

## Rabies

Rabies is a disease caused by the rabies virus. Rabies can affect all mammals, including wild animals, domestic animals (like pets and livestock), and humans. All mammals, including humans, are susceptible to rabies. **If rabies exposure is left untreated, the virus can cause disease in the brain, resulting in death for the exposed animal or person.**

## Transmission

Rabies is almost always contracted via:

- **Animal to Person** through direct contact with saliva or brain/nervous system tissue from an infection animal.
  - **The exposure is typically through a bite or scratch but can also be through broken skin or mucous membranes in the eyes, nose, or mouth.**

Person to person and environment to person transmission is extremely rare; however, precautions should be taken to prevent exposure to the saliva of a person with rabies. Blood, urine, and feces is not associated with risk for infection. Tissues from individuals with rabies must not be used in transplant procedures.

## Symptoms

The time between exposure (usually a bite) and the onset of symptoms, which is called the incubation period, averages **one to three months** but ranges from days to years based on:

- **Location of the exposure site** (how far away it is from the brain)
- **Type** of rabies virus
- Any **existing immunity**

### Early symptoms include:

- Weakness
- Discomfort
- Headache
- Fever
- Itching or pain at the site of exposure

### Late symptoms include:

- Anxiety
- Confusion
- Agitation
- Delirium
- Abnormal behavior
- Hallucinations
- Hydrophobia (fear of water)
- Insomnia
- Death

**By the time any symptoms appear, rabies cannot be successfully treated.**

## Diagnosis

Consult a health care provider. Several tests are necessary to diagnose rabies before death in humans; no single test is sufficient. Tests are performed on samples of saliva, serum, spinal fluid, and skin biopsies of hair follicles at the nape of the neck.

In animals, rabies is diagnosed using a laboratory test that looks for rabies virus antigens in brain tissue.

## Treatment

- **Immediate thorough cleansing** of the animal bite or scratch wounds **with soap and water**.
- **Decision to vaccinate**, known as post exposure prophylaxis (PEP), is based on type of exposure and animal you were exposed to, as well as laboratory and surveillance information. Health care provider and/or state/local health department will decide if you need rabies vaccination.
- **For those not previously vaccinated against rabies**, treatment consists of one shot of rabies immune globulin and four shots of rabies vaccine.
  - **Shots are administered on:**
    - Day **zero** (the day you begin the shots): rabies immune globulin and rabies vaccine.
    - Day **three**: rabies vaccine
    - Day **seven**: rabies vaccine
    - Day **14**: rabies vaccine
    - Day **28**: additional rabies vaccine shot if person is immune compromised

**Rabies has an almost 100% fatality rate once a person starts showing symptoms.**

- **A person should be seen as soon as possible after the bite/exposure** by a health care provider to determine the need for rabies PEP. **Untreated exposures will almost always result in death.**
- If treatment is started quickly after a rabies exposure, most cases of rabies will be prevented.

## Prevention


- **Do not have contact** with stray dogs and cats
- **Vaccinate** pet dogs, cats, and ferrets
- **Stay away from wild animals**, especially those behaving abnormally
- **Avoid** keeping exotic or wild animals as pets
- **Wear protective gloves** when working with sick livestock

For more information about the treatment of rabies contact your health care provider or visit [www.hhs.nd.gov/rabies](http://www.hhs.nd.gov/rabies) or [www.cdc.gov/rabies/index.html](http://www.cdc.gov/rabies/index.html).

## Exclusion Guidance

Individuals with rabies will likely not be able to attend work, school or child care, [general exclusions apply](#). For additional information about rabies, contact North Dakota Health and Human Services' Public Health Division at 800.472.2180.

**This disease is a reportable condition. As mandated by North Dakota law, any incidence of this disease in humans shall be reported to the North Dakota Department of Health and Human Services.**

 **Report Immediately: 800.472.2180 or 701.328.2378**

### Resources:

1. Centers for Disease Control and Prevention. (2022, December 8). Rabies. Centers for Disease Control and Prevention. Retrieved June 9<sup>th</sup>, 2023, <https://www.cdc.gov/rabies/index.html>.
2. Centers for Disease Control and Prevention. Human Rabies Prevention – United States, 2008. Recommendations of the Advisory Committee on Immunization Practices. MMWR 2008;57(Vol. 57/RR-3) pg.1-21.
3. Centers for Disease Control and Prevention. Use of a Reduced (4-Dose) Vaccine Schedule for Postexposure Prophylaxis to Prevent Human Rabies. Recommendations of the Advisory Committee on Immunization Practices. MMWR 2019;59(Vol. 59/RR-2) pg 1-7.
4. Heymann, D.L. (2022). Control of Communicable Diseases Manual, 21<sup>st</sup> Edition. Rabies. American Public Health Association, 2022: 526-536.

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### Public Health Division

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