

ZOO NOTIC & VECTOR-BORNE

Public Health Newsletter

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The New York City Department of Health and Mental Hygiene publishes this newsletter to provide local animal health professionals with summaries of recent investigations by the Department, as well as important current events in the field of zoonotic and vector-borne diseases." The mission of the Zoonotic and Vector-Borne Disease Unit (ZVDU) is the prevention and control of zoonotic and vector-borne diseases in New York City. Please visit our website at www.nyc.gov/html/doh/html/zoo/zoo.shtml.

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Enterohemorrhagic *Escherichia coli* Excretion by Child and Her Cat

The following is adapted from an article that appeared in the journal *Emerging Infectious Diseases*.

In this article, the authors describe a case in which a child and her pet cat were infected with the same strain of Enterohemorrhagic *E. coli* (EHEC). Strains of EHEC can cause severe gastrointestinal illness, and in some instances hemolytic uremic syndrome (HUS). Children are most susceptible to severe infections. Of the many EHEC strains characterized, the most important is *E. coli* O157:H7. There is no definitive treatment for EHEC infections aside from palliative care, as there is concern that antibiotics may increase the risk of HUS.

The child, a two year old girl, developed bloody diarrhea and vomiting. She was diagnosed with EHEC serotype O145:H-. Cattle and other livestock are the natural reservoirs of EHEC's, but the only animal exposure identified for the child was her cat. The cat lived indoors, ate canned food only and did not exhibit any gastrointestinal illness.

Stool samples collected from the cat revealed an isolate of EHEC serotype O145:H- identical to that of the child. Working under the assumption that the cat was the source of the child's infection, the cat was treated unsuccessfully with probiotics (dietary supplements containing bacteria or yeast). The cat continued to shed the bacteria until an experimental oral vaccine was used. The child stopped excreting EHEC within three months, without the use of antibiotics.

In the article, the authors theorize the girl might have contracted the disease from her cat, but argue that more likely the girl was the source of infection for the cat, which may have resulted in a cycle of mutual reinfection.



The authors note, "this case illustrates several issues: 1) domestic animals such as cats, dogs, and rabbits may serve as reservoirs for EHEC, irrespective of whether they are the primary or secondary source for these bacteria; 2) domestic cats as carriers may excrete EHEC for a prolonged period; and 3) autovaccination may be effective for treating EHEC-infected animals." It is interesting to note that the parents opted not to remove the cat from the home as they felt the child was extremely attached to the pet.

Busch U, Hörmansdorfer S, Schranner S, Huber I, Bogner K-H, Sing A. Enterohemorrhagic *Escherichia coli* excretion by child and her cat. *Emerg Infect Dis*. 2007 Feb. Available from www.cdc.gov/EID/content/13/2/348.htm

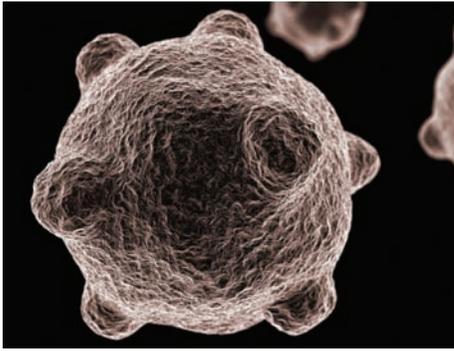
Tick Borne Disease Surveillance in NYC



There are several tick borne diseases that are reportable in New York City including Rocky Mountain spotted fever, ehrlichiosis, anaplasmosis, and Lyme disease. When new cases are reported to the DOHMH, a phone interview is conducted with the patient to assess risk factors for infection including travel to endemic areas and history of a tick bite. Analysis of several years of data has shown a correlation between travel outside New York City and ehrlichiosis, anaplasmosis and Lyme disease, but not with Rocky Mountain spotted fever (RMSF). The findings support previous studies reporting that RMSF can be acquired locally within NYC¹, while transmission of ehrlichia, anaplasma, and *Borrelia burgdorferi* (the spirochete that causes Lyme disease) is likely occurring outside of NYC.

Interviews conducted by DOHMH reveal that the latter diseases are almost exclusively identified in persons who reported travel outside of NYC to endemic areas, including Long Island, Connecticut, Massachusetts, Westchester County and other parts of upstate New York. These findings also correlate with tick surveillance data collected several years ago and in 2006. While limited in scope, tick surveillance suggests that the tick responsible for transmitting RMSF, *Dermacentor variabilis*, is found in large numbers in all five boroughs, while the ticks responsible for ehrlichiosis, anaplasmosis and Lyme disease, *Ixodes scapularis* and *Amblyomma americanum*, are rarely isolated in NYC. These findings can be used to educate clients on the importance of tick checks and use of tick repellents during tick season, especially when traveling to tick infested areas.

¹ A focus of Rocky Mountain spotted fever within New York City. Salgo et. al. *N Engl J Med*. 1988 May 26;318(21):1345-8.



Methicillin-resistant *Staphylococcus aureus* (MRSA) overview

Staphylococcus aureus bacteria, also known as staph, are one of the most common causes of skin infection in humans and animals in the U.S. They also cause pneumonia, surgical wound infections, and bloodstream infections. Approximately 25% to 30% of the population is colonized (when bacteria are present, but not causing an infection) in the nose with staph bacteria. Methicillin-resistant *Staphylococcus aureus* (MRSA) is a type of staph that is resistant to beta-lactam antibiotics such as penicillin and amoxicillin. The majority of MRSA infections occur among human patients in hospitals or other health-care settings; however, it is becoming more common in the community setting. Approximately 1% of the human population is colonized with the more serious MRSA.

Transmission of MRSA between human and companion animals has been theorized in multiple articles that have described the movement of identical MRSA isolates between humans and animals. The frequency with which MRSA associated disease is diagnosed among domestic species is increasing. MRSA has been isolated from an expanding list of species including dogs, cats, rabbits and horses. Three articles on MRSA as it relates to animal and human disease are summarized below. The first describes MRSA in a cat and its owner. The other two suggest that MRSA carriage is greater among veterinarians and their staff than the general public.

Methicillin-resistant *Staphylococcus aureus* in Cat and Owner

Vitale CB, Gross TL, Weese JS. Methicillin-resistant *Staphylococcus aureus* in cat and owner [letter]. *Emerg Infect Dis*. 2006 Dec [date cited]. Available from www.cdc.gov/ncidod/EID/vol12no12/06-0725.htm

The authors report on a three-year-old, neutered male, domestic shorthaired cat presenting with a one year history of pyoderma described as patches of crusted and well-demarcated ulcers. Diagnosed as a flea allergy, the cat did not respond well to a variety of antimicrobials (amoxicillin-clavulanic acid and enrofloxacin) and corticosteroids.

Compendium of Animal Rabies Prevention and Control

The 2007 version of the compendium is now available. It can be found on the NYC DOHMH website at: www.nyc.gov/html/doh/downloads/pdf/zoo/zoo-rabies-compendium-2007.pdf

Examination of the exudate collected from the skin lesions revealed cocci within neutrophils and eosinophils, and a leukocytosis with eosinophilia on CBC. Histopathology of the ulcers revealed a pattern of inflammation indicative of methicillin-resistant staphylococcal infection.

Interestingly, three months earlier the cat owner had been treated for skin abscesses and pneumonia. No microbiological testing was done.

Further investigation entailed collecting swabs from the nares of both the owner and the cat. Identical strains of MRSA were isolated, specifically a strain named USA300 MRSA. USA300 is a community-associated strain of MRSA found widely dispersed throughout North America and Europe.

The authors note, "reports of MRSA infection and colonization in pets have increased dramatically in the past few years. Although this rise may be partially the result of increased testing and reporting, MRSA is definitely emerging in pet populations throughout the world. The role of pets in transmission of MRSA is still unclear; however, recent evidence suggests that MRSA can be transmitted between persons and their pets, in both directions. Reports of MRSA infection and colonization in pets have indicated that pets tend to be infected with isolates that are consistent with clones that are predominant in the human population in their area. Accordingly, USA100 accounted for initial isolations of MRSA in pets in North America. The similarity between pet and human isolates has led to speculation that pet MRSA is closely linked to human MRSA and that the source of MRSA in pets may often be colonized humans. If this is the case, it is not surprising that USA300 would emerge as a cause of disease in pets as it increases in prevalence in the human population. Considering the rapid dissemination of USA300 in humans in the United States, particularly in California, where it is the predominant community-associated clone, finding USA300 in a household pet in that state is not unexpected."

MRSA likely was transmitted between the cat and owner, although the authors note, "while it is tempting to assume that the owner was the source of infection because of the owner's previous history of a soft tissue infection, this cannot be definitively determined on the basis of the timing of sampling in this case." The authors urge that, "ongoing MRSA surveillance in animals is required, including proper testing of specimens from clinically affected animals and surveillance for colonization. The potential for transmission of this clone between humans and pets should also be evaluated to clarify its epidemiology and to facilitate development of measures to reduce household transmission."

This is adapted from an article that appeared in the journal *Emerging Infectious Diseases* which can be found online at: www.cdc.gov/eid • Vol. 12, No. 12, December 2006

Methicillin-resistant *Staphylococcus aureus* Colonization in Veterinary Personnel

This abstract is from an article that appeared in the journal *Emerging Infectious Diseases* which can be found online at: www.cdc.gov/eid • Vol. 12, No. 12, December 2006

The authors report that methicillin-resistant *Staphylococcus aureus* (MRSA) was isolated from nares of 27 out of 417 (6.5%) attendees at an international veterinary conference made up of veterinarians, technicians, and others. Colonization was more common for large-animal than small-animal personnel or those with no animal patient contact. Large-animal practice was the only variable significantly associated with colonization. Pulsed-field gel electrophoresis (PFGE) identified two predominant clones with similar distribution among veterinarians as previously reported for horses and companion animals. In conclusion, MRSA colonization may be an occupational risk for veterinary professionals.

Hanselman BA, Kruth SA, Rousseau J, Low DE, Willey BM, McGeer A, et al. Methicillin-resistant *Staphylococcus aureus* colonization in veterinary personnel. *Emerg Infect Dis*. 2006 Dec. Available from www.cdc.gov/ncidod/EID/vol12no12/06-0231.htm

Compendium of Veterinary Standard Precautions: Zoonotic Disease Prevention in Veterinary Personnel

The National Association of State Public Health Veterinarians (NASPHV) Veterinary Infection Control Committee (VICC) recently released a new compendium that provides guidelines for infection control practices in veterinary care settings. It is an excellent resource designed to prevent transmission of zoonotic pathogens from animal patients to veterinary personnel in private practice. Please read the summary below for more information. This document can also be found at <http://nasphv.org/Documents/VeterinaryPrecautions.pdf>

Veterinary practices are unique environments that bring humans into close contact with many different species of ill animals. In the practice environment, whether in a building or "in the field," veterinary personnel are frequently exposed to recognized and unrecognized infectious human pathogens, many of which are zoonotic (transmitted from animals). Some of the documented zoonotic infections that have occurred in veterinary personnel include: multi-drug resistant *Salmonella typhimurium*, cryptosporidiosis, cat associated plague, cat-associated sporotrichosis, Methicillin-resistant *Staphylococcus aureus* (MRSA), and

dermatophytosis. Infection control measures vary from practice to practice and may be insufficient to prevent zoonotic disease transmission.

The Veterinary Standard Precautions (VSP) in the new compendium are designed to prevent transmission of zoonotic pathogens from animal patients to veterinary personnel in private practice. The compendium committee has set the following objectives:

- Raise awareness of the scope of zoonotic disease risk in veterinary practice
- Address issues specific to veterinary practices, such as bites and other trauma from veterinary patients, and housing and monitoring of ill animals in common treatment areas
- Provide practical, science-based guidance that will reduce transmission from recognized and unrecognized sources of infection
- Outline sensible infection control practices
- Provide a model infection control plan for use by individual veterinary practices

Update on Rabies in New York City, 2007

The rabies epizootic in Staten Island has continued into 2007. This year to date (April), we have received reports of a total of 17 rabid raccoons, one kitten and one groundhog from Staten Island. Four additional rabid raccoons were found in the Bronx and one in Queens for a city total of 24 animals. In 2006, there were a total of 44 rabid animals in NYC, the majority of which were from Staten Island with 29 raccoons, 2 skunks and 4 cats. The finding of rabies in stray cats serves as a reminder to encourage clients to vaccinate their dogs and cats against rabies, instruct them to stay away from stray and wild animals, keep cats indoors, and ensure that their children and pets do not have contact with stray or wild animals.

The DOHMH's Veterinary Public Health Services is offering free rabies vaccine to cats residing on Staten Island until June 30th, 2007. For more information, visit the Animal Care and Control website at www.nycacc.org/FreeRabies_Calendar.html or call 311.

Any pet dog or cat that has bitten or scratched a person is required to be confined and observed by

the owner (in most instances) for 10 days. Animal bites are reportable to the DOHMH Veterinary Public Health Services (VPHS) Animal Bite Unit at 212-676-2483. For questions about whether persons should receive rabies PEP, contact a health care provider or the DOHMH Bureau of Communicable Disease (BCD) at 212-788-9830 during business hours (Outside of business hours, please call the Poison Control Center at 212-POISONS or 212-764-7667).

Additional information about rabies is available on the DOHMH website at www.nyc.gov/html/doh/html/cd/cdrab.shtml including summary data for New York City.



Leptospirosis Surveillance in NYC Dogs

In June 2006, the DOHMH began collecting laboratory reports for dogs testing positive for leptospirosis. Laboratory reports are reviewed and investigated if any of the antibody titers for the seven *Leptospira* serovars included on the panel are $\geq 1:800$ by serum agglutination. Currently, there is no national standard case definition for leptospirosis in dogs. The NYC DOHMH developed a case definition which is used solely to include or exclude cases for surveillance purposes; it is not intended to provide clinical guidance. If you suspect leptospirosis in any dog based on clinical presentation and supportive laboratory work, it should be treated accordingly.

According to the working DOHMH case definition, a confirmed case of leptospirosis includes a clinically compatible presentation along with;

1. Isolation of *Leptospira* from a clinical specimen,
2. A fourfold or greater increase in *Leptospira* agglutination titer between acute and convalescent phase serum specimens obtained ≥ 2 weeks apart, OR
3. Demonstration of *Leptospira* in a clinical specimen by immunofluorescence.

A probable case is a clinically compatible presentation along with a single *Leptospira* agglutination titer of $\geq 1:800$.

To date we have investigated 17 reports. Of these, seven were determined not to be leptospirosis because of recent vaccination, old infection, or diagnoses with another illness. Of the ten remaining cases, one was excluded because a convalescent specimen did not result in a fourfold change in titer. Among the remaining nine cases, seven were classified as probable and two as confirmed cases of leptospirosis.

Because of cross reactivity, most reports had elevated titers for more than one serovar. For those cases in which multiple serovars had matching elevated titers, they were included in the predominant serovar count.

Among confirmed or probable cases, *Leptospira icterohaemorrhagiae* was the predominant serovar (n=4) followed by *L. bratislava* (n=4), *L. autumnalis* (n=2), and *L. grippityphosa* (n=2)². It is important to note that serological testing by MAT is specific only to the serogroup, and not the serovar. Therefore the panel serovar with the highest titer cannot always predict the actual infecting serovar.

Four of the five boroughs had cases; Manhattan (4), Bronx (2), Brooklyn (2) and Queens (1). Seven of the cases occurred between July and August. There was no common link identified among the cases, although potential sources of exposures included contact with rodents. *Leptospira icterohaemorrhagiae* is associated with rodents and raccoons, and *L. Bratislava* with rodents and swine.

Leptospire die within minutes of exposure to dry environments. As such, outbreaks of leptospirosis tend to only occur in warm, moist environments. The cold winters of New York City likely limit the extent to which leptospire can survive in the environment, suggesting that most cases of leptospirosis are due to direct contact with an infected animal. Exposure most commonly occurs through contact with open wounds or mucous membranes with water, moist soil or vegetation contaminated by urine of infected animals. Swallowing contaminated water, direct contact with urine or tissues of infected animals, or inhalation of aerosolized contaminated fluids are other possible routes of transmission.

Infected dogs theoretically pose a risk of transmission to their owners through contact with their urine, although such direct transmission has been infrequently documented. If you are treating an animal you suspect may have leptospirosis, limit the number of staff members who have direct contact with the animal, its urine or its bedding. Post signs for staff and remind owners to use appropriate caution when handling the dog's urine, and wash hands whenever there is any question that there was urine contact. Use of protective equipment or

clothing, such as gloves, face shields, and minimizing contact with urine, blood or contaminated will help prevent potential transmission.

We will continue to investigate reports of canine leptospirosis and analyze the data to look for patterns of disease for which prevention measures can be put in place.

REMINDER - Please remember, there are several animal diseases reportable to the DOHMH:

- Upon suspicion, CALL the DOHMH: anthrax, brucellosis, glanders, plague, Q fever, tularemia, monkeypox and rabies, or "an outbreak of any disease or condition in birds or animals, of known or unknown etiology, which may pose a danger to public health."
- Upon diagnosis, report by telephone, mail, or fax: psittacosis, leptospirosis, and arboviral encephalitides.

To report to the Department of Health and Mental Hygiene:

1. Call the Bureau of Communicable Disease at 212-788-9830 during regular business hours, and for urgent matters after regular business hours call the Poison Control Center at 212-764-7667.
2. Complete an Animal Disease Report Form (available online at www.nyc.gov/html/doh/downloads/pdf/zoo/zoo-disease-report-form.pdf) and fax to 212-788-4268 or mail to Zoonotic and Vector Borne Disease Unit, Bureau of Communicable Disease, 125 Worth St., Box 22A, New York, NY 10013.

The New York City Department of Health and Mental Hygiene's Zoonotic and Vector-Borne Public Health Newsletter provides summaries of zoonotic disease investigations undertaken by the Department along with current events. The mission of the *Zoonotic and Vector-Borne Disease Unit* (ZVDU) is the prevention and control of zoonotic and vectorborne diseases in New York City. Please visit our website at www.nyc.gov/html/doh/html/zoo/zoo.shtml

² Using the serovar with the highest titer to define the agent responsible for infection

Notice of Internet Adoption Scams Involving Imported Pets



The Centers for Disease Control and Prevention (CDC) has been notified of an increasing number of Internet scams involving adoptions of pets from other countries into the United States. In most of these scams, victims respond to Internet classified advertisements in which animals, such as Capuchin monkeys or purebred puppies, are offered for adoption in exchange for shipping costs. Typically, the person offering the animal for adoption lives in another country and requests that the shipping fee be prepaid. After paying the shipping fee up front, victims discover that the animal is never delivered, and in some cases, that it is illegal to bring the animal to the United States.

In a typical scam, the animal offered for adoption is a Capuchin monkey. Unfortunately, victims may be unaware of federal regulations prohibiting the importation of nonhuman primates as pets. The CDC regulations covering the importation of nonhuman primates as pets are found online at www.cdc.gov/ncidod/dq/nonhuman.htm.

Furthermore, all monkeys and other types of nonhuman primates are considered endangered species, which may not be imported without proper permits according to the Convention on International Trade in Endangered Species (CITES). Often, the person offering the monkey for adoption claims to be a missionary in an African country who can no longer care for the animal. The scammer offers the monkey for adoption and asks for several hundred dollars to cover shipping costs. In several instances, unsuspecting persons have paid this fee and then received an e-mail telling them that the monkey was seized at an airport because it lacked the proper permits. In reality, the monkey never existed.

CDC has also been notified of at least one scam in which a purebred puppy, such as a Yorkshire terrier, was offered for adoption in a similar scheme. In this situation, the person offering the puppy for adoption first demanded payment of shipping fees, then payment for additional vaccinations that were actually not required by CDC. In reality, this was also a scam.

In these situations, the person conducting the scam often engages the victim in frequent e-mails and telephone calls to establish sincerity. CDC cautions consumers to be aware of the potential for Internet fraud involving the commercial trade of animals. Consumers should avoid situations in which they pay prior to shipment and educate themselves about federal

requirements for importing and shipping animals. Consumers should also be cautious of offers for animal adoptions from overseas, especially from countries in Africa. If Internet fraud is suspected, consumers should report these instances to the Internet site posting the classified advertisement and should also consider reporting to the Internet Fraud website at www.usa.gov/Citizen/Topics/Internet_Fraud.shtml.

This was posted on the CDC website on October 30, 2006



Importation of Pets, Other Animals, and Animal Products into the United States

The recent outbreaks of Monkeypox, SARS and highly pathogenic avian influenza H5N1 have highlighted serious risks to human health posed by close contact between people and animals, and by global animal trade. Efforts are being made to better regulate the movement of animals into the United States. According to a recent article from the Associated Press, based on documents from the U.S. Fish and Wildlife Service, more than 650 million animals were imported legally into the U.S. in just the past three years. Animals and animal parts are brought into the U.S. legally every day, with limited oversight. Several different agencies are responsible for different animals. For clients who have questions regarding importation regulations and whom to contact for what, please refer to the websites listed below.

The United States Department of Agriculture Animal and Plant Health Inspection Service (USDA APHIS):

All non-U.S. origin pet birds imported into the United States (except from Canada) are required to be quarantined for 30 days in a United States Department of Agriculture (USDA) animal import quarantine facility at the owner's expense. A reservation at a facility must be made in advance. U.S. origin pet birds may be kept at the owner's home during the quarantine period.

Any bird imported from a highly pathogenic avian influenza (HPAI) affected country must be quarantined in a USDA facility.

Websites with information on the following species are provided here:

Dogs from screwworm endemic areas:
www.aphis.usda.gov/vs/ncie/pet-info.html

Birds: www.aphis.usda.gov/vs/ncie/importing.html

Horses, sheep and canine semen and embryos:
www.aphis.usda.gov/vs/ncie/importing.html

The Centers for Disease Control and Prevention:

The Centers for Disease Control of the U.S. Public Health Service regulates the importation of primates, turtles, dogs, cats, and other wildlife that may be carriers of human disease. Pets taken out of the United States are subject upon return, to the same

Memorial to Edward Boyce

The Department of Health and Mental Hygiene was greatly saddened to learn of the passing of Edward Boyce on February 23, 2007. Ed was the Assistant Director of Veterinary Public Health Services, and was truly devoted to his job, never missing a day of work through his 17 year tenure with the DOHMH. For those of you who had the opportunity to work with Ed, there are many memories of a man who held a wealth of information on the rules and regulations related to animal care and control, as well as the inner workings of New York City – for which he was a stickler! Ed worked closely with his “friends on the street,” namely the rodents, bats, raccoons, carriage horses, and the occasional tiger! Any memory of Ed will bring a vision of a man who was always in a suit and tie, regardless of the temperature outside or where his work brought him, including the middle of a horse pasture. His family has requested charitable donations in lieu of flowers. For more information about donating please contact DOHMH at (212) 788-4160.

regulations as those entering for the first time. The CDC does not require general certificates of health for pets for entry into the United States. However, health certificates may be required for entry into some states, or may be required by airlines for pets. Pet owners should check with officials in the state of destination and with their airline prior to traveling domestically and internationally.

Small terrestrial mammals (ferrets, rabbits) and rodents (hamsters, guinea pigs) do not have restrictions unless they are known to carry a recognized zoonotic disease or are a species recognized as carrying diseases of that are transmissible to other domestic or wild animals.

Visit the CDC website at:

www.cdc.gov/ncidod/dq/faq_animal_importation.htm

US Fish and Wildlife:

Most persons who import or export wildlife must file a special declaration and may be required to have certain documents from foreign governments as well. In most cases, anyone importing or exporting wildlife or wildlife products must file a U.S. Fish & Wildlife Service Form 3-177 (Declaration for Importation or Exportation of Fish and Wildlife) with the U.S. Fish & Wildlife Service or U.S. Customs Service at the time of importation or exportation.

Certain wildlife may also require a Federal permit in order to be imported and include:

- endangered or threatened species
- species protected by CITES
- injurious species
- migratory birds
- marine mammals.

Visit the US Fish and Wildlife Service website at:

www.fws.gov/le/ImpExp/CommWildlifelmpoortExport.htm

Note: New York City has extensive laws that prohibit the sale, transfer or possession of most wild animals, with the certain exceptions. You can find this specific section of the New York City Health Code on our website at www.nyc.gov/html/doh/html/zoo/zoo-code.shtml