Laboratory Testing of Hantavirus, Including Andes Virus

FAQ For Clinical Laboratories: Developed Jointly by ASM and APHL

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Initial Publication: May 26th, 2026
Update Date: N/A

Please note that this document was written in May 2026, and the information included encompasses the available information at the time of writing. This is an evolving situation, and test availability, requirements and algorithms are subject to change. Contact your local public health authorities and consult the U.S. Centers for Disease Control and Prevention (CDC) website for the most up-to-date information or with questions.

1. What is hantavirus?

Hantaviruses are a group of global zoonotic, single-stranded, tri-segmented negative-sense RNA viruses within the *Orthohantavirus* genus (1). They are generally divided into 2 groups, New World and Old World hantaviruses, based on geographic distribution.

Sin Nombre virus, a New World hantavirus, is endemic in the United States. Andes virus, also a New World hantavirus, is found in South America. Andes virus is the species associated with the May 2026 multinational outbreak on a cruise ship (2). Old World hantaviruses, which include Seoul, Hantaan, Dobrava, and Puumala, are endemic to Asia and Europe. Hantavirus is rare in the United States and usually found west of Mississippi. According to the CDC, from 1993-2023 less than 900 cases have been reported since surveillance started (3).

Hantaviruses cause 2 distinct clinical syndromes in humans: 1) hantavirus pulmonary syndrome [HPS, alternatively called hantavirus cardiopulmonary syndrome (HCPS)] caused by Andes virus and Sin Nombre virus (4, 5) and 2) hemorrhagic fever with renal syndrome (HFRS), associated with Old World hantaviruses Seoul virus, Hantaan virus and Puumala virus (6).

2. How is hantavirus transmitted?

Transmission of hantavirus typically occurs through inhalation of aerosolized rodent excreta or nesting materials infected with hantavirus. Individuals are at risk if they are exposed to rodents or perform cleaning of areas where rodents have resided and hantavirus is endemic (7).

While rare, Andes is the only species of hantavirus that has been documented to spread from person-to-person through prolonged close contact with an infected person via exposure to infected respiratory droplets and body fluids (8).

3. What other pathogens should be considered?

Other pathogens and infectious diseases that should be considered when evaluating for New World hantavirus infection include respiratory viral infections (e.g., influenza or COVID-19), dengue virus, leptospirosis, severe bacterial pneumonia, Q-fever, typhoid fever and meningococcal septicemia (5, 9). The infectious differential for patients with HFRS can vary greatly depending on geographic exposure history but may include dengue fever, leptospirosis, Crimean-Congo hemorrhagic fever, rickettsiosis and others (10, 11).

4. What are associated clinical laboratory findings?

Hantavirus Pulmonary Syndrome

HPS is characterized by thrombocytopenia even early in disease presentation (12). Other frequent laboratory findings include hemoconcentration and circulating immunoblasts and immature myeloid cells (13). Leukocyte counts are often increased but may be normal or depressed. Studies of HPS caused by Sin Nombre virus in the southwestern U.S. have identified peripheral blood findings that are highly indicative of hantavirus infections in suspected cases, specifically when at least 4 of 5 criteria are met: thrombocytopenia, hemoconcentration, granulocytic left shift, absence of toxic changes and >10% immunoblasts (12, 14).

In studies of Andes virus infections, disease is associated with thrombocytopenia and leukocytosis in conjunction with lymphopenia, neutrophilia and immunoblasts. Serum aspartate aminotransferase (AST), alanine aminotransferase (ALT) and lactate dehydrogenase concentrations are frequently elevated. In fewer cases, prothrombin time (PT) and activated thromboplastin time (aPTT) are prolonged and mild renal insufficiency is evident by elevated serum creatinine levels (15-17).

Hemorrhagic Fever with Renal Syndrome

Thrombocytopenia and leukocytosis are typical in the hypotensive stage (18, 19). During the oliguric phase, hematuria, proteinuria and pyuria are often evident on urinalysis (18). Hyponatremia, hyperkalemia, hyperphosphatemia and elevated blood urea nitrogen and creatinine concentrations can be detected as a result of diminished renal function (18, 19).

At the time of presentation, elevated liver enzymes, including ALT and AST, in addition to increased C-reactive protein, erythrocyte sedimentation rate and procalcitonin levels are frequently seen (19, 20).

A smaller proportion of patients with HFRS manifest prolonged PT or aPTT (20). In the less common occurrence of pancreatitis with HFRS, elevated serum amylase and lipase have been reported (19).

5. What diagnostic testing should be ordered?

Because patients with hantavirus infection present with nonspecific symptoms, a laboratory blood test is necessary to confirm the diagnosis. Clinicians and laboratories should conduct a thorough review of the patient's history, with particular attention to possible rodent exposure, and may consult the CDC's Viral Special Pathogens Branch for patient specific advice and guidance regarding testing (5). Of note, there are no FDA- cleared or approved hantavirus tests available in the U.S.

All patients being tested for hantavirus should receive serology testing at a minimum. IgM and IgG antibody testing for the diagnosis of hantavirus infection is available from the CDC, several public health laboratories and a few commercial laboratories (5, 21, 22). In the U.S., available serology tests are usually developed and validated to detect antibodies against Sin Nombre virus or New World hantaviruses. Cross-reactivity between antibodies against New World hantaviruses is common, and many assays may also detect Old World hantaviruses, but validation for the detection of these species varies. The identification of hantavirus-specific IgM or a fourfold (or greater) rise in IgG titers between acute and convalescent samples, together with compatible clinical features, meets the case definition for a confirmed case of hantavirus infection (23). IgM can remain positive for several weeks to months post-infection and IgG can persist for years after exposure (11).

Molecular testing has demonstrated utility at detecting disease earlier in infection (24). The viral load in blood may be low or undetectable around 7–10 days after initial symptoms (25), though in some cases RNA may be detected up to several weeks post-symptom onset (11). Detecting hantavirus RNA in a patient's blood during the acute phase of illness also provides laboratory evidence for the definition of a confirmed case (23). However, PCR testing in the U.S. is currently limited to several laboratories and may not be designed to detect both Sin Nombre and Andes viruses. Work with your local or state health department to determine PCR testing availability.

Hantavirus antibodies and viral RNA may be undetectable during the first 72 hours of infection (7). Therefore, in patients with strong clinical suspicion and negative test results from specimens collected early in infection, repeat testing is recommended (7). This reflects the natural course of infection, including the incubation period, the delay before IgM (peaking shortly after the febrile phase) and IgG (peaking near the convalescent phase) reach detectable concentrations, and fluctuations in viral load, which is highest in the febrile phase (18).

Immunohistochemistry of tissues can also be used to detect hantavirus antigens, which can particularly be useful in post-mortem examinations of fatal cases (26). Prior studies have demonstrated that immunohistochemistry staining for the nucleocapsid proteins from a variety of tissues from infected humans and mice, including cardiac, pulmonary and renal endothelial tissues (27, 28).

6. Are there different testing recommendations for Andes virus?

Andes virus (*Orthohantavirus andesense,* also known as Andes hantavirus), is one of several hantavirus species. Owing to the broad antigenic cross-reactivity among New World hantaviruses (29), no additional serologic testing recommendations are necessary to detect Andes virus antibodies if using a hantavirus assay offered through public health laboratories in the U.S. Most commercial laboratory hantavirus serology tests are also expected to detect Andes virus. If not clearly stated in the laboratory's test directory or supplemental materials (e.g., test FAQ, test limitations, test performance descriptions) consider consulting the performing laboratory for additional test information. There is currently no Andes virus-specific serologic test available for patient testing in the U.S.

The inclusivity of individual molecular tests may vary. If Andes virus is suspected, submitting laboratories should contact the performing laboratory to determine if the offered hantavirus molecular test is validated to detect Andes virus. Notably, Nebraska Public Health Laboratory may perform CLIA-validated Andes virus-specific RT-PCR assay for approved cases (30).

7. Is hantavirus testing recommended for individuals who were potentially exposed to hantavirus but are asymptomatic?

Testing is generally not recommended in asymptomatic individuals and may lead to false positive results (9). Currently, the CDC recommends testing be reserved for those with symptoms compatible with hantavirus infection and history of rodent/animal exposure or close contact with a confirmed case (31).

8. What is the approval process for sending samples to public health laboratories?

Laboratories should follow guidance from their local or state public health department regarding the process for specimen submission. Communicating with the appropriate point of contact will ensure the necessary jurisdictional coordination as well as dissemination of information required for approval of testing by CDC occur (21).

9. What are the safety considerations for laboratories processing samples that may contain hantavirus?

If performing clinical laboratory testing on specimens from patients who are suspected of having Andes virus, a site-specific risk assessment should be performed. According to Biosafety in Microbiological and Biomedical Laboratories guidance, serum or blood can be handled in a BSL-2 laboratory using BSL-2 practices, containment equipment and procedures. A biosafety cabinet should be used for handling body fluids whenever there is risk for generation of aerosol or splatter (32). Handling of tissue specimens should be done in a BSL-2 facility following BSL-3 practices and procedures or in a BSL-3 laboratory. Autopsy of suspected cases may be performed using universal precautions with protection of mucous membranes and use of at least an N-95 respirator (33, 34).

A full risk assessment should be completed by each individual laboratory before performing hantavirus testing. For Andes virus, BSL-3 practices should be considered, including using a biosafety cabinet and respiratory protection, whenever there is a possibility of generating aerosols.

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