Rabies
Rabies Epidemiology

- 16-39K require rabies post-exposure prophylaxis annually
  - Medical urgency, not medical emergency
  - $300 million annually

- About 1 or 2 cases of rabies annually in US
Sources of Exposure

- Domestic animal exposure very rare
- Canine exposures internationally
  - >1/3 cases from international exposures
- Wildlife exposure most common
  - Raccoons, skunks, bats
  - Almost 60% human exposures from bats
# Postexposure Recommendations

<table>
<thead>
<tr>
<th>Animal type</th>
<th>Evaluation</th>
<th>Recommendations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dogs, cats, ferrets</td>
<td>Healthy and available for 10 day observation</td>
<td>No prophylaxis unless signs</td>
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<tr>
<td></td>
<td>Rabid or suspected</td>
<td>Immediate vaccination</td>
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<tr>
<td></td>
<td>Unknown (escaped)</td>
<td>Consult public health</td>
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<tr>
<td>Skunks, raccoons, foxes, most carnivores, bats</td>
<td>Regard as rabid unless proven negative</td>
<td>Consider immediate vaccination</td>
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| Livestock, small rodents, lagomorphs (rabbits), large rodents (beaver, woodchucks), other mammals | Consider individually | Consult public health.  
Bites of squirrels, hamsters, guinea pigs, gerbils, chipmunks, rats, mice, small rodents, rabbits, almost never require prophylaxis |
Types of Exposure

- Transmitted by introduction of virus via bite wound or open cuts, onto mucous membranes
- Bites
  - Bat bites inflict minor injury
- Nonbites
  - Aerosolized virus in laboratory
  - Airborne exposure in caves with bats
Bat Exposures

- Little trauma associated with exposure
- Consider postexposure prophylaxis
  - Sleeping in room with bat
  - Child, mentally disabled person in room with bat
- Human contact with bats must be minimized
Treatment of Wounds

- Immediate, thorough washing with soap and virucidal (povidone-iodine) agent
- Tetanus prophylaxis
- Antibiotic treatment as indicated
Rabies Biologics

- Rabies vaccine
  - Antibody response in 7-10 days
  - Lasts for at least 2 years
- Rabies immune globulin (RIG)
  - Half life of 21 days
- Both products used simultaneously for post exposure prophylaxis unless previously immunized
Rabies Vaccines

- Human diploid cell vaccine
- Purified chick embryo cell vaccine
Rabies Immune Globulin

- Concentration 150 IU/ml
- Recommended dose 20 IU/kg
Rabies Immunization Strategies

- **Primary immunization**
  - For those at high risk of exposure
  - Need post-exposure prophylaxis (two doses of vaccine), but no RIG

- **Post-exposure prophylaxis**
  - Used following potential or actual exposure to rabies in previously unimmunized individual
  - Use both RIG and rabies vaccine series
Primary Vaccination Indications

- Pre-exposure for high risk individuals
  - Veterinarians, animal handlers, laboratory workers
  - Individuals with frequent contact with high risk animals
  - International travelers with likely exposure

- Intramuscular
  - IM on days 0, 7, 21 or 28
Booster Doses

- Serum antibody concentrations every 6 months to every 2 years
  - Depends on risk
- No testing or boosters for those with infrequent exposure
  - Veterinarians, animal control and wildlife workers in low rabies areas, international travelers with exposure
Postexposure Therapy for Vaccinated Individuals

- Intramuscular vaccine immediately and three days later
- Must have received pre-exposure regimen appropriately
- Rapid anamnestic response following booster
Postexposure Immunization

● Passive and active immunization
● Begin as soon as possible after exposure (unless waiting for results of animal quarantine)
● Indicated regardless of delay unless clinical signs of rabies
Rabies Immune Globulin

- Administer on day 0
  - May administer up to day 7
- RIG dose 20 IU/kg
- Infiltrate RIG around wound site
- Any remaining volume administered intramuscularly at site distant from vaccine administration
Rabies Vaccine

- Administer in conjunction with RIG
- Four dose series intramuscularly
  - Days 0, 3, 7, 14 (5th dose on day 28 for immunocompromised)
  - Administered intramuscularly
    - Deltoid for adults
    - Anterolateral aspect of thigh for children
    - DO NOT USE GLUTEUS
Adverse Reactions

- Local injection site reactions
- Systemic reactions
- Management
  - Do not interrupt or discontinue series
  - Serious hypersensitivity should be carefully managed
  - Serious systemic, anaphylactic, neuroparalytic reactions very rare—serious dilemma for clinician and patient