



Safety Information

The Raccoon Roundworm

The risk of infection to humans is real and serious, since the larva of *Baylisascaris procyonis*, the raccoon roundworm, can reach the central nervous system and cause severe damage. It is important to take the necessary measures to protect the human population. Over sixty percent of all raccoons are infected with *B. procyonis*. Juveniles have a higher prevalence of patent infection than adults. Infected raccoons shed millions of eggs per day. These eggs remain viable in the environment for months to years. The eggs become infective in about 3 – 4 weeks and the parasite can be transferred to young raccoons that ingest the eggs. Human beings become infected by ingesting infected eggs from the environment, raccoon feces, contaminated soil, wood chips or water. If ingested, the larvae penetrate the intestine and head for the liver before migrating throughout the body. The preferred tissue is spine, brain and eyes.

Raccoons do not exhibit clinical signs of infection. *B. procyonis* is highly pathogenic in intermediate hosts such as rodents, birds and man. The larva continue to migrate and grow in such a host, causing visceral and ocular larva migrans and cerebrospinal nematodiasis.

Diagnostics used to indicate an infection include a WBC differential, fecal flotation and direct smear. The number of eosinophils increases with a roundworm infection. There are a variety of controls and antihelmintics for the raccoons, but no known treatment for humans.

ETIOLOGY

The mature female roundworm lives in the small intestine of the raccoon. She lays fertile eggs within a protective shell. The eggs are passed in the raccoon's feces. Fresh feces are not infective, but become so in 3 – 4 weeks.

Larvae in raccoon do a lot of damage because they are large. This means they cause more damage to the tissues they enter. Secondly, they cause a vigorous immune response. This is meant to be defensive, but the defense becomes offense and damages the very tissues it was meant to protect. The larvae continue to grow in their target tissue until the body eventually walls them off.

Larvae cause a varying amount of damage in human beings, depending on:

1. **How many infective eggs are ingested.**
2. **How many larvae migrate to the target tissue.**
3. **What the target tissue is.**

Individuals infected with a few larvae may remain symptom-less. In the eye, the larvae can cause blindness. A large number of larvae in critical areas of the brain can cause symptoms in 2 – 4 weeks that rapidly progresses to coma and death.

To prevent exposure, avoid contact with raccoons and, if contact is unavoidable, wash your hands thoroughly afterwards. In addition, eating dirt should be discouraged.

Rabies and Canine Distemper

Safety should always be your first priority when dealing with any wildlife situation. Never handle any animal you don't feel safe handling, even if it means leaving the animal in a risky situation for a time.

SYMPTOMS

Because of the contagious and deadly nature of both rabies and distemper, it is extremely important to know the signs of the diseases.

The following signs, singularly or in combination, are cause to call Animal Control or Operation Wildlife immediately.

- **discharge** from the eyes and/or nose (watery, mucous or pus)
- **paralysis**
- muscular **tics, spasms, twitches** or **convulsions**
- **erratic behavior** (calm one minute, hyper the next; nocturnal animal out during the day, friendly)
- **weak, lethargic**, but without any outward signs of injury
- **vomiting, diarrhea, dehydration, emaciation** but without any signs of injury
- **excessive salivation** (frothing at the mouth)
- **aggressive** towards humans and other animals (wild animals are usually extremely fearful unless cornered and then they will fight)

If you are dealing with a possible rabies or distemper case, you will have to seek assistance from **Animal Control, Kansas Department of Wildlife and Parks** or your county health department. If you need contact information, call Operation Wildlife.

IF SOMEONE HAS BEEN BITTEN

The animal must be watched. It will have to be captured and tested for rabies. If the animal is lost, the victim of the bite or scratch will have to endure the hassle and great expense of rabies treatment (somewhere in the neighborhood of \$300 - \$3000).

Someone should keep an eye on the animal from a safe distance until Animal Control gets to the scene. This is necessary for the safety of unsuspecting neighborhood kids, pets and others who might stumble upon the animal and get hurt. People must be kept away for their own good as well as to keep the animal from wandering away. The last thing people want is a possibly rabid animal at large in their neighborhood.

No attempt should be made to capture the animal and it should not be killed by bystanders lest vital tissues be damaged beyond a testable state.

If the animal is already dead, stay with the body, but **DO NOT TOUCH IT!**

If a pet has been bitten, contact your veterinarian for quarantine procedures.

Operation Wildlife prefers to contact Animal Control in cases of bites due to Public Health Department procedures and possible legal ramifications. **WE ARE REHABILITATORS, NOT DOCTORS!** Although we are aware of safety procedures and policies used by local health departments, this is mainly for protection of our volunteers and proper handling in the early stages of emergency calls of this type. Also, OWL cannot be held responsible for costs incurred by bite victims for rabies testing of the animal in question (approximately \$75-\$100 per test).

RABIES AND HIGH RISK SPECIES

Carnivorous mammals and bats are high risk rabies animals. Although other species such as squirrels, opossums and cottontails can theoretically carry the disease, it is highly unlikely that one of these animals could survive the attack of a predator. Therefore, these animals are considered low risk.

Etiology

1. Rabies is a virus characterized by encephalitis (brain inflammation).
2. Rabies is a neurotropic virus. Quite fragile in the environment, it becomes inactivated in dried saliva.
3. One million people are bitten annually in the US and at least 25,000 go through post-exposure immunization.
4. Most bites occur from rabid wild animals – Kansas reservoirs are skunks, raccoons, bats and foxes.

How It's Transmitted

1. Bite from wild animal shedding virus in saliva OR non-bite exposure: contamination of open wound or sore.
2. Wild animals also become infected through ingestion of carrion, through their mother's milk, or through the placenta.
3. The virus may be viable in salivary glands and nervous tissue for 7 – 10 days after death.
4. Incubation period varies from 9 days to 1 year depending on the depth of the bite and the area of the body.

The Two Types

1. **"Furious Form"** -Furious form rabies is typical of the "mad dog syndrome" in which the animal becomes very aggressive and will viciously attack anything (e.g. "Ol'Yeller").
2. **"Silent" or "Paralytic" Form** –The silent or paralytic form of rabies is a little harder to distinguish. Most animals will exhibit abnormal behavior. This form can mimic canine distemper.

The Three Stages

1. **Prodromal stage:** Lasts 2-3 days, animal may also show subtle changes in temperament, slow palpebral and corneal reflexes, and self-mutilation. (Often confused with canine distemper)
2. **Furious stage:** Increasingly restless and irritable, episodes of aggression by visual and auditory stimuli, muscular incoordination, disorientation, pica, grand mal seizures.
3. **Paralytic stage:** Lasts 2-4 days. Paralysis ascends from the bite wound until the entire central nervous system is affected. Laryngeal and pharyngeal paralysis are the first signs of this phase, which result in drooling.

Diagnosis

Laboratory confirmation from brain tissue of the infected animal.

Treatment

1. Humanely destroy the animal in question. Do not damage the head.
 - a. (The brain must be microscopically examined for negri bodies.)
2. Vigorous wound hygiene – the virus must attach to a nerve to survive!
 - a. Wash bite area with copious amounts of water containing soap, detergent or quaternary ammonium compounds. 70% ethyl alcohol is raticidal.
3. If a human has been bitten or scratched – get to a doctor for:
 - a. Tetanus vaccination
 - b. Antibiotics
 - c. Post exposure treatment for rabies with HDCV (Post-exposure immunization).
4. If a pet has been bitten or scratched – the guidelines are as follows:
 - a. Unvaccinated animals should be killed immediately.
 - b. If unwilling to destroy your pet – then strict quarantine in veterinary clinic for a period of 4 – 12 months. This is a costly procedure that runs approximately \$15 per day.
 - c. Vaccinated animals should be revaccinated within 5 days of exposure.

- d. Animals that are overdue for vaccinations should follow quarantine requirements and be revaccinated immediately.

CANINE DISTEMPER AND HIGH RISK SPECIES

Raccoons, skunks, coyotes and foxes are affected by canine distemper. Humans, domestic felines, bats, and non-carnivorous mammals are not at risk (felines, skunks and raccoons are susceptible to feline distemper but we rarely see this disease).

Etiology

1. Canine distemper is caused by a specific paramyxovirus related to measles.
2. The virus is sensitive to lipid solvents and most disinfectants and is unstable outside the host.

How It's Transmitted

1. The virus is airborne and aerosol; droplet infection from secretions of infected animals is the main route of infection.

Clinical Signs

1. Mucopurulent material accumulates in the medial canthus of the eyes.
2. Conjunctiva is reddened
3. Mucopurulent discharge from nose
4. Photophobia, as evidenced by squinting
5. Twitching or tics of a muscle or a group of muscles
6. Ataxia or partial or complete paralysis
7. Convulsive seizures characterized by chewing movements of the jaw, petit mal seizures, may fall on side, may run in place with involuntary urination and defecation.

Diagnosis

Necropsy by histopathological lesions or by immunofluorescent assay of viral antigen in tissues.

Treatment

None – almost 100% fatal in wild animals. Survivors become carriers, shedding the virus and infecting healthy animals.