Implementing Decolonization in Nursing Homes to Prevent MDROs and Hospitalizations

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The High Risk of Infections in Nursing Homes

- 1.3 million persons receive care in U.S. nursing homes each year
- On average, each resident has at least 2 infections per year
- Every year, nursing home residents experience:
  - 2 to 3 million nursing home-associated infections
  - 150,000 infection-related hospitalizations
  - 380,000 infection-related deaths

https://health.gov/sites/default/files/2019-09/hai-action-plan-ltcf.pdf

The Rise of MultiDrug-Resistant Organisms (MDROs)

In addition, there has been a steady rise of MDROs in healthcare

- Methicillin Resistant *Staphylococcus aureus* (MRSA)
- Vancomycin Resistant Enterococcus (VRE)
- MultiDrug-Resistant Pseudomonas
- Extended Spectrum Beta Lactamase Producers (ESBLs)
- Carbapenem Resistant Enterobacterales (CRE)
- Carbapenem Resistant *Acinetobacter baumanii* (CRAB)
- *Candida auris*

MDROs in Nursing Homes

Approximately 10-15% of hospitalized patients harbor an MDRO

In nursing homes, 50-65% of residents harbor an MDRO

High prevalence in nursing homes may be related to:

- Shared activities
- Shared rooms
- Longer lengths of stay
- More chronic illness and devices, including feeding tubes
- Less stringent hand hygiene, contact precautions vs hospitals

What is Decolonization and How Does It Work?

Decolonization: Pathogen Burden Reduction

Decolonization: use of topical antiseptic soaps and nasal ointments to reduce the body's bacteria during high-risk times for infection

Moments when our body bacteria becomes our own worst enemy

- Surgery
- Wounds
- Devices
- Difficulty with hygiene, clearance of secretions
- Hospitalization and nursing home stays

Why is Decolonization Needed?

Because human pathogen transmission is a cascade of unfortunate events

- Humans shed pathogens
  - Environment is contaminated
    - Contamination persists
      - Failure to clean or disinfect
        - Staff acquires pathogen
          - Staff fails to remove
            - Transfers to patient
              - Risk for infection

Interventions to Prevent Transmission

- Humans shed pathogens ← **Prevents shedding**
  - Environment is contaminated
    - Contamination persists
      - Failure to clean or disinfect
        - Staff acquires pathogen
          - Staff fails to remove
            - Transfers to patient
              - Risk for infection

Broad solution for all MDROs
Benefits carriers too

Which Products?

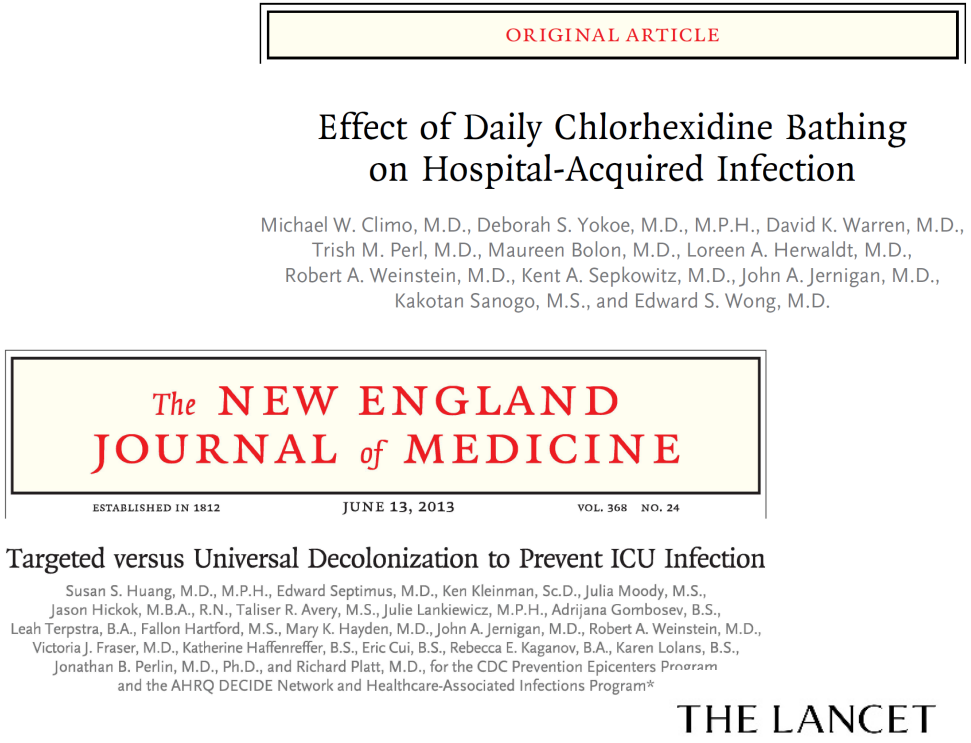
- **Most common products:**
  - chlorhexidine gluconate (CHG)
  - iodophor (povidone-iodine)
  - Mupirocin
- **Work better than soap and water**
- **Years of use in healthcare:**
  - CHG: >60 years
  - iodophor: >60 years
  - Mupirocin >20 years

Prior Precedence:

Clinical Trial Evidence for Decolonization in Hospitals

Use of Chlorhexidine

- Antiseptic uses in healthcare
  - Hand antisepsis at 2% and 4%
  - Dental hygiene
  - 1990s: Cleaning of skin prior to line i
  - 1990s: Pre-operative bathing
  - 2000s: Surgical prep
  - 2000s: Pre-op *S. aureus* carriers
  - **2010s: Universal ICU bathing**
  - 2019: CHG for non-ICU bathing
  - 2019: Post-discharge CHG + mupirocin for MRSA



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THE LANCET

Chlorhexidine versus routine bathing to prevent multidrug-resistant organisms and all-cause bloodstream infections in general medical and surgical units (ABATE Infection trial): a cluster-randomised trial

Susan S Huang, Edward Septimus, Ken Kleinman, Julia Moody, Jason Hickok, Lauren Heim, Adrijana Gombosev, Taliser R Avery, Katherine Haffenreffer, Lauren Shimelman, Mary K Hayden, Robert A Weinstein, Caren Spencer-Smith, Rebecca E Kaganov, Michael V Murphy, Tyler Forehand, Julie Lankiewicz, Micaela H Coady, Lena Portillo, Jalpa Sarup-Patel, John A Jernigan, Jonathan B Perlin, Richard Platt, for the ABATE Infection trial team

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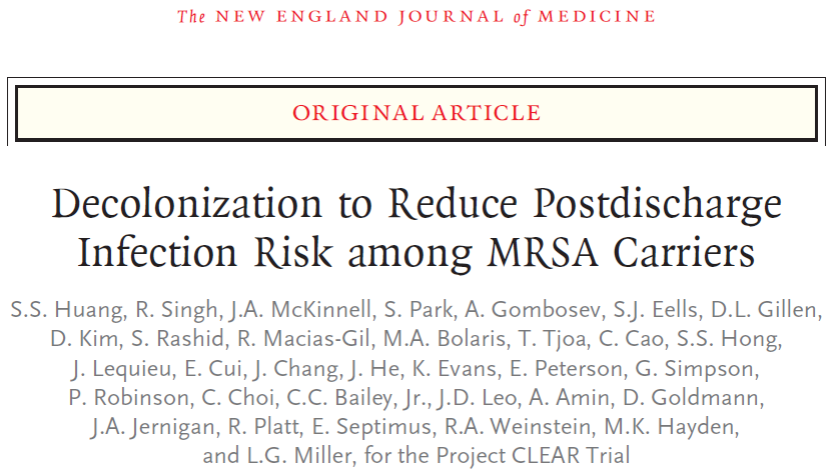

Universal Decolonization Trials in Hospitals

Trial	Setting	N	Intervention	Decolonization Impact
Climo et al. ICU Trial [1]	7 Academic Hospitals 9 Adult ICUs	7700	Daily CHG	23% ↓ MRSA/VRE acquisition 28% ↓ Bloodstream infections
Pediatric Scrub Trial [2]	5 Academic Hospitals 10 Pediatric ICUs	1500	Daily CHG	36% ↓ Bloodstream infections
REDUCE MRSA Trial [3]	43 Community Hospitals 74 Adult ICUs	74,000	Daily CHG 5d bid mupirocin	37% ↓ MRSA clinical cultures 44% ↓ Bloodstream infections
Mupirocin-Iodophor Swap Out Trial [4]	137 Community Hospitals 233 Adult ICUs	353,000	Mupirocin-CHG vs Iodophor-CHG	Mupirocin superior to Iodophor by 18% for *S. aureus*; 14% for MRSA
ABATE Infection Trial [5]	53 Community Hospitals 194 Adult Non-ICUs	340,000	Daily CHG Mupirocin if MRSA+	Subset effect in patients with devices: 37% ↓ MRSA/VRE clinical cultures 32% ↓ Bloodstream infections
CLEAR Trial [6]	Post Hospital Discharge	2,100	CHG, Mupirocin qoweek x 6 mo	30% ↓ MRSA Infection at 1y 17% ↓ All infection; 85% rehospitalized

[1] Climo MW et al. NEJM 2013;368:533-542
[2] Milstone AM et al. Lancet 2013:381(9872):1099-1106
[3] Huang SS et al. NEJM 2013:368:2255-2265
[4] Huang SS et al. JAMA 2023;330(14):1337-1347
[5] Huang SS et al. Lancet 2019;393(10177):1205-1215
[6] Huang SS et al. NEJM 2019:380:638-650

The Evidence for Decolonization in Nursing Homes

The Evidence

Two studies

- SHIELD Regional Collaborative
- Protect Trial

The NEW ENGLAND JOURNAL of MEDICINE

ORIGINAL ARTICLE

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Research

JAMA | Original Investigation

Reducing Hospitalizations and Multidrug-Resistant Organisms via Regional Decolonization in Hospitals and Nursing Homes

Gabrielle M. Gussin, MS; James A. McKinnell, MD; Raveena D. Singh, MA; Loren G. Miller, MD, MPH; Ken Kleinman, ScD; Raheeb Saavedra, AS; Thomas Tjoa, MPH, MS; Shruti K. Gohil, MD, MPH; Tabitha D. Catuna, MPH; Lauren T. Heim, MPH; Justin Chang, MD; Marlene Estevez, BA; Jiayi He, MS; Kathleen O'Donnell, MPH; Matthew Zahn, MD; Eunjung Lee, MD, PhD; Chase Berman, BS; Jenny Nguyen, BA; Shalini Agrawal, BS; Isabel Ashbaugh, MSc; Christine Nedelcu, BS; Philip A. Robinson, MD; Steven Tam, MD; Steven Park, MD, PhD; Kaye D. Evans, BA, MT; Julie A. Shimabukuro, BS; Bruce Y. Lee, MD, MBA; Emily Fonda, MD, MMM; John A. Jernigan, MD, MS; Rachel B. Slayton, PhD, MPH; Nimalie D. Stone, MD, MS; Lynn Janssen, MS; Robert A. Weinstein, MD; Mary K. Hayden, MD; Michael Y. Lin, MD, MPH; Ellena M. Peterson, PhD; Cassiana E. Bittencourt, MD; Susan S. Huang, MD, MPH; for the CDC Safety and Healthcare Epidemiology Prevention Research Development (SHEPheRD) Program

SHIELD OC: 35 Facility Decolonization Intervention

- **28-month regional intervention:** April 2017-July 2019
- **Participants:** 16 nursing homes (NHs), 3 long-term acute care hospitals (LTACHs), 16 hospitals with high patient sharing in Orange County, CA
- **NHs and LTACHs:** universal decolonization
  - ✓ Chlorhexidine (CHG) antiseptic soap for routine bathing/showering
  - ✓ Nasal iodophor for 5d on admission and every other week
- **Hospitals:** decolonize patients on contact precautions
  - ✓ Daily CHG bathing/showering
  - ✓ Nasal iodophor decolonization for 5 days
  - ✓ Support ongoing ICU CHG daily bathing

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SHIELD Nursing Home Impact: 23% MDRO Reduction

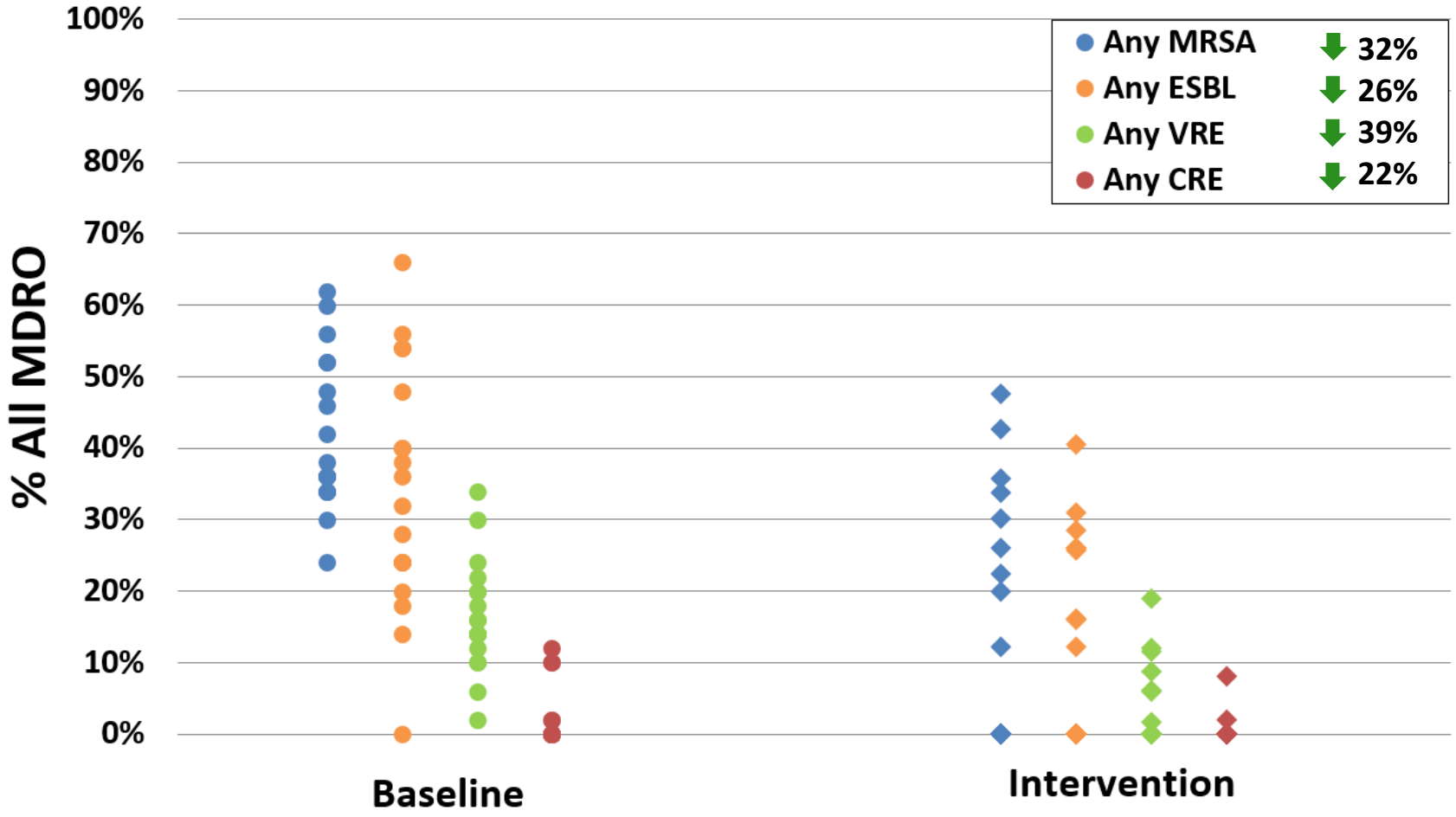

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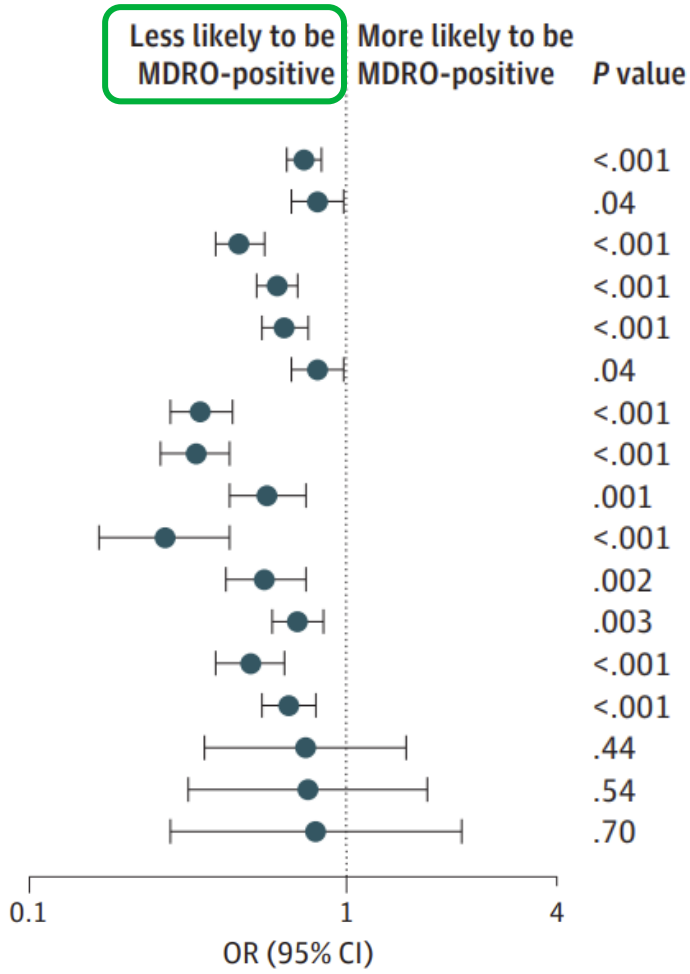
Figure 1. MDRO Point Prevalence (Screening) Among Facilities Participating in the Regional Decolonization Collaborative, Baseline and End of Intervention

Colonization	Baseline		Intervention		OR (95% CI)	P value
	No. of MDRO-positive persons	Mean (SD) prevalence across facilities, %	No. of MDRO-positive persons	Mean (SD) prevalence across facilities, %		
Nursing homes						
Any MDRO	511	63.9 (12.2)	709	49.9 (11.3)	0.77 (0.69-0.86)	<.001
Nares	236	29.5 (7.3)	360	25.1 (8.6)	0.84 (0.71-0.99)	.04
Axilla or groin	370	46.3 (13.7)	337	24.7 (8.0)	0.51 (0.44-0.60)	<.001
Perirectal	412	51.5 (13.5)	473	34.1 (11.1)	0.65 (0.57-0.74)	<.001
Any MRSA	343	42.9 (11.2)	422	29.8 (9.3)	0.68 (0.59-0.79)	<.001
Nares	236	29.5 (7.3)	360	25.1 (8.6)	0.84 (0.71-0.99)	.04
Axilla or groin	247	30.9 (10.5)	176	13.1 (6.5)	0.40 (0.33-0.49)	<.001
Perirectal	207	25.9 (9.2)	142	10.8 (5.5)	0.39 (0.31-0.48)	<.001
Any VRE	125	15.6 (7.6)	134	9.4 (6.7)	0.61 (0.48-0.78)	.001
Axilla or groin	68	8.5 (5.4)	37	2.7 (3.3)	0.32 (0.21-0.48)	<.001
Perirectal	114	14.3 (7.8)	120	8.4 (5.8)	0.60 (0.47-0.78)	.002
Any ESBL	269	33.6 (17.2)	356	25.5 (10.5)	0.74 (0.63-0.87)	.003
Axilla or groin	167	20.9 (12.0)	163	12.1 (6.1)	0.55 (0.44-0.68)	<.001
Perirectal	248	31.0 (16.5)	310	22.3 (9.5)	0.70 (0.59-0.83)	<.001
Any CRE	17	2.1 (4.3)	22	1.6 (2.8)	0.78 (0.41-1.47)	.44
Axilla or groin	12	1.5 (3.5)	16	1.1 (2.0)	0.79 (0.37-1.68)	.54
Perirectal	8	1.0 (2.1)	11	0.9 (1.5)	0.83 (0.33-2.09)	.70



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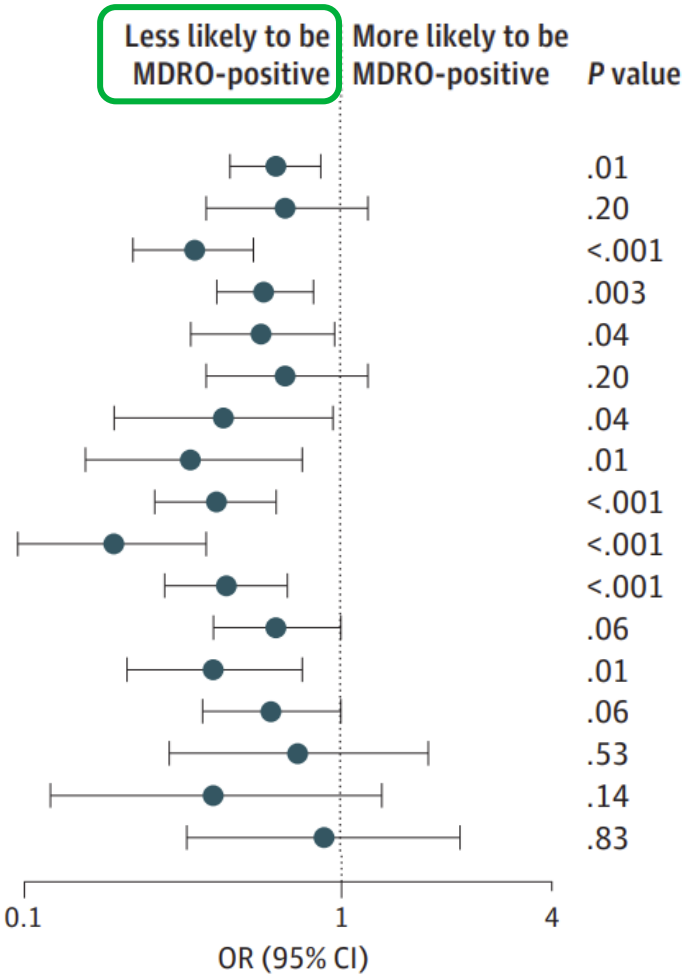
	No. of MDRO-positive persons	Mean (SD) prevalence across facilities, %	No. of MDRO-positive persons	Mean (SD) prevalence across facilities, %		
Long-term acute care facilities						
Any MDRO	120	80.0 (7.2)	80	53.3 (13.3)	0.67 (0.50-0.89)	.01
Nares	35	23.3 (9.5)	25	16.7 (8.3)	0.71 (0.43-1.20)	.20
Axilla or groin	91	60.7 (9.0)	36	24.0 (6.0)	0.40 (0.27-0.58)	<.001
Perirectal	109	72.7 (9.5)	68	45.3 (12.9)	0.62 (0.46-0.85)	.003
Any MRSA	49	32.7 (8.3)	30	20.0 (10.6)	0.61 (0.39-0.97)	.04
Nares	35	23.3 (9.5)	25	16.7 (8.3)	0.71 (0.43-1.20)	.20
Axilla or groin	25	16.7 (3.1)	12	8.0 (2.0)	0.48 (0.24-0.96)	.04
Perirectal	28	18.7 (11.0)	11	7.3 (7.6)	0.39 (0.20-0.79)	.01
Any VRE	83	55.3 (5.0)	38	25.3 (10.1)	0.46 (0.31-0.67)	<.001
Axilla or groin	55	36.7 (6.4)	13	8.7 (3.1)	0.24 (0.13-0.43)	<.001
Perirectal	78	52.0 (5.3)	38	25.3 (10.1)	0.49 (0.33-0.72)	<.001
Any ESBL	58	38.7 (9.0)	39	26.0 (10.4)	0.67 (0.45-1.01)	.06
Axilla or groin	40	26.7 (5.8)	18	12.0 (3.5)	0.45 (0.26-0.79)	.01
Perirectal	52	34.7 (8.1)	34	22.7 (11.7)	0.65 (0.42-1.01)	.06
Any CRE	13	8.7 (1.2)	10	6.7 (3.1)	0.77 (0.34-1.76)	.53
Axilla or groin	11	7.3 (1.2)	5	3.3 (3.1)	0.45 (0.16-1.31)	.14
Perirectal	11	7.3 (1.2)	10	6.7 (3.1)	0.91 (0.38-2.15)	.83



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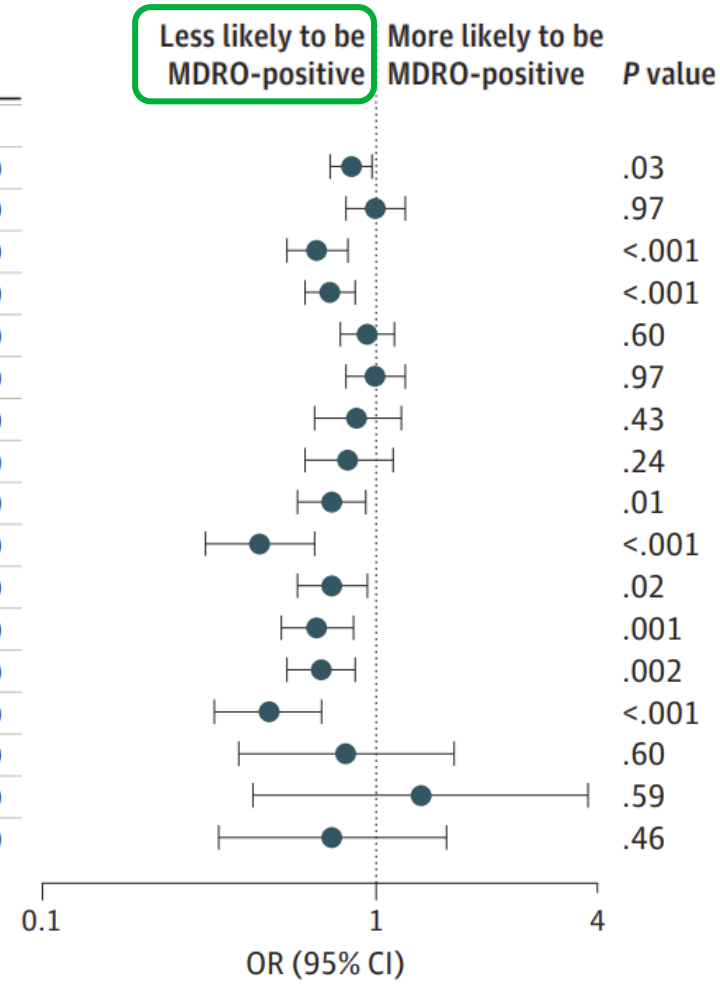
	No. of MDRO-positive persons	Mean (SD) prevalence across facilities, %	No. of MDRO-positive persons	Mean (SD) prevalence across facilities, %		
Hospitals with patients in contact precautions						
Any MDRO	474	64.1 (8.5)	409	55.4 (13.8)	0.86 (0.75-0.98)	.03
Nares	221	29.9 (6.5)	220	29.7 (10.9)	1.00 (0.83-1.21)	.97
Axilla or groin	242	32.9 (10.8)	167	22.5 (14.1)	0.69 (0.57-0.84)	<.001
Perirectal	363	49.2 (9.0)	273	37.2 (13.2)	0.75 (0.64-0.88)	<.001
Any MRSA	265	35.9 (7.6)	252	34.2 (13.3)	0.95 (0.80-1.13)	.60
Nares	221	29.9 (6.5)	220	29.7 (10.9)	1.00 (0.83-1.21)	.97
Axilla or groin	104	14.1 (7.5)	93	12.8 (11.0)	0.89 (0.68-1.18)	.43
Perirectal	105	14.3 (6.7)	88	12.1 (9.2)	0.84 (0.64-1.12)	.24
Any VRE	185	25.1 (7.1)	141	19.3 (11.9)	0.76 (0.61-0.94)	.01
Axilla or groin	101	13.8 (6.6)	49	6.7 (5.9)	0.48 (0.34-0.68)	<.001
Perirectal	175	23.8 (6.7)	134	18.4 (11.6)	0.76 (0.61-0.95)	.02
Any ESBL	202	27.3 (6.8)	143	19.3 (6.0)	0.69 (0.55-0.87)	.001
Axilla or groin	97	13.1 (5.9)	49	6.7 (3.4)	0.71 (0.57-0.88)	.002
Perirectal	181	24.5 (5.5)	125	16.9 (6.6)	0.51 (0.36-0.71)	<.001
Any CRE	18	2.4 (2.3)	15	2.1 (3.0)	0.83 (0.42-1.65)	.60
Axilla or groin	6	0.8 (1.3)	8	1.1 (1.6)	1.34 (0.46-3.86)	.59
Perirectal	17	2.3 (2.0)	13	1.8 (2.5)	0.76 (0.37-1.57)	.46



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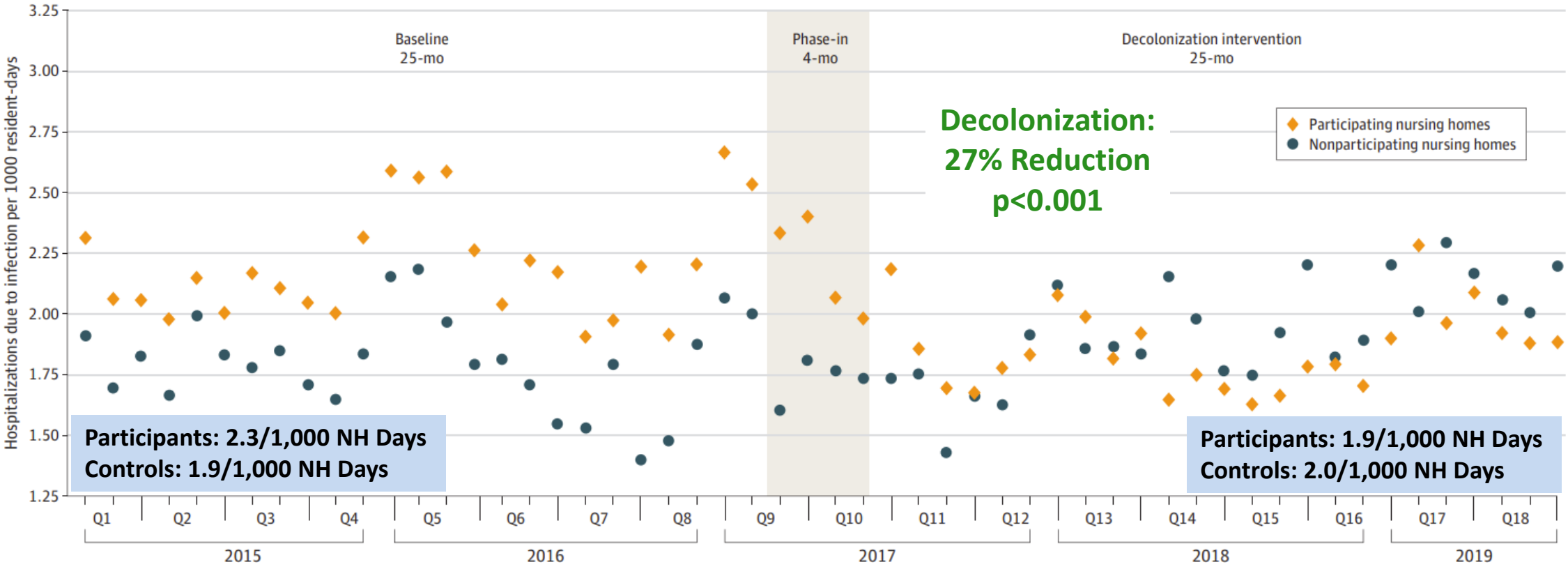
Impact: NH Hospitalizations Due to Infection

Figure 5. Monthly Infection-Related Hospitalization Rates Among Nursing Homes Residents in Participating (Decolonization) vs Nonparticipating Nursing Homes



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Impact: NH Hospitalization-Related Costs & Deaths

Costs Associated with Infection-Related Hospitalization					
Decolonization Group	Costs per 1,000 Resident Days		Adjusted Analysis [b]		
			Clustered Cost Ratio	Group-By-Period Interaction Effect	
	Baseline	Intervention		% Reduction (95% CI)	P-value
Participant	$64,651	$55,149	0.96	-26.8% (-26.7, -26.9)	<0.001
Non-Participant	$55,151	$59,327	1.31		
Deaths Associated with Infection-Related Hospitalization					
Decolonization Group	Events per 1,000 Resident Days		Adjusted Analysis [b]		
			Clustered Hazard Ratio	Group-By-Period Interaction Effect	
	Baseline	Intervention		% Reduction (95% CI)	P-value
Participant	0.29	0.25	0.62	-23.7% (-4.5, -43.0)	0.006
Non-Participant	0.23	0.24	0.81		

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The Protect Trial

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Miller LG et al. NEJM 2023 (Nov 9); 389:1766-1777

The Protect Trial

Pragmatic Trial

- 28 nursing homes
- Involved nearly 14,000 residents
- All activities performed by usual nursing home staff

Group 1: Routine Care

- Usual soap for showering/bathing

Group 2: Decolonization

- CHG for all bathing/showering
- Nasal iodophor for all residents, M-F twice daily, every other week

Miller LG et al. NEJM 2023 (Nov 9); 389:1766-1777

CHG for All Routine Bathing and Showering

- Liquid CHG for showering
  - 4% rinse off CHG
- CHG cloths for bed bathing
  - 2% leave on CHG

4% rinse off for shower

2% cloths for bath

Iodophor for Nasal Decolonization

- 10% povidone-iodine swabs (iodophor) to each nostril
- Facility-wide universal strategy
- Twice daily for 5 days
- On admission and M-F every other week

MDRO Carriage Reduction (Skin/Nares)

Table 3. Prevalence of MDRO Carriage during the Baseline Period and near the End of the Intervention Period.*

MDRO or sample	Prevalence in the Routine-Care Group		Prevalence in the Decolonization Group		Risk Ratio (95% CI)†
	Baseline (N=700)	Intervention (N=650)	Baseline (N=700)	Intervention (N=550)	
	percent (number of positive samples)				
Any MDRO	48.3 (338)	47.2 (307)	48.9 (342)	32.0 (176)	0.70 (0.58–0.84)
Any MRSA	37.6 (263)	36.9 (240)	36.4 (255)	25.1 (138)	0.73 (0.59–0.92)
Nostril swab sample	29.1 (203)	27.1 (176)	29.9 (209)	22.0 (121)	0.81 (0.62–1.05)
Skin swab sample	26.1 (183)	25.4 (165)	22.6 (158)	11.6 (64)	0.58 (0.42–0.79)
VRE	5.9 (41)	5.1 (33)	8.3 (58)	2.2 (12)	0.29 (0.14–0.62)
ESBL producer	15.9 (111)	17.9 (116)	16.7 (117)	9.2 (51)	0.50 (0.34–0.75)
CRE	1.4 (10)	0.6 (4)	0.4 (3)	0.4 (3)	3.53 (0.44–28.52)

Miller LG et al. NEJM 2023 (Nov 9); 389:1766-1777

Trial Outcomes

Outcome	Infection-Related Hospitalization	Any Hospitalization
Reason among hospitalizations Reason among discharges	**17% reduction** in infection–related hospitalizations, among hospitalized	**15% reduction** in hospitalizations, among discharged
Per 1,000 Resident Days	**31% reduction** in infection–related hospitalizations per 1,000 resident days	**18% reduction** in hospitalizations per 1,000 resident days
Number Needed to Treat (NNT)	**9.7 residents**	**8.9 residents**

1.9 infection-related hospitalizations averted per month per 100-bed nursing home

Miller LG et al. NEJM 2023 (Nov 9); 389:1766-1777

Implementation Steps

Step 1: Assess Readiness for Adoption

- Nursing home leadership sees value, need to reduce
  - Infections
  - Hospitalizations
  - MDRO pathogens (65% of residents colonized, common outbreak source)
    - Gram positives: MRSA, VRE
    - Gram negatives: ESBL, CRE, CRAB
    - Fungi: *C. auris*

Support Options:

✓ Share 2-page evidence sheet

✓ Share NACCHO recorded webinar on decolonization evidence

✓ Request special webinar presentation by UCI to nursing homes in your area

Decolonization Benefits in Nursing Homes

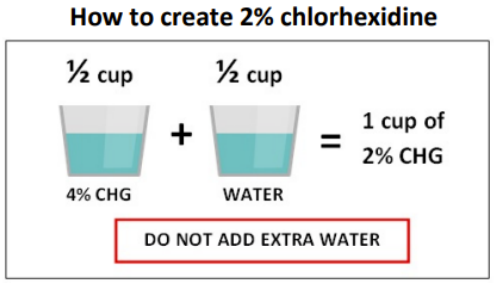
The below results are from the Protect Trial and were redemonstrated during the SHIELD regional intervention, both of which involved pragmatic adoption of decolonization in nursing homes.

Residents less colonized by MDROs	***Residents less likely to be hospitalized***
✓ Any MDRO **30% reduction** ✓ MRSA **27% reduction** ✓ VRE **71% reduction** ✓ ESBL **50% reduction**	✓ Overall hospitalization rate **18% reduction** ○ 1 hospitalization prevented for every 9 residents treated ✓ Infection hospitalization rate **31% reduction** ○ 1 infection-related hospitalization prevented for every 10 residents treated
Decolonization results in fewer MDROs, less MDRO colonization, and fewer residents on contact precautions	**Decolonization prevents 1.9 infection-related hospitalizations *per month* per 100 beds**

Step 2: Agree to Investment for Quality & Cost Savings

- Universal decolonization requires leadership support to
  - ➢ Adopt as Quality Assurance/Performance Improvement (QAPI) Program
  - ➢ Prepare for a campaign
  - ➢ Purchase products
  - ➢ Designate champions

4% rinse off CHG for showers



Create 2% leave-on CHG for bed baths

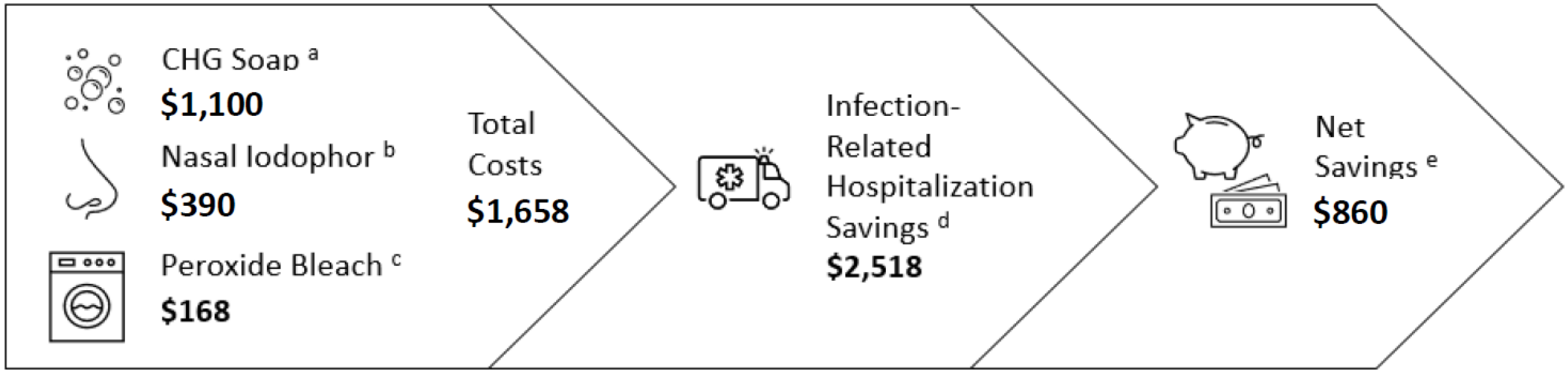
Nasal Iodophor Swabs

Options:

✓ Share 2-page cost savings sheet

Decision Making and Costs

Estimated Monthly Savings for a 100-Bed Nursing Home = $860

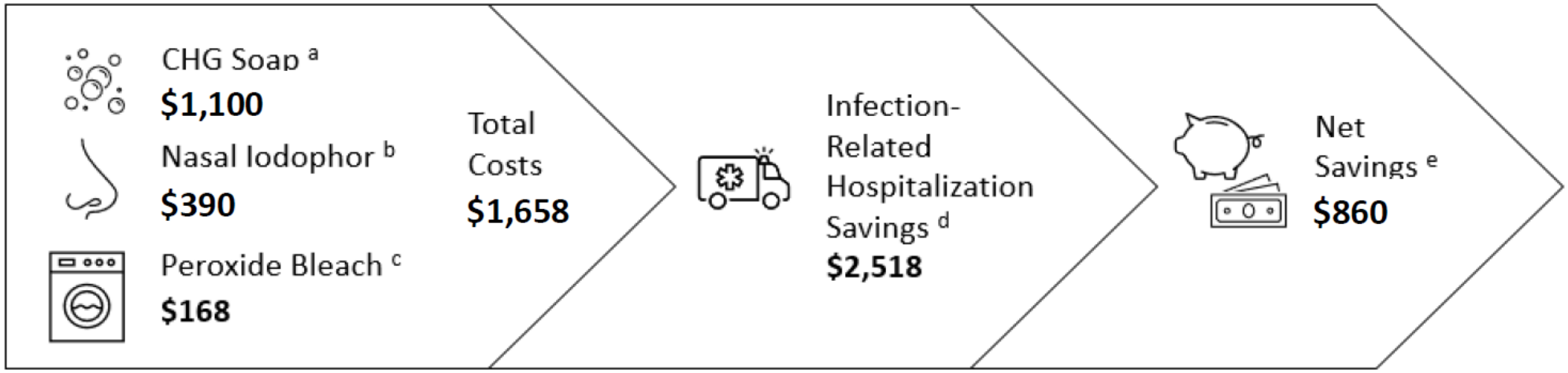


a. **Switching from regular soap to CHG soap**
   - Assumes baseline use of 50 gallons regular soap/month at $20/gallon (gal) = $1,000/mo
   - Assumes 35 gal of CHG at $60/gal = $2,100/mo (CHG protocol uses less volume of soap)
   - Difference = $1,100 added product cost/month

b. **Purchasing nasal iodophor.** $6.95 for box of 50 swabs. At perfect compliance, a 100-bed nursing home uses: 2 swabs (one/nostril) x 2 times/day x 10 days/month x 100 residents = 4,000 swabs (80 boxes). Studies suggest 70% compliance, at cost of $390/mo.

Decision Making and Costs

Estimated Monthly Savings for a 100-Bed Nursing Home = $860



c. **Switching from chlorine to peroxide bleach.** Estimated costs are for 20 gal/month. Chlorine bleach: $65/5-gal or $260/mo. Peroxide: $107/5-gal or $428/mo. Difference per month is $168. Some laundry contracts with a fixed price per bed do not incur additional cost when switching from chlorine to peroxide bleach.

d. **Decolonization prevents 1.9 infection-related hospitalizations per month per 100 beds.** A 100-bed nursing home would save $2,518 per month by preventing 5.3 bed-hold days per hospitalization at $250 per day.

Step 3: Checklist

☐ Purchase product

- 4% Chlorhexidine (CHG) (gallon formulation for humans, not pets)
- 10% Povidone-Iodine swab sticks (generic)
- Non-cotton disposable dry wipes or cloths
  - Note: Tena non-cotton dry cloths work particularly well
  - Cotton binds CHG and does not release well to skin

☐ Switch from chlorine to peroxide bleach

- Chlorine and CHG can mix in the laundry and leave a brown stain
- Ensure several laundry runs with peroxide occur before CHG adopted

☐ Confirm lotions and skin products are CHG compatible

- Call manufacturers to confirm skin products are compatible. Because CHG is widely used in hospitals, common healthcare manufacturers have tested their products against CHG. If not, several same-priced alternatives exist.

Step 4: Prepare to Launch

- Benefit tied to ensuring proper process
  - ➢ Designate MD, RN, LVN, and CNA champions
  - ➢ Create a training plan
  - ➢ Plan to report feedback and improvement to champions, QA meeting
  - ➢ Plan to track outcomes

Support Options:

- ✓ Access nursing home toolkit at **ucihealth.org/shield**
- ✓ Print handouts and training materials
- ✓ Request train-the-trainer webinar presentation
- ✓ Schedule dates for direct-to-staff training sessions

Nursing Home Decolonization Toolkit

Step 1: Adopt SHIELD program as Quality Assurance Performance Improvement (QAPI)

1. QAPI Project Documentation Form (PDF) (DOC)
2. Universal Plan of Care (PDF) (DOC)
3. Resident Plan of Care (PDF) (DOC)
4. Pre-Launch Checklist for the Infection Preventionist (PDF) (DOC)

Step 2: What to Expect? (PDF) (DOC)

Step 3: Communication to Residents

1. Admission Packet Letter (PDF) (DOC)
2. Resident/Ombudsman Information Sheet (PDF) (DOC

Step 4: Products & Protocols

1. Products (PDF) (DOC)
2. CHG Compatibility (PDF) (DOC)
3. Protocol: Bed Bath With CHG Cloths (PDF) (DOC)
4. Protocol: Bed Bath With CHG Liquid (PDF) (DOC)
5. Protocol: Showering With CHG (PDF) (DOC)
6. Protocol: Nasal Iodophor (PDF) (DOC)
7. Order Set Examples (PDF)
8. Admission – SHIELD Checklist (PDF) (DOC)

ucihealth.org/shield

Step 5: Staff Education & Training

1. Paper or Computer Based Training (PDF) (PPT)
2. Staff Post-Training Test and Answer Key: Basin Bed Bathing
3. Staff Post-Training Test and Answer Key: CHG Cloths (PDF)
4. Physician and Staff Notification Flyer (PDF) (DOC)
5. Staff Handouts for CHG Bathing/Showering (PDF) (PUB)
6. Staff Handout for Basin Bed Bathing With CHG (PDF) (PUB)
7. Staff Handout for Nasal Iodophor (PDF) (PUB)
8. Staff Huddle Reminder Documents (PDF) (DOC)
9. FAQ: General (PDF) (DOC)
10. FAQ: Nasal Iodophor (PDF) (DOC)
11. FAQ: CHG for Bathing (PDF) (DOC)
12. FAQ: Wound Care (PDF) (DOC)
13. FAQ: Do and Don't (PDF) (DOC)

Step 6: Resident Education & Training

1. Resident Handout for CHG Bed Bath (PDF) (PUB)
2. Resident Handout for CHG Shower (PDF) (PUB)
3. Resident Handout for Nasal Iodophor (PDF) (PUB)
4. Waterproof Shower Poster for Residents (PDF) (DOC)
5. Resident Talking Points: CHG (PDF) (DOC)
6. Resident Talking Points: Iodophor (PDF) (DOC)

Step 7: Skills Assessments and Compliance Checks

1. CHG Cloth Skills Assessment Checklist (PDF) (DOC)
2. CHG Liquid Bed Bath Skills Assessment Checklist (PDF) (DOC)
3. Resident Self-Showering Assessment (PDF) (DOC)
4. Resident Self-Bed Bath Assessment (PDF) (DOC)

Step 8: Safety and Side Effects

1. Safety and Side Effects (PDF) (DOC)
2. Side Effect Tracking Form (PDF) (DOC)

Nursing Home Decolonization Toolkit

Prevent infections during each nursing home stay

BATHE or SHOWER with Chlorhexidine (CHG) soap

STAFF

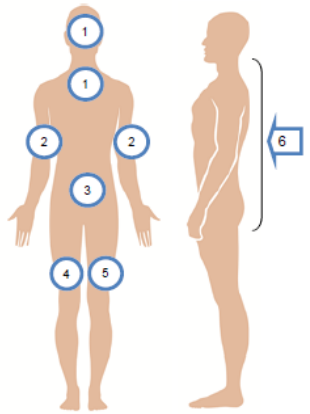
Bathe with CHG to remove germs and prevent infection

CHG works better than soap and water

CHG is a protective bath

CHG cloths are less drying than soap

Apply as shown below



Avoid eyes, mouth, & ear canals

REMINDERS

- **Your enthusiasm** helps residents understand why CHG is important
- Bathing on admission removes germs to protect the resident and nursing home
- CHG works for 24 hours to kill germs
- **Firmly massage** CHG onto skin
- Clean **6 inches** of lines, drains, tubes
- Safe on surface wounds, rashes, burns
- Use only CHG-compatible lotions
- If barrier protection needed, apply CHG then apply barrier protection

Clean all skin areas with attention to:

- Neck
- All skin folds
- Skin around all devices (line/tube/drain)
- Wounds unless deep or large
- Armpit, groin, between fingers/toes

SHOWERING with CHG soap

1. Rinse body with warm water
2. Wash hair and face with CHG
3. Avoid getting into eyes and ears
4. Turn off water and lather mesh sponge with plenty of CHG
5. Massage CHG onto all skin areas
5. Leave CHG on for **2 minutes** then rinse

BATHING with CHG cloths

1. Tell residents these cloths are their protective bath
2. Use all 6 cloths. More, if needed.
3. **Firmly massage** skin with cloth
4. Clean over semi-permeable dressings
5. Clean 6 inches of lines, tubes, and drains
6. Air dry. Do not wipe off.
7. Put used cloths in trash. Do not flush.

Prevent infections during each nursing home stay

BASIN BED BATHING with Chlorhexidine (CHG) Liquid

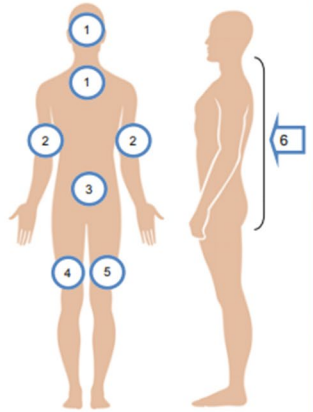
STAFF

Bathe with CHG to remove germs and prevent infection

CHG works better than soap and water

CHG is a protective bath

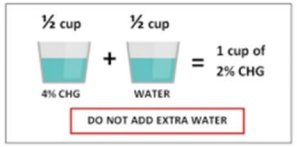
Apply as shown below



Avoid eyes, mouth, & ear canals

BASIN BATH Instructions

1. Prepare 4% liquid CHG, a measuring cup, a bed basin, and 6 disposable wipes (more if needed).
2. Dispense 1/2 cup of 4% CHG liquid into basin.
3. Add 1/2 cup of water. **Do not dilute more than equal part of water to CHG.**



4. Soak wipes in basin and wring before use. Do not place back into basin after use.
5. **Firmly massage** skin with wipes.
6. Clean over semi-permeable dressings.
7. Clean 6 inches of lines, tubes, and drains.

REMINDERS

- **Your enthusiasm** helps residents understand why CHG is important
- Bathing on admission removes germs to protect the resident and nursing home
- CHG works for 24 hours to kill germs
- **Firmly massage** CHG onto skin
- Clean **6 inches** of lines, drains, tubes
- Safe on surface wounds, rashes, burns
- Use only CHG-compatible lotions
- If barrier protection needed, apply CHG then apply barrier protection

Clean all skin areas with attention to:

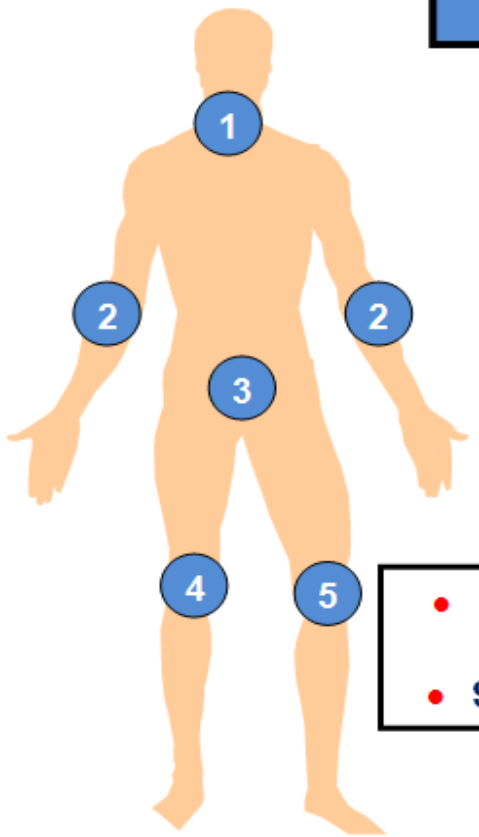
- Neck
- All skin folds
- Skin around all devices (line/tube/drain)
- Wounds unless deep or large
- Armpit, groin, between fingers/toes

ucihealth.org/shield

For internal use only, not for distribution.

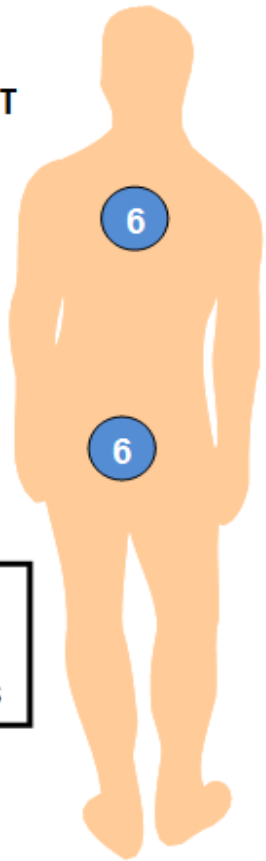
Apply Chlorhexidine WITH FIRM MASSAGE to remove bacteria

USE ALL 6 CHG CLOTHS
Avoid EYES & EAR CANAL



FRONT

1. FACE, NECK SHOULDERS & CHEST
2. BOTH ARMS & HANDS
3. ABDOMEN, GROIN & PERINEUM
4. RIGHT LEG & FOOT
5. LEFT LEG & FOOT
6. BACK, THEN BUTTOCKS



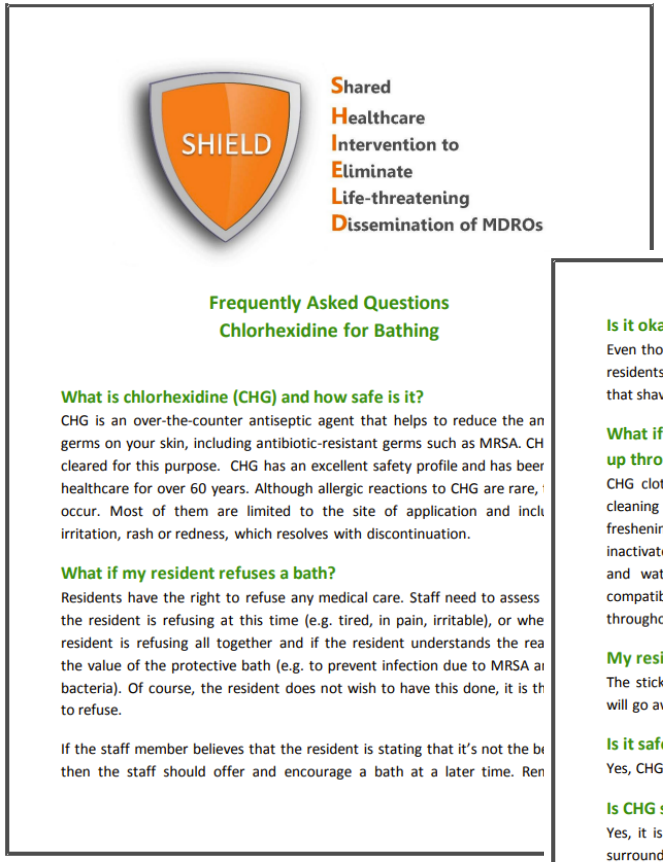
BACK

- Clean 6 inches of all tubes, lines, and drains closest to patient with CHG
- Safe on superficial wounds, rash, burns

Skin may feel sticky for a few minutes after CHG application.
Do NOT wipe off. Allow to air dry.

THIS IS a PROTECTIVE BATH
Do not use soap which can inactivate CHG

Decolonization FAQs



SHIELD

Shared
Healthcare
Intervention to
Eliminate
Life-threatening
Dissemination of MDROs

Frequently Asked Questions
Chlorhexidine for Bathing

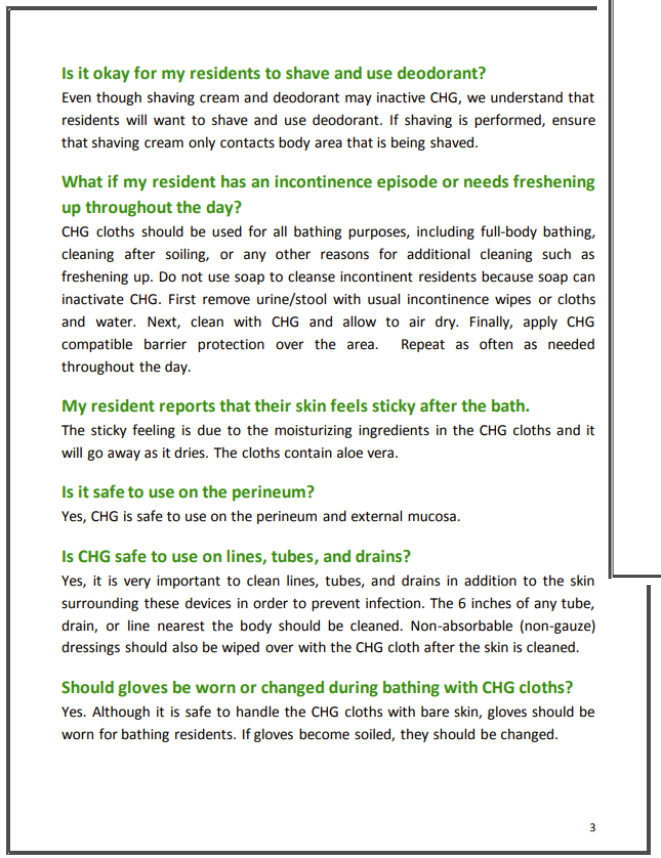
What is chlorhexidine (CHG) and how safe is it?

CHG is an over-the-counter antiseptic agent that helps to reduce the an
germs on your skin, including antibiotic-resistant germs such as MRSA. CH
cleared for this purpose. CHG has an excellent safety profile and has beer
healthcare for over 60 years. Although allergic reactions to CHG are rare,
occur. Most of them are limited to the site of application and inclu
irritation, rash or redness, which resolves with discontinuation.

What if my resident refuses a bath?

Residents have the right to refuse any medical care. Staff need to assess
the resident is refusing at this time (e.g. tired, in pain, irritable), or whe
resident is refusing all together and if the resident understands the rea
the value of the protective bath (e.g. to prevent infection due to MRSA a
bacteria). Of course, the resident does not wish to have this done, it is th
to refuse.

If the staff member believes that the resident is stating that it's not the b
then the staff should offer and encourage a bath at a later time. Ren



Is it okay for my residents to shave and use deodorant?

Even though shaving cream and deodorant may inactive CHG, we understand that residents will want to shave and use deodorant. If shaving is performed, ensure that shaving cream only contacts body area that is being shaved.

What if my resident has an incontinence episode or needs freshening up throughout the day?

CHG cloths should be used for all bathing purposes, including full-body bathing, cleaning after soiling, or any other reasons for additional cleaning such as freshening up. Do not use soap to cleanse incontinent residents because soap can inactivate CHG. First remove urine/stool with usual incontinence wipes or cloths and water. Next, clean with CHG and allow to air dry. Finally, apply CHG compatible barrier protection over the area. Repeat as often as needed throughout the day.

My resident reports that their skin feels sticky after the bath.

The sticky feeling is due to the moisturizing ingredients in the CHG cloths and it will go away as it dries. The cloths contain aloe vera.

Is it safe to use on the perineum?

Yes, CHG is safe to use on the perineum and external mucosa.

Is CHG safe to use on lines, tubes, and drains?

Yes, it is very important to clean lines, tubes, and drains in addition to the skin surrounding these devices in order to prevent infection. The 6 inches of any tube, drain, or line nearest the body should be cleaned. Non-absorbable (non-gauze) dressings should also be wiped over with the CHG cloth after the skin is cleaned.

Should gloves be worn or changed during bathing with CHG cloths?

Yes. Although it is safe to handle the CHG cloths with bare skin, gloves should be worn for bathing residents. If gloves become soiled, they should be changed.

SHIELD

Shared
Healthcare
Intervention to
Eliminate
Life-threatening
Dissemination of MDROs

Frequently Asked Questions
Wound Care

The majority of our nurses and certified nursing assistants (CNAs) feel comfortable using chlorhexidine (CHG) cloths on superficial wounds, but some do not. How would you suggest easing their concerns?

Remind all nursing staff that CHG cloths are safe to use on superficial wounds and stage 1 & 2 decubitus ulcers. Using the buddy system, in which nursing staff who are comfortable using CHG on superficial wounds buddy up with staff who are less comfortable, can also help.

Should I be concerned about CHG having a stinging effect on wounds?

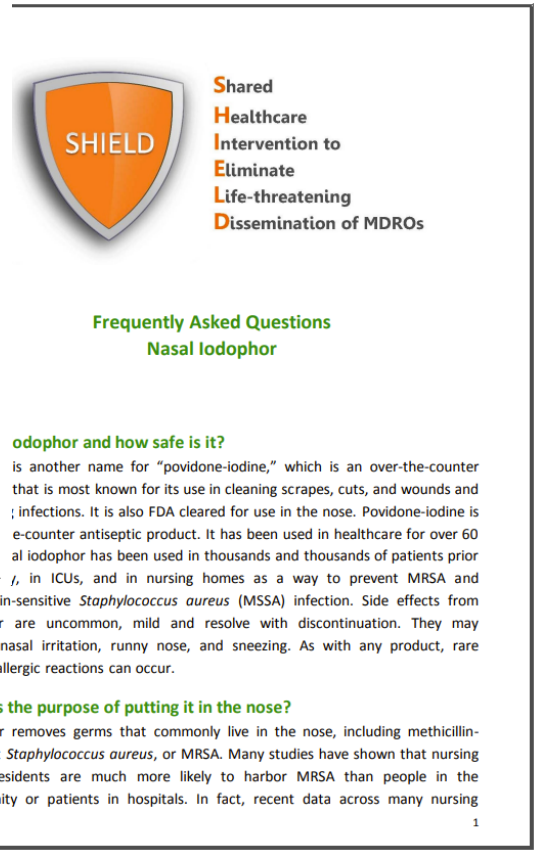
Antiseptic over-the-counter products often contain alcohol and will sting when applied to wounds. In contrast, CHG cloths do not contain alcohol and will not sting. In fact, CHG cloths contain dimethicone and aloe vera which are moisturizers and actually have a soothing effect on the superficial wound area.

Will CHG be absorbed if I put it on a wound?

There is minimal to no systemic absorption when using CHG on a superficial wound. In addition, the CHG may be particularly important to get rid of bacteria in an open wound and prevent infection.

For what types of wounds is CHG safe?

CHG can be gently applied to any superficial wound, including stage 1 and 2 decubitus ulcers, friable skin/rash, and superficial burns. We do not recommend



SHIELD

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Eliminate
Life-threatening
Dissemination of MDROs

Frequently Asked Questions
Nasal Iodophor

odophor and how safe is it?

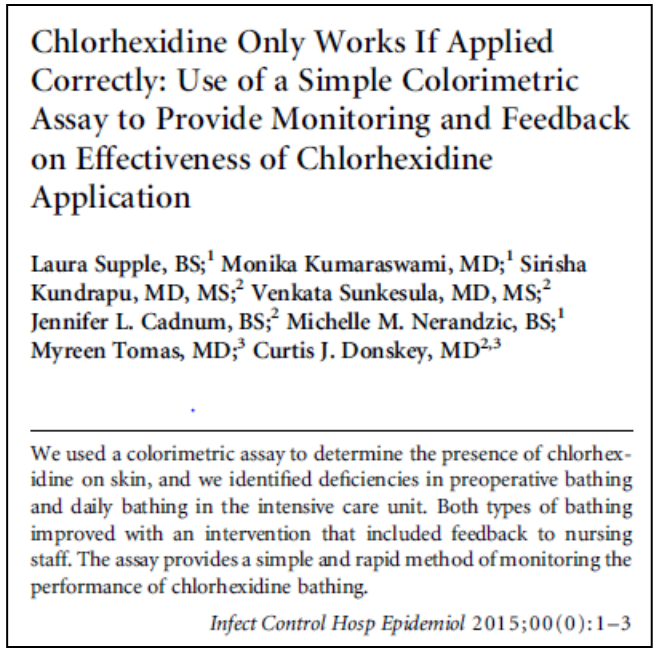
is another name for "povidone-iodine," which is an over-the-counter that is most known for its use in cleaning scrapes, cuts, and wounds and ; infections. It is also FDA cleared for use in the nose. Povidone-iodine is e-counter antiseptic product. It has been used in healthcare for over 60 al iodophor has been used in thousands and thousands of patients prior , in ICUs, and in nursing homes as a way to prevent MRSA and methicillin-sensitive *Staphylococcus aureus* (MSSA) infection. Side effects from iodophor are uncommon, mild and resolve with discontinuation. They may include nasal irritation, runny nose, and sneezing. As with any product, rare serious allergic reactions can occur.

What is the purpose of putting it in the nose?

Iodophor removes germs that commonly live in the nose, including methicillin-resistant *Staphylococcus aureus*, or MRSA. Many studies have shown that nursing home residents are much more likely to harbor MRSA than people in the community or patients in hospitals. In fact, recent data across many nursing

Decolonization Success Depends on Application

- Lack of training shown to yield no benefit
- Training pearls for CHG
  - Massage firmly
  - Avoid cotton cloths
  - Clean wounds, devices, breaks in skin
  - Check lotion, skin product compatibility
  - 4% rinse-off CHG, 2% leave-on (air dry)



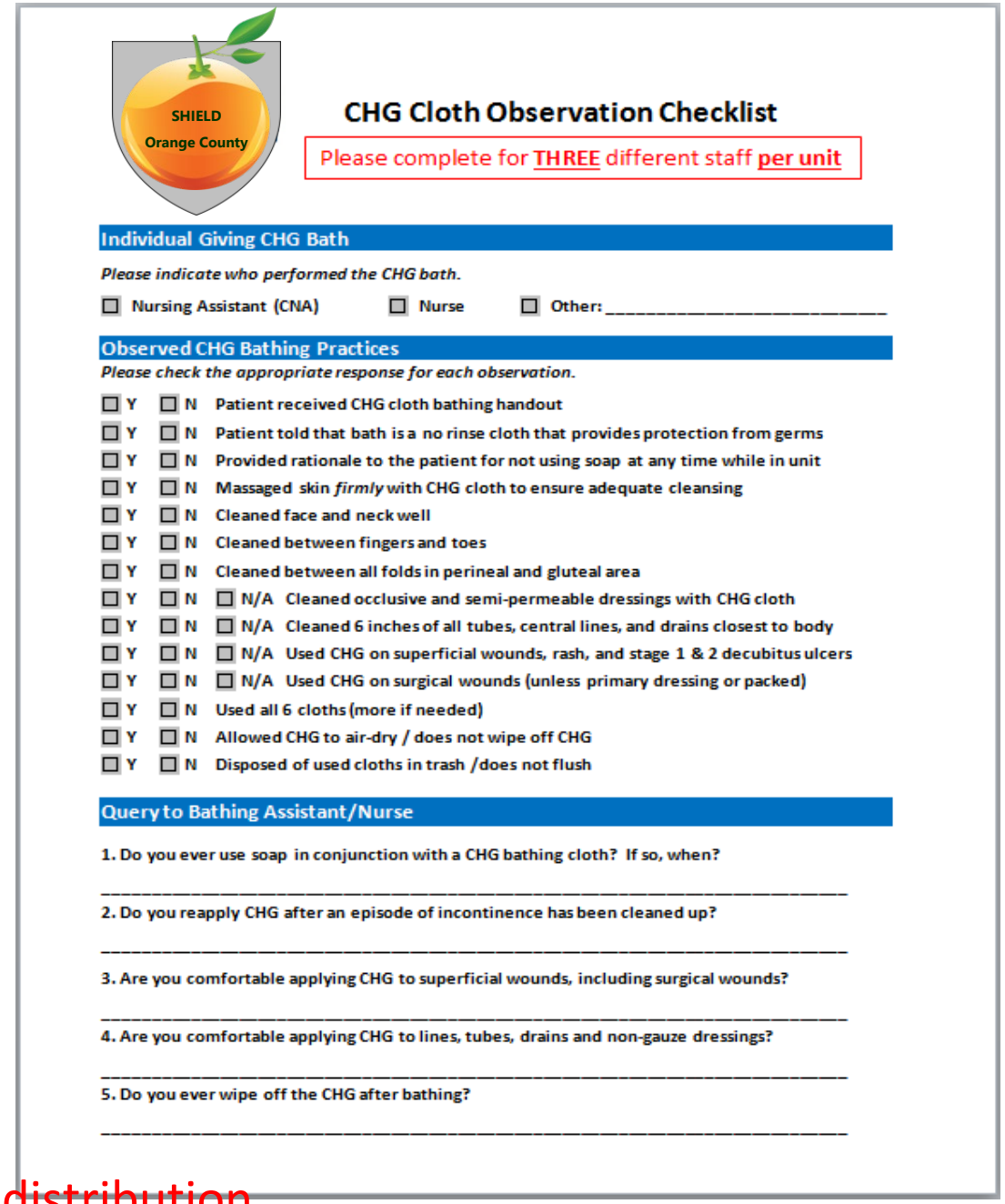
Chlorhexidine Only Works If Applied Correctly: Use of a Simple Colorimetric Assay to Provide Monitoring and Feedback on Effectiveness of Chlorhexidine Application

Laura Supple, BS;[1] Monika Kumaraswami, MD;[1] Sirisha Kundrapu, MD, MS;[2] Venkata Sunkesula, MD, MS;[2] Jennifer L. Cadnum, BS;[2] Michelle M. Nerandzic, BS;[1] Myreen Tomas, MD;[3] Curtis J. Donskey, MD[2,3]

We used a colorimetric assay to determine the presence of chlorhexidine on skin, and we identified deficiencies in preoperative bathing and daily bathing in the intensive care unit. Both types of bathing improved with an intervention that included feedback to nursing staff. The assay provides a simple and rapid method of monitoring the performance of chlorhexidine bathing.

Infect Control Hosp Epidemiol 2015;00(0):1–3

Popovich KJ Int Care Med 2010;36(5):854-8
Supple L ICHE 2015;36(9):1095-7



SHIELD
Orange County

CHG Cloth Observation Checklist

Please complete for **THREE** different staff **per unit**

Individual Giving CHG Bath

Please indicate who performed the CHG bath.

☐ Nursing Assistant (CNA) ☐ Nurse ☐ Other: _____

Observed CHG Bathing Practices

Please check the appropriate response for each observation.

☐ Y ☐ N Patient received CHG cloth bathing handout
☐ Y ☐ N Patient told that bath is a no rinse cloth that provides protection from germs
☐ Y ☐ N Provided rationale to the patient for not using soap at any time while in unit
☐ Y ☐ N Massaged skin *firmly* with CHG cloth to ensure adequate cleansing
☐ Y ☐ N Cleaned face and neck well
☐ Y ☐ N Cleaned between fingers and toes
☐ Y ☐ N Cleaned between all folds in perineal and gluteal area
☐ Y ☐ N ☐ N/A Cleaned occlusive and semi-permeable dressings with CHG cloth
☐ Y ☐ N ☐ N/A Cleaned 6 inches of all tubes, central lines, and drains closest to body
☐ Y ☐ N ☐ N/A Used CHG on superficial wounds, rash, and stage 1 & 2 decubitus ulcers
☐ Y ☐ N ☐ N/A Used CHG on surgical wounds (unless primary dressing or packed)
☐ Y ☐ N Used all 6 cloths (more if needed)
☐ Y ☐ N Allowed CHG to air-dry / does not wipe off CHG
☐ Y ☐ N Disposed of used cloths in trash /does not flush

Query 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 has been cleaned up?

_____

3. Are you comfortable applying CHG to superficial wounds, including surgical wounds?

_____

4. Are you comfortable applying CHG to lines, tubes, drains and non-gauze dressings?

_____

5. Do you ever wipe off the CHG after bathing?

_____

Decolonization Dos and Don’ts

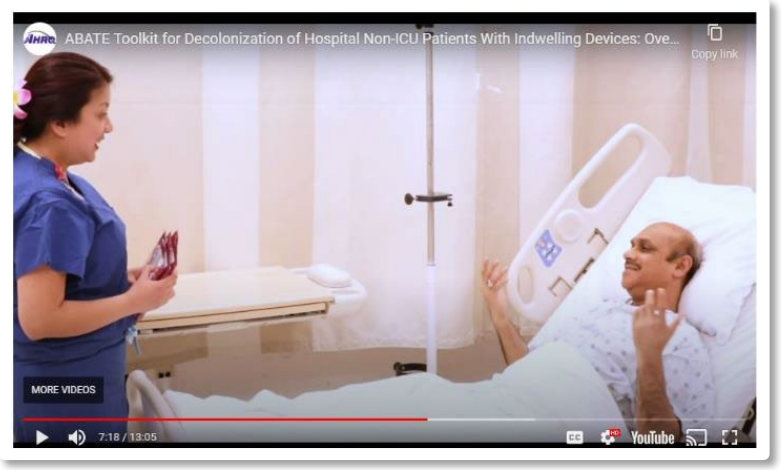
DO
• Begin decolonization on admission to remove germs as soon as possible
• Use chlorhexidine (CHG) for all bathing/showering needs for all residents
• Use 2% no-rinse CHG cloths for bed baths *or* 4% rinse-off liquid CHG for showers
• Use CHG for regular bathing during resident’s entire nursing home stay
• Massage CHG onto skin for best effect
• Use CHG on lines, tubes, drains, and over non-gauze dressings
• Use on superficial wounds and rashes to remove germs
• Use nasal iodophor treatment twice a day for a 5-day period every other week

DON’T
• Do NOT get CHG into eyes or ears
• Do NOT wipe off after applying CHG cloths. Let air dry.
• Do NOT apply dressings when skin is still sticky. Wait until fully dry.
• Do NOT flush CHG cloths. Place in trash.
• Do NOT use cotton cloths for showering – it binds CHG and does not release well
• Do NOT use iodophor and/or CHG on resident if resident is allergic

REFER TO NURSING PROTOCOL FOR STEP-BY-STEP INSTRUCTIONS

Training Video for CHG Bathing

- CHG bathing and showering instructions
- Scenarios for how to encourage patients to accept bath
- Commonly missed and important protocol details
  (i.e., cleaning lines, tubes, drains, superficial wounds)
- Instructions for patients wishing to self-bathe

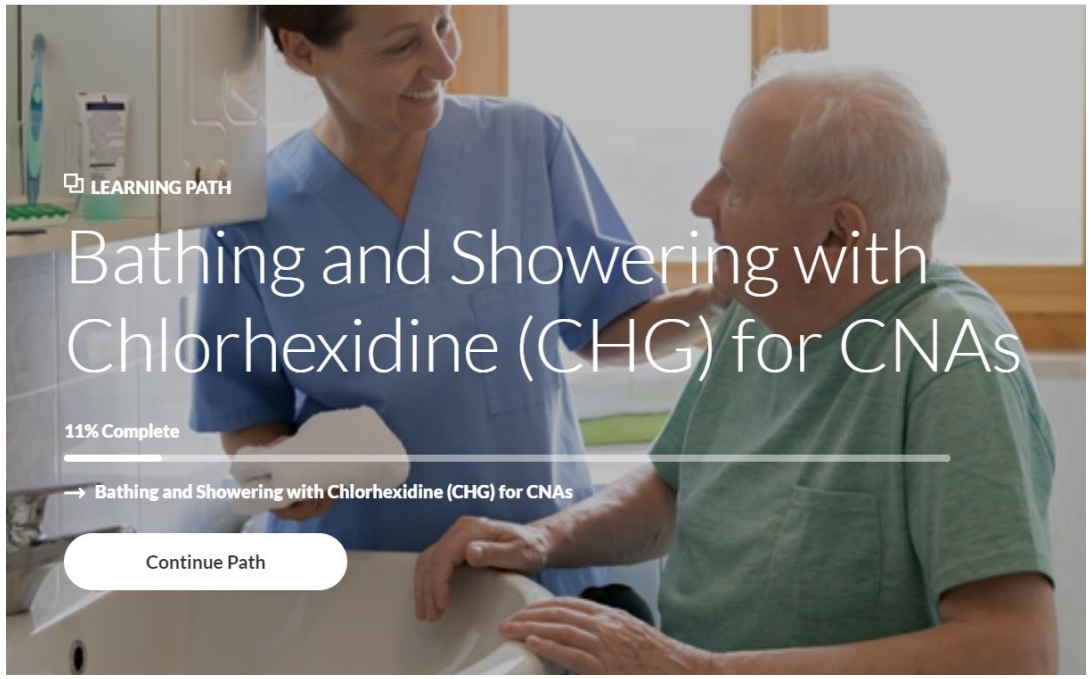


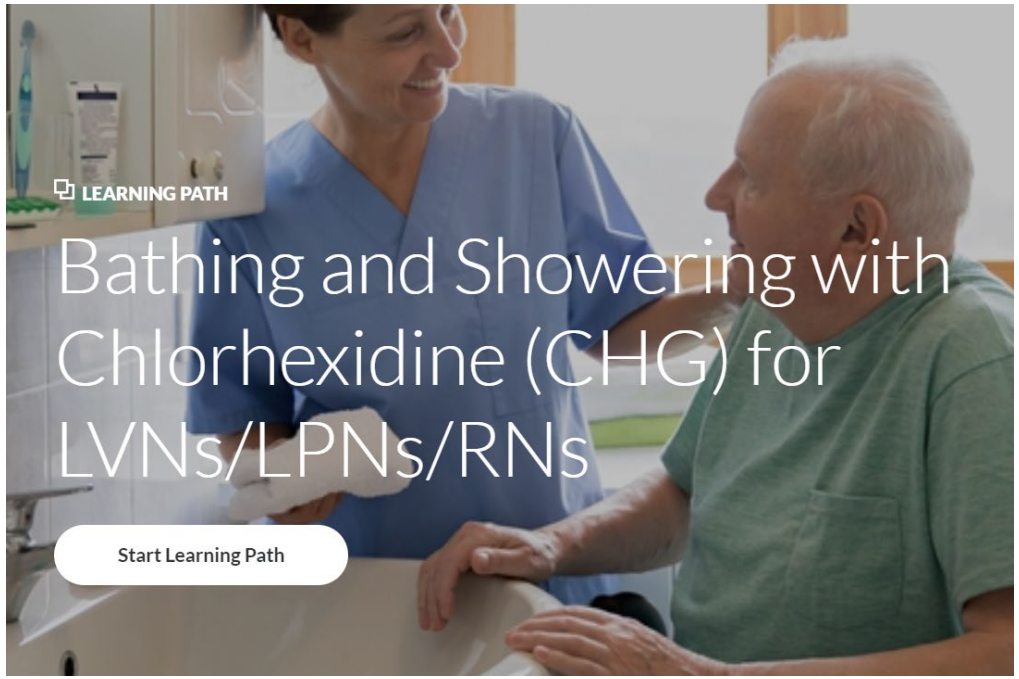
https://www.ahrq.gov/hai/tools/abate/index.html

NACCHO
National Association of County & City Health Officials

UNIVERSITY

an online education and training resource to develop knowledge and competencies for local public health





https://www.pathlms.com/courses?category_ids%5B%5D=1009&slug=naccho

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Step 5: Process and Practice

- ☐ Select Launch Date
- ☐ Pre-Launch Facility-wide Training Days
  - CNAs
  - LVN/RNs
  - See toolkit modules and videos to be used with in-person train-the-trainer
- ☐ Pre-Launch Skin Check to avoid attributing existing conditions to CHG
- ☐ Launch
- ☐ Provide Admission Packet materials on routine decolonization (see toolkit)
- ☐ Post-Launch Feedback on Bathing Quality
  - Toolkit assessment tool (few times weekly early in campaign)
- ☐ Ongoing Training for new hires

Support Options:

- ✓ Access nursing home toolkit at **ucihealth.org/shield**
- ✓ Schedule UCI on-site visit 2 or 3 months after launch for troubleshooting, reinforcement

Step 6: Outcomes

Track Some of the Following Benefits:

- Skin checks
- MDRO prevalence
- Contact precautions
- Antibiotic use
- Infections
- Hospitalizations due to infection

Summary: Decolonization

- Topical decolonization of skin and nose repeatedly shows benefit:
  - ✓ Reduces MDROs, Gram+ and Gram-
  - ✓ Reduces bloodstream infections in hospitals
  - ✓ Reduces hospitalizations from serious infections in nursing homes, and reduces related costs and deaths
- Universal application most effective in high-risk populations
- Quality of training and application matters
- Free, online tools can help with implementation