

# STATE OF COLORADO

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Colorado Department  
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## Recommendations for Management of Children with Methicillin Resistant *Staphylococcus aureus* (MRSA) in School and Child Care Settings

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### INTRODUCTION

*Staphylococcus aureus* (also referred to as “staph”) is a bacterium that is commonly found in the noses and on the skin of healthy people. When staph are present on or in the body without causing illness we say they are “colonized” with staph. About 25% to 30% of people are colonized with *S. aureus* bacteria at any given time.<sup>1,2</sup> Staph colonization usually occurs in the inside of the nose, or on the skin of the armpit, groin, or genital areas. Sometimes, these bacteria can get through the skin barrier, such as through a cut or scrape, and cause a skin or soft tissue infection. Although most infections are not severe, staph can sometimes cause more serious illness such as bloodstream or lung infections.

Over time, certain staph bacteria have developed resistance to antibiotics that were successfully used in the past to treat staph infections. This resistant form of staph is called methicillin- resistant *Staphylococcus aureus* or “MRSA” and is resistant to the penicillins and the cephalosporins. Resistance means that those antibiotics and other similar antibiotics will not work to treat MRSA infections. MRSA was first identified in the United States in the late 1960s and until more recently has primarily been seen in association with hospitals and long-term care facilities (such as nursing homes).

Since the late 1990s, MRSA colonization and infection have been increasingly seen among healthy people in the community who have not been in the hospital or other healthcare facilities. It appears that these people have acquired MRSA in the community, rather than in a healthcare setting. Compared to the more typical hospital-associated MRSA infections, these community-associated MRSA infections occur in any age group and usually cause skin and soft tissue infections. Persons colonized with MRSA might be more likely to develop infections than persons colonized with more susceptible forms of staph, and the infections might be more severe.<sup>3</sup> Infections caused by MRSA can be more difficult to treat because there are fewer effective antibiotics to use. Data from a 2001-02 national survey indicated that approximately 1% of the population might be colonized with MRSA at any given time,<sup>1,2</sup> although some recent data indicates this figure might be higher, and likely varies depending on the patient population.

## COLONIZATION AND INFECTION

Most people with staph including MRSA are only colonized, that is, the bacteria are present in or on the body but are not causing illness or infection. When a person gets an infection, the symptoms differ depending on the part of body that is infected. Skin infections typically result in local redness and warmth of the infected area with or without pus. Localized infections include boils, impetigo, and wound infections. Sometimes they can resemble spider bites. Most infections are uncomplicated, but staph bacteria can get into the bloodstream and other body sites and then cause more severe illness. If persons with suspected staph infection do not improve with treatment, they should be encouraged to return to their healthcare provider.

## HOW MRSA AND STAPH SPREAD

MRSA and other staph are usually spread from one person to another by direct skin-to-skin contact or contact with a contaminated item (such as towels or bandages) used by someone with MRSA on their skin. Persons who have draining skin infections are more likely to spread MRSA. Although staph are not usually spread through the air, certain procedures such as suctioning a person with a tracheostomy might spread these bacteria to persons within a few feet who are not wearing personal protective equipment.

## GENERAL PREVENTION STRATEGIES TO LIMIT THE SPREAD OF MRSA

**NOTE: Although this document focuses on MRSA, these strategies are effective in the prevention of spread of many infectious diseases.**

A. Hand hygiene is the most effective method of preventing the spread of staph and other infectious diseases. Students, children in child care, and school and child care personnel should wash their hands regularly. School and child care personnel should wash their hands and those of a young child after sneezing, blowing or touching their nose, or wiping a child's nose; before and after close contact with another person; after using the toilet; before and after assisting a child with toileting or changing a child's diapers; before and after eating, handling food and food utensils, and administration of medication; after handling animals; when coming in from outdoors; after cleaning activities or handling soiled items; when arriving at child care or school, and before leaving or after arriving home after child care or school; and any other time hands become soiled.<sup>4</sup> Children should be educated in proper hand-washing techniques. *According to the Rules and Regulations Governing the Health and Sanitation of Child Care Facilities in the state of Colorado (6 CCR 1010-7)*, in child care settings, alcohol-based hand sanitizers should not be used in place of hand washing and should only be used for children  $\geq 3$  years of age and in situations where hand-washing facilities are not available.<sup>4</sup> Alcohol-based hand sanitizer should only be used under supervision and kept out of the reach of children.

Proper hand-washing procedure:

- 1) use warm running water
- 2) wet hands and wrists
- 3) use a bar of soap or thumbnail size of liquid soap and work soap into a lather washing between the fingers, under fingernails, and up to wrists for at least 15 seconds
- 4) dry hands thoroughly and turn off faucet using a clean cloth or paper towel

If alcohol-based hand sanitizer is used (such as in a school setting), the proper procedure for use is as follows:

- 1) apply product to palm of one hand
- 2) rub hands together, covering all surfaces of hands and fingers, until hands are dry
- 3) follow the manufacturer's recommendations regarding the volume of product to use

B. Other steps to prevent the spread of MRSA in the school or child care setting:

- Children with open or draining wounds or skin sores should keep them covered with bandages and a layer of clothing (if possible).
- Towels and other personal care items should not be shared.
- When clothing or linen is soiled with body fluids from a child known to be infected or colonized with MRSA, the item should be washed at home using the hottest water possible (or if cooler water temperatures are used, use a detergent appropriate for that water temperature) and dried on the hottest setting possible.
- Clean and disinfect surfaces, equipment, or any part of the activity area that comes in contact with an open wound or other potentially colonized/infected body fluids before anyone else comes in contact with the surface or item. Use either:
  - Environmental Protection Agency [EPA]-registered commercial disinfectant with a label claim for *Staphylococcus aureus* used according to the manufacturer's instructions<sup>5</sup> ; or
  - Fresh (daily) solution of diluted bleach (1/4 cup of household bleach to one gallon of water).
- ***Rules and Regulations Governing the Health and Sanitation of Child Care Facilities in the state of Colorado (6 CCR 1010-7)*** state that toys in child care facilities that are not contaminated with body fluids should be cleaned and sanitized at least once a week, when visibly soiled, and when mouthed by a child.<sup>4</sup> If toys come into contact with body fluids, such as wound drainage, toys should be disinfected and rinsed (or disinfected followed by a wash-rinse-sanitize step) prior to use by another child. In classrooms with children known to be colonized or infected with MRSA, consideration should be given to disinfecting and rinsing toys on a more frequent basis (e.g. daily). In some cases, dedicated toys or objects may be considered. *NOTE: if used as a sanitizer, household bleach should be mixed at one tablespoon per gallon of water; if used as a disinfectant, household bleach should be mixed at 1/4 cup per gallon of water.*
- School personnel expecting to come into contact with open wounds or sores (such as when changing a bandage) should wash their hands, wear disposable non-sterile gloves during the task, and wash hands again after removing gloves. Gloves should be removed and discarded immediately after the task is complete and prior to touching anything else. Gloves should not be washed or reused.
- If spraying/splashing of contaminated body fluids might occur, such as during the suctioning of a child with a **tracheostomy**, non-sterile disposable gloves, a disposable gown (or apron that covers the front), mask, and eye protection (e.g., goggles) should be worn. Wash hands before putting on and removing gloves. Gloves should not be washed or reused. In most cases when performing **oral** suctioning, gloves alone are sufficient, unless spraying or splashing is expected to occur (such as with coughing).
- Soiled trash such as gloves, bandages, dressings, disposable gowns, etc. should be disposed of in a sealed plastic bag or a covered trash receptacle.

## **SPECIFIC RECOMMENDATIONS FOR MANAGING CHILDREN WITH MRSA IN SCHOOL AND CHILD CARE SETTINGS**

Healthcare personnel in school and child care settings, when available, should be involved in the management and placement of children with MRSA in these settings.

### **I. Children known to be colonized with MRSA in the nose or on the skin**

- These children do not need to be excluded from the school/child care classroom.
- General prevention strategies listed above should be followed, and basic hand hygiene among children and staff should be emphasized.

### **II. Children known to have MRSA in draining wounds or skin sores**

- Children with draining wounds or open skin sores should keep them covered with bandages and a layer of clothing (if possible).
- If wounds/sores can be covered and contained, these children do not need to be excluded from the school or child care setting. Exclusion from school or child care should be considered **only** if the wounds/sores cannot be covered and contained, and the dressing maintained intact and dry.
- Staff members who perform dressing changes in the school or child care setting should use gloves. Hands should be washed before putting on gloves and after removing gloves. Gloves should be discarded prior to touching any other surface and should not be washed or reused. Surfaces that become soiled from the wound should be immediately cleaned and disinfected before any other person comes in contact with the area.
- General prevention strategies listed above should be followed. Basic hand hygiene among children and staff should be emphasized.

### **III. Children known to be colonized with MRSA in a tracheostomy site**

- These children should **not** routinely be excluded from school or child care settings. Consideration should be given to excluding a child when there is a change from his/her normal respiratory status or sputum production (such as an increase in secretions, an increase in the frequency of suctioning, a change in the color of secretions or an increasing cough) until signs and symptoms resolve, adequate therapy has been completed, and/or the child's medical provider approves return to the classroom.
- Suctioning should be performed at a distance from other persons in the classroom or in another room. ***Staff members performing the suctioning should wear gloves, a disposable gown (or apron that covers the front), mask, and eye protection such as goggles.*** Hands should be washed before donning gloves and after removing gloves, and gloves should be discarded prior to touching any other surface. Do not wash gloves or attempt to reuse them.
- Surfaces that become soiled from respiratory secretions should be immediately cleaned and disinfected before any other person comes in contact with the area.
- General prevention strategies listed above should be followed, and basic hand hygiene among children and staff should be emphasized.

#### **IV. More complex situations can be assessed on a case-by-case basis in conjunction with the local or state health department and pediatric infectious diseases or infection control specialists.**

Healthcare personnel in school and child care settings, when available, should be involved in case-by-case assessments, taking into account factors such as specific needs or characteristics of the child; the classroom setting; the number and types of children; classroom staffing; and the ability of the program to implement precautions that need to be taken to minimize the risk of transmission.

Considerations for more complex situations:

- 1) What is the site of colonization or infection?
- 2) Does the child have an assigned personal assistant?
- 3) If there is a personal assistant, is the staffing one-to-one?
- 4) What are the specific needs or characteristics of the child?
- 5) Is the child mobile or wheel chair bound?
- 6) What type of classroom setting is involved?
- 7) What are the numbers and types of children in the classroom?
- 8) Are there children with severe immune suppression (such as cancer chemotherapy with low white blood cell count or HIV infection with low CD4 count) or other risk factors for infection (such as central lines) in the classroom?
- 9) What is the ability of the program to implement the precautions listed above?

Questions can be addressed to the Colorado Department of Public Health and Environment, Communicable Disease Epidemiology Program at 303-692-2700 or your local health department.

#### **REFERENCES**

- 1) Graham PL, Lin SX, Larson E. A US population-based survey of *Staphylococcus aureus* colonization. *Ann Int Med* 2006;144:318-25.
- 2) CDC. Community-associated MRSA information for the public. Available at: [http://www.cdc.gov/ncidod/dhqp/ar\\_mrsa\\_ca\\_public.html](http://www.cdc.gov/ncidod/dhqp/ar_mrsa_ca_public.html). Accessed October 19, 2007.
- 3) Siegel JD, Rhinehart E, Jackson M, Healthcare Infection Control Practices Advisory Committee (HICPAC). Management of multidrug-resistant organisms in healthcare settings, 2006. Available at: <http://www.cdc.gov/ncidod/dhqp/pdf/ar/mdroGuideline2006.pdf>. Accessed October 19, 2007.
- 4) Colorado Department of Public Health and Environment, Consumer Protection Division. State Board of Health Rules and Regulations Governing the Health and Sanitation of Child Care Facilities. 6 CCR 1010-7. Available at: <http://www.cdphe.state.co.us/regulations/consumer/101007childcaresanitarystandards.pdf>. Accessed November 12, 2007.
- 5) Selected EPA-Registered Disinfectants. Available at: <http://www.epa.gov/oppad001/chemregindex.htm>. Accessed October 31, 2007.

#### **OTHER RESOURCES**

Colorado Department of Public Health and Environment, Consumer Protection Division. State Board of Health Rules and Regulations Governing Schools. 6 CCR 1010-6. Available at: <http://www.cdphe.state.co.us/regulations/consumer/101006schools.pdf>. Accessed November 12, 2007.