## SEALPOX VIRUS

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<th>Animal Group(s) Affected</th>
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<td>Many pinniped species, especially seals and sea lions.</td>
<td>Direct contact (i.e., rubbing, bites, scratches, saliva, bodily fluids), and fomites (i.e., rubber gavage tubing, feeding apparatus, gloves, needle puncture)</td>
<td>Most often seen in juveniles, animals in distress or newly housed. Firm skin nodules (1-3cm) will appear on head, neck, and thorax and can spread to abdomen, flippers, and mucosa. Infected area can become inflamed or necrotic</td>
<td>Often mild severity with low mortality. Those individuals with immune-suppressive conditions are at risk for a more severe infection</td>
<td>Lesions usually heal within a few weeks without treatment and leave a slightly raised gray scar without fur</td>
<td>Restrict movement of animals between enclosures; replace or disinfect gloves when handling animals; drain and scrub pens with 10% bleach solution regularly; wear proper personal protective equipment</td>
<td>Yes</td>
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**Fact Sheet compiled by:** Nadia F Gallardo-Romero, Benjamin P Monroe  
**Sheet updated on:** 20 August 2013  
**Fact Sheet Reviewed by:** William Van Bonn; Ginny Emerson  

**Susceptible animal groups:** Harbor seals, grey seals, Northern fur seals, Northern elephant seals, California sea lions, Steller’s sea lions and South American sea lions.  

**Causative organism:** Sealpox virus, a member of the *Parapoxvirus* genus  

**Zoonotic potential:** Yes  

**Distribution:** The geographic range of sealpox virus is considered worldwide, and infection has been confirmed in free-ranging pinnipeds in the Atlantic and Pacific Oceans (including America, Europe, and Siberia), and Antarctica. Sealpox infection has been identified in captive pinnipeds and humans at marine rehabilitation centers in North America and Europe.  

**Incubation period:** Clinical signs can appear within 1-5 weeks post exposure in captive animals. Human clinical signs have reportedly developed one week after exposure.  

**Clinical signs:**  

**Animals:** Sealpox infection is highly contagious in confined spaces with low mortality rates but very high morbidity. Juveniles, distressed, and newly-housed animals are the most likely to have active disease. The skin will present 1-3 cm firm skin nodules or lumps on head, neck and thorax, and may spread to abdomen, flippers, and mucosa. Lesions can present as solitary, in clusters, or generalized and progress from inflamed skin to necrotic.  

**Humans:** Persons who handle sick animals may come into contact with the virus and may get infected if they have small open cuts or breaks in the skin. Rare cases develop painful, swollen sores that may evolve into a bullous lesion. Infection may be more severe in persons with skin or immune-deficient medical conditions.
** Seahorse Virus**

**Post mortem, gross, or histologic findings:** Firm cutaneous nodules 1-3 cm diameter are the characteristic lesions of the disease. They can be congested and focally ulcerated, solitary, in clusters, or generalized along the animal body. Histologically, the lesions are characterized by epithelial hyperplasia and acanthosis. The dermis may present intense inflammatory infiltrate and necrosis, the epidermis may demonstrate edema, vacuolization and ballooning degeneration of keratinocytes. Eosinophilic cytoplasmic inclusions are also typical findings.

**Diagnosis:** Classic clinical presentation is used predominantly, especially in rehabilitation settings where it is observed seasonally. Molecular assays for viral DNA detection are most commonly used including PCR, RFLPs, and sequencing. Observation of typical cytoplasmic effect (CPE) in cell culture, histology, viral isolation, and virion visualization by electron microscopy also are used as confirmation of findings. Differential diagnosis with “seal finger” (caused by a *Mycoplasma*), anthrax, and fungal infections should be performed.

**Material required for laboratory analysis:** Swabs of swelling, mucosal or other lesions are the preferred sample. Place swab in a dry, sterile micro tube, store at -20°C. Skin biopsies containing a margin of normal tissue around the affected area. Place the half of the sample in 10% formalin, and the other half in a dry, sterile micro tube, store at -20°C. CDC laboratories can provide specimen collection guidance. Contact the reference laboratory prior to shipping to inquire about necessary permits.

**Relevant diagnostic laboratories:**

- Centers for Disease Control and Prevention
  - Poxvirus and Rabies Branch
  - CDC Poxvirus Inquiry line: 404-639-4129
  - 1600 Clifton Rd NE, Atlanta GA 30333
  - Nzr6@cdc.gov

- University of Florida
  - College of Veterinary Medicine,
  - Marine Mammal Health Program
  - Fax: (352) 392-5464
  - PO Box 100126, Gainesville, FL 32610
  - NollensH@mail.vetmed.ufl.edu

**Treatment:** Lesions usually resolve within a few weeks without treatment and may leave a scar. Palliative treatment is recommended for human infection to control secondary infections, inflammation, and pain. However, the literature has previously reported *in vitro* susceptibility of sealpox virus to cidofovir.

**Prevention and control:** Quarantine newly admitted animals, restrict movement of animals between enclosures, and decrease the number of animals per pen. Replace or disinfect gloves and equipment when handling sick animals and between enclosures; drain and scrub pens with 10% bleach solution or other disinfectant regularly. Wear proper personal protective equipment (PPE) including rubber or latex gloves, rain pants, overalls or suits, goggles and/or masks. Frequent hand washing is encouraged after handling animals, enclosures, or equipment.

**Suggested disinfectant for housing facilities:** 10% bleach solution, chlorhexidine gluconate based solutions, and other anti-viral solutions.

**Notifications:** Sealpox virus infection is not a reportable disease. However, state or local health departments should be notified of suspected human infections.

**Measures required under the Animal Disease Surveillance Plan:** The disease is not currently listed under the USDA National Animal Health Surveillance and/or Reporting systems.

**Measures required for introducing animals to an infected animal(s):** Sealpox is highly contagious among pinnipeds and will spread easily between animals in direct contact. Introduction of healthy animals
to sick animals is not recommended until skin lesions have completely healed.

**Conditions for restoring disease-free status after an outbreak:** No specific standards exist at this time. However, it is recommended to test the animals for viral DNA presence once the lesions are completely healed. If all animals from the center are negative, disease-free status can be restored and recommendation of quarantine and testing of new individuals should be applied.

**Experts who may be consulted:**
Mary Reynolds, PhD, MPH  
Poxvirus and Rabies Branch  
CDC Poxvirus Inquiry line: 404-639-4129  
1600 Clifton Rd NE, Atlanta GA 30333  
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**References:**