

Zoonotic Disease: The Enemy In Our Midst

By **Kate Hurley, DVM, MPVM**

We're surrounded by it in shelters every day: zoonoses, illnesses that can be transmitted between animals and humans. Potential threats include bacteria, viruses, fungi, and parasites of every description. They're found in feces, saliva, pus, birthing fluids, in blood and on fur. Some have to be injected by a bite or a scratch, but others require only the most casual contact. They cling to clothing, lurk on counters, float through the air, or hitch a ride with fleas or ticks. Some die quickly once they're off the animal, while others can't be killed by anything short of a flamethrower.

A two-inch thick binder full of zoonotic disease descriptions looms above my desk, and I can't possibly cover even a fraction of those here. On page 13 I've shown just a handful of the more common threats and their likely means of transmission by an animal. (Some germs are additionally spread by other means such as contaminated food or water). More information on these diseases can be found at the UC Davis shelter medicine program website (www.sheltermedicine.com) and at the website for the Center for Disease Control (www.cdc.gov).

Old dogs can learn new tricks

In case the bewildering variety of zoonotic infections we already know about isn't enough, new threats are emerging all the time. In fact, most of the newly recognized human diseases in the last decades have come from animals. Sometimes a previously mild pathogen changes enough to cause severe disease, as in the periodic emergence of highly virulent strains of avian influenza. Some novel diseases are triggered by previously unknown agents, such as the prion that causes "Mad Cow" disease in cows and New Variant Creutzfeldt-Jacobs disease in humans. Other new diseases derive

from well-known animal germs that suddenly decide to infect humans. For instance, the SARS epidemic is believed to have started with a coronavirus that normally infects civet cats. Researchers speculate that the highly crowded, stressful conditions of the wild animal markets where these animals are sold may have given the virus a perfect opportunity to mutate and make the leap into the human population.

Why us?

Those crowded, stressful conditions are all too familiar to many people in shelters, where infectious disease control is always a challenge. The majority of the time, affected animals don't look particularly ill. And while even the most coddled pet can carry zoonotic disease, shelter animals are at higher risk than the average pet. A recent study in the *Journal of Feline Medicine and Surgery* showed that shedding of germs increases by as much as a million-fold in the first week a cat is in a shelter. That's a lot of germs spreading around, and high population turnover means there's always a new group of animals to infect. Roaming, hunting, scavenging, fighting, and biting—the once favorite activities of many of the incoming strays—all

increase exposure to zoonotic agents.

Many homeless or unwanted animals are unvaccinated, infested with parasites, stressed, and malnourished, greatly increasing the likelihood of infection. Treatment with antibiotics for any reason, concurrent disease, and simply being a puppy or kitten are additional risk factors. Most readers will recognize at least a few of these factors that apply to their shelter population.

Why worry?

Zoonotic disease is such an everyday part of life for those of us who work closely with animals that it's all too easy to become complacent about the risk. We can't afford to let that happen. While many zoonotic infections are no more than a temporary nuisance, illness can be severe, disabling—even life-threatening. Young children, older folks, pregnant women, and people with compromised immune systems are at especially high risk. For instance, *Bordetella bronchiseptica* (the most common cause of kennel cough), is not normally a significant threat, but it can cause severe disease or death in AIDS patients and people with lung disease. The last thing we want is for our animals to make an adopter or foster family sick. Zoonotic infections have also led to lawsuits against shelters and veterinary clinics. Most shelters can ill afford the \$54,000 a family recently demanded after they contracted ringworm from their pet dog—and that was for a relatively minor nuisance infection. In another case, a pet shop was ordered to pay \$450,000 after a child lost vision in one eye due to a round-



worm infection. The negative publicity from such a case can discourage adopters, which translates into fewer homes and lost animal lives.

Just how bad can it be?

Even a well-run shelter can be hit with an unexpected outbreak. For Jeff Rosenthal, a veterinarian and director of the Idaho Humane Society, it all started with a disturbing phone call from local health authorities. Six people hospitalized for severe *Salmonella* infections had one thing in common: all had recently been exposed to cats from Rosenthal's shelter. Over the next few weeks, a nightmare unfolded. Dozens of cases occurred in both cats and humans, and ten people were so ill they had to be hospitalized. Almost every surface of this modern, seemingly clean shelter was found to be contaminated. At

the worst of it, Rosenthal wondered if his shelter would ever be able to care for cats again. Tens of thousands of dollars and hundreds of hours of overtime later, the shelter was back on track and doing better than ever, but life will never be quite the same at the Idaho Humane Society. (Find out what was learned from this outbreak in the next installment of "The Doc is In," when I interview Rosenthal about his shelter's experience.)

Not just dogs and cats

This article emphasizes dogs and cats, but just about every species can carry zoonotic infections. For instance, a few years ago a California animal shelter impounded a herd of goats that turned out to be infected with Q fever (*Coxiella burnetii*), a bacterial infection that can cause severe systemic disease in humans. By the time it was all over,

245 shelter workers and volunteers had been exposed, and 30 cases of illness had been confirmed. Although there were no deaths, chronic infection can cause lingering problems, and the situation took a huge financial and emotional toll on the shelter. It is worth reviewing the common zoonotic infections of any species your shelter cares for, especially if the animals have just been taken from a situation in which they were neglected and received poor health care.

One often forgotten culprit in the spread of zoonotic disease is good old *Homo sapiens*. An infected employee or volunteer can serve as an efficient means to spread such worrisome conditions as *Salmonella* or ringworm. Good health care and hygiene practices for animal care staff are important parts of any program to control the spread of these infections.

What Can We Do?

LUCKILY, IN SPITE OF ALL THE RISKS, serious outbreaks of zoonotic disease in shelters remain infrequent. Good general husbandry and infectious disease control go a long way towards reducing the risk of human infection. Although not significant zoonotic threats in themselves, levels of upper respiratory infection provide a good indicator of overall disease levels. If URI is rampant, zoonotic infections may not be far behind. In the event that a zoonotic infection does slip through, a well-trained staff and clear communication among shelters, veterinarians, physicians, and public health officials can prevent a minor occurrence from turning into a major disaster. Here are some simple steps for protecting your environment, animals, and people—and ultimately, your shelter's reputation.

PROTECT YOUR ENVIRONMENT:

- ☛ Make sure all areas of the shelter are carefully cleaned daily or more often. General-use as well as animal areas can become contaminated. If possible, repair or replace materials that are impossible to effectively clean.
- ☛ Use a broad-spectrum disinfectant and take special precautions when

cleaning up after ringworm and other resistant agents.

- ☛ Check or treat animals for resistant agents such as roundworm, hookworm, and ringworm before allowing in common areas. Even if your shelter can't afford a fecal exam or fungal culture for every animal, a good physical exam, a pass under a Woods lamp (or black light)

to check for ringworm, and deworming for puppies and kittens will help keep common areas disease-free.

- ☛ Pick up feces daily or more often (some germs aren't infectious right away, but will be if feces are allowed to sit).
- ☛ Immediately isolate animals showing signs of infectious disease, even if a known zoonosis is not identified.

NASAL DISCHARGE AND SALIVA

Salmonella (in saliva as well as feces!)

Bordetella bronchiseptica
(transmitted by dogs infected with kennel cough)

FLEAS AND TICKS

Rocky Mountain Spotted Fever
(from ticks)

Lyme disease (from ticks)

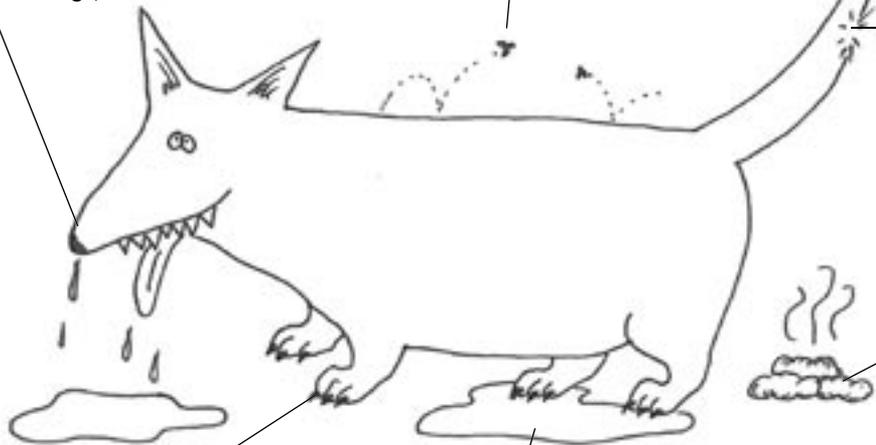
Cat scratch fever (from fleas)

FUR AND SKIN

Ringworm

Scabies

Cheyletiella (“Walking dandruff”)



SCRATCHES AND BITES

Cat scratch fever

Rabies

Pasteurella and *Capnocytophaga*
(infections caused by dog and cat bites)

ASSORTED OTHER EXUDATES

Leptospirosis (from bacteria in urine)

Q fever (from bacteria in birthing and abortion fluids from cats as well as livestock)

FECES

Salmonella, various serovars

Campylobacter, various species

Giardia

Roundworm

Hookworm

Hydatid disease

Toxoplasma

THE CULPRITS: Here are some common or serious zoonotic disease risks for shelters, listed according to where they're most likely to be found in the assorted substances that ooze, leak, squirt or otherwise exude from our animal friends. A generic beast is depicted because some of the diseases listed are found only in dogs or cats, while others are found in many species. —KH

PROTECT YOUR ANIMALS:

- ☛ Deworm all nursing moms, puppies, and kittens according to Center for Disease Control (CDC) guidelines (visit www.cdc.gov/ncidod/dpd/parasites/ascaris/prevention.htm, or do a search for “CDC ascarid control guidelines”).
- ☛ Perform diagnostics and treat appropriately for other zoonotic infections not covered by routine deworming.
- ☛ Use effective flea and tick control for animals and the environment as needed.
- ☛ If treating animals, use antibiotics only when clearly indicated.
- ☛ Vaccinate all animals at intake with core shelter vaccines. Consider rabies vaccination at facilities that hold animals long term.

PROTECT YOUR PEOPLE:

- ☛ Provide verbal and written information about zoonotic disease to adopters, volunteers, foster families, and staff. Good resources for this include PAWS/HSUS Safe Pet Guidelines at www.pawssf.org/library_safepetguidelines.htm and the CDC’s Healthy Pets Healthy People website at www.cdc.gov/healthy-pets.
- ☛ Provide staff with sick leave to prevent reverse zoonoses (spread from humans to animals), and encourage staff to alert their physicians to the professional risk for zoonotic disease exposure.
- ☛ Provide at-risk staff with rabies vaccination according to CDC guidelines (visit www.cdc.gov/ncidod/dvrd/rabies/

Professional/publications/ACIP/ACIP99.pdf, or search for “Human Rabies Prevention”).

- ☛ Designate non-animal areas for human food preparation and eating.
- ☛ Provide hand-washing stations, gloves, and/or hand sanitizer for use before, between, and after handling animals. (Hand sanitizer is the least effective choice but is better than nothing.)

AND MOST IMPORTANTLY:

- ☛ Train all staff and volunteers in prevention of zoonotic disease transmission. For other information and tips on disease control and disinfection, visit www.animalsheltering.org and click on “Shelter Library.”