

## **PREVENTING HANTAVIRUS PULMONARY SYNDROME IN THE WORKPLACE**

Some occupations have a higher chance of exposure to deer mice in California. This includes:

- Forest Service and national, state, or regional park employees
- Field biologists
- Campground employees and maintenance workers
- Other occupations that involve working in mice infested structures.

Besides potential work-related exposure to rodents, contact with infected deer mice can also occur in recreational and home environments.

### **What is hantavirus pulmonary syndrome (HPS)?**

HPS is a rare, but often fatal, disease of the lungs. HPS was first recognized in 1993 in the southwestern United States. Cases of HPS occur throughout the United States but are most common in the west. Although several hantaviruses have been found in the United States only one, the Sin Nombre virus (SNV), is known to cause HPS in California.

### **How are hantaviruses maintained in nature?**

Hantaviruses are maintained in nature in wild rodents. In California, only deer mice have been associated with transmission of SNV to humans. Other rodents, such as squirrels, chipmunks, and house mice are rarely, if ever, infected and are not considered to pose a risk of HPS to humans.

### **How does a person get HPS?**

Infected deer mice shed hantavirus in their urine, droppings, and saliva. A person most commonly becomes infected by breathing air contaminated with rodent urine or droppings when cleaning or otherwise disturbing rodent-infested areas. HPS exposure risk increases in small, confined spaces where there is little air circulation and an active deer mouse infestation exists.

Rarely, individuals can also be infected by 1) consuming food contaminated with rodent urine or droppings, 2) touching surfaces contaminated by rodents and then touching their mouth, eyes, or nose, or 3) being bitten by an infected rodent.

### **What are the symptoms of HPS?**

The first symptoms typically develop one to two weeks after exposure to SNV, but may develop up to five weeks post-exposure. Early symptoms can be easily confused with the flu.

### Early symptoms of HPS:

- fever
- headache
- muscle aches

### Other symptoms include:

- dizziness
- vomiting
- chills
- nausea
- diarrhea
- abdominal pain

After two to seven days of these symptoms, patients develop breathing difficulties that range from cough and shortness of breath to severe respiratory failure. Approximately 35 percent of HPS patients in California die from the disease.

### **What is the treatment for HPS?**

Currently, there is no specific treatment, cure, or vaccine for HPS. However, if infected individuals are recognized and hospitalized early, supportive care can improve their chance for survival. Patients with severe respiratory disease can require intensive support of their heart and lung functions.

### **How can I prevent HPS in the workplace?**

You can help eliminate or minimize contact with all rodents, including deer mice in your workplace by doing the following:

#### **Seal-up**

- Seal holes and gaps around doors, windows, and pipes that are 1/4 inch or larger in diameter to keep rodents out of buildings.
- Use materials such as steel wool, galvanized hardware cloth, sheet metal, mortar, caulk, and concrete to seal the openings.

#### **Trap-up**

- Place and routinely check snap traps to remove existing rodents from structures.

#### **Clean-up**

- Air out the work space prior to starting clean-up activities.
- Use protective gear when cleaning up mice infested areas, including rubber, latex, or vinyl gloves and protective eyewear. If there is extensive mouse contamination, also consider using coveralls (disposable, if possible), rubber boots or disposable shoe covers, and respiratory protection.
- Do not sweep or vacuum in areas where mouse urine, droppings, or nests may be present.
- Disinfect areas where dead mice, droppings, or nests are found by spraying contaminated areas with disinfectant or a mixture of bleach and water (follow the label instructions for proper dilution and disinfection time).
- Use only wet-cleaning methods, such as a mop or sponge, to minimize the chance of aerosolizing the virus.
- Use paper towels to pick-up any dead rodents or contaminated materials after they have been disinfected and dispose of the waste in double-bagged plastic bags; place the bags in an outdoor garbage container that is regularly emptied.
- Remove gloves, disinfect or discard in trash, and wash hands with soap and water when you are done cleaning-up.

### **Minimize rodent attractants**

- Eliminate materials in which rodents may nest such as boxes, newspapers, and woodpiles.
- Place firewood, woodpiles, trash cans, or dumpsters at least 100 feet from structures.
- Fix leaks in sprinklers or other outside pipes that might attract mice by providing a source of water.
- Reduce rodent food sources by storing food in tightly sealed containers.
- Bring pet food or water bowls inside at night time.
- Keep garbage in tightly sealed containers away from structures, and dispose of trash on a regular basis.

### **How do I safely close and open seasonally-occupied buildings?**

Taking the proper steps to close and safely open a seasonally occupied building or other intermittently used structure can significantly decrease the risk of exposure to hantavirus.

#### **Closing**

- Remove all trash and food sources to discourage rodent infestation.
- If the building has a kitchen area, clean and disinfect all kitchen surfaces, drawers, and cabinets to help minimize rodent contamination during the closed period.
- Cleaning up rodent droppings, nests, or any evidence of rodent contamination will aid in evaluating rodent activity when the building is reopened.

#### **Opening**

- When opening a structure that has been closed for a period of time, first open all accessible doors and windows while taking care to minimize the movement of building contents or other activities that could stir up dust.
- Leave the building and allow the space to air out for a minimum of 30 minutes.
- USE ADDITIONAL PERSONAL PROTECTIVE MEASURES if there is visual evidence of extensive rodent contamination such as large amounts of rodent feces, live or dead mice, or nesting materials.

### **Where can I find more information about HPS?**

[The California Department of Public Health hantavirus webpage](https://www.cdph.ca.gov/Programs/CID/DCDC/Pages/HantavirusPulmonarySyndrome.aspx#)

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[The U.S. Centers for Disease Control and Prevention hantavirus webpage](http://www.cdc.gov/ncidod/diseases/hanta/hps/index.htm)

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