Infection Prevention with Chlorhexidine Gluconate

Chlorhexidine gluconate (CHG) is a relatively safe, broad spectrum antiseptic that has been used for many years as a topical disinfectant. CHG is now available in a range of healthcare products including mouth rinse, surgical skin preparation, central line dressing, surgical mesh, hand sanitizer and bath wipes.

Depending upon the concentration, CHG is bacteriocidal, fungicidal and virucidal with the exception of non-encapsulated viruses like rotovirus, adenovirus and enterovirus. CHG is not sporicidal so it is not effective against *Clostridium difficile* spores.

CHG reduces mouth and skin flora and it persists for hours. It is used to prevent various types of infections:

- **Pneumonia** – In 2010, the Institute of Healthcare Improvement added CHG mouth rinse to the recommended bundle of interventions to prevent ventilator-associated pneumonia (VAP). This was based on careful review of eleven studies with the conclusion that oral decontamination with CHG is associated with a lower risk of VAP.

- **Surgical Site Infections** – CHG has persistence and remains active when in contact with blood or serum products. Several studies have demonstrated reduced surgical site infections, including Cesarean-section infections, by using a CHG-alcohol skin preparation instead of the traditional providone-iodine preparation. In addition, the Association of Operating Room Nurses (AORN) recommends CHG bathing before surgery for patients undergoing an open, class I procedure. There is evidence that pre-surgical bathing with CHG can reduce surgical site infections by 50 percent or more.

- **Central Line Infections** – In 2011, the Advisory Committee to the Centers for Disease Control and Prevention recommended using a chlorhexidine skin preparation prior to line insertion and using a chlorhexidine-impregnated sponge dressing. The Committee also recommended a daily chlorhexidine bath for patients with a central line. This is based on a study of over 800 medical intensive care unit patients. Results indicated that...
patients bathed with CHG were significantly less likely to acquire a primary blood stream infection than those bathed with soap and water.

- **Organism transmission** – There are numerous studies that support daily bathing of critical care patients to reduce the risk of blood stream infection and to reduce the risk of transmitting multi-drug resistant organisms (MDROs) such as Methicillin-Resistant Staphylococcus aureus (MRSA) and Vancomycin-Resistant enterococcus (VRE). A recent CHG bathing trial conducted on six intensive care units in four academic medical centers had impressive results. MRSA acquisition decreased 32% and VRE acquisition decreased 50%. In addition, VRE bacteremia decreased 73%, and bacteremia in VRE colonized patients dropped 44%. Another large study of CHG daily bathing on general medical units demonstrated a 64% reduction in MRSA and VRE transmission.

There are few adverse reactions to CHG, and that there is currently no evidence of emerging CHG resistance. Carondelet Health Network has embraced the use of CHG to help reduce healthcare-acquired infections. It is used in mouthwash for critical care patients particularly in those that are intubated. It is used as a skin prep before surgery or central line insertion, and it is impregnated in the central line dressing. CHG baths are provided to patients before surgery, and daily CHG baths are provided to all critical care patients and all patients with a central line. For more information, contact your Infection Prevention Department.

**Public Health Alerts**

**Measles**
The CDC has issued a travel warning due to measles outbreak in Europe and urges all travelers to ensure they are immunized. If a patient has symptoms of a fever, cough, red eyes, runny nose, and a red, raised rash and has a history of any recent international travel, measles should be considered. **One case of measles is considered an outbreak.** Immediately place suspect cases in Airborne Isolation, document the time isolation was initiated, and notify Infection Prevention.

**West Nile Virus (WNV)**
West Nile Virus season has begun with mosquito activity reported in Maricopa County. The Health Department’s “Fight the Bite” campaign is underway. Residents are urged to use repellent, wear long sleeves and pants, avoid outdoor activities at dawn and dusk, and to clear standing water where mosquitoes can breed.

The incubation period is 2-14 days and approximately 20% of those infected develop symptoms which include fever, headache, fatigue and occasionally skin rash on trunk, swollen lymph glands and eye pain. About 1 out of 150 people who are antibody positive will develop neuroinvasive disease: meningitis, encephalitis, flaccid paralysis, muscle weakness, ataxia and seizures. People over age 50 are 10 times more likely to develop neuroinvasive disease which has a 9% mortality.

The differential diagnoses include enterovirus, St. Louis Encephalitis, Western Equine Encephalitis, herpes simplex, mycoplasma, coccidiomycosis, tuberculosis and bacterial disease. Patients with acute neurological disease should be tested by ordering WNV IgM in blood and/or cerebrospinal fluid. There is no specific treatment for WNV infection.
References

3. Chlorhexidine gluconate preoperative skin preparation initiated a 100% reduction of incisional Cesarean section infections while other risk factors were evaluated and corrected”, University of MN Medical Center, Poster presented at 2008 Association for Professionals in Infection Control and Epidemiology (APIC) Annual Conference
8. “Effectiveness of chlorhexidine bathing to reduce catheter-associated bloodstream infection in medical intensive care unit patients”, Archives of Internal Medicine, 2007 Oct 22; 167(19):2073-9
10. “Horizontal Reduction of Hospital Acquired Infections in the Intensive Care Unit by Replacing Bed Baths with Chlorhexidine Impregnated Washcloths, Riverside Regional Medical Center, VA. Poster presented at 2011 Association for Professionals in Infection Control and Epidemiology (APIC) Annual Conference
11. “A Bath a Day: Keeping MRSA at Bay”, Stanford University Medical Center, Poster presented at 2011 Association for Professionals in Infection Control and Epidemiology (APIC) Annual Conference

Websites:
1. Institute for Healthcare Improvement: [www.ihi.org/knowledge/Pages/Changes/DailyOralCarewithChlorhexidine.aspx](http://www.ihi.org/knowledge/Pages/Changes/DailyOralCarewithChlorhexidine.aspx)
3. Centers for Disease Control & Prevention: [www.cdc.gov](http://www.cdc.gov)
4. Pima County Health Department: [www.pimahealth.org](http://www.pimahealth.org)