

# Chlorhexidine Bathing

## Practical Advice

Susan Huang, MD MPH

Professor of Medicine

University of California Irvine School of Medicine

Medical Director, Epidemiology & Infection Prevention

Division of Infectious Diseases & Health Policy Research Institute

# Disclosures

Conducting clinical trials and studies in which participating hospitals and nursing homes are receiving contributed product from Sage Products, 3M, Clorox, and Molnlycke

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# The Case for Chlorhexidine

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# What is Chlorhexidine (CHG)?



- Chemical antiseptic (1950, England)
- Active against bacteria and fungi
- Works by disrupting cell membranes
- Colorless and odorless
- Available in 0.12%, 2%, and 4% aqueous formulations

# Chlorhexidine Uses

- Dental – gingivitis, periodontal disease
- Central line skin prep
- Surgical skin prep
- Surgical pre-operative bathing
- Wound cleanser
- Bathing to reduce microbial burden and infection

# Source Control

- Numerous pathogens
- Resistance rising
- Shedding is common and persistent
- Contamination hard to remove
- Need a broad solution
- Impact carriers not just prevent new carriers

ORIGINAL ARTICLE

## Effect of Daily Chlorhexidine Bathing on Hospital-Acquired Infection

Michael W. Climo, M.D., Deborah S. Yokoe, M.D., M.P.H., David K. Warren, M.D.,  
Trish M. Perl, M.D., Maureen Bolon, M.D., Loreen A. Herwaldt, M.D.,  
Robert A. Weinstein, M.D., Kent A. Sepkowitz, M.D., John A. Jernigan, M.D.,  
Kakotan Sanogo, M.S., and Edward S. Wong, M.D.

- 7 academic hospitals, 12 ICUs
- 23% decrease in MDRO acquisition
- 27% decrease in bloodstream infection
- 53% decrease in central line infections

# Pediatric SCRUB Trial

## Scrubbing with CHG Reduces Unwanted Bacteria

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Daily chlorhexidine bathing to reduce bacteraemia in critically ill children: a multicentre, cluster-randomised, crossover trial

*Aaron M Milstone, Alexis Elward, Xiaoyan Song, Danielle M Zerr, Rachel Orscheln, Kathleen Speck, Daniel Obeng, Nicholas G Reich, Susan E Coffin, Trish M Perl, for the Pediatric SCRUB Trial Study Group*

- 5 academic hospitals, 10 pediatric ICUs
- 36% decrease in bloodstream infection

Milstone et al. Lancet. 2013; 381(9872):1099-1106



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## Targeted versus Universal Decolonization to Prevent ICU Infection

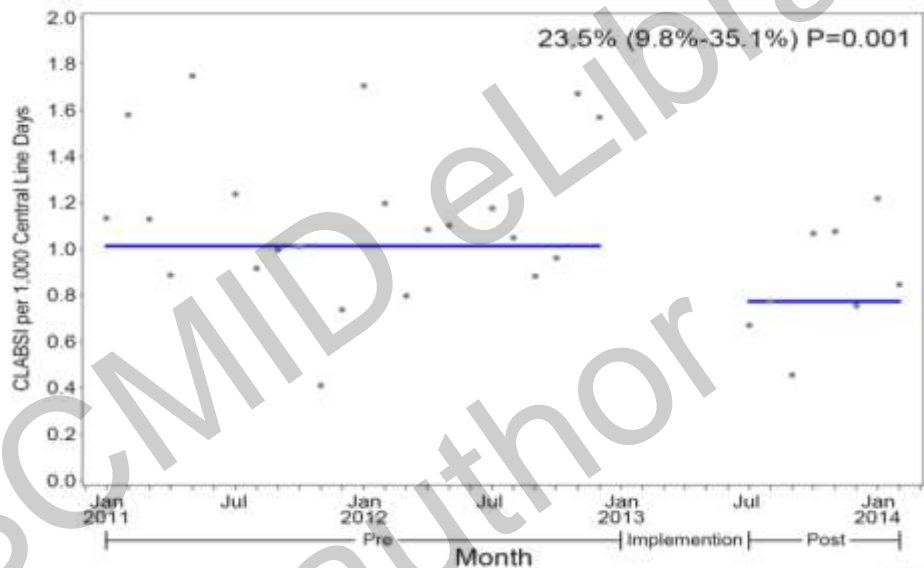
Susan S. Huang, M.D., M.P.H., Edward Septimus, M.D., Ken Kleinman, Sc.D., Julia Moody, M.S., Jason Hickok, M.B.A., R.N., Taliser R. Avery, M.S., Julie Lankiewicz, M.P.H., Adrijana Gombosov, B.S., Leah Terpstra, B.A., Fallon Hartford, M.S., Mary K. Hayden, M.D., John A. Jernigan, M.D., Robert A. Weinstein, M.D., Victoria J. Fraser, M.D., Katherine Haffenreffer, B.S., Eric Cui, B.S., Rebecca E. Kaganov, B.A., Karen Lolans, B.S., Jonathan B. Perlin, M.D., Ph.D., and Richard Platt, M.D., for the CDC Prevention Epicenters Program and the AHRQ DECIDE Network and Healthcare-Associated Infections Program\*

- The REDUCE MRSA Trial
- 43 hospitals, 74 ICUs
- Community hospitals
- Universal decolonization with CHG bathing and nasal mupirocin:  
37% reduction in MRSA, 44% reduction in all-cause bacteremia

# Pragmatic Protocol: REDUCE MRSA Trial

- Goal was to test QI strategy
  - Leveraged routine infrastructure at each site
  - No research staff on site
  - Provided protocol, education, tools, coaching calls, observation forms
  - Intent was to reflect what a usual US hospital could achieve if protocol implemented

# Post-Trial Roll Out Hospital Corporation of America



- Release of ICU universal decolonization protocol to 90 hospitals, 136 ICUs
  - Rolled out post-abstract Jan-July 2013
  - 24% reduction in CLABSI

Septimus, IDWeek 2014  
(In press, CID)

# Secondary Outcomes for Universal Decolonization

- Blood culture contamination decreased by 45% <sup>1</sup>
- Urinary bacterial colony counts in men <sup>2</sup>
  - 37% reduction in candiduria
  - 26% reduction in low level bacteriuria
- Cost effectiveness per 1,000 ICU admissions <sup>3</sup>
  - Saves \$171,000 (USD) (vs. screening and isolation)
  - Prevents 9 additional bloodstream infections

<sup>1</sup> Septimus E. CID 2014;35 Suppl 3:S17-S22.

<sup>3</sup> Huang SS. ICHE. 2014;35 S3:S23-S31.

<sup>2</sup> Huang SS. Lancet ID. 2016 Jan;16(1):70-9.

# **Implementation Pitfalls and Pearls for Chlorhexidine Bathing**

# Things That Matter

- Method
- Concentration
- Consistency
- Safety

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# Decolonization Method

- Technique
  - Massage into skin for sustained 24 hour activity
  - No rinse
- Protocol
  - Attention to high risk skin areas
  - Clean over non-gauze dressings
  - Proximal 6 inches of lines, catheters, devices
  - Perineum and wounds
  - Interactions – many soaps and shampoos inactivate

# Chlorhexidine Concentration

- Concentration matters
  - 2% no-rinse cloth most commonly studied
  - 4% no rinse solution → higher skin adverse events
  - 4% rinse solution in shower or bath
    - Lower but adequate concentrations
    - 2 minute contact time → rinse
    - Mesh sponge works well for liquid application



# Consistency

- Consistency
  - 24 hour effect → daily application
  - Staff training <sup>1</sup>
    - Include night and temporary staff
    - Reinforce method: no rinse and high risk areas
    - Compliance checks

<sup>1</sup> Popovich et al. Intensive Care Med 2010;36(5):854-8

# Safety: Minimal Adverse Events

- <1% Attributable Mild Skin Reactions
- Climo et al.
  - 2.0% CHG skin reactions vs 3.4% regular soap
- REDUCE MRSA
  - 7 mild events (<0.1%)
- Pediatric SCRUB Trial
  - 3% (n=43) CHG vs 1% (n=26) of controls
  - Mild skin reactions, only 12 believed to be related
- Anaphylaxis rare

# AHRQ Website: Toolkit

**AHRQ** Agency for Healthcare Research and Quality  
Advancing Excellence in Health Care

Health Care Information | For Patients & Consumers | **For Professionals** | For Policymakers | Research Tools & Data | Funding & Grants | Centers, Portfolios & Initiatives | News & Events

Home > For Professionals > Hospitals & Health Systems > Hospital Resources > Universal ICU Decolonization Protocol

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## Universal ICU Decolonization: An Enhanced Protocol

Publication # 13-0052-EF

### Introduction and Welcome

This enhanced protocol is based on materials successfully used in the REDUCE MRSA Trial (Randomized Evaluation of Decolonization vs. Universal Clearance to Eliminate Methicillin-Resistant *Staphylococcus aureus*), which found that universal decolonization was the most effective intervention. Universal decolonization led to a 37 percent reduction in MRSA clinical cultures and a 44 percent reduction in all-cause bloodstream infections.

[http://www.ahrq.gov/professionals/systems/hospital/universal\\_icu\\_decolonization.html](http://www.ahrq.gov/professionals/systems/hospital/universal_icu_decolonization.html)

# Toolkit Contents

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Introduction and Welcome

Universal ICU Decolonization Protocol Overview

Scientific Rationale

References

## Appendixes

Appendix A. Flow Chart for Implementing Universal Decolonization

Appendix B. Decisionmaking and Readiness for Implementation

Appendix C. Universal Decolonization in Adult ICUs Overview Statement

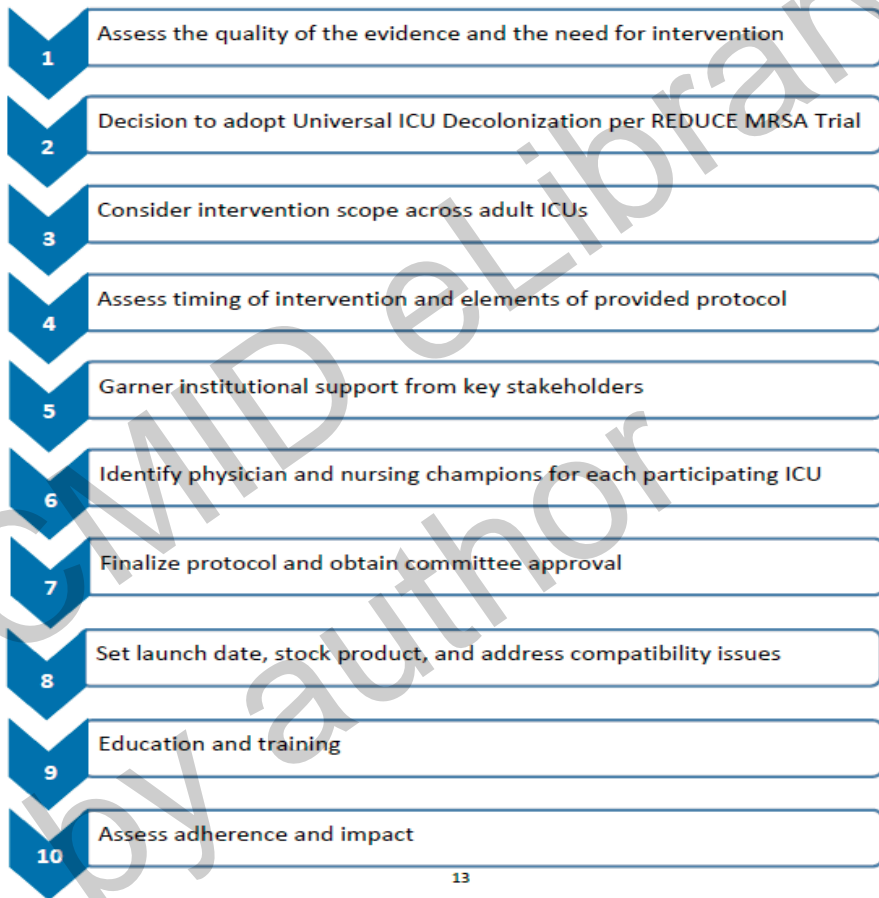
Appendix D. Universal ICU Decolonization Nursing Protocol

Appendix E. Training and Educational Materials

Appendix F. Chlorhexidine Bathing Skills Assessment

Appendix G. Safety and Adverse Events

## Appendix A. Steps for Implementing Universal Decolonization





## Universal ICU Decolonization

### DO

- Use chlorhexidine (CHG) baths in place of daily bathing with soap and water.
- Massage firmly into skin to bind skin proteins and prevent bacteria for 24 hours.
- Give CHG baths every day for entire ICU stay.
- Use nasal mupirocin twice a day for 5 days of ICU stay.
- Only use CHG-compatible lotions.
- Restart entire protocol for readmitted ICU patients.
- Clean 6 inches of tubing closest to body.
- Use over superficial wounds, including stages 1 and 2 decubitus ulcers.

### DON'T

- Do NOT use above jawline.
- Do NOT rinse or wipe off CHG. Let air dry.
- Do NOT flush CHG cloths (discard in trash, not toilet or commode).
- Do NOT continue protocol after ICU discharge.
- Do NOT include patients who are allergic to mupirocin and/or CHG.

→ Current recommendations  
to avoid eyes and ear canal

## Appendix F. CHG Bathing Skills Assessment

Please record your observations when monitoring a patient being bathed with CHG.

### Observed CHG Bathing Practices

Please circle your answer:

- |   |   |   |
|---|---|---|
| Y | N | Cleanses entire neck area well including skin folds and around lines.       |
| Y | N | Massages skin <i>firmly</i> with CHG cloth to ensure adequate cleansing .   |
| Y | N | States rationale for not using soap below jaw line at any time.             |
| Y | N | Uses all six cloths and more if needed.                                     |
| Y | N | Cleans armpit and back of knee well.  |
| Y | N | Cleans in between toes and fingers.   |
| Y | N | Cleans between all folds in perineal and gluteal area.                      |
| Y | N | Wipes occlusive and semi-permeable dressing with CHG cloth.                 |
| Y | N | Cleans tubing, lines, and drains closest to body (after emptying drains).   |
| Y | N | Bathing is completed with no skin below jaw line missed.                    |
| Y | N | N/A Uses CHG on superficial wounds, rash, and stage 1 & 2 decubitus ulcers. |
| Y | N | N/A Uses on closed surgical wounds.   |
| Y | N | Allows to air dry/does not wipe off CHG.                                    |
| Y | N | CHG bathing documented.   |

### Queries to Bathing Assistant/Nurse

1. Do you ever use soap in conjunction with a CHG bathing cloth? If so, when?  
\_\_\_\_\_
2. Do you reapply CHG after an episode of incontinence?  
\_\_\_\_\_
3. If a patient needs freshening up/second bath, do you use CHG cloths or a different product?  
\_\_\_\_\_
4. Are you comfortable applying CHG to superficial wounds?  
\_\_\_\_\_
5. Are you comfortable applying CHG to stage 1 & 2 decubitus ulcers?  
\_\_\_\_\_
6. Are you comfortable applying CHG to closed surgical wounds?  
\_\_\_\_\_
7. Do you ever wipe off the CHG after bathing?  
\_\_\_\_\_

# Decolonization Trials in Progress

- ICU  
REDUCE MRSA Trial →  
Mupirocin-Iodophor Swapout
- Non-ICU  
ABATE Infection Trial
- Post-Discharge  
Project CLEAR
- Nursing Homes  
PROTECT Trial
- Regions  
SHIELD Orange County



# Questions?

