

Institutional Animal Care and Use Committee Clemson University

Guidelines for Protecting Clemson Personnel from Hantavirus Pulmonary Syndrome

Hantavirus pulmonary syndrome (HPS) first emerged in the United States in 1993, in the “Four Corners” region of the southwest; <http://www.cdc.gov/ncidod/diseases/hanta/hps/> . With an initial mortality rate >90%, the United States Centers for Disease Control and Prevention (CDC) promptly initiated a vigorous investigation. One result of this early burst of efforts was a set of guidelines for workers exposed to rodents potentially infected with the viruses that cause HPS. Knowledge of the biology and etiology of HPS has improved greatly in the past 15 years and updated guidelines intended for personnel that may come in contact with wild are warranted.

1. All personnel should be fully aware of the symptoms of HPS, which include severe muscle aches, fever, and headaches. If these flu-like symptoms appear within 6 weeks after fieldwork, the person should see a physician immediately and report that he or she might have been exposed to Hantavirus.
2. All personnel should visit the CDC website regularly to get updates on Hantaviruses (<http://www.cdc.gov/ncidod/diseases/hanta/hps/index.htm>), HPS, and other rodent-borne diseases (<http://www.cdc.gov/rodents/diseases/>).
3. Handling of rodents known to transmit viruses that cause HPS should be done in the open air with the rodent (or trap containing the rodent) held away from the face and positioned such that direct wind (and wind vortices) do not blow aerosolized particles from the rodent toward the investigator.
4. Live traps containing rodents known to transmit viruses that cause HPS should not be transported within a vehicle unless they are securely isolated in intact plastic bags (e.g., large garden bags) otherwise placed in an area in which air circulation is separate from that of the driver and any passengers.
5. Personnel should avoid direct contact with urine, feces, saliva, blood, and internal organs of rodent species associated with HPS. Eye protection and rubber, latex, vinyl, or nitrile gloves are recommended when handling or doing invasive procedures with rodents that potentially transmit Hantavirus.
6. Appropriate training should prioritize safe and secure handling of small mammals to avoid being bitten or scratched. Rodents can be anesthetized or euthanized by placing the trap containing the rodent inside a disposable plastic bag containing the anesthetic agent. For mark-and release studies smaller rodents (<100 g) can be

removed from traps using disposable plastic or washable cloth bags and handled safely and securely by grasping them firmly at the nape of the neck.

7. In the unlikely event that someone is bitten, scratched, or comes into direct contact with the fluids of rodents that potentially transmit Hantavirus, the affected area should be washed thoroughly with soap and water, then disinfected with an alcohol-based hand sanitizer or similar disinfectant, such as Lysol or Clorox hand wipes.
8. Personnel should not use a cabin or field bunkhouse that shows evidence of current or prior occupation by rodents until the structure is thoroughly cleaned. Because feces and other signs of rodents known to transmit hantaviruses can be difficult to distinguish from those of non-hantavirus-transmitting species, workers should be conservative and assume that small feces and other rodent signs pertain to hantavirus-transmitting species. Because Hantavirus infection is thought to be acquired primarily by inhalation, efforts should be made to minimize aerosolization of dust inside the dwelling; we suggest that workers spray surfaces with disinfectant, use a mop rather than a broom, and use HEPA respirators during initial cleaning if dust is likely to be aerosolized. Once the dwelling is cleaned, workers should maintain a program of removal of small mammals from the structure by live or kill trapping, following the recommendations below. Hantaviruses are readily killed by contact with common disinfectants (e.g., 10% bleach, 3% Lysol) or exposure (30 min) to direct sunlight or heat, 60C.

References

Mills, J., Childs, J, Ksiazek, T., and Peters, C. Methods for trapping and sampling small mammals for virologic testing. National Center for Infectious Diseases, Division of Viral and Rickettsial Diseases. Centers for Disease Control and Prevention, 1995.

Kelt, Douglas A, Hafner, Mark S., and the American Society of Mammalogists' Ad Hoc Committee for Guidelines on Handling Rodents in the Field, *Journal of Mammalogy*, 91(6):1524-1527, 2010