Staphylococcus aureus: HA-MRSA & CA-MRSA

Situation:

Infectious diseases caused by drug-resistant organisms are a major and costly public health problem. Resistant bacterial infections are associated with increased morbidity, prolonged hospital stays, greater direct and indirect costs, prolonged periods during which individuals are infectious, and greater opportunities for the spread of infection to other individuals.

This document will help you and decision makers to better understand the basic infection control principles of controlling the transmission of HA-MRSA in healthcare settings and CA-MRSA in community settings.

Background:

*Staphylococcus aureus,* often referred to as “Staph”, is ubiquitous. It can naturally be found on human skin and mucous membranes without causing infections. Approximately 25% to 30% of the population is colonized (when bacteria are present, but not causing an infection) in the nose with Staph. Methicillin-resistant *Staphylococcus aureus* (MRSA) is a variant of *S. aureus,* which by definition must be resistant to one of the following semi-synthetic penicillins: Methicillin, oxacillin or nafcillin. As such MRSA is resistant to all beta-lactam antibiotics (including penicillins, cephalosporins, and cephamycins) and is often resistant to other classes of antibiotics including aminoglycosides, macrolides and quinolones. Thus, MRSA is not only Methicillin-resistant but also multi-drug resistant as well.

HA-MRSA:

Hospital-Acquired MRSA (HA-MRSA) is the most common of MRSA infections and is generally what most people are referring to when they talk about MRSA infections. HA-MRSA is defined as an infection occurring in a patient in a hospital or other health care facility in whom the infection was not present or incubating at time of admission. The HA-MRSA infection manifests >72 hours after admission to a health care facility or within several weeks after a hospital-based invasive procedure. This includes infections
acquired in the hospital but appearing after discharge, and also occupational infections among staff of the facility.

Today, those who are at greatest risk for HA-MRSA infection include hospitalized patients or those in long-term treatment facilities, and individuals who under surgery, dialysis, or implantation of invasive devices. In other words, people who have weakened immune systems. Once MRSA becomes endemic within a hospital, it is rarely eliminated and may eventually account for 5 – 50% of all nosocomial Staph infections.

**CA-MRSA:**

Staph and MRSA can also cause illness in persons outside of hospitals and healthcare facilities. MRSA infections that are acquired by persons who have not been recently (with the past year) hospitalized or had a medical procedure (such as dialysis, surgery, catheterization) are known as Community-Acquired MRSA (CA-MRSA) infections. CA-MRSA infections are usually manifested as skin infections, such as pimples and boils, and occur in otherwise healthy people.

CA-MRSA is a rapidly emerging public health problem. Clusters of CA-MRSA skin infections have been documented among athletes participating in contact sports, military recruits, IV drug users and prisoners. Factors that have been associated with the spread of CA-MRSA skin infections in otherwise healthy people include: close skin-to-skin contact, openings in the skin such as cuts or abrasions, contaminated items (including shared sports equipment) and surfaces, crowded living conditions, and poor hygiene. However, children and adults have developed CA-MRSA infections without any known risk factors.

**HA-MRSA & CA-MRSA Epidemiology:**

MRSA is transmitted primarily by direct contact with a person who either has a purulent site of infection, a clinical infection of the respiratory tract or urinary tract, or is colonized with the organism (asymptomatic carrier). Person-to-Person contact appears to be the most likely mode of transmission both within healthcare facilities and the community. Transmission by the airborne route is much less likely to occur but may be important in patients with tracheostomies who are not able to control their secretions, in burn units or in dermatology units where aerosolized MRSA may contaminate environmental surfaces.

Colonized and infected patients are the major reservoirs of MRSA. MRSA has been isolated from environmental surfaces including floors, sinks, work areas, sports equipment and medical equipment such as blood pressure cuffs or tourniquets used for blood drawing. Although MRSA has been isolated from environmental surfaces, these are not the most likely source of spread.
Prevention and Control of MRSA using Disinfectants:

Routine cleaning and disinfection of the patient’s surroundings should be done daily to reduce bacterial load. Using a Health Canada approved hospital grade disinfectant with S. aureus and most importantly MRSA claims, bedside equipment such as tables, bed rails, beside commodes, wheelchairs and other assistive devices should be cleaned and disinfected. It is important to note, that not all hospital grade disinfectants contain detergent properties to aid in the cleaning process nor are all disinfectants good cleaners. If the product is not a good cleaner a cleaning step using a detergent before applying the disinfectant should be considered.

Sharing of non-critical equipments (such as thermometers, blood pressure cuffs, and intravenous poles) should be not permitted. If use of common equipment or items is unavoidable, then the equipment must be cleaned and disinfected thoroughly before use on another patient. When a patient has been discharged from a room or no longer has MRSA, terminal cleaning should include changing the bedside curtains.

Careful and disinfection of patient rooms and medical equipment contributes substantially to the overall control of MRSA. Both S. aureus and MRSA are susceptible to several Health Canada registered low- and intermediate-level disinfectants (e.g., alcohols, sodium hypochlorite, quaternary ammonium compounds, phenolics, and hydrogen peroxide based disinfectants) at recommended use dilutions for environmental surface disinfection.

Use of AHP in the Prevention and Control of MRSA:

Accelerated Hydrogen Peroxide when used at the 0.5% concentration is a very good cleaner and is very effective at killing both S. aureus and MRSA. Unlike most disinfectant products, AHP carries a 30-second Broad-Spectrum Sanitizing claim that provides a 5-Log reduction (99.999% kill) against both S. aureus and MRSA even in a soil load. This means that in 30-seconds the surface has been rendered safe to use. Allowing the surface to remain wet for 5-minutes provides a 6-Log reduction (99.9999% kill) required to achieve terminal disinfection.

In Summary:

- S. aureus and MRSA are vegetative bacteria (gram positive cocci)
- HA-MRSA infection is related to hospitalization or invasive medical procedures in a health care facility
- CA-MRSA infection occurs within the community
- **Accelerated Hydrogen Peroxide surface and device products carry a 30-second sanitizing claim and a 5-minute Bactericidal claim against S. aureus and MRSA. You and your clients should have full confidence in its efficacy and ability to inactivate all forms of S. aureus**