There has been considerable media attention to the problem of methicillin-resistant *S. aureus* infections in humans. MRSA infections in companion animals, particularly horses and dogs, are also increasing in frequency, leading to concerns that zoonotic transmission of MRSA is an important public health problem.

MRSA bacteria are associated with companion animals in two ways. In some cases, the bacteria are causing true infections and in other cases the animals are colonized with MRSA but not infected. The distinction between colonization and infection is a clinical one. Infection occurs when MRSA enters a body site and multiplies, causing tissue destruction and disease. Infection often presents with severe dermatitis, draining wounds, or debilitating post-operative joint infections and sepsis. These infections require aggressive clinical management. Culture and sensitivity results are critical to the selection of appropriate antibiotic therapy.

Colonization occurs when an animal has MRSA in or on a body site but has no clinical signs of disease. Animals may be colonized with MRSA for days to a few months, but most animals clear the organism when a source of re-exposure is absent.

MRSA isolates from horses are a different genetic type than those typical of MRSA in humans. However, the horse type of MRSA can transfer to humans, and persons with extensive equine contact are at risk for colonization. Veterinary health care workers who are colonized with equine MRSA may also spread the organism to their equine patients.

MRSA isolates from dogs and cats are the same genetic types as are found in humans and are thought to originate in most cases from contact with a colonized or infected person. Transmission of these strains from human-to-animal and animal-to-human may occur within households. However, available evidence suggests that colonized dogs and cats become decolonized when the continuing potential for re-exposure from colonized humans is prevented.

Because of the potential for spread of MRSA between colonized companion animals and humans, veterinarians are increasingly being asked to “screen” pets for MRSA as part of the investigation of MRSA infections within households. Clients are approaching veterinarians upon the recommendation of physicians who are implicating pets in the transmission cycle. The advice animal owners are receiving can be as extreme as, “get rid of the dog,” and therefore clients are often distressed when communicating with their veterinarian. So what do you do when presented with these questions?

First, client education is important and this article and additional information in the Bacteriology Section of the DCPAH website (www.animalhealth.msu.edu) may be of assistance.

Second, companion animals can be screened for colonization with MRSA by culture of oropharyngeal and perineal swabs. Enriched culture techniques are required, and these are available at DCPAH. However, such screening is only reasonable if there is epidemiological evidence to suggest that a pet is involved in transmission within a household or if there is concern about exposure of immunocompromised persons.

Third, thought must be given as to what will be done if an animal is found to be colonized. The typical decolonization therapy used in humans, intra-nasal mupirocin, is not routinely effective and is difficult to deliver in animals. Parenteral antibiotics are also not very effective in eliminating colonization in dogs and cats. Hand hygiene and infection control practices are the most effective way to decrease transmission of MRSA. However, another strategy that may be considered is to remove the pet from the household for a 1- to 2-week period while household members are undergoing treatment. This is likely to break the cycle of infection to the pet.
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CASE #1: The Case of the Cranky Kitty

An 11-year-old neutered male domestic shorthair cat presented to the Veterinary Teaching Hospital (VTH) at Michigan State University for a 3-week history of lethargy, decreased appetite, and squinting of the left eye. The referring veterinarian had examined the cat 4 days earlier and noted fluid-filled swellings on the left front paw and the right foreleg. The cat was treated with systemic antibiotics with no clinical improvement. On presentation to the VTH, the cat wasafebrile but depressed. There were draining subcutaneous lesions on the right foreleg, the left front paw, the dorsal neck and the right rear leg. The popliteal lymph nodes were mildly enlarged. The left eye had a dilated pupil and discolored iris. Menace and pupillary light reflexes were absent. Ophthalmologic examination revealed a detached retina and a blood clot attached to the iris. Ultrasound revealed a mass behind the eye. The right eye was normal. CBC results were within normal limits. Abnormal findings on a serum chemistry profile were limited to moderately increased total protein and globulin concentrations. FeLV and FIV tests were negative. A fine needle biopsy was obtained from the right foreleg and direct smears were made (Figure 1 and Figure 2).

The Case of the Cranky Kitty: SOLVED!
The diagnosis is: pyogranulomatous inflammation due to blastomycosis. Cytology revealed large numbers of neutrophils and macrophages with low numbers of extracellular yeast. The yeast were round and similar in size to a neutrophil. They had a thick cell wall (Figure 1) and occasional broad-based budding (Figure 2). Blastomycosis is a systemic disease caused by the dimorphic fungus Blastomyces dermatitidis. Animals are usually infected by inhalation of spores in the environment. Organisms can then spread from the respiratory tract to other organs. Commonly affected sites in cats include the lungs, skin, eyes, and central nervous system. Identification of organisms on cytologic examination is diagnostic.

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