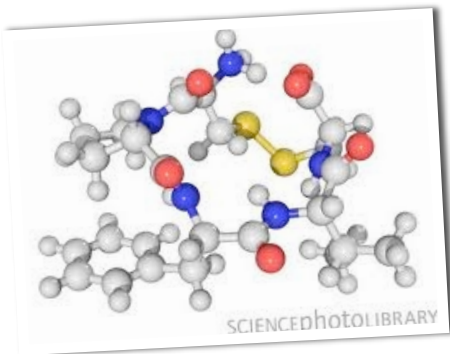


# Hantavirus Pulmonary Syndrome (HPS)

Group V (-ssRNA) Family: *Bunyaviridae*



Hantavirus Pulmonary Syndrome (HPS) is a severe respiratory disease in humans that is sometimes fatal. Anyone, even those who are healthy, who encounter an infected rodent is at risk of HPS. The primary risk of exposure to Hantavirus is rodent infestation in and around the home. HPS cases occur sporadically. The Sin Nombre Hantavirus is responsible for the majority of HPS cases in the United States. The *Peromyscus maniculatus* (deer mouse) is the host of the Sin Nombre virus. This mouse is found throughout the central and western regions of the United States. There are several other Hantaviruses, throughout the U.S., capable of causing HPS connected to other rodent species. Deer mice (*P. maniculatus*), cotton rats (Sigmodontini tribe), & rice rats (*Oryzomyini* tribe) in the southeastern states & the white-footed mouse (*Peromyscus leucopus*) in the Northeast states are known reservoir hosts of the virus. These rodents shed the virus in their

saliva, urine, & droppings and then transmitted to humans when they inhale air contaminated with the virus.

Any activity putting you in contact with rodents and their saliva, urine, droppings, and/or bedding puts you at risk for HPS infection. This virus is spread through airborne transmission (inhalation). When particles from an infected host are stirred into the air and if the virus particles inhaled HPS infection can occur. It is important to avoid activity that promotes dust when dealing with rodents. Avoid sweeping, vacuuming and dry dusting when cleaning up after rodents. Hantavirus can be spread from rodent to human several different ways: by bite, although rare due to the fact that individuals bitten by rodent is not common, researchers believe that infection can occur after touching contaminated rodent feces, saliva, bedding, etc., then touching your nose or mouth, also individuals can become ill if they eat food contaminated by infected rodent activity. The types of Hantaviruses that cause HPS, in the U.S., cannot be transmitted from person to person. This virus cannot be transmitted from a healthcare worker who has treated someone with the virus, or by kissing an infected individual, and you cannot get HPS through blood transfusion. In the

U.S. only certain rodent species are known transmitters of the Hantavirus. Pets (cats & dogs) are not known to carry the virus; however, they can introduce infected rodents into the home.

## **Potential Risk Activities for HPS**

### Reopening/open unused areas:

Cleaning and or opening unused buildings such as cabins, outbuildings, sheds, barns, storage facilities, and garages, that have been unused during the winter are potential Hantavirus risks.

### Housecleaning Activities:

If rodents have invaded your home cleaning can put you at risk for HPS. Many homes may shelter rodents, especially in cold winters.

### Work related Exposure:

Utility workers, pest control and construction workers may be exposed when working in crawl spaces, in vacant buildings, or under houses.

### Campers and Hikers:

Can be exposed to HPS if trail shelters and/or camps are infested with rodents

The chances of Hantavirus exposure is higher for those who live, work, and play in closed spaces with rodent activity. Recent research shows that many individuals who have become infected with HPS were infected after continued contact with infected rodents and their droppings. Many individuals who have become ill have also stated that they have seen no evidence of rodent activity before becoming ill.

## Signs & Symptoms for Hantavirus Pulmonary Syndrome (HPS)

Incubation time for HPS is unclear because there have only been a small number of cases. Due to this limited information it appears that symptoms may occur between 1 and 5 days after exposure to infected rodent droppings, urine, saliva, and/or bedding.

Early symptoms include fever, fatigue, and muscle aches. Muscle aches are universal and appear in the larger muscle groups (thighs, back, hips, sometime shoulders). Infected person may also experience headaches, chills, dizziness, nausea, diarrhea, vomiting, and stomach pains. Late symptoms (4 to 10 days later) may appear as coughing and shortness of breath. HPS has a 38% mortality rate & can be fatal.

## Preventing Hantavirus Pulmonary Syndrome (HPS)

Minimizing &/or eliminating rodents in your home, workplace, or campsite is key in prevention of HPS. Seal up all gaps and holes and place traps in and around areas of concern to decrease rodent infestation, and clean up all-available food sources.

Seal up holes inside and outside the home to keep rodents out. Holes and gaps can be found outside the home: in the roof among the eaves, &/or rafters, around doors, windows,

foundation, and holes for plumbing, cable, electrical, and gas lines. Inside the home: under, inside, and behind cabinets, refrigerators, and stoves, around doors, fireplaces, inside closets near the floor corners, around pipes going to hot water heaters, furnaces, under sinks, and washing machines, around dryer and floor vents, and inside basements, attics or crawl spaces,

Fill small holes with steel wool and put caulk around the steel wool to keep it in place. For large holes use metal sheeting, hardware cloth, cement, lath screen or lath metal. Sealing up holes in areas of concern will help in preventing rodent re-infestation. Placing traps in & around rodent infested areas will help reduce the present rodent population. Choose the appropriate snap trap (is it for a mouse? A rat?). Bait it with something desirable to the rat (this may take a few tries, peanut butter, cheese, berries). Before setting traps read instructions.

Keep in mind, when placing a trap, rats prefer to run along walls or other objects for safety reasons and do not like to be out in the open. Place the baited end of the trap closest to the wall, forming a "T". Make sure to place traps in areas that show evidence of rodent activity. Some rodents are cautious and may take several days to trap while others are less cautious and can be trapped more easily. Live and glue traps are not recommended since these traps

are likely to scare rodents causing them to urinate increasing exposure to possible HPS risk. There are natural rodent predators (owls, hawks, nonpoisonous snakes) that can help in rodent control outside the home. In rodent control it is not only essential to trap rodents but to continue to seal up any holes or gaps within the home so new rodents cannot gain entry.

It is always best to discourage rodents from entering the home in the first place by keeping it clean. Some guidelines in rodent control/prevention are to: store food in thick plastic &/or metal containers with tight lids, do not leave food or water setting out overnight (including pet food & water). Keep outside grilling areas & inside cooking areas clean, clean up spilled food, wash dishes, & utensils immediately after use, use thick metal or plastic garbage cans with tight fitting lids, keep compost bins at least a 100 feet from the home, animal feed should be stored in thick containers with tight fitting lids & return uneaten feed to its proper container in the evening, and hang bird feeders far from the home with squirrel guards to limit rodent access to the feeder.

**BE SAFE! ASSUME ALL RODENTS, BEDDING, AND DROPPINGS ARE INFECTED AND ALWAYS TAKE SAFETY PRECAUTIONS BEFORE AND DURING RODENT CLEAN UP.**

## PROTOCOL FOR SAFE RODENT CLEAN UP:

- DO NOT stir up dust by sweeping or vacuuming up nesting materials, droppings, or urine.
- Wear rubber, vinyl, or latex gloves
- Spray area in question with either a disinfectant or mixture of 1 part bleach to 10 parts water and let contaminated area soak for 5 minutes. If using disinfectant, follow the manufactures instructions on the label for disinfectant time and dilution.
- Use a paper towel to pick up disinfected droppings, urine, &/or nesting and immediately dispose of in the garbage
- When all rodent droppings and urine have been removed, disinfect all possible contaminated items.

Contact you local vector control district for rodent control/prevention assistance (909) 635-0307

For more information on how you can prevent rodent infestations, the following information is available on the [CDC Rodents](#) site.

[Rodentshttp://www.cdc.gov/rodents/index.html](http://www.cdc.gov/rodents/index.html)

<http://www.cdc.gov/hantavirus/hps/history.html>

Information provided by Centers of Disease Control and Prevention