



Module 3:

Dog Exposures

When Friendly Faces Turn Fierce





Module 3 : Dog Exposures

- After completion of this module, learners will have a better understanding of:
 - Dog exposure considerations and the decision to immediately initiate or delay rabies PEP:
 - U.S. dog rabies epidemiology.
 - Feasibility of observation.
 - Medical urgency of exposure.
 - Wound cleaning and tetanus diphtheria and pertussis (Tdap) vaccine assessment.



Case 2: The Mail Carrier and the Guard Dog *Presentation*



(USPS, 2024)

Chief Complaint:

Multiple dog bites to the right arm

- A mail carrier, aged 42 years, presents to the ED with multiple bite wounds to his right arm. The patient was bitten while delivering mail to a home in which was guarded by an unleashed dog.
- The patient discloses that the owners were not immediately forthcoming about the dog's rabies vaccination status. The police have been notified.

Case 2: The Mail Carrier and the Guard Dog *Examination*



Chief Complaint:

Multiple dog bites to the right arm

- **Physical Findings:**

Superficial lacerations and puncture wounds on the right forearm.

- **Patient's Rabies Vaccination History:**

Not previously vaccinated.



Dog Exposure Considerations

Dog exposure considerations when deciding to delay rabies PEP initiation:

- U.S. dog rabies epidemiology.
- Feasibility of observation.
- Medical urgency of exposure.





The Epidemiology of Dog Rabies in the US



- The occurrence of rabies among dogs is **rare and sporadic in the United States**; this is due primarily to widespread canine vaccination efforts and effective animal control programs.
- Dog-maintained rabies virus variants (DMRVV) were declared eliminated from the United States in 2007.
- The last dog-to-dog transmission of DMRVV in the U.S. was in 2004.
- The last human rabies death from DMRVV was in 1994.



The Epidemiology of Dog Rabies Worldwide



- **Outside the United States, dog exposures remain the leading cause of human rabies** (especially in parts of Africa and Asia).
- Persons who are bitten or scratched by dogs overseas are at higher risk for rabies exposure.
- Persons who are from areas where DMRVV rabies is endemic may have heightened concerns after exposure to a dog in the US.



Dog Rabies in The US By the Numbers



- Dogs still function as spillover hosts for other rabies virus variants (much like humans) and **have the ability to transmit rabies if infected.**
- In 2024, 24 dogs tested positive for non-DMRVV rabies in the United States.
- Between 2000 and 2023, an average of 1 dog has tested positive for rabies in Maryland each year.
- Between 2007 and 2021, 5 imported dogs tested positive for DMRVV in the U.S.



Ruling Out Rabies In Domesticated Animals

- Rabies exposure from domesticated animals (dogs, cats, ferrets) can be ruled out in two ways:
 - Testing of the animal's brain tissue for the rabies virus.
- or
- a 10-day observation.





Terminology: Incubation Period

- **Incubation period:** the time between the exposure and the appearance of clinical signs, during which the rabies virus travels from exposure site to brain; this can take weeks to months; the animal shows no signs of illness during that time and cannot spread the virus to humans or animals.

This incubation period is the basis for the 4 or 6 month strict quarantine when an unvaccinated animal has been exposed to a rabid animal.



(CDC, n.d.)



Terminology: Shedding Period

- **Shedding period:** the period after the virus has multiplied in the brain and passes to the salivary glands; the animal begins excreting rabies virus in its saliva, which can occur before the animal begins to exhibit clinical signs. The infected animal usually dies within 10 days of becoming ill. The shedding period for rabies is typically less than 5 days before symptom onset to the death of the animal.



The shedding period is the basis for the 10 day observation after human exposure.

Feasibility of Animal Observation

Regardless of an animal's vaccination status:

- A healthy dog, cat, or ferret* that exposes a person should be confined and observed daily for 10 days from the time of the exposure.
- Administration of rabies vaccine to the animal is not recommended during the observation period to avoid confusing signs of rabies with rare adverse vaccine reactions.
- **If the animal remains well after 10 days after bite or nonbite contact with a person, then the individual is considered not to be exposed to the rabies virus at the time of the bite or nonbite contact.**

*Other domestic animals may also be eligible for observation if they are healthy and available. Consult your local or state health department for specific recommendations.



(CDC, 2018)



Animal Observation

- Owned animals are usually observed in their homes under the supervision of the local health and animal control officials.
- If an animal is not well at the time of exposure or becomes ill during observation, with clinical signs consistent with rabies infection, it should be immediately euthanized and tested.



If an animal remains well after the 10 days, does this mean that the animal is not infected with rabies?



Animal Observation: COMAR

No, the 10-day rule for animal observation help determine if the animal was shedding virus AT THE TIME OF THE EXPOSURE. An animal may still be infected with rabies and be in the incubation period.

- To rule out rabies infection in a domestic animal that may have been exposed to the rabies virus, under Maryland public health law (COMAR):
 - If the owner is able to provide a current or expired vaccination certificate for the animal, then the animal should be immediately revaccinated and observed for 45 days.
 - Animals without proof of vaccination are euthanized or immediately vaccinated and put under strict observation for 4-6 months. Perspective serological monitoring may also be considered.



Medical Urgency

- In general, potential rabies exposures are **medical urgencies, not emergencies**. Rabies PEP decisions are often delayed by several days while animals are assessed, tested, or undergoing observation, with determinations made on a case-by-case basis..
- An exposure can be considered more urgent than others depending on the location of the exposure site and the severity of the wound.
- Exposures to the **head, face, and neck** elevate urgency, as these sites are highly innervated and close to the brain.
- **Severe bite wounds** also call for more prompt attention, as these wounds are usually associated with greater saliva contamination and consequently higher viral loads.





Case 2: The Mail Carrier and the Guard Dog *Risk Assessment*



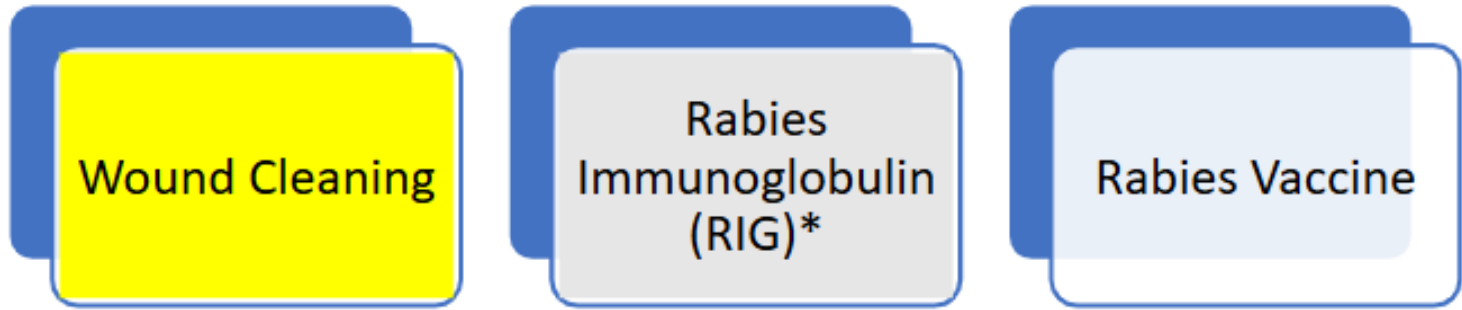
(USPS, 2024)

Risk assessment:

- The epidemiology of canine rabies variant virus in Maryland and the rest of the United States, suggests a low likelihood that the dog that attacked the mail carrier is rabid.
- The patient did not sustain severe wounds or wounds to the head, face, or neck.
- Territorial aggression is not uncommon among dogs, and in these circumstances, it is probably normal for the animal.
- The dog owners are known, so the dog can likely be observed for ten days by county public health and animal control personnel.



Three Components of Rabies PEP



*only if the patient has *not* previously received a full course of rabies PEP or PrEP



Case 2: The Mail Carrier and the Guard Dog *PEP Determination*



PEP Decision:

- **Rabies PEP can be delayed** until the dog has been observed for 10 days or tested. If rabies exposure is ruled out using either strategy, do not administer PEP.
- The patient should receive appropriate **wound care** and be evaluated for a **Tdap** booster if they are not up to date on their vaccination.
- Regardless of the risk of rabies, bite wounds can cause serious injury and infection. In addition to rabies prevention, for many types of bite wounds, immediate and gentle irrigation has been shown to significantly decrease the risk of bacterial infections.



Knowledge Check Module 3

TRUE OR FALSE?



Knowledge Check Question 1

TRUE OR FALSE?

Since dog-maintained rabies virus variants (DMRVV) have been eliminated from the U.S., dogs cannot get and transmit the rabies virus.



Knowledge Check Question 1 Answer

If you answered FALSE, you were correct.

While dogs are infrequently rabid in the U.S., they can still become infected with other variants of the rabies virus and transmit the disease.



Knowledge Check Question 2

TRUE OR FALSE?

If a dog is healthy at the end of a 10-day observation following a bite or nonbite incident, then the risk of rabies from the bite is ruled out, regardless of the dog's vaccination status.



Knowledge Check Question 2 Answer

If you answered TRUE, you were correct.

The 10-day rule applies to all domestic dogs, cats, and ferrets regardless of vaccination status.



Module 3

Conclusion

Exit and continue to the next module