HEALTHCARE ASSOCIATED INFECTIONS: IS TARGETING ZERO A GLOBAL REALITY?

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Objectives/Outline

• Review the scope of healthcare-associated Infections in the U.S. and around the world.
• Discuss the concept and rational behind “Targeting Zero Healthcare Associated Infections.”
• Describe successful local, national and international Targeting Zero central line-associated bloodstream infections (CLABSI) strategies.
Healthcare-Associated Infections (HAIs)

**United States**

- Approximately 1.7 million HAIs occur annually (1 in every 20 hospitalized patients) resulting in up to 90,000 deaths and costing up to $45 billion in added healthcare costs.


  Scott, CDC March 2009

**Developing Countries**

- Systematic review and meta-analysis showed overall HAI prevalence of 15.5 infections per 100 patients (compared to 7.1 in Europe and 4.5 in US). Pooled HAI density in adult ICUs was 47.9 per 1000 patient days (compared to 13.6 in US)

**Healthcare-Associated Infections (HAIs)**

The International Nosocomial Infection Control Consortium (INICC) recently reported 2004-2009 surveillance data from 422 ICUs in 36 countries in Latin America, Asia, Africa, and Europe. Device-associated nosocomial infection rates were significantly higher compared to US.

<table>
<thead>
<tr>
<th>Infection</th>
<th>INICC</th>
<th>US NHSN</th>
</tr>
</thead>
<tbody>
<tr>
<td>Central line associated bloodstream infection (per 1,000 central line days)</td>
<td>6.8</td>
<td>2.0</td>
</tr>
<tr>
<td>Ventilator associated pneumonia (per 1,000 ventilator days)</td>
<td>15.8</td>
<td>3.3</td>
</tr>
<tr>
<td>Catheter associated UTI (per 1,000 catheter days)</td>
<td>6.3</td>
<td>3.3</td>
</tr>
</tbody>
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Impact of HAIs

- Increase length of stay (increasing risks for other events)
- Increased attributable mortality
- Increased resistance of micro-organisms to antimicrobials
- Increased financial cost
- Societal cost: lack of consumer trust, increased litigation, legislation
- Personal cost to patient and families

Loved...

...barbeques, hugging his wife & fly fishing.

Teddy Shultz
1940 - 2003
Loved...

...British mysteries, Thai cooking classes & gardening.

Adelaide Madsen
1951 - 2006
Loved...

...blueberries, teasing his little sister & soccer.

Adam Miller
1997 - 2005
Loved...

...shadows, soft baby talk & Mom’s glasses.

Ava Clark
2005 - 2006
Why Target Zero HAIs?

Love Goes On
What is “Targeting Zero HAIs”

Targeting Zero is a culture, a goal, an attitude, and a long term commitment

- **Culture** that holds everyone accountable for adhering to proven infection prevention strategies and practices.
- **Goal** that each time a reduction is achieved...sustain it...keep going until you get to zero or as close to zero as possible.
- **Attitude** to treat every HAI as something that should never happen, investigating root causes.
- **Long term commitment**
Learning From Each HAI

1. What happened?

2. Why did it happen?

3. What will you do to reduce the risk of recurrence?

4. How will you know the risk is reduced?
Targeting Zero HAIs

What is the challenge for today’s leaders?

Setting the goal – elimination of HAIs and creating the infrastructure and partnerships for success.
US Drivers to Target Zero HAIs

- Hospital reimbursement – as of October 2008, the Centers for Medicare and Medicaid Services (CMS) no longer reimbursed hospitals for certain preventable events

- Public reporting – as of January 2011 mandatory national reporting of central line associated bloodstream infections required
Is Achieving Zero HAIs a Reality?

ABSOLUTELY!

Growing evidence that organizations have gone long periods of time without a particular type of nosocomial infection
Is Sustaining Zero HAI a Reality?

ABSOLUTELY!

The evidence indicates that organizations have sustained the gains

Up to 24 months without a CLABSI in adult ICUs

Pronovost et al., *Health Affairs* 2011;30:628-634
Eliminating CLABSI
The Roads to Success

- The Patient Unit Level
- Michigan Keystone ICU Project (The Michigan Project)
- The Rhode Island ICU Collaborative
- England’s “Matching Michigan” project
- The INICC project
- The US National Plan to Prevent HAI
Patient Unit Success

A NICU Example: Eliminating CLABSI
The Children’s Hospital of Philadelphia 2004

1. Teamwork and Safety Culture Survey
2. NICU Safe Passage Campaign
3. Institute for Healthcare Improvement (IHI) “Reducing Complications from Central Lines in the ICU” collaborative
4. Strategies to improve clinical communication among the clinical team through skill building and structured communication.
Reducing Central Line Associated Infections

Vermont Oxford Collaborative Random Safety Audits

Clinical Consensuses

Core Teams and Unit Restructuring

Organizational Nursing Practice Initiatives

Coaching Sessions for Nurses: “Finding Your Voice”

SBAR Tool (Situation – Background – Assessment – Recommendation)
May 2004 - June 2005

CLABSI per 1000 Cath Days

- ~IHI start
- "Finding Your Voice" nurse coaching sessions
- Teamwork & Safety Culture Survey
- +SBAR
- "Finding Your Voice" nurse coaching sessions
- RN bundle education completed
- *DGS

Median

May '04 Jun Jul Aug Sep Oct Nov Dec Jan '05 Feb Mar Apr May Jun
The Michigan Keystone ICU Project

In 2003, Agency for Healthcare Research and Quality (AHRQ) funded a 2 year initiative to prevent CLABSI and to improve the culture of safety in 127 intensive care units across the state of Michigan. The initiative included:

**Use evidence-based interventions**

(hand hygiene, catheter insertion using maximal sterile barrier precautions, chlorhexidine-containing disinfectant for skin antisepsis, favoring subclavian insertion site, and daily checks for catheter removal)

+ a patient safety model called the *Comprehensive Unit-based Safety Program (CUSP)*
The CUSP Model

- Created through a collaborative effort of the AHRQ and state and national-level innovators in patient safety
- Supports a range of quality and safety improvement models
- Encompasses a wide range of safety tools and approaches
- Based on the understanding that all culture is local, and that work to improve culture must be owned at the unit level
- Believes that harm is not an acceptable “cost of doing business”
- Can be applied by anyone, anywhere
The CUSP Model

The program is designed to:

- educate and improve awareness about patient safety and quality of care
- empower staff to take charge and improve safety in their workplace
- partner units with a hospital executive to improve organizational culture and provide resources for unit improvement efforts
- provide tools to investigate and learn from defects
CUSP Components

**Engage (adaptive)** How does this make the world a better place?

**Educate (technical)** What do we need to know?

**Execute (adaptive)** What do we need to do? What can we do with our resources and culture?

**Evaluate (technical)** How do we know we improved safety?
The Michigan Keystone ICU Project

• **Purpose:** improve patient safety in the adult ICUs in Michigan by reducing the rate of catheter-related bloodstream infections

• **Methods:** collaborative cohort of 103 adult ICUs implemented an evidence-based change package to prevent CLABSI and the CUSP framework and monitor/measured the effect for 18 months

The Michigan Keystone ICU Project

Results

• 103 ICUs reported data for 1981 ICU months and 375,757 catheter-days.
• CLABSI were reduced by 66% in the first 18 months
• The overall median rate of CLABSI decreased from 2.7 (mean 7.7) infections/1000 catheter days at baseline, to 0 (mean 2.3) at 3 months after implementation of the study interventions, and was sustained at 0 (mean 1.4) during 18 months of follow-up. Pronovost et al N Engl J Med 2006;355:2725-32.

Follow-Up

60% of ICUs sustained zero CLABSI for 12 months or more and 26% for 24 months or more. Pronovost et al., BMJ 2010;340:c309.
The Rhode Island ICU Collaborative

- In 2005 implemented the “Michigan model” in 100% of 23 ICUs in 11 hospitals in the state of Rhode Island
- Funded by hospitals and insurers
- **Results**: The statewide mean CLABSI rate decreased 74% from 3.73 (median 1.95) infections per 1000 catheter days to 0.97 (median 0)

DePalo et al *Qual Saf Health Care* 2010;19:555-561
England

• The National Patient Safety Agency coordinated an initiative known as “Matching Michigan” in adult and pediatric ICUs from 2009-2011

• **Methods**: 2-year, four cluster, stepped non-randomized study to prevent CLABSI.

• **Results**: 215/223 ICUs in England participated. Adult ICU’s achieved a 60% CLABSI reduction. Pediatric ICU’s a 48% reduction.

The Matching Michigan Collaborative & Writing Committee, *BMJ Qual Saf* 2012;0:1-14
The INICC Initiative

Findings of the International Nosocomial Infection Control Consortium (INICC), Part III: Effectiveness of a Multidimensional Infection Control Approach to Reduce Central Line–Associated Bloodstream Infections in the Neonatal Intensive Care Units of 4 Developing Countries

Victor Daniel Rosenthal, MD; Lourdes Dueñas, MD; Martha Sobreyra-Oropeza, MD; Khalidi Ammar, MD; Josephine Anne Navoa-Ng, MD; Ana Concepción Bran de Casares, RN; Lillian de Jesus Machuca, RN; Nejla Ben-Jaballah, MD; Asma Hamdi, MD; Victoria D. Villarrea, RN; Maria Corazon V. Tolentino, RN
The INICC Project

- **Purpose:** improve patient safety in the neonatal ICUs in Michigan focused on an intervention to reduce the rate of catheter-related bloodstream infections

- **Methods:** collaborative cohort of 4 NICUs (El Salvador, Mexico, Philippines, Tunisia). Implemented evidence-based interventions (bundles, education, daily patient goal sheet, comprehensive unit-based safety program to improve the safety culture) and monitor the effect for 18 months

- **Results:** CLABSI rate decreased by 55% from 21.4 per 1000 CL days to 9.9.

U.S. National Action Plan to Prevent HAI: Roadmap to Elimination


**National targets for elimination include:**
- Central line-associated blood stream infections
- Catheter-associated urinary tract infections
- Surgical site infections
- MRSA bacteremia
- *Clostridium difficile* infections
U.S. National Action Plan to Prevent HAI: Roadmap to Elimination

Partnerships for Patients

Three Phases of Focus

• Hospitals
• Ambulatory
• Long term care facilities
Imperatives for Elimination of HAIs

- Promote adherence to evidence-based practices through partnering, education, implementation, and investment
- Increase sustainability through the alignment of financial incentives and reinvestment in successful strategies
- Fill knowledge gaps to respond to emerging threats through basis, translational, and epidemiological research
- Collect data to target prevention efforts and to measure progress

Action Plan Tier 1: Eliminating CLABSI

*Why start with CLABSI?*

- In the U.S. central venous lines catheters cause an estimated 82,000 bloodstream infections and up to 30,000 deaths among patients in ICUs, costing $2.3 billion annually.

- Clear scientific evidence base from which key interventions focused on a specific procedure (eg, catheter insertion) could be effectively and efficiently applied using innovative strategies to increase practice compliance and a method to measure outcomes accurately.

Pronovost et al *Clin Infect Diseases* 2011;52:507-513
Eliminating CLABSI (2008-2011)

(www.safercare.net)

• The national initiative, called On the CUSP: Stop BSI, started in 2008. It was organized and implemented as a State or region-level collaborative, structured around the hospital association in the State or region.

• **Goal:** reduction of CLABSI to 1 per 1,000 central line day and to improve unit safety culture in ICUs and non-ICUs.

• **Participants:** 44 States, the District of Columbia, and Puerto Rico. Collectively, these States and regions recruited more than 1,000 hospitals and 1,800 hospital units to participate in the project, representing over 25 percent of all adult ICUs in the nation.
Eliminating CLABSI

Results:

• States reduced their adult ICU CLABSI rate from 1.915 infections per 1,000 line days (baseline) to 1.133 infections, or a relative reduction of 41%.

• The percentage of units with zero CLABSI increased from 30% at baseline to 68%.

• Non-ICU and pediatric units had similar reductions in CLABSI rates.

• States that started with low CLABSI rates achieved additional improvements, again demonstrating that “getting to zero” was possible.
Eliminating CLABSI

Summary of National Results

- Reduce the CLABSI rate from 1.9 infections per 1000 central line days to 1.1 infections (reduced the rate of CLABSI by 40%)
- Prevented 2000 infections
- Saved 500 lives
- Saved $34 million in health care costs

Kuehn JAMA 2012; 308:1617-1618
Lessons Learned

1. Have well-defined, evidence-based interventions
2. Build a solid implementation structure and project plan
3. Collect and use timely, accurate, and actionable data to improve performance
4. Tailor national program for local and unit audiences
5. Evolve project strategies and emphases over time

The lessons learned contributed to the project’s success and can be applied to future large scale interventions.
CUSP Toolkit

The CUSP toolkit includes training tools to make care safer by improving the foundation of how your physicians, nurses, and other clinical team members work together. It builds the capacity to address safety issues by combining clinical best practices and the science of safety.

http://www.ahrq.gov/legacy/cusptoolkit/
Summary

Although “targeting zero” may not seem a realistic goal, the number of hospitals approaching this idealistic threshold is growing. The evidence is now clear that CLABSI can be reduced and even eliminated using a multimodal approach within a patient safety framework.

The question today is not ‘what to do’ but ‘how to do it.’

Zingg et al Curr Opin Infect Dis 2011;24:377-384
Reflection

• Where are you and your organization on the Targeting Zero HAI journey?
• Do you have the organizational support and the tools to help you along the journey?
• What additional skills do you need to take the journey?
Eliminating Healthcare Associated Infections: It’s In Our Hands!
Muchas Gracias

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