



NOAA FISHERIES



Marine Mammal Health and Stranding Response Program

The Marine Mammal Health and Stranding Response program was formalized by the 1992 Amendments to the Marine Mammal Protection Act, with NOAA's National Marine Fisheries Service as the lead agency to coordinate related activities.

The program has the following components: stranding networks, responses to and investigations of mortality events, biomonitoring, tissue and serum banking, and analytical quality assurance.

<http://www.nmfs.noaa.gov/pr/health/>

Influenza A Infection in Marine Mammals

What causes influenza?

Influenza refers to a group of viruses that infect human, avian, terrestrial and aquatic species around the world. There are three types of influenza viruses: A, B and C. Human influenza A and B viruses cause seasonal epidemics of disease almost every winter in the United States. Influenza C infections cause a mild respiratory illness and are not thought to cause epidemics. Influenza A viruses are divided into subtypes based on two proteins on the surface of the virus: hemagglutinin (H) and the neuraminidase (N). There are 16 different hemagglutinin subtypes and 9 different neuraminidase subtypes. Influenza A viruses can be further broken down into different strains. Subtypes can be species specific, so not all subtypes are found in all species. *(For more information, visit the CDC website at <http://www.cdc.gov/flu>)*

How are marine mammals affected by an Influenza A infection?

The presence of Influenza A in marine mammals was first recognized in the 1980's and appears to be associated with intermittent mortality events in seals along the northeastern Atlantic coast. Evidence of exposure to influenza has been found in other U.S. marine mammal populations, however illness and death due to influenza is not commonly reported in these animals. The population level significance of Influenza A in marine mammals is still unknown.

Seals with clinical Influenza A infection have exhibited the following:

- Nasal discharge
- Skin lesions
- Pneumonia
- Secondary Infections

What types of Influenza A have been found in marine mammals in the United States?

In general, Influenza A viruses of avian origin have been isolated from seals. Past mortality events have been associated with Influenza A H7N7, H4N5, H4N6, and H3N3 subtypes. A recent seal mortality event in 2011 involved Influenza A H3N8. Although the H3N8 subtype encompasses the virus responsible for canine and equine influenza, the seal virus is molecularly different from those viruses and appears more similar to the wild bird H3N8 subtype. The University of California Davis recently released a study identifying the presence of H1N1 in elephant seals returning from sea in the spring of 2010, one year after H1N1 emerged as a human pandemic in 2009. The H1N1 virus did not cause any illness in the exposed elephant seals.

How does Influenza A spread among animals?

In most species, influenza virus can be spread within a population by direct contact with airborne respiratory droplets, mucus, or feces from infected individuals or contact with a contaminated object. Influenza can sometimes be transmitted between different species. It is not clear how this particular virus is transmitted to seals and whether there is any connection with circulating infections in wild birds or other species in the area.

What should I do if I see a marine mammal on the beach?

Do not approach or touch the animal. Keep your pets away from the animal as well. Remember these are wild animals, so for both your safety and theirs please keep a safe distance. Only trained marine mammal responders should handle the animal. If you think the animal may be in trouble, contact your local Marine Mammal Stranding

How can I find out more information on Influenza?

Visit the following online resources:

Influenza in general:

Centers for Disease Control and Prevention (CDC):
<http://www.cdc.gov/flu>

World Health Organization (WHO):
http://www.who.int/influenza/human_animal_interface/en/index.html

Avian Influenza:

American Association of Zoo Veterinarians (AAZV):
<http://www.aazv.org/displaycommon.cfm?an=1&subarticlenbr=107>

Centers for Disease Control and Prevention (CDC):
<http://www.cdc.gov/flu/avianflu/>

Food and Agriculture Organization:
<http://www.fao.org/avianflu/en/index.html>

National Wildlife Health Center:
http://www.nwhc.usgs.gov/disease_information/avian_influenza/

United States Agriculture Department:
http://www.usda.gov/wps/portal/usda/usdahome?navtype=SU&navid=AVIAN_INFLUENZA

World Organization for Animal Health (OIE): <http://www.oie.int/animal-health-in-the-world/web-portal-on-avian-influenza/>

Network. To find the contact information for your local network, visit:
<http://www.nmfs.noaa.gov/pr/health/networks.htm>

What safety guidance do marine mammal stranding response teams follow when handling seals?

The Stranding Network follows safety precautions for handling stranded seals as provided in each organization's safety plan and in NOAA Fisheries' "Best Practices for Marine Mammal Stranding Response, Rehabilitation, and Release." In addition, we are distributing an infectious disease prevention fact sheet to our network responders and we are working with the Centers for Disease Control and Prevention (CDC) and state public health officials to develop additional guidance as needed.

Has a strain of influenza virus from a seal ever infected a human?

There is a documented case of H7N7 from an experimentally infected seal causing influenza viral conjunctivitis in a laboratory worker (Webster et al., 1981), so there is a low but possible risk of transmission of influenza viruses to animal care workers from sick pinnipeds through expelled respiratory droplets. Human infections with new influenza viruses would be concerning if they occurred. Influenza viruses are constantly changing and it is possible for a virus to change such that it could more easily infect humans. For this reason, the Centers for Disease Control, the National Wildlife Health Center and other organizations are investigating the H3N8 influenza virus related to the 2011 seal mortality event and other animal influenza viruses very closely. (For more information, visit the CDC website <http://www.cdc.gov/flu>)

What is the risk of contracting Influenza A virus from eating seafood?

Influenza A virus does not cause disease in fish or shellfish so there is no risk of catching this virus by eating seafood.

Are there any risks to pets?

Pets should be kept away from marine mammals. Dogs and cats can share infectious diseases with marine mammals and should not be allowed to approach live or dead marine mammals or to consume dead stranded marine mammals or their parts. NOAA Fisheries recommends contacting your pet's veterinarian to discuss the potential risk to pets in your local area. (For more information, visit the CDC websites <http://www.cdc.gov/flu/canine/> and <http://www.cdc.gov/healthypets/>)

Which marine mammal species in U.S. waters have shown exposure to Influenza A viruses?

Influenza A virus antibodies have been detected in the following species of pinnipeds and cetaceans:

| | |
|--|---|
| Harbor seals (<i>Phoca vitulina</i>) | Northern elephant seal (<i>Mirounga angustirostris</i>) |
| Harp seals (<i>Phoca groenlandica</i>) | Pacific walrus (<i>Odobenus rosmarus divergens</i>) |
| Ringed seals (<i>Phoca hispida</i>) | Beluga whales (<i>Delphinapterus leucas</i>) |
| Grey seals (<i>Halichoerus grypus</i>) | Pilot whale (<i>Globicephala malaena</i>) |
| California sea lions (<i>Zalophus californianus</i>) | |

Updated November 1, 2013