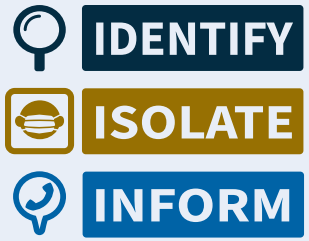
PPE Matrix for High-Consequence Infectious Diseases

Introduction

High-Consequence Infectious Diseases (HCIDs) are acute, severe infections with high illness and death rates, and few or limited treatment or preventive options. All of these special pathogens are contagious person-to-person and have the potential to spread in communities and healthcare settings.

Due to the significant risks these diseases may pose to healthcare workers, they may require strict isolation, complex personal protective equipment, and special handling for waste and/or laboratory specimens.

The Identify-Isolate-Inform Model



- **Identify**: Screen patients at all points of entry for the presence of symptoms and travel/exposure risks.
- **Remember that patients may present at any point in their illness.**
  - Most HCIDs begin with non-specific, influenza-like symptoms, including fever, headache, and body aches.
  - Viral Hemorrhagic Fever illness symptoms may also include nausea, vomiting, and diarrhea.
  - Novel Respiratory Pathogens presenting symptoms may also include cough, shortness of breath, and sore throat.
  - Pediatric patients may present only with fever.

- **Isolate**: Promptly isolate potential HCID patients and use appropriate PPE. Initial screening to Identify HCID patients should be followed by a history and physical exam to determine if a patient meets epidemiological risks for exposure.

- **Inform**: Contact Infection Prevention and your internal and external partners for guidance. Your hospital epidemiologist, Infection Prevention department, local or state public health authorities, and the CDC can help determine a suspect case.

Learn more about PPE pieces and ensembles used in the care of patients with suspected or confirmed HCIDs in the NETEC resource "Know Your PPE"

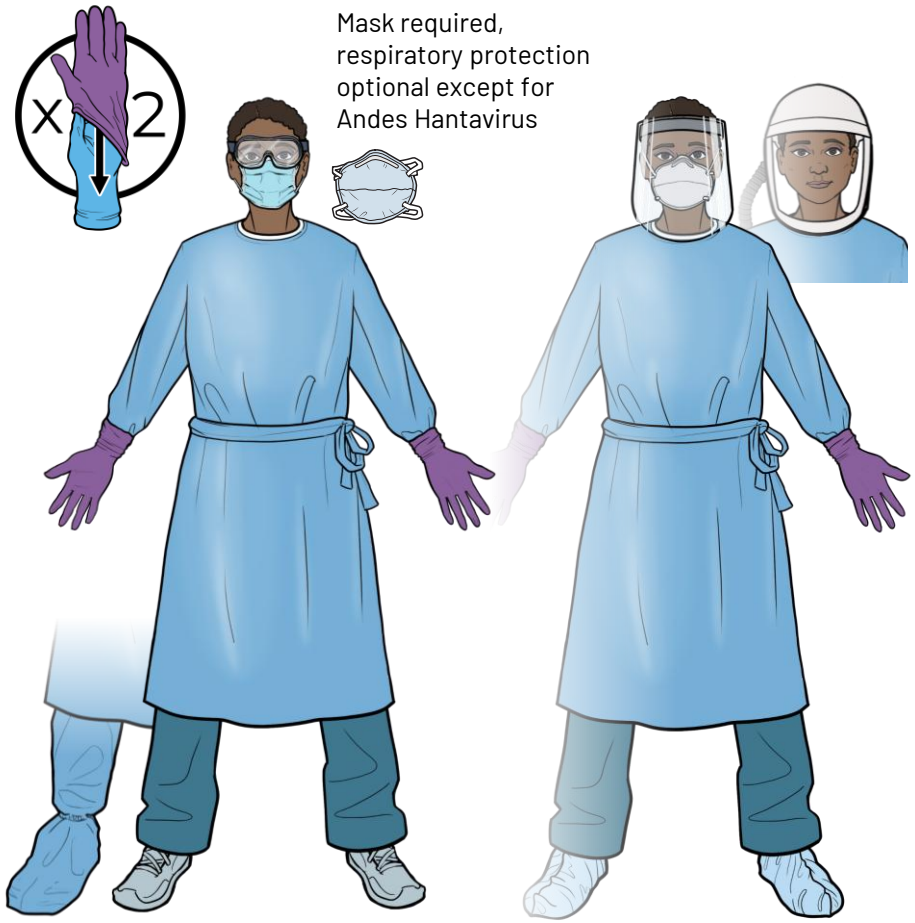
PPE selection should be based upon:

- ✓ Known or suspected pathogen
- ✓ Transmission pathways, when known
- ✓ Patient condition
- ✓ Facility and role risk assessment

Protection levels should start high and scale back when allowable.

DRY AND SUSPECT Viral Hemorrhagic Fever (VHF)

Dry/Suspect/Stable PPE:
For a suspect case with stable vital signs and NO vomiting or diarrhea.



Boot (shoe) covers optional

WET OR CONFIRMED Viral Hemorrhagic Fever (VHF)

Wet/Confirmed/Unstable PPE:
For a suspect case with unstable vitals or vomiting or diarrhea, and ALL confirmed patients.

Pathogen & Illness	1. Symptoms listed are <u>in addition to</u> fever, headache, nausea, vomiting, and diarrhea 2. Epidemiological Risks listed are <u>in addition to</u> ill contacts
Ebola Virus Disease (EVD) 4 species cause disease in humans: EBOV (Zaire), SUDV (Sudan), BDBV (Bundibugyo), TAFV (Tai Forest) **Incubation period:** 2–21 days	1. Myalgia, hiccups 2. Travel to central or sub-Saharan Africa; exposure to bats, bushmeat, funeral care *Vaccine currently available for EBOV only
Marburg Virus Disease (MVD) **Incubation period:** 2–21 days	1. Altered mental status, rash 2. Travel to central or sub-Saharan Africa; exposure to caves, fruit bats, funeral care
Lassa fever **Incubation period:** 2–21 days	1. Sore throat, facial swelling without peripheral edema 2. Travel to West Africa and endemic in Nigeria, Sierra Leone, Liberia, and Guinea; exposure to rodents, rodent droppings, cleaning, farms, food stores
Crimean-Congo Hemorrhagic Fever (CCHF) **Incubation period:** 1–14 days	1. Sudden onset of fever, joint pain, photophobia, petechial rash 2. Travel to Europe, Mediterranean, Middle East, Africa, India, China; exposure to ticks, livestock, farms, slaughterhouses
South American Hemorrhagic Fevers (SAHF) **Incubation periods**: Junin (6–14 days), Sabia (6–21 days), Machupo (3–16 days), Guanarito (3–19 days)	1. Malaise 2. Travel to South America; exposure to rodents, rodent droppings, cleaning, farms, food stores
Andes Hantavirus (ANDV) is currently the only Hantavirus with known PTP spread **Incubation period:** 9–42 days	1. Rapid progression to high fever, respiratory distress 2. Travel to South America, especially Argentina, Chile; exposure to rodents, rodent droppings **PPE: Dry VHF PPE with respiratory protection (N95 or higher) sufficient for Suspect and Confirmed patients.** **Waste: Not currently Category A waste**
Nipah virus (NiV) **Incubation period:** 5–14 days	1. May rapidly progress to respiratory distress or encephalitis 2. Travel to Asia, Bangladesh, India, Malaysia; exposure to fruit bats, pigs, date palm sap, or juice
Hendra virus (HeV) **Incubation period:** 9–16 days	1. Sore throat, cough 2. Extremely rare. Travel to Australia; exposure to flying fox (bats), horses
Langya (LayV) **Incubation period**: 2 days–2 months, very limited data	1. Anorexia 2. Extremely rare. Travel to China; exposure to animal market, shrews **Waste: Not currently Category A waste**
Severe Fever with Thrombocytopenia Syndrome (SFTS) **Incubation period**: 5–14 days	1. Altered mental status, low platelets/WBCs 2. Travel to China, Japan, South Korea; exposure to ticks, farms, rural areas, animal bites **Waste: Not currently Category A waste**

<u>Transmission Risks:</u>
Body fluid exposure, either direct or indirect, as from contaminated materials, fomites, splashes and sprays.
Risk of infectious aerosols when in wet phase and with Andes Hantavirus. Strict isolation, AIIR when available.

<u>PPE Recommendations</u>:

- Dry, Suspect, and Stable = Fluid-resistant gown, mask, eye protection, shoe covers (optional), double gloves (extended cuff outer glove), Respiratory protection for Andes Hantavirus.
- Wet, Confirmed, or Unstable = Total body coverage with fluid-impervious outer layer, respiratory protection, and double gloves (extended cuff outer glove).

<u>Precautions:</u>
Unless otherwise noted, all waste is Category A waste. For lab, many are Select Agents.

Pathogen & Illness	1. **Symptoms listed are <u>in addition to</u> fever, headache, cough** 2. **Epidemiological Risks listed are <u>in addition to</u> ill contacts**
Middle East respiratory syndrome coronavirus (MERS-CoV) Incubation period: 2–14 days	1. Shortness of breath (SOB), myalgia, vomiting, diarrhea 2. Travel to the Arabian Peninsula; exposure to camels, camel milk, camel meat
Severe acute respiratory syndrome associated coronavirus (SARS-CoV-1) SARS Incubation period: 2–7 days	1. SOB, myalgia, vomiting 2. Travel to Asia; exposure to unknown host species, possibly bat, civet cat
Influenzas (highly pathogenic) Incubation period: 2–7 days (HPAI)	1. Sore throat, conjunctivitis, SOB 2. Avian influenza risk with contact with ill animals, birds, dairy cattle
Pneumonic plague (Yersinia pestis) Incubation period: 1–6 days	1. Bloody or frothy sputum, rapid progression to pneumonia 2. Global potential; rural areas of the western US (New Mexico, Arizona, Colorado, California, Oregon, Nevada); exposure to rodents, including prairie dogs, fleas

NRP
Novel Respiratory Pathogen

Novel Respiratory Pathogen PPE:
For any suspect case and confirmed cases.

<u>Transmission Risks:</u>
Droplet and aerosol
Airborne Infection Isolation Room (AIIR) when available, especially with any intensive aerosol-generating procedures.

<u>PPE Recommendations</u>:
Respirator, eye protection, gown, and gloves.

<u>Precautions:</u>
Laboratory and waste considerations for Novel Respiratory Pathogens: *Yersinia pestis* is a Category A Select Agent. Other novel respiratory pathogens may have a Select Agent designation or be classified as Category A waste if they are in culture form or can be propagated. Consult with the Federal Select Agent Program.

Waste: All other patient care waste from Novel Respiratory Pathogens patients may be handled in accordance with facility protocols and does not require special handling or disposal.