Rabies Postexposure Treatment Recommendations

Jennifer House, DVM, MPH, DACVPM
Veterinary Epidemiologist
Bite Treatment

- Clean wound
- Use a virucidal agent
- Evaluate the need for antibiotics
1. Virus enters tissue from saliva of biting animal
2. Virus replicates in muscle near bite
3. Virus moves up peripheral nervous system to CNS in spinal cord
4. Virus ascends spinal cord
5. Virus reaches brain and causes fatal encephalitis
6. Virus enters salivary glands and other organs of victim
Incubation Period

- Normal is 3-12 weeks (humans)
- Range may be 9 days to 7 years

***Long incubation period allows time to wait for treatment in certain situations***
Risk of rabies transmission

- Degree of exposure
- Circumstances of bite
- Behavior of biting animal
- Vaccination status
- Prevalence of rabies - geographic area

- SPECIES of animal involved
## Rabies, Indiana 2000 - 2010

<table>
<thead>
<tr>
<th>Year</th>
<th>Bat</th>
<th>Horse</th>
<th>Skunk</th>
<th>Human</th>
</tr>
</thead>
<tbody>
<tr>
<td>2000</td>
<td>15</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2001</td>
<td>15</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2002</td>
<td>31</td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>2003</td>
<td>31</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2004</td>
<td>11</td>
<td></td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>2005</td>
<td>11</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2006</td>
<td>11</td>
<td></td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>2007</td>
<td>13</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2008</td>
<td>11</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2009</td>
<td>39</td>
<td></td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>2010</td>
<td>24</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Skunks Rabies, 1990 - 2010

- 1996 – 1
- 1997 – 4
- 1998 – 1
- 2002 – 1
- 2004 – 1
## Last Rabies Positive Submission

<table>
<thead>
<tr>
<th>Species</th>
<th>Year</th>
<th>Species</th>
<th>Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dog</td>
<td>1989</td>
<td>Cat</td>
<td>1984</td>
</tr>
<tr>
<td>Horse</td>
<td>2002</td>
<td>Skunk</td>
<td>2004</td>
</tr>
<tr>
<td>Fox</td>
<td>1990</td>
<td>Cow</td>
<td>1986</td>
</tr>
<tr>
<td>Pig</td>
<td>1967</td>
<td>Ground Hog</td>
<td>1983</td>
</tr>
<tr>
<td>Raccoon</td>
<td>1979</td>
<td>Bat</td>
<td>2011</td>
</tr>
<tr>
<td>Goat</td>
<td>1967</td>
<td>Mouse</td>
<td>1970</td>
</tr>
<tr>
<td>Opossum</td>
<td>1968</td>
<td>Human</td>
<td>2006, 2009</td>
</tr>
</tbody>
</table>
Submissions - ISDH Rabies Lab

<table>
<thead>
<tr>
<th>Animal Type</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dog</td>
<td>642</td>
<td>366</td>
<td>345</td>
</tr>
<tr>
<td>Cat</td>
<td>435</td>
<td>289</td>
<td>263</td>
</tr>
<tr>
<td>Bat</td>
<td>443</td>
<td>390</td>
<td>273</td>
</tr>
<tr>
<td>High Risk Terrestrial</td>
<td>77</td>
<td>100</td>
<td>82</td>
</tr>
<tr>
<td>Other</td>
<td>87</td>
<td>68</td>
<td>67</td>
</tr>
</tbody>
</table>

The chart shows the number of submissions for different animal types from 2008 to 2010.
Low risk animals

- Not usually considered rabies exposures
- Treatment or testing is not normally necessary
  - Recommendation may change if IN gets Raccoon variant
- Evaluate for unusual circumstances that may indicate possible rabies
Since 1990, US

• BATS!
• In-apparent bites?
• Not recognizing bite or not reporting
• Rabies is not always suspected by medical personnel when clinical signs develop (non-specific)
Recent Human Cases in the US

- 45 Cases in United States (1995-2010)
  - 34 bat variant
    - 3 organ/tissue transplantations
  - 8 canine variant (foreign origin)
  - 3 other variants
    - Raccoon
    - Mongoose
    - Fox
Bats and Rabies

- ~1% of bats carry rabies virus
- May or may NOT show symptoms
- Bites don’t always leave visible marks
- Most exposure occur when bats enter human living quarters

Photo: Green River Health District, KY
When to use Prophylaxis

- When animal *tests positive* for rabies
- When animal is a *high risk animal* that is NOT available for testing or tests results are inconclusive
  - Bats
  - Skunks
  - Raccoons
  - Coyotes
  - Foxes
When NOT to use Prophylaxis

- When the biter is NOT a mammal
- Low risk species with normal behavior
- Domestic animal that is known to be alive and can be quarantined
- When animal is available for testing
  - Submit for testing ASAP
  - Consider treatment if testing will be delayed
Prophylaxis Window

- Delay the decision for PEP if animal is quarantined or available for testing.
- Incubation period for development of rabies symptoms is normally 3 to 12 weeks after exposure.
- Yes you CAN wait to treat.
Rabies Treatment Algorithm
This chart applies only to Indiana and to the current rabies situation (2/27/08)

Was the skin broken and/or were mucous membranes (eye, mouth) exposed to saliva or nerve or brain tissue

No exposure—no further action required

Yes

Was the animal a mammal? (birds, reptiles, and amphibians do not get or transmit rabies)

No

Yes

The animal is a wild animal (higher risk)

The animal is a domestic animal (lower risk)

The animal is a wild animal (higher risk)

The animal is not a species at high risk for rabies

The animal is a squirrel, rabbit, field mouse, or other rodent

The animal is a cow, horse, or other livestock

The animal is a dog, cat, or ferret

The animal is a cage-raised/confined animal such as a hamster, mouse, or gerbil

 Generally, these species do not contract or transmit rabies. Unless there is an unusual circumstance, PEP is not required. Consult with local health department or ISDH if desired.

 Consult with the local health department or ISDH. Generally, no other action is required.

 If the animal escaped or is not available, the decision to use PEP should be based on the circumstances of incident and the presence of rabies in the area. Local health department or ISDH is available to assist in the decision.

 If the animal is available for observation or laboratory exam, no further action is needed until laboratory or observation results are available.

 These animals generally do not have an opportunity to be exposed to rabies virus and rarely have rabies. Except in unusual circumstances, no further action is required.

 ISDH Rabies Consultant M-F 317.233.7125
 Evenings, weekends, and holidays 317.233.1325

Animal bites and the administration of rabies postexposure prophylaxis (PEP) are reportable events

Generally, if the animal is available for laboratory exam, PEP may be delayed until lab results are available. If not available, consult PEP. Consult with local health department or ISDH if desired.
Rabies Prevention Guidance

  - MMWR: May 23, 2008 / 57 (RR-03);1 – 28
  - MMWR Update: March 19, 2010 / 59(02);1-9

Treatment...

- Effective if given after exposure
- Anytime before symptoms develop
- Can be shipped to HCP overnight (manufacturer)
- Expensive!
Rabies Immunoglobulin (RIG)

- Given once (day 0)
- Immediate, passive antibodies
- Weight based (20 IU/kg)
- Given at the site of bite
- If no known bite or bite area is too small for full dose—give in a large muscle group
Vaccine

- Small dose
- Given in muscle (arm)
- 4 doses over 2 weeks
  - Day 0 (with RIG)
  - Day 3
  - Day 7
  - Day 14

Day 0 is the date when the 1st vaccine was given NOT when the exposure occurred
What if RIG wasn’t given?

- Should be given with the 1\textsuperscript{st} dose of vaccine (different location on body)
- May be given up to 7 days after the 1\textsuperscript{st} dose of vaccine
- If no vaccine has been given but it’s been days to weeks after a high risk exposure give RIG immediately!
What if a dose of vaccine is missed?

- Give that dose as soon as possible
- Give the next dose the appropriate # of days later

- Dose 1 = Day 0
- Dose 2 = 3 days later
- Dose 3 = 4 days later
- Dose 4 = 7 days later
Questions?