Utilizing Simulation Techniques for Chlorhexidine Gluconate (CHG) Bathing

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Objectives

1. Define the significance of healthcare-associated infections (HAIs)
2. Discuss the use of chlorhexidine gluconate in healthcare to prevent infections
3. Determine when, where, and on whom chlorhexidine bathing is recommended
4. Asses the effects of chlorhexidine bathing in the intensive care units (ICUs), patients with devices, and for surgical prep
5. Perform simulated experiences to reinforce the importance of chlorhexidine bathing to prevent infections

Pre-Brief:

Healthcare-Associated Infections (HAIs)

- **Healthcare-associated infections (HAIs)** occur when a patient suffers from an infection during healthcare treatment or soon after said treatment.
- HAIs are often preventable.
- HAIs can be detrimental, even fatal, to the patient; and, are costly to the healthcare system.

Types of HAIs

- Central Line-Associated Bloodstream Infections (CLABSI)
- Catheter-Associated Urinary Tract Infections (CAUTI)
- Surgical Site Infection (SSI)
- C. difficile Infections
- Methicillin-resistant staphylococcus aureus (MRSA) bacteremia
- Ventilator-associated events (VAE)
- Dialysis related infections

What is chlorhexidine gluconate (CHG)?

- Broad spectrum antiseptic
- Effective against many organisms that live on skin, even Staphylococcus aureus and Enterococcus spp.
- Works actively and has residual effects to continue fighting off microbes
- Decreases the microbial load on the skin
- Can remove/kill germs, but also prevent contamination from the surrounding areas
- Can be in the impregnated wipes (2% CHG) or liquid soap (4% CHG)

Insert annotations as needed

Infection prevention and CHG

- **CHG can be used to prevent HAIs in many ways**:
  - **Daily CHG bathing**
    - Patient populations specifically at risk for developing multidrug resistant organism (MDRO) infections [i.e. methicillin-resistant Staphylococcus aureus (MRSA) bacteremia, and vancomycin-resistant enterococcus (VRE)]
    - MRSA decolonization therapy Post-operative prevention of surgical site infections (SSIs)
    - Patients with medical devices
  - **Surgical preparation**
    - See our presentation on Surgical Site Infections for more information

High Risk Populations where CHG Bathing is Recommended

- **Intensive Care Units (ICUs) in patients >2months of age**
  - NICU has special considerations for surveillance and active decolonization*
- **Patients with medical devices** (i.e. central lines, midlines, lumbar drains)
- **Surgical patients** (done in the form of surgical prep the night before and/or morning of surgery)
  - Per SHEA: “Decolonize surgical patients with an anti-staphylococcal agent in the preoperative setting for orthopedic and cardiothoracic procedures (HIGH). Decolonize surgical patients for other procedures at high risk of staphylococcal SSI, such as those involving prosthetic material (LOW).”

Active Bathing to Eliminate (ABATE) Infection Trial

- Study including 53 hospitals from HCA Healthcare in a cluster-randomized trial
- 12 month period from 2013-2014 (*baseline*) and a 21 month period from 2014-2016 (*intervention*)
- Studied the effect of universal daily CHG bathing and targeted nasal mupirocin* on decolonization of non-intensive care unit (ICU) adult patients with medical devices
- Results
  - 32% decrease in all bloodstream infections
  - 37% decrease in MRSA and VRE cultures

What if my patient has a CHG allergy?

- Be sure to review and discuss allergies with the patient, and provider if needed.
- Follow your facility's protocol for CHG allergy

Intensive Care Units (ICUs)

- **SHEA/IDSA/APIC 2022 Practice Recommendations**
  - Daily CHG bathing for all adult ICU patients

Patients with Devices

- **SHEA/IDSA/APIC 2022 Practice Recommendations**
  - CHG baths to MRSA carriers outside of the ICU with medical devices (central lines, midlines, and lumbar drains)

Surgical Site Infection Prevention

- **SHEA/IDSA/APIC 2022 Practice Recommendations**
  - Decolonize pre-operatively with CHG bath for orthopedic and cardiothoracic procedures.
    - Followed daily CHG baths
  - Targeted decolonization with CHG bathing to known MRSA carriers in surgical units to prevent post-op MRSA infections
- **CDC 2017 Guidelines**
  - Patients should bathe with antimicrobial soap or an antiseptic agent on at least the night before surgery
- **American College of Surgeons (ACS) 2016 Guidelines**
  - Routine pre-op bathing with CHG decrease skin microbial load, but has not shown to decrease SSI*

Steps to properly perform a CHG Bath with 2% wipes

- **Use six cloths by firmly massaging in this order:**
    1. Face, neck, and chest (avoiding eyes and ear canals)
    2. Both shoulders, arms, and hands
    3. Abdomen and then groin/perineum
    4. Right left and foot
    5. Left leg and foot
    6. Back of neck, back and then buttocks
- **Clean any device on the body focusing on the 6 inches closest to the body using a clean section of cloth or a new CHG cloth**
- **Allow CHG to air dry**

Steps to properly performing a CHG Bath with 4% Liquid chlorhexidine

- **One page instruction list should be provided to the patient performing this bath themselves**
  - Use CHG as a body cleanser
  - Wet skin with water, and turn water off
  - Using a wet mesh sponge with CHG-create a foam and firmly massage all over skin in this order
    - Neck, chest, and under women's breasts
    - Back of neck, shoulders, and back
    - Armpits, arms, and hands
    - Abdomen, hips, and groin
    - Both legs and feet
    - Perineum (genitals) last
  - Leave on for 2 minutes prior to rinsing

Additional Considerations

- Using firm massage when CHG bathing ensures the CHG can bind to the proteins on the skin
- Regular soaps and moisturizers may deactivate CHG
- If moisturizer is needed, only use ones that are compatible with CHG

Video Demonstration of Correct CHG Bath with 2% wipes

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Simulation #1:

Correct CHG Bath Simulation

- **After watching the video demonstrating how to correctly perform a CHG bath, select the correct order of wipes to perform.**

Abdomen and then groin/perineum

Left leg and foot

Back of neck, back, and then buttocks

Both shoulders, arms, and hands

Face, neck, and chest

Right leg and foot

Simulation #1: Correct Order

- Face, neck, and chest
- Both shoulders, arms, and hands
- Abdomen and then groin/perineum
- Right leg and foot
- Left leg and foot
- Back of neck, back, and then buttocks

Simulation #2:

Identify which patient requires a daily CHG bath

- 47 y.o. with IJ central line in the ICU ✓
- 3 day old term baby in newborn nursery ✗
- 72 y.o. having a hip replacement ✓
- 86 y.o. having a cardiac stent placed ✓
- 55 y.o. diabetic patient with hx of MRSA ✓
- 29 y.o. post-op appendectomy, med-surg pt, no MRSA hx ✗
- 64 y.o. med-surg pt with a lumbar drain ✓
- 43 y.o. non-ICU pt admitted for IV fluids via peripheral IV ✗

Debrief

- What is the impact?
- How can Human Factors Engineering be applied to this issue?
- What went well?
- What would you change?

Key Take-home Points

- CHG bathing has been shown to prevent HAIs
- CHG bathing is recommended for ICU patients, surgical patients (pre- and post-operatively), and for patients with medical devices
- CHG has active properties, as well as residual effects
- CHG bathing should be done in the proper sequence
- Using firm massage while bathing ensures the CHG can bind to the skin's proteins
- There is a distinct difference between pre-operative CHG bathing and a decolonization protocol

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Insert annotations as needed

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