EXCELLENCE IN DERMATOLOGY™

CONTROLLING METHICILLIN RESISTANT STAPHYLOCOCCUS INFECTIONS IN VETERINARY FACILITIES: A GUIDE FOR VETERINARIANS, TECHNICIANS AND STAFF FOR CONTROLLING METHICILLIN RESISTANT STAPHYLOCOCCUS INFECTIONS

WHAT ARE THE BACTERIA INVOLVED IN METHICILLIN RESISTANT STAPHYLOCOCCUS (MRS) INFECTIONS IN ANIMALS AND WHAT ARE THE ZOONOTIC RISKS FOR EACH SPECIES? It is important to have the laboratory identify the species of Staphylococcus cultured, as the zoonotic potential is different depending on the species isolated.

Staphylococcus aureus is a human source bacteria carried primarily in our anterior nares and on hands. Overall this bacterium is a rare cause of infection in animals. Cats and less commonly dogs may carry S. aureus as part of their normal skin and mucosal bacterial flora.[1,2] Approximately 30% of people carry S. aureus in their nose, and 1.5% of people carry methicillin resistant S. aureus.[3] Small animal veterinarians are at 3X increased risk for nasal carriage of methicillin resistant S. aureus, with a 4.4% carriage rate.[4] **Methicillin resistant *S. aureus*, or MRSA** (often called "Mersa"), can be spread from people to pets (this is called reverse zoonoses or anthroponosis). Examples of reverse zoonotic MRSA infections include a dog that develops MRSA as a post-surgical infection from the surgeon's hands or a pet that becomes infected with either skin or urinary tract infections from their owner who has recently been hospitalized or who works in a health care field. Colonized or infected pets can then act as a reservoir for colonizing or infecting people, especially if the people are immunosuppressed. According to Dr. David Aucoin, chief technical officer of Antech, in 2010 only 2% of S. aureus pyoderma cultures and 3% of S. aureus wound cultures from small animals in general practice were methicillin resistant.[5] Pets with MRSA should be isolated in the veterinary hospital.

Staphylococcus pseudintermedius is a dog or cat source bacteria found in cases of pyoderma, otitis, and wound infections. This is by far the most common cause of Staphylococcus infections in pets and is much more common than S. aureus. Overall, the majority of S pseudintermedius bacteria are still sensitive to most commonly used beta-lactam antibiotics. **Methicillin resistant *S. pseudintermedius* or MRSP**, sometimes called "Mersud", is the most common species of methicillin resistant Staphylococcus that we see in small animals. According to Dr. David Aucoin from Antech, in 2010 18% of S. pseudintermedius pyoderma cultures, 10% of S. pseudintermedius wound cultures and 8% of S. pseudintermedius otitis cultures from small animals in general practice were methicillin resistant.[5] MRSP are often multi-drug resistant. Dogs and cats with MRSP are much less likely to spread infection to people unless the people are immunosuppressed. Uncommonly, people who have close contact with their infected pets can become asymptomatically colonized with MRSP.

Staphylococcus schleiferi subsp. coagulans, a coagulase positive bacterium, less commonly causes pyoderma and otitis in dogs and cats. This bacterium only very rarely causes human infection. **Staphylococcus schleiferi subsp. schleiferi** is a coagulase negative bacterium, and thus may be reported erroneously by the diagnostic laboratory as "non-pathogenic" if the lab fails to speciate out the bacteria. This bacterium uncommonly causes pyoderma and otitis in dogs (approximately 10% of total number of Staphylococcus in 52 dogs with inflammatory skin disease)[2] and cats (4% of total number of

Staphylococcus in 48 cats with inflammatory skin disease)[1], but has high levels of methicillin resistance. However, it tends not to be as multi-drug resistant as MRSP. This bacterium is part of the normal axillary flora in people and can cause post-surgical skin and soft tissue infections. Zoonotic infection from S. schleiferi spp. is extremely rare.

HOW DO I PREVENT THE SPREAD OF MRS INFECTIONS IN MY HOSPITAL AND IN MY PATIENTS? The most cost-effective method is to have a formal infection control program. It is safest to treat all dogs and cats with pyoderma, wound infections or post-surgical infections as if they have methicillin-resistant Staphylococcus infections. Make sure all staff are trained and informed. There should be clear written protocols for each work area and piece of equipment so every staff member knows when to clean, how to clean and what to clean it with, including which product to use and at what dilution. Let all veterinary staff know when a known MRS infected animal is in the hospital to make sure that patient isolation and barrier nursing precautions are taken. This can be accomplished by putting a yellow collar on the pet and warning signs or labeled stickers on the cage, exam room, and chart.

WHAT SPECIFIC HYGIENE PRECAUTIONS SHOULD I TAKE TO PREVENT SPREAD OF INFECTION? All patients w/ pyoderma, open wounds, abscesses, and draining lesions should be treated as if they have MRS. Cover open wounds and draining skin lesions. MRS is cultured from everything you touch, so wash your hands including under your nails for 20 sec and use wall-mounted alcohol- based hand sanitizers (Avagard-3M is a highly recommended brand) before and after patient exams, in between patients, and before and after putting on gloves, which should be worn during all examinations of pets with pyoderma. Have wall-mounted hand sanitizers outside each exam room, in the treatment room and in other convenient areas to prevent them from "walking away." You should not have to touch anything to get to a sink or hand sanitizer. Gel pouches of hand sanitizer can be clipped onto uniforms for easy reach during the day. Wash your hands before putting on sterile gloves especially when inserting indwelling urinary catheters, central venous or peripheral vascular catheters.

HOW DO I PREVENT TRANSMISSION OF MRS INFECTIONS FROM ANIMAL TO ANIMAL? We can try to prevent transmission of animal to animal MRS infection by vigorous hand washing, isolation of all suspected cases, and widespread and frequent environmental disinfection.[6]

Outpatients: Try to schedule suspected or known MRS patients as the last cases of the day. If possible, prevent these cases from waiting in the main waiting room. Keep the pet in the car if weather allows, then when the veterinarian is ready to see them have the owner carry small dogs directly into the exam room or place protective booties on the larger pet's paws and take the pet directly to a dedicated isolation room on a transport cart. The transport cart and scale should then be thoroughly disinfected. Use dedicated thermometers, stethoscopes, and leashes and use disposable items when possible. In the exam room, consider having a separate sterilized pack of diagnostic tools for the MRS patient including: a skin scraping blade, spatula, otoscope cone, flea comb and clipper blade.

Inpatients: Isolate hospitalized pets with MRS infections and use barrier nursing practices such as gowns, gloves, protective eyewear and footwear, antibacterial foot baths, and separate stethoscopes and thermometers. Laundry items from the infected pet should be kept separate and washed with hot water

and bleach.

HOW DO I PREVENT TRANSMISSION OF MRS INFECTIONS FROM ANIMALS TO PEOPLE? In addition to regular hand washing and application of hand sanitizers, veterinarians and practice staff should wear clean protective lab coats or uniforms changed daily with bare arms up to the elbow, tied back hair, no neck ties for men and no jewelry. Uniforms and lab coats should be changed after close handling of a pet with MRS. Wear gloves, masks, eye protection, and disposable aprons for contact w/ infected wounds, body fluids, and contaminated materials.

HOW SHOULD I CLEAN MY HOSPITAL AND EQUIPMENT TO KILL MRS? Regular hospital disinfection is important. Physical cleaning of soiled surfaces with hot water and detergent is a vital first step. MRS can be killed by most common hospital disinfectants such as diluted bleach or dimethyl ammonium chloride-containing products. A newer disinfectant category is the accelerated hydrogen peroxides (AHP) such as Accel TB (virox.com, anivaxfirst.com). These AHP products are environmentally "green", safe and effective against MRS with only a 1 min contact time, and are recommended by infection control specialists. They come in wipes, ready-to-use sprays and dilutable concentrates for larger areas. In addition to commonly disinfected areas like exam tables, pet transport carts, floors, the inside of cages, food and water bowls and kennel runs--consider regular cleaning and use of antibacterial wipes on high hand touch items that are less commonly cleaned but often have the most bacteria. These would include stethoscopes, thermometers, IV pumps, door and drawer handles, and faucet knobs. Otoscope handles, clipper handles and microscope knobs should be wiped down with disinfectant wipes after using. Clipper blades should be removed, disinfected and replaced with freshly cleaned blades after using on a MRS positive patient. Don't forget to use disinfecting wipes to wipe down your desk surface, computer keyboards, mice, pens, office phones, cell phones, iPads, and PDA's- these are loaded with Staphylococcus bacteria. MRSA can live for weeks-months on surfaces, up to 1 year in hospital dust.[7] **Wormsandgermsblog.com** has excellent links to infection control protocols for veterinary hospitals.

HOW CAN I PREVENT TRANSMISSION OF MRSA INFECTION DURING SURGERY? Strict asepsis during surgery including a thorough hand and nail scrubbing with a cleaning and disinfectant agent followed by sterile gowning and gloving as well as wearing caps, masks, and booties is most important in preventing transmission of MRSA from the colonized surgeon or assistant to the pet. The surgical suite should not be used for other procedures besides sterile surgery and traffic through this area should be minimized and limited to essential personnel. Should we be screening our veterinary surgeons, staff and patients routinely for MRSA colonization? This is done on admittance in some human hospitals and this procedure has lessened MRSA infection rates. With good hand hygiene there is only a small risk of transmission of MRSA from colonized individuals to animals or people.

WHAT GUIDELINES DO I GIVE MY CLIENTS WITH PETS THAT I HAVE CULTURED MRS FROM? We know that people love to kiss their pets on the face and many people sleep in bed with their pets. In 1 study, people in close contact with a patient with MRSA were 7.5X more likely to be colonized by the bacteria than casual contacts.[8] Pets would fit the definition of a close contact for many people. This can be a concern for the transfer of MRS infections from people to pets and back again. Here are some recommendations from informational hand-outs that can be printed out from **wormsandgermsblog.com**

for pet owners when their pet has been diagnosed with a MRS infection:

- Don't allow pets to lick your face, and avoid touching your pets' nose, mouth, and rear end
- Wear gloves, and your wash hands before and after treating your pet or touching infected of the skin
- Cover open wounds on pets
- Young children, elderly, and immunosuppressed people should avoid close contact with infectedpets
- Walk dogs away from other pets, and dispose of the feces, as MRS can be spread in this way
- Wash pet bedding, collars and pet clothing daily to every other day

Pet owners should inform veterinarians, pet boarding personnel and groomers of their pet's positive MRS status so that the proper precautions can be taken, and should bathe their pet with a 3-4 % chlorhexidine shampoo before the appointment to reduce bacterial carriage.

ARE THERAPY DOGS AT INCREASED RISK FOR MRSA COLONIZATION FROM PEOPLE IN HEALTH CARE FACILITIES? This is a frequently asked question from veterinarians and support staff, many of whom are involved with therapy dog work with their own pets. In a 2009 study[9] 7/ 116 dogs (6%) developed MRSA colonization after an average of 2X /week (minimum 2X / mo.) for 1 year visits to human health care facilities. These pet therapy dogs that visited human health care facilities had a 4.7X increased risk of MRSA colonization vs. those dogs that visited schools or non-healthcare-related facilities. So dogs that visit nursing homes or hospitals have an increased risk for MRSA colonization.

WHAT ARE SOME INFECTION CONTROL STRATEGIES FOR MRS FOR THERAPY DOGS? The following recommendations come out of the same study: [9]

- The pet should be bathed with an antibacterial shampoo before and after visits.
- Don't allow the pet to lick the patients' face and nose, and patients should not touch the pet's nose, mouth, and rear end.
- Patients should wash hands, use hand sanitizer before and after touching the pet.
- As hard as this is, patients should not feed pets treats
- Pets should stay off patients' beds
- If the pet is allowed on the bed, a barrier pad should be placed between the pet and the bed and patient
- Any IV's or open wounds should be covered, and the pet should not have contact with these areas
- Pet owners should wash their hands, and should use hand sanitizer before and after visits

SUMMARY FOR INFECTION CONTROL STRATEGIES FOR MRS In summary, veterinarians and pet owners should aim to follow the British Small Animal Veterinary Association guidelines to help prevent and control MRS including: Scrupulous hand hygiene, a clean hospital and home environment, prudent antibiotic use, and compliance with all of the above.

WHERE CAN I READ MORE ABOUT INFECTION CONTROL STRATEGIES FOR MRS? Useful information on controlling MRS in veterinary practice:

- British Small Animal Veterinary Association - www.bsava.com
- Federation of European Companion Animal Veterinary Associations- www.fecava.org
- wormsandgermsblog.com
- pets-mrsa.com (UK)

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