

# Visitation Dogs Carry *C. difficile*, MRSA, Salmonella

*A hospital tested visitation dogs for C. difficile and found it in 57%; one poodle shed an epidemic strain.*

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SAN ANTONIO — Dogs serving as visitation-therapy animals in health care facilities have tested positive for *Clostridium difficile* and can also harbor salmonella and methicillin-resistant *Staphylococcus aureus*, according to new research.

Sandra Lefebvre, D.V.M., and her colleagues of the Ontario Veterinary College at the University of Guelph discussed her group's findings on *C. difficile* in a poster presentation at a meeting of the Southwest Conference on Diseases in Nature Transmissible to Man.

They collected fecal samples from dogs used in a hospital visitation program in Ontario and used polymerase chain reaction techniques to identify microorganisms in the samples. They found *C. difficile*

in 58 (57%) of the 102 dogs. Of the strains identified, 10% were indistinguishable from human strains.

One dog, a toy poodle, shed an epidemic strain of the bacteria. The investigators discovered that this healthy animal had previously visited a hospital with documented cases of *C. difficile*-associated disease. Dr. Lefebvre and her colleagues recently reported these findings in a published letter (*Emerg. Infect. Dis.* 2006;12:1036-7).

The group is currently conducting a prospective cohort canine study (to be published in October) that has revealed perhaps a more ominous discovery. "We're finding that dogs are picking up MRSA, too," as well as salmonella, Dr. Lefebvre said in an interview. She noted that the dogs often lick the hand of a patient with the infection and then lick a noninfected patient, risking transmission of the dis-

ease. Such findings do not prove that dogs have spread such diseases to humans, her group wrote—but "they certainly support that possibility."

Furthermore, visitation dogs then return to the home and neighborhood, where they can spread the disease to humans and other dogs, she said at the meeting, held in conjunction with the International Conference on Diseases in Nature Communicable to Man. Three dogs so far have tested positive for MRSA after visiting hospitals, but one dog with no such exposure has also tested positive.

"These animals are going from patient to patient, getting up onto beds and licking people," Dr. Lefebvre said. "They also lick and are handled by health care workers, who are notorious for having contaminated hands."

She added that the MRSA found so far in the dogs is community acquired—an ominous fact, given that this type of bacterium (unlike the less robust hospital-acquired variant) attacks people other than the elderly and immunocompromised alone.

Additionally, one-third of the dogs have so far tested positive for salmonella, she noted, speculating that a diet containing raw meat or poultry (common among visitation dogs) is the prime suspect.

Dr. Lefebvre emphasized that, even in light of these findings, she personally supports dog-visitation programs and believes they "spread more good than harm. ... But people are being really naive in their approaches, and they need to practice more intact vector control than they are right now.

"A few simple precautions, particularly practicing hand hygiene [before and] after handling the animals, can reduce the potential harms—to both pets and people," she said.

She also targeted the dogs' habit of licking as a principal link in the disease-transmission chain. "I think it's a bad idea to ... let dogs lick people and think there are no ramifications for that," she said. Dr. Lefebvre also advised that people caring for visitation dogs not feed them raw meat or poultry. ■

## New Ehrlichia Species Emerges; Lone Star Tick Is U.S. Vector

SAN ANTONIO — Physicians who see patients presenting with extreme localized pain beginning a few days after a tick bite have a new reason to consider the possibility of ehrlichiosis, based on findings reported at a meeting of the Southwest Conference on Diseases in Nature Transmissible to Man.

Researchers from the Centers for Disease Control and Prevention have discovered a possible new *Ehrlichia* species found to cause illness in humans, as well as goats. The vector for the disease is the domestic Lone Star tick.

Amanda Loftis, D.V.M., of the CDC's medical entomology laboratory in Atlanta, reported a human case that she said could be a "divergent strain" of the bacterium *Ehrlichia ruminantium*, which is on the U.S. Department of Agriculture's watch list of foreign pathogens, or a new *Ehrlichia* species.

Dr. Loftis said the new bacterium is genetically similar to *Ehrlichia ruminantium*, common in Africa and the Caribbean but so far unreported in the United States.

The new agent causes only mild illness in humans and animals, unlike *E. ruminantium*, which causes heartwater disease.

Five days after removing a tick from his upper arm, the patient, an Atlanta man, experienced extreme neck pain that was unresponsive to NSAIDs. He presented to a physician 4 weeks after removing the tick.

The physician suspected tick-borne illness, took a blood sample, and administered doxycycline; the patient reported significant improvement in neck pain after 48-60 hours, Dr. Loftis said.

Dr. Loftis and her colleagues first discovered the new agent when they tested local ticks on a laboratory goat that subsequently became mildly ill.

Genetic tests for five genes showed that the agent infecting the goat was highly similar to *E. ruminantium* but not identical to any described strains.

Further, the CDC performed DNA tests on the patient's blood and found *Ehrlichia* DNA identical to sequences found in the goat and in wild Lone Star ticks.

No other bacterial DNA were detected, Dr. Loftis reported at the meeting, held in conjunction with the International Conference on Diseases in Nature Communicable to Man.

"Nothing like this has ever been reported from the United States," Dr. Loftis said.

"The scary thing is that the Hartsfield international airport, a USDA port of entry for import of animals, is very close to our collection site.

Both are within the Atlanta metro area—so we have to ask the question, where did this come from?" Dr. Loftis said.

There are 13 species of tick that can be vectors of *Ehrlichia ruminantium*, but only 3 of these species live in the United States, Dr. Loftis explained. ■

## Powassan Encephalitis Cases Rising in Northeast, Canada

SAN ANTONIO — The incidence of Powassan encephalitis, a tick-borne cause of long-term neurologic problems, disability, and death, has recently been increasing in the northern United States and in Canada, and a second virus lineage found in the deer tick might someday enable the disease to spread even further, a researcher from the New York State Department of Health reported.

The U.S. infection rate, which had held at 0.7 cases per year for 30 years, has climbed to 1 case per year since 1998, Susan Wong, Ph.D., said at the Southwest Conference on Diseases in Nature Transmissible to Man.

According to the Centers for Disease Control and Prevention, mild cases of arboviral encephalitis may present with only a slight fever and/or headache and body aches. Severe infections, however, occur with rapid onset and usually feature high fever, headache, and disorientation; they can include tremors, convulsions, paralysis, coma, and death. There is no effective treatment for the disease, which is fatal in 10%-15% of cases.

The primary lineage of Powassan virus is carried by a tick (*Ixodes cookei*) that feeds on the woodchuck (groundhog) and other small mammals, including squirrels and chipmunks, Dr. Wong said. Persons at greatest risk of infection are residents of the aforementioned regions who have close exposure (e.g., via gardening) to woodchuck burrows. Most cases occur from May to December, with the peak incidence from June to September.

During 1999-2001, four cases of Powassan encephalitis were reported in New Hampshire and Maine. During 2002-2006, there were two cases in New York (one in Westchester County, a suburb of New

York City), as well as one in Wisconsin and one in Michigan, she said. This contrasts with the 1958-1998 period, wherein there were only 27 human cases in the United States and Canada.

Moreover, a second strain of the virus was found in the deer tick (*Ixodes scapularis*) in the 1990s, she noted, adding that in this second lineage there appears to be "potentially perhaps a greater epidemic potential," because this tick species is the one that carries Lyme disease, ehrlichiosis, and other more common tick-borne diseases.

Dogs and horses can also become infected by ticks carrying the virus and can spread it to humans, she noted at the meeting, which was held in conjunction with the International Conference on Diseases in Nature Communicable to Man.

Powassan viral isolates have been found in California, South Dakota, New York, West Virginia, Connecticut, Massachusetts, and Maine, as well as Ontario. Moreover, serologic testing has identified human infections in most other Canadian provinces bordering the United States, Dr. Wong said.

The virus until recently was considered a low threat to human health. In North America, the disease first appeared in Canada in 1958, in a patient from Powassan, Ont. The first U.S. case occurred in New Jersey in 1970.

The Powassan virus is the least common cause of arboviral encephalitis in North America, whereas West Nile virus is the most common.

The incidence of another often lethal arbovirus, Eastern equine encephalitis virus, has been increasing in New England, according to the CDC. ■