To Bathe or Not to Bathe With Chlorhexidine Gluconate: Is It Time to Take a Stand for Preadmission Bathing and Cleansing?

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Many health care facilities have incorporated an antiseptic skin cleansing protocol, often referred to as preoperative bathing and cleansing, to reduce the endogenous microbial burden on the skin of patients undergoing elective surgery, with the aim of reducing the risk of surgical site infections (SSIs). According to a recent study by Injean et al,1 91% of all facilities that perform coronary artery bypass surgery in California have a standardized preoperative bathing and cleansing protocol for patients. Historically, this practice has been endorsed by national and international organizations, such as the Hospital Infection Control Practice Advisory Committee and the Centers for Disease Control and Prevention,2 the Association for Professionals in Infection Control and Epidemiology (APIC),3 AORN,4 the Institute for Healthcare Improvement (IHI),5 and the National Institute for Health and Care Excellence (NICE),6 which recommend bathing and/or cleansing with an antiseptic agent before surgery as a component of a broader strategy to reduce SSIs. The 2008 Society for Healthcare Epidemiology of America (SHEA)/Infectious Diseases Society of America (IDSA)/Surgical Infection Society (SIS) strategies to prevent SSIs in acute care hospitals declined to recommend a specific application policy regarding selection of an antiseptic agent for preoperative bathing but acknowledged that the (maximal) antiseptic benefits of chlorhexidine gluconate (CHG) are dependent on achieving adequate skin surface concentrations.7 Findings in reports published in the past 10 years have identified SSIs to be the most common healthcare-associated infection (HAI) and the most expensive in terms of resource utilization.8,9 This provides a strong business case for healthcare institutions to invest in targeted, evidence-based, interventional strategies that reduce the risk of postoperative complications. In addition, because the microbial flora of the skin, especially staphylococci, provides a prominent reservoir of pathogens that cause SSIs,7,10 focused interventions aimed at mitigating this reservoir in preoperative patients represent a logical and effective risk reduction strategy.

THE YIN AND YANG OF PREADMISSION BATHING: A RATIONAL CONSIDERATION OF BENEFIT

Despite the prevalent clinical practice of preoperative bathing with CHG, clinicians are now confronted with a possible shift in both CDC and AORN recommendations. The current proposed draft recommendations for perioperative skin antisepsis are summarized in Table 1. The 2015 AORN “Guideline for preoperative patient skin antisepsis”11 and the CDC draft guideline12 both have expanded their recommendations for perioperative skin antisepsis from using CHG products to also using other cleansing products (eg, antimicrobial or nonantimicrobial soap, other unspecified skin antisepsics). These expanded recommendations marginalize the practice of
using CHG for the prevention of SSIs by suggesting that soap or an unspecified antiseptic agent provides benefits that are equivalent to those of CHG.

It is important to note that six of the seven studies cited in the CDC draft document were also cited in the Webster and Osborne13 2007 Cochrane Review, which evaluated a total of six clinical studies involving 10,157 patients that analyzed preoperative bathing with 4% CHG compared with placebo, bar soap, or no preoperative bathing before hospital admission. These cited clinical studies were conducted more than 20 years ago (ie, between 1983 and 1992). The conclusions reached by Webster and Osborne13 suggested that preoperative bathing with CHG does not result in a significant reduction in SSIs involving clean surgical procedures; however, these authors clearly pointed out that one of the limitations they faced in conducting a systematic review was the quality of some of the studies.13 This observation should not be viewed as trivial but instead as an honest expression of the limitations that Webster and Osborne encountered in developing their manuscript. Unfortunately, the CDC draft guideline12 has chosen to cite the studies reviewed by Webster and Osborne as evidence that the preadmission shower with 4% CHG has no (or limited) risk reduction benefit, despite the reported limitations of these studies.

The characteristics of the seven studies14-20 cited in the recent CDC draft guideline document are presented in Table 2. Collectively, the seven studies suggested that there is a high level of surgical heterogeneity (ie, surgical classes 1, 2, and 3). In four of the studies, the patients showered once16,17,19,20; in two studies, the patients showered or bathed twice15,18; and in one study, the patients showered a total of three times.14 Inadequate postoperative SSI surveillance was noted in five of the seven cited studies.15-18,20 No written showering instructions or inadequate showering instructions were noted in five of the seven studies.15-17,19,20 There was no evidence in any of the

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**Table 1. Professional Organizations’ Current and Draft Recommendations**

<table>
<thead>
<tr>
<th>Source</th>
<th>Previous Recommendations</th>
<th>Draft Recommendations</th>
<th>New Recommendations</th>
</tr>
</thead>
<tbody>
<tr>
<td>AORN</td>
<td>Cleanse 2 times with CHG</td>
<td>Not applicable</td>
<td>Cleanse 1 time with soap or an antiseptic</td>
</tr>
<tr>
<td></td>
<td>“Patients undergoing open Class I surgical procedures below the chin should have two preoperative showers with chlorhexidine gluconate (CHG) before surgery, when appropriate.”11(p73)</td>
<td></td>
<td>“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.”2(p45)</td>
</tr>
<tr>
<td>Hospital Infection Control Practice Advisory Committee—Centers for Disease Control and Prevention</td>
<td>Cleanse at least 1 time with an antiseptic</td>
<td>Cleanse at least 1 time with soap or an antiseptic</td>
<td>Not applicable</td>
</tr>
<tr>
<td></td>
<td>“Require patients to shower or bathe with an antiseptic agent on at least the night before the operative day.”11(p267)</td>
<td>“Advise patients to shower or bathe (full body) with either soap (antimicrobial or nonantimicrobial) or an antiseptic agent on at least the night before the operative day.”2(p69)</td>
<td></td>
</tr>
<tr>
<td>Institute for Healthcare Improvement—Project JOINTS</td>
<td>Cleanse 3 times with CHG</td>
<td>Not applicable</td>
<td>Not applicable</td>
</tr>
<tr>
<td></td>
<td>“Instruct patients to bathe or shower with [CHG] soap for at least three days before surgery.”5(p6)</td>
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<table>
<thead>
<tr>
<th>Author (year)</th>
<th>Study Design</th>
<th>Number of Subjects</th>
<th>Follow-up</th>
<th>Compliance</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Byrne et al (1992)¹</td>
<td>Randomized controlled trial (RCT)</td>
<td>Patients: 3,733</td>
<td>6-week post-discharge surveillance</td>
<td>Written instructions to patient</td>
<td>4% CHG vs placebo</td>
</tr>
<tr>
<td></td>
<td>Patients took 3 showers using 50 mL CHG per shower</td>
<td></td>
<td>Infection defined by wound purulence only</td>
<td>No compliance measured</td>
<td>Significant heterogeneity of surgical cases</td>
</tr>
<tr>
<td>Earnshaw et al (1989)²</td>
<td>RCT</td>
<td>Patients: 66</td>
<td>No postdischarge surveillance</td>
<td>Variable instructions given to patients</td>
<td>4% CHG vs soap</td>
</tr>
<tr>
<td></td>
<td>Patients took 2 baths (no shower)</td>
<td></td>
<td>Infection defined by wound purulence only</td>
<td>No compliance measured</td>
<td>No standardized instruction between groups</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Possible group selection bias</td>
</tr>
<tr>
<td>Hayek et al (1987)³</td>
<td>Cluster RCT</td>
<td>Patients: 2,015</td>
<td>No postdischarge surveillance</td>
<td>Instructions provided to 4% CHG and placebo group only</td>
<td>4% CHG vs placebo vs bar soap</td>
</tr>
<tr>
<td></td>
<td>Patients took 1 shower or bath the day before surgery</td>
<td></td>
<td>Nonstandard SSI definitions used</td>
<td>No compliance measured</td>
<td>Possible group selection bias</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>No baseline patient data presented in text</td>
</tr>
<tr>
<td>Randall et al (1983)⁴</td>
<td>RCT</td>
<td>Patients: 94</td>
<td>7-day postdischarge surveillance</td>
<td>No evidence of instructions provided to patients</td>
<td>4% CHG vs soap vs no intervention</td>
</tr>
<tr>
<td></td>
<td>Patients took 1 preadmission shower</td>
<td></td>
<td>Nonstandard SSI definitions used</td>
<td>No compliance measured</td>
<td>Possible selection bias</td>
</tr>
<tr>
<td>Rotter et al (1988)⁵</td>
<td>Cluster RCT</td>
<td>Patients: 2,593</td>
<td>21-day postdischarge surveillance</td>
<td>Instructions provided to all participants</td>
<td>4% CHG vs placebo group</td>
</tr>
<tr>
<td></td>
<td>Patients took 2 showers using 50 mL 4% CHG per shower</td>
<td></td>
<td>Nonstandard SSI definitions used</td>
<td>No compliance measured</td>
<td></td>
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</table>

(continued)
<table>
<thead>
<tr>
<th>Author (year)</th>
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<th>Number of Subjects</th>
<th>Follow-up</th>
<th>Compliance</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Veiga et al (2009)(^6)</td>
<td>RCT</td>
<td>Patients: 150</td>
<td>30-day postdischarge surveillance</td>
<td>No evidence that instructions were given to patients</td>
<td>4% CHG vs placebo vs no intervention</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Class 1 Plastic surgery procedures involving the trunk</td>
<td>Used standard CDC definitions for SSIs</td>
<td>No compliance measured</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Patients took 1 shower</td>
<td>30-day postdischarge surveillance</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wihlborg (1987)(^7)</td>
<td>RCT</td>
<td>Patients: 1,530</td>
<td>No postdischarge surveillance</td>
<td>No indication that instructions were given to patients</td>
<td>4% CHG total body shower vs 4% CHG partial body wash vs no CHG shower</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Class 1 and 2 General surgical procedures</td>
<td>Infection defined by presence of wound purulence only</td>
<td>No compliance measured</td>
<td>Study was conducted over 6 years (from 1978 to 1984)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Possible outcome bias</td>
</tr>
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seven studies that an effort was made to measure patient compliance. Only two studies used a standardized method for assessing postoperative wound infection. 18,19 Selective elements of operational bias were noted in four of the seven studies. 15-17,20 Finally, one study was conducted over an extended six-year period (ie, from 1978 to 1984), which may have affected the continuity of patient selection and enrollment. 20 Although these seven studies may be characterized as randomized controlled clinical trials and, therefore, existing at the top of the evidence-based pyramid of research, they all exhibit significant design and methodological flaws and cannot be viewed as robust representatives of evidence-based medicine. Although AORN rejected the Webster and Osborne study as inappropriate to be considered two of the seven studies cited by the CDC, the 2015 AORN “Guideline for preoperative patient skin antisepsis”11 considered two of the seven studies (Rotter et al, Veiga et al) cited by the CDC.

A series of single studies21-26 and bundled interventional studies27-33 published since 2009 that address SSI risk reduction in class 1 and class 2 surgical procedures are presented in Tables 3 and 4. These studies were not considered in the CDC draft guideline. Although the studies presented in Table 3 were not considered in the AORN guideline, the studies in Table 4 were not. This series of evidence-based research comprised case-control studies, cohort analyses, prospective interventional analyses, prospective observational analyses, randomized controlled trials, retrospective cohort studies, or sequential

<table>
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<tr>
<th>Author (Year)</th>
<th>Outcome</th>
<th>Type of Study</th>
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</thead>
<tbody>
<tr>
<td>Eiselt (2009)</td>
<td>• In the three quarters before implementation of the protocol, the surgical site infection (SSI) rate was 3.19%. • In the three quarters after use of the 2% CHG cloth was implemented, the SSI rate decreased to 1.59%, representing a 50.16% reduction in SSIs.</td>
<td>Sequential cohort</td>
</tr>
<tr>
<td>Dizer et al (2009)</td>
<td>• In the group for whom a CHG bath was not applied, the researchers found the infection risk to be 4.76 times greater (95% confidence interval, 1.20-18.83) even after corrections for age and sex had been made. • The difference between the control group and the study group with respect to SSIs also was significant (P &lt; .05).</td>
<td>Retrospective cohort</td>
</tr>
<tr>
<td>Johnson et al (2010)</td>
<td>• Of the 1,134 patients who underwent hip arthroplasty, 157 patients completely complied with the preoperative CHG preparation protocol. • Fourteen infections occurred in the group that was not compliant (1.6% infection rate). • No infections occurred in the compliant patient population.</td>
<td>Cohort</td>
</tr>
<tr>
<td>Graling (2013)</td>
<td>• There was a significant (P = .01) overall reduction of infection in the group that received a 2% CHG cloth bath before surgery.</td>
<td>Cohort</td>
</tr>
<tr>
<td>Johnson et al (2013)</td>
<td>• A lower incidence of SSI was found in patients using the CHG cloths (0.6%) compared with patients undergoing in-hospital perioperative skin preparation only (2.2%). • Based on the results of this study, a preadmission CHG protocol was considered an effective method to prevent SSIs after total knee arthroplasty procedures.</td>
<td>Cohort</td>
</tr>
<tr>
<td>Kapadia et al (2013)</td>
<td>• A lower incidence of infections occurred in patients who used the CHG cloths (0.5%) compared with patients undergoing in-hospital perioperative skin preparation only (1.7%). • These results confirm prior studies suggesting that this is an effective method to prevent periprosthetic hip arthroplasty infections.</td>
<td>Cohort</td>
</tr>
</tbody>
</table>

cohort studies. Furthermore, these studies were conducted by respected clinical professionals, vetted by peer review, and published in highly respected medical, nursing, infection control, and surgical journals. Clinicians should view these newer studies as more timely and representative of sound evidence-based analysis. As presented in Table 3, many of these studies demonstrated a reduction of SSIs for patients undergoing general, vascular, or orthopedic surgery when using CHG to clean the skin preoperatively in a standardized and controlled manner. Unfortunately, in evaluating the evidence to support the new draft recommendations and guidelines, neither the CDC nor AORN, respectively, took into consideration the limitations of the earlier body of evidence to support the new draft recommendations and guidelines, neither the CDC nor AORN, respectively, took into consideration the limitations of the earlier body of evidence-based analysis. As presented in Table 3, many of these studies demonstrated a reduction of SSIs for patients undergoing surgical interventions. However, additional research is needed to validate these findings and to further refine the CHG preadmission showering strategy for optimal infection control.

**Table 4. Bundled Interventional Studies Including Chlorhexidine Gluconate (CHG) Preadmission Showering Strategy**

<table>
<thead>
<tr>
<th>Author (Year)</th>
<th>Outcome</th>
<th>Type of Study</th>
</tr>
</thead>
</table>
| Bode et al (2010) | • 6,771 patients were screened prospectively.  
  • The rate of Staphylococcus aureus (S aureus) infection was 3.4% in the mupirocin/CHG group compared with 7.7% in the placebo group (relative risk [RR], 0.42; 95% confidence interval [CI], 0.23-0.75).  
  • The greatest benefit for intervention was seen with deep incisional surgical site infections (SSIs) (RR, 0.21; 95% CI, 0.07-0.62). | Randomized control trial       |
| Kim et al (2010)  | • 7,019 patients underwent polymerase chain reaction (PCR) staphylococcal screening, of which 22.6% were identified as S aureus carriers and 4.4% were identified as methicillin-resistant S aureus (MRSA) carriers.  
  • Compared with nonscreened historical control patients (5,283), the infection rate was significantly reduced (0.19%, P < .0093) in the mupirocin/CHG group. | Prospective observational      |
| Lipke et al (2010)| • In a quality improvement study, SSIs were reduced by 67% and MRSA SSIs decreased by 78% after active surveillance (ie, nasal mupirocin and CHG preadmission screening). | Prospective interventional      |
| Rao et al (2011)  | • The overall SSI rate decreased from 2.7% (20/741) in the preintervention control patient group to 1.2% (17/1,440) in the interventional total joint patient group (P < .009). | Cohort                          |
| Thompson et al (2013)| • The rate of MRSA SSIs significantly decreased in patients who underwent cardiac, orthopedic, vascular, and neurosurgical procedures (N = 9,818, P < .0003) after implementation of a care bundle (ie, mupirocin/CHG intervention). | Case control                    |
| Chen et al (2013) | • Nasal mupirocin and CHG preadmission showers were effective at reducing methicillin-sensitive S aureus (MSSA) colonization (P < .001); MRSA colonization approached significance (P < .063). | Prospective interventional      |
| Chien et al (2014)| • After implementation of a cardiac care bundle that included CHG preadmission showers, the sternal wound SSI rate decreased from 3.5% to 1.4% (P < .03).  
  • The care bundle was highly protective against MRSA infection (0.5% vs 2.3%, P < .02). | Sequential cohort               |

In addition to the studies identified in Table 3, seven clinical studies with findings that suggest a “care bundle” approach is effective for reducing the risk of SSIs in general, orthopedic, and cardiothoracic surgical procedures are presented in Table 4. A bundled approach often includes three separate elements:

1. Real-time, proximate nasal screening of patients for colonization with *Staphylococcus aureus* (methicillin-sensitive and/or -resistant strains).
2. Use of nasal mupirocin.
3. Preadmission bathing and/or cleaning using either 2% or 4% CHG.

The risk of a *Staphylococcus aureus* SSI in nasal carriers is 5.8 times greater than in non-nasal carriers, which relates to the need for achieving adequate skin surface concentrations on the skin to combat the microbial flora of the patient’s skin.

Although it is difficult in the current evidence-based literature to sort out the hierarchical benefit of each individual component, the adjunctive nature of the combined interventions has a rational, mechanistic quality that together serves to lower the microbial burden of those pathogens most problematic to the surgical patient population. Interestingly, more than 25 years ago, Kaiser et al and Garibaldi et al demonstrated in two separate randomized, prospective clinical trials of surgical patients that bathing with a 4% aqueous solution of CHG was more effective at reducing staphylococcal skin colonization than using povidone-iodine or antiseptic bar soap. Although neither study was sufficiently powered to evaluate SSI reduction, both studies did clearly document that repeat application of 4% CHG was superior to a single shower (<0.05) in reducing the concentration of the staphylococcal skin microbiota.

**STANDARDIZATION AS A PATHWAY FOR IMPROVING PATIENT OUTCOMES**

Recent studies, as presented in Table 4, have documented that CHG-containing products require a minimum of two applications to attain maximum antimicrobial benefit, so usually repeated antiseptic showers are indicated. Furthermore, findings from research recently completed in the first author’s laboratory in the Department of Surgery at the Medical College of Wisconsin showed that skin surface concentrations of CHG were maximized after two showers if a standard regimen was followed that included using 4 oz of CHG per shower and using a 60-second time out before rinsing. The investigators found no additional benefit to adding a third shower to the regimen to boost skin surface concentrations of CHG (written communication; January 2015; unpublished findings). A recent meta-analysis conducted by Chlebicki failed to find a significant difference in SSI reduction in patients taking multiple CHG baths or cleansing. The authors of this study found the results to be surprising given that CHG has been shown in practice to have a demonstrable cumulative effect on the skin with repeated application and is highly efficacious at reducing the microbial burden on the surface of the skin. The current pragmatic perspective suggests that antiseptic bathing, specifically with CHG, before a surgical procedure reduces endogenous flora, thus reducing the risk of SSIs caused by the patient’s resident (ie, endogenous) microbial populations.

Most new research, as shown in Table 4, has generally focused on two standardized methods of using CHG preoperatively:

- **Method 1:** one hour after a regular bath or shower, apply the CHG to the surface of the skin by cleansing with cloths impregnated with 500 mg of CHG.
- **Method 2:** apply liquid CHG (4%) directly to the skin surface during a shower and then rinse with water.

A potential problem with interpretation of findings from studies conducted before 2009 that used the 4% CHG liquid formulation is a lack of a standardized process. This limitation is significant because researchers and investigators have only recently appreciated the importance of process standardization that includes a consistent application of CHG to the surface of the skin (eg, leaving lather on the skin for one to two minutes before rinsing). Given that most patients would be unfamiliar with the preoperative shower or cleansing strategy, their receiving recommendations for a minimum of two preoperative showers with detailed instructions on effective application may be considered prudent skin antisepsis practice. In addition, to maximize the effectiveness of the CHG shower or cleansing process, careful consideration should be given to the development of an effective patient education tool to enhance process compliance.

**HOW CAN CLINICIANS IMPROVE PATIENT COMPLIANCE?**

Patient compliance with CHG skin cleansing instructions is a common concern. When patients cleanse at home, they lack supervision of skilled health care providers, which makes it difficult to verify whether they cleansed correctly or even cleansed at all. In a recently published study, researchers queried 100 general surgical and orthopedic patients about their preadmission shower compliance (ie, completion):

- 71 patients indicated that they took two showers as prescribed,
- 19 patients indicated that they took only one shower, and
- 10 patients indicated that they skipped the protocol entirely.

The reasons cited for lack of compliance included apathy, lack of interest, or that the patient did not fully realize the importance of completing the task. Because of the potential...
risk of noncompliance, the full benefit of this intervention is likely truncated and, as a result, may explain why health care institutions (and practitioners) that have invested in the CHG shower or cleansing process may fail to see the full benefit of this interventional strategy.

Addressing this challenge requires an understanding of the barriers to patient compliance. Patients have a lot on their minds before surgery; often fear and uncertainty cloud their thought processes, and even the best-intentioned patients may not follow their surgical team’s instructions correctly. According to Gignon et al, factors associated with patient noncompliance with emergency department discharge instructions may include

- failure to understand administrative instructions,
- physical limitations to thorough cleansing (eg, underlying pain/restricted range of motion caused by osteoarthritis),
- use of unfamiliar medical terminology,
- social isolation,
- language barriers,
- low educational level or illiteracy, and
- socioeconomic status.

Effective patient education is an essential driver of both compliance and improved patient outcome. When patients receive skin cleansing instructions, they need to understand the importance of this process and how these products should be used. A recent study has documented the benefit of using SMS text messaging as a reminder prompt to the patient to complete the preadmission showering process at a designated time. An effective educational process empowers the patient, making the individual an intimate partner in the health care experience while addressing the root causes of patient noncompliance.

In addition to implementing educational programs with patients, product choice can also help enhance the skin cleansing process. Typically, CHG skin cleansing products come in two categories:

2. CHG-impregnated polyester cloths.

Both products are highly effective in reducing the number of bacteria on the surface of the skin. Some of the 4% CHG manufacturers include applicator devices and other materials with their product to assist in the shower/cleansing process. These CHG cleansing kits provide everything in one place and are convenient for patients and health care personnel and may make it easier for patients to comply with institutional protocols and instructions. To date, most manufacturers also provide a digital, web-based alert system (ie, SMS text messaging, e-mail, voice mail) that is designed to enhance patient compliance. This innovative approach to improving patient outcomes has been used successfully in other patient care venues, such as enhancing patient compliance to prescription care venes, such as enhancing patient compliance to prescription medication use or resulting in increasing influenza vaccination rates within a low-income pediatric and adolescent patient population.

STAYING THE COURSE

Despite the new CDC draft recommendations and AORN guidelines that marginalize the importance of CHG antiseptic preadmission showering and cleansing protocols for SSI reduction, clinical evidence (see Tables 3 and 4) supports a minimum of two preadmission 4% CHG showers or no-rinse 2% CHG cloth applications as a critical component of a broader interventional strategy for reducing the risk of SSIs. Clinicians face ongoing challenges with HAIs, including SSIs, and now is not the time to scale back efforts in that arena. A recent letter to the editor by Rauber and colleagues states, “Analyzing the types of surgeries covered in the studies reveals a remarkable diversity of surgical sites, which could affect infection risk based on timing and complexity of surgical procedures and disease severity.”

Following is our recommendation that is based on a thoughtful analysis of current contemporary studies reviewed in this paper: preadmission showering or cleaning with CHG should be implemented as a standard of practice for all patients undergoing elective surgery. Furthermore, efforts to implement this practice within the ambulatory surgical environment would provide an additional benefit as more and more surgical procedures transition from inpatient facilities to the outpatient settings. As previously stated, our evaluation of the CDC draft recommendations and the AORN guideline does not provide a compelling reason for expanding skin antisepsis practices to include nonspecific antiseptic agents or soap, thereby marginalizing the practice of preadmission bathing and/or cleansing with CHG products. Evidence-based medicine is a moving target, and the wealth of current peer-review clinical studies clearly suggest that a standardized protocol that embraces CHG preadmission showering and cleansing is an effective risk reduction strategy.

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References


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