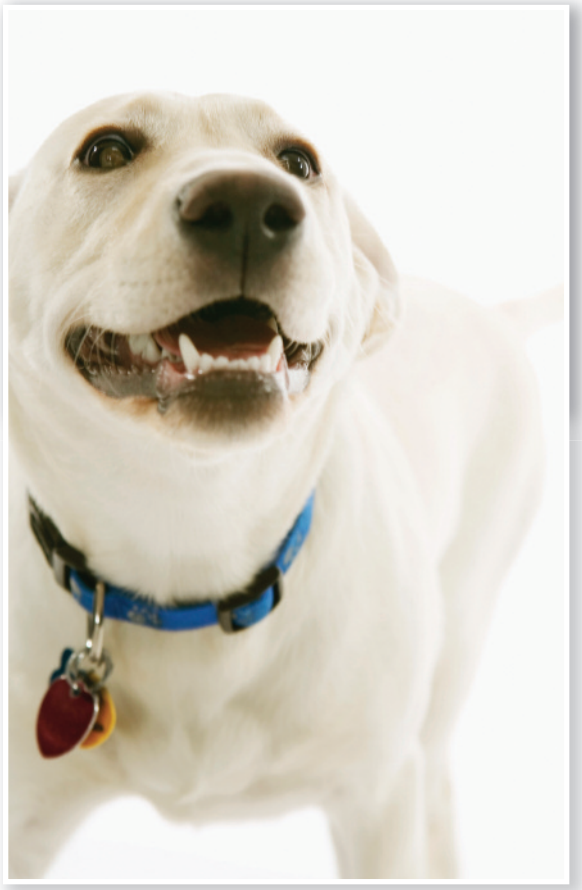
Recurrent Pruritus & Zoonotic Potential

J. Scott Weese, DVM, DVSc, DACVIM
University of Guelph



Olive, a 4-year-old, spayed Labrador retriever, was presented for evaluation of pruritus.

History

Olive had a history of seasonal atopy and had presented with superficial bacterial folliculitis (SBF) at approximately the same time each of the past 2 years. She had not been treated since receiving cephalexin at her presentation the previous year.

Examination, Diagnostic Testing, & Treatment

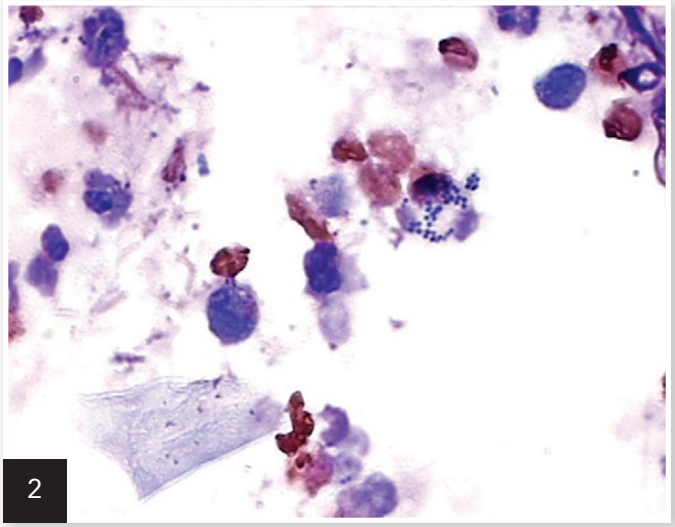
At presentation, Olive was overweight but appeared clinically normal except for disseminated skin lesions (**Figure 1**). Erythematous papules and pustules were present, particularly over the ventral abdomen. Areas of self-induced trauma were noted. Cytology of a pustule sample revealed abundant intracellular cocci and inflammatory cells (**Figure 2**).

Daily bathing in 2% chlorhexidine was recommended pending culture results for the same pustule sample. Methicillin-resistant *Staphylococcus pseudintermedius* (MRSP) was isolated (**Table**). During a phone call to receive test results, the owners reported that Olive's pruritus had improved significantly with bathing. Continuing topical chlorhexidine treatment 2 to 3 times weekly and a recheck in 10 to 14 days was recommended (ideally, bathing would continue until 7 days after resolution of signs). However, the owners called back after researching MRSP on the Internet; they were particularly concerned for their 6- and 10-year-old children.

After MSRP infection was confirmed, the owners sought further information on zoonotic risk.

1

Focal staphylococcal folliculitis caused by MRSP
Courtesy Dr. B. Valentine



2

Cytologic appearance of superficial bacterial folliculitis. Note the inflammatory cells and engulfed cocci.

Table **Culture & Susceptibility Results: *Staphylococcus pseudintermedius* 4+**

Antimicrobial	*Result*
Amikacin	Susceptible
Amoxicillin–clavulanate	Resistant
Ampicillin	Resistant
Cefovecin	Resistant
Cefoxitin	Resistant
Cephalothin	Resistant
Chloramphenicol	Susceptible
Clindamycin	Resistant
Doxycycline	Resistant
Enrofloxacin	Resistant
Imipenem	Resistant
Marbofloxacin	Resistant
Minocycline	Resistant
Orbifloxacin	Resistant
Trimethoprim-sulfamethoxazole	Resistant

Ask Yourself

Which of the following statements is true?

A. MRSP is a canine pathogen that does not infect humans.

B. MRSP is a rare human pathogen, so the owners should not be concerned.

C. MRSP is a rare human pathogen, but pet owners should use basic hygiene and infection control measures to lower their risk for infection.

D. MRSP is an uncommon human pathogen, but infected dogs should be treated with systemic antibiotics to ensure that the infection is rapidly eliminated.

E. MRSP is a concern particularly for children, so the dog should be strictly isolated at home, handled only by adults, and not allowed outdoors.

F. MRSP is a concern for adults and children, so infected dogs should be hospitalized until test results are negative for MRSP.

MRSP = methicillin-resistant *Staphylococcus pseudintermedius*, SBF = superficial bacterial folliculitis

MORE ▶

Correct Answer

C. MRSP is a rare human pathogen, but pet owners should use basic hygiene and infection control measures to lower their risk for infection.

Internationally, MRSP diagnosis in dogs is increasingly common and has become a common cause (and in some geographic locations, the leading cause) of opportunistic infections in dogs, particularly skin and surgical site infections.[1-4] As with other methicillin-resistant staphylococci, MRSP is inherently resistant to all β-lactam antimicrobials (eg, penicillins, cephalosporins, carbapenems) and is often resistant to multiple other antimicrobials. MRSP is commonly highly drug resistant with few viable antimicrobial options,[3,5] thereby complicating treatment.

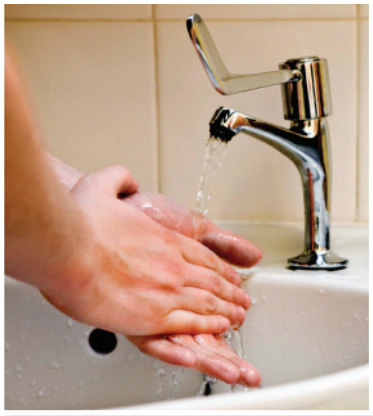
Most dogs that harbor MRSP do so without any disease signs and probably never develop an infection. However, healthy carriers are at risk for subsequent MRSP infection and are a potential source of infection for other dogs (or, rarely, humans).

MRSP can be transmitted between animals, particularly housemates. A dog that lives with an MRSP-infected dog is likely to become a carrier. Whether anything can be done to minimize risk is unclear. By the time MRSP is diagnosed, the other dog will already have been exposed. Strict isolation of infected dogs can be challenging in multidog households, making it difficult to recommend aggressive practices that lower the risk for MRSP transmission between cohabitating dogs.

Similarities exist between MRSP in dogs and methicillin-resistant *S aureus* (MRSA) in humans. Albeit uncommon and transient, cross-species transmission of both pathogens can occur.[6-8] *S pseudintermedius* colonization, including colonization with MRSP, can typically be found in less than 5% of healthy humans (mainly pet owners and veterinarians).[5-7,9-11]

In addition to colonization, *S pseudintermedius* can cause clinical infections in humans, but these are rare and often misidentified as *S intermedius*.[12-14] Considering the high prevalence of *S pseudintermedius* in healthy dogs and large percentage of the population with regular canine contact,[15] the rarity of human infections indicates that this bacterium is poorly able to infect humans. Few reports of human MRSP infections exist,[14,16] and while more infections have probably occurred than have been published, evidence that MRSP infections are anything but rare in humans is lacking. In addition, because there is no evidence that MRSP is more likely to cause an infection than is methicillin-susceptible *S pseudintermedius*, little evidence suggests that increasing MRSP rates in dogs will result in increasing human infections.

Despite this rarity, basic measures to reduce human exposure are indicated to prevent potential infection, as MRSP is typically highly drug resistant (ie, while infections are unlikely, they can be difficult to treat). Strict isolation is neither practical nor typically necessary. The use of basic hygiene practices (eg, good attention to hygiene after contact with the dog, limiting contact with the dog, avoiding contact with body sites where MRSP is common [eg, infected skin, nose, mouth, perineum]) is practical and may reduce risk for dog-to-human transmission. Recommending that children not help with bathing, that bathing be done outdoors if possible, and that those who bathe the dog wash their hands and change their clothes afterward is reasonable.



Systemic antimicrobial therapy is not always required for MRSP infections, and topical therapy and addressing identifiable underlying causes can be an effective approach for *S pseudintermedius* SBF.[17,18] ■ cb

See **Aids & Resources**, back page, for references & suggested reading.

The Take-Home

- MRSP is increasingly common in dogs, particularly those with pyoderma.
- Although MRSP can infect humans, infections are rare and the risk posed by an infected dog is low.
- Basic hygiene practices are easy to implement in a household and can likely reduce the risk for zoonotic transmission of MRSP and similar pathogens.

MRSP = methicillin-resistant *Staphylococcus pseudintermedius*, SBF = superficial bacterial folliculitis