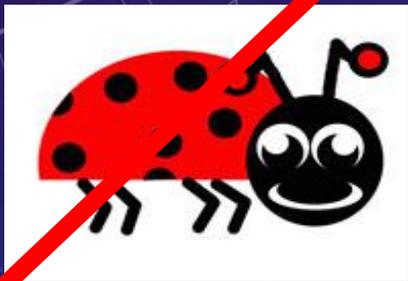


BUGS BE GONE: Reducing HAIs and Streamlining Care!



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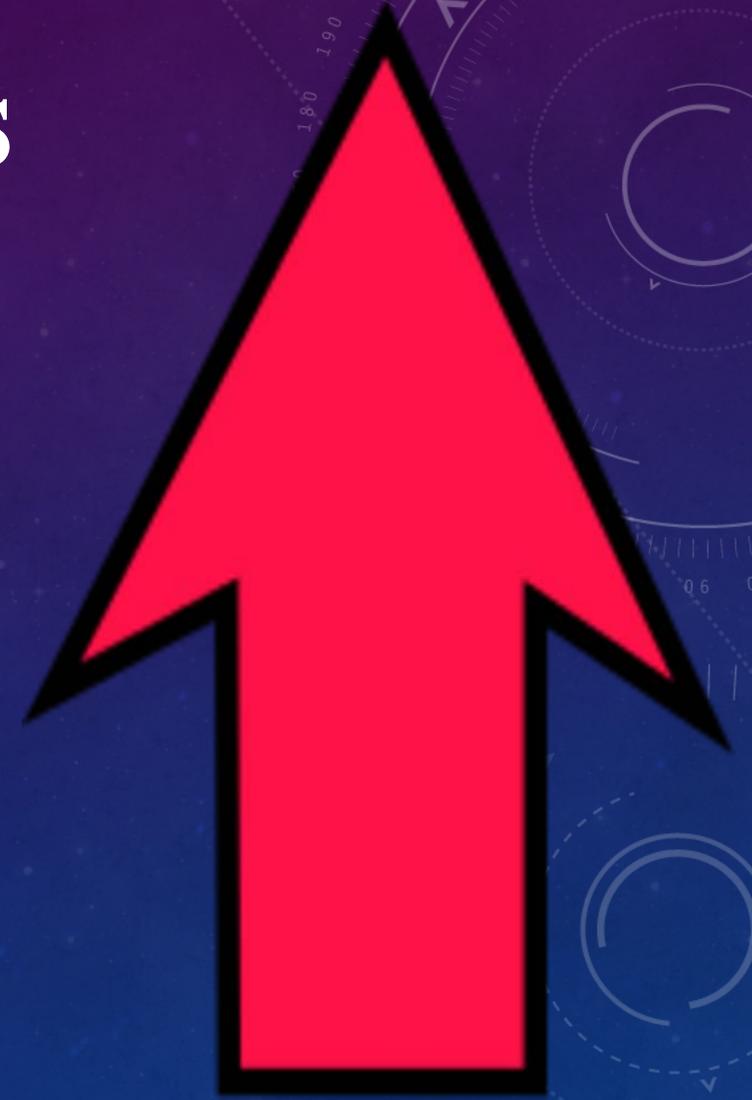
LEARNING OUTCOMES

1. Describe HAI's and the impact disposable ECG leads have on patient safety.
2. State ways to improve delivery of care to reduce the burden of HAI's at your institution.

HOSPITAL-ACQUIRED INFECTIONS

HAI's = preventable events that result in:

- Increase length of stay
- Increased cost of care
- Increased mortality
- Increased morbidity



HAI IMPACT ON PATIENTS

Question: How common are HAI's today?

- a) 1 in 25 patients gets an HAI.**
- b) 1 in 100 patients gets an HAI.**
- c) 1 in 150 patients gets an HAI.**
- d) 1 in 1000 patients gets an HAI.**

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HAI's ASSOCIATED WITH:

- Indwelling medical devices
 - central lines
 - ETT
 - urinary catheters
- Surgical procedures
- Contaminated healthcare environment
 - Blood pressure cuffs
 - ECG lead wires
 - Surfaces in patient care areas
- Overuse or improper use of antibiotics



SSI VAP



CLABSI



CAUTI



PROGRESS IN PREVENTION

Center for Disease Control and Prevention

- Reports progress
- National Healthcare Safety Network (NHSN)
 - National system to track HAI's
 - > 14,500 reporting statistical findings
- Bundled care protocols
 - Evidence-based interventions
 - Successful when fully implemented

PROTOCOL-DRIVEN CHANGE

Centers for Medicare and Medicaid Services (CMS)

- Changes in reimbursement
 - October, 2008
 - Enforced need for improved care
 - No longer paying for preventable adverse events
- Providers developed & implemented strategies
- Bundled care protocols began working

HOW ARE WE DOING?

Question: Which HAI statistic is NOT improving?

- a) CLABSI
- b) MRSA
- c) SSI
- d) CAUTI

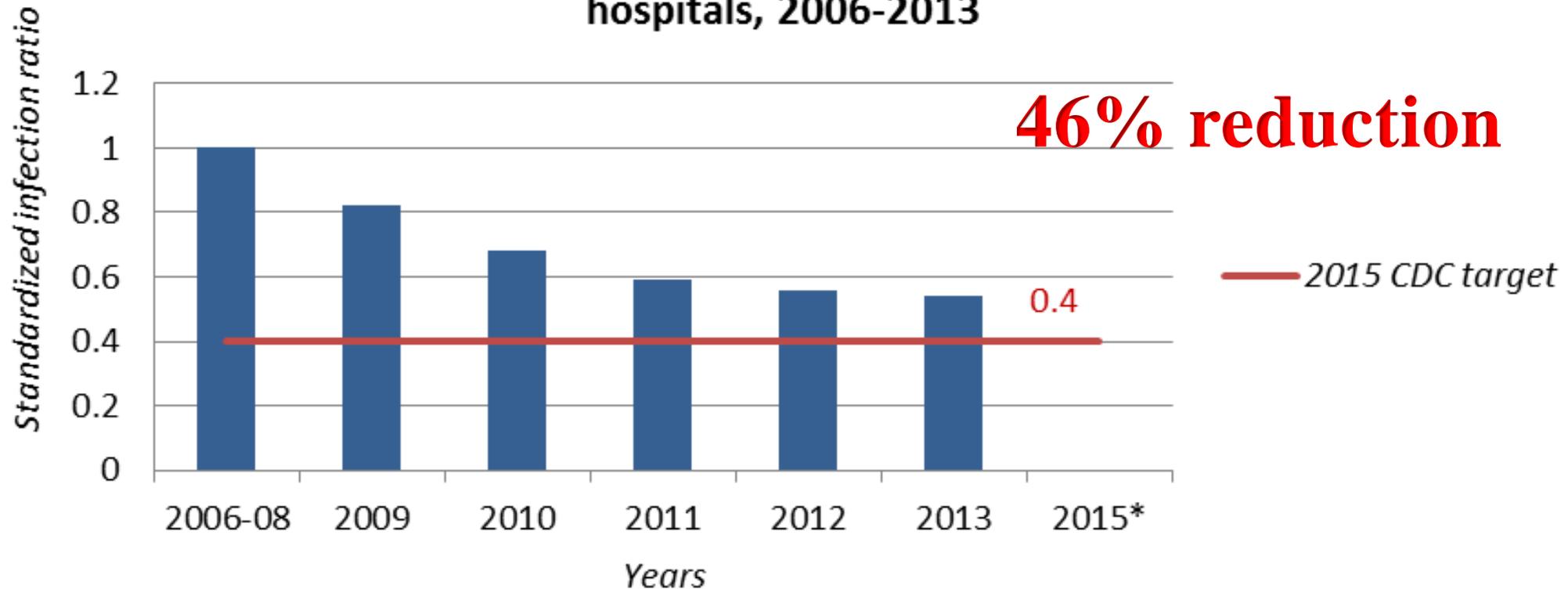
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CLABSI TRENDS

Trends in central line-associated blood stream infections (CLABSI) in hospitals, 2006-2013

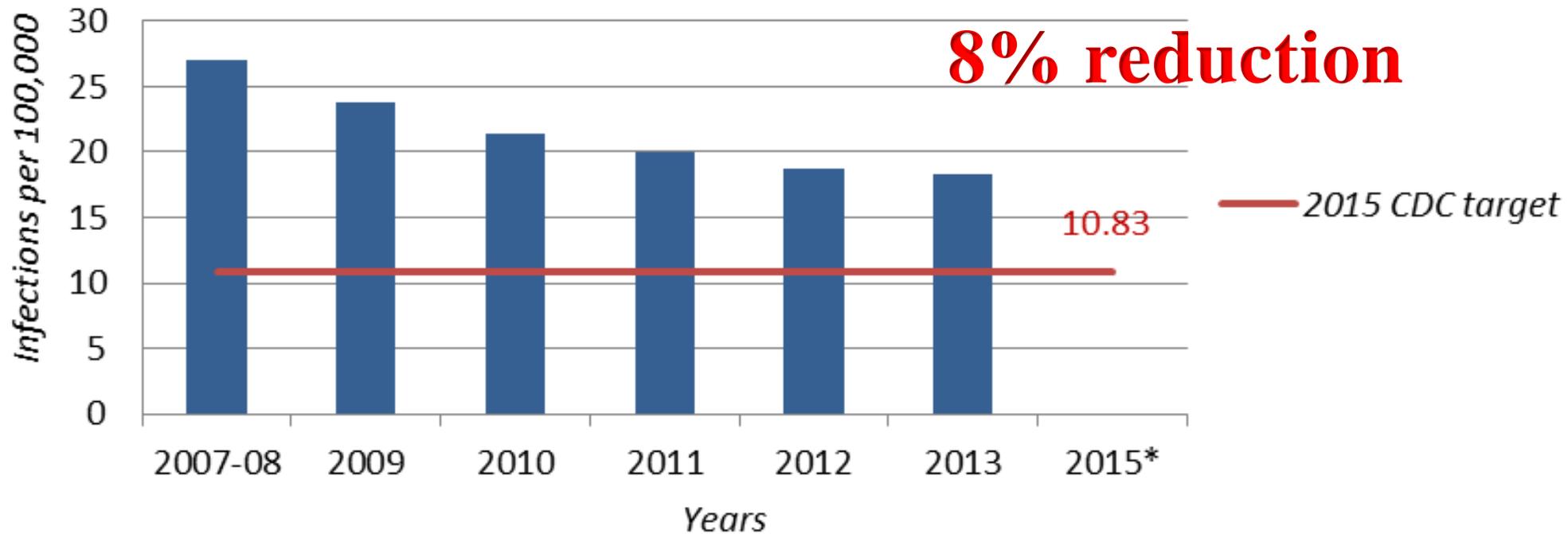


Source: CDC's National Healthcare Safety Network (NHSN)

*data anticipated November 2016

MRSA TRENDS

Trends in healthcare-associated invasive methicillin-resistant *Staphylococcus aureus* (MRSA) infections, 2007-2013

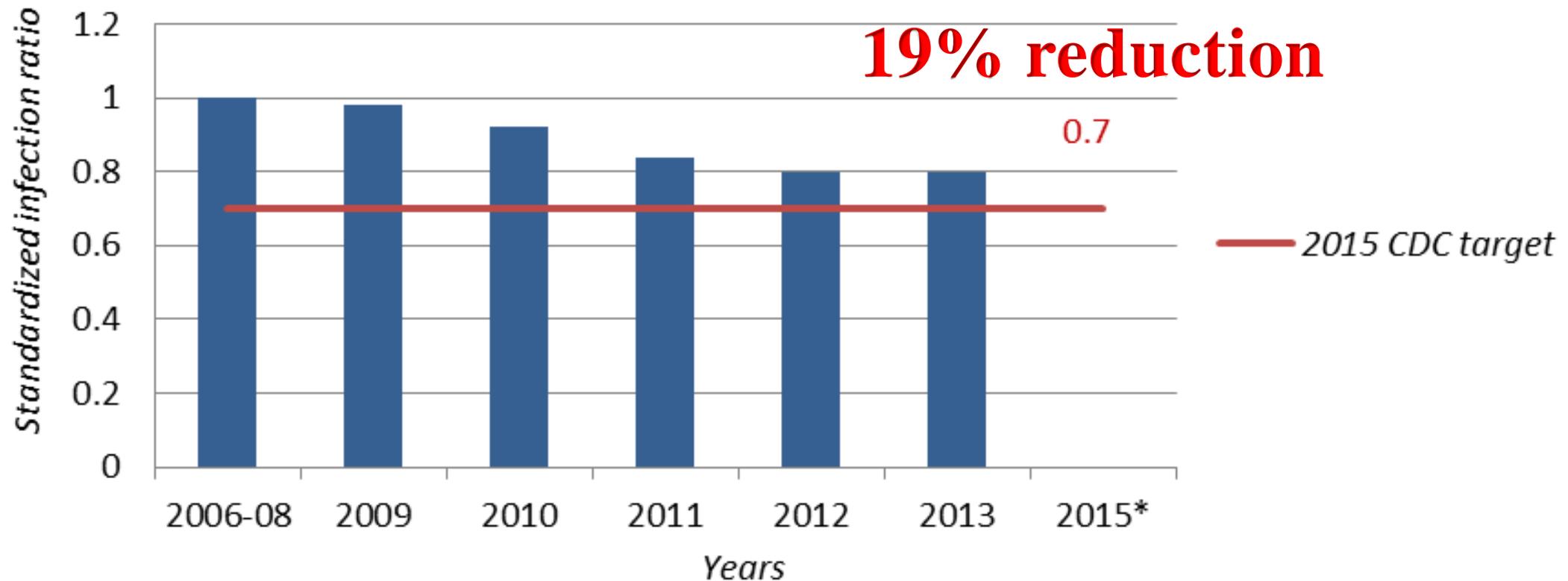


Source: Emerging Infections Program / Active Bacterial Core Surveillance

*data anticipated November 2016

SURGICAL SITE INFECTION TRENDS

Trends in surgical site infections (SSI) in hospitals, 2006-2013

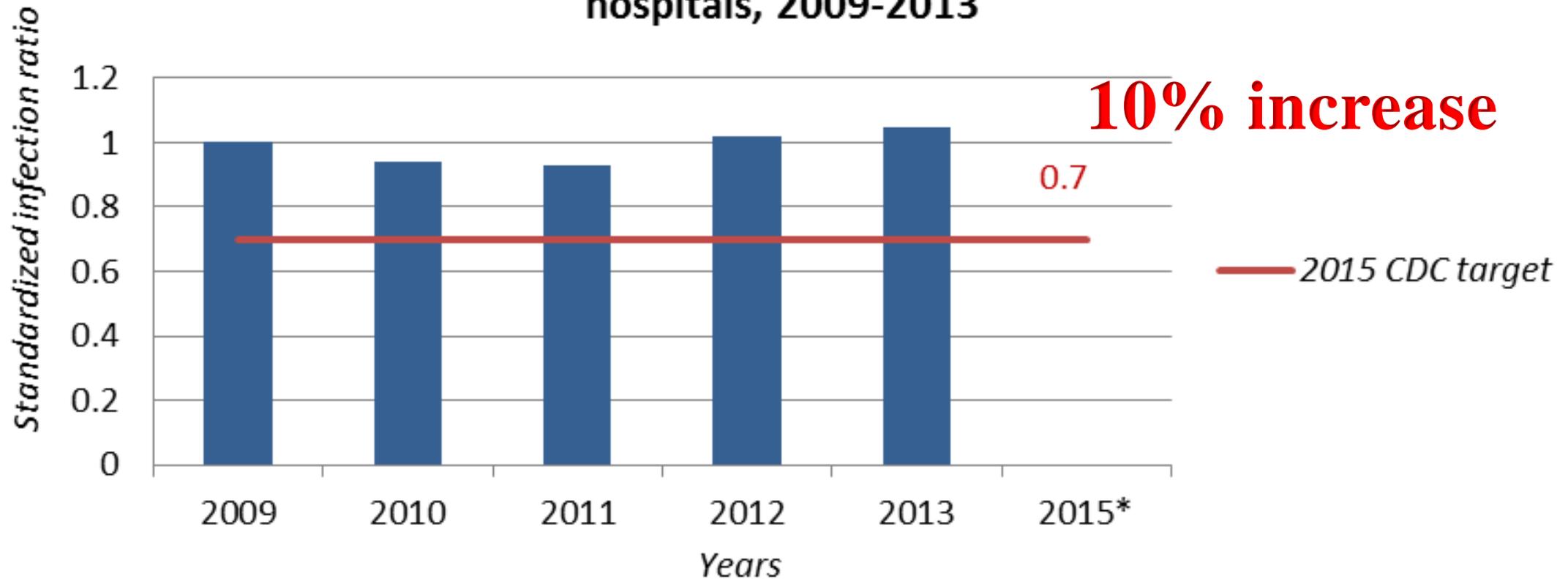


Source: CDC's National Healthcare Safety Network (NHSN)

*data anticipated November 2016

CAUTI TRENDS:

Trends in catheter-associated urinary tract infections (CAUTI) in hospitals, 2009-2013



Source: CDC's National Healthcare Safety Network (NHSN)

*data anticipated November 2016

CORE STANDARDS FOR CAUTI PREVENTION

Guidelines for insertion necessity

- Urinary retention or outlet obstruction
- Immobility or critically ill
- Incontinence with pressure ulcers/wounds
- Palliative care - end of life comfort
- Perioperative - selected surgical procedures

INSERTION & MAINTENANCE

1) Strict adherence to aseptic technique

- Excellent hand washing
- Consider having extra person to maintain sterility

2) Maintenance and care

- Excellent hygiene
 - 66% of CAUTI from bacteria entering catheter-urethral interface
- Avoid dependent loops
- Stabilization device
 - 34% of CAUTI from migration/manipulation

3) Nurse-driven protocols

- Reduction of catheter days
 - Bacteria colonizes at 3-10% daily (100% at 30 days)
- Alternatives
 - External catheters
 - Disposable, mega-absorbent dry pads (can hold 800 mL)

CROSS CONTAMINATION

Question: Which of the following potentially result in bacterial cross contamination?

- a) Stethoscope**
- b) Electrocardiographic lead wires**
- c) Blood pressure cuff**
- d) Patient room: over bed table, call bell**

CROSS CONTAMINATION

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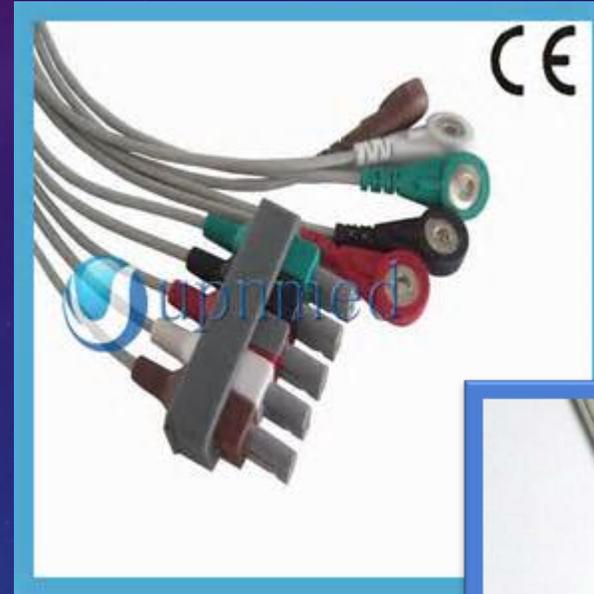
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ELECTROCARDIOGRAPHIC LEAD WIRES

(MUST NOT OVERLOOK NONCRITICAL DEVICE CONTAMINATION)

How are lead wires cleaned?

- Do we use standard protocols?
- Who disinfects the wires?
 - Nurses
 - Monitor techs
 - Environmental
- Are they cleaned effectively?



ONE STUDY OF CLEAN LEAD WIRES

- 451 ECG lead wires “clean and ready for use”
- 51.4% (n=232 sets) contaminated w/ > 30 CFUs/mL
- Only 2 were not contaminated!
 - 96% *coagulase negative staphylococci*
 - 71.2% spore forming bacteria
 - 10.2 % isolated with GNR -*Pseudomonas aeruginosa*
 - *Streptococcus, Enterobacter, Klebsiella, Enterococcus*
- Ridges & clips = vector for transmission of MDRO bacterial pathogens

COMPARATIVE EFFECTIVENESS RESEARCH

- Large study (n=7240) in quaternary-care medical center
- Randomized disposable leads with cleaned reusable leads
 - Strict cleaning protocols
 - CVICU surgical patient leads went to CVOR for ultrasound cleaning
 - Remaining cleaned by environmental services
 - ❖ Clorox healthcare germicidal wipes
 - ❖ Kill CDT spores in 3 minutes
 - ❖ 50 other bacteria in 30 seconds or less
- Infection rates decreased from 0.9 to 0.15 per 100 ICU days
- Strict protocols enhanced results

BACTERIAL SURVIVAL

Surfaces harbor bacterial colonization → cross-contamination

➤ *Vancomycin-resistant enterococci (VRE)*

- Survived on hands/gloves up to 60 minutes
- Survived on inanimate surfaces up to 4 months

➤ *Acinetobacter* – 3 days to 11 months

➤ *Clostridium difficile* spores - > 5 months

➤ *Pseudomonas aeruginosa* – 6 hours to 16 months

➤ *Klebsiella* – 2 hours to >30 months

➤ *Staphylococcus aureus* (including MRSA) – 7 Days to > 12 months

➤ Norovirus – 8 hours to > 2 weeks

ECG WIRES IMPLICATED IN VRE OUTBREAK

Burn unit in 800-bed university medical center

- VRE outbreak that was successfully resolved
- Reoccurred 5 weeks later
- Traced to a single ECG lead



OPTIMIZING SAFE PATIENT CARE

Disposable versus reusable lead wires

- Eliminates cross contamination

One study in St. Petersburg, Florida

- Added disposable lead wires to infection bundle
- Within 1st quarter:
 - 70% reduction of HAI due to MRSA, VRE, Acinetobacter
 - 30 % reduction in CDT

Virginia hospital reported 23-month zero infection rate

COST-BENEFIT RATIO

Question: Does the benefit of disposable lead wires outweigh the cost?

- a) Yes**
- b) No**

COST-BENEFIT RATIO

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COST-BENEFIT RATIO COMPARISON

One healthcare system's findings:

- After evaluating the effectiveness of lead wire disinfection
 - Based on 174 cardiovascular surgeries
 - Disposable lead wire costs \$2,865.78
 - Cost of one mid-sternal surgical site infection: \$299,237
 - Mortality rate up to 40%

REDUCED ALARM FATIGUE

Study compared alarms between reusable and disposable ECG leads:

- 1611 patients (9386 monitoring days)
- Disposable ECG leads with push-button design superior
 - Reduced lead fail, leads off, & no telemetry alarms ($p < .001$)
 - Artifact alarms significantly lower ($p < .02$)
 - All false-alarm events reduced ($p = .002$)
- Fewer alarms
 - Saves time for nurses
 - Reduces alarm fatigue
 - Improves patient safety



ADDITIONAL BENEFITS

➤ Dedicated disposable wires = efficiency

- Placed in OR
- Stay with patient on transfer
- Connect quickly to transport or resuscitate



CONCLUSION

- 1) HAIs continue to plague healthcare.
- 2) Bundled care and strict protocols work.
- 3) Disposable lead sets reduce cross contamination, reduce alarm fatigue, and increase efficiency.
- 4) More research is needed for best practice.
- 5) Onus is on us to deliver high quality, cost effective, safe care.



FIRST AND
FOREMOST:

Always
remain
CALM!

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