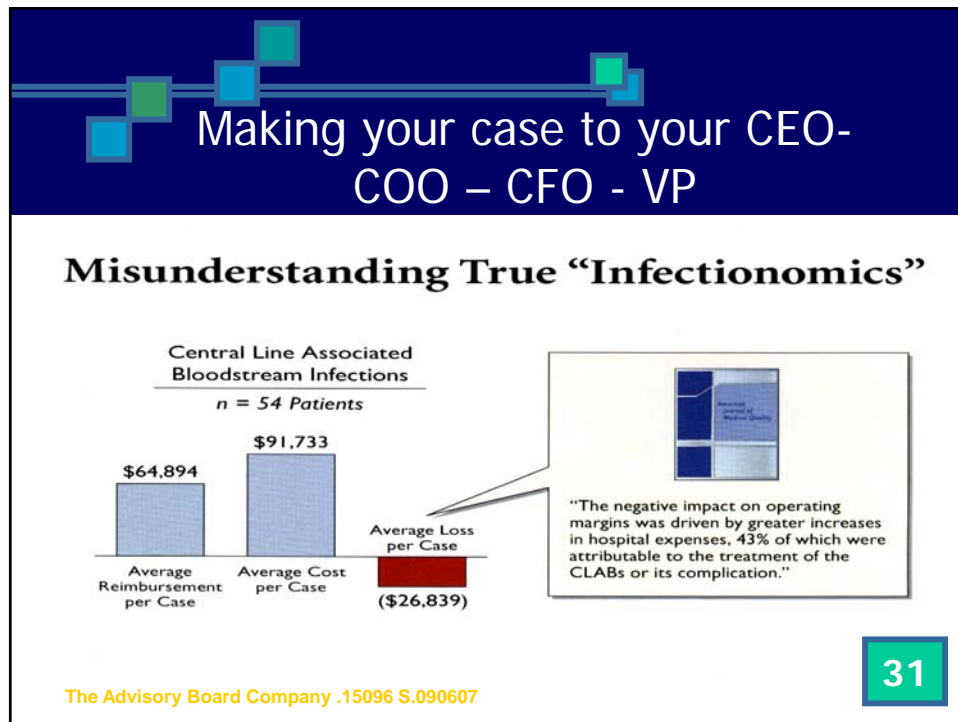


87 percent of U.S. facilities have not fully implemented the organization's recommended measures for preventing four common types of nosocomial infections

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<http://www.leapfroggroup.org/>

## Implementing the Central-Line Bundle



### Making your case...p2.

#### Understanding the Economic Burden

Impact of CLABs on Gross Margin

	Acute Pancreatitis	Pancreatitis with cc <sup>1</sup>	Pancreatitis with Tracheostomy	Pancreatitis with Tracheostomy + CLAB
Revenue (\$)	5,907	99,214	125,576	200,031
Expense (\$)	5,788	58,905	98,094	241,844
Gross Margin (\$)	119	40,309	27,482	(41,813)
Costs Attributable to CLAB (\$)				170,565
Length of Stay	4	38	41	86

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## Summary

- If not this then what?
- If not us then who ?
- Joe Calvasso CEO Mount Carmel Hospital

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Knowing is not enough.....

Johan Wolfgang von Goethe



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