

Canadian Academy of  
Veterinary Dermatology

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**Worms & Germs Blog**  
*Promoting Safe Pet Ownership*

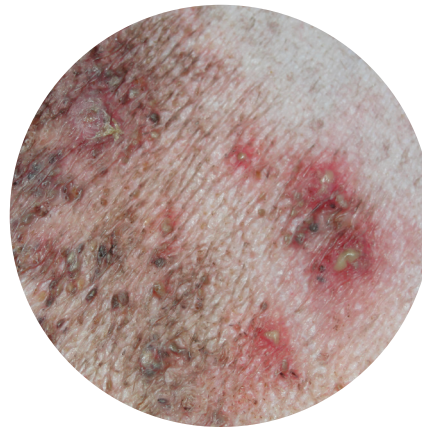
## MRSP For Pet Owners

# What is Methicillin-resistant *Staphylococcus Pseudintermedius*?

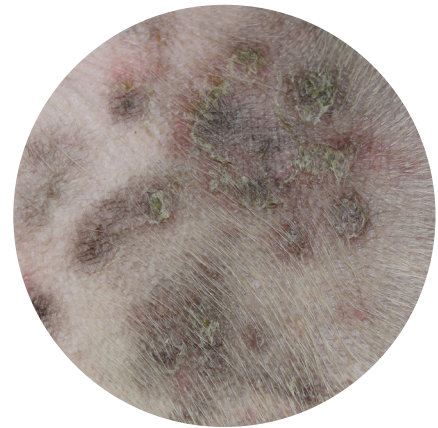
Scott Weese DVM, DVSc, DACVIM and Charlie Pye DVM, DVSc, DACVD

### *Staphylococcus pseudintermedius*

is a bacterium commonly found on the skin, nostrils, mouth, anus and in the intestines of most dogs. This bacterium usually does not cause any problems in healthy animals but is an opportunist, meaning that if there is damage to the skin, such as a wound or an animal with allergies, it can cause an infection. *S. pseudintermedius* is responsible for about 90% of skin infections in dogs with allergies and is also a common cause of ear infections.



Bacterial skin infection



Bacterial skin infection



**Worms & Germs Blog ([www.wormsandgermsblog.com](http://www.wormsandgermsblog.com))** is an educational website coordinated by Drs. Scott Weese and Maureen Anderson of the Ontario Veterinary College's Centre for Public Health and Zoonoses. The site was initially set up with the help of funding from City of Hamilton Public Health. The site focuses on infectious diseases of companion animals (household pets and horses), with an emphasis on zoonotic diseases – diseases that can be transmitted from animals to people. In reality, we take a broader approach, considering diseases that can be spread from animals to people AND from people to animals.

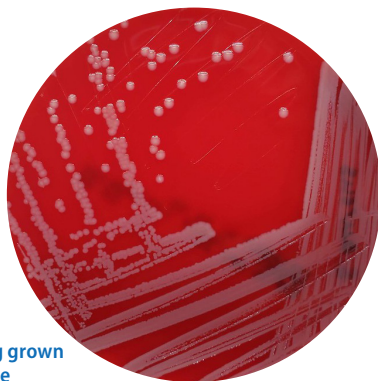
The CAVD ([www.cavd.ca](http://www.cavd.ca)), established in 1986, is a not-for-profit organization intended for everyone with a professional interest in veterinary dermatology. They are one of the member organizations of the World Association of Veterinary Dermatology ([www.wavd.org](http://www.wavd.org)). Their mission is to advance the science and practice of veterinary dermatology in Canada by providing education and resources for veterinary teams, supporting research, and promoting excellence in care for animals with skin and ear disease.



# WHAT IS MRSP?

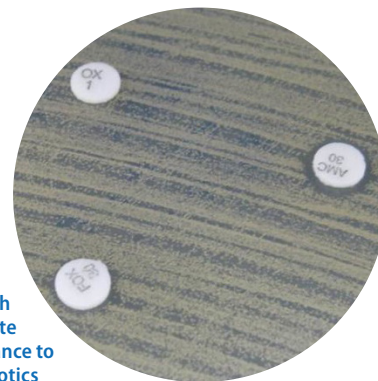
**MRSP** stands for **methicillin-resistant *S. pseudintermedius***. This is a type of *S. pseudintermedius* that is resistant to a group of antibiotics called “beta-lactams”. This includes some of the more commonly used antibiotics for bacterial infections. MRSP can cause ear infections, skin infections, gingivitis, surgical site infections, urinary tract infections, respiratory infections and arthritis. MRSP strains also commonly become resistant to other antibiotics, sometimes resulting in few treatment options, which can complicate therapy. However, MRSP is not more likely to cause serious disease compared to susceptible strains; it may just be harder to eliminate when an infection develops.

## How is MRSP different from MRSA?



Bacterium being grown  
on a culture plate

**Staphylococcus aureus** is a bacterium found on human skin and in the human respiratory tract. About one third of people are colonized by this bacterium. Colonized means that the bacterium has “set up residence” on the skin but is not causing infection. It can be present on the skin short term or long term. However, *S. aureus* colonization in dogs is much less common, and *S. aureus* found in dogs is often acquired from contact with people.



Bacterial growth  
on a culture plate  
showing resistance to  
common antibiotics

**MRSA**, or methicillin-resistant *Staphylococcus aureus*, is an antibiotic-resistant form of *S. aureus*. While some of the issues regarding MRSP and MRSA are similar, in that they are both resistant bacteria that can cause infections and can be difficult to treat, MRSA and MRSP are very different. Often, there is confusion about MRSA and MRSP. **The vast majority of dogs that have a methicillin-resistant staphylococcal infection have MRSP.** To determine whether a dog has MRSP or MRSA, it is necessary to look at the specific bacterial name; *S. pseudintermedius* (MRSP) vs. *S. aureus* (MRSA). If you have read about MRSA and your dog is diagnosed with MRSP, you should know that these two infections have very different implications. MRSA can potentially be transmitted to dogs from humans, but MRSA infection in dogs is far less common than MRSP infection.

## Did you know?



**In people, MRSA is a well-known health problem, but MRSP infections are very rare.**



**In dogs, MRSP is a common health problem but MRSA infections are uncommon.**

Culture photos courtesy The Rubin Lab, Department of Veterinary Microbiology, Western College of Veterinary Medicine, Saskatoon, Canada.  
[www.wcvm.usask.ca/departments/vet-micro.php](http://www.wcvm.usask.ca/departments/vet-micro.php)



## How common is MRSP?

Healthy animals can carry MRSP. If a dog is a carrier of MRSP this means that the bacterium is present transiently on the individual animal, but the bacterium is not active. Studies have shown that up to 17% of healthy dogs are carriers of MRSP; however, in the general population of healthy dogs, MRSP is probably only carried by 1-2% of dogs at any time. MRSP carriage rates are higher in dogs that have been treated with antibiotics or have had previous MRSP infections.



MRSP is a major cause of skin infections in dogs, particularly in dogs with recurrent disease. In dogs with recurrent infections, up to 41% of infections are due to MRSP. Potential risk factors for an animal becoming MRSP-positive include: antimicrobial use, animals having been hospitalized for longer periods and animals visiting veterinary clinics regularly due to chronic disease. Up to 62% of dogs may remain carriers after being treated for an MRSP skin infection. Some dogs will eliminate MRSP within a short period of time but others can remain colonized for months, if not longer.

## Can people get MRSP?



MRSP infection is a zoonotic disease. This means it can be transmitted between animals and people. Humans can get MRSP but this is quite rare. There are several reports of MRSP infections in people worldwide. Human infections with methicillin-susceptible *S. pseudintermedius*

are also rare, despite the fact that dog owners are probably exposed to this bacterium on a regular basis. The bacterium is apparently not well adapted to cause disease in people.

Approximately 4% of veterinarians working with dogs and cats are colonized with MRSP but because they are healthy individuals, this does not cause them any issues. Methicillin-resistance does not make the infection caused by the bacterium any more severe or contagious.

## How do animals (and people) get MRSP?

MRSP infections occur most commonly in pets that are immunocompromised or have an underlying problem that affects their normal skin barrier (e.g. allergy or other skin disease, wounds, surgical incisions). Infections occur due to direct contact with the bacterium from another infected animal or a carrier/colonized animal (animal with no signs of disease). It is possible for infection to occur from an inanimate object that has been contaminated with MRSP, but this appears to be very rare.

Owners of infected pets and veterinarians in contact with infected animals have a slightly higher risk of acquiring MRSP. There are, however,



very low numbers of reports of MRSP infection in veterinarians. Veterinarians also want to prevent transmission of MRSP between patients. Your veterinary team may wear gloves and take additional precautions when examining your pet in order to prevent transmission of MRSP between patients.

It has been shown that people who wash their hands after touching their pets carry *S. pseudintermedius* less commonly compared to people who do not.



## How is MRSP diagnosed?

MRSP infections do not look any different from an infection caused by methicillin-susceptible *S. pseudintermedius*. To diagnose MRSP, your veterinarian will take a sample from your pet, using a swab or tissue sample and will send this away to a laboratory for culture and susceptibility testing. The lab will grow the species of bacteria causing your pet's infection and then test this against numerous antibiotics to determine which ones will be effective at treating the infection in your pet. This can take approximately 7 days to complete.

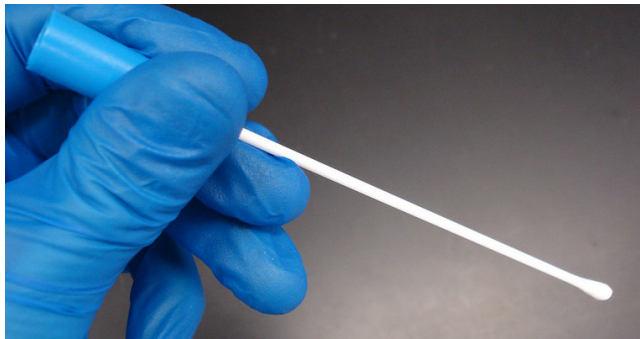


Photo courtesy The Rubin Lab, Department of Veterinary Microbiology, Western College of Veterinary Medicine, Saskatoon, Canada.  
[www.wcvm.usask.ca/departments/vet-micro.php](http://www.wcvm.usask.ca/departments/vet-micro.php)

## How is MRSP treated?



■ **Infection:** Once your veterinarian receives the culture and susceptibility results they might recommend either an oral or injectable antibiotic and/or topical therapy (medicated shampoos, sprays, ointments) for your pet. Some MRSP infections respond very well to topical therapy; just as well as susceptible *S. pseudintermedius*. Your pet may be on this therapy for several weeks to fully clear the infection. Sometimes a strain of MRSP can be resistant to almost all antibiotics, which makes selection of an antibiotic difficult. In this situation your veterinarian may recommend intensive topical therapy alone or may

recommend referral to a Veterinary Dermatologist or consultation with a pharmacology expert to decide on the best treatment for your pet.

■ **Colonization:** Some humans that are carriers of resistant bacterial species may undergo decolonization therapy (e.g. someone who is a carrier of MRSA and is undergoing major surgery). Decolonization therapy with antibiotics is not recommended in pets as we have no known effective ways to eliminate MRSA and MRSP colonization in dogs, and we do not want to increase the risk of further antibiotic resistance through ineffective treatment.





## What should I do if my pet has an MRSP infection?

- **Relax and take a deep breath!** Most pets with an MRSP infection are treated successfully and the infection resolves.
- **Talk to your veterinarian and follow their advice:** Make sure to give medication according to instruction and make sure to always finish the prescription (unless instructed otherwise by your veterinarian) even if your pet looks and feels better sooner. It is also very important to **schedule a recheck** with your veterinarian when the medication regimen is finished to re-evaluate your pet's progress and determine the infection has completely resolved. Discuss why your pet has developed this infection, and how to prevent it from returning.
- **Hand hygiene:** This is the simplest way to prevent transmission of MRSP. Wash your hands with soap and water or use an alcohol based hand sanitizer. This is especially important for individuals who are immunocompromised as the risk of infection is greater with these individuals. Hand hygiene is important after handling any animal as it is possible that any dog could be carrying MRSP.
- **Avoid contact with the infected area:** If infected areas are open wounds, these should be covered with a bandage. If you have to change the bandage you should wear gloves and throw the bandage in the garbage right away. Don't allow your pet to sleep in the bed with you or lick you while they are being treated for the infection.
- **Clean:** During treatment, your pet's bedding, toys, bowls etc. should be cleaned regularly (2-3 times weekly) with warm water and soap. MRSP can survive in the environment for a lengthy period of time but it is susceptible to most common disinfectants if the surface is cleaned properly first. Any wipeable surfaces should be wiped down with diluted bleach or accelerated hydrogen peroxide 2-3 times weekly. Laundry should be washed separately using hot water and dried in a dryer.
- **Quarantine and isolation are not necessary:** Don't worry, you don't have to lock your pet away! MRSP is widespread in the dog population so strict quarantine is not required. However, it is recommended to reduce exposure to other pets and people while your pet is being treated. This would include not taking your dog to the dog park, no off-leash activity, no doggy daycare and avoiding immunocompromised individuals (humans and animals). MRSP can be found in feces so always make sure to clean up after your pet!
- **Assume your pet is carrying MRSP at other body sites:** You should also follow the recommendations below for colonized pets.

*S. pseudintermedius* is responsible for about 90% of skin infections in dogs with allergies and is also a common cause of ear infections.



## What should I do if my pet is colonized with MRSP?

- **Avoid contact with your pet's nose, mouth and bum:** These areas are most likely to harbour MRSP. If contact with these areas occurs, make sure to wash your hands with soap and water after. Avoid allowing your pet to sleep on your bed.
- **Avoid licking:** Don't let your pet lick your face or any regions of the body with dry or broken skin.
- **Clean:** Regularly clean bowls, bedding, toys etc. Laundry should be washed separately using hot water and dried in a dryer.
- **Hand hygiene:** Hand hygiene is important after handling any animal as it is possible that any dog could be carrying MRSP.

## How long will my pet be colonized with MRSP?

Colonization with MRSP can continue for months after an infection has resolved. Testing to see if your pet is colonized is not recommended because testing is not 100% and there are no effective treatments to eliminate colonization.

## How do I prevent my pet from getting MRSP?

- Unfortunately, it is impossible to prevent exposure to MRSP because it is carried by many healthy animals.
- One important step to prevent MRSP infection is using antibiotics responsibly.
  - Always follow prescription instructions for your pet and give the correct dose at the correct time and make sure to finish the whole prescription even if your pet is looking/feeling better.
  - Only give antibiotics to your pet when needed and only if your veterinarian recommends them.
- Probably the most important step is limiting the risk of infections. This includes identifying and treating any predisposing causes for the infection, such as skin allergies.

### PROTECT YOUR PETS

### Top Tips for MRSP Prevention

1

#### Use antibiotics responsibly:

- a. Always follow prescription instructions for your pet and give the correct dose at the correct time and make sure to finish the whole prescription even if your pet is looking/feeling better.
- b. Only give antibiotics to your pet when needed and only if your veterinarian recommends them.

2

Probably the most important step is **limiting the risk of infections**. This includes identifying and treating any predisposing causes for the infection, such as skin allergies.

3

**Use topical therapy** (such as medicated shampoos) as prescribed to reduce bacterial numbers on the skin.

4

**See your veterinarian** if you suspect that infection is recurring.





## Will my other dogs develop the same infection?

Healthy dogs in close contact with MRSP-infected dogs can acquire the bacterium, but rarely develop disease. It is important to remember that MRSP is no more likely to cause disease in a dog than a susceptible strain. It is just harder to kill when it does. Therefore the risk to other dogs is mainly of concern when those other dogs have high risk factors for infections (e.g. uncontrolled allergies, wounds, etc). The risk of MRSP colonization of dogs living

in a household together with an MRSP positive dog is greatly lowered if the previously positive dog becomes MRSP-negative following treatment. Studies show that dogs within the same household as a dog with MRSP may not become carriers of this bacterium. MRSP is an opportunistic infection so the skin must be damaged for the bacterium to cause an infection.

### PROTECT YOUR PETS AND YOURSELF

## Pause to Clean your Paws!

Hands are the **#1** way infections spread.

**It only takes 20 seconds to clean your hands.**

Wash your hands or use an alcohol-based hand sanitizer to help stop the spread of infections to your pets and yourself!



USE SOAP



PALM TO PALM



BACK OF HANDS



FINGERS INTERLACED



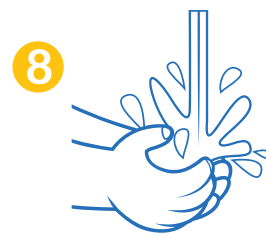
BASE OF THUMBS



FINGERNAILS



WRISTS



RINSE HANDS



DRY HANDS

#### PROPER HANDWASHING TIPS

- Wash hands thoroughly with soap + warm water.
- Wash for 15-20 seconds.
- Soap and warm water are the best way to clean your hands, but if they aren't available, use an alcohol-based hand sanitizer, that contains at least 60% alcohol.

#### HOW TO USE HAND SANITIZERS

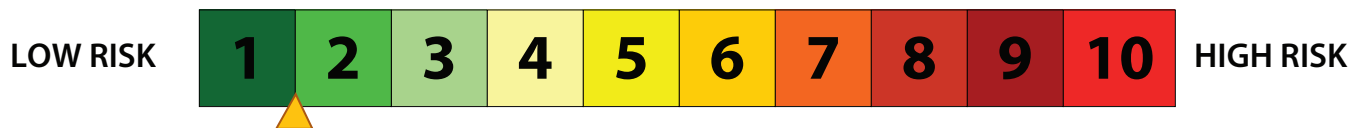
- Apply the sanitizer to the palm of one hand.
- Rub hands together.
- Rub the sanitizer over all the surfaces of your hands + fingers until your hands are dry.



## What is the risk to people?

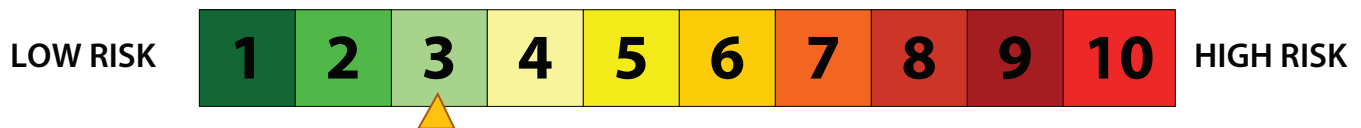
### Healthy Adults:

- On a scale of 1 (low risk) to 10 (high risk) of a healthy adult becoming infected with MRSP, the risk is very low; about a 1-2.



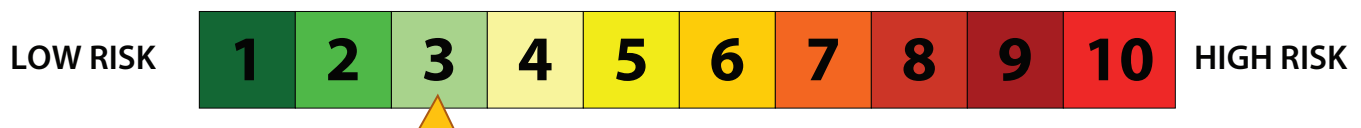
### Infants and young children:

- The risk of a young child becoming infected is a 3 due to the fact that the immune system of a younger child is not yet mature.
- Young children are more likely to handle animals and then touch their faces and put their hands in their mouth. This close contact can increase the risk of disease transmission.
- Children should be supervised when playing with animals and families should make sure the children wash after handling the pet.



### Elderly individuals:

- The risk of an elderly person becoming infected is a 3 due to the fact that the immune system of an elderly person might not respond as well to immune challenge.
- These individuals are susceptible to many types of infections and therefore should minimize close contact with any pet that is colonized or infected with MRSP if possible.
- Contact with open wounds and feces should be avoided.
- Thorough and regular cleaning of the environment should occur promptly.



### Immunocompromised individuals:

- If an individual is immunocompromised (e.g. someone undergoing chemotherapy, suffering from an immunosuppressive disease, or someone who had an organ transplant) the risk of infection is about a 3. This is because immunocompromised people are more susceptible to many different kinds of infection.
- These individuals should minimize close contact with any pet that is colonized or infected with MRSP if possible. They should focus on good hygiene practices, particularly hand washing.
- Contact with open wounds and feces should be avoided.
- Thorough and regular cleaning of the environment should occur promptly.

