

WHAT IS RABIES?

Rabies is a viral disease that affects the nervous system of mammals. In the last stages of the disease, the virus moves from the brain into the salivary glands and saliva. From there the virus can be transmitted through a bite or by contact with mucous membranes (nose, mouth, and eyes). It is fatal once symptoms occur. Dogs can be infectious to others for as long as 2 weeks before the symptoms of the disease appear, hence the need to confine and observe suspect animals.

WHAT SPECIES ARE THE MAJOR CARRIERS OF RABIES?

Rabies is predominantly a disease of wild carnivores but it can affect all mammals, including humans. Different species have become the main carriers (vectors) in different areas of the world: dogs in Asia, Africa, the Middle East, and Latin America; foxes in western Europe and parts of the United States and Canada; raccoons in the eastern United States and Ontario, Canada; bats in North and South America and southeast Asia; mongooses in South Africa.

Marsupials are much less susceptible to rabies than placental mammals. In the U.S., for example, opossums commonly share habitat and food sources with raccoons, but are virtually never infected. Rodents are relatively easily infected with rabies, but typically die so quickly that they are rarely involved in spreading outbreaks.

HOW IS IT TRANSMITTED?

Rabies is caused by rhabdovirus--a large enveloped bullet-shaped DNA virus. It is very sensitive to heat, light detergents (including ordinary soaps) and disinfectants and cannot survive for long outside the body of an infected animal.

The virus is carried in the saliva of an infected animal. It cannot penetrate intact skin. It can be transmitted by licking when animals groom each other in a manner which allows the saliva of an infected animal to come in contact with an open wound. This is believed to be a common method of transmission among raccoons, among whom mutual grooming by family members is routine, but is not considered common among other vector species.

The virus multiplies at the site of the bite, invades nerve fibres, and travels to the brain. The incubation period (the time between the bite and the onset of symptoms) is related to the distance of the wound from the head and neck: the nearer the head, the shorter the incubation. Bites to the head and neck carry the highest risk. This has relevance to the efficacy of post exposure therapy. Growth of the virus in the brain causes severe nervous degeneration and eventually death. The virus also spreads from the brain along other nerves to organs including the salivary glands, where the virus is excreted in the saliva. Bites in general are high-risk exposures. Animal contact by itself--such as being in the vicinity of a rabid animal, petting or handling a rabid animal, or coming into contact with the blood, urine or feces of a rabid animal--does not usually constitute exposure and, therefore, does not usually require post-exposure rabies treatment. The exception is if fresh, warm saliva may have been transmitted into an open wound.

Exposure of a human to a rabid animal does not always result in rabies. If prevention treatment is obtained promptly following a rabies exposure, most cases of rabies will be prevented. All animal bites should be evaluated by a health professional to determine if treatment is necessary.

WHO CAN SPREAD RABIES?



The rabies virus can infect any mammal, but infection is most common among dogs, cats, cows, horses, bats, skunks, foxes, and raccoons, who have in common a relatively long latency interval between exposure and the time symptoms appear. Transmission usually occurs while the vector animal (the animal carrying the disease) is in the latent phase (before symptoms appear).

Though it is thought to happen rarely, rabies can also be spread by animals eating the freshly killed carcasses of infected animals.

HOW CAN PEOPLE BE PROTECTED AGAINST RABIES?

The best protection against rabies is for people to vaccinate their pets and any street dogs or cats living near their homes, and for city authorities to conduct mass vaccination campaigns for street dogs and cats, ideally humanely sterilizing (spaying or castrating) the animals at the same time. Killing animals has never been effective in preventing the spread of rabies.

In regions where bat rabies occurs, one should avoid allowing bats to roost in human sleeping areas. Bat transmissions of rabies typically occur through accidental nocturnal contact, and as bat fangs typically leave marks no larger and no more uncomfortable than mosquito bites, the victims are frequently unaware that they have been bitten.

IS RABIES CURABLE?

There is no cure once the signs of rabies appear. It is then inevitably fatal. However, the relatively long incubation period allows post-exposure therapy to be effective if done correctly.

WHAT ARE THE SIGNS AND SYMPTOMS OF RABIES IN ANIMALS?

Symptoms of rabies in animals may include any one or more of the following signs: excitability; vicious behavior or attacks; biting; agitation; restlessness; uncharacteristic aggression; fearlessness; excessive salivation (so-called frothing at the mouth); aversion to water (where the name "hydrophobia" comes from); inability to swallow or drink; dilated pupils; muscular dysfunction; coordination or gait irregularities; paralysis; convulsions; and eventually death, almost always within 10 days. These symptoms are referred to as furious rabies.

Some rabid animals do not exhibit typical rabid symptoms. These are generally referred to as dumb rabies. These animals may display other symptoms of general illness which may include an avoidance of contact with humans or other animals, lethargy, loss of appetite, and eventually death. Some dogs just howl for days and retreat into dark corners. Their hind legs may give way. A dog may show very mild symptoms of anorexia (not eating) and listlessness only, and is found dead in three or four days. Sometimes the dog shows no signs at all, yet is suddenly found dead, and a post-mortem examination reveals rabies.

ARE THESE SYMPTOMS CHARACTERISTIC OF RABIES ONLY?

Unfortunately not. Extreme pain, fear or confusion can make an animal aggressive. Profuse salivation and the inability to swallow may result from obstruction in the throat, foreign bodies in the teeth, or the ingestion of irritating or toxic substances. Howling could be due to hunger, fear, or pain. Tetanus infections may sometimes be misdiagnosed as rabies. But, in any case, such animals should also be approached with caution as in their pain they may attack.

At present, rabies can only be positively diagnosed by testing the brain of an infected animal, and this must be done at an appropriate laboratory. There are no tests currently available to definitively diagnose rabies in a live animal.

WHAT ARE THE SYMPTOMS OF RABIES IN HUMANS?

Early symptoms in humans include irritability, inexplicable depression, headache, fever, and sometimes itching or pain at the site of exposure. The disease eventually progresses to paralysis, spasms of the throat muscles, convulsions, delirium, and death. It is important to note that once symptoms appear, rabies cannot be successfully treated.

HOW SOON AFTER INFECTION DO SYMPTOMS APPEAR?

The incubation period (the time between exposure and the onset of symptoms) is variable but is normally 3 to 8 weeks in humans. In dogs, the incubation period is normally between 21 to 80 days, but it may be shorter or longer.

WHEN AND FOR HOW LONG IS A PERSON ABLE TO SPREAD RABIES?

Person to person transmission is extremely rare, but precautions should be taken to prevent exposure to the saliva of the diseased person, including saliva in aerosol form from coughing, sneezing, or spitting.

WHAT TREATMENT IS NEEDED AFTER EXPOSURE TO RABIES?

Exposure to a rabid animal does not always result in rabies. If treatment is obtained promptly following a rabies exposure, most cases of rabies will be prevented. All animal bites should be evaluated by a health professional to determine if treatment is necessary.

The most effective rabies prevention is immediate and thorough cleansing of the site of the animal bite or scratch wounds with liberal amounts of soap and water, or flushing mucous membranes with warm water. If the wound is bleeding profusely, apply pressure with fingers or hands, or apply a pressure bandage. The wound should not be sutured, as this is thought to increase the risk of the virus entering nerves.

This is followed by the administration of an injection of HRIG (human anti-rabies immune globulin) and five doses of human diploid cell rabies vaccine administered in the arm on days 1, 3, 7, 14 and 28 after exposure. In some places, multiple site intradermal (within the skin) injection protocols are being used successfully and are cheaper than the standard intramuscular (within the muscle) post-exposure vaccination program, as they require less antigen. The old fashioned and inhumane vaccines of animal brain origin that were injected into the stomach have now been replaced in most parts of the world by more effective and safer tissue culture vaccines. The first injection is an antibody to fight the virus, and the rest of the injections are a vaccine to ensure long lasting protection. Post-exposure therapy is required even by those people who have received prophylactic vaccination (pre-exposure vaccination); however, pre-exposure vaccination decreases the number of doses of vaccine needed and eliminates the need for HRIG--an important benefit in that there is a worldwide shortage of HRIG. A tetanus toxoid injection is also recommended after an animal bite or any deep wound.

HRIG provides rapid protection against rabies for one or two weeks after exposure, while the more lasting vaccine-induced immune response is developing. HRIG should be given to any previously unvaccinated person regardless of their age, type of exposure, or time since exposure. It can be given through the seventh day following administration of the first dose of vaccine.

For adults and older children, the vaccine should be injected into the deltoid muscle. For small children and infants, the muscles of the anterolateral thigh can be used. The vaccine should never be given in the gluteal area or in the same anatomical site as HRIG. If an individual misses any vaccine doses during the first two weeks of the regimen, consult the vaccine manufacturer. The schedule should be adjusted to ensure that four doses of vaccine are received during the first 14 days. The fifth dose can be given on day 28. Persons who have received pre-exposure prophylaxis still require two booster doses of vaccine on day 0 (zero) and day 3.

WHY WOULD A PERSON BE VACCINATED AGAINST RABIES BEFORE BEING EXPOSED?

Pre-exposure treatment is given for several reasons. First, it will provide protection to persons with exposure to rabies which has not been obvious. Second, it will protect persons whose post-exposure therapy might be delayed. Finally, although pre-exposure vaccination does not eliminate the need for additional therapy after rabies exposure, it simplifies therapy by eliminating the need for HRIG (human anti-rabies immunoglobulin) and decreasing the number of doses of vaccine needed. This is important for persons at high risk of being exposed to rabies in areas where immunizing products may not be available or where they may carry a high risk of adverse reactions. The longer the treatment is postponed, the less likely it is to be effective.

People who are handling animals on a long-term basis--such as veterinarians, people who work with wildlife, laboratory staff who work with the rabies virus, municipal dog catchers, people working in animal shelters in endemic rabies areas, and long-term travelers to areas where rabies is common--should be given the pre-exposure vaccinations on a schedule of day 0 (zero), day 7 and day 21. This should be followed by a biannual (every other year) booster. However, If exposed to a rabid animal or an animal who may be rabid, post-exposure treatment is still required, even with pre-exposure vaccination.

Currently, there is debate among health professionals as to which sectors of the general public may be "at risk" for rabies. The cost of rabies pre-exposure vaccination makes it prohibitively expensive to administer to large

numbers of people in rabies endemic areas. It is generally agreed, however, that children under the age of 12 are at higher risk than other age groups.

WHAT SHOULD BE DONE WITH AN APPARENTLY HEALTHY DOG OR CAT WHO HAS BITTEN SOMEONE?

A healthy dog or cat, whether vaccinated against rabies or not, who bites someone should be confined and observed for 10 days. If the animal develops any sign of rabies in that time, he should be quickly and painlessly euthanized. If no symptoms of rabies develop, the animal may be released after 10 days. If there is no proof of prior vaccination, the animal should be vaccinated before release from isolation.

If the animal is homeless and unwanted, it is recommended by veterinary public health authorities that he be humanely euthanized and tested for rabies without delay.

A person should not postpone post-exposure rabies vaccination pending completion of the animal's 10-day observation period. If there is any reason whatsoever to suspect that the animal may have transmitted rabies, post-exposure rabies treatment should begin immediately.

WHAT SHOULD I DO IF MY PET IS BITTEN BY A POSSIBLY RABID ANIMAL?

When your pet has been in a fight with an infected wild or domestic animal, and the saliva on the wound is still moist, wash your pet's wound with soap and water and wear waterproof gloves for protection while handling your pet within the first few hours of the incident.

If your pet is vaccinated, he should be revaccinated immediately and closely observed for 45 days. Animals with expired vaccinations should be evaluated on a case-by-case basis.

If your pet has not been vaccinated, health authorities generally recommend either that the animal be humanely destroyed or be placed in strict isolation for 6 months and vaccinated against rabies one month before release. Some rabies experts recommend vaccination at the beginning of the isolation period.

ARE STREET DOGS OR STRAY DOGS MORE LIKELY TO BE RABID?

In the past this may have been the case. However, modern humane population control methods (involving sterilization and release programs) which include rabies vaccination have done much to reduce the risk by making the stray dog population stable, safe and controlled. These methods form an essential part of the overall program to control rabies in some countries.

WHAT SHOULD I DO IF I SEE A RABID DOG?

In the case of street dogs:

- * Do not approach/provoke the animal.
- * Do not throw sticks or stones at it.
- * Disperse gathering crowds to reduce stress on the dog and reduce risks.
- * Call the appropriate authority: the local animal control agency, police department, animal welfare organization, veterinary service, or public health authority.

In the case of a pet dog:

- * Muzzle the animal.
- * Take it to a veterinarian to confirm if the pet is actually rabid. If the animal is obviously rabid, euthanize the animal as painlessly and as quickly as possible. If there are no obvious signs of rabies, but rabies is still suspected, the animal should be isolated and observed for at least 10 days.

HOW CAN I HELP IN THE CONTROL OF RABIES?

Vaccination of your own pets and the street dogs and cats in and around your area is the best method for controlling rabies. Keep your pets supervised on your property to reduce the chance of exposure to rabies. Ask government authorities to institute vaccination campaigns for pets and street dogs.

If you see any animal acting strangely, notify the local health or animal control authorities. Do not try to catch the animal yourself. However "barking a lot," "looking odd," "sniffing other dogs," or "looking threatening" should not be interpreted as strange or unusual behavior.

If any contact occurs or is suspected, get medical advice as soon as possible. Be sure your vaccinated pet gets a booster vaccination.

If a person gets bitten, do not panic. Wash the wound thoroughly with soap and lots of water. Get medical help. Obtain post-exposure therapy for people who may have been exposed to the virus. Determining risk of exposure to rabies involves evaluation of the type of exposure, location of the wound, rabies vaccination status of the biting animal, and the efficacy and risk of prophylactic treatment.

WHAT SHOULD I KEEP IN MIND WITH PRE-EXPOSURE VACCINATION OF A DOG?

Keep the following factors in mind before vaccinating:

- * Age: do not vaccinate before 12-16 weeks.
- * Deworm: at least 2-3 days before rabies vaccination.
- * Health: check for normal eating habits, temperature, etc., before vaccinating.
- * Medication: if the animal is on immunosuppressants (such as steroids), postpone the vaccination.

After vaccination observe for signs of fever or other illness. Do not allow contact with unprotected animals for at least 3-5 days.

WHAT SHOULD I DO IF I SEE A DEAD ANIMAL WHO IS LIKELY TO HAVE DIED OF RABIES?

If you must handle the dead animal, use gloves, sticks or other tools to avoid direct contact with saliva, neural fluid and brain tissue. Immediately contact your local health authorities to see if there is a facility that tests dead animals for rabies. They may ask you to bring the whole body or just a sample of brain tissue, after a veterinarian completes a post-mortem; however, it is not easy to remove a brain, and a person unskilled at post-mortem procedure could potentially introduce the virus through self-inflicted cuts.

A rabies-testing agency can perform a number of tests. The two main ones are (1) Negri body examination where they look for inclusion bodies produced by the virus in the brain cells, and (2) the ELISA (Enzyme Linked Immunosorbent Assay) which tests for the presence of antibodies to rabies in the tissue sent. The second test is more accurate but will take 3-4 days.

If health authorities do not take it for testing or disposal, you must dispose of the potentially infected carcass by burning it or burying it at least 6-feet deep with lime.

HOW TO AVOID DOG BITES?

- * Pay attention to typical warning signs of unfriendly dogs--such as snarling, a stiff stance, ears laid back, or fur on the dog's back standing up.
- * Train your dog not to bite by teaching him simple commands.
- * Do not play aggressive games like wrestling or tug-of-war.
- * Do not leave children unattended with dogs.
- * Tell your children to avoid strange dogs and growling dogs.

- * Teach children not to take food and toys away from dogs.
- * Do not run past a dog, as they naturally love to chase and catch things.
- * If dogs are fighting, do not try to break them up by hand. Spray them with water, yell at them, or make loud noises.
- * Dogs should be on leash when taken out for a walk.
- * Neuter your dog, as neutered dogs are less likely to bite.