Plastic and Aesthetic Nursing

Fundamentals of Plastic and Aesthetic Nursing

NCPD 1.5 ANCC Contact Hours

# Best Practices for Using All Skin Antiseptics and for Using 4% Chlorhexidine Gluconate

Sharon Ann Van Wicklin, PhD, RN, CNOR, CRNFA(E), CPSN-R, PLNC, FAAN, ISPAN-F

***Plastic and Aesthetic Nursing* (*PAN*), *the official journal of the International Society of Plastic and Aesthetic Nurses (ISPAN) publishes this column to provide accurate, evidence-based information about fundamental best practices for plastic and aesthetic nurses.***

Providing effective skin antisepsis is a fundamental component of plastic and aesthetic nursing practice. The purpose of using a skin antiseptic is to reduce the risk for infection by removing soil, skin oils, and resident and transient microorganisms from the patient's skin (Dumville et al., 2013). The goal of skin antisepsis is to reduce the microbial count on the skin as much as possible, in the shortest time possible, with the least amount of tissue irritation possible, and to prevent subsequent rebound microbial growth (King & Spry, 2019).

Using topical antiseptics to prevent infection is an evidence-based strategy that dates back to 1867, when Lister published a series of case studies detailing the use of phenol as a germicide (Lister, 1867). Lister showed that spraying surgical wounds with phenol was an effective method for reducing infection.

The U.S. Food and Drug Administration (FDA) issued its final rule, Safety and Effectiveness of Health Care Antiseptics; Topical Antimicrobial Drug Products for Over-the-Counter Human Use, in December 2017 (FDA, 2017). The 2017 final rule applies to health care antiseptics and defines them as compounds or preparations used for preinjection and/or perioperative skin preparation. The FDA requires that patient skin preparation products significantly reduce the number of microorganisms on the skin and that they are broad-spectrum, fast-acting, and persistent.

**Sharon Ann Van Wicklin, PhD, RN, CNOR, CRNFA(E), CPSN-R, PLNC, FAAN, ISPAN-F,** is Editor-in-Chief, *Plastic and Aesthetic Nursing*, and a Perioperative and Legal Nurse Consultant, Aurora, CO.

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Address correspondence to Sharon Ann Van Wicklin, PhD, RN, CNOR, CRNFA(E), CPSN-R, PLNC, FAAN, ISPAN-F, 8256 South Shawnee St, Aurora, CO 80016 (e-mail: sharonvwrn@ispan.org).



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Plastic and aesthetic registered nurses (RNs) play an important role in developing protocols for using and applying skin antiseptics to promote patient safety and reduce the risk for infection (Association of periOperative Registered Nurses [AORN], 2021).

## BEST PRACTICES FOR USING ALL SKIN ANTISEPTICS

To prevent patient harm and reduce the risk for patient complications, before selecting and applying any skin antiseptic, plastic and aesthetic RNs should conduct a patient assessment and examination of the patient's skin (AORN, 2021). Performing a nursing assessment before providing an intervention is a standard of plastic and aesthetic nursing practice (American Nurses Association & International Society of Plastic and Aesthetic Nurses, 2020).

In a review of the literature focused on various types of antiseptics used for preoperative or preinjection skin preparation, Murkin (2009) concluded that it was important for RNs performing skin antisepsis to first evaluate the patient and the condition of their skin and then select the most appropriate antiseptic for the patient. The patient assessment should also include assessing the patient for allergies and sensitivities to skin antiseptics. In a case report, Sivathasan and Goodfellow (2011) noted that using chlorhexidine gluconate (CHG) as an antiseptic in patients who have a history of contact dermatitis could be problematic. Likewise, there have been reports of anaphylactic reactions associated with the use of CHG as a skin antiseptic (Garvey et al., 2001; Khan et al., 2011; Toomey, 2013).

When applying any skin antiseptic, plastic and aesthetic RNs should use aseptic technique (AORN, 2021). Relative to applying skin antiseptics, aseptic technique includes the following:

- Performing hand hygiene before applying the antiseptic;
- Wearing clean or sterile gloves when applying the antiseptic;
- Applying the antiseptic by starting at the incision or injection site and moving toward the peripheral areas; and

- Discarding the applicator after contact with the peripheral or contaminated area and using another applicator for additional applications.

Safe and effective application of all skin antiseptics also includes taking measures to prevent prolonged contact of the antiseptic with the patient's skin by using clean or sterile towels or gauze to absorb drips and excess solution during application and removing any materials that have become saturated with the antiseptic. There have been reports of chemical injury, including chemical burns to patients caused by wet antiseptic solution dripping or pooling beneath them (Borrego, 2013; Hodgkinson et al, 1978).

Allowing the antiseptic to dry for the full time recommended in the manufacturer's instructions for use (IFU) before beginning the procedure or draping the patient is also important when performing preinjection or preoperative patient skin antisepsis (AORN, 2021). Allowing the antiseptic to dry completely helps ensure the necessary time for the antiseptic to achieve skin antisepsis has been reached and thus improves the safety and efficacy of the skin preparation.

When the procedure is completed, the plastic or aesthetic RN should reassess the patient's skin to ensure there is no injury from the antiseptic. The RN should also document skin antisepsis in the patient's record, making note of the condition of the patient's skin at the procedural site before antisepsis, the antiseptic used, area prepared, person performing the skin antisepsis, and the condition of the patient's skin following the procedure including any skin irritation, hypersensitivity, or allergic reaction (AORN, 2021).

When applying any preoperative or preinjection skin antiseptic, plastic and aesthetic nurses should follow the antiseptic manufacturer's IFU (AORN, 2021) and be knowledgeable about information noted on the product's safety data sheet (SDS).

## BEST PRACTICES FOR USING 4% CHLORHEXIDINE GLUCONATE

4% CHG is an aqueous skin antiseptic that has been found to be effective against a wide range of gram-positive (e.g., *Staphylococcus aureus*, *Staphylococcus epidermidis*) and gram-negative (e.g., *Escherichia coli*, *Klebsiella pneumoniae*) bacteria, yeasts, and some viruses (Dumville et al., 2013). Plastic and aesthetic RNs and physicians should select antiseptic products for use in clinical practice, after reviewing current research literature (AORN, 2021) and the FDA (2017) final rule for Safety and Effectiveness of Health Care Antiseptics. There are a vast number of studies demonstrating the efficacy of 4% CHG for use as a surgical hand scrub, handwashing agent, or general cleanser for skin and wounds, as well as an antiseptic for preinjection or preoperative skin preparation (Dumville et al., 2013; Wade et al., 2020, 2021).

Notably, the FDA determined that CHG was ineligible for evaluation under the 2017 Over-the-Counter Drug Review because it was not included in health care antiseptic products marketed for the specified health care antiseptic uses before May 1972. As a result, there are CHG products not affected by this rule because they are marketed under a New Drug Application.

When applying 4% CHG as a skin antiseptic, plastic and aesthetic RNs should follow the product manufacturer's IFU (AORN, 2021) and be knowledgeable about information noted on the product's SDS. Reading, understanding, and adhering to the manufacturer's IFU and SDS are the safest methods for handling, applying, storing, and disposing of skin antiseptics. The manufacturer's IFU communicate important safety and efficacy information to the user. They are developed for the product after rigorous testing under specific conditions and contact times.

The SDS provides information about the chemical properties of a product; its physical, health, and environmental health hazards; protective measures that should be implemented when using the product and in the event of an exposure (e.g., splash to the eyes); and safety precautions for handling, storing, and transporting the product (AORN, 2021). The Occupational Safety and Health Administration (OSHA, 2013) mandates that the SDS of all chemicals used in the practice setting be readily available for employees or other individuals who may be using the product. Failing to follow the precautions provided in the product's SDS may lead to patient harm and/or reduce the effectiveness of the antisepsis.

The manufacturer's IFU for using CHG as a patient preoperative/preinjection skin preparation state that the product should be applied liberally to the procedural site and then:

- Swabbed for at least 2 min,
- Dried with a sterile towel,
- Swabbed for an additional 2 min, and
- Dried with a sterile towel. (AVA, Inc., 2012)

Note that CHG (or any skin antiseptic) should be used full strength and not diluted (AORN, 2021). In a study to evaluate time-dependent concentrations of CHG at various concentrations, Stinner et al. (2011) found that diluting CHG correlated directly with a reduction in bacterial activity. The researchers also found that the effectiveness of CHG was directly related to its contact time. The researchers recommended a minimum of 2 min of contact time before making a skin incision.

The manufacturer's IFU (AVA, Inc., 2012) warn against using CHG as a preoperative skin preparation of the head or face, in the genital area, or in contact with the meninges. The manufacturer also warns the user to keep the product out of the patient's eyes, ears, and mouth as it may cause serious and permanent eye injury if placed in the eye or may cause deafness if instilled in the middle ear. In the event the

CHG solution contacts these areas, the manufacturer recommends prompt and thorough rinsing with water.

The SDS for 4% CHG states that the product causes skin irritation and serious eye damage and is suspected of causing cancer and warns the user against handling the product without having read and understood all safety precautions (Xttrium Laboratories, Inc., 2018). The recommended first aid measures include seeking medical attention if skin irritation develops or persists, flushing the eyes with plenty of water for at least 15 min and seeking medical attention after eye contact, and not inducing vomiting and seeking medical attention after ingestion. The SDS does not recommend using any personal protective equipment but does reinforce the need for flushing the eyes with plenty of water for at least 15 min if eye exposure occurs. In the event of a product spill, the SDS recommends using absorbent material to soak up the spilled product, placing in an approved container, and disposing in accordance with local, state, and federal regulations. The product should be stored away from open flames, hot surfaces, and ignition sources at a temperature not exceeding 98.6 °F (37 °C).

***If you are a plastic or aesthetic nurse and would like to write about an issue of fundamental importance to plastic or aesthetic nurses, or if you would like to see your issue presented in a future* Fundamentals of Plastic and Aesthetic Nursing Practice *column of* PAN*, please contact Sharon Ann Van Wicklin, Editor-in-Chief at sharonvwrn@ispan.org.***

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