

Facts for Healthcare Professionals about
**Methicillin-Resistant
Staphylococcus aureus
(MRSA) and Animals**



*College of Veterinary Medicine
College of Public Health*



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the Ohio Department of Health Zoonotic Disease Program

Images of *Staphylococcus aureus* courtesy of
Janice Haney Carr and the Centers for Disease Control and Prevention

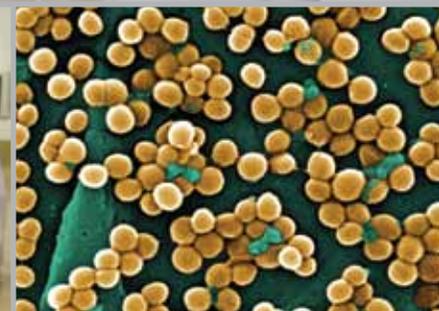


Ohio Department of Health
246 N. High Street
Columbus, OH 43215
(614) 752-1029
odh.ohio.gov



COLLEGE OF
VETERINARY MEDICINE

The Ohio State University
College of Veterinary Medicine
1900 Coffey Road
Columbus, OH 43210
(614) 292-3551
vet.osu.edu



Should people with MRSA get rid of their pet(s)?

NO! Companion animals should be treated as any other member of the household. Other human members of the household have the potential to become colonized or infected just as the pets, so treat the pet no differently.

Should companion animals in the household be screened?

It depends. It is recommended to deal with animals living in the patient's home as you would any other human member of the household; therefore, animals living in the household should only be screened if ALL other family members and close contacts are also screened. If other members of the household are not screened, then it does not make sense to screen the companion animal(s). If screening is indicated and there is more than one pet in the household, it is recommended that all animals be screened because MRSA can infect some animals but not others.

How are pets screened?

To screen an animal for MRSA colonization, a veterinarian should swab the nasal and perianal areas (and any skin lesion) and submit the swabs for routine MRSA culturing.

Should positive pets receive treatment?

Maybe. If the pet is symptomatic or if other members of the household are going to be decolonized, then treatment should be considered by the family's veterinarian. Companion animals are believed to be transient carriers of MRSA. When decolonization of household members is indicated, asymptomatic colonized animals may be temporarily removed from the contaminated environment in lieu of antimicrobial therapy.

This time apart will allow the pet to naturally eliminate MRSA colonization while the other members of the household undergo decolonization therapy. Different decolonization therapies are available for animals and treatment decisions are best made on a case by case basis. Contact the family veterinarian to work in a coordinated manner from both the human and veterinary health perspective.

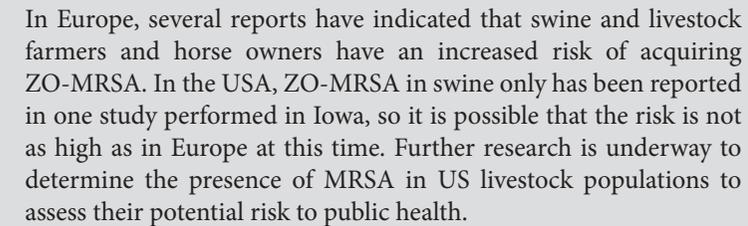
Where can I find more information?

If you require more detailed information about this subject, please contact the Zoonotic Disease Program at the Ohio Department of Health (614-752-1029, option 2); or Dr. Armando Hoet, Veterinary Public Health Coordinator at The Ohio State University (614-292-0684).

MRSA is a zoonotic pathogen that can move from humans to animals and from animals to humans.



Recently, several reports have shown that animals can be affected by MRSA and even can be involved in the transmission of this pathogen.



In Europe, several reports have indicated that swine and livestock farmers and horse owners have an increased risk of acquiring ZO-MRSA. In the USA, ZO-MRSA in swine only has been reported in one study performed in Iowa, so it is possible that the risk is not as high as in Europe at this time. Further research is underway to determine the presence of MRSA in US livestock populations to assess their potential risk to public health.

Is pet ownership a risk factor?

No. It is important to highlight that MRSA is a human pathogen spilling over to companion animals. However, once infected (or colonized) the dog or cat can play a role in maintaining the household cycle of MRSA transmission, or serve as a source of primary infection for some individuals. Therefore, individuals with a weak immune system, recent surgery, an open wound, or those who have had previous MRSA infections need to be aware of their susceptibility when handling MRSA positive animals.

Can pets be involved in MRSA treatment failure?

Yes. Several scientific reports have shown that colonized/infected pets can play a role in MRSA treatment failures or reinfections. Therefore, as a healthcare provider, it is important to gather the most complete patient history possible, including the presence of pets at home. If you have a MRSA-positive patient with recurring infections or MRSA treatment failures, it is vital to consider, in addition to other members of the household and the environment, that companion animals can be a possible source of MRSA reinfection.

What is MRSA?

Methicillin-resistant *Staphylococcus aureus* or MRSA, the newly emerging beta-lactam resistant bacteria, has been recognized as a significant problem in human medicine since the 1960s.

What species are involved in transmission?

The first isolation of MRSA from an animal occurred in 1972 in Belgium in a cow with mastitis. Since then, MRSA has been isolated from companion animals such as dogs, cats, rabbits and birds, as well as recreational and livestock animals such as equine, cattle, swine and poultry.

Where do animals acquire MRSA?

Like humans, animals can become colonized or infected when in close contact with a MRSA contaminated environment or infected individuals, including their owners and veterinary personnel. Additional risk factors for companion animals may include living with a healthcare worker or visiting human hospitals or nursing homes.

MRSA strains isolated from cats and dogs are identical to the most common human MRSA strains, indicating that humans may be the main source of infection or colonization for companion animals. Studies have shown that swine and equine have unique strains of MRSA that are different from any previously identified human types. These true zoonotic MRSA (ZO-MRSA) strains can circulate in those animal populations without producing any apparent clinical disease in the animals. However, ZO-MRSA strains can be transmitted during occupational exposure to humans who then can be clinically affected by the disease.

How can zoonotic transmission occur?

In general, there are two scenarios where colonized or infected animals can transmit MRSA to humans:

- MRSA positive companion animals (dogs and cats) are rarely infected, but can serve as transient MRSA reservoirs. This poses a risk of infection to their owners, household members, veterinary professionals and other animals that are in direct contact with the infected animal.
- Humans who are in direct contact with swine and equine populations can acquire infection by ZO-MRSA strains originating in these animal populations. Therefore, infections in humans from these isolates are directly correlated to occupation (i.e. swine farming and equine breeding) and recreational activities (i.e. horse owners).

Is occupation a risk factor?

Yes. If an individual has an occupation with a high level of animal contact, this person is more likely to be exposed to an infected animal. Just as doctors and human healthcare professionals are at a higher risk of exposure to MRSA in the hospital setting, staff in large and small animal veterinary hospitals have an increased risk of MRSA infections in the animal hospital setting.

Occupational exposure at the agricultural level is also a risk factor due to the potential for exposure to ZO-MRSA strains. These strains have the potential to cross the species barrier, producing infections in farmers and food animal veterinarians, who can manifest primary infections and serve as a vehicle to transmit ZO-MRSA to other humans or animals.