Guidelines for management of University of Georgia Veterinary Teaching Hospital patients with active confirmed methicillin resistant staphylococcal (MRS) infection

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IMPORTANT NOTE: Although the following recommendations are intended to help prevent dissemination of methicillin-resistant staphylococci (MRS) from infected patients, it is important to remember that animals and humans with no signs of disease can shed MRS inapparently. In addition, animals may be clinically infected with MRS but their status as such, may not be determined for several days while in the hospital or as out patients. Common sense practices to limit infectious disease transmission, such as hand washing after handling patients, avoiding unnecessary contact with patients, and preventing contact of clothing and fomites between patients, should always be observed to prevent unintended transmission of MRS from inapparent sources.

Background

Staphylococcus aureus and other species of coagulase negative staphylococci, often referred to simply as "staph," are commonly carried on the skin or in the nose of healthy humans and animals. *S. aureus* is carried asymptomatically by 25-30% of the human population, with approximately 1-3% of the human population carrying methicillin resistant *Staph. aureus* (MRSA) asymptomatically. In the United States approximately 80% of community-onset skin and soft-tissue infections in people are caused by MRSA. Methicillin resistance means that these bacteria are resistant to all beta-lactam antimicrobials, including cephalosporins; even when beta-lactams are used in combination with potentiators such as clavulanic acid.

Some reports show that *S. aureus* is carried asymptomatically by up to 14% of the canine population, with MRSA carriage rates in canines ranging from 0 - 1.5%. Resistance rates to clindamycin, erythromycin and the fluroquinolones for canine MRSA are high. Some reports show that MRSA is carried asymptomatically by 0 - 4.7% of the equine population on horse farms, and 2.9 - 16% in equine veterinary clinics or hospitals. Equine origin MRSA show high frequencies of resistance to erythromycin, gentamicin, tetracycline, and trimethoprim/sulfamethoxazole.

In humans methicillin resistant staphylococcal (MRS) species other than *Staph. aureus* (such as *Staph. epidermidis*) and other coagulase negative staphylococci are less likely to cause disease; however, they can infect surgical wounds, cuts or scrapes, making these wounds more difficult to treat.

In dogs the main pathogenic methicillin resistant staphylococcus is *S. pseudointermedius* (MRSP). MRSP is known to colonize people transiently when shed in large quantities by dogs with dermatitis. After the disease resolves carriage also resolves. Nevertheless, infection with MRSP in people, although not common, has been documented. Relative prevalence of MRSP in humans may be unclear due to morphological similarities between MRSP and MRSA. MRSP is

becoming increasingly multi-drug resistant in Europe and the United States. In addition to beta-lactams, it is frequently resistant to gentamicin, tetracycline, macrolides and lincosamides, and trimethoprim/sulfamethoxazole.

It is useful to remember that MRS may be isolated from healthy individuals with no signs of disease; this is considered "carriage" or "colonization", and is distinguished from "infection", wherein the MRS is causing signs of disease.

For more information on MRS in humans and animals, see the AVMA publication "Methicillin resistant Staphylococcus aureus Backgrounder", dated June 24, 2009 (available on the Infectious Disease Committee website).

Fundamental principles of control of infectious disease transmission in veterinary hospitals underlie these recommendations for managing patients with MRS. For a review, see "Compendium of Veterinary Standard Precautions for Zoonotic Disease Prevention in Veterinary Personnel", *J Am Vet Med Assoc* 2008, 233:416-432 (available on the IDC website).

When should MRS infection in a patient be suspected?

1. Animals with purulent lesions (dermatitis / pyoderma, otitis, surgical wound, others).
2. When an antibiotic susceptibility report shows a *Staphylococcus* isolate resistant to oxacillin (a marker for methicillin resistance).

Note: The Athens Veterinary Diagnostic Laboratory routinely performs a panel of tests on all oxacillin-resistant *Staphylococcus* isolates from the VTH to determine true MRS status. These results will lag behind the preliminary culture report by several days. **If a report of an oxacillin-resistant *Staphylococcus* infection is received, or if an animal has clinical signs consistent with MRS infection, the clinician should contact their departmental Infectious Disease Officer to inform them of the presence of the patient in the clinic.** Guidelines for patient management are listed below.

Protocol for patients received by the VTH with known active confirmed MRS infections

1. Animals with active confirmed MRS infections (e.g., cases confirmed by culture by the RDVM) should not be brought into the public receiving area or have contact with people other than their owners and VTH staff as needed. Animals with confirmed or suspected MRS infections should not have contact with other animals in the hospital. Inform clients of this policy prior to visit; educate clients regarding the risks of transmission to other animals and potentially to people.

2. The animal should be taken directly to an exam room, and the student and clinicians should go directly to the exam room for the office call.

3. If the animal is to be admitted, a plan should be made prior to admission regarding where animal will be housed in the clinic.

4. If the animal will be treated as an outpatient, the animal may remain with the owner if possible, or may be housed in a cage or stall (see guidelines below) while awaiting a procedure.

a. Allow the animal and owner to stay in the examination room while they wait OR

b. House the animal in a cage or stall with appropriate signage ("Suspected or confirmed MRS infection, only clinician and student to handle").

Protocol for hospitalized animals with active confirmed MRS infections

1. Limit the people that handle the animal to the attending clinician and student as much as possible.

2. Restrict caregivers to those that are healthy and not at increased risk for opportunistic infections.

3. Do not house affected animals between animals that do not have MRS infections. Consider housing MRS suspect animals in isolation if barrier nursing is not practical in other wards.

a. Animals with MRS should have their own rectal thermometers. DO NOT use rectal thermometers used for these animals for any other animals. When the infected animal goes home, please discard the thermometer in a labeled biohazard bag using care not to contaminate the outside of the bag.
b. Keep the animal housed in one cage or stall.
c. Use common sense when moving the animal around the hospital. For example, do not allow contact with other animals, and do not allow people to pet the animal. Immediately pick up and discard any feces from the animal.
d. If the animal must be handled in diagnostic imaging, endoscopy, or another area, use appropriate barrier precautions as outlined below. Such procedures should occur at the end of the day when possible. Clean and disinfect all areas with which the animal had direct contact using protocols as for cleaning isolation. Once an area is disinfected, no "down time" is needed.

4. Use appropriate barrier precautions when handling the animal for diagnostic procedures.

a. Wear a gown, gloves, and shoe covers upon entering the animal's cage or stall. These are to be removed upon leaving the cage or stall.
    i. While wearing gloves, do not write on the patient's record, treatment sheet or on anything else. Do not touch/use pagers, cell phones, PDAs, etc. until gloves are removed and hands are washed.
    ii. Do not allow long hair or jewelry to come in contact with the patient.
b. Wear a mask and eye protection if contaminating material is likely to be splashed or aerosolized (e.g. wound flushing, coupage, urinary catheter management).
c. If a stethoscope is used to examine the patient, wipe it with soap and water, and then apply 70% ethanol, and let it dry. It is preferable that a committed hospital stethoscope be assigned for use on patients with MRSA.
d. Wash hands with antibacterial soap and apply an alcohol gel immediately after handling the animal.

e. Use disposable bedding for the animal (e.g. large green pads instead of towels and blankets for small animal patients).
f. Use a separate biomedical waste bag for disposable materials (bedding material, gloves, gowns, and other disposable material coming in contact with the animal). These bags should be taken to Central Services for disposal as potentially infectious waste (same protocol as used for disposable materials from isolation) after the animal is discharged.
g. Place sharps from the animal in standard sharps containers.
h. Clean and disinfect the table in the examination room (for small animals) and any other areas with which the animal has come into direct contact, along with the cage or stall in which the animal was housed when the animal leaves the clinic.
i. Once an area is cleaned and disinfected, no "down time" is required before use by another patient.

Note: once an animal has been treated for MRS infection and clinical signs associated with infection have resolved, it may be advisable to determine if the animal is colonized with MRS. This may be accomplished by collecting nasal and rectal swabs and submitting them to the Athens Veterinary Diagnostic Laboratory for **screening** culture. On the request, note site of resolved infection and accession number of related previous submissions. To submit nasal swabs for screening culture, use a sterile culture swab to swab 0.5 cm into each nostril; (for cats and very small dogs, the swab may be rubbed along the outside of the external nares), and submit to the bacteriology service at the Diagnostic Laboratory. For rectal swabs, insert swab 0.5 – 1.0 cm into rectum. Note on the form that the swab is being submitted to **screen** for methicillin resistant *Staphylococcus*. Please contact your department Infectious Disease Officer or a member of the IDC with questions.

References

Compendium of Veterinary Standard Precautions for Zoonotic Disease Prevention in Veterinary Personnel. *J Am Vet Med Assoc* 2008, 233:416-432.

Guidelines for VTH patients with active or suspected MRS infection. Purdue University School of Veterinary Medicine. 2009.

Methicillin resistant *Staphylococcus aureus* Backgrounder. American Veterinary Medical Association. June 24, 2009.

National MRSA Education Initiative: Preventing MRSA Skin Infections. Centers for Disease Control. www.cdc.gov/mrsa

Protocol for Patients with Resistant Bacterial Infections (including MRSA). University of Georgia Veterinary Teaching Hospital. October 2008.