

Preoperative Skin Cleansing Focused on Patient Compliance

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Introduction

Infection control and prevention are critical components to improving health outcomes and curbing healthcare costs. Surgical-site infections (SSIs), the most frequently reported healthcare-associated infection (HAI), are associated with patient morbidity and mortality.^{1,2,3} SSIs affect between 2% and 5% of inpatient surgery patients and result in death as often as 3% of the time.⁴ A 2014 study suggests that SSIs account for an excess of up to \$3.5 billion in healthcare expenditures per year,⁵ not including the additional costs of hospitalization, post-discharge outpatient expenses, and long-term disability care and management.⁶ Another study concluded that as many as 55% of SSIs may be prevented with current evidence-based strategies.⁷

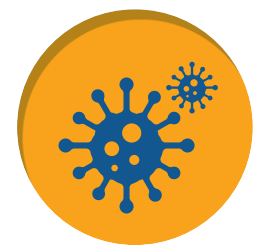
When it comes to recommended infection prevention strategies, the U.S. Centers for Disease Control and Prevention (CDC) and Association of periOperative Registered Nurses (AORN) both issue recommendations for practice development and implementation. These evidence-based recommendations have remained mostly consistent and unchanged for preoperative skin cleansing, with the last update by the CDC in 1999. However in 2015, both organizations intend to publish new recommendations.

This paper will discuss the proposed 2015 changes to the CDC and AORN preoperative skin cleansing recommendations and their potential impact. It will also provide an evidence-based protocol for two preoperative cleanses with chlorhexidine gluconate (CHG) before surgery and best practices to increase patient compliance.

Understanding Current Surgical Site Infection Prevention Recommendations

While the CDC is the principal source of SSI prevention recommendations, AORN is also recognized as a leader in recommended skin antisepsis practices. In 2014, both the CDC and AORN issued drafts of intended updates to their preoperative patient skin antisepsis recommendations. Rather than advocating the usage of an antiseptic, these revised recommendations will advocate the use of either an antiseptic or soap and water. In addition, the AORN Recommended Practices have gone from recommending two cleanses to at least one cleanse (*Figure A*):

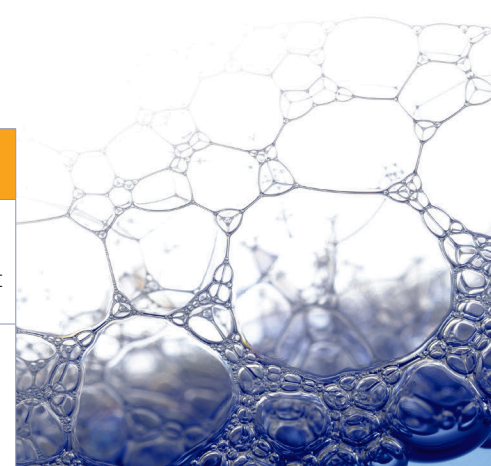
The proposed CDC and AORN Recommended Practice updates have the potential to cause confusion with healthcare professionals, as they leave skin cleansing protocols more open to interpretation.



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Figure A.

	2014 Recommended Practices	Draft 2015 Recommended Practices
CDC	"Require patients to shower or bathe with an antiseptic agent on at least the night before the operative day." ⁴	"Advise patients to shower or bathe (full body) with either soap (antimicrobial or non-antimicrobial) or an antiseptic agent on at least the night before the operative day." ⁸
AORN	"Patients undergoing open Class I surgical procedures below the chin should have two preoperative showers with chlorhexidine gluconate (CHG) before surgery, when appropriate." ⁹	"Patients should bathe or shower before surgery with either soap or a skin antiseptic on at least the night before or the day of surgery." ¹⁰



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Variability of Skin Cleansing Protocols and Need to Focus on Compliance

SSI prevention strategies are numerous and varied. Depending on the facility and the guidelines it follows, CHG skin cleansing protocols can vary dramatically with respect to differences in the number of preoperative cleanses (one vs. two vs. three), the type of cleansing product (CHG vs. soap and water), and the product form (CHG wipes vs. CHG liquid soap) recommended. The proposed changes to the CDC and AORN Recommended Practices have the potential to continue to expand upon the variation and number of different skin cleansing protocols currently used by healthcare professionals.

In an online survey conducted in 2014, infection preventionists' (IPs) responses underscored broad compliance issues. Eighty-seven IPs responded to questions surrounding their facilities' use of CHG as part of a strategy to prevent infections for patients undergoing surgery. Of those surveyed, a total of seven reported that they did not currently use CHG for this purpose,

and five said that they planned to adopt the use of CHG products. However, while the majority of IPs reported the use of CHG as part of an infection prevention strategy for patients who receive surgery or those who are bedridden, the details of use showcased inconsistencies within and across institutions. IPs responded to the level of frequency for various circumstances of proposed CHG use (Figure B.) measuring Always, Often, Sometimes, Seldom, Never.¹¹

Additionally, in December 2014, an *Infection Control Today* survey of 470 IPs and surgical services directors and managers revealed that 27% do not have a formal protocol for pre-surgical skin cleansing, while 6% are uncertain of an existing protocol.¹² The inconsistent implementation of in-hospital CHG patient cleansing and CHG cleansing performed by patients at home further complicates the adoption of these practices by healthcare providers and their patients.

The benefits of CHG cleansing prior to surgery are limited if the suggested protocol is not followed properly. A 2014 study found that 36% of IPs were somewhat



27% of IPs and surgical services directors and managers don't have a formal protocol for pre-surgical skin cleansing
6% are uncertain of an existing protocol

Figure B.

	Always	Often	Sometimes	Seldom	Never
How frequently does your facility use CHG products to reduce the risk of infection among surgical or bed-ridden patients?					
Patient bathing 1+ night prior to surgery, by patient at home		34	26	22	3 13
Regular patient bathing of bed-ridden patients	12	6	22	19	32
Patient bathing 1+ hour prior to surgery, in hospital (nurse applied)	19	24	25	11	19
Patient bathing 1+ hour prior to surgery, in hospital (patient applied)	17	15	20	22	22
Other	23	3	3	2	62

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confident, while only 6% of IPs evaluated were very confident that their patients were properly following skin cleansing protocols at-home.¹¹ Even though protocols may vary, both the healthcare provider and CHG product developers should help facilitate patient understanding and ability to follow instructions for use. A major factor in noncompliance among patients is poor understanding of product and application instructions.¹³ When using products at home, patients may not have the same level of guidance to ensure proper product usage. Since patients have a lot on their mind prior to surgery, they can forget to cleanse as instructed. The use of patient reminder systems to assist with this has been shown to improve compliance.¹⁴ Maintaining and implementing clear protocols can help to increase adoption, adherence and compliance with these protocols.

Our Recommendation: SSI Prevention Through Two Preoperative CHG Cleanses

A number of studies have proven the effectiveness of CHG preoperative cleansing as part of a strategy to prevent SSIs. Additional studies have not only supported CHG cleansing, but also demonstrated the advantage of multiple cleanses before surgery due to the benefit of CHG accumulation on the skin.^{15,16} In 2009, for example, the *Journal of Clinical Nursing* published outcomes of a study that found an infection risk 4.76 times higher among patients who did not receive a CHG cleansing prior to surgery.¹⁴ Findings of a study published in the *Journal of Knee Surgery* similarly stated that “a statistically lower incidence of surgical site infections was found in patients using [CHG] cloths (0.6%) compared with patients undergoing in-hospital perioperative skin preparation only (2.2%).”¹⁵

Two preoperative cleanses produce a greater accumulation of CHG on the skin than one.¹⁷ A 2010 study documented that a standardized preoperative cleansing strategy, calling for two preoperative CHG cleanses (4% CHG shower or 2% CHG presaturated cloths), resulted in a range of “25.3 to almost 350 times the [CHG] concentration required to inhibit or kill staphylococci skin and clinical isolates, including MRSA” – otherwise recognized as infection-causing bacteria often found on the skin.¹⁶ The study also demonstrated that cleansing only once with 4% CHG prior to surgery only “resulted in a ratio of 0.7 [C^{CHG}/MIC₉₀]” and represented “subtherapeutic skin levels of CHG,” while the group that received two CHG showers “revealed a mean skin surface of CHG that was 1.9 times the MIC₉₀ (5 mcg/mL) for staphylococci skin and clinical isolates.”

SSI prevention strategies should continue to include the use of two preoperative CHG showers for optimal infection prevention outcomes. While certain facilities may use more than two preoperative CHG cleanses, in their studies on the relative efficacy of two vs. one preoperative CHG cleanses, Dr. Charles Edmiston and others have concluded that the accumulative effect of two cleanses offers significant benefits by increasing the concentration of CHG on the skin.^{14,16} These studies collectively support the need for recommended practices to reflect the science demonstrating the benefit of at least two CHG cleanses.



Only **6%** of nurses were very confident that their patients were properly following skin cleansing protocols at home

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Conclusion: Steps to Improved Infection Prevention and Protocol Compliance

There are a number of factors that influence patient compliance and ultimately, the impact of infection prevention strategies. Compliance in any healthcare environment is critical, and in the case of SSI prevention strategies, it can truly mean the difference between life and death for a patient. Both patients and healthcare professionals play an important role to help ensure infection prevention practices are implemented properly. For example, a patient may need to conduct two preoperative CHG cleanses while at home before his or her surgery. If the patient cannot or does not comply, the healthcare provider may have to take additional time the day of surgery to cleanse the patient.

Additionally, there are strategies that can be implemented now to address the broader infection prevention recommendation inconsistencies, improve compliance, and ultimately, help ensure patient safety:

1. Educate Healthcare Professionals

Through training, make staff aware of existing guidelines and the science to support them. Training should focus not only on the recommended practices, but also on how best to work with patients to encourage at-home compliance.

2. Provide Patients with Product

Make the process of getting the correct product as easy as possible to reduce the likelihood of the patient forgetting, picking up the wrong product or not picking up enough product. Providing easy-to-use products that are offered as a kit may leave even less room for patient error.

3. Provide Clear Instruction to Patients

Clear instructions outlining proper

product application can help increase compliance.¹⁸ With proper instructions, patients should be able to conduct at-home CHG cleanses appropriately and without confusion.

4. Implement Patient Reminder Systems

The use of automatic reminder systems, including email, text message, and voicemail, has been an effective method to get patients to adhere to preoperative antiseptic cleansing regimens. Providing skin cleansing products that use these approaches has been proven to increase compliance and combat patient distraction prior to surgery.¹³

Ultimately, ensuring patient safety through effective, consistent infection prevention and curbing healthcare expenditures is the responsibility of many, starting with the organizations that develop the guidelines and recommended practices, to the facilities and healthcare professionals that implement them, as well as the patients that have at-home, preoperative needs. Compliance is a collective effort, one that can be made easier and more effective through education and clear, standardized recommendations. It is important that organizations and healthcare professionals closely examine current evidence supporting today's infection prevention guidelines and, at minimum, advocate for consistency, clarity, and standardization.

Note

Patient should consult their doctor on the proper use of CHG for skin cleansing.



Strategies that can help
enable patient compliance:

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