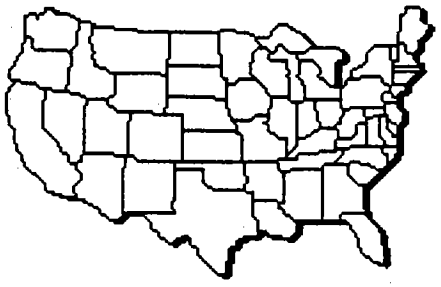
U.S. Army Center for Health Promotion and Preventive Medicine
(Provisional)

Just the Facts

64-001-0893

Interim Recommendations for Reducing Risk of Hantavirus Infection

OUTBREAK OF HANTAVIRUS INFECTION, Southwest U.S., 1993



1. BACKGROUND: Since May 1993, the state health departments in Arizona, Colorado, New Mexico and Utah, along with the Center for Disease Control (CDC) and the Indian Health Service, have been investigating an outbreak of acute respiratory illness related to a newly recognized Hantavirus. Hantavirus is the agent of hemorrhagic fever with renal syndrome (Korean hemorrhagic fever) which occurs largely in China and Korea and affected many U.S. soldiers during the Korean War. There are several antigenic subtypes of the virus with different rodent reservoirs.

2. RESERVOIR: Rodents are suspected to be the main reservoirs of Hantavirus. In June, it was learned that deer mice are capable of carrying the Hantavirus suspected of causing the recent outbreak. Other forms of the virus have previously been identified in the Norway rat and the meadow vole. Until further information is known, it must be assumed that all rodents are possible reservoirs of Hantavirus. Domestic dogs and cats are not known to be reservoirs of Hantavirus.

3. CASES: Eighteen laboratory-confirmed cases had been reported through 27 July 1993; fourteen (78 percent) had died. The major symptoms are flu-like and may progress to an acute respiratory distress syndrome. This is in contrast to the hemorrhagic symptoms and renal failure seen with the Korean form. Twelve of the eighteen patients were from New Mexico; four were from Arizona. The median age was 31 years old with a range from 13 to 64 years. Illnesses in 28 additional patients from the four-state area are currently under investigation (laboratory confirmation). Fifty-five additional patient specimens from 24 other states have been sent to the CDC for diagnosis/confirmation. One resident of central Nevada and another in eastern Texas have been confirmed. This would indicate that the illness is not limited to the four-state area. The Office of the Surgeon General requires that any suspected cases be reported to its headquarters telephonically (COL Tomlinson or MAJ Fonseca, DSN 289-0125, Commercial 703-756-0125) or by FAX (-0243) with a MED-16 report by electronic-mail to follow (DA Message 051130Z Aug 93). Instructions will be given for the collection of specimens for laboratory diagnosis.

- **Hantavirus**
- **Transmission**
- **Rodent**
- **Risk Reduction**

4. TRANSMISSION: The primary mode of transmission is aerosolization of rodent excreta; bites also can transmit the virus. Transmission of dried material through broken skin, to conjunctivae, or by ingestion of contaminated food or water may also be possible. Virus is present in urine, feces and saliva of infected asymptomatic rodents; highest virus concentration is found in the lungs. The illness has not been associated with direct transmission from person to person. Incubation period is usually 12-16 days. Arthropod vectors do not transmit Hantavirus.

Entomological Sciences Division - DSN 584-3613 or C 410-671-3613
Industrial Hygiene Division - DSN 584-2559 or C 410-671-2559
Occupational and Environmental Medicine Division - DSN 584-2714 or C 410-671-2714
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5. AFFECTED AREAS: The CDC currently considers New Mexico, Arizona, Colorado, and Utah to be affected areas. Cases have also been confirmed in Oregon, Louisiana, California, Nevada and Texas. The evolving epidemic has been featured in *Morbidity and Mortality Weekly*, Nos. 22, 23, 26, and 29 (June and July 1993); forthcoming issues should be consulted for updates. The CDC has released interim recommendations which have relevance to our populations in the affected areas, entitled "Hantavirus Infection — Southwestern United States: Interim Recommendations for Risk Reduction," July 30, 1993, Vol. 42, No. RR-11. Copies of the CDC recommendations may be requested from the Office of Infectious Diseases, CDC, (404) 639-3052.

6. USAEHA RECOMMENDS THE FOLLOWING CONTROL MEASURES:

◆ Avoidance of rodents and their excreta by decreasing the availability of food sources and nesting sites is the primary preventive strategy. Consult USAEHA Technical Guide 138, Guide to Commensal Rodent Control. Before performing rodent exclusion or control in building interiors, fleas must be controlled in order to prevent transmission of plague bacteria to humans as fleas search for an alternate host. Use an EPA-registered insecticide and always follow label instructions.

◆ Rodent infestation can be determined by observation or inferred from droppings or evidence of gnawing at food. Exclude rodents from entering structures by covering all openings larger than one-quarter of an inch with steel mesh screening, wood or cement. Discourage nesting by disposing of trash and clutter, moving woodpiles, and cutting grass, brush and dense shrubbery in a 100-foot perimeter around the structure. Three inches of gravel under the base of elevated structures will also prevent burrowing.

◆ Rodents do not stay where they do not have access to food and water. Keep food covered in rodent-proof metal or thick plastic containers with heavy lids. Keep pet food and water covered and stored in rodent-proof containers. Wash dishes and cooking utensils immediately, remove spills, and store garbage and utensils in rodent-proof containers.

◆ Trap rodents by using snap traps placed in pairs with triggers facing away from each other parallel to walls in rodent runways (mousetrap, spring, NSN 3740-00-252-3384; rat trap, spring, NSN 3740-00-260-1398 per dozen). Suspected runway locations can be confirmed by the presence of tracks in talcum powder.

◆ Dispose of rodents caught in traps by first spraying the rodent and trap with a general purpose household disinfectant or bleach solution (3 tablespoons of household bleach in 1 gallon of water.) Next, place the trap and rodent directly into a plastic bag. Seal the bag and place it sealed-end-first (upside down) in another plastic bag and seal. Dispose of the bag in accordance with local or state health department guidelines.

◆ Pest control workers and others with frequent rodent contact in affected areas should be instructed in preventive measures, the symptoms of the disease, and when to seek medical attention. Baseline serum may be drawn and stored frozen. Workers who become ill must be certain to inform their physicians of possible exposure. Workers should always wear protective clothing when handling traps containing rodents: rubber or plastic gloves, coveralls, rubber boots or disposable shoe covers, protective goggles, and a respiratory protection device such as a half-mask air-purifying (or negative pressure) respirator with a high-efficiency particulate air (HEPA) filter. Disposable protective gear and respirator filters should be disposed of at the completion of work by placing them into a bag containing disinfectant solution. High efficiency particulate air prefilters, HEPA canister filters and HEPA disposable respirators should be handled on a one-use/ one-time basis. If coveralls are not disposable, they should be kept in disinfectant until they can be laundered.

◆ Workers who are issued and use respiratory protection should be included in an installation respiratory protection program that complies with AR 11-34. As a minimum, workers should be provided medical surveillance, instruction in respirator use, limitations and maintenance, fit testing and wear instruction (including no facial hair), disposal instructions for handling potentially contaminated HEPA filters, and personal hygiene instruction.

◆ Installation pesticide workers should already be included in a respiratory protection program. Additional instructions for use of respirators for Hantavirus protection should be minimal. It is important to instruct pesticide workers that if they use a pesticide respirator for potential Hantavirus protection, many pesticide respirator prefilters are not HEPA filters and may not provide equal protection against the Hantavirus. Pesticide prefilters and HEPA prefilters for use on pesticide respirators cannot, in all situations, be interchanged and continue to maintain the pesticide respirator certification and approval (i.e., NIOSH certification). Pesticide workers should be instructed to have someone knowledgeable in respirator selection validate any changing of pesticide prefilters to HEPA prefilters to ensure the respirator approval is not invalidated.

◆ Others who may become potentially exposed to Hantavirus include facilities engineers, housekeeping workers, plumbers, carpenters, insulation workers, telephone repair and installation workers, and warehouse personnel. Currently, there is insufficient information available to make general recommendations to all workers with potential exposure, other than that they avoid disrupting rodents or droppings. Specific occupationally-related questions should be directed to the Installation Medical Authority. Many installations have services provided by contractors. Although the government may not be directly responsible for contractor personnel health and safety, information transfer about potential Hantavirus exposure in government facilities is medically ethical. AMEDD personnel are advised to contact their installation contract manager. New installation service contracts may need to include information on potential for Hantavirus and the need for contractors to provide their employees additional health and safety services (including a contractor-established respiratory protection program). Communication between the government and contractors is usually through the contracting officer or his recognized representative. Such communication by AMEDD personnel may be in violation of contract law.

◆ The following is a list of HEPA respirators and HEPA canister filters with National Stock Numbers available as part of the Paperless Ordering Placement System (POPS). This information should provide cost-effective equipment for personnel requiring respiratory protection for potential Hantavirus exposure.

*RESPIRATORS AND HEPA FILTERS AVAILABLE THROUGH THE PAPERLESS ORDER PLACEMENT SYSTEM (POPS)**

Disposable Respirators

NSN No. 4240-01-272-1876 (size Medium)
4240-01-272-1877 (size Large)
Model - 3M** 9970 High Efficiency Respirator
High Efficiency Pre-Filter for 3M 5000 and 6000 Series Respirators

NSN No. 4240-01-320-1954
Model - 2040 HEPA prefilter (may require purchase with the following Prefilter Adaptor)

NSN No. 4240-01-320-1956
Model - 502 Prefilter Adaptor
High Efficiency Filters for MSA+ Comfo II, Ultra Twin, and Belt Mounted Respirators
(note: combination HEPA and specific contaminant cartridges are also available. Consult manufacturer for specific NSN numbers).

NSN No. 4240-01-230-6894
Model MSA Type H HEPA filter cartridge

Reusable Respirators

(note: Combination HEPA and specific contaminant cartridges are also available. Consult manufacturer for specific NSN numbers).

NSN No. 4240-01-342-5237 (size Small)
Model - 6140 3M HEPA Respirator (6000 Series)

NSN No. 4240-01-342-5238 (size Medium)
Model - 6240 3M HEPA Respirator (6000 Series)

NSN No. 4240-01-342-2855 (size Large)
Model - 6340 3M HEPA Respirator (6000 Series)

High Efficiency Pre-Filters for 3M 7000 Series Respirators

NSN No. 4240-01-320-1954
Model - 2040 HEPA Prefilter (may require purchase with one of the following Prefilter holders)

NSN No. 4340-01-320-1958
Model - 9286 Half Mask Holder

NSN No. 4240-01-320-1955
Model - 9891 Full Facepiece Holder

NSN No. 4240-01-246-5411
Model - 7255 High Efficiency Filter (may require purchase with the following retainer)

NSN No. 4240-01-231-7718
Model - 7288 High Efficiency Filter Retainer

Powered Air Purifying Respirator (PAPR)

NSN No. 4240-01-301-4364
Model - 3M PES6 Whitecap PAPR 7800S (L)

Filters for PAPRs

NSN No. 4240-01-301-4379
Model - 3M High Efficiency Filter for 3M Whitecap W-3200 PAPR

NSN No. 4240-01-310-8874
Model - Racal P3 High Efficiency Filter for Breath Easy PAPR

**3M is a registered trademark of the Minnesota Mining and Manufacturing Company, Inc., St. Paul, Minnesota.

+ MSA is a registered trademark of Mine Safety Appliance Company, Pittsburgh, Pennsylvania.

◆ Readers are advised to consult personnel knowledgeable in respirator selection and use. Respirators already in use may require only a HEPA prefilter but proper selection is necessary to ensure component compatibility. Complete respirator assemblies with HEPA prefilters and associated canisters/cartridges also require proper selection. In either case, proper selection of HEPA prefilters, canisters or cartridges and complete assemblies must be made to ensure proper worker protection and adherence to respirator certification and approval. Not all POPS participants (manufacturers) and products are listed due to the variety of use situations and the number of manufacturers and products available. Interested parties are advised to contact manufacturers for assistance prior to ordering.