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### Standardizing Surgical Skin Antisepsis

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Standardizing Surgical Skin Antisepsis Benchmark Project  
A Paper Submitted in Partial Fulfillment of the Requirements  
For NURS 5382: Capstone  
In the School of Nursing  
The University of Texas at Tyler  
by  
Crystal Vackar  
December 5, 2021

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### **Acknowledgments**

I would like to express a heartfelt thanks to the people who have helped me most throughout my project and journey through graduate school. First, thank you to all the faculty at the University of Texas at Tyler that have provided guidance and feedback and for their ongoing support during my time in graduate school. I would also like to thank my family, especially my husband, Lonnie, and daughters, Cassidy and Courtney, for their encouragement and patience while pursuing my master's degree while balancing work, reserves, and family life. Lastly, I would like to thank my coworkers, especially Laura, for covering for me at work and working extra in my absence.

### **Executive Summary**

Surgical skin antisepsis is a significant surgical site infection (SSI) prevention strategy and choosing which one to use can be complex. Ultimately the OR nurse decides which antiseptic to use at the point of care by assessing the patient ensuring the planned skin antisepsis is appropriate based on allergy status, skin integrity, and surgical site. Since surgical skin antisepsis is primarily a nursing task, understanding nursing staff's perspectives and experiences with prepping is key to understanding issues with its proper use and technique of application. That is why a protocol to standardize surgical skin antisepsis geared to surgical staff by way of teaching and compliance efforts is needed.

Alvarez (2018) discusses the need for the surgical team to be under constant training to implement and maintain compliance with asepsis and antisepsis protocols such as validation of competencies at least once a year including patient safety processes and quality indicators. An educational competency tool will be provided that must be evaluated annually ensuring standardized education and observation of technique of the surgery staff. Developing standardized and simplified educational tools will help ensure compliance with skin antisepsis. The evidence supporting the surgical preparation protocol policy will be reviewed and updated at least every two years since there are always new techniques or products being evaluated and researched. If the protocol and policy is updated, then the surgical staff must be educated and made aware of the changes during daily morning huddles. This will allow for follow-up and consistency with staff and physicians.

I am proposing a protocol standardizing patient skin prepping as a surgical site infection improvement project including performing critical tasks, the same way facility wide to reduce the risk of error and eliminate variation in processes. The research concludes that chlorhexidine

gluconate (CHG) combined with alcohol appears to be the most effective surgical skin antiseptic, followed by povidone-iodine and alcohol in cases where CHG is inappropriate. At the surgical committee meeting, the findings of the literature review will be presented, and the most effective prepping solutions will be used moving forward, surgeons' preference cards will then be updated, and the new guidelines from American Operating Room Nurses (AORN) will be utilized in staff education. This meeting is based on necessity since there are still ritualistic surgeons who need to be convinced that change needs to happen and that there are better prepping agents available. Once everyone is on board standardizing the prepping practices will allow for prepping technique to be in compliance and will empower the nurses to choose the appropriate product thus reducing the risk of a surgical site infection.

### Standardizing Surgical Skin Antisepsis

While surgical site infections hold a heavy financial burden on organizations, they all cannot be eliminated. A reduction in the infection rate to a minimal level has significant benefits. This will be achieved by the development of standardization of surgical site preparation techniques, how to choose the appropriate antiseptic, re-education, and monitoring compliance. Therefore, to ensure evidence-based practices and improved patient outcomes, there must be continuous project support, ongoing outcome evaluation, and best practice review throughout the organization. To assist in efforts to find the most effective antiseptic, the following PICOT was formulated: In surgical patients (P), how does chlorhexidine gluconate (CHG) skin preparation (I) compared to povidone-iodine (C) affect the occurrence of surgical site infections (O) over 30 days (T)?

#### **Rationale for the Project**

According to the Centers for Disease Control and Prevention (CDC), surgical site infection is defined as infection related to an operative procedure that occurs at or near the surgical incision within 30 days of the procedure (Berrios-Torres et al., 2017). The prevention of SSI is becoming increasingly important as the number of surgical procedures performed in the United States (US) continue to rise (Berrios-Torres et al., 2017). SSIs occur in 2-5% of patients undergoing inpatient surgery with 160,000-300,000 occurring each year in the US which accounts for \$3.5-10 billion in annual healthcare expenditures (Anderson et al., 2017). Estimates show approximately half of SSIs are preventable by application of evidence-based strategies and numerous recommendations from various organizations. Despite the availability of evidence-based guidelines, SSI rates have not measurably fallen, due to poor knowledge of and/or non-compliance with correct practices (Zucco, Lavano, Nobile, Papadolpoli, & Bianco, 2019).

Preoperative skin antisepsis is one of the most critical factors for preventing postoperative SSI, but with the lack of high-quality research, the choice of which preoperative skin antiseptic is best remains a puzzling problem for clinicians (Chen, Chen, Guo, & Xu, 2020). The goal of this benchmark project is aimed at implementing and standardizing a surgical skin antiseptic protocol for the organization to utilize as a tool for staff and surgeons to be aware of best practices according to the evidence while reducing the risk of SSIs. With that in mind making the decision about which antiseptic to use can be complex. Therefore, input from an interdisciplinary team with experience and knowledge of skin antiseptics is helpful during review of current research, clinical guidelines, and information from manufacturers of the agents (AORN, 2021).

### **Literature Synthesis.**

Current evidence-based practices (EBP) for skin preparation play an important role in the prevention of SSI. Many studies have evaluated their effectiveness in the prevention of SSIs by comparing different surgical preparation solutions, such as chlorhexidine and povidone-iodine, with and without an alcohol component. There were eleven out of twelve studies that show chlorhexidine's effectiveness in prevention of surgical site infection, even though they ranged from low to moderate to high level evidence. Alcohol was an additional solution that has shown to aid in the prevention of surgical site infection with its antimicrobial properties when used with chlorhexidine (Dumville et al., 2015). However, in one study Xu (2017), Betadine was superior in prevention of positive cultures, but the only surgery performed was hand surgeries. Overall, chlorhexidine showed superior results in its efficacy to prevent surgical site infections when used as a surgical site skin preparation before most types of surgeries. Therefore, moderate quality evidence shows a significant benefit in reducing the risk of SSI with alcohol-based chlorhexidine



compared to povidone-iodine. The literature supports a need for a change project of using the most appropriate and effective skin preparation preventing SSI and making it more standardized using evidence-based practices. According to current literature, standardizing the process of the most effective skin antiseptic ensures reduction of microbial burden on the skin prior to surgery with correct application each time, choosing the appropriate agent for each procedure, and knowing what alternatives are available.

### **Project Stakeholders**

While stakeholder support is necessary for a successful change, the facility administrators, surgical unit staff, surgeons, patients, patients' families, and suppliers are impacted by this proposed change. The importance and influence of patient participation and education is an increasingly important concept and advocated to improve patient safety in the prevention of infection. Educating and informing patients is one way to help them understand the evidence. Ways to educate and inform patients include preoperative teaching about best practices to ensure patients they are receiving safe quality care. Also, standardizing the evidence and educating stakeholders, surgeons, and staff members about surgical antiseptic use in the prevention of surgical site infections is key to benefiting both the patients and organizations.

Nurses who are knowledgeable about surgical infections, and who use EBPs to prevent infection, will help prevent surgical site infections. EBP increases nurse's empowerment and better-quality skills to combine research evidence and patient preferences into practice.

Therefore, as nurses, we are at the center of patient care, and we must listen to our patients and provide them with options they need from the best available scientific evidence.

Multidisciplinary teams comprised of nurses, nurse leaders, surgeons, infection preventionists, and educators all play a critical role in interprofessional involvement. A key strategy for success

is involvement of leaders and staff who are directly affected by the potential change, including those having difficulty accepting the change (Melnyk & Fineout-Overholt, 2019). The gatekeepers in the organization are the administrators and chief of surgery since they oversee the clinical protocols and hold meetings regularly discussing hospital policies and procedures. Allies in the organization consist of other nurses concerned about EBP and improving patient outcomes. Some barriers to EBP change include lack of knowledge and skills and social and organizational barriers. Effective barrier assessment includes recognizing knowledge, attitudes, and beliefs of administrators surrounding practice change and their perceived roles in communicating support for this change. Resources needed to enact change include access to clinical resources, personnel involved in a surgical improvement SSI committee, trainings on a regular basis, mentors, and supplies for training. Associated costs with bringing this change to the organization will be minimal. The multidisciplinary team of nurses and nurse educators will carry out the change and sustain it as an ongoing learning process for the surgical department.

### **Implementation Plan**

The major steps in the implementation plan include creating awareness and interest, building knowledge through educating staff and patients, promoting action, and pursuing integration and sustainability of the change. The first phase of implementation will be to collaborate and convince the surgical staff, infection preventionists, and surgeons on which surgical preps will be utilized by the facility, limiting product choices based on the patient population and procedures performed following the recommended evidence guidelines and literature reviews from AORN and other organizations such as the World Health Organization, the National Institute for Health and Care Excellence for prevention of surgical site infection. Next, the surgical skin antiseptic protocol will be written with the collaboration from the surgical

committee, surgical nurses, administration, and infection preventionists. The non-approved antiseptic products will then be removed from the Operating Rooms and inventory with only the approved products remaining. Education and training of the staff and surgeons will then commence with the competency tool for the nurses to complete on an annual basis along with visual evaluation of technique which is an essential step in the reevaluation part of planning. The infection prevention team will monitor any surgical site infections or adverse skin reactions documented from the surgeons monthly. Then after the protocol has been in place for three months the effectiveness will be evaluated by monitoring surgeon and staff behaviors, monthly infection control audits, competencies, and correct documentation.

#### **Timetable/Flowchart**

The timeline for implementation takes place over a period of two weeks. During this time the evidence will be presented, and the surgical interdisciplinary team will be educated on the new protocol guidelines. Then after it is introduced, there will be many educational offerings, educational posters, competency tool initiation, and meetings to discuss it further. Then after thirty days of the protocol's approval, reinforcement of compliance is initiated and followed up. Three months after the protocol has been in place, the progress will be tracked by monitoring surgical site infections, behaviors, competencies and any possible discrepancies voiced from the team. Then finally, the protocol will be updated as needed.

#### **Data Collection Methods**

Data collection methods for this benchmark project were through studies evaluating the most effective surgical skin antiseptic. To establish the effectiveness of the implemented evidence-based intervention in the hospital, a thorough evaluation plan that describes and identifies anticipated variables and outcomes will be developed. One of the outcomes for the

project is the surgical preparation protocol that standardizes the surgical skin prep for surgical patients. The next outcome is for nurses to comprehend and know how to choose the correct preparation and how to apply it according to manufacturer's guidelines. Competency will be assessed initially and annually of the staff, monitoring for surgical site infections monthly, and tracking staff and surgeon behavior towards this change will be ongoing. According to Albarquouni, Hoffman, and Straus (2018), core competencies define what is expected to be able to work optimally for health professions and to improve the quality of care by developing assessment tools that provide a valid and reliable evaluation. Another measure of the effectiveness is patient outcomes, in terms of reducing the incidence of surgical site infections or adverse skin reactions from the preparation. My perceptions of the project are that this will be a great update to the organization, and everyone will be onboard with the changes. Changing how we choose which skin preparation is the intended purpose of this project based on the evidence of which antiseptic solution is best for the surgical site and which one is the most effective to prevent surgical site infection.

### **Cost/Benefit Discussion**

Public reporting of outcome, process, and other quality improvement measures is now required, and reimbursements for treating SSIs are being reduced or denied estimating approximately that half of SSIs are preventable by application of evidence-based interventions (Barrios-Torres, Umscheid, & Bratzler, 2017). The U.S. CDC estimates approximately 1.7 million patients per year develop hospital acquired infections (HAIs) therefore, the Centers for Medicare and Medicaid Services (CMS) have implemented quality and pay-for-performance initiatives to reduce hospital acquired infections and hospital readmissions (Haque, Sartelli, McKimm, & Baker, 2018). The estimated annual incidence of SSIs in the U.S. ranges from

160,000 to 300,000, and estimated annual cost ranges from \$3.5 billion to \$10 billion, thus increasing hospital stay by 9.7 days (Loyola University Health System, 2017).

There have been many advances in the reduction of HAIs through the years, but due to the high number of deaths still occurring there needs to be more strategic polices, evidence-based research, and routine educational initiatives focusing on prevention of SSIs. Surgical site infections are associated with substantial morbidity, increased health care costs, and longer hospital stay. The costs of this project are minimal, when compared to a surgical site infection occurrence. Staff education will be done during meetings and through a competency assessment tool so it will be done during working hours. There will be a significant implied financial savings shown by a reduction in SSIs. Through SSI preventions, this change project improves patient outcomes and reduces health care expenditures.

### **Discussion of Results**

There are no results of this project currently due to the reduced number of surgical cases being performed because of the pandemic. While the implementation of the protocol has not been possible, the surgical department manager and surgical team have shown interest in its implementation. With the results of most studies stating that chlorhexidine used with alcohol was superior in the prevention of postoperative infections, the chosen prepping agent will be chlorhexidine with alcohol or chloraprep unless contraindicated. Guidance will be provided in the surgical antiseptis protocol policy. Once this protocol is in place, I'm hopeful that the staff will fully understand the purpose and use of the protocol with consistent evaluation and education resulting in an overall outcome of a decrease in surgical site infections.

### **Conclusions/Recommendations**

Even though there has been a lot of evidence about interventions to reduce hospital acquired infections in recent years, there is still a large gap between the evidence and practice in the prevention in general which means there is a need for translation and sustainability of proven efficacious intervention (Musuuza et al., 2017). The goal for any type of surgical antiseptic solution will be to reduce any instance of surgical infections in a safe, cost effective, and complete manner. The hospital or organization will choose the right product that is cutting costs, is the most effective, saving surgical time, and has the safest results for the patient. To ensure these are long-lasting changes, compliance to best practices must be reinforced. Reinforcing the process by reminding and reeducating staff of the standardized protocols and tracking prepping agents, and site infections in the electronic medical record is a strategy to monitor compliance. Working as a team to reduce surgical site infections should not be reliant on one element, it should be a multi-pronged approach to excellence within the organization. Therefore, a standardized approach that utilizes proven products, along with reinforced compliance and tracking, will result in fewer errors, less waste, and better-quality products for the patient and the institution.

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## Appendix A

**Synthesis Table****PICOT Question:**

**In surgical patients (P), how does chlorhexidine gluconate (CHG) skin preparation (I) as compared to povidone-iodine (C) affect surgical site infections (O) over 30 days (T)?**

Evidence Synthesis Table

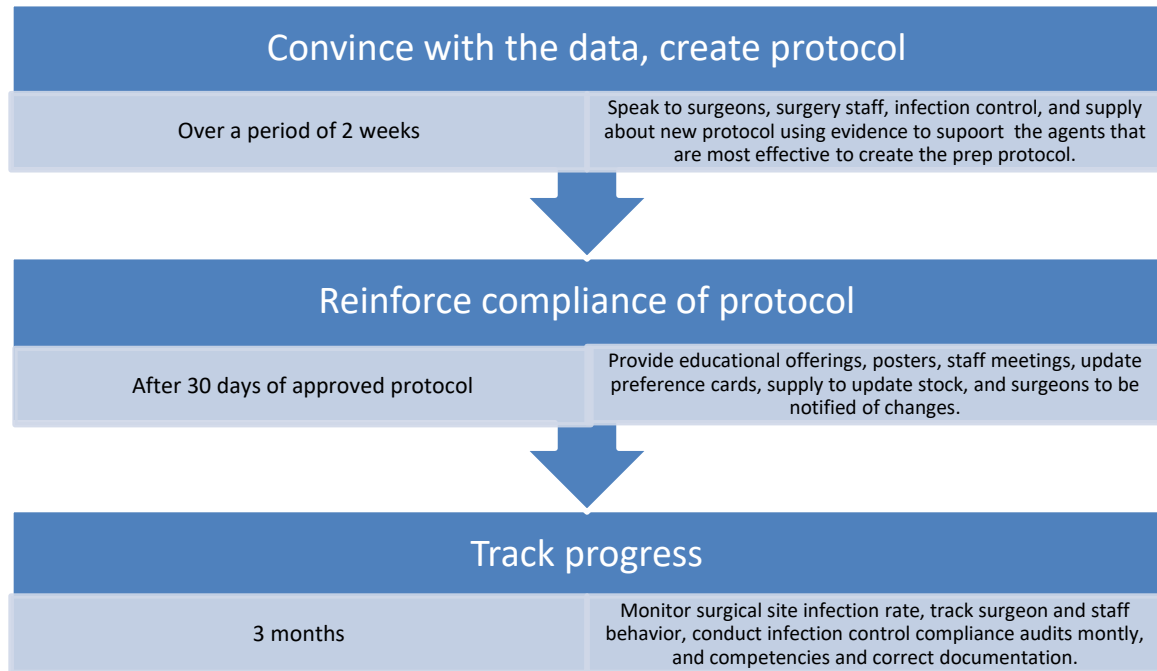
Studies	Design	Sample	Intervention	Outcome
A	Meta-analysis Review	N=2,623	-CH 4% in AI -PI in AI -SS & MS -CH 2-2.5% in AI -PIS & PIP -PIP	-CH in AI, highest in preventing SSI (AI in the mix added antimicrobial properties suggested by literature) -PI in AI, moderately affective in preventing SSI -SS & MS low results in SSI prevention -CH 2-2.5% in AI, very low results in SSI prevention -PIS & PIP, very low results in SSI prevention -PIP, very low results in SSI prevention
B	Meta-analysis Review	N=6,237	-Dr vs No Dr -CH vs PI -PI & PCMX vs PI -AI (5min scrub) & IDr vs PI scrub (5min scrub) w/o Dr	-Dr vs No Dr low quality and moderate quality evidence -CH vs PI low quality evidence, slightly reduced SSI for CH rather than PI -PI & PCMX vs PI very-low quality evidence -AI scrub & IDr vs PI scrub without Dr very-low quality evidence
C	Meta-analysis Review	N=2,080	-CH & AI -PI	-CH & AI more superior than PI in SSI prevention -CH can reduce positive culture after skin antiseptics

D	Quantitative Randomized control trial, Experimental	N=240	-CH -D -B	-CH higher rate of positive cultures -D & B lower rate of positive cultures
E	Meta-analysis Review	N=29,600	-CH -PI -SAE	-CH superior to PI -SAE no significant difference
F	Systematic Review and Meta-analysis	N=19	-CH -Other Antiseptics	-CH high quality evidence -Other no statistically significant difference
G	Meta-analysis	N=8,787 CH: n=2,615 CG: n=6,172	-CH -CG	-CH high level quality evidence in SSI reduction
H	Systematic Review and Meta-analysis	N=3,059	-CH in Al -PI	-CH in Al significant reduction in SSI, high level evidence
I	Systematic Review and Meta-analysis	N=10,830 EG: n=2,593 CG: n=8,237	-EG: CH cloth -CG: standard disinfection	-CG (standard disinfection) incidence of SSI significantly high than in the EG (CH cloth)
J	RCT, open label trial	N=1,114 PI: n=590 CH: n=524	-PI -CH	-PI higher rate of SSI than in CH group
K	RCT	N=1,147 CH-Al: n=572 PI-Al: n=575	-CH in Al -PI in Al	-CH in Al, significantly lower risk of SSI -PI in Al, low quality evidence
L	RCT, Comparison study	N=420 PI: n=210 CH: n=210	-PI -CH	-CH, rate of SSI considerably lower than in PI group

Legend: A = Dumville et al., 2015, B = Hadiati et al., 2018, C = Angghrahita et al., 2017, D = Xu, 2017, E = Chen, 2020, F = Privitera et al., 2016, G = Wang et al., 2017, H = Tolcher et al., 2019, I = Cai et al., 2017, J = Lakhi et al., 2018, K = Tuuli et al., 2016, L = Das et al., 2017, Al = alcohol, B= betadine, CG = control group, CH = chlorhexidine, D = duraprep, Dr = drape, EG = experimental group, IDr = iodine drape, MS = methylated spirits, PCMX = para-chloro-meta-xylenol PI = povidone iodine, PIP = povidone-iodine paint, PIS = povidone-iodine scrub, SAE = skin adverse event, SSI = surgical site infection

Appendix B

Flowchart



## Appendix C

**Instruments**

<b>Skill Criteria</b>	<b><i><u>Intraoperative Surgical Skin Preparation</u></i></b>	
	<b><i><u>Competency Assessment Checklist</u></i></b>	
	<b><i>Assessment of Competence by Assessor</i></b>	
	<b>Initial &amp; Yearly assessment of perioperative nurse</b>	<b>Comments</b>
	<b>Signature/Date</b>	
Correct identification of patient and operative site		
Ensure patient allergies checked and documented		
Identify if hair removal is necessary at surgical site		
Demonstrate correct hair removal at the surgical site		
Perform preoperative skin cleaning with CHG wipe if appropriate		
Determine which surgical skin antiseptic is appropriate for surgical site and any possible contraindications		
Identify dangers of pooling of preparation used to disinfect the skin and how to prevent pooling		
Demonstrate correct method of skin preparation		
Demonstrate correct documentation for skin preparation		

**SKIN ANTISEPSIS-PREOPERATIVE PATIENT**

[Insert facility name or a header]

**ADMINISTRATIVE APPROVAL**

Date Created:

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Last Date Revised:

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Last Date Reviewed:

---

Date of Next Review:

---

Approval signature(s) with title and date of signature:

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Signature

Title

Date

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Signature

Title

Date

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Signature

Title

Date

**Purpose**

To provide guidance to perioperative personnel for performing preoperative patient skin antisepsis. The expected outcome is that the patient will be free from signs and symptoms of infection.

**Policy**

It is the policy of **[insert name of facility]** that:

- Preoperative patient bathing and skin antisepsis products will be approved by **[facility-specific personnel]** and the product selection committee; only bathing and skin antisepsis products approved and provided by the health care organization will be used.
- Patients will be instructed to bathe or shower before surgery with chlorhexidine gluconate.
- Hair at the surgical site will be left in place when feasible and will only be removed in select clinical situations.
- Perioperative team members will select a safe, effective, facility-approved surgical site skin antiseptic for the individual patient.
- Perioperative team members will apply the surgical site skin antiseptic in a safe and effective manner.
- Safety data sheets for all skin antiseptics must be readily available in the practice area.
- All personnel must follow local, state, and federal regulations for storage and disposal of flammable skin antiseptics.

**Procedure Interventions**

*Preoperative Patient Bathing*

- Instruct the patient to bathe or shower at least once before surgery with chlorhexidine gluconate soap
  - Instruct the patient to follow the product manufacturer's instructions for use.
  - Instruct the patient not to apply alcohol-based hair or skin products, lotions, emollients, or cosmetics after the preoperative bath or shower.
  - Instruct the patient not to apply deodorant when the axilla will be in the sterile field.
  - Instruct the patient undergoing surgery on the hand or foot that the nails on the operative extremity should be clean and natural, without artificial nail surfaces.
  - Instruct the patient undergoing surgery on the head or neck to shampoo their hair with a facility-approved product or shampoo.

### *Hair Removal*

- Instruct the patient to leave hair in place at the surgical site before surgery.
- Leave hair at the surgical site in place when feasible.
- If hair removal is necessary, minimize the amount to be removed, and remove hair at the surgical site by using clipping or depilatory methods in a manner that minimizes injury to the skin.
  - Remove hair as close to the start of surgery as feasible in a private location (eg, preoperative room or bay) before entering the operating or procedure room.
  - When removing hair outside the operating or procedure room is contraindicated, remove the patient's hair in a manner that prevents hair dispersal into the air
  - Use single-use clipper heads and dispose of them after each patient use.
  - Disinfect reusable clipper handles after each use, in accordance with the manufacturer's instructions for use.
  - When using depilatories for hair removal, follow the manufacturer's instructions for use, including testing skin for skin allergy and irritation reactions in an area away from the surgical site at least 24 hours before the procedure.

### *Surgical Site Preparation*

- Unless contraindicated, use an alcohol-based antiseptic.
- Prior to entering the operating or procedure room, select a safe, effective, facility-approved surgical site antiseptic for the individual patient based on the patient assessment, the surgical anatomic site, and a review of the manufacturer's instructions for use and contraindications.
  - The perioperative RN will assess the patient's
    - allergies and sensitivities to preoperative skin antiseptics,
    - skin pigmentation (ie, fair, medium-fair, medium-dark, dark),
    - skin integrity at the surgical site, and
    - surgical site for the presence of hair.
  - The perioperative RN will consult the physician when selecting
    - iodine and iodophor-based antiseptics for patients susceptible to iodism or
    - chlorhexidine gluconate and alcohol-based antiseptics for neonates.
  - Perioperative team members will collaboratively evaluate the risks and benefits of using an alternative antiseptic product when facility-approved antiseptic products are contraindicated for the individual patient.
- Perioperative team members will confirm the surgical site before the surgical site antiseptic is applied.
- The perioperative RN will assess the condition of the patient's skin at the surgical site and prepare the skin for antiseptics.
  - Wash skin at the surgical site with a facility-approved product or soap when soil, debris, emollients, cosmetics, or alcohol-based products are present.
  - Remove the patient's jewelry at the surgical site before skin antiseptics.
  - If soiled, cleanse the areas in the surgical site that are of greater contamination than the surrounding area (eg, umbilicus, foreskin, under nails, intestinal or urinary stoma) prior to beginning surgical site preparation.

- Isolate highly contaminated areas (eg, anus, colostomy) that are near the surgical site with a sterile barrier drape.
- A nonscrubbed perioperative team member will apply the skin antiseptic using sterile technique according to the manufacturer's instructions for use.
  - Perform hand hygiene.
  - Wear sterile gloves (nonsterile gloves may be worn if the antiseptic applicator is of sufficient length to prevent contact of the gloved hand with the antiseptic solution and the patient's skin).
  - Use sterile supplies to apply the antiseptic.
  - When using a pre-filled antiseptic applicator, follow manufacturer's instructions for maximum and minimum surface area per applicator.
  - Use radiopaque sponges to apply antiseptic when pre-filled antiseptic applicators or pre-packaged sponge kits are not available.
  - Apply the antiseptic to an area large enough to accommodate potential shifting of the surgical drapes, extension of the incision (eg, during conversion of a minimally invasive procedure to an open procedure), potential additional incisions, and all potential drain sites.
  - Apply the antiseptic starting at the incision site and moving toward the periphery of the surgical site.
    - For an incision site that is more contaminated than the surrounding skin (eg, perineum), prep the area with lower bacterial count first, followed by the area of higher contamination, as opposed to working from the incision toward the periphery.
    - When performing procedures with different wound classifications (eg abdominal-perineal) complete two separate surgical site preparations and prep the more contaminated site first.
  - Discard the applicator after contact with a peripheral or contaminated area. Use another sterile applicator for additional antiseptic applications.
  - Apply the antiseptic with care on fragile tissue, burns, open wounds, or malignant areas.
  - Cover all surfaces of the skin in the surgical field (e.g., areas between fingers or toes, when applicable).
  - Take protective measures to prevent prolonged contact with skin antiseptics.
    - Protect sheets, padding, and positioning equipment from dripping or pooling of the skin antiseptic beneath and around the patient.
    - Protect electrodes (e.g., electrocardiogram, electrosurgical unit dispersive electrode) and tourniquets from contact with the skin antiseptic.
    - For the patient in lithotomy position, place a fluid-resistant pad under the patient's buttocks during perineal surgical site preparation.
  - Allow the antiseptic to dry for the full time recommended in the manufacturer's instructions for use before sterile drapes are applied.
- Take protective measures to minimize the risk of fire when flammable antiseptics are used.
  - Do not heat flammable skin antiseptics.
  - Prevent antiseptics from pooling or soaking into linens for the patient's hair by
    - Using reusable or disposable sterile towels to absorb drips and excess solution during application,
    - removing materials that are saturated with the skin antiseptic from the patient care vicinity before the patient is draped, and
    - wicking excess solution with a sterile towel to help dry the surgical prep area completely.
  - Allow time for the antiseptic to dry completely and for any fumes to dissipate before surgical drapes are applied or a potential ignition source is used.
  - Communicate use of flammable antiseptics as part of the fire risk assessment involving the entire perioperative team before the surgical procedure begins.
- At the end of the surgical procedure, remove the skin antiseptic from the patient's skin before application of an occlusive dressing or tape unless otherwise indicated by the manufacturer's instructions for use.
- The perioperative RN will assess the patient's skin for injury after surgery.

- Depending on the patient's condition, a thorough evaluation of the patient's skin may be postponed until the patient is transferred to the postoperative area.
- All personnel will review and follow the skin antiseptic manufacturer's instructions for use and safety data sheets for handling, storing, and disposing of skin antiseptics.
  - Store skin antiseptics in the original, single-use container.
  - Do not dilute skin antiseptics after opening.
  - Discard skin antiseptics in single-use containers after each use and do not refill.
  - Only heat nonflammable skin antiseptics in accordance with the manufacturer's instructions for use.
  - Do not warm skin antiseptics in a microwave oven or steam sterilizer.

## Documentation

- The perioperative RN will document hair removal in the patient's health care record, including
  - person performing hair removal,
  - hair removal method,
  - time of removal, and
  - area of hair removal.
- The perioperative RN will document preoperative patient skin antisepsis in the patient's health care record, including
  - removal and disposition of any jewelry.
  - condition of the skin at the surgical site (e.g., presence of rashes, skin eruptions, abrasions, redness, irritation, burns).
  - antiseptic used.
  - person performing preoperative patient skin antisepsis.
  - area prepped; and
  - postoperative skin condition, including any skin irritation, hypersensitivity, or allergic response to preparation solutions.

## Competency

Perioperative personnel will receive education and complete competency verification activities on preoperative patient skin antisepsis.

## Quality

Perioperative personnel will participate in quality assurance and performance improvement activities on preoperative patient skin antisepsis.

## Glossary

*Antiseptic:* A product with antimicrobial activity that is applied to the skin to reduce the number of microbial flora.

*Iodism:* Poisoning by iodine, a condition marked by severe rhinitis, frontal headache, emaciation, weakness, and skin eruptions. Caused by the administration of iodine or one of the iodides.

*Patient care vicinity:* A space in a location intended for the examination and treatment of patients that extends 1.8 m (6 ft) beyond the normal location of the bed, chair, table, treadmill, or other device that supports the patient during examination and treatment and extends vertically to 2.3 m (7 ft 6 inches) above the floor.



*Preoperative bathing:* A standardized regimen to reduce skin surface pathogens that is performed by showering or bathing/washing with an antiseptic or soap prior to surgical or other invasive procedures.

*Surgical site preparation:* Preoperative treatment of the patient's skin in the operating or procedure room that includes not only the immediate site of the intended surgical incision but also a broader area of the patient's skin.

## References

Guideline for preoperative patient skin antisepsis. In: *Guidelines for Perioperative Practice*. Denver, CO: AORN, Inc.

AORN Syntegrity® Solution. AORN Syntegrity® On-line Companion Guide; 2021.

## Appendix: Facility-Approved Products

### Preoperative Patient Bathing

Unless contraindicated, chlorhexidine gluconate (CHG) is the preferred product for preoperative patient bathing.

### Patient Skin Antisepsis

The following preoperative patient skin antiseptics are approved for use:

- chlorhexidine gluconate-alcohol, or chloraprep
- povidone-iodine alcohol, or duraprep
- aqueous iodine/iodophors (10%), and
- chlorhexidine gluconate (CHG) (4%).
- Chloroxylenol topical

Unless contraindicated Chloraprep-chlorhexidine gluconate-alcohol is the preferred antiseptic for preoperative patient skin antisepsis.

- For vaginal antisepsis, aqueous iodine/iodophor (10%) is preferred. If patient is allergic to iodine, use of 4% **Chlorhexidine gluconate** is preferred.
- For open wounds: iodine/iodophor (10%) is preferred
- For eye antisepsis, 5% povidone-iodine is preferred. If patient is allergic to iodine, use of Chloroxylenol topical around the eye and rinse the eye with warm saline is preferred.