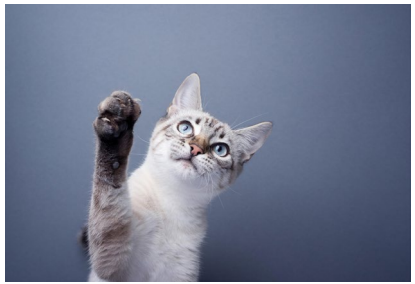
Module 5:
Cat Exposures

Claws and Consequences



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Module 5 : Cat Exposures

- After completion of this module, learners have a better understanding of:
  - Epidemiology of cat rabies in the U.S.
  - Rabies vaccine for PEP:
    - How, when, and where to administer.
    - Dosing Schedule.
    - Considerations for immunocompromised persons.

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Case 4:
The Rabid Kitten in the Shed
Presentation

Chief Complaint:

Injuries from a rabid kitten encounter

- A 71-year-old husband and wife present to the ER two days after encountering a kitten in their shed in Maryland.
- The wife, a retired animal control officer, tried to capture the kitten, the cat bit her hand.
- Her husband got scratched attempting to restrain the animal. The couple called animal control, who captured the kitten.
- The kitten appeared ill and was humanely euthanized and sent for rabies testing.

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Case 4:
The Rabid Kitten in the Shed
Prior Care

Chief Complaint:

Injuries from a rabid kitten encounter

- The couple received a Tdap booster and primary wound care at Urgent Care the day of the exposure and were waiting until the rabies test results for the kitten were available to start rabies PEP per the guidance of their local health department.
- The couple was just notified that the results of the kitten's rabies test were positive at Maryland's Public Health Laboratory.

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Case 4:
The Rabid Kitten in the Shed
Examination

Chief Complaint:

Injuries from a rabid kitten encounter

- **Physical Findings:**

  Husband: Multiple lacerations to the right forearm.

  Wife: Four puncture wounds on the right hand.

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

  Husband: Not previously vaccinated.

  Wife: Has completed rabies PrEP.

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The Epidemiology of Cat Rabies in the U.S.

- Although cats do not maintain the rabies virus as reservoirs, rabies in cats is a growing public health concern in North America.
- The cat population is large in the United States (60-62 million owned cats and between 30-100 million free-roaming cats).
- Free-roaming cats are less likely to receive veterinary care, compared to other domestic pets, contributing to population growth and lower rabies vaccination rates.
- Unhoused cat populations are particularly vulnerable due to their low vaccination rates and frequent encounters with other wildlife.

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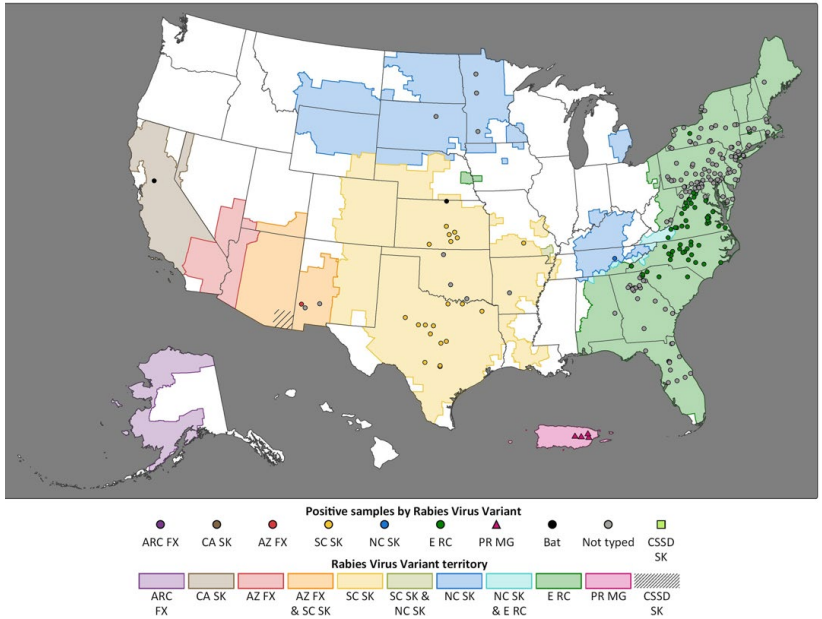
Cat Rabies in the US: By the Numbers

Figure S2: Rabid cats detected in the US, including Puerto Rico, during 2024.



(CDC, 2024)

- In the United States, rabid cats are most common in places where rabid raccoons are common (i.e., eastern seaboard).
- In Maryland, between 2017-2024 an average of **9% of laboratory-confirmed rabies cases** were cats.

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Case 4: The Rabid Kitten in the Shed

Risk Assessment and PEP Determination

Risk Assessment:

- Due to the positive rabies result, there is a high likelihood that infectious saliva contaminated the victims' bite and scratch wounds.
- Animals often lick their paws and claws, potentially contaminating them with saliva.
- While the volume of saliva and overall viral load introduced via bite wound is typically higher, scratches from animals are also a source of exposure as they may potentially introduce contaminated saliva into the victim's body.

PEP Decision:

Initiate rabies PEP.

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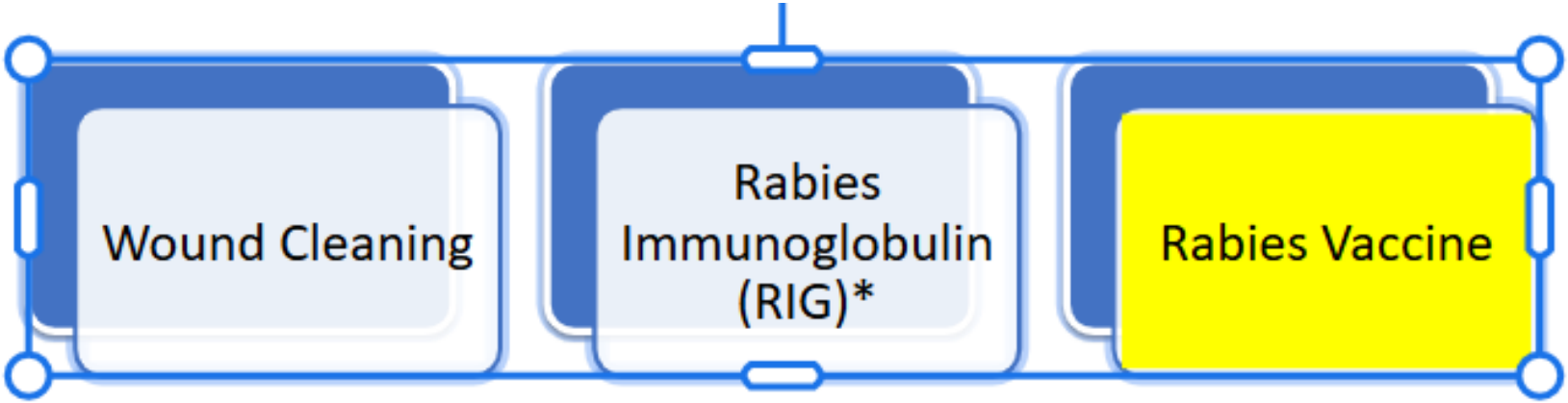
Three Components of Rabies PEP



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

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What is Rabies Vaccine?

There are two types of human rabies vaccine approved for use in the United States:

- Human diploid cell vaccine (HDCV)
- Purified chick embryo cell vaccine (PCECV)

Both are inactivated vaccines derived from cell cultures with a potency of >2.5 international units (IU) of rabies antigen, and either one can be used for PEP.

Vaccination serves one purpose: to induce an active immune response against the rabies virus.

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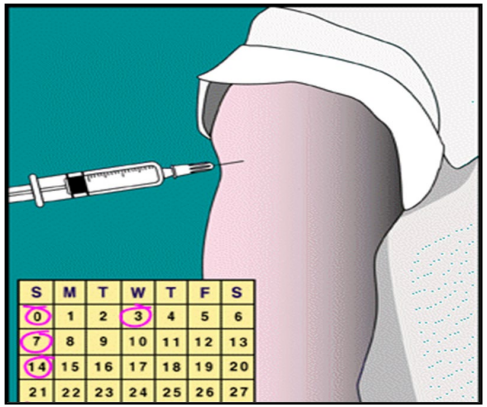
How Should Rabies Vaccine Be Administered?

The number of vaccine doses a **healthy patient** requires for PEP depends on their previous rabies vaccination history.



(CDC, n.d.)

Per ACIP Guidelines:

- In **previously unvaccinated** persons, 1 mL of vaccine should be administered intramuscularly (IM) on days **0*, 3, 7, and 14**. RIG *should* also be given on day 0.
- In **previous recipients of PEP or PrEP**, 1 ML of vaccine should be given IM on days **0* and 3**. RIG *should not* be administered to these patients.

*Day 0 is the day the vaccination series is started. (Day 0 is NOT the Day of Exposure)

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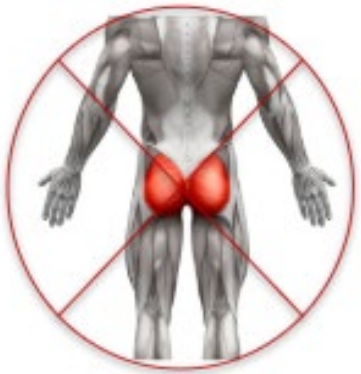
Where Should Rabies Vaccine Be Administered?

- **In Adults**: Administer rabies vaccine Intramuscularly (IM) in the deltoid area
- **In Children**: Administer rabies vaccine IM, in the deltoid or anterolateral aspect of the thigh.



<u>Do not</u> administer vaccines in the buttocks or gluteal area.

To minimize antagonism from RIG, the vaccine should be injected in acceptable site that is **<u>distant</u>** from where RIG was administered.

It is acceptable to give RIG in the same limb as the vaccine, as long as they are administered in different muscle groups. However, if possible this should be avoided.

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Vaccine Considerations

- There are no known contraindications for rabies PEP.
- If you have been exposed to rabies virus, you should get vaccinated regardless of concurrent illnesses, pregnancy, breastfeeding, or weakened immune system.
- Pregnancy is not a contraindication for rabies PEP, and exposure to rabies or a rabies diagnosis in the mother does not require pregnancy termination.
- PEP is suitable for all age groups, including infants and children.

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RIG and Vaccine Reactions

Most reactions associated with RIG and rabies vaccination are local and self limiting.

Reactions include:

- Soreness, redness, swelling, or itching at the site of the injection, and headache, nausea, abdominal pain, muscle aches, or dizziness.
- Hives, pain in the joints, or fever sometimes happen after booster doses.

Once initiated, rabies PEP should NOT be discontinued because of local or mild systemic reactions to the vaccine.

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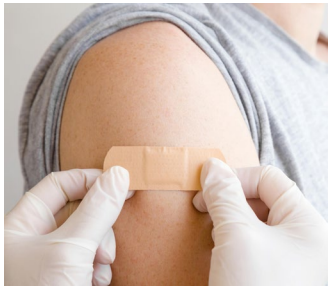
Adverse Reactions

- **Don't interrupt rabies PEP if there are mild reactions to the treatment**; manage them with anti-inflammatory drugs like ibuprofen or acetaminophen
- **Serious reactions to rabies vaccines are rare** and require careful consideration before discontinuing vaccination. The rabies vaccine can be changed to an alternative, followed by titers to ensure adequate immune response.
    - Healthcare providers should seek advice from their state or state health departments for managing serious reactions.



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Immunocompromised Patients

Immunosuppression (either due to illness, medication, or therapy for an illness or condition) is a clinical diagnosis determined by the patient's physician.

Vaccine considerations for immunocompromised persons include:

- A **FIFTH** vaccine dose, with vaccines on days **0, 3, 7,14, and 28**.

AND

- A **serum antibody titer** 7-14 days after finishing the postexposure treatment course using a rapid fluorescent focus inhibition test (RFFIT) to confirm an adequate rabies vaccine response. An RFITT result of *0.5 IU/mL or higher* is considered an adequate immune antibody response.

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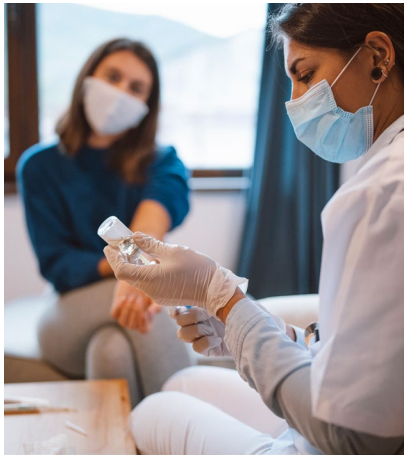
Immunocompromised: Previously Vaccinated

- Per the CDC Rabies Team: Individuals who were previously vaccinated, but who have newly developed or worsening immune system disorders may not respond adequately to a 2-dose booster series; full PEP with HRIG and 5 doses of vaccine should be considered for these individuals followed by a titer.
- If receiving the 2 dose booster, they should have an RFFIT test to check for adequate immune antibody response to PEP 7-14 days after finishing post-exposure treatment.



If there is any doubt in a patient's ability to respond adequately to vaccination, a titer check is always a reasonable action

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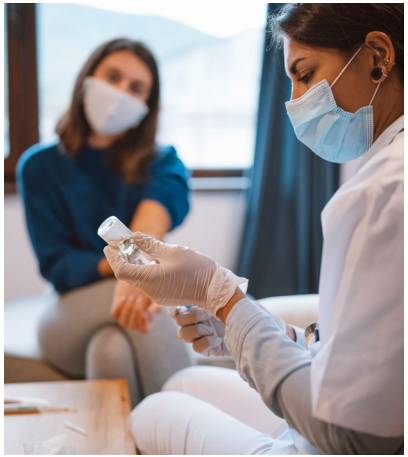
Immunocompromised: Antibody Levels

Any patient who fails to develop protective antibody levels in response to rabies PEP should be managed in consultation with their physician and appropriate local and state public health officials.



Routine serological testing is not recommended for healthy patients who have received PEP in accordance with ACIP guidelines.

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Case 4:
The Rabid Kitten in the Shed
PEP Administration
Husband

Husband (Healthy and immunocompetent, no prior history of PrEP or PEP):

1. Verify that all wounds were cleaned during the initial visit to Urgent Care.
2. Calculate the appropriate dose of RIG and infiltrate all wounds on the right forearm as much as anatomically feasible (even if they have started to heal).
3. Administer the “day 0” dose of vaccine by injecting a 1-mL volume IM into the left deltoid (distant from RIG site).
4. Advise patient to return for subsequent doses 3, 7, and 14 days later.

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Case 4:
The Rabid Kitten in the Shed
PEP Administration
Wife

Wife (Healthy and immunocompetent, previous history of PrEP):

1. Verify that all wounds were cleaned during the initial visit to Urgent Care.
2. Administer the “day 0” dose of vaccine by injecting a 1-mL volume IM into either deltoid. Do NOT give this patient RIG!
3. Advise patient to return for one subsequent rabies vaccine dose 3 days later.

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Knowledge Check Module 5

MULTIPLE CHOICE

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Knowledge Check Question 1

In an adult patient, which is an acceptable site for the injection of the rabies vaccine?

A. Gluteus.

B. Site of injury.

C. Deltoid.

D. Abdominal area.

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Knowledge Check Question 1 Answer

If you answered C, you were correct.

The deltoid is the ACIP-recommended site for the rabies vaccine in adults. For children, the anterolateral aspect of though is acceptable. Care should be taken to administer the vaccine at a site distant from the RIG.

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Knowledge Check Question 2

Which of the following patients should receive a 5-dose course of rabies vaccination on days 0, 3,7, 14, and 28:

A. A patient with a broken leg.

B. An infant.

C. Anyone bitten by a lab-confirmed rabid animal.

D. An immunocompromised patient on chemotherapy.

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Knowledge Check Question 2 Answer

If you answered D, you were correct.

The ACIP recommends immunocompromised persons receive a 5th dose of rabies vaccine, followed by an RFFIT test to determine immune response.

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Module 5 Conclusion

Exit and continue to next module

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