

Public Health Aspects of Pet Sheltering

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Pet Sheltering in Disasters

- In the wake of a disaster, it may be necessary to shelter pets
- Animals may be co-located with their owners
- Sheltering duties may include stray animals

Major Public Health Concerns

- Potential for transfer of infectious diseases in such settings
- Some of these diseases could be transmitted to humans (zoonotic agents)
- Increased potential for bites

Major Public Health Concerns

- Many zoonotic pathogens are associated with hand-to-mouth contact
- Other pathogens may spread to people via other routes such as direct contact, inhalation or vector-borne
- Serious illness or injury may occur, especially in children and the immunocompromised

Major Public Health Concerns

- Zoonotic pathogens do not necessarily cause illness in animals
- Normal behavior of animals may be altered
- Bite related injuries

Fecal-oral transmission

- *Toxocara*
- *Ancylostoma*
- *Giardia*
- *Toxoplasma*
- *Campylobacter*

Toxocara and Ancylostoma

- Roundworms and hookworms
- Eggs shed in feces of infected dogs and cats
- Signs of infection in dogs and cats:
 - Poor weight gain
 - Diarrhea
 - Weakness (hookworm especially)



Toxocara and Ancylostoma

- Infection in people
 - Can depend on level of infection and where larva migrate
 - Eye infections (roundworm)
 - Skin infections (hookworm)
 - Advanced infections can cause abdominal pain, anemia and/or lung infections

Toxocara and Ancylostoma

- Source of exposure for people
 - Infected dogs and cats
 - Soil contaminated with larvae
 - Contaminated food, water, hands
- Source of exposure for animals
 - Infected animals
 - Soil contaminated with larvae
 - Contaminated food, water

Giardia

- A microscopic parasite found in the feces of infected people and many animals
- In dogs and cats, the prevalence of infection can range widely

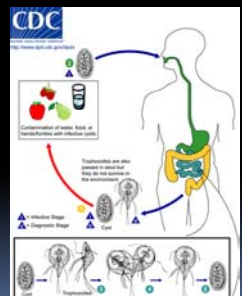


Giardia

- Dogs and cats may have diarrhea or may not have any signs at all
- Infection is more frequent in young
- More likely to be ill in situations where animals are stressed, immunosuppressed or housed in groups

Giardia

- People exposed to *Giardia* may develop diarrhea (for either a short or long period of time) or show no symptoms
- Reservoir typically infected people, but animals may play a role

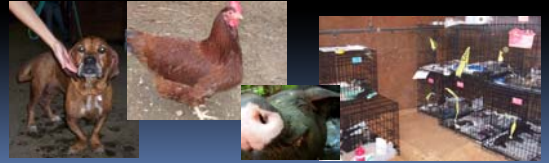


Giardia

- Source of exposure for people
 - Contaminated water
 - Contaminated food and hands
 - Infected people
 - Infected animals
- Source of exposure for animals
 - Infected animals
 - Contaminated environment

Campylobacter

- A bacterial infection that can be spread by infected animals and people
- Can be found in many domestic and wild animals and the environment



Campylobacter

- Dogs and cats may have diarrhea or may show no signs of infection
- Illness most common in young animals (<6months old)
- Higher rates of infection found in kennels and shelters

Campylobacter

- One of the most common cause of diarrheal illness in people
- Infection results in diarrhea, fever and stomach pain
- Most infections resolve without complications

Campylobacter

- Source of exposure for people
 - Infected animals
 - Contaminated food, water, hands
- Source of exposure for animals
 - Infected animals
 - Contaminated environment

Prevention: fecal-oral



- Disposal of fecal material properly and promptly
- Use barrier precautions when cleaning areas contaminated with fecal material
 - Depending on the circumstances this may mean wearing gloves, an apron, face shield
- Wash your hands after cleaning an area where fecal material has been

Prevention: fecal-oral

- Wash your hands in between handling animals
- Do not eat or drink in animal holding areas
- Keep surfaces clean and dry

Inhalation

- *Bordatella bronchiseptica*
 - "kennel cough"
- *Chlamydophila felis*
- Not common zoonoses, but have been reported especially in immunocompromised people



Inhalation

- Both *Bordatella bronchiseptica* and *Chlamydophila felis* are bacteria
- Both cause upper respiratory illness (URI) in cats
- *Bordatella bronchiseptica* causes URI in dogs
- Clinical signs include runny nose and eyes, sneezing, coughing (especially in dogs)

Inhalation

- Immunocompromised people are at the greatest risk of being infected with *Bordatella bronchiseptica* and *Chlamydophila felis*
- Reports of severe coughing, bronchitis, pneumonia and infections of other organs

Inhalation

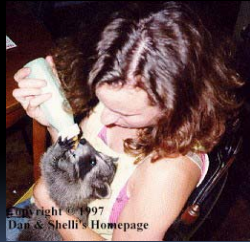
- Source of exposure for people
 - Infected animals
 - Contaminated surfaces
- Source of exposure for animals
 - Infected animals
 - Contaminated surfaces

Prevention: Inhalation

- Provide adequate ventilation for each animal
- Use disinfectants at proper strengths
 - Too concentrated can be an irritant
- Control temperature and humidity
- Vaccination for animals at specific risk

Direct Contact/Wounds

- Leptospirosis
- Rabies
- Sarcoptic mange



Leptospirosis

- Leptospirosis is caused by a bacteria that can be found in stock ponds or slow moving streams
- Many animals including white-tailed deer, raccoons, skunks, foxes, opossums and rodents are considered sources of this bacteria in the environment



Leptospirosis in Animals

- Cats do not usually become ill
- Dogs can experience vomiting, jaundice, rapid breathing, lethargy, diarrhea
- Signs in dogs can depend on serovar

Leptospirosis in People

- People can be infected when this bacteria contacts broken skin, water softened skin or mucus membranes
- Severity of illness can vary
- Initial symptoms often flu-like
- Infected people may experience fevers, headaches, muscle aches, vomiting, eye infections, liver and or kidney problems

Leptospirosis

- Source of exposure for people
 - Contact with urine and tissues of infected animals
 - Bites from infected animals
 - Contact with contaminated water sources, food, bedding
- Source of exposure for animals
 - Contact with infected urine, tissues, bite wounds, venereal transmission
 - Contact with contaminated water sources, food, bedding

Prevention: Leptospirosis

- Avoid contact with urine, other fluids of sick animals
 - Good barrier precautions: gloves, face protection, hand washing
- Separate sick from well animals
- Control rodents
- Vaccinate animals

Rabies



- A virus that attacks the central nervous system of mammals
 - Not fish, birds, amphibians or reptiles
- Terrestrial carnivores and bats are the major reservoirs
- The virus is transmitted in the saliva or central nervous system tissue of infected animals

Rabies



Animal Rabies Statistics in Virginia*

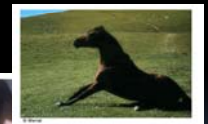
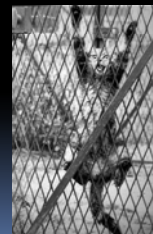
Animal	2008	2009	2010
Raccoon	308	269	315
Skunk	157	151	128
Fox	79	59	60
Bat	22	22	19
Groundhog	5	5	3
Cat	34	41	27
Cow	6	10	11
Dog	4	4	5

*Statistics typically also include $\leq 5/yr$ = beaver, coyote, deer, donkey, goat, horse, otter, mink, rabbit, rat, opossum

Rabies



- Rabid animals exhibit abnormal behavior classified as being "dumb" or "furious"



Rabies in Animals

- Clinical presentation is variable
- Early – vague, nonspecific
- Behavioral – more or less aggressive, vocalization
- Physical – appetite loss, paralysis, seizures, coma, death
- Quickly progresses to signs that are clearly abnormal

Rabies in People

- Initial clinical symptoms include anxiety, headache, mild fever, irritation at bite site
- Progresses to muscle spasms, difficulty swallowing, hydrophobia
- Clinical course is typically short

Rabies



- Once clinical signs develop, the disease is fatal
- The diagnosis of rabies is done postmortem
- Source of infection for any mammal is the wet saliva or central nervous system tissue of an infected mammal

Prevention: Rabies

- Goal is to prevent CNS tissue and saliva from entering skin and mucous membranes
 - Waterproof gloves (preferably disposable)
 - Mask (disposable or washable)
 - Safety glasses or goggles
 - Coveralls and/or waterproof apron

Exposure response

- Bite report protocol
- Area where animals being confined can be kept or identification of such animals
- Contact information for the local health department and/or animal control

Prevention: Rabies

- Prevent bites
 - Proper handling techniques
 - Barrier precautions
 - Sedation



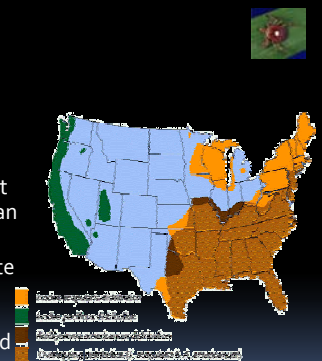
Vector-borne Diseases

- Erlichiosis
- Lyme Disease
- Rocky Mountain Spotted Fever



Erlichiosis

- Erlichiosis is the general name use to describe several bacterial diseases that affect animals and man
- Erlichiae are transmitted by the bite of an infected tick, such as the lone star tick or the blacklegged tick



Erlichiosis

- **Cats**
 - Not as commonly reported as compared to dogs
 - Can see weight loss, difficulty breathing, lethargy
- **Dogs**
 - Lethargy, bleeding from the nose, seizures, tremors, may have eye problems

Erlichiosis in People



- The severity of illness can vary
 - Symptoms can range from flu like to more severe including brain inflammation
- Most cases in people are reported from the southeast US

Ehrlichiosis

- Source of exposure for both people and animals is infected ticks
- Lone star tick is the main carrier of the types of *Ehrlichia* that affect people
- Prevention involves avoiding ticks bites and/or prompt removal of ticks

Lyme Disease



- Lyme disease is a bacterial disease that is transmitted to humans by the bite of an infected blacklegged tick



Lyme disease in animals

- **Cats**
 - Lyme disease has not been described in cats
- **Dogs**
 - Most dogs that are exposed to the bacteria that causes Lyme disease never become ill
 - Illness may manifest as lameness, joint swelling and kidney disease

Lyme disease in people

- Symptoms of Lyme disease include flu-like symptoms and may include a skin rash
- Sometimes late manifestations of Lyme disease can occur that can include neurologic problems, heart problems and joint pain

Lyme disease

- Source of exposure for people and animals is the bite from an infected tick
- Prevention involves avoiding ticks bites and/or prompt removal of ticks

Prevention: Tick-borne

- Frequently inspect yourself, your children and your pets for crawling or attached ticks
- Apply repellents, such as DEET, to yourself and your children
- Apply appropriate repellents on your pets



Prevention: Tickborne

- Prompt and proper tick removal may prevent transmission of an infection
 - Using tweezers, grasp the tick's mouthparts as close to the skin as possible
 - Gently pull the tick straight out, using a firm steady motion
 - Wash your hands and the bite wound with soap and water
 - Consult with your physician if you develop any symptoms within 30 days from the tick bite

Prevention: general

- Promptly remove animal waste and soiled animal bedding from animal areas
- Store animal waste and specific tools for waste removal in designated areas restricted from public access
- Avoid transporting soiled bedding through nonanimal areas or transition areas

Prevention: general

- Need to clean then disinfect and use fresh disinfectant
 - Most disinfectants will not work well in the presence of organic material
- Where feasible, disinfect animal areas (e.g., flooring and railings) routinely
- Keep animal areas as dry as possible
 - A wet environment will encourage bacterial growth and can be more hospitable for parasites

Prevention: general

- Animal identification
- Separate ill from well animals
- Seek prompt veterinary advice for ill animals
- Vaccinate animals
- Bite and ill animal protocol

Prevention: general



- Practice good hygiene
- Wash your hands routinely, at least:
 - Before eating
 - After using the bathroom
 - Any time they are visibly soiled
- "Hands are the most common reservoirs...for microorganisms...and hand disinfection is probably the *single most important* and immediate way of reducing...infections." Greene, 2006

Prevention: general

- Control visitor traffic to avoid overcrowding
- If possible, allow only adults in the animal area
 - One adult owner in charge of his own animal
- Set a schedule for routine animal care and maintain a daily log of those owners who access the shelter

Prevention: general

- Extra care should be taken with immunocompromised people
- Recommend that people with weak immune systems not work with animals under 1 year of age or any sick animal

Prevention: general

- Educate operators, staff, and owners about the potential risk and measures to prevent infection
 - Post signs to discourage eating in animal areas and stressing the importance of proper hand washing
 - Restrict contact of animals with persons other than owners and supervise animal-owner interactions when possible

Prevention: general

Directions for Washing Hands

HOW

- 1 Wet hands with running water
- 2 Place soap into palms
- 3 Rub together to make a lather
- 4 Scrub hands vigorously for 20 seconds
- 5 Rinse soap off hands
- 6 Dry hands with disposable paper towels, not on clothing



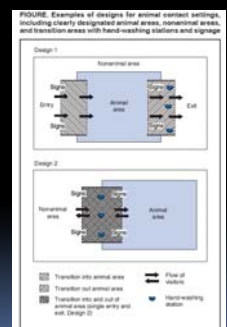
WHEN

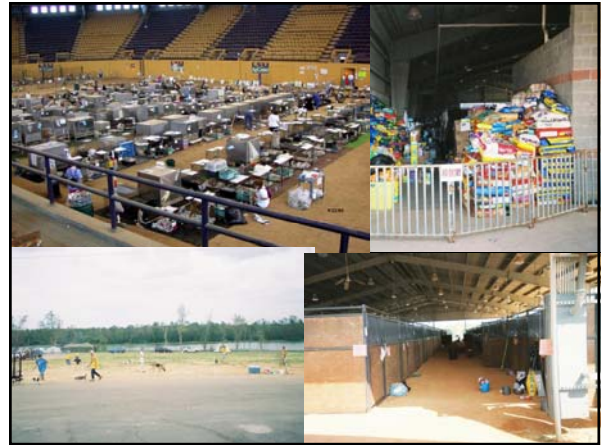
- After going to the toilet
- Upon exiting animal areas
- Before eating
- Before preparing foods
- After removing soiled clothes or shoes



Prevention: general

- Design and manage facilities to control potential transmission events.





Zoonotic Disease Resources

- www.cdc.gov
 - Health Pets Health People
 - Rabies page
- www.vdh.virginia.gov
 - Rabies Control
 - Zoonoses
- www.cfsph.iastate.edu/
 - Iowa State Center for Food Safety and Public Health

Questions?




THE NUMBER ONE REASON PEOPLE REFUSE TO EVACUATE THEIR HOMES DURING AN EMERGENCY IS BECAUSE THEY DON'T WANT TO LEAVE A PET BEHIND.

