



Practices for Prevention of Methicillin-Resistant *Staphylococcus aureus* (MRSA) in Chronically-Instrumented Animals

- 1.0 Purpose:** To outline procedures and personal protective equipment (PPE) required in laboratory areas containing chronically-instrumented non-rodent animals to prevent the spread of Methicillin-Resistant *Staphylococcus aureus* (MRSA). This policy is intended to prevent the transmission of MRSA between personnel and animals, (primarily to protect the animals from contracting infections from personnel though animal to human transmission can also occur) to prevent transmission between individual animals, and to contain any infections that may occur.
- 2.0 Scope:** All animal use areas within the University of Wisconsin Madison containing chronically-instrumented non-rodent animals and all personnel that have contact with these animals or areas are included in this policy. Chronically-instrumented rodents and applicable areas are not included in this guidance because these species are generally housed in containment caging that already provides adequate microbial isolation for these animals.
- 3.0 Definitions:**
- Chronically-Instrumented Animal- any non-rodent animal with a permanent or semi-permanent percutaneous implant; e.g. an implant that partially extends outside of the body not allowing the skin to make a complete barrier, potentially providing the opportunity for infection.
 - Clothing: non-disposable garments worn to cover the body or feet (including shoes); may be an employer-provided dedicated uniform or personally-provided street clothing. Acceptable clothing and footwear should not have holes, tears or rips which may expose skin.
 - PPE- Personal Protective Equipment: includes disposable and reusable equipment used to protect personnel from biological, chemical or physical hazards. Includes items such as lab coats, gloves and eye protection. Can also be used to protect the subject (i.e. animals) from biological hazards generated by personnel (i.e. respiratory secretions, skin microflora).
- 4.0 Guidance Information:** Methicillin-Resistant *Staphylococcus aureus* (MRSA) is a bacterium that commonly colonizes humans and does not usually cause infection in healthy individuals. The methicillin resistant varieties of *S. aureus* have acquired resistance to commonly used beta-lactam antibiotics, such as penicillins and cephalosporins. This resistance has led to concerns in the treatability of hospital acquired infections. Immunocompromised individuals are more susceptible, and surgery or other trauma that compromises the skins natural barrier also increases the risk of infection with MRSA. The species of concern in the laboratory environment, non-rodent research species such as dogs and cats, are not natural carriers of MRSA. Generally, humans carry this organism asymptotically on their skin and in the nostrils. Chronically-instrumented animals are more susceptible to infection from this organism due to their close contact with human carriers and their immunocompromised status (due to instrumentation). While humans could

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also contract MRSA from an infected animal, immunocompromised persons already exclude themselves from many research areas on campus and animal to human transmission is considered extremely low risk. This guidance is intended to protect the animals from unintended transmission of MRSA from humans.

5.0 Policy: Contact precautions must be observed when working with chronically-instrumented animals. Skin must be covered to minimize transfer of pathogens between personnel and animals. Any open wounds must be bandaged with a water-proof bandage and covered with PPE; for the hands, double gloving over the bandage is recommended. Cross contamination between rooms must be avoided; disposable PPE may not be reused. All common contact surfaces are disinfected between animals and rooms are disinfected after working with animals.

6.0 Personal Protective Equipment (PPE) and Hygiene Practices:

6.1 To enter a room minimum clothing and PPE must consist of long pants, close toed shoes, disposable lab coat, and gloves.

6.2 To work with animals, a surgical mask is added to protect the animal from any aerosols that may be generated by personnel. The same PPE is acceptable to handle the animal unless aerosols or splashing from animal fluids or cleaning activities is anticipated; then additional PPE consisting of eye protection (suitable to the level of splashing anticipated), a face mask and face shield are utilized as appropriate.

6.3 Change all PPE that has contacted the animal or equipment between animals when performing maintenance of implants or experimental or surgical procedures. Hands should be washed or an approved alcohol based sanitizer used prior to donning new gloves. For husbandry activities that involve group housed animals or other animal activities that already allow the animals contact with each other (such as socialization), disposable PPE does not need to be changed in between animals because the animals are already in contact with one another.

6.4 To exit a room, all disposable PPE should be removed and placed into a trash container inside of the room; reusable eye protection should immediately be sanitized and stored inside the room in a closed container. Personnel must immediately wash hands or utilize an appropriate alcohol based sanitizer, taking care not to cross contaminate the door knob upon exit.

6.5 Animals with known infections may require additional procedures; these will be determined by the veterinary staff on a case-by-case basis taking into account factors such as the animal's health, the MRSA strain, housing environment and isolation control factors.

NOTE: Only disposable lab coats are allowed for use with chronically-instrumented animals. Due to pathogen cross contamination, reusable cloth lab coats are inappropriate for use with these animals.



Hygiene Practices: DO NOT touch your face or hair with gloved hands while in these areas. Change your gloves any time they are soiled or ripped. Wash hands often with an antimicrobial soap or use an approved alcohol based sanitizer any time gloves are removed or changed using appropriate hand hygiene techniques indicated in the “Research Hand Hygiene Guidelines”. Because MRSA lives in the nostrils, it is advised not to work in these areas when you have frequent nasal discharge or sneezing.

7.0 Room Practices: An appropriate disinfectant that is effective against MRSA must be used and the contact time required by the manufacturer observed. See the appendix A for recommended list.

7.1 All animal common contact surfaces must be disinfected after work with individual animals. These include: counter tops and work areas, testing areas, caging or holding pens and all instruments and equipment.

7.2 At the end of procedures with animals the floors (and walls if they come in contact with animals) and human common contact areas are also disinfected. These include door knobs, computer keyboards, writing utensils, drawer handles and equipment interface components.

7.3 It is recommended that toys and other enrichment items are sanitizable, or when sanitizable options are not available, that the items are dedicated to a specific room or an individual animal whenever possible. These items should be sanitized on the same schedule as the caging.

8.0 Related Documents:

Centers for Disease Control and Prevention (CDC) guidance “Methicillin-resistant *Staphylococcus aureus* (MRSA) Infections”. <http://www.cdc.gov/mrsa/index.html>

National Research Council “Guide for the Care and Use of Laboratory Animals Eighth Edition” 2011.

List H: EPA’s Registered Products Effective Against Methicillin Resistant *Staphylococcus aureus* (MRSA) and Vancomycin Resistant *Enterococcus faecalis* or *faecium* (VRE), January 9, 2009

“Increase in Resistance of Methicillin-Resistant *Staphylococcus aureus* to β -Lactams Caused by Mutations Conferring Resistance to Benzalkonium Chloride, a Disinfectant Widely Used in Hospitals”; *Antimicrob Agents Chemother.* 1999 December; 43(12): 3042–3043.

“Reduced Triclosan Susceptibility in Methicillin-Resistant *Staphylococcus epidermidis*”; *Antimicrob Agents Chemother.* 2004 April; 48(4): 1397–1399.

“Research Hand Hygiene Guidelines” University of Wisconsin-Madison, Environment, Health and Safety Department.

9.0 Document Revision:

Revision History



Revision Number	Revision Date	Description of Revision
1		
2		



Appendix A

Recommended Products Effective Against MRSA

NOTE: This list is not intended to be all inclusive and is intended for guidance only. Please consult the manufacturer's technical specifications when choosing alternative products for effectiveness against MRSA.

Antimicrobial Soaps

	<u>active ingredient</u>
Exidine-2	2% Chlorhexidine Gluconate
Bactoshield® CHG 2% Surgical Scrub	2% Chlorhexidine Gluconate
PROVON® Antimicrobial Skin Cleanser	2% Chlorhexidine Gluconate

Hand Sanitizers

3M™ Avagard™ Foam Instant Hand Antiseptics	Ethanol 62%
Avant Hand Sanitizer	Ethanol 60%
PURELL® Advanced Instant Hand Sanitizer	Ethanol 70%

Surface Disinfectants

Roccal D Plus	Didecyl dimethyl ammonium chloride 9.2%
	Alkyl dimethyl benzyl ammonium chloride 13.8%
	bis-n-tributyltin oxide 1.0%
ASW SHIELD® Advance wipes	Isopropanol 70%
Accel® TB	Hydrogen Peroxide 0.5%

Antimicrobials not recommended for use against MRSA

Benzalkonium Chloride- While this antimicrobial is considered effective against non-methicillin resistant *Staphylococcus* species, the same genes that convey resistance to β -Lactams have also been shown to convey resistance to benzalkonium chloride.

Triclosan- There are recent reports of MRSA strains as well as other *Staphylococcus* species developing reduced susceptibility to triclosan so it is no longer recommended for use against MRSA.

Important Disinfectant Practices

Contact Time- Contact time varies by product, and can be up to ten minutes. Always consult the packaging for the appropriate contact time. During the wait period, the surface must be wet with disinfectant the entire period for effective disinfection.

No "Topping Off"- Containers for disinfectants, soaps and sanitizers should never be "topped off". They should always be completely emptied, washed out and allowed to dry before refilling. Topping off can allow the buildup of biofilms that allow bacteria build up, and lead to spreading of microorganisms and contamination of product.