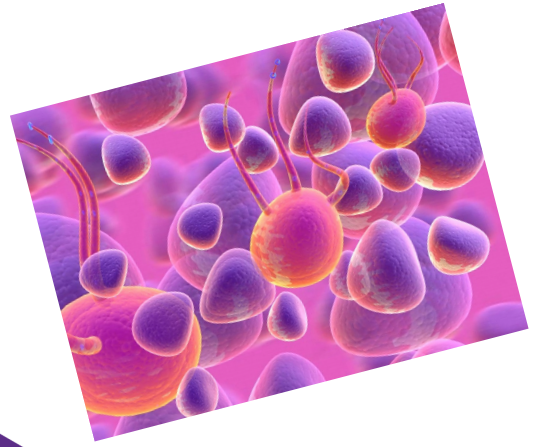

Patient Decolonization: The Impact on HAI's

Kathleen Vollman
ADVANCING NURSING THROUGH KNOWLEDGE & INNOVATION

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Disclosures

- Consultant-Michigan Hospital Association Keystone Center
- Subject matter expert for CAUTI, CALBSI, CDI, Sepsis, HAPI and culture of Safety for HIIN/CMS
- Consultant and speaker bureau:
  - Stryker Sage
  - Potrero Medical
  - Ondine Biomedical
  - Baxter Healthcare

Session Objectives

- Identify modes of transmission for the spread of microorganism in the healthcare environment

- Evaluate key evidence-based care practices that can reduce bacterial load on the patient and/or prevent health care acquired infections.

Incidence, Mortality & Cost of MDRO's in US & Canada

- Canada 2014-2018
  - MRSA BSI ↑ 59% from .66 to 1.05 per 10,000 pt days
  - VRE BSI ↑ 143% from .14 to .34 per 10,000 pt days
  - CRE remain low and stable
  - Cost: Canada large teaching hospital 35 million a year
  - 1 billion per year to health system
- 2018: 5400 deaths attributably to antibiotic resistance

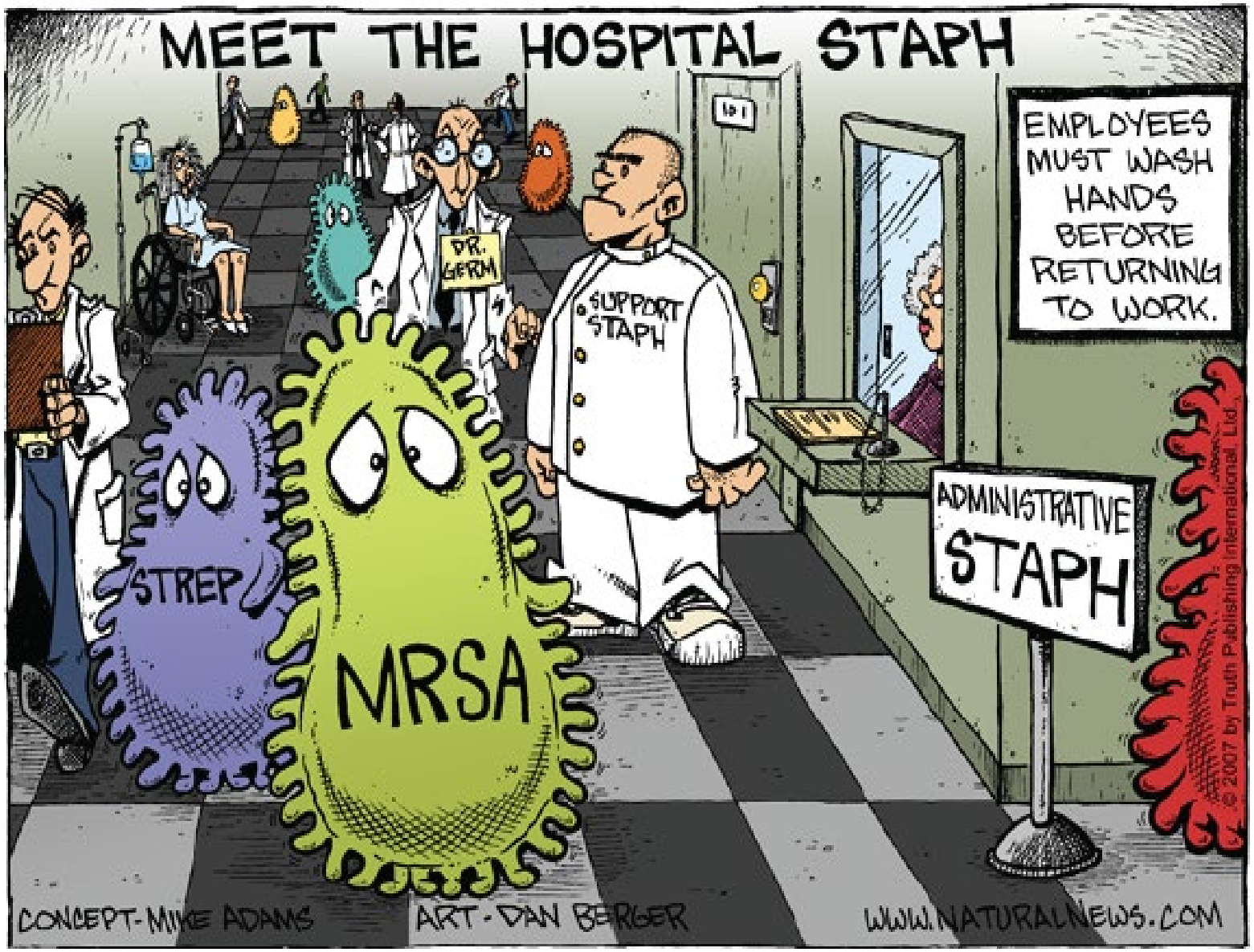
- US 2019
  - 23,000 deaths associated with MDRO's
  - Between $1700 to $4600 per stay
  - 2.39 billion in treatment costs
  - Staff bacteremia's 2017
  - 119,000 blood stream infections
  - 20,000s death
- Rate of improvement has slowed nationally

*Morbidity and Mortality Weekly Report (*MMWR), March 2019
Johnston KJ, et al Health Services Research, 2019 Mar 12. doi: 10.1111/1475-6773.13135
Canadian Nosocomial Infection Surveillance Program. Can Commun Dis Rep 2020;46(5):99–112.
Council of Canadian Academies

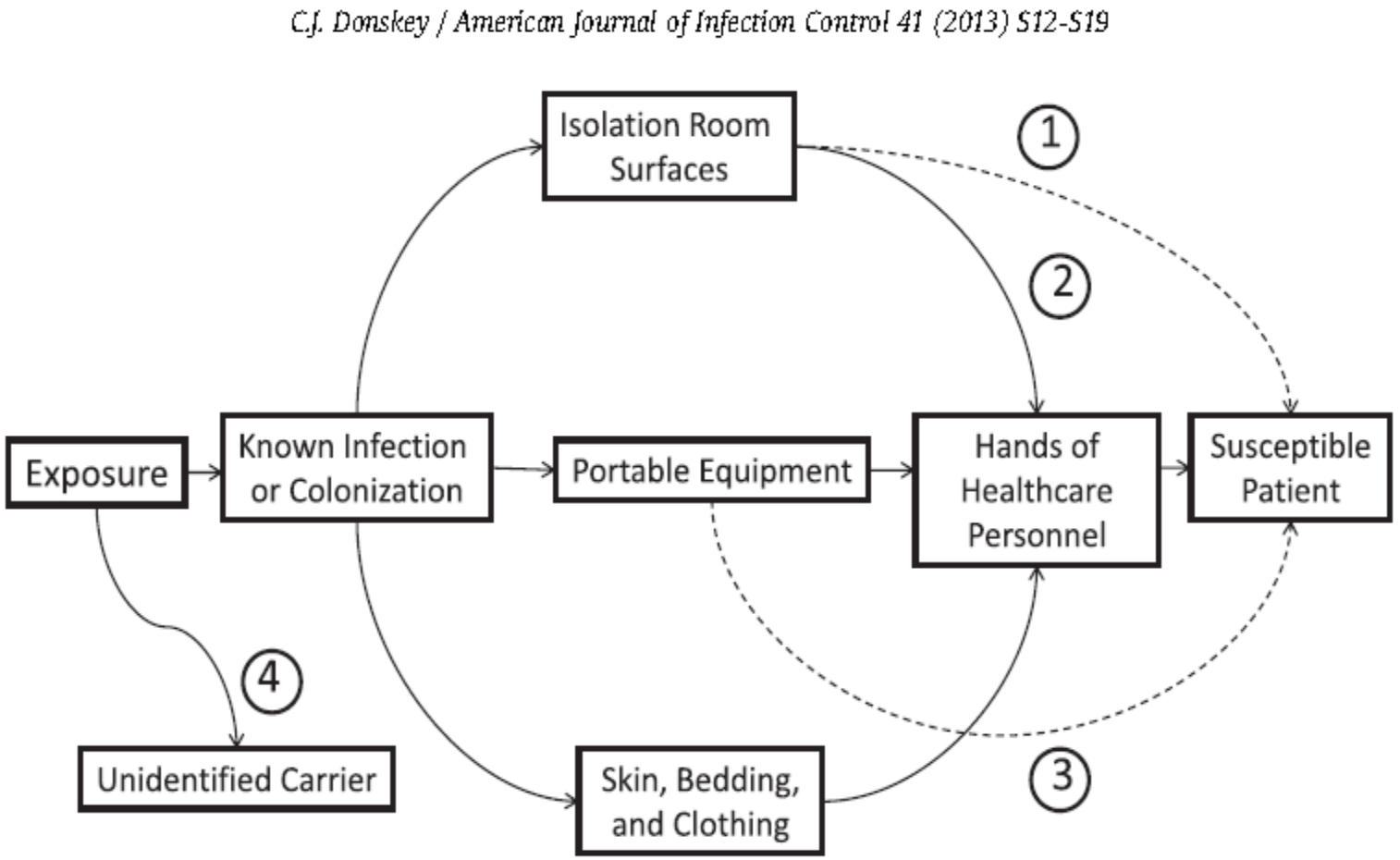
Independent Predictors of Acquiring an MDRO Infection

- Prolonged prior hospital or ICU stay
- Recent surgery or procedure
- Presence of invasive devices
- Recent exposure to antibiotics

Mills JP, et al. Infect Dis Clin N AM 2021;35:969-994

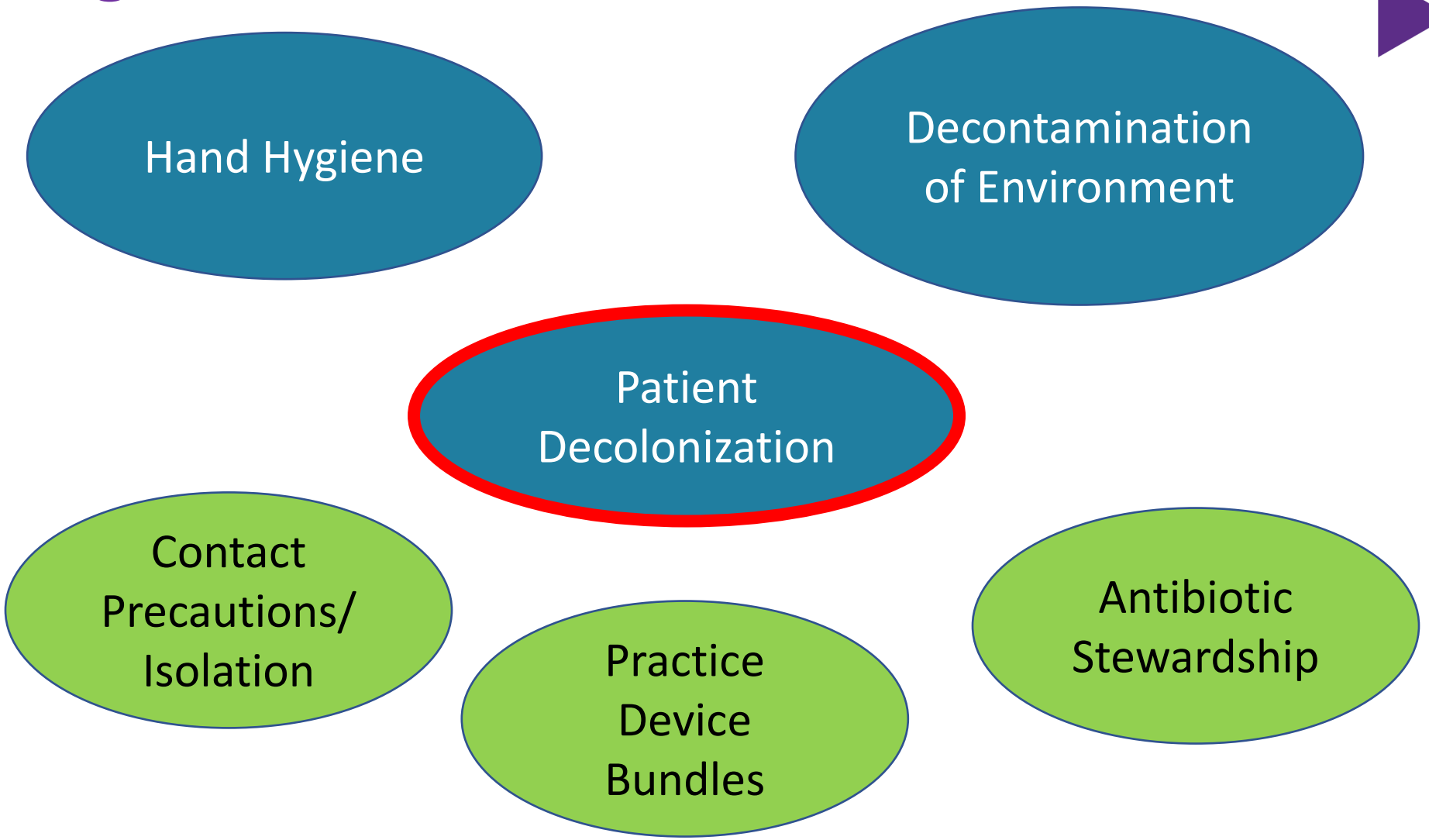

MEET THE HOSPITAL STAPH
EMPLOYEES MUST WASH HANDS BEFORE RETURNING TO WORK.
DR. GERM
SUPPORT STAPH
STREP
MRSA
ADMINISTRATIVE STAPH
© 2007 by Truth Publishing International, Ltd.
CONCEPT-MIKE ADAMS
ART-DAN BERGER
WWW.NATURALNEWS.COM

Common Routes of Transmission



HAI in the ICU was the patients' endogenous flora (40%-60%); cross-infection via the hands of health care personnel (HCP; 20%-40%); antibiotic-driven changes in flora (20%-25%); and other(including contamination of the environment; 20%). Weinstein RA.. Am J Med 1991;91(Suppl):179S-184S.

Reducing MDRO's

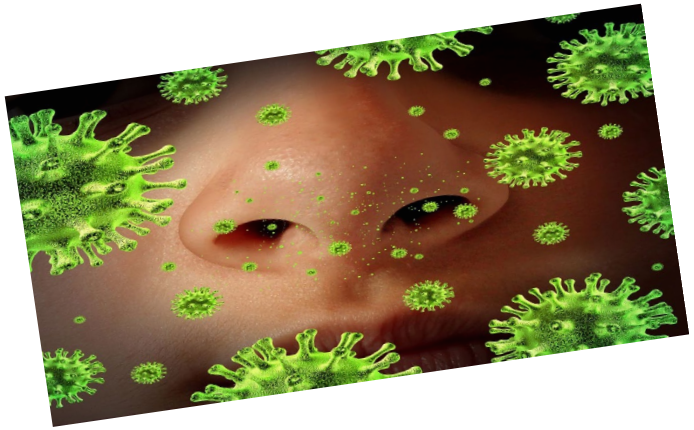


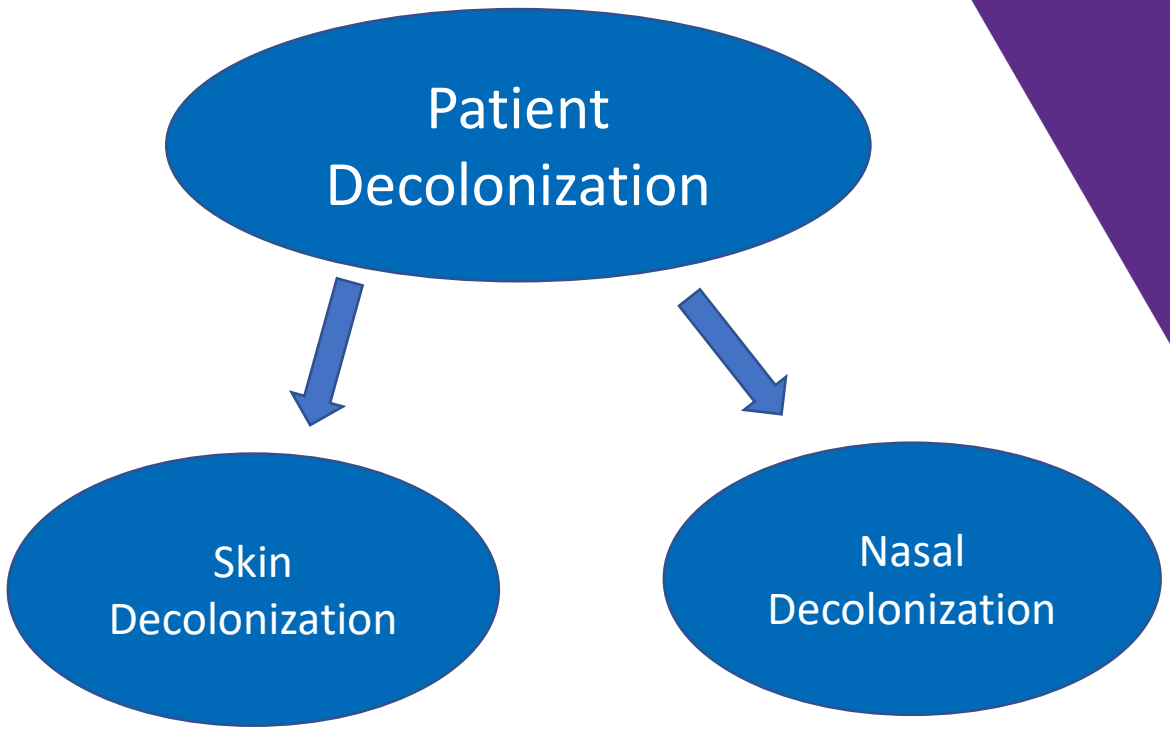
Calfee DP, et al. Infect Control Hosp Epidemiol, 2014;35(7):772-796
Huang SS, et al. New Engl J of Med, 2013;368(24):2255-65
Health Research & Educational Trust (2017). MDRO Change Packect. Accessed at www.hret-hiin.org.

Even if you are on the right track, you will get run over if you just sit there.

Will Rogers

Reducing Bacterial Load on the Patient: A Horizontal Strategy





Traditional Bathing

Soap and water basin bath was an independent predictor for the development of a CLABSI

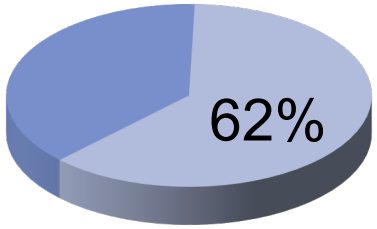
Bleasdale SC, e tal. Arch Intern Med. 2007;167(19):2073-2079

Bath Basins:
Potential Source of Infection

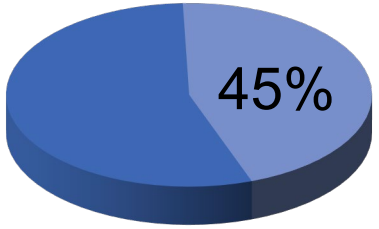
- Large multi-center study evaluates presence of multi-drug resistant organisms

Total hospitals: **88**

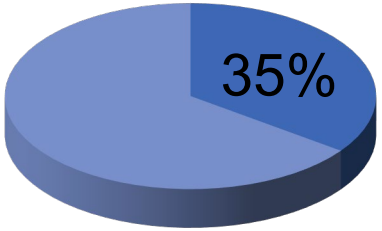
Total basins: **1,103**



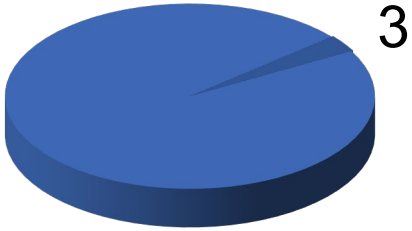
Contaminated
686 basins/88 Hospital



Gram negative bacilli
495 basins/86 hospitals



Colonized w/ VRE
385 basins/ 80 hospitals



MRSA
36 basins/28 hospitals

Marchaim D, et al. *Am J of Infect Control*. 2012;40(6):562-564

Mechanisms of Contamination

- Skin flora
- Multiple-use basins
  - Incontinence cleansing
  - Emesis
  - Product storage
- Bacterial biofilm from tap water

Shannon RJ, et al. *J Health Care Safety Compliance Infect Control*. 1999;3:180-184.
Larson EL, et al. *J Clin Microbiol*. 1986;23(3):604-608.
Johnson D, et al. *Am J Crit Care*, 2009;18(1):31-38, 41.
Marchaim D, et al. *Am J Infect Control*. 2012;40(6):562-564.

Waterborne Infection

Hospital Tap Water

- Bacterial biofilm
- Most overlooked source for pathogens
- 29 studies demonstrate an association with HAIs and outbreaks
- Transmission:
  - Drinking
  - Bathing
  - Rinsing items
  - Contaminated environmental surfaces
- Immunocompromised patients at greatest risk

Anaissie EJ, et al. *Arch Intern Med*. 2002;162(13):1483-1492.
Cervia JS, et al. Arch Intern Med, 2007;167:92-93
Trautmann M, et al. Am J of Infect Control, 2005;33(5):S41-S49,
https://www.pinterest.com/pin/332914597437828576/?l=t

Pre-Operative for Reduction in SSI's

CDC – Guideline for Prevention of Surgical Site Infections, 2017[1]
• "Before surgery, patients should shower or bathe (full body) with soap (antimicrobial or non-antimicrobial) or an antiseptic agent on at least the night before the operative day" (*Category IB-strong recommendation; accepted practice.)*
SHEA/IDSA* – Strategies to Prevent Surgical Site Infections, 2014[2]
• "Preoperative bathing with chlorhexidine-containing products" (Unresolved issue). To gain the maximum antiseptic effect of chlorhexidine, adequate levels of CHG must be achieved and maintained on the skin.
AORN – Perioperative Standards and Recommended Practices, 2018[3]
• "The collective evidence supports that preoperative patient bathing may reduce the microbial flora on the patient's skin before surgery." • "The patient should be instructed to bathe or shower before surgery with either soap or a skin antiseptic on at least the night before or the day of surgery." • Although many studies support the use of 2% CHG cloths for preoperative bathing, additional research is needed before a practice recommendation can be made."

1. Centers for Disease Control and Prevention, "Guideline for Prevention of Surgical Site Infections," *JAMA Surg*. doi:10.1001/jamasurg.2017.0904
2. Anderson, D.J., et al, Strategies to Prevent Surgical Site Infection in Acute Care Hospitals: 2014 Update. Infect Control Hosp Epidemiol 2014; 35(6): 605-627.
3. AORN. Guidelines for Perioperative Practice, Denver, Colorado: AORN, Inc : 2018

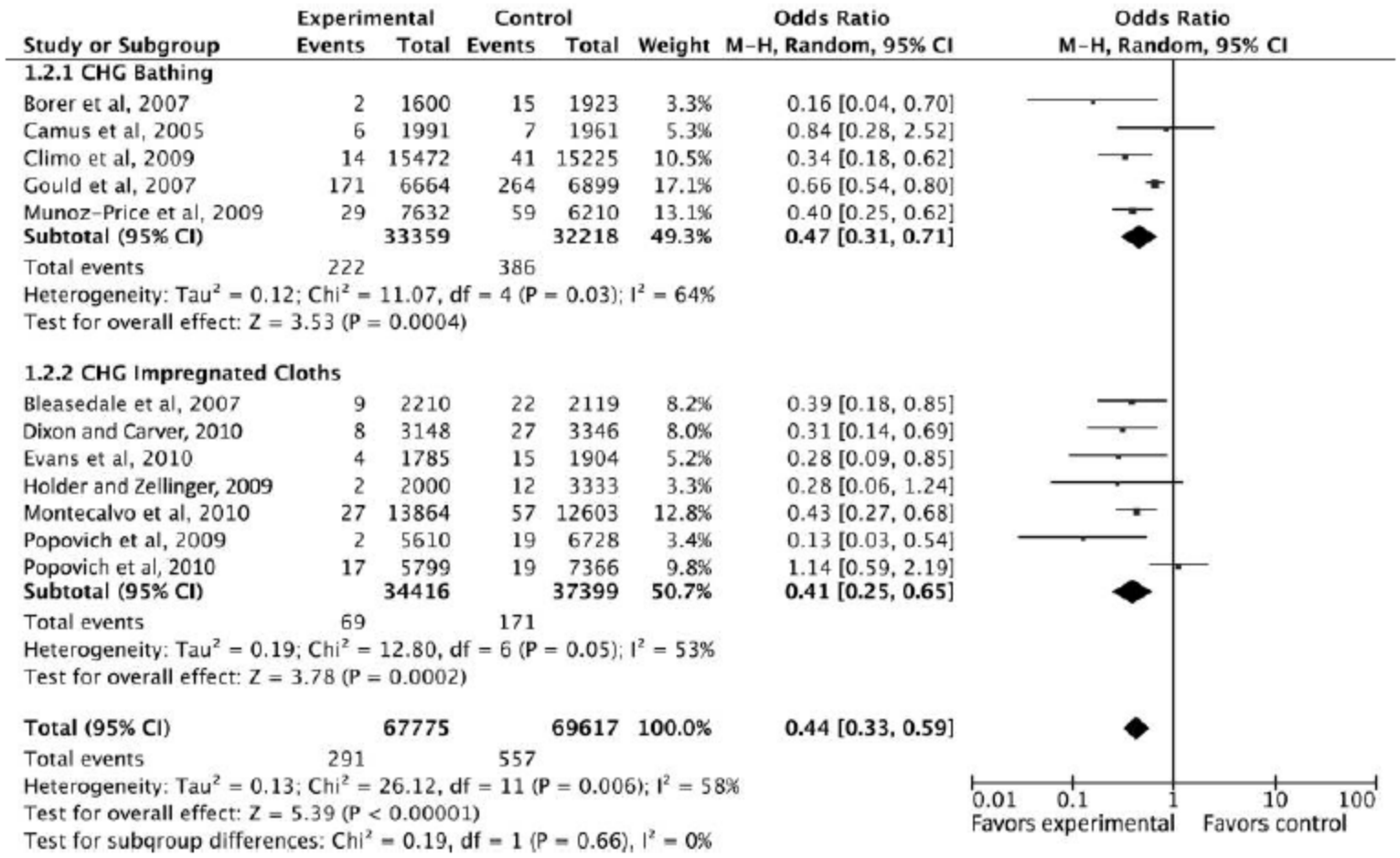
Pre-Op CHG bathing

- Review by Webster did not show a statistically significant reduction in SSI, the studies included were limited to use of 4% CHG[1]
- Meta-analysis by Chlebicki, et al did not find a significant reduction in SSI rates[2]
  - Varying/lack of application protocols (multiple vs. single application) and CHG concentrations
- Additional studies specifically examining the effect of 2% CHG cloths demonstrate an appreciable impact on SSI[3-8]
  - Recent systematic review that included studies with consistent bathing protocols of two preoperative baths, found that the use of 2% CHG cloths significantly reduced SSI risk[7]
  - Low risk and low-cost intervention that has shown effective in reducing bacteria on the skin, a risk factor for SSI

1. Webster J, Osborne S. *The Cochrane Library* 2012;
2. Chlebicki MP, et al.. *AJIC* 2013; 41:167-73.
3. Eislet D.. *Orthopaedic Nursing* 2009; 28(3): 141-45.
4. Johnson AJ, et al.. *J Arthroplasty* 2010; 25(Suppl 6): 98-102.
5. Zywiel MG, et al.. International Orthopaedics 2011; 35(7): 1001-06.
6. Graling PR, Vasaly FW. *AORN* 2013; 97(5): 547-51.
7. Kapadia BH, et al.. *J Arthroplasty* 2013; 28:490–93.
8. Karki S, Cheng AC.. *J Hosp Infect* 2012; 82:71-84.

The Efficacy of Daily Bathing with Chlorhexidine for Reducing Healthcare-Associated Bloodstream Infections: A Meta-analysis

John C. O'Horo, MD;[1] Germana L. M. Silva, MD;[2] L. Silvia Munoz-Price, MD;[3] Nasia Safdar, MD, PhD[4]



Study or Subgroup	Experimental Events	Experimental Total	Control Events	Control Total	Weight	Odds Ratio M-H, Random, 95% CI
1.2.1 CHG Bathing						
Borer et al, 2007	2	1600	15	1923	3.3%	0.16 [0.04, 0.70]
Camus et al, 2005	6	1991	7	1961	5.3%	0.84 [0.28, 2.52]
Climo et al, 2009	14	15472	41	15225	10.5%	0.34 [0.18, 0.62]
Gould et al, 2007	171	6664	264	6899	17.1%	0.66 [0.54, 0.80]
Munoz-Price et al, 2009	29	7632	59	6210	13.1%	0.40 [0.25, 0.62]
Subtotal (95% CI)		**33359**		**32218**	**49.3%**	**0.47 [0.31, 0.71]**
Total events	222		386			
Heterogeneity: $Tau^2 = 0.12$; $Chi^2 = 11.07$, df = 4 (P = 0.03); $I^2 = 64\%$						
Test for overall effect: Z = 3.53 (P = 0.0004)						
1.2.2 CHG Impregnated Cloths						
Bleasedale et al, 2007	9	2210	22	2119	8.2%	0.39 [0.18, 0.85]
Dixon and Carver, 2010	8	3148	27	3346	8.0%	0.31 [0.14, 0.69]
Evans et al, 2010	4	1785	15	1904	5.2%	0.28 [0.09, 0.85]
Holder and Zellinger, 2009	2	2000	12	3333	3.3%	0.28 [0.06, 1.24]
Montecalvo et al, 2010	27	13864	57	12603	12.8%	0.43 [0.27, 0.68]
Popovich et al, 2009	2	5610	19	6728	3.4%	0.13 [0.03, 0.54]
Popovich et al, 2010	17	5799	19	7366	9.8%	1.14 [0.59, 2.19]
Subtotal (95% CI)		**34416**		**37399**	**50.7%**	**0.41 [0.25, 0.65]**
Total events	69		171			
Heterogeneity: $Tau^2 = 0.19$; $Chi^2 = 12.80$, df = 6 (P = 0.05); $I^2 = 53\%$						
Test for overall effect: Z = 3.78 (P = 0.0002)						
Total (95% CI)		**67775**		**69617**	**100.0%**	**0.44 [0.33, 0.59]**
Total events	291		557			
Heterogeneity: $Tau^2 = 0.13$; $Chi^2 = 26.12$, df = 11 (P = 0.006); $I^2 = 58\%$						
Test for overall effect: Z = 5.39 (P < 0.00001)						
Test for subgroup differences: $Chi^2 = 0.19$, df = 1 (P = 0.66), $I^2 = 0\%$						

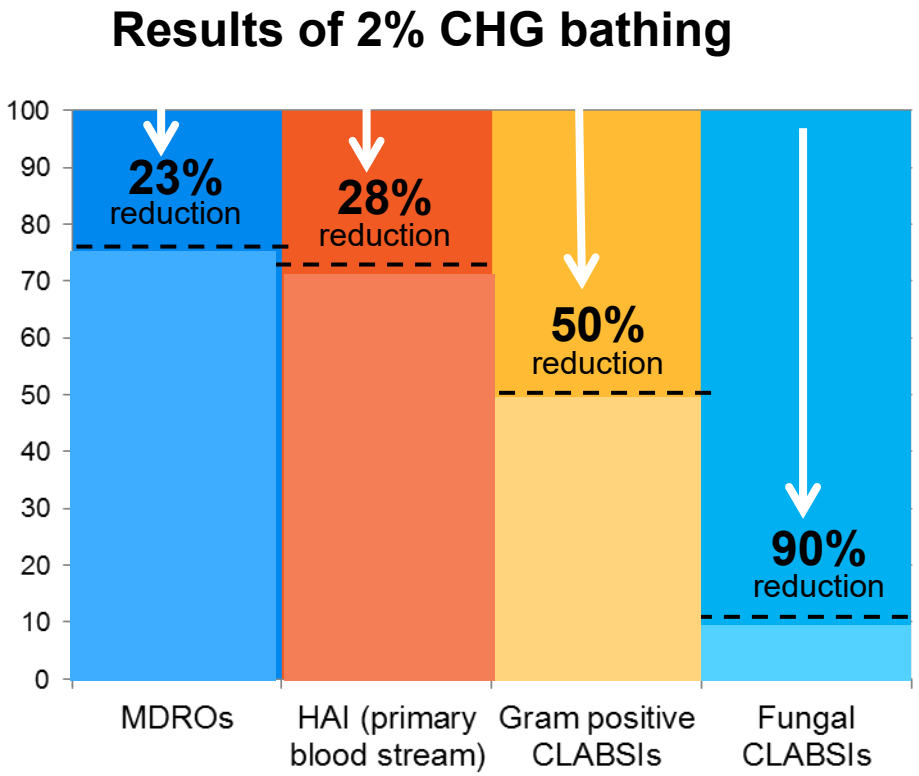
Infect Control Hosp Epidemiol 2012;33(3):257-267

The Evidence: Impact of Antisepsis Bathing

Evaluate effect of daily bathing with CHG on acquisition of multidrug resistant organism's (MDRO's) and incidence of CLABSI

9ICU's and Bone Marrow Transplant unit
Randomly assigned 7727 patient:

a. No-rinse, Antisepsis washcloths
b. Non-antimicrobial, no-rinse bath cloths



Climo, M et al, *N Engl J Med*, 2013;368:533-542

Impact of Antisepsis Baths

Study to determine the best method for reducing spread of methicillin-resistant Staphylococcus aureus (MRSA) and MDROs

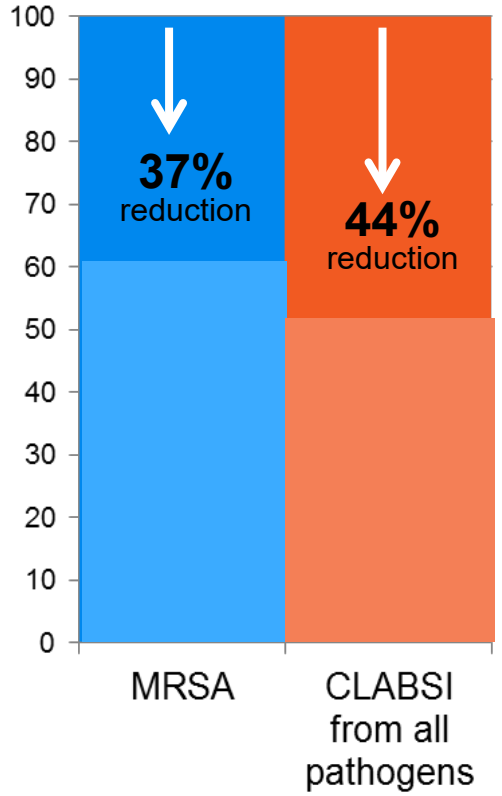
3 protocols tested:

a) Swab for MRSA on admission to ICU
- △ Isolate if positive

b) Swab for MRSA on admission to ICU
- △ Isolate if positive
- △ Nasal mucopiricin x 5 days
- △ antisepsis bathing for entire ICU stay

c) No swab
- △ Nasal mucopiricin x 5 days
- △ Antisepsis bath for entire ICU stay

Results: No Swab Group Universal Decolonization Demonstrated



Huang SS, et al. New Engl J of Med, 2013;368(24):2255-65.

Antisepsis vs. Routine Bathing to Prevent MDRO and CLABSI in General Medical and Surgical Units

- 53 hospitals in 14 states
- Compared routine bathing (non-medicated disposable cloth or showering) to decolonization with universal chlorhexidine and targeted nasal mupirocin in non-critical-care units.
- 12-month baseline period, 2 month phase and 21 month intervention

Decolonization with universal chlorhexidine bathing and targeted mupirocin for MRSA carriers did not significantly reduce multidrug-resistant organisms in non-critical-care patients

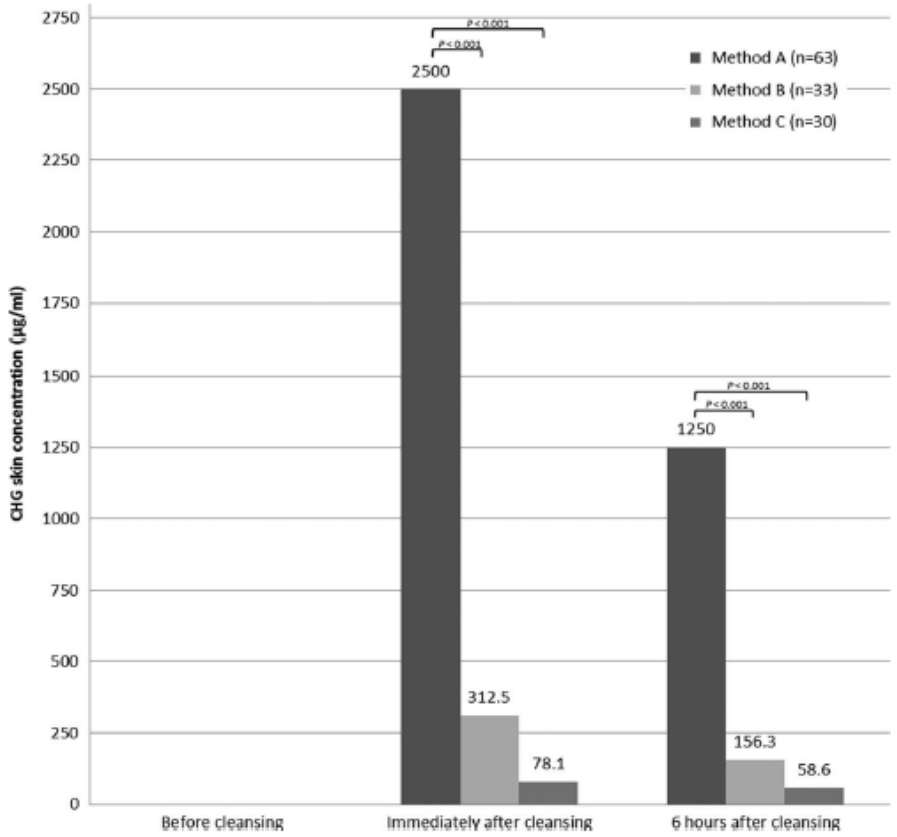
Patients with medical devices had a 32% greater reduction in all cause bacteremia and a 37% greater reduction in MRSA or VRE clinical cultures compared with the routine care group

Huang SS, et al. Lancet. 2019 March 23rd; 393

Differential Effects of Antisepsis Skin Cleansing Methods

Rhee Y, et al. Infect Control Hosp Epidemiol 2018;39:405–411

- Prospective, randomized 2-center study with blinded assessment.
- To determine whether 3 different CHG skin cleansing methods yield similar residual CHG concentrations and bacterial densities on skin.



Method A- 2% CHG cloth
Method B- 4% CHG liquid poured onto non-medicated cloth
Method C-4% CHG liquid on cotton wash cloth

Nasal Decolonization

- S. aureus colonization
  - Carriage is the most important independent risk factor for developing an SSI[2]
  - Usually associated with the nares (~70%)
  - Other sites includes the skin, axilla, groin / perineal space
  - Carriers of high numbers of S. aureus have 3-6 times the risk of HAIs[1]
- Swabbing the nares identifies 80%-90% of MRSA carriers[2]
- Patients may have S. aureus on the skin and other sites and not in the nose
- Decolonization of nasal and extranasal sites may reduce infection risk[4]
  - ASHSP report - mupirocin should be used intranasally for all patients with documented colonization with Staph aureus (Strength of evidence for prophylaxis = A)[3]

1. Bode, Lonneke G. M. et. al. *N* Engl J Med 362;1 January 7, 2010
2. Prokuski, Laura. J Am Acad Orthop Surg 2008;16:283-293
3. Bratzler D, et al. J Health-Syst Pharm.2013; 70:195-283
4. Courville, et. al. ICHE February 2012; 33(2):152-159.

Nasal Decolonization for Reducing SSI's

- 2014 SHEA/IDSA Practice Recommendation
  - If unacceptably high SSI rates exist for surgical populations despite implementation of the basic SSI prevention strategies, then applying standard infection control methods for outbreak investigation and management are recommended, including:
    - Screen surgical patients for S. aureus and **decolonize** preoperatively for high risk procedures, including some orthopedic and cardiac procedures
  - **Routine preoperative decolonization with mupirocin without screening and targeted use is not currently recommended due to concerns about evolving resistance**.
- WHO 2017 Recommendations
  - Nasal decolonization with mupirocin for Cardio or Ortho surgeries: Patients with known nasal carriage of S. aureus should receive intranasal application of mupirocin ointment. (Strong recommendation)
  - Nasal decolonization with mupirocin for other surgeries: Use of nasal mupirocin ointment is suggested (Conditional recommendation)
- AORN 2021 Recommendations
  - Create an interdisciplinary team to develop facility wide decolonization protocols
  - Use a risk based approach
  - Establish a preoperative S aureus decolonization program
    - Choose universal, targeted or blended

Link, T. (2022), Guidelines in Practice: Preoperative Patient Skin Antisepsis. AORN J, 115: 156-166.

Nasal Decolonization Used-Surgery & ICU's

- Mupirocin-Most data on efficacy-eradicates
  - Concerns on widespread implementation
    - Antibiotic resistance identified in multiple studies & results in decolonization failure
    - In opposition to antimicrobial stewardship
    - Resulted in widespread adoption of the skin decolonization but not nasal
  - Other potential barriers
    - Unpleasant to use
    - Dosed 2x daily for 5 days to achieve log kill (compliance issues)

Christie J, et al. *Am J Infect Control*. 2020;48(8):922-924
Septimus EJ. AJIC, 2019;A53-A57.

Frontiers in Nasal Decolonization

- Povidone Iodine-Studies show effective in combination with CHG prep for SSI
  - Activity against gram + & gram-
  - 5% and 10% solution
  - Effective within 1hr-lasts up to 12hrs-
    - time from application to surgery matters
  - Application each nostril for 30 sec (2 different parts) with 1 applicators each nostril and then repeated

Septimus EJ. AJIC, 2019;A53-A57
Martin VT, *et.* Med Sci Monit 2020;26:e927052.

Frontiers in Nasal Decolonization

- Alcohol based nasal antiseptics-antimicrobial by denaturing proteins, fights against gram + and gram- including MDRO's
  - More studies needed
  - 3x per day pre & post surgical till d/c (con't 5-7 days) post d/c
  - Potential compliance issues

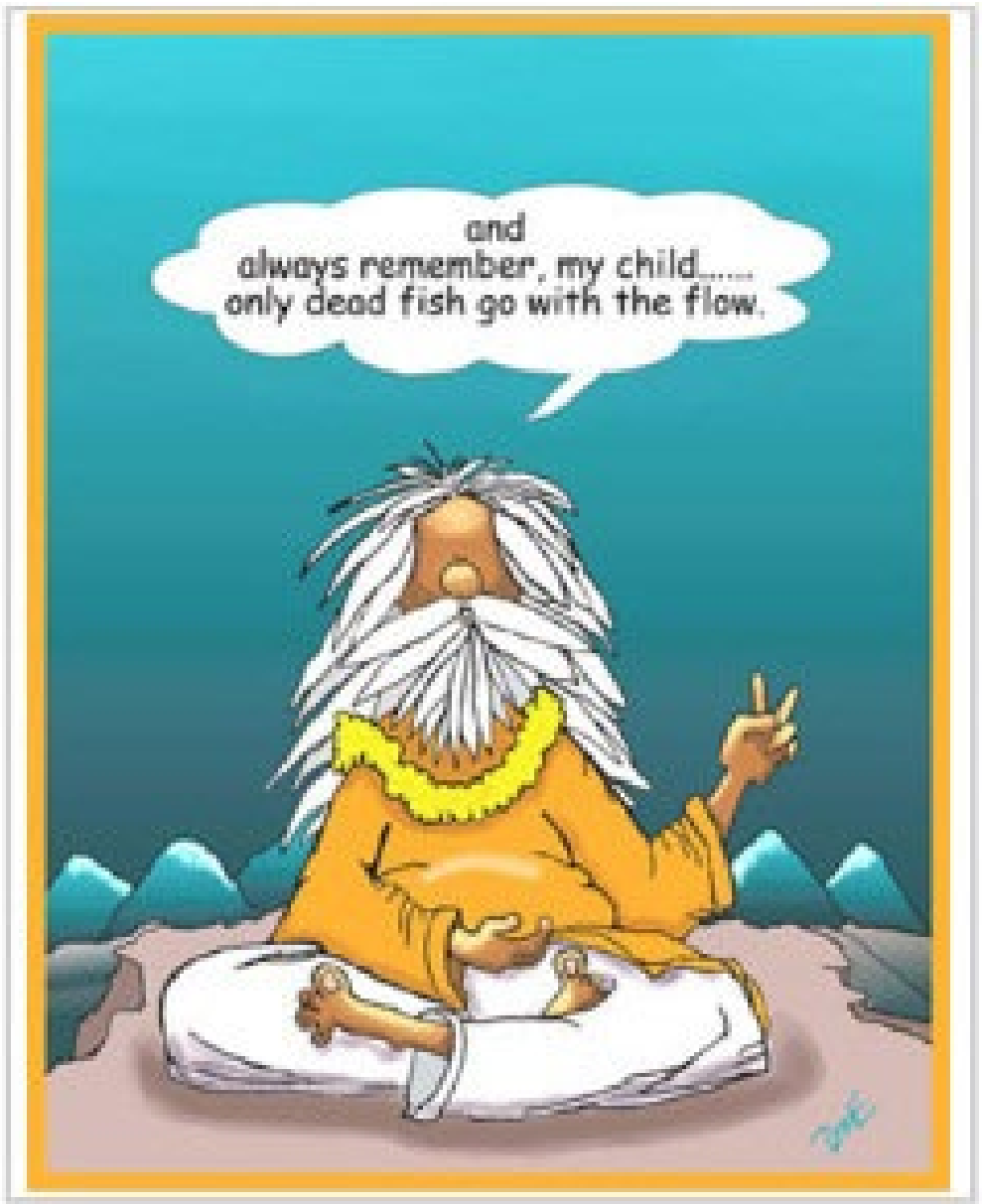
Christie J, et al. *Am J Infect Control*. 2020;48(8):922-924
Septimus EJ. AJIC, 2019;A53-A57.

Frontiers in Nasal Decolonization

- Photo dynamic therapy-use of laser to eliminate S aureus, gram +, gram- and viruses, and fungi
- Combines light activated chemical & cool infrared red wavelength
  - In human testing: eliminated nasal MRSA in < 10 min
  - Published trial showing reduction in SSI/More studies needed
  - One-time tx for surgical pre-op-5 min
  - Sustain elimination for 3 days
  - No adverse events reported

- Vancouver General Experience over 10 years
  - 78% reduction in SSI
  - 53 fewer SSI per year
  - 4.2 million per year in cost avoidance

Septimus EJ. AJIC, 2019;A53-A57.
Bryce E, et al. *J Hosp Infect*. 2014;88(2):89-95.


and
always remember, my child.....
only dead fish go with the flow.


WHEN WOULD NOW BE A GOOD TIME TO DO THIS?
It is not enough to do your best; you must know what to do, and THEN do your best.
~ W. Edwards Deming

Bugging Out

HAI prevention courses by Kathleen Vollman

https://www.medbridgeeducation.com/advancing-nursing

MEDBRIDGE

Kathleen Vollman
ADVANCING NURSING THROUGH KNOWLEDGE & INNOVATION

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Introduction to

Steriwave™ Nasal Photodisinfection

Jason Hickok, MBA, RN
VP, Clinical & Medical Affairs

steriwave™

Conflicts of Interest

- Employed by Ondine Biomedical

Ondine Biomedical

Life sciences company headquartered in Vancouver, Canada

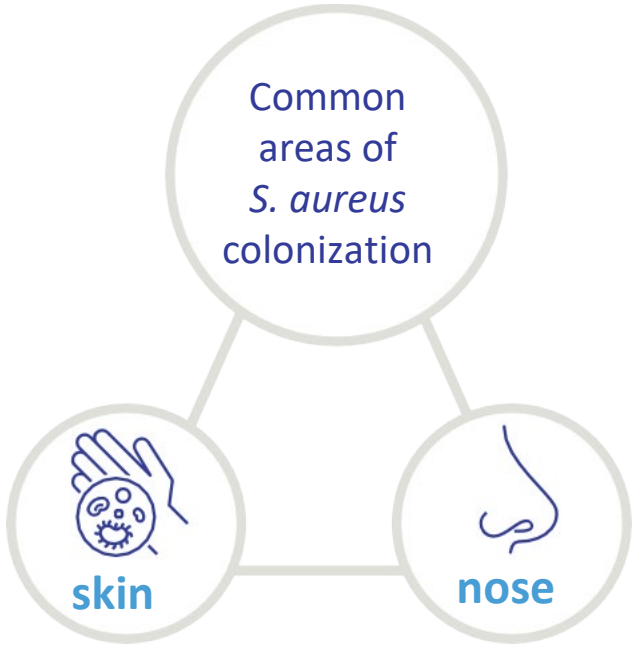
Breakthrough photodisinfection-based therapies to **prevent** and **treat** a **broad spectrum of infections**

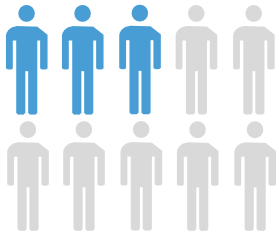
Lead product, Steriwave, **eliminates harmful nasal pathogens** that can lead to healthcare-associated infections (HAIs), Health Canada approved

S. aureus nasal carriage

a leading cause of HAIs

EPIDEMIOLOGY MSSA & MRSA…





~30%

of people are colonized in the **nose**

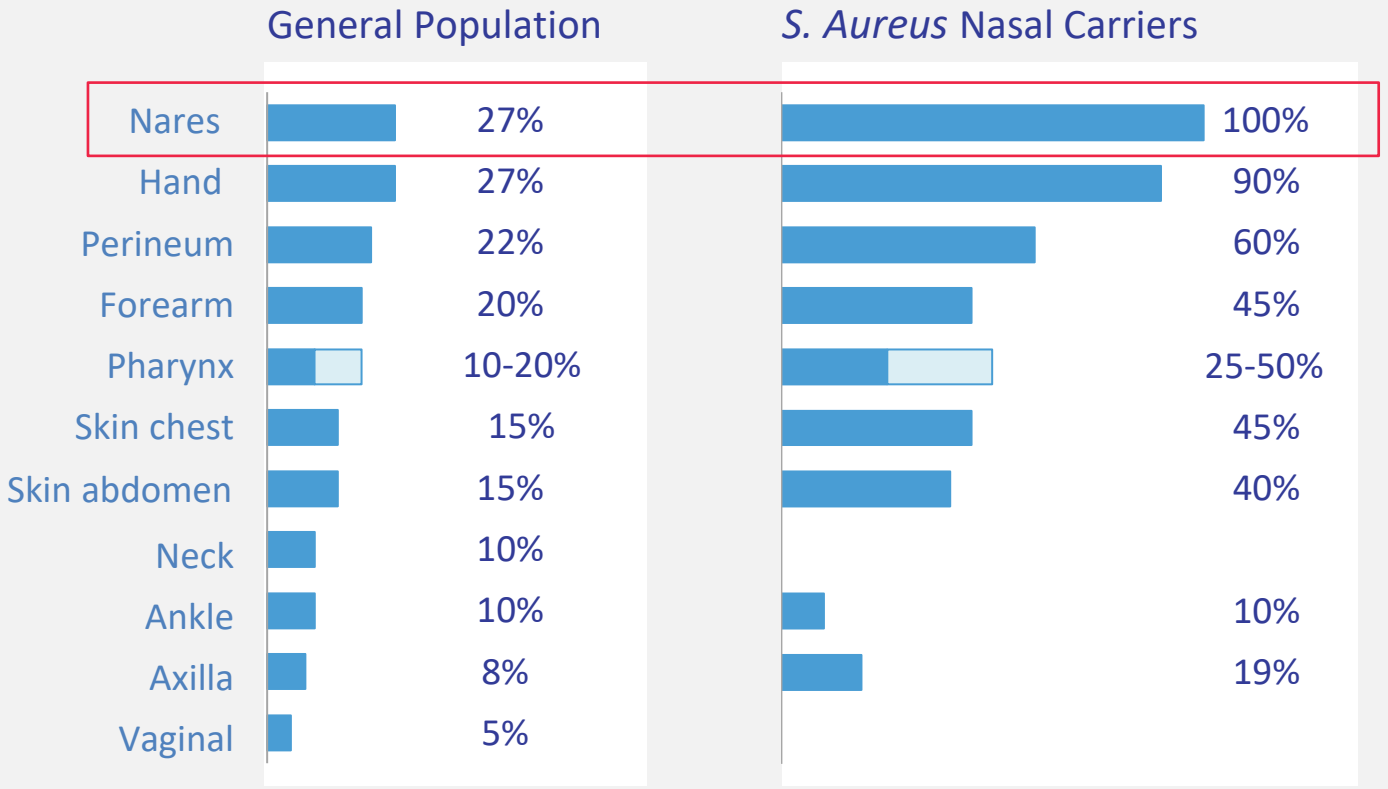
#1 cause of surgical site infections (SSIs)

#2 cause of HAIs overall

(Lancet Infect Dis 2005; 5:751)
(Infect Contrl and Hosp Epi 2008; 29 (11):996)
(N Engl J Med 2014;370:1198)

Nasal carriage is single most important determinant

of subsequent *S. aureus* infections



(Lancet Infect Dis 2005; 5:751)

MRSA Carriers

Need to include the nose when screening for MRSA. Identification rate by anatomic sites:

Testing site	Positive
Nares only	73%
Rectum only	47%
Axilla only	25%
Nares + Rectum	91%
Nares + Axilla	83%

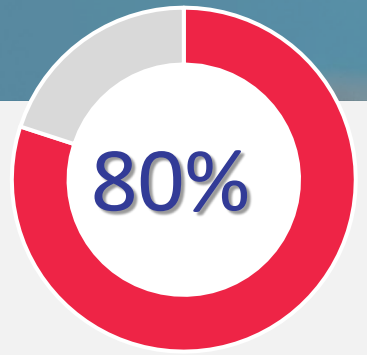
(ICHE 2006; 27:181)

Decolonization

is an essential infection control strategy

Reduces bioburden
from surfaces of the body

Reduces transmission
of pathogens



of *S. aureus* HAIs are caused by the **patient's own bacteria**

(Lancet Infect Dis 2005; 5:751)

Skin
Chlorhexidine gluconate (CHG)

Nares
Antimicrobial ointment

(Med Research Arch 2023; vol 10 No 12)

40%+ reduction in infection risk

when implementing nose + skin decolonization in various patient populations

Study	Year	Study Design	Patient Pop.	Sample Size	Treatment	Infection Rate Reduction
Bode et al. NEJM	2010	DB-RCT*	Surgical	6,771	Mupirocin/CHG soap vs. placebo/bland soap	56% *P*=0.008
Huang et al. NEJM	2013	Cluster randomized	ICU	74,256	Universal decolonization with mupirocin + CHG skin	44% *P<0.001*
Bryce et al. J Hosp Infect	2014	Historical control	Surgical	3,068	Universal decolonization with nasal photodisinfection + CHG skin	42% *P*=0.0004
Schweizer et al. JAMA	2015	Quasi-experimental, Pragmatic	Surgical	42,534	Targeted decolonization with mupirocin + CHG	42% *P*=0.02
Huang et al. Lancet	2019	Cluster randomized	Non-CCU	528,983	Routine care vs. CHG + mupirocin	31% and 37%

**Randomized, double-blinded, placebo-controlled multicenter study*

Findings from other studies / meta-analyses:

- Decolonization is an intervention that can reduce rates of HAI *(literature review: Septimus et al. Clin Microboil Rev)*
- Decolonization (nasal and prophylaxis against MRSA) showed protection against SSIs due to *S. aureus* (pooled relative risk from 17 studies: 0.39, 95% conf. interval 0.31 to 0.50) *(meta-analysis: Schweizer et al. BMJ)*

Compliance Drives Outcomes

Nasal and skin decolonization among cardiac and ortho patients

Subgroup: By Bundle Adherence *(skin and nasal decolonization)*	**No. of Procedures during Intervention**	**Rate Ratio** *(95% CI)*	**P-value**
Fully Adherent	5,321.....39%	0.26 (0.10, 0.69)	0.007
Partially or Not Adherent	8,995.....61%	0.80 (0.49, 1.31)	0.37

"The complex S. aureus SSI rates decreased significantly among patients in the fully adherent group compared with the preintervention period (RR, 0.26 [95%CI,0.10-0.69]), but rates did not decrease significantly in the partially adherent or nonadherent group (RR, 0.80 [95% CI, 0.49-1.31])."

JAMA, 2015, 313(21):2162-71.)

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Danger of overusing antibiotics

Resistance developing with typical nasal decolonization

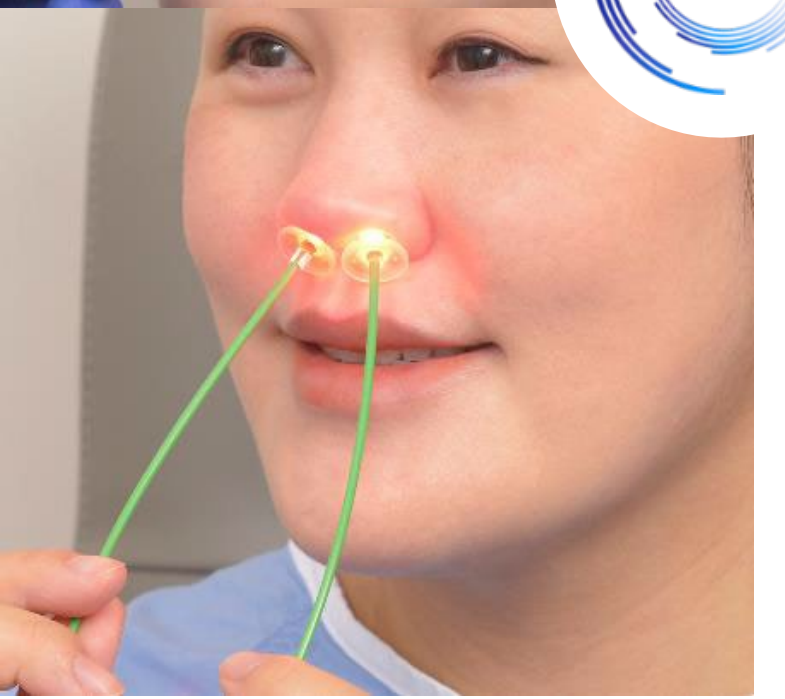
Mupirocin

topical nasal antibiotic ointment

- Applied twice daily for 5 days
  (10 treatments total)
- Bacteria becoming resistant

We need a new alternative!

(Infect Control Hosp Epidemiol 2003; 24:342)

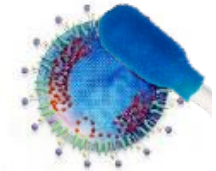


steriwave™

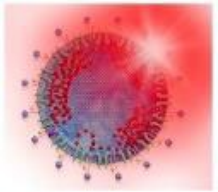
Easy, Safe and Painless

Fast-Acting 2-step Treatment

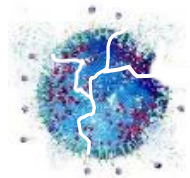
TAKES LESS THAN 5 MINUTES
(including cleaning between patients)



1. Swab blue liquid inside nose
Blue liquid selectively attaches to germs



2. Insert light tips and start light source... 2-minute countdown
Non-thermal red light activates the photosensitive liquid



3. Repeat
Pathogens physically destroyed in moments

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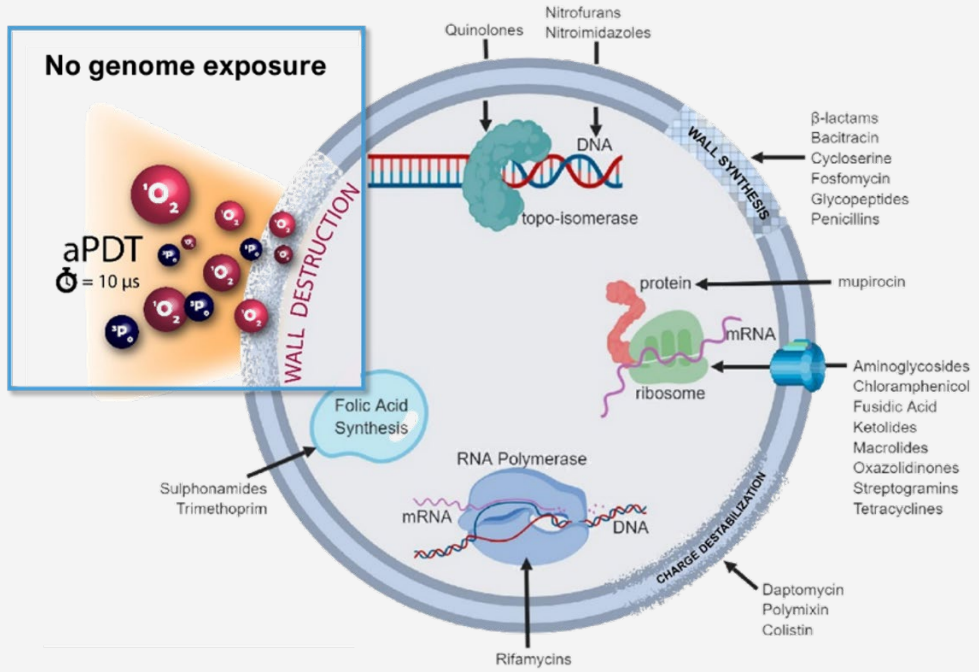
Kills

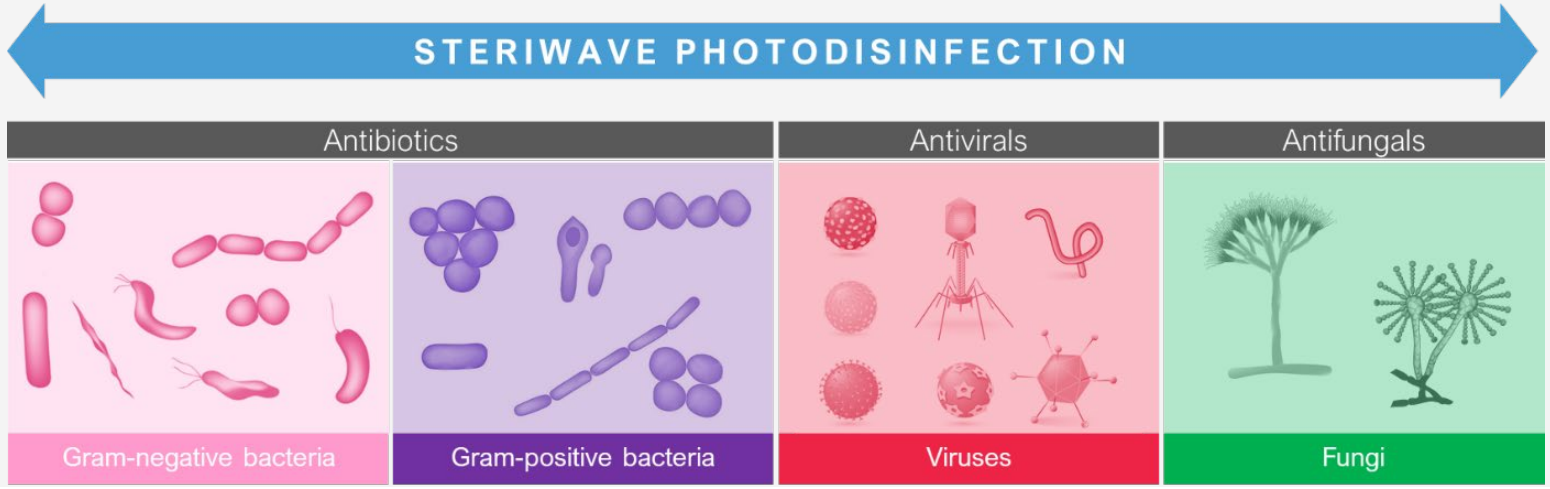
> 99.99%

- Immediate, broad-spectrum efficacy
- No resistance
- Single application, lasts 48 hours
- High compliance



Treatment-related side effects

- Runny nose
- Sneeze
- Nose irritation



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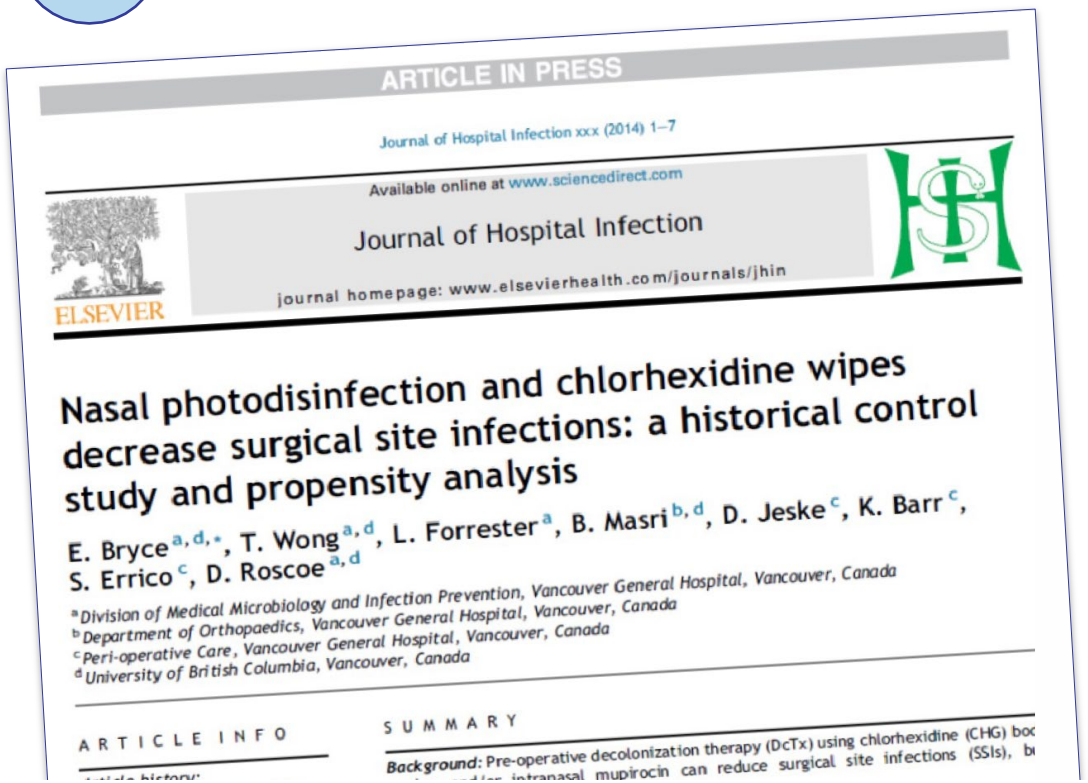
Publications

demonstrated impact

1 Initial study



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Nasal photodisinfection and chlorhexidine wipes decrease surgical site infections: a historical control study and propensity analysis

E. Bryce [a,d,*], T. Wong [a,d], L. Forrester [a], B. Masri [b,d], D. Jeske [c], K. Barr [c], S. Errico [c], D. Roscoe [a,d]

[a] Division of Medical Microbiology and Infection Prevention, Vancouver General Hospital, Vancouver, Canada
[b] Department of Orthopaedics, Vancouver General Hospital, Vancouver, Canada
[c] Peri-operative Care, Vancouver General Hospital, Vancouver, Canada
[d] University of British Columbia, Vancouver, Canada

ARTICLE INFO

SUMMARY

Background: Pre-operative decolonization therapy (DcTx) using chlorhexidine (CHG) boc
intranasal mupirocin can reduce surgical site infections (SSIs), b

- Nasal (Steriwave) + Skin (CHG) decolonization in pre-op
- **42%** reduction in SSIs
- **94%** compliance during study

- Further infection reduction since
- Expanded treatment to additional surgeries
- **70,000+** patients safely treated
- **0** adverse events reported

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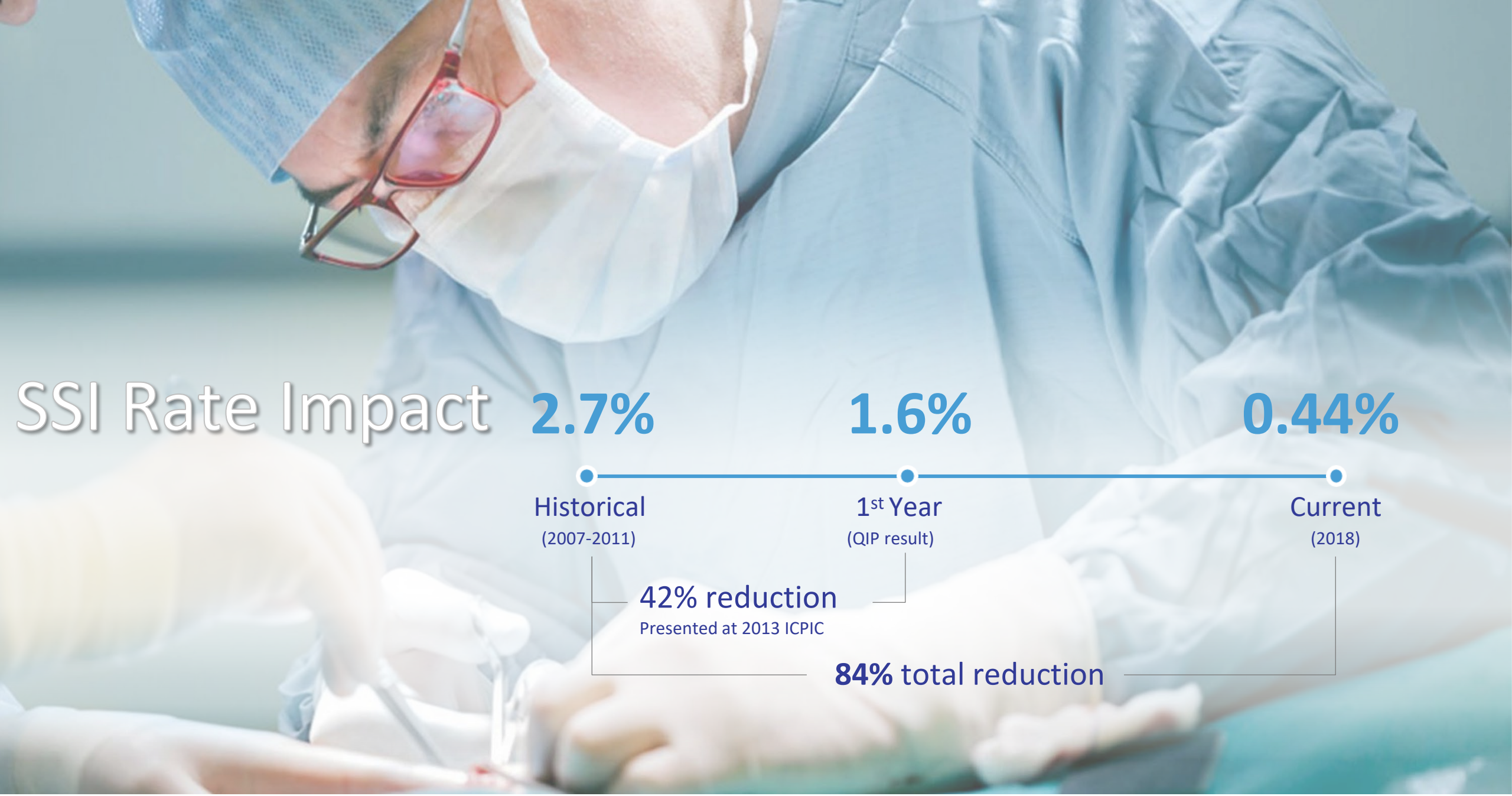


Publications

demonstrated impact

2 10-year study of QI initiatives to reduce SSIs in spinal surgeries

- Nasal (Steriwave) + Skin (CHG) decolonization in pre-op
- Applied to all elective and emergent spine cases
- SSI rate fell from 7.3% to 2% as a direct result
- Greatest reduction of all interventions

Surgical Site Infection Reduction – a 10 year Quality Improvement Journey

Dr. Supriya Singh[1,2], Dr. Dan Banaszek[1,2], Dr. Titus Wong[2], Dr. Christian Di Paola[2], Dr. Tamir Ailon[1,2], Dr. Raphaele Charest-Morin[1,2], Dr. Nicolas Dea[1,2], Dr Marcel Dvorak[1,2], Dr. Charles Fisher[1,2], Dr. Brian Kwon[1,2], Dr. Scott Paquette[1,2], Dr. John Street[1,2]

[1]Vancouver Spine Surgery Institute, Vancouver, British Columbia, Canada. [2]University of British Columbia, Vancouver, British Columbia, Canada.

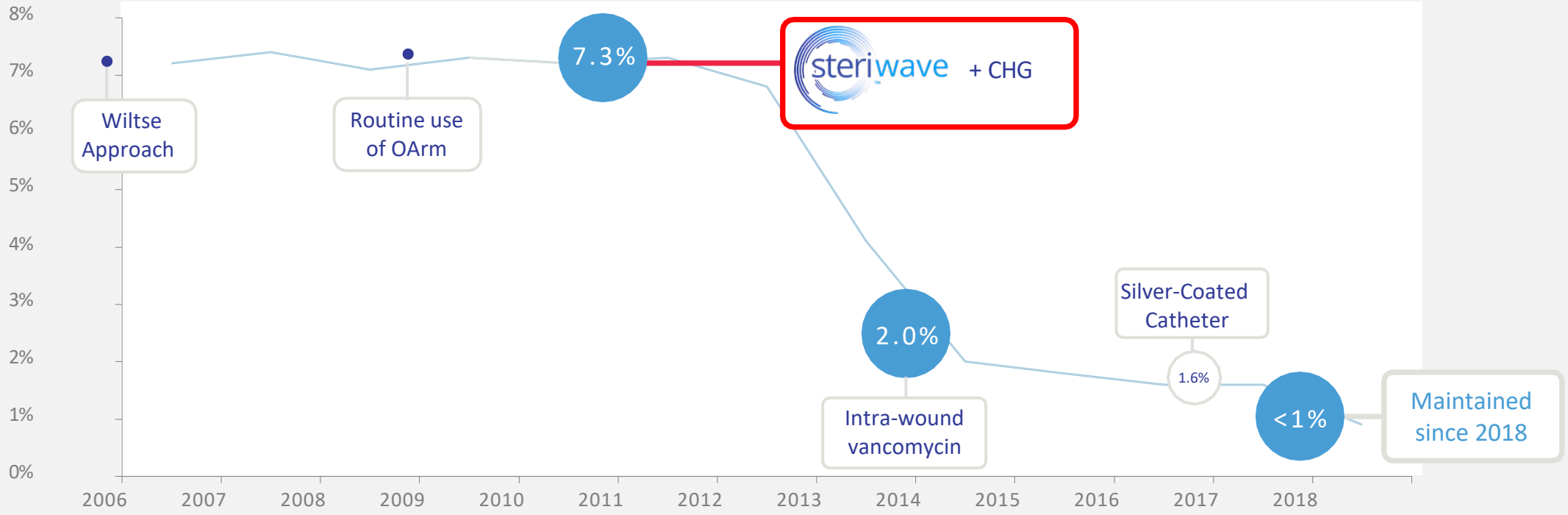
Objectives

In 2007, the spine surgical site infection (sSSI) rate at our Canadian quaternary referral center was 8.1% As a result, a multidisciplinary team was created to identify and initiate quality improvement (QI) strategies to reduce this unacceptably high sSSI rate. This abstract outlines the institutional and divisional QI strategies that have been central to our ongoing efforts to reduce the incidence of sSSI.

Abstract presented at 2020 Canadian Spine Society 20th Annual Scientific Conference

Vancouver General Spine Program

significant impact on SSIs



Abstract presented at 2020 Canadian Spine Society 20th Annual Scientific Conference

Variable - Inpatients only class	No Steriwave	Steriwave	P value
Number of procedures	383	475	
Antibiotics pre- incision compliance	100%	99.2%	0.072
Antibiotics 72hr-30 days post surgery	**17.6%**	**6.7%**	**<0.001**
Mean length of stay (days)	**14.12 ± 17.56**	**5.59 ± 9.30**	**<0.001**
Return to ED	7%	6.7%	0.857
Return to OR	6.5%	4.4%	0.173
Readmission	4.7%	2.5%	0.085

Steriwave pre-surgical implementation for spine surgery

The Ottawa Hospital | L'Hôpital d'Ottawa

Abstract presented at 2023 Canadian Spine Society 23rd Annual Scientific Conference

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Minimal impact on nursing workflow

- Performed in preop (holding area)
- Portable (moves easily via hospital roll stand)
- Can be applied by an RN or LPN
- Eliminates patient compliance issues (seen with mupirocin)
- Only 5-7 minutes (~2 mins direct nursing time)

Because nurses **feel empowered to stop SSIs**, they take ownership of the process (**>94% compliance**)

Steriwave™ Nasal Photodisinfection

Better *Technology*

Better *Compliance*

Better *Outcomes*

Better *Care*

steriwave™

Thank you for joining us.

APPENDIX

Publications

demonstrated impact

3 Evaluation of microbiological changes before and after Steriwave

Finding:

- Microbiological spectrum of SSIs was **similar pre and post** implementation

Pre-operative decolonization does not adversely affect the microbiologic spectrum of spine surgical site infection

Dr. Supriya Singh[1,2], Dr. Alexandra Gara[3], Dr. Dan Banaszek[1,2], Dr. Titus Wong[2], Dr. Tamir Ailon[1,2], Dr. Elizabeth Bryce[3], Dr. Raphaele Charest-Morin[1,2], Dr. Nicolas Dea[1,2], Dr. Marcel Dvorak[1,2], Dr. Charles Fisher[1,2], Dr. Brian Kwon[1,2], Dr. Scott Paquette[1,2], Dr. John Street[1,2]

[1]Vancouver Spine Surgery Institute, Vancouver, British Columbia, Canada. [2]University of British Columbia, Vancouver, British Columbia, Canada. [3]Infection Control VCH, Vancouver, British Columbia, Canada

Objectives

In 2011, a pre-operative decolonization program was introduced for all spine patients, using intranasal photodisinfection therapy, in addition to chlorhexidine-impregnated body wipes (PDT/CHG). This intervention resulted in an absolute risk reduction of 5.2% [spine surgical site infection (SSI) reduction from 7.2% to 2% from 2011-2014]. It is unknown whether such decolonization affects the microbiological spectrum of subsequent surgical site infections, as this could have profound treatment implications. The purpose of this study was to investigate the effect of PDT/CHG on the microbiology of subsequent surgical site infections.

Method

Abstract presented at 2020 Canadian Spine Society 20th Annual Scientific Conference

Recognized importance of nasal disinfection

RECOMMENDED

World Health Organization

… for **patients undergoing surgery**

HRET
HEALTH RESEARCH & EDUCATIONAL TRUST

… to **prevent surgical site infections** caused by *S. aureus*

SHEA
The Society for Healthcare Epidemiology of America

… for **all patients in ICU and at high risk** to prevent HAI

CDC
CENTERS FOR DISEASE CONTROL AND PREVENTION

… as a source control strategy to kill germs and **prevent infections**