HUNTER NEW ENGLAND
NSW HEALTH

Our vision: Healthier communities, Excellence in healthcare
Our values: Teamwork, Honesty, Respect, Ethics, Excellence, Caring, Commitment, Courage

What is the role of chlorhexidine in infection prevention?

November 2015

John Ferguson
Director, Infection Prevention Service
Hunter New England Health, NSW

ACIPC 2015 Conference

Scope

1. Pre-operative bathing/showering to prevent surgical site infection
2. Use of chlorhexidine containing solutions for operative skin site disinfection
3. Use of chlorhexidine containing wipes or bathing to reduce multi-resistant organism acquisition
4. Prevention of ventilator-acquired pneumonia through regular oral care with chlorhexidine solutions .

Cochrane review 2015 update

"This review provides no clear evidence of benefit for preoperative showering or bathing with chlorhexidine over other wash products, to reduce surgical site infection."

GRADE Working Group grades of evidence: assessed as

High quality: Further research is very unlikely to change our confidence in the estimate of effect.

Webster et al, 2015

Summary

Seven trials (no new ones) n=10,157

- Three trials (n=7791) compared bathing with chlorhexidine with a placebo. Relative risk of SSI 0.91 (95% CI 0.80 to 1.04).
- Three trials (n=1443) participants compared bar soap with chlorhexidine; Relative risk 1.02 (95% CI 0.57 to 1.84)
- Three trials (n=1192) compared bathing with chlorhexidine with no washing, the largest study found a statistically significant difference in favour of bathing with chlorhexidine (RR 0.36, 95%CI 0.17 to 0.79). The smaller studies found no difference.
- One trial compared a regimen that included three preoperative washes, three trials included a two-wash regimen and participants in three trials had only one wash preoperatively

Would a better standardised application process make a difference?

Evidence for a Standardized Preadmission Showering Regimen to Achieve Maximal Antiseptic Skin Surface Concentrations of Chlorhexidine Gluconate, 4%, in Surgical Patients.

Edmiston CE Jr[1], Lee CJ[2], Krepel CJ[1], Spencer M[3], Leaper D[4], Brown KR[2], Lewis BD[2], Rossi PJ[2], Malinowski MJ[2], Seabrook GR[2].

A standardized preadmission shower regimen that includes 118 mL of aqueous chlorhexidine gluconate, 4%, per shower; a minimum of 2 sequential showers; and a 1-minute pause before rinsing results in maximal skin surface (16.5 µg/cm2) concentrations of chlorhexidine gluconate that are sufficient to inhibit or kill gram-positive or gram-negative surgical wound pathogens.

JAMA Surg. 2015 Nov 1;150(11)

Scope

1. Pre-operative bathing/showering to prevent surgical site infection
2. Use of chlorhexidine containing solutions for operative skin site disinfection
3. Use of chlorhexidine containing non-rinse cloths to reduce CLABSI, SSI and multi-resistant organism complications
4. Prevention of ventilator-acquired pneumonia through regular oral care with chlorhexidine solutions .

Intervention Review

Preoperative skin antiseptics for preventing surgical wound infections after clean surgery

Jo C Dumville[1,*], Emma McFarlane[2], Peggy Edwards[3], Allyson Lipp[4], Alexandra Holmes[5], Zhenmi Liu[1]

Database Title
The Cochrane Library

Editorial Group: Cochrane Wounds Group

Published Online: 21 APR 2015

- Thirteen studies included (n=2,623), evaluating several different types of skin antiseptics - 11 different comparisons
- one study with positive result- preoperative skin preparation with 0.5% chlorhexidine +methanol compared with alcohol + povidone iodine - RR 0.47 (95% CI 0.27 to 0.82); missing data on intervention & trial conduct - estimates of bias difficult
- no other statistically significant differences in SSI rates in the other comparisons of skin antisepsis. Overall risk of bias in included studies unclear.
- mixed treatment comparison meta-analysis suggested that **alcohol-containing products had the highest probability of being effective** – however quality of evidence was low.

OPEN ACCESS Freely available online PLOS ONE

The Forgotten Role of Alcohol: A Systematic Review and Meta-Analysis of the Clinical Efficacy and Perceived Role of Chlorhexidine in Skin Antisepsis

Matthias Maiwald[1,2,5*], Edwin S. Y. Chan[3,4,5]

- Blood culture contamination, IV device insertion and surgical skin disinfection studies examined
- Found high proportion of primary and secondary literature and some prominent tertiary sources attributed the efficacy of the combination of CHG +alcohol combinations to CHG alone.
- No evidence for superiority of CHG acqueous over acqueous povidone iodine

Australian trials

NSW (Hunter) trial

- All types of surgery including contaminated
- Acqueous povidone vs alcohol+povidone vs alcohol+chlorhex
- Recruiting commenced July – 300 patients now

BMJ Open. 2014 May 15;4(5):e005424. doi: 10.1136/bmjopen-2014-005424.

Alcoholic Chlorhexidine or Alcoholic Iodine Skin Antisepsis (ACAISA): protocol for cluster randomised controlled trial of surgical skin preparation for the prevention of superficial wound complications in prosthetic hip and knee replacement surgery.

Peel TN[1], Cheng AC[2], Buising KL[3], Dowsey MM[1], Choong PF[1].


Official Media Partner
kathmandupost
kathmandupost
MISS
INTELLECTUAL

Scope

1. Pre-operative bathing/showering to prevent surgical site infection
2. Use of chlorhexidine containing solutions for operative skin site disinfection
3. Use of chlorhexidine containing non-rinse cloths to reduce CLABSI, SSI and multi-resistant organism complications
4. Prevention of ventilator-acquired pneumonia through regular oral care with chlorhexidine solutions .

Review

Impact of non-rinse skin cleansing with chlorhexidine gluconate on prevention of healthcare-associated infections and colonization with multi-resistant organisms: a systematic review

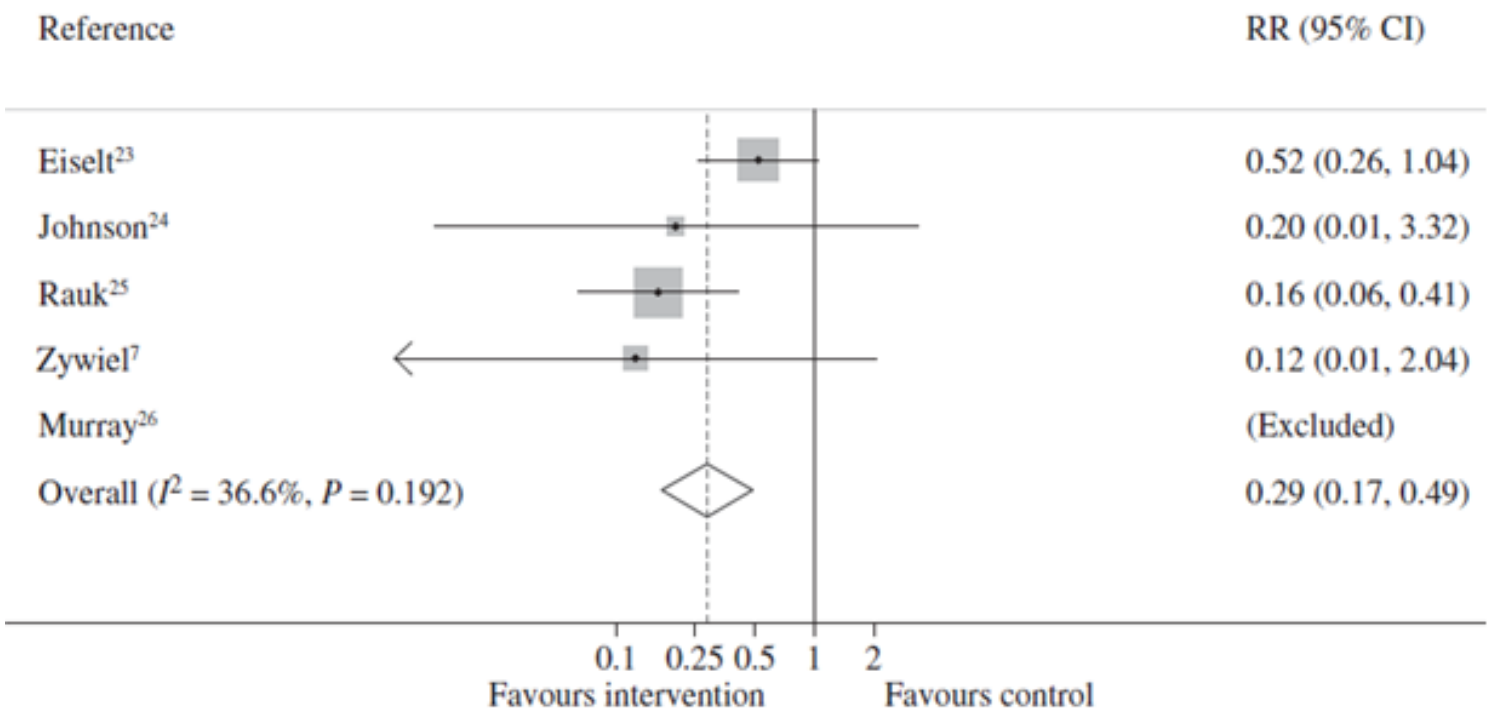
JHI 2012

S. Karki, A.C. Cheng*

Infectious Disease Epidemiology Unit, Department of Epidemiology and Preventive Medicine, Monash University, Melbourne, Australia

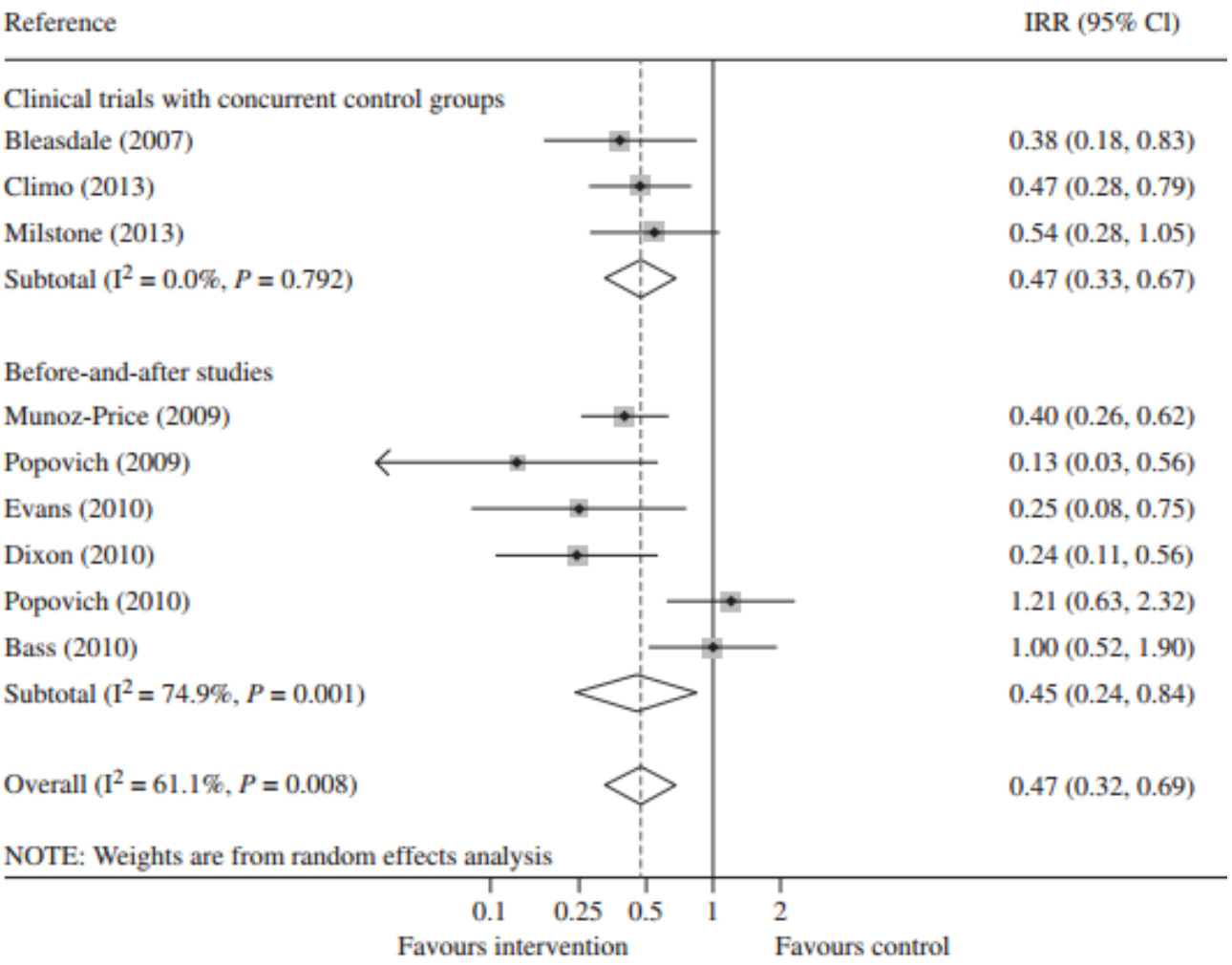
- Systematic review included published randomized controlled trials, crossover trials, cohort studies and before-and-after studies. Studies compared use of CHG in washcloths with any of soap and water bathing, routine advice or no intervention.
- Sixteen published studies (2006-2011) and four conference abstracts included; variety of patient settings including 6 ICU studies; 14 were before and after studies
- Study quality assessments performed – variable but not excessively bad

Reduction in SSI



2% CHD impregnated washcloths; 1 or 2 applications, operative site or whole body

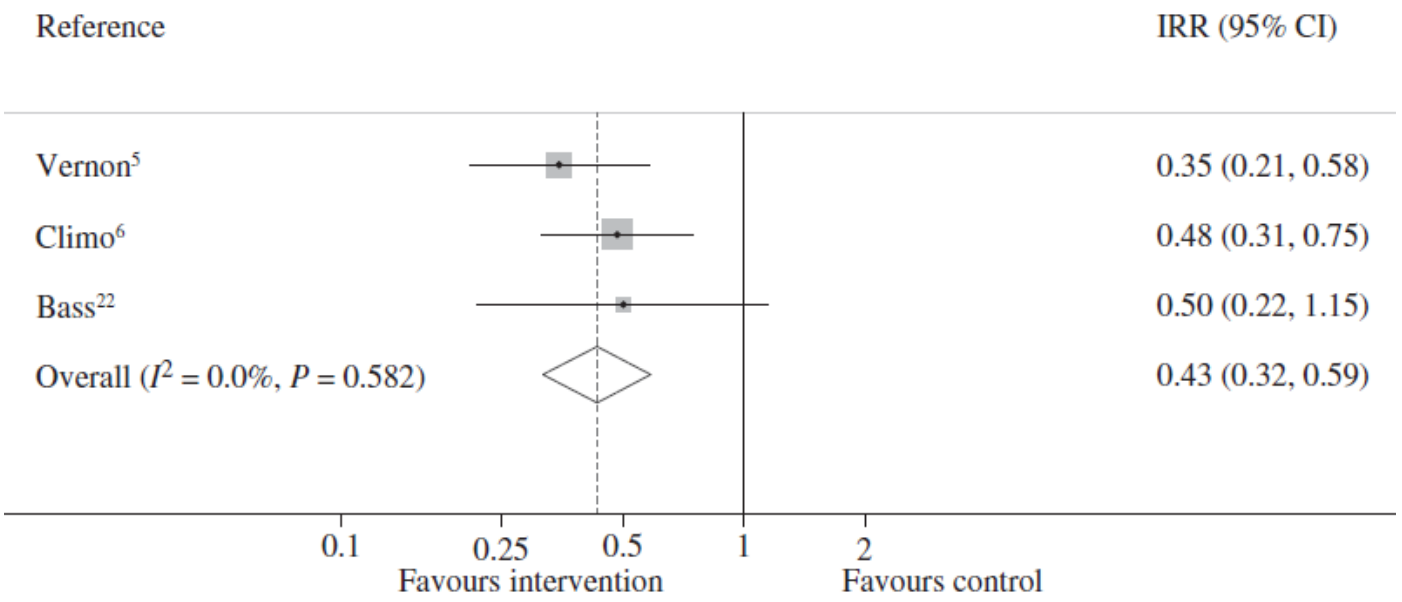
Reduction in CLABSI (Cheng, 2012 & 2013)



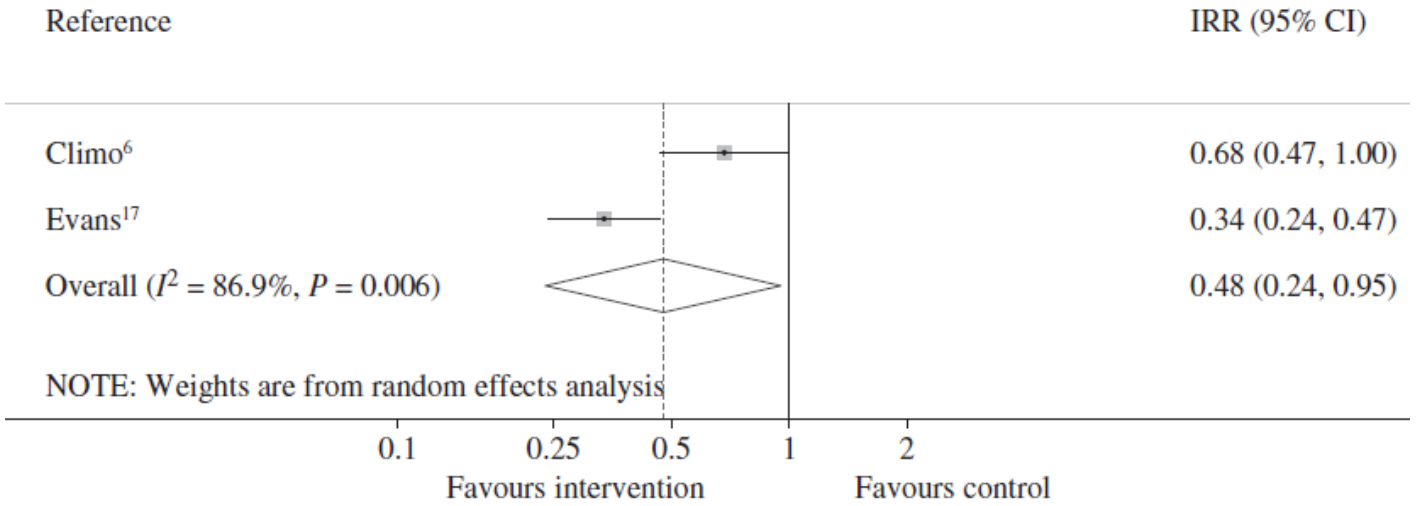
Studies conducted in ICU settings - incidence rate ratio 0.40 (95% CI 0.24-0.65). At incidence rate of 3/1000 = NNT 560

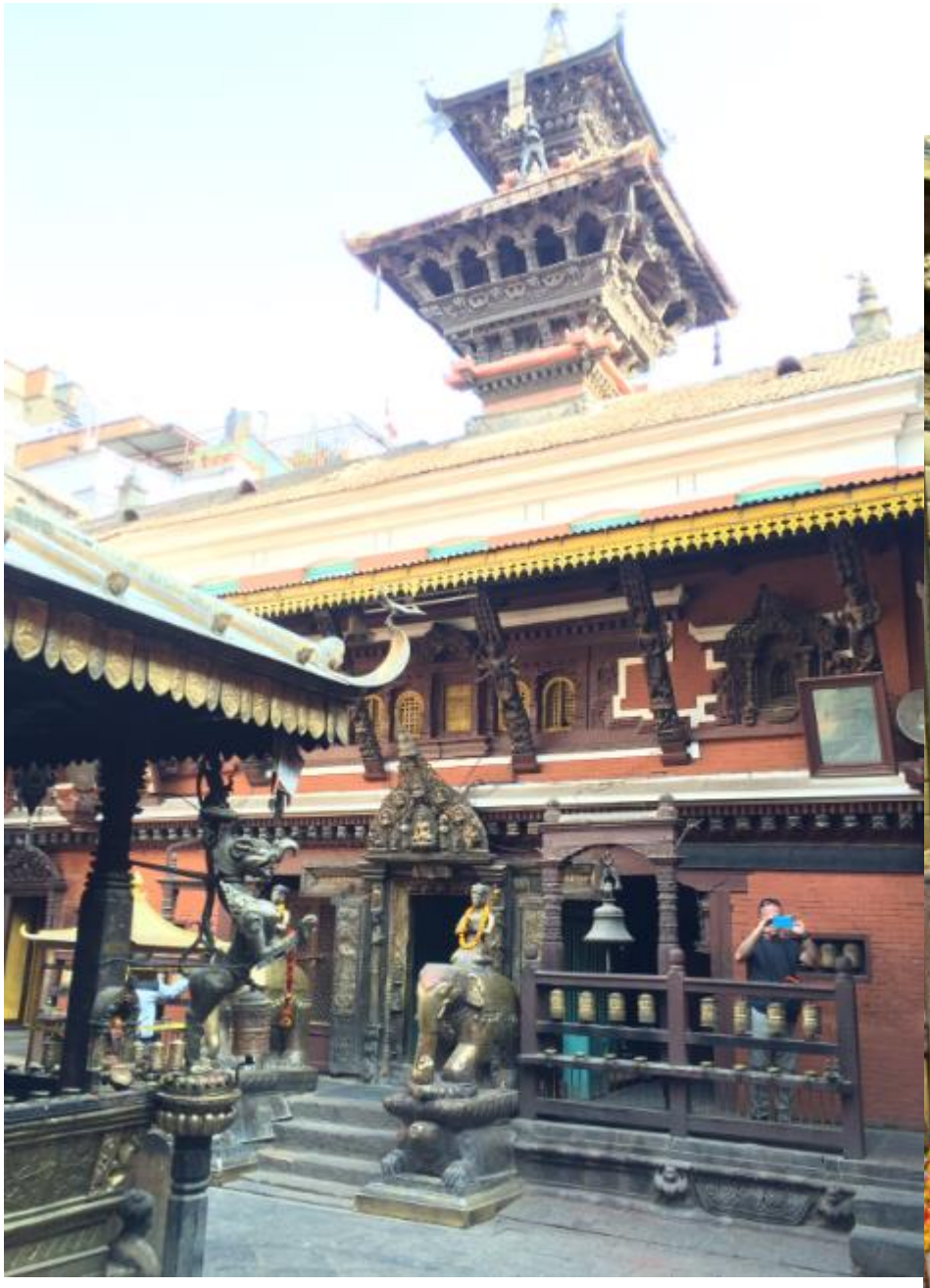
Reduction in MRO colonisation

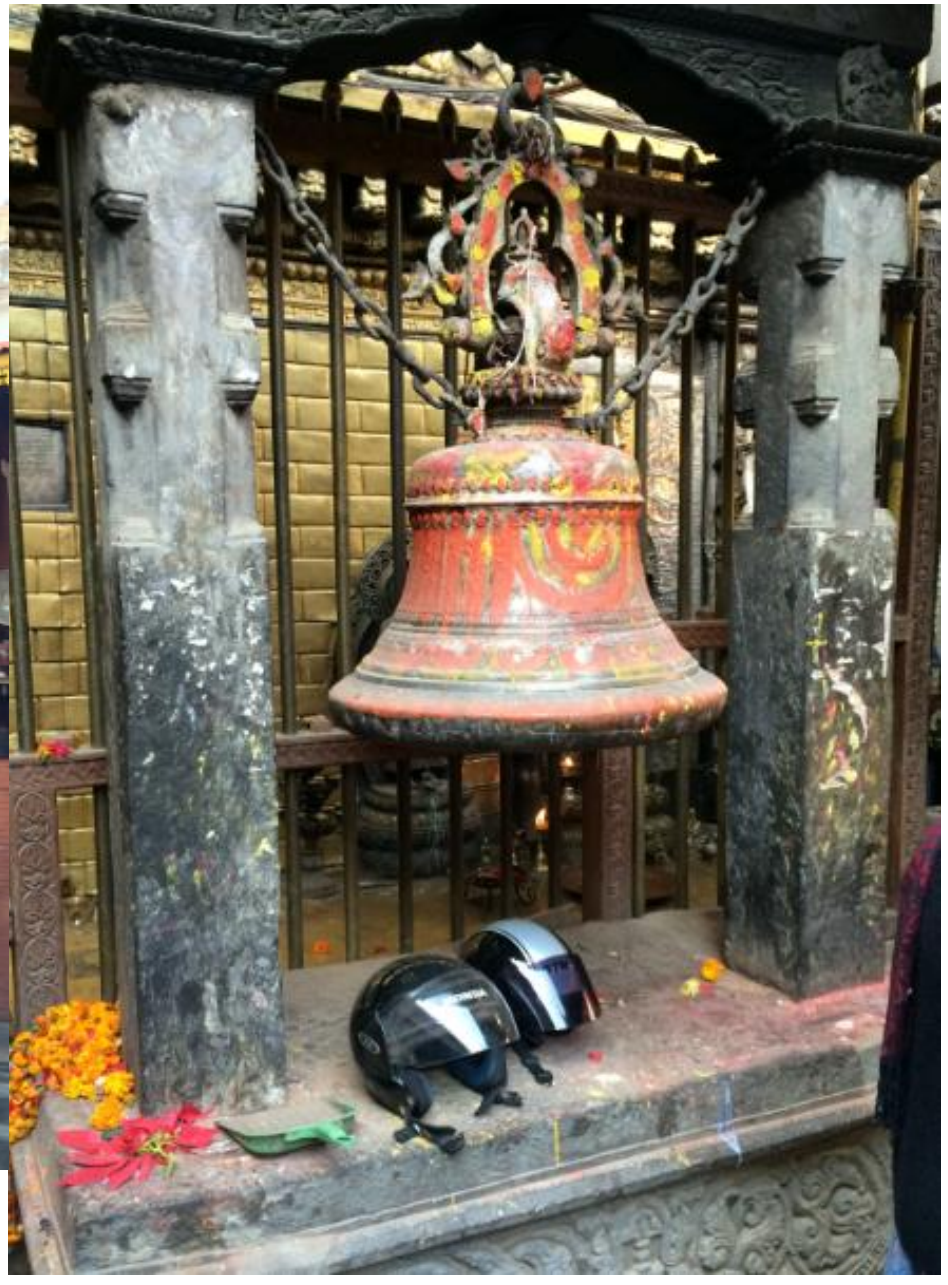
VRE



MRSA







Scope

1. Pre-operative bathing/showering to prevent surgical site infection
2. Use of chlorhexidine containing solutions for operative skin site disinfection
3. Use of chlorhexidine containing non-rinse cloths to reduce CLABSI, SSI and multi-resistant organism complications
4. Prevention of ventilator-acquired pneumonia through regular oral care with chlorhexidine solutions .

Cochrane: Shi et al 2013 Oral hygiene care (OHC) for critically ill patients to prevent VAP

- OHC with either chlorhexidine mouthwash or gel associated with 40% reduction in the odds of developing ICU VAP.
- No difference in mortality, duration of mechanical ventilation or duration of ICU stay.
- No evidence that OHC with both CHX and toothbrushing is different from OHC with CHX alone
- Insufficient evidence to determine whether powered toothbrushing or other oral care solutions are effective in reducing VAP

- Evidence quality – moderate – only 14% of 35 studies were well conducted and described