JUNE 2023

EMS INFECTIOUS DISEASE PLAYBOOK

VERSION 2.0

DEPARTMENT OF HEALTH & HUMAN SERVICES · USA

ASPR
ADMINISTRATION FOR STRATEGIC PREPAREDNESS AND RESPONSE

TRACIE
HEALTHCARE EMERGENCY PREPAREDNESS INFORMATION GATEWAY

This document was created in 2017 using official or best practice information taken from multiple organizations that was vetted and assembled by subject matter experts working for the Technical Resources, Assistance Center, and Information Exchange (TRACIE) at the request of the U.S. Department of Health and Human Services (HHS) Administration for Strategic Preparedness and Response (ASPR). The aim was not to develop novel guidance for emergency medical services (EMS) agencies, but to unify multiple sources of information in a single, concise planning document addressing the full spectrum of infectious agents for EMS agencies developing their service policies. This document does not represent official policy of HHS ASPR or other federal or private agencies.

The information contained in this playbook is intended as a planning resource and should be incorporated into agency standard operating procedures and reviewed by the EMS medical director. EMS agencies should review the playbook and understand that while the core principle is preventing exposure to potentially infectious body fluids, there are multiple types of personal protective ensembles that may be appropriate based on the biological threat. Donning and doffing procedures are dependent on the personal protective equipment (PPE) ensemble selected. Appropriate education and training are critical to the success of infection prevention and control protocols. The authors, ASPR TRACIE, and HHS ASPR do not take responsibility or bear liability for any clinical care outcomes, provider injury/illness, or inaccuracies in or resulting from this document. The playbook was revised in 2023 (with links updated in 2024) and all recommendations were current at the time of publication and vetted to the best of our ability.

Inclusion of specific references and resources is offered as an acknowledgement of their contribution of material and for additional information for EMS planners but does not constitute endorsement or vouch for accuracy or applicability of the referenced documents.

Contents

Dispatch/Responder Actions

GENERAL PRINCIPLES – CALL TAKING/DISPATCH

- Safe response by EMS requires an integrated approach, including: appropriate information from the caller and dispatcher; appropriate protocols for response, clinical care, application of administrative and environmental controls and use of PPE by EMS responders; and transport to a health care facility that can provide effective evaluation and treatment of the suspected condition.
- Ideally, 911 call takers/emergency medical dispatchers will identify patients with a potentially infectious disease through integrated routine screening questions and relay that information to emergency responders prior to their arrival on the scene.
- During the caller interrogation, if information about communicable diseases is offered, call takers ensure the information is documented and relayed to responders in accordance with established policies/protocols on how to share patient-related information.
- Screening for suspected high consequence infectious diseases (HCID) often involves questioning the caller/patient about recent international travel and presenting signs and symptoms. The timeframe for these conditions varies (e.g., 14 days for Middle East Respiratory Syndrome [MERS], 21 days for Ebola Virus Disease [EVD]). The playbook uses 21 days in the general screen for consistency since this timeframe is inclusive of the HCIDs but can be adjusted as required if screening for specific pathogens.
- Local screening questions may be needed during outbreaks and can be inserted into the dispatch algorithm and keyed to the appropriate precautions. EMS agencies should consult with local and state public health and EMS authorities to identify required modifications to processes and protocols to ensure consistency with Centers for Disease Control and Prevention (CDC) guidance.
- If persons under investigation for a HCID are known to public health, it may be beneficial for public safety to enter a temporary note on their address in the computer-aided dispatch (CAD) system to alert 911 responders to the potential for illness/exposure. This is a local decision dependent on the systems and policies in the community and the note should be removed once the infectious period has passed.
- Fever may be a helpful contributing sign or symptom but should not be used to exclude the presence of communicable disease as it is not universally present.

Dispatch/Responder Actions

GENERAL PRINCIPLES – RESPONSE

- Regardless of dispatch information, EMS responders should be vigilant for travel history and signs and symptoms of communicable disease (e.g., fever, cough, gastrointestinal [GI] symptoms, unusual rash). Standard precautions should always be used with the addition of appropriate transmission-based precautions whenever history or exam findings warrant.
- EMS responders should implement strict standard and transmission-based precautions based on the patient's clinical information to avoid exposure to potentially infectious bodily fluids, droplets, and airborne particles.
- Responders should avoid direct contact with a patient who may have a communicable disease until they are wearing appropriate PPE.
- Maintaining distance from the patient and increasing fresh air circulation can reduce respiratory transmission. Maintaining a distance of at least six feet is generally recommended unless specific PPE is worn.[1]
- Responders should understand and practice with PPE so they can efficiently and safely don and doff the equipment without self-contamination.
- Patients, caregivers, and bystanders may find responders wearing high levels of PPE such as hoods, suits, and respirators alarming. Communicating with and calming anxious persons may be more challenging due to PPE. Responders should be mindful of this and be prepared to provide reassurance and to address public distress and fear. Hand gestures and other non-verbal actions may help with reassurance as it may be difficult for others to hear responders.
- Limit the number of EMS responders in direct contact with a potentially infectious patient to the minimum required to perform tasks safely.

[1] The maximum distance for droplet transmission is unresolved and many illnesses are not strictly droplet or aerosol transmitted but involve both. The recommendation to maintain a distance of 6 feet or more is used throughout this document to be uniform. The CDC review https://www.cdc.gov/infection-control/hcp/isolation-precautions/scientific-review.html provides additional details.

Dispatch/Responder Actions

- EMS must be able to implement effective infection control practices for responder safety while avoiding excessive delays in care. Training and practice should allow EMS responders to provide lifesaving medical care without waiting for a specialized response team.
- Specialized transport should be reserved for stable patients with a suspected HCID (e.g., EVD, Marburg Virus Disease [MVD], Smallpox) or for inter-facility transport of those patients with a suspected or confirmed HCID. Communities may also have dedicated medical transport services equipped to manage HCID patients built into their regional transportation plans for planned patient movements.
- Hand hygiene (e.g., handwashing with non-antimicrobial soap and water, alcohol-based hand rub [ABHR], or antiseptic handwash) is one of the best ways to remove pathogens, avoid getting sick, and prevent the spread of pathogens to others. (Note that ABHRs do not protect against spores such as Clostridium difficile [C. difficile] and efficacy for norovirus is incomplete and depends on formulation.)
- Placing a surgical mask[2] on the patient (for source control) helps to contain infectious respiratory droplets and is recommended if tolerated. Patients unable to tolerate a mask should: cover their nose and mouth when coughing or sneezing; use tissues to contain respiratory secretions (and, after use, dispose them in the nearest waste receptacle); and perform hand hygiene after having contact with respiratory secretions and contaminated objects or materials.
- Influenza and other diseases can transmit via the ocular surfaces as well as other mucous membranes. Responders should use PPE to protect the mucous membranes of the eyes, nose, and mouth during procedures and patient care activities that are likely to generate splashes or sprays of blood, body fluids, secretions, and excretions. Select masks, goggles, face shields, and combinations of each according to the need anticipated by the task performed.

[2] The term surgical mask is used for simplicity and includes additional masks that are medical grade, flexible fabric, half-face mask with multiple layers and water-resistant surface suitable for standard or droplet precautions. When used for source control (as in this example) the material does not need to be water-resistant.

Dispatch/Responder Actions

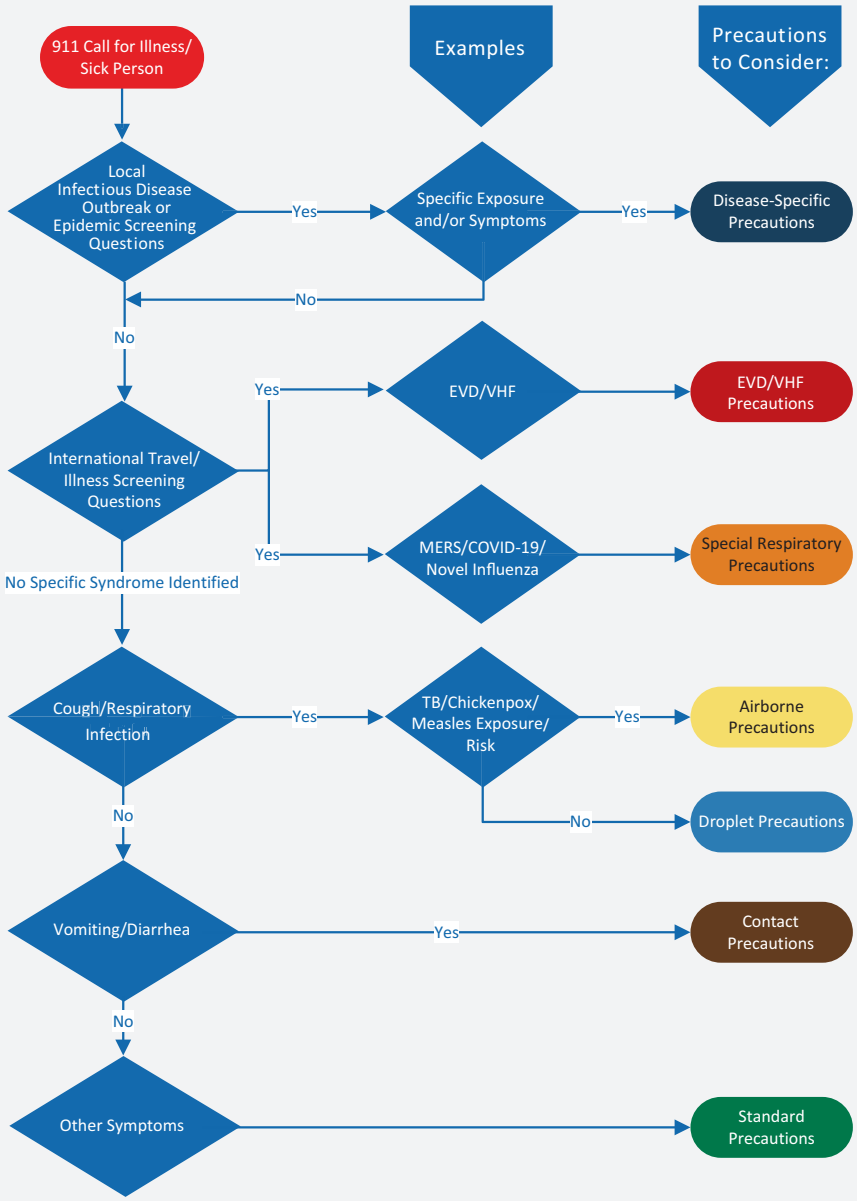
- Infection control practices can evolve with novel and emerging pathogens or during infectious disease outbreaks or epidemics. The EMS agency must be aware of how these changes may affect employees and adjust policies and practice accordingly.[3]
- EMS agencies should practice their response to a patient with a suspected or confirmed HCID with health care facilities and state, local, tribal, and territorial public health entities.

[3] The CDC maintains a web page with information on current outbreaks at https://www.cdc.gov/outbreaks/.

Dispatch/Responder Actions

DISPATCH SCREENING ALGORITHM*

*Dispatch screening is designed to suggest the highest potential level of precautions that may be required. On-scene evaluation is required to adjust precautions according to history and exam. Transmission based precautions are always accompanied by standard precautions.



Dispatch/Responder Actions

NOTES ON THE DISPATCH SCREENING ALGORITHM:

- EMS agencies should have an individual designated to be the point of contact for public health and to monitor available resources (e.g., CDC website, health alerts) for outbreaks of concern and communicate to all crews relevant information about potential cases, signs, and symptoms.
- Basic travel and symptom screening offers guidance on a level of transmission-based precautions for responders. Additional evaluation is required on-scene to determine the appropriate transmission-based precautions, which may affect the PPE needed (either increased or decreased) for the responder.
- If a medically trained dispatcher is not available, these screening questions may still be used. Best practice would incorporate these questions into the emergency medical dispatch algorithm. The responding personnel may also be able to establish contact with the patient/ caller via a callback number to gather additional information. EMS systems should tailor these functions and adopt processes appropriate for their structure and staffing.
- Because many respiratory diseases generate both droplet nuclei and airborne particulates and because EMS will not usually know the specific pathogen, EMS services may opt to use respirators rather than surgical masks for illnesses in situations of uncertainty.
- Responders should be aware of infectious disease outbreaks or epidemics in their community and, based on a "doorway evaluation," be prepared to rapidly adopt appropriate infection control precautions in accordance with established public health guidelines.

ADDITIONAL DISPATCH CONSIDERATIONS

The following information may be used to update/modify dispatch reference cards:

- Call taker obtains location (and phone number) and patient status information (e.g., age, consciousness, whether breathing normally).
  - » Implement dispatch life support to include giving the caller instructions to help treat the patient until the responding EMS unit arrives per service protocols.

Dispatch/Responder Actions

  - » Consider modifying the response to "ambulance only" for calls involving patients with a suspected HCID (EVD/viral hemorrhagic fever [VHF] or Special Respiratory Precautions) based on travel or exposure history (i.e., cancel first responder unless unconscious, difficulty breathing, or other immediate life threat).

- Subsequent "chief complaint" information regarding type/severity of medical emergency:
  - » Chief complaint – If illness-related 911 call, additional screening questions include:
    - – Priority symptoms – severe bloody vomiting or diarrhea (e.g., large amounts of GI blood loss), decreased level of consciousness, respiratory difficulty, chest pain.
    - – Pertinent medical history - any known illness or exposures to Methicillin-resistant Staphylococcus aureus (MRSA), tuberculosis (TB), C. difficile, COVID-19, norovirus, etc.
    - – Pertinent travel history - any international travel within the previous 21 days.
- For the following specific chief complaints, the call taker should ask **additional questions** and provide emergency medical dispatch instructions as indicated:
  - » Breathing problems
  - » Cardiac/respiratory arrest
  - » Chest pain
  - » Convulsions/seizure
  - » Headache
  - » Hemorrhage (non-traumatic)
  - » Sick person
  - » Unconscious/fainting (or near)
  - » Unknown problem (person down)

Dispatch/Responder Actions

- **Additional questions:**
  - Is there anyone else on-scene who is also sick?
  - Are there any known exposures to a diagnosed disease?
  - In the last two days any:
    - Fever or chills?
    - Severe cough?
    - Vomiting or diarrhea?
    - Active bleeding?

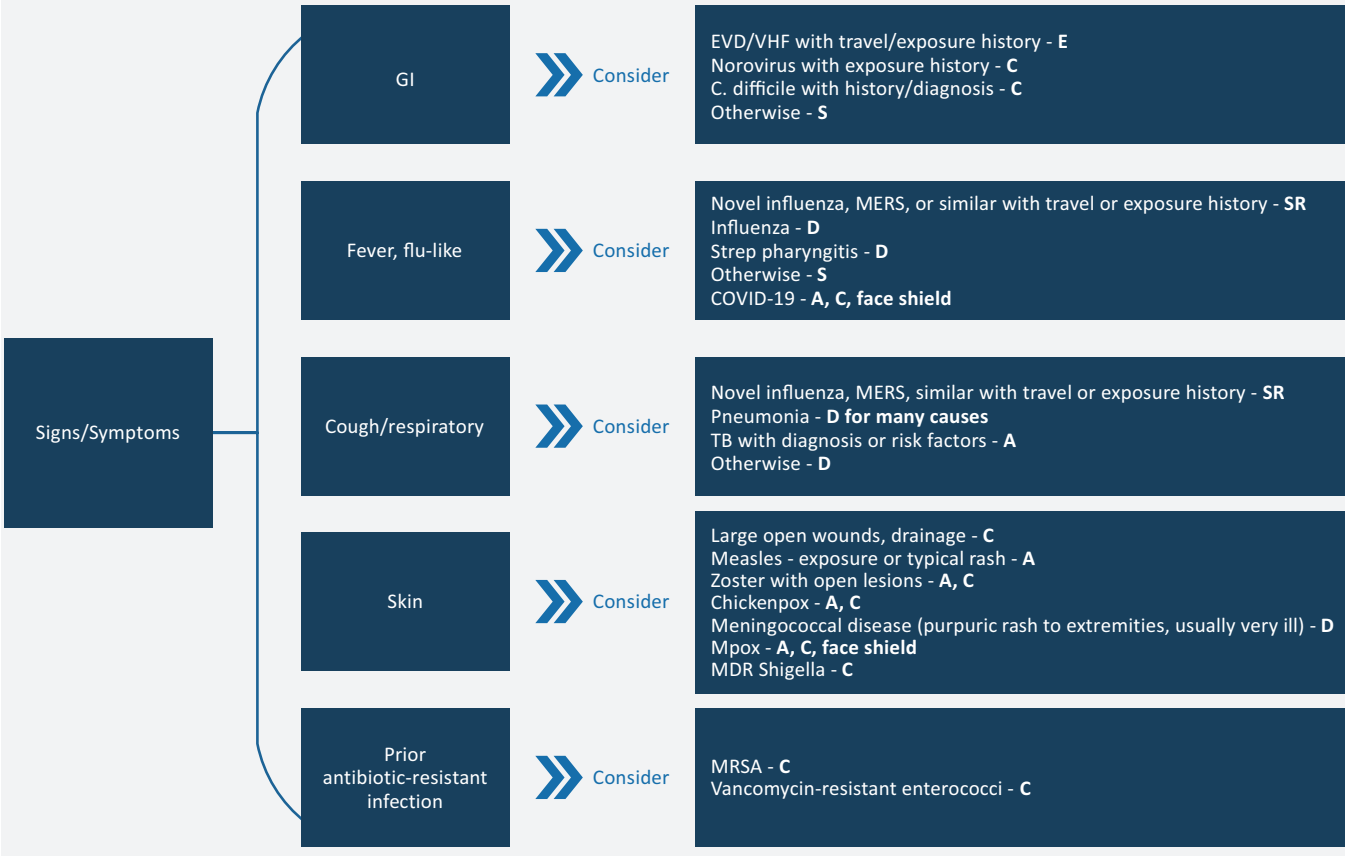
For any positive questions, the emergency medical dispatcher will alert first responders and EMS providers being dispatched of potential for a patient with a communicable disease and to implement infection control measures as indicated. This designation is preliminary and responders may be able to adjust precautions based on further information from the patient/ family. If language barriers prevent questions, the dispatcher should advise the crew that they cannot rule out an infectious patient.

Implement emerging infectious disease surveillance tool[4] whenever a novel or dangerous disease is endemic in specific areas.

[4] Example: Emerging Infectious Disease Surveillance Tools (COVID-19)

Dispatch/Responder Actions

ON-SCENE ASSESSMENT ALGORITHM



Type of Precautions
(Transmission-based precautions are always accompanied by standard precautions.)

S Standard | **C** Contact | **D** Droplet | **A** Airborne | **SR** Special Respiratory | **E** EVD-VHF

Dispatch/Responder Actions

FIRST RESPONDERS AND EMS RESPONDERS

- Responders should:
  - Have access to and monitor radio or CAD for alerts regarding potential risks.
  - Ask dispatch/the communications center for additional information if needed.
  - Identify patients who may be infected with a communicable disease by verbal screening, noting symptoms, and recognizing potential hazards.
  - Upon recognizing a patient with a suspected communicable disease, notify dispatch/ the communications center to ensure the enroute ambulance responders are prepared to implement appropriate infection prevention and control measures.
  - Apply PPE appropriate for the patient's condition prior to making direct patient contact.
  - For patients with respiratory illnesses, attempt to conduct the interview at least 6 feet away from the patient as this may provide some protection.
  - Ask any patient with respiratory symptoms to wear a surgical mask if they can tolerate it.
  - Limit the number of EMS responders making patient contact to the minimum required to perform tasks safely. Consider the strategy of one responder putting on PPE and managing the patient while the other responder does not engage in direct patient care but instead provides the "doorway evaluation" and communications/ charting. The second responder should be prepared to quickly don the appropriate PPE should the first responder require assistance.
  - Avoid unnecessary direct contact with the patient.

Dispatch/Responder Actions

- Use caution when approaching a disoriented or delirious patient as erratic behavior (e.g., flailing or staggering) can place EMS responders at additional risk of exposure.
- Keep nonessential equipment away from the patient or patient's environment to minimize contamination on the scene and in the ambulance.
- If patient has nausea or vomiting, treat symptoms per protocols, provide emesis bag, and contain any emesis.
- For profuse diarrhea, consider asking the patient to wear an absorbing undergarment and/or wrapping the patient in an impermeable sheet to reduce contamination of other surfaces.[6]
- Choose a receiving facility appropriate for the suspected disease (based on regional HCID plans as appropriate) and alert them about the patient, suspected condition, current symptoms, and estimated time of arrival (ETA) as early as possible.
- Contact medical control with questions or for additional guidance.

For geographically associated HCIDs (e.g., VHF), the public health or EMS medical authority may request responders ask additional screening questions about:

1. Travel history and/or direct exposure to potential case within the number of days of the incubation period for the illness of interest.
2. Specific signs and symptoms of illness.

Responders should contact the EMS or public health authority for guidance about family members or close patient contacts who may be at the scene.

[6] NETEC offers a training video on the use of a containment wrap in a special pathogen isolation area.

Dispatch/Responder Actions

GENERAL PPE CONSIDERATIONS

The following is a list of PPE referred to throughout this document. This is a suggested list only. Quantities and exact PPE stocked are dependent on ambulance service protocols and transport volumes/patient population. Modifications may be necessary for specialized transport units or during specific epidemics/pandemics.

- Disposable exam gloves – standard gloves for standard precautions.
- Disposable exam gloves – with elongated cuffs for use with barrier gowns/coveralls.
- Reusable goggles that can be cleaned OR face shield.
- Surgical masks for patients and responders.
- Disposable fluid-resistant gown OR disposable fluid-resistant coverall.
- Disposable National Institute for Occupational Safety and Health (NIOSH)-approved, fit-tested, disposable N95[7] or equivalent/higher level respirator (e.g., reusable half-face elastomeric respirator N95 or higher rating mask or powered air purifying respirator [PAPR] with full hood and high-efficiency particulate air [HEPA] filter).
- Disposable boot/shoe covers.

EVD/VHF Precautions – additional equipment required:

- Full face shield (plus consideration of a head cover).
- Respiratory protection options:
  - N95 respirator worn with impermeable hood that covers head and shoulders and full face shield.
  - PAPR with HEPA filtration and integrated impermeable drape-style hood.
- Boots (disposable or reusable).
- Fluid-resistant coverall – if service uses gowns for other contact exposures.
- OPTION: Disposable, impermeable apron in addition to fluid-resistant coverall for unstable or “wet” patients.

[7] Throughout this document, disposable N95 respirators should be NIOSH-approved and fit tested.

Dispatch/Responder Actions

RESOURCES

- CDC Current Outbreak List
- Containment Wrap in a Special Pathogen Isolation Area
- Emerging Infectious Disease Surveillance Tool (COVID-19)
- Interim Guidance for EMS Systems and 9-1-1 Answering Points
- Protocol 36: Pandemic/Epidemic/Outbreak
- Review of Scientific Data Regarding Transmission of Infectious Agents in Health care Settings

Standard Precautions

EXAMPLE DISEASES

Acquired immune deficiency syndrome (AIDS)/human immunodeficiency virus (HIV) • anthrax (cutaneous or pulmonary) • botulism • cellulitis • dengue • minor wound infections including abscess • nonspecific upper respiratory infections.

GOAL OF PRECAUTIONS

Apply standard practice to protect against contact with blood, body fluids, non-intact skin (including rashes), and mucous membranes for all patient encounters. Examples include routine use of hand hygiene and gloves and adding eye protection and mask when caring for patients with respiratory symptoms and during airway interventions, or gown for potential splash exposures.

DISPATCH ACTIONS

- Resource assignment: Usual assignment of first responders and appropriate basic life support (BLS)/advanced life support (ALS) response.
- Patient instructions: Usual pre-arrival instructions (e.g., turn on porch light, control animals, gather medications).
- Crew instructions: Advise responding crew of patient illness/symptoms.

Standard Precautions

ARRIVING EMS ACTIONS/CONSIDERATIONS

- Assess patient upon arrival from a distance of at least six feet if possible.
- Adjust infection prevention precautions as required.
- Perform hand hygiene before and after patient care activities.

PPE

- Gloves during patient contact for any potential exposure to infectious agents or bodily fluids.
- Goggles/face shield and surgical mask for any airway procedures (intubation, suctioning) or patient with active cough from apparent infectious source and to protect mucous membranes from splash/ liquid exposure.
- Impermeable gown for any situation likely to generate splash/ liquid exposures.
- Consider using a checklist or graphic to assist with proper donning and doffing.[8]
- PPE should be removed in an appropriate doffing area to prevent secondary contamination. Meticulous care should be taken to avoid self-contamination. PPE waste should be placed in a labeled leak-proof container.
- Potential exposures should be reported according to existing service protocols.

[8] Example: Sequence for Donning and Removing Personal Protective Equipment

Standard Precautions

PATIENT CARE CONSIDERATIONS

- Provide a surgical mask for all patients with acute infectious respiratory symptoms who can tolerate it.
- Provide tissues to patients for secretion control and encourage patient hand hygiene and cough etiquette practices.

TRANSPORT CONSIDERATIONS

- Standard transportation to appropriate health care facility.
- If the patient compartment is equipped with an exhaust fan, ensure that it is turned on.

AMBULANCE DECONTAMINATION

- Any visibly soiled surface must first be cleaned and decontaminated using an Environmental Protection Agency (EPA)-registered[9] disinfectant according to directions on the label.
- Disinfect all potentially contaminated/high touch surfaces including the stretcher with an EPA-registered disinfectant according to directions on the label.
- Medical equipment (e.g., stethoscope, blood pressure [BP] cuff) making patient contact should be disposable or cleaned and disinfected before use on another patient.

[9] Selected EPA-Registered Disinfectants is relevant to all mentions of EPA-registered disinfectants in this document.

Standard Precautions

RESOURCES

- Considerations for Selecting Protective Clothing used in Health care for Protection against Microorganisms in Blood and Body Fluids
- Guideline for Isolation Precautions 2007
- Selected EPA-Registered Disinfectants
- Sequence for Donning and Removing Personal Protective Equipment
- Standard Precautions for All Patient Care

Contact Precautions

EXAMPLE DISEASES

Excessive wound drainage • MRSA • Vancomycin-resistant enterococci (VRE) • C. difficile • norovirus* • other suspected infectious diarrhea • head lice/body lice/scabies • respiratory syncytial virus (RSV)*.

GOAL OF PRECAUTIONS

- Provide impermeable barriers to infectious agents that are either highly pathogenic, drug resistant, contagious, or persistent and that can easily be contracted or spread to other environments via fomites and surface contact.

DISPATCH ACTIONS

- Resource assignment: Usual assignment of first responders and appropriate BLS/ALS response.
- Patient instructions: Usual pre-arrival instructions (e.g., turn on porch light, control animals, gather medications).
- Crew instructions: Advise responding crew of patient illness/symptoms.

*Wear mask during vomiting/diarrhea if norovirus is suspected. Also wear mask if RSV is suspected.

Contact Precautions

ARRIVING EMS ACTIONS/CONSIDERATIONS

- Be aware of any community-based outbreaks of norovirus, RSV, or other epidemic disease requiring contact precautions and obtain relevant history as indicated.
- Assess patient upon arrival from a distance of at least six feet if possible.
  - » Inquire specifically about C. difficile and MRSA history.
  - » Look for evidence of infestation or large open draining wounds.
- Adjust infection prevention precautions as required based on symptoms (e.g., add protection for the eyes, nose, and mouth by using a mask and goggles or face shield when it is likely that there will be a splash or spray of any respiratory secretions or other body fluids as defined in standard precautions).
  - » Not all GI illness requires contact precautions, but since norovirus and C. difficile (among others) do, consider maintaining contact precautions unless clearly not required (and can assume standard precautions at that point).
- Perform hand hygiene before and after all patient care activities. This should involve hand washing or alternative methods that do not rely on alcohol-based solutions that may not be effective against norovirus or C. difficile.

Contact Precautions

PPE

- Consider using a checklist or graphic to assist with proper donning and doffing.
- Report potential exposures according to existing service protocols.

Type:

- Disposable fluid-resistant gown that protects the provider's legs without becoming a trip hazard or consider disposable fluid-resistant coveralls.
- Disposable gloves.
- Ensure strict adherence to standard precautions based on situation (e.g., mask, goggles/face shield for splatter risk or airway interventions).

Donning:

1. Personal items (e.g., jewelry [including rings], watches, cell phones, pens) should ideally be removed and stowed. Long hair should be tied back. Eyeglasses should be secured with a tie.
2. Inspect PPE prior to donning to ensure not torn or ripped, that all required supplies are available, and that correct sizes are selected for the responder.
3. Perform hand hygiene; allow hands to dry before moving to next step
4. Put on gown or coverall. Ensure large enough to allow unrestricted movement.
5. Put on gloves. Ensure the cuffs are pulled over the sleeves of the gown or coverall and are tight.
6. After donning, the integrity of the ensemble should be verified. The responder should go through a range of motions to ensure sufficient range of movement while all areas of the body remain covered.

Contact Precautions

Doffing:

Remove PPE only in an appropriate doffing area. Meticulous care should be taken to avoid self-contamination. PPE waste should be disposed of in accordance with medical waste protocols.

1. Inspect the PPE for visible contamination, cuts, or tears before removal. If visibly soiled, remove the PPE in a manner that avoids contact with the contaminated surface. If cut or torn, assess for soilage of underlying garment or skin after removal.
2. Remove gown or coverall and discard.
    - Gown: Depending on gown design and location of fasteners, the responder can either untie or gently break fasteners. Pull the gown away from the body, being careful not to touch the inside with hands. Once the gown is off shoulders, pull the gown down one arm and then the other. Roll the gown inward while progressing downward.
    - Coverall: Tilt head back to reach zipper or fasteners. Unzip or unfasten completely before rolling down while turning inside out. Avoid other contact with outer surface of coverall during removal, touching only the inside of the coverall.
    - Dispose of gown or coverall per medical waste protocols.
3. Inspect the glove outer surfaces for visible contamination, cuts, or tears.
    - Visible contamination, cut, or tear: If glove is visibly soiled, remove the gloves in a manner that avoids contact with the contaminated surface. Wash hands with soap and water if visibly soiled. Perform hand hygiene with ABHR on bare hands. If the glove is cut or torn, inspect the underlying skin for abrasion or break in the skin, contact supervisor, and follow service exposure guidelines.

Contact Precautions

- No visible contamination, cuts, or tears: Remove the gloves and perform hand hygiene, ideally with hand washing as ABHR is helpful but not sufficient for norovirus or C. difficile.[10]

4. Perform hand hygiene.
   - Visibly dirty, contaminated, or soiled with blood or body fluids: Wash hands with soap and water, then perform hand hygiene with ABHR.
   - Not visibly soiled: Perform hand hygiene with handwashing; use ABHR if handwashing is not available.
5. Inspect for any contamination of the responder uniform. If there is contamination, secure the garment for cleaning. Contaminated clothing should be washed or discarded in accordance with pathogen-specific guidelines, generally with hot water, usual detergent, and the addition of household bleach as appropriate for the garment.

PATIENT CARE CONSIDERATIONS

- Provide anti-emetics per service clinical care guidelines.
- Cover draining wounds with adequately absorbent dressings.
- Anticipate additional stool/vomitus to reduce contamination of the responder and the ambulance (emesis bags, towels available, and/or impermeable sheet placed on stretcher). Consider the use of a containment wrap.

[10] ABHR do not kill the spores of C. difficile and are variably effective for norovirus depending on the formulation and concentration.

Contact Precautions

TRANSPORT CONSIDERATIONS

- Consider applying an impermeable barrier sheet to the patient to protect the responder and environmental surfaces in the presence of excessive wound drainage, fecal incontinence, or other discharges.
- Advise receiving hospital of patient on contact precautions who should preferably be transported to a private room.

AMBULANCE DECONTAMINATION

- Any visibly soiled surface should be cleaned using an EPA-registered disinfectant according to directions on the label.
- Medical equipment (e.g., stethoscope, BP cuff) making patient contact should be disposable or cleaned and disinfected before use on another patient. Other visibly contaminated equipment should similarly be cleaned and disinfected.
- Confirmed or suspected C. difficile infection decontamination should utilize hypochlorite solutions. EPA-registered disinfectants with sporicidal activity may be sufficient but limited data is available.

Contact Precautions

RESOURCES

- C. diff: Facts for Clinicians
- Considerations for Selecting Protective Clothing used in Health care for Protection against Microorganisms in Blood and Body Fluids
- Guidelines for Isolation Precautions 2007
- Sequence for Donning and Removing Personal Protective Equipment
- Selected EPA-Registered Disinfectants

Droplet Precautions

EXAMPLE DISEASES

Neisseria meningitidis • mumps • mycoplasma • streptococcal and many other causes of pneumonia • parvovirus • pertussis • pneumonic plague • rhinovirus • rubella • seasonal influenza • streptococcal pharyngitis.

GOAL OF PRECAUTIONS

- Protection of responder's mucous membranes and respiratory system from exposure to potentially infectious droplets during direct patient care activities.

DISPATCH ACTIONS

- Resource assignment: Usual assignment of first responders and appropriate BLS/ALS response except in infectious disease outbreak or epidemic situation consider restricting first responders if no life-threatening symptoms (chest pain, difficulty breathing, altered mental status) present.
- Patient instructions: Usual pre-arrival instructions (e.g., turn on porch light, control animals, gather medications, ask patient to wear a mask if they have one and can tolerate it).
- Crew instructions: Advise responding crew of patient illness/symptoms.

Droplet Precautions

ARRIVING EMS ACTIONS/CONSIDERATIONS

- Be aware of any community-based outbreaks of influenza or other epidemic disease requiring droplet precautions and obtain relevant history as indicated.
- Assess patient upon arrival from a distance of at least six feet if possible.
  - » Inquire specifically about influenza or other specific exposures.
- Adjust infection prevention precautions as required based on symptoms/ history. Maintain strict adherence to standard precautions.
- Perform hand hygiene before and after all patient care activities.

PPE

- Consider using a checklist or graphic to aid PPE compliance.[11]
- PPE should be removed in an appropriate doffing area to prevent secondary contamination. Care should be taken to avoid self-contamination. PPE waste should be placed in an appropriate container.
- Report potential exposures according to existing service protocols.

Type:

- Disposable surgical mask (N95 respirator not required but optional per service protocols).
- Disposable gloves.
- Eye protection – goggles or face shield.

[11] Example: Sequence for Donning and Removing Personal Protective Equipment

Droplet Precautions

Donning:

1. Select gloves and mask and inspect to ensure not torn or ripped and that they are the correct size.
2. Perform hand hygiene with ABHR; allow hands to dry before moving to next step.
3. Put on gloves.
4. Put on eye protection if using.[12]
5. Put on surgical mask.

[12] Per CDC, no recommendation for routinely wearing eye protection, but influenza and other diseases can transmit via the ocular surfaces as well as other mucous membranes. Use PPE to protect the mucous membranes of the eyes, nose, and mouth during procedures and patient-care activities that are likely to generate splashes or sprays of blood, body fluids, secretions, and excretions. Select masks, goggles, face shields, and combinations of each according to the tasks performed or anticipated.

Droplet Precautions

Doffing:

Care should be taken to avoid self-contamination when removing mask and gloves. Appropriately dispose of PPE.

1. Inspect PPE for visible contamination, cuts, or tears before starting to remove. If visibly soiled, remove the PPE in a manner that avoids contact with the contaminated surface. If cut or torn, assess for soilage of underlying garment or skin after removal.
2. Remove and discard gloves, taking care not to contaminate hands when removing the gloves. Dispose of gloves in accordance with medical waste protocols.
3. Remove eye protection: Remove by strap; avoid touching the front surface of the eye protection. Perform hand hygiene with ABHR. Reusable goggles must be thoroughly cleansed and disinfected with EPA-registered disinfectant wipes.
4. Remove the surgical mask by tilting the head slightly forward, grasping the elastic straps, sliding them off the ears/head, and removing the mask without touching the front fabric. Dispose of the mask.
5. Perform hand hygiene: If hands are visibly dirty or soiled with blood or body fluids or other material, wash hands with soap and water, then perform hand hygiene with ABHR. If hands are not visibly soiled, simply perform hand hygiene with ABHR.
6. Inspect for any contamination of the responder uniform. If there is contamination, remove the soiled garment and secure it for cleaning. Contaminated clothing should be washed or discarded in accordance with disease-specific guidelines, generally with hot water, usual detergent, and the addition of household bleach as appropriate for the garment.

Droplet Precautions

PATIENT CARE CONSIDERATIONS

- Provide a surgical mask for all patients with acute infectious respiratory symptoms who can tolerate it.
- Provide tissues to patients for secretion control and encourage patient hand hygiene and cough etiquette practices.
- Responders not in appropriate PPE should maintain a distance of at least 6 feet from the patient and should wear gloves to guard against infectious agents on the surfaces of objects close to the patient.
- Minimize use of nebulizers to avoid aerosolization of respiratory droplets; consider metered dose inhalers instead.
- Minimize airway interventions that may cause coughing (e.g., suctioning) to degree possible.

TRANSPORT CONSIDERATIONS

- Standard transportation.
- Consider having the patient compartment exhaust vent on high and isolating the driver compartment if performing aerosol generating procedures (airway suctioning, intubation, aerosolized medication administration, non-invasive positive pressure ventilation). Increase ventilation by having air or heat on non-recirculating cycle and/or opening windows.
- Advise receiving hospital of respiratory symptoms and that a private (but not negative pressure) room is preferred.

Droplet Precautions

AMBULANCE DECONTAMINATION

- Any visibly soiled surface should be cleaned using an EPA-registered disinfectant according to directions on the label.
- Disinfect all potentially contaminated/high touch surfaces including the stretcher with an EPA-registered disinfectant according to directions on the label.
- Medical equipment (e.g., stethoscope, BP cuff) making patient contact should be disposable or cleaned and disinfected before use on another patient.

RESOURCES

+ Guidelines for Isolation Precautions 2007
+ Sequence for Donning and Removing Personal Protective Equipment
+ Selected EPA-Registered Disinfectants

Airborne Precautions

EXAMPLE DISEASES

Measles • TB (suspected or confirmed pulmonary or laryngeal) • varicella (chickenpox).

GOAL OF PRECAUTIONS

- Provide respiratory protection against inhalation of potentially infectious suspended droplet nuclei/aerosols (agents suspended in the air that are respirable and remain infectious over long distances).

DISPATCH ACTIONS

- Resource assignment: Consider restricting assignment to ambulance only if no life-threatening symptoms (chest pain, difficulty breathing, altered mental status) present and high suspicion for airborne disease to decrease first responder exposure.
- Patient instructions: Usual pre-arrival instructions (e.g., turn on porch light, control animals, gather medications, ask patient to wear a mask if they have one and can tolerate it).
- Crew instructions: Advise responding crew of patient illness/symptoms and concern for airborne transmissible infection.

Airborne Precautions

ARRIVING EMS ACTIONS/CONSIDERATIONS

- Be aware of any community or institution-based outbreaks of TB, measles, or other disease requiring airborne precautions and obtain relevant history as indicated.
- Assess patient upon arrival from a distance of at least six feet if possible.
  - » Inquire specifically about TB, measles, or other relevant exposures.
- Wear appropriate respiratory protection when making patient contact or interacting with patient in a closed space. Adjust infection prevention precautions as appropriate based on symptoms and exposure history. Change to standard (or droplet) precautions if not significantly concerned about airborne spread. Maintain strict adherence to standard precautions.
- Perform hand hygiene before and after patient care activities.

PPE

- Consider using a checklist to assist with proper donning and doffing.
- Report potential exposures according to existing service protocols.

Type:

- Disposable NIOSH-approved, fit-tested N95 respirator.
  - » EMS agencies often use PAPRs with full hood and HEPA filter for airborne precautions for employees who cannot safely fit test on N95 respirators due to facial hair, facial structure, and other factors.
  - » For the purposes of consistency and simplicity, the use of respirators for all infectious agents known to be transmitted by infectious aerosols is recommended.
- Disposable exam gloves.

Airborne Precautions

Donning:

1. Inspect PPE prior to donning to ensure that it is in serviceable condition (e.g., correct size, gloves not torn or ripped, respirator not soiled or creased; if using PAPR, check motor, airflow, and battery status).
2. Perform hand hygiene with ABHR; allow hands to dry before donning gloves.
3. Put on gloves.
4. Put on respirator.
    - N95 or elastomeric respirator: Apply respirator, mold to nose/face, and perform fit check to ensure seal.
    - PAPR: Turn on PAPR motor, apply hood ensuring inner and outer liner drape smoothly over shoulders, and adjust headband to comfort.

Doffing:

PPE should be doffed in an appropriate removal area (particularly if using a PAPR). Care should be taken to avoid self-contamination during removal. Appropriately dispose of PPE waste. PAPR should be placed in a separate bag and/or managed by service protocol.

1. Inspect glove surfaces for visible contamination, cuts, or tears.
    - Visible contamination, cut, or tear: If glove is visibly soiled, remove the gloves in a manner that avoids contact with the contaminated surface and dispose in biohazard bag. Wash hands with soap and water if visibly soiled. Perform hand hygiene with ABHR. If the glove is cut or torn, inspect the underlying skin. If any break in the skin, contact supervisor and follow service exposure guidelines.
    - No visible contamination, cuts, or tears: Remove and discard gloves, taking care not to contaminate hands during removal. Dispose of gloves in accordance with medical waste protocols. Perform hand hygiene with ABHR.

Airborne Precautions

2. Respirator.
    - N95: Remove N95 respirator tilting the head slightly forward, grasping the elastic straps, sliding them off the ears/head, and removing the respirator without touching the front fabric. Appropriately dispose of respirator.
    - Elastomeric half-face respirator: Remove respirator by straps, wipe surface with EPA-registered disinfectant wipe, and allow to dry. Remove gloves worn during disinfection and perform hand hygiene with ABHR.
    - PAPR with External Belt-Mounted Blower (if used): Remove PAPR belt and set PAPR down in front of body. Lean forward, grasp top of hood (avoid grabbing hose), slowly remove hood by pulling off and straight down to floor. Retain the belt-mounted blower unit and reusable PAPR components in a separate bag for disinfection (must be wiped down with EPA-registered disinfectant wipes and allowed to air dry).
3. Perform hand hygiene.
    - Visibly dirty, contaminated, or soiled with blood or body fluids: Wash hands with soap and water, then perform hand hygiene with ABHR.
    - Not visibly soiled: Perform hand hygiene with ABHR.
4. Inspect for any contamination of the responder uniform. If there is contamination, secure the garment for cleaning. Contaminated clothing should be washed or discarded in accordance with disease-specific guidelines, generally with hot water, usual detergent, and the addition of household bleach as appropriate for the garment.

Airborne Precautions

PATIENT CARE CONSIDERATIONS

- Ensure strict adherence with standard precautions.
- Ask the patient to wear a surgical mask (N95 respirator not required) if they are able to tolerate it.
- Provide tissues to patients for secretion control and encourage patient hand hygiene and cough etiquette practices.
- The performance of procedures that can generate suspended droplet nuclei/aerosols (i.e., aerosol-generating procedures), such as endotracheal intubation, non-invasive ventilation, and open suctioning of the respiratory tract have been associated with higher risk of transmission of infectious agents to health care personnel, including M. tuberculosis. Protection of the eyes – in addition to respirator and gloves – is recommended while performing these procedures in accordance with standard precautions.
- If clinically indicated and available, rapid sequence intubation should be considered for any patient requiring definitive airway management to avoid aerosol generation as a consequence of coughing.

TRANSPORT CONSIDERATIONS

- Notify the receiving hospital of the need for an airborne infection isolation room (AIIR) for patient placement.
- Consider having the patient compartment exhaust vent on high and isolating the driver compartment from the patient compartment. Consider having the driver compartment ventilation fan set to high without recirculation.
- If driver/pilot compartment is not isolated from the patient compartment, vehicle operator should wear N95 respirator.
- Patients who are intubated should be ventilated with a bag-valve device or ventilator equipped with a HEPA filter in-line or on the exhalation port.

Airborne Precautions

AMBULANCE DECONTAMINATION

- Any visibly soiled surface should be cleaned using an EPA-registered disinfectant according to directions on the label.
- Disinfect all potentially contaminated/high touch surfaces including the stretcher with an EPA-registered disinfectant according to directions on the label.
- Medical equipment (stethoscope, BP cuff, etc.) making patient contact should be disposable or cleaned and disinfected before use on another patient.

RESOURCES

- Guideline for Isolation Precautions: Preventing Transmission of Infectious Agents in Health care Settings
- Respiratory Protection Standards
- Selected EPA-Registered Disinfectants
- Sequence for Donning and Removing Personal Protective Equipment

Special Respiratory Precautions

EXAMPLE DISEASES

MERS • novel influenza strains (e.g., H5N1) • smallpox • Mpox • COVID-19.

GOAL OF PRECAUTIONS

- Provide protection of mucous membranes and respiratory protection against inhalation of potentially infectious suspended droplet nuclei/ aerosols (agents suspended in the air that are respirable and remain infectious over long distances).
- Create an impermeable barrier to reduce spread of highly pathogenic viruses on surfaces and via fomites during direct patient care activities (standard + contact + airborne + eye protection).

Special Respiratory Precautions

DISPATCH ACTIONS

- In addition to travel history to affected countries, EMS agencies may need to ask screening questions based on local cases.
- Resource assignment: Consider restricting assignment to ambulance only if no life-threatening symptoms (chest pain, difficulty breathing, altered mental status) present to decrease first responder exposure. Consider use of dedicated infectious disease medical transport services if built into the community's regional transportation plan for planned movement of patients with special respiratory disease.
- Patient instructions: Usual pre-arrival instructions (e.g., turn on porch light, control animals, gather medications, ask patient to wear a mask if they have one and can tolerate it). Request family member to meet arriving personnel at door.
- Crew instructions: Advise responding crew of patient illness/symptoms and concern for special pathogen.

Special Respiratory Precautions

ARRIVING EMS ACTIONS/CONSIDERATIONS

- Be aware of any community-based outbreaks of Mpox/MERS/novel influenza/COVID-19 type diseases or other disease requiring special precautions and obtain relevant travel and exposure history as indicated.
- Ensure appropriate training and education on PPE use and patient management.
- Conduct "doorway evaluation" if possible. If stable and verbal, minimize contact with patient while donning appropriate PPE.
- Ensure history is consistent with dispatch information.
  - » Inquire specifically about relevant travel and exposures.
- Adjust infection prevention precautions as required based on symptoms. Change to standard or other respiratory precautions based on symptoms if no significant concern for special pathogen. Maintain strict adherence to standard precautions.
- For possible special pathogens, minimize number of direct responders.
- Perform hand hygiene before and after all patient care activities.

Special Respiratory Precautions

PPE

Type:

- Disposable N95 or equivalent/higher level respirator (e.g., re-usable half-face elastomeric respirator N95 or higher rating mask or PAPR with full hood and HEPA filter).
- Disposable face shield or disposable or cleanable goggles (if not using hooded PAPR).
- Disposable fluid-resistant gown that extends to at least mid-calf or disposable fluid-resistant coveralls.
- Disposable gloves with extended cuffs.
- Consider disposable boot/shoe covers.

Special Respiratory Precautions

Donning:

1. Personal items (e.g., jewelry [including rings], watches, cell phones, pagers, pens) should ideally be removed and stowed. Long hair should be tied back. Eyeglasses should be secured with a tie.
2. Inspect PPE prior to donning to ensure that it is in serviceable condition (e.g., correct size, gloves not torn or ripped, respirator not soiled or creased; if using PAPR check motor, airflow, and battery status).
3. Perform hand hygiene with ABHR; allow hands to dry before donning gloves.
4. Put on gloves.[13]
5. Put on gown or coverall. Ensure large enough to allow unrestricted movement. Ensure cuffs of gloves are pulled over the sleeve of the gown or coverall.
6. Put on boot/shoe covers.
7. Put on respirator.
    - N95 or elastomeric respirator: Apply respirator, mold to nose/face, perform fit check to ensure intact seal; apply face shield if not using goggles.
    - PAPR: Turn on PAPR motor, apply hood ensuring inner liner (if equipped) is tucked into coverall (if used) and outer liner drapes smoothly over shoulders and adjust headband to comfort.
8. If not using hooded PAPR, apply full face shield or goggles.
9. After donning, the integrity of the ensemble should be verified by the responder. The responder should go through a range of motions to ensure sufficient range of movement without suit binding/stretching while all areas of the body remain covered.

[13] EMS agencies may prefer to double glove for suspected highly virulent pathogens (e.g., MERS, Clade I Mpox). Ensure the cuffs of inner gloves are tucked under the sleeve of the gown or coverall. Ensure the cuffs of outer gloves are pulled over the sleeves of the gown or coverall and are tight. Consider taping, if required.

Special Respiratory Precautions

Doffing:

PPE should be doffed in a designated removal area, particularly when using a PAPR. Care should be taken to avoid self-contamination during removal. Place all PPE waste in a labeled, leak-proof biohazard bag. PAPR should be placed in a separate biohazard bag and/or managed by service protocol.

1. Inspect the PPE for visible contamination, cuts, or tears before removal. Clean any visible contamination with an EPA-registered disinfectant wipe.
2. Disinfect gloved hands with either an EPA-registered disinfectant wipe in accordance with manufacturer recommendations or ABHR.[14] If double-gloving, remove tape if applied and remove and discard outer gloves into biohazard bag, taking care not to contaminate inner gloves in the process.
3. Inspect the glove outer surfaces for visible contamination, cuts, or tears.
    - Visible contamination, cut, or tear: If glove is visibly soiled, then clean the glove with either an EPA-registered disinfectant wipe or ABHR, remove the gloves, perform hand hygiene with ABHR on bare hands, and don a new pair of gloves. If the glove is cut or torn, after removal and hand hygiene, check the underlying skin and review occupational exposure protocol with supervisor.
    - No visible contamination, cuts, or tears: Disinfect gloves with either an EPA-registered disinfectant wipe or ABHR.
4. Remove gown or coverall and boot/shoe covers and discard. *(Note: Gown or coverall should be removed before face protection and respirator. If that is not possible due to the design of the PPE, remove the gown or coverall after face protection and respirator.)*

[14] Preliminary research suggests that multiple applications of some types of ABHR may affect nitrile and latex gloves. Switching the type of glove or ABHR product used is necessary if glove integrity decreases (e.g., they start to tear or rip) or unusual changes (e.g., gloves become sticky, shrink, or harden) that would affect work-related tasks are observed during training and practice.

Special Respiratory Precautions

- Gown: Depending on gown design and location of fasteners, the responder can either untie or gently break fasteners. Pull the gown away from body, being careful not to touch the inside with hands. Once the gown is off shoulders, pull the gown down one arm and then the other. Roll the gown inward while progressing downward.
- Coverall: Tilt head back to reach zipper or fasteners. Unzip or unfasten completely before rolling down while turning inside out. Avoid contact with outer surface of coverall during removal, touching only the inside of the coverall.
- Dispose of gown or coverall into the biohazard bag.

5. Disinfect gloves with either an EPA-registered disinfectant wipe or ABHR.
6. Remove goggles or face shield (if used) sliding fingers under straps and sliding up and off away from face. Do not touch the front surface of the goggles/shield. Discard into biohazard bag. If re-using goggles, must clean all surfaces with EPA-approved disinfectant wipes.
7. Disinfect gloves with either an EPA-registered disinfectant wipe or ABHR.
8. Respirator.
    - N95 respirator: Tip head slightly forward, remove by sliding fingers under the elastic straps and sliding them off the ears/head allowing the mask to fall away from the face being careful not to touch the front of the mask. Discard into the biohazard bag.
    - Elastomeric half-face respirator: Remove respirator by straps without touching the front surface of the respirator, wipe surface with EPA-approved disinfectant cloth, and allow to dry.

Special Respiratory Precautions

- PAPR with External Belt-Mounted Blower: Remove PAPR belt and set PAPR down in front of body. Lean forward, grasp top of hood, (avoid grabbing hose), and slowly remove hood by pulling off and straight down to floor. Retain the belt-mounted blower unit and reusable PAPR components in a designated bag or area for disinfection in accordance with manufacturer instructions (must be wiped down with EPA-approved disinfectant and allowed to air dry).

9. Disinfect gloved hands with either an EPA-registered disinfectant wipe or ABHR. Remove and discard gloves, taking care not to contaminate bare hands during removal process. Dispose of gloves into the biohazard bag.
10. Perform hand hygiene.
    - Visibly dirty, contaminated, or soiled with blood or body fluids: Wash hands with soap and water, then perform hand hygiene with ABHR. Refer to the Occupational/Health Exposures information in the Resources/Special Considerations section for additional guidance to ensure that occupational health is aware of potential exposure.
    - Not visibly soiled: Perform hand hygiene with ABHR.
11. Responders should inspect for any contamination of their uniform. If there is contamination, remove and secure garment for cleaning. Contaminated clothing should be washed or discarded in accordance with disease-specific guidelines, generally with hot water, usual detergent, and the addition of household bleach, as appropriate for the garment.

Special Respiratory Precautions

PATIENT CARE CONSIDERATIONS

- Ask the patient to wear a surgical mask (N95 respirator not required) if they are able to tolerate it.
- Provide tissues to patients for secretion control and encourage patient hand hygiene and cough etiquette practices.
- Exercise caution when performing aerosol-generating procedures (endotracheal intubation, airway suctioning, administration of nebulized medication, non-invasive ventilation [e.g., continuous positive airway pressure (CPAP)/bilevel positive airway pressure (BiPAP)], and/or cardiopulmonary resuscitation [CPR]). Only perform these procedures if medically necessary and cannot be postponed.
- If clinically indicated and available, rapid sequence intubation should be considered for patients requiring definitive airway management to avoid aerosol production from coughing.
- Ventilate patients who are intubated with a bag-valve device or ventilator with a HEPA filter in-line or on the exhalation port.

Special Respiratory Precautions

TRANSPORT CONSIDERATIONS

- Notify the receiving hospital of the need for an AIIR for patient placement.
- The patient compartment exhaust vent should be on high and the driver compartment should be isolated from the patient compartment if possible. The driver compartment ventilation fan should be set to high without recirculation.
- The vehicle operator should wear an N95 respirator if the patient compartment and cab cannot be isolated.
- EMS agencies should have a plan for family members wishing to accompany the patient that minimizes additional crew exposures.

AMBULANCE DECONTAMINATION

- Any visibly soiled surface should be cleaned using an EPA-registered disinfectant according to directions on the label.
- Disinfect all potentially contaminated surfaces including the stretcher with an EPA-registered disinfectant according to directions on the label.
- Medical equipment (e.g., stethoscope, BP cuff) making patient contact should be disposable or cleaned and disinfected using appropriate disinfectants before use on another patient.

Special Respiratory Precautions

RESOURCES

- Considerations for Selecting Protective Clothing used in Health care for Protection against Microorganisms in Blood and Body Fluids
- Disinfectants for Emerging Viral Pathogens (EVPs): List Q
- Interim Guidance for Infection Control Within Health care Settings When Caring for Confirmed Cases, Probable Cases, and Cases Under Investigation with Novel Influenza A Viruses Associated with Severe Disease
- Infection Control Guidance: SARS-CoV-2
- Mpox Infection Prevention and Control in Healthcare Settings
- Middle East Respiratory Syndrome (MERS)
- Selected EPA-Registered Disinfectants

EVD-VHF Precautions

EXAMPLE DISEASES

EVD • MVD • Lassa fever • Crimean-Congo fever.

GOAL OF PRECAUTIONS

- Provide maximal impermeable barrier and respiratory protection against highly pathogenic VHF viruses.

DISPATCH ACTIONS

1. Inquire about travel and direct exposure history within the previous 21 days.
    - Has patient traveled to or lived in a country with hemorrhagic fever virus transmission?
    - Has patient had direct contact with a person who is confirmed or suspected to have EVD/VHF? (including local cases, if applicable)
        - » If yes, does the patient have any fever, severe headache, muscle pain, weakness, fatigue, diarrhea, vomiting, abdominal (stomach) pain, or unexplained hemorrhage (bleeding or bruising)?

EVD-VHF Precautions

- Notify responding units of any affirmative answer(s) to these questions. Provide following guidance/ask crew to reference guidance and cancel first responder units if no life-threatening symptoms present (unconscious/altered mental status, difficulty breathing, chest pain).

2. Instructions to patients and EMS providers for EVD/VHF positive screen:
   - Instruct other people at the scene to restrict contact with patient unless wearing appropriate PPE. Provide usual pre-arrival instructions (e.g., turn on porch light, control animals, gather medications, ask patient to wear a mask if they have one and can tolerate it). Request bystander on scene to meet arriving personnel at door. Ask bystander to ensure patient is wearing clean clothing prior to EMS arrival, if possible.
   - Alert any first responders (if required for emergent symptoms) and EMS responders being dispatched of potential for a patient with possible exposure/signs and symptoms of EVD/VHF before they arrive on scene. This may best be done via CAD, text messaging, or other secure means.
   - Advise EMS responders to don appropriate PPE before direct contact with the patient.
     - » Advise EMS responders before entering the scene to wear the highest level of PPE recommended if complaints include bleeding, vomiting, or diarrhea.

EVD-VHF Precautions

- If responding to an airport or other port of entry to the United States, notify the CDC Port Health Station for the port of entry. Contact information for CDC Port Health Stations can be accessed at https://www.cdc.gov/port-health/stations/port-health-station-contact-list.html.
- Dispatch should notify EMS supervisor and others per service protocols.
- Consider alerting EVD/VHF specialized personnel and equipment/ ambulance if available as secondary responder and the patient is stable enough to await this resource.
- If patient is transported, ensure follow-up with hospital regarding final diagnosis and report any exposures or issues to public health.

EVD-VHF Precautions

ARRIVING EMS ACTIONS/CONSIDERATIONS

- Be aware of any international and/or community-based outbreak.
- Consider the strategy of one responder putting on PPE with the use of a trained observer and managing the patient while the other responder does not engage in patient care but provides the "doorway evaluation" and communications/charting from at least 6 feet away from the patient. The second responder should be prepared to quickly and safely don the appropriate PPE should the first responder require assistance.
- Ensure history is consistent with dispatch information.
  - » Inquire specifically about travel and relevant exposures.
  - » If initial assessment confirms suspicion of EVD/VHF and patient is stable and alert, then continue specialized EMS ambulance response to location, if available.
- Adjust infection prevention precautions as required based on symptoms and suspicion. Change to standard precautions with appropriate transmission-based precautions based on symptoms if no significant concern for EVD/VHF. Maintain strict adherence to standard precautions.
- Minimize number of direct caregivers.
- Perform hand hygiene before and after all patient care activities.
- Ensure that appropriate ALS/BLS care is provided. The vast majority of suspected cases will *not* have EVD/VHF.

EVD-VHF Precautions

PPE

Initial responders to **suspect** case **without** active bleeding, vomiting, or diarrhea.[15]

Donning:

1. Use a checklist and a trained observer.[16]
2. Personal items (e.g., jewelry [including rings], watches, cell phones, pagers, pens) should be stowed. Long hair should be tied back. Eyeglasses should be secured with a tie.
3. Visually inspect the PPE to ensure that it is not torn or ripped, all required PPE and supplies are available, and the correct sizes are selected.
4. Perform hand hygiene with ABHR. When using ABHR, allow hands to dry before moving to next step.
5. Put on inner gloves.
6. Put on gown or coverall. Ensure gown or coverall is large enough to allow unrestricted movement. Ensure cuffs of inner gloves are tucked under the sleeve cuff.
7. Put on surgical mask.[17]

[15] PPE: Clinically Stable Patients Suspected to have VHF

[16] CDC provides videos demonstrating donning and doffing procedures for various PPE combinations.

[17] EMS agencies may recommend use of an N95 respirator for all suspect cases. Use of surgical masks is consistent with CDC guidance for suspected cases when exposure to blood and body fluids is not anticipated and aerosol-generating procedures are not performed.

EVD-VHF Precautions

8. Put on second pair of gloves (with extended cuffs). Ensure the cuffs are pulled over the sleeves of the gown or coverall (consider taping).
9. Put on full face shield over the surgical mask to protect the eyes as well as the front and sides of the face. Consider use of a head cover.
10. Verify the integrity of the ensemble (e.g., there should be no cuts or tears in the PPE). The responder should be comfortable and able to extend the arms, bend at the waist, and go through a range of motions while all areas of the body remain covered.

Doffing:

Doffing is a high-risk step in VHF patient care. PPE should be doffed in a designated PPE removal area. Meticulous care should be taken during this process to avoid self-contamination as this is a major contributor to responder disease. Place all PPE waste in a labeled leak-proof biohazard bag.

1. Use a checklist and a trained observer.
2. Inspect the PPE for visible contamination, cuts, or tears before starting to remove. If any visible contaminant, disinfect using an EPA-registered disinfectant wipe.
3. Disinfect outer-gloved hands with either an EPA-registered disinfectant wipe in accordance with manufacturer recommendations or ABHR. Remove tape if applied and remove and discard outer gloves, taking care not to contaminate inner gloves in the process. Dispose of outer gloves into biohazard bag.
4. Inspect the inner glove outer surfaces for visible contamination, cuts, or tears.
    - Visibly soiled, cut, or tear: Clean the glove with either an EPA-registered disinfectant wipe or ABHR, remove the inner gloves and discard into biohazard bag, perform hand hygiene with ABHR on bare hands, and don a new pair of gloves. For cut or tear, inspect skin for injury and report potential exposure to supervisor immediately.

EVD-VHF Precautions

- No visible contamination and no cuts or tears: Disinfect the inner gloves with either an EPA-registered disinfectant wipe or ABHR.

5. Remove the face shield (and head cover/hood if used) by tilting the head slightly forward, grabbing the rear strap, and pulling it over the head, allowing the face shield to fall forward. Avoid touching the front surface of the face shield. Discard the face shield into the designated biohazard bag.
6. Disinfect inner gloves with either an EPA-registered disinfectant wipe or ABHR.
7. Remove gown or coverall.
    - Gown: Depending on gown design and location of fasteners, the responder can either untie or gently break fasteners. Pull the gown away from the body, being careful not to touch the inside with hands. Once the gown is off shoulders, pull the gown down one arm and then the other. Roll the gown inward while progressing downward.
    - Coverall: Tilt head back to reach zipper or fasteners. Unzip or unfasten coverall completely before rolling down while turning inside out. Avoid contact with outer surface of coverall during removal, touching only the inside of the coverall.
    - Dispose of gown or coverall into the biohazard bag.
8. Disinfect inner gloves with either an EPA-registered disinfectant wipe or ABHR. Remove and discard gloves, taking care not to contaminate bare hands during removal.
9. Perform hand hygiene with ABHR and don a new pair of gloves.
10. Remove the surgical mask by tilting the head slightly forward, grasping the elastic straps, and pulling the straps off the ears and/or top of head to release the mask allowing it to fall forward off the face. Avoid touching the front of the mask. Discard into the biohazard bag.

EVD-VHF Precautions

11. Disinfect gloved hands with either an EPA-registered disinfectant wipe or ABHR. Remove and discard gloves, taking care not to contaminate bare hands during removal process. Dispose of inner gloves into the biohazard bag.
12. Perform hand hygiene with ABHR.
13. Inspect for any contamination of the responder uniform. If there is contamination, remove the soiled garment and place it into the biohazard bag, cleanse skin with ABHR, and immediately inform supervisor of the potential exposure.

PPE

Transport of **confirmed case** or those **with** active bleeding, vomiting, or diarrhea.[18]

Note: Services may elect to use N95 respirator in combination with impermeable hood that covers head and shoulders and a full face shield. The previous PPE section may be modified for use of this ensemble. This section covers donning/doffing with PAPR with impermeable drape-style hood. Services may elect to add a heavier impermeable apron for high-risk situations.

Donning:

1. Identify trained observer and use a checklist.
2. Ensure hydration and use the restroom prior to donning if possible.

[18] PPE: Confirmed Patients and Clinically Unstable Patients Suspected to have VHF

EVD-VHF Precautions

3. Personal items (e.g., jewelry [including rings], watches, cell phones, pagers, pens) should ideally be stowed. Long hair should be tied back. Eyeglasses should be secured with a tie.
4. Visually inspect the PPE ensemble to ensure it is the correct size, in good condition (e.g., not torn or ripped), and all required PPE and supplies are available. Check battery status and test the PAPR motor and airflow. Check that the filters fit securely, and ensure all filter caps are off.
5. Don and test two-way radio headset microphone (if using).
6. Perform hand hygiene with ABHR; allow hands to dry before moving to next step.
7. Put on first pair of gloves.
8. Put on coverall; ensure unrestricted movement. Ensure cuffs of inner gloves are tucked under the sleeve cuff.
9. Put on impermeable boots, pull coverall material over top of boot and tape (leaving tab) if suit and boots allow. If using boot covers per service protocols, put on boot covers.
10. Put on second pair of gloves (with extended cuffs). Ensure the cuffs are pulled over the sleeves of the coverall (consider taping).
11. Turn PAPR on and put on belt and then hood. Ensure inner hood (if present) is tucked into coverall and outer hood drapes over shoulders. Ensure comfortable airflow and adjust headband if required.
12. Put on disposable apron, if using.
13. Observer and responder should verify the integrity of the ensemble (e.g., there should be no cuts or tears in the PPE). The responder should be comfortable and able to extend the arms, bend at the waist, and go through a range of motions without binding/stretching the coverall.

EVD-VHF Precautions

Doffing:

Doffing is a high-risk step in VHF patient care. PPE should be doffed in a designated PPE removal area. Meticulous care should be taken during this process to avoid self-contamination as this is a major contributor to responder disease. Place all PPE waste in a labeled leak-proof biohazard bag.

1. Identify a trained observer and use a checklist.
2. Inspect the PPE for visible contamination, cuts, or tears before starting to remove. If any visible contaminant, clean using an EPA-registered disinfectant wipe.
3. Disinfect outer gloves with EPA-registered disinfectant or ABHR.
4. Remove apron if using (e.g., by breaking or untying neck strap and releasing waist ties) and roll the apron away from body, containing the soiled outer surface while rolling; discard apron into biohazard bag being careful not to contact other surfaces. Re-inspect underlying coverall.
5. Disinfect outer-gloved hands with either an EPA-registered disinfectant wipe in accordance with manufacturer recommendations or ABHR. Remove tape if used and remove and discard outer gloves, taking care not to contaminate inner gloves in the process. Dispose of outer gloves into biohazard bag.
6. Inspect the inner gloves' outer surfaces for visible contamination, cuts, or tears.
    - Visibly soiled, cut, or tear: Clean the glove with either an EPA-registered disinfectant wipe or ABHR, remove the inner gloves and discard into biohazard bag, perform hand hygiene with ABHR on bare hands, and don a new pair of gloves. For cut or tear, inspect skin for injury and report any potential exposure immediately to supervisor.
    - No visible contamination and no cuts or tears: Disinfect the inner gloves with either an EPA-registered disinfectant wipe or ABHR.

EVD-VHF Precautions

7. Remove PAPR with External Belt-Mounted Blower: Remove PAPR belt and set PAPR down in front of body. Lean forward, grasp top of hood (avoid grabbing hose), slowly remove hood by pulling off and straight down to floor.
8. Retain the belt-mounted blower unit and reusable PAPR components in a separate bag for disinfection.
9. Disinfect inner gloves with either an EPA-registered disinfectant wipe or ABHR.
10. Remove coverall.
    - Tilt head back to reach zipper or fasteners. Unzip or unfasten coverall completely and release tape at boot cuff. If wearing booties, remove these.
    - Avoid contact with outer surface of coverall during removal, touching only the inside of the coverall as hands slide down the inside of the suit, rolling it inside-out.
    - Step out of boots onto clean surface.
    - Boots Disposable: Discard both boots and coverall into biohazard bag.
    - Boots Re-usable: After stepping out of boots, dispose of coverall into biohazard bag, then place boots into separate bag for later decontamination.
11. Disinfect inner-gloved hands with either an EPA-registered disinfectant wipe or ABHR. Remove and discard gloves, taking care not to contaminate bare hands during removal. Dispose of inner gloves into the biohazard bag.
12. Perform hand hygiene with ABHR.
13. Observer and responder inspect for any contamination of their uniform. If there is contamination, remove the soiled garment and place it into a leak-proof biohazard bag, cleanse skin with ABHR, and inform the supervisor of potential exposure.
14. Step into clean area.

EVD-VHF Precautions

PATIENT CARE CONSIDERATIONS

- Ask the patient to wear a surgical mask (N95 respirator not required) if they are able to tolerate it.
- Be aware that the biggest risk to suspect EVD/VHF patients is withholding appropriate treatment as few will actually have the disease.
- Recognize that the more body fluids, the higher the transmission risk.
- Anticipate potential stool/vomitus and control contamination of the responder and the ambulance (use emesis bags, towels, and/or place impermeable sheet on stretcher). Refer to the Ambulance Decontamination section for additional information.
- Minimize the number of responders who make patient contact.
- Use dedicated medical equipment (ideally disposable) for the provision of patient care whenever possible.
- Strongly consider having the patient wear a barrier garment, surgical mask, and gloves if tolerated.
- Patient should wear an adult undergarment if having large volumes of diarrhea.
- Exercise caution when performing aerosol-generating procedures (endotracheal intubation, airway suctioning, administration of nebulized medication, CPAP/BiPAP, CPR). Only perform these procedures if medically necessary and cannot be postponed. *(Note that cardiac arrest early in the illness may be due to electrolyte imbalance and may be survivable. Late cardiac arrest from multi-organ failure likely carries a dismal prognosis.)*

EVD-VHF Precautions

- Do not perform phlebotomy or any other invasive procedures unless urgently required for patient care or stabilization. Handle any needles and sharps with extreme care and dispose in puncture-proof, sealed containers that are specific to the single patient. Do not dispose of used needles and sharps in containers that have sharps from other patients in them.
- Consider giving oral or nasal medicine to reduce nausea and/or pain per service protocols rather than injectable.
- Use hands-free communications devices (e.g., tactical headsets) inside the PPE ensemble to facilitate communication and avoid contamination of radios.
- Complete charting either verbally to a partner in a clean area or after transport.

EVD-VHF Precautions

TRANSPORT CONSIDERATIONS – GENERAL

- Advise the designated receiving hospital as early as possible about a suspect case to allow them preparation time.
- If the patient is a highly suspect case and stable, consider specialized ambulance preparation and transport (refer to next section) if time and acuity allow.
- Interfacility transport of confirmed case should be performed by EMS personnel with properly prepared ambulances or patient containment devices (refer to next section).
- For emergency transport, consider applying an impermeable barrier sheet or cocoon to the patient[19] to protect the responder and environmental surfaces in the presence of incontinence, draining wounds, or other discharges.
- The driver's compartment should remain clean. No family members or patient belongings are permitted in the driver's compartment.
- Suspect EVD/VHF cases should be transported to a hospital capable of evaluation and initial management and placed into a dedicated isolation room. Placement should be coordinated in consultation with local/state public health authorities and the receiving facility.
- Consider deferring ambulance decontamination for a brief period to determine if EVD/VHF can be quickly ruled out during initial hospital assessment.
- Formal decontamination after transport of a suspect/confirmed case should occur in a designated area by trained personnel as described in the next section.

[19] NETEC offers a training video on the use of a containment wrap in a special pathogen isolation area.

EVD-VHF Precautions

- EMS agencies should have a plan for family members wishing to accompany the patient that prevents crew exposures to highly infectious diseases.
- Identify point of contact at the hospital to allow EMS to obtain final diagnosis/test results and inform employee monitoring and waste disposition process.

SPECIALIZED AMBULANCE PREPARATION/ INTERFACILITY TRANSFER[20]

Assumptions:

- All involved health care providers (hospital and out-of-hospital) have received education and training and demonstrated competencies for EVD/VHF PPE and patient management.
- Health care facilities and specialized transporting ambulance agencies have protocols for the management of patients, exposures, and ambulance preparation and decontamination.
- Facilities and transporting ambulance agencies conduct exercises to evaluate their integration.

Ambulance preparation

- If a commercial patient containment system is used, these guidelines may be modified accordingly. EMS personnel must be carefully trained on these systems—including appropriate cleaning, disposition, and impact on mission recovery—and understand the limitations on patient care they impose.

[20] Adapted from Example: Standard Operating Procedure (SOP) for Patient Handoff between a Healthcare Facility and a Transporting Ambulance.

EVD-VHF Precautions

- Apply clear plastic sheets (at least 4mil) or similar impermeable barrier cloth to walls of ambulance and duct tape in place. If the ceiling is a flat impermeable surface, the agency may elect not to apply plastic to the ceiling.
- Overlap all seams by at least 1 inch.
- Apply sheets to walls, cutting holes for air supply/vents and exhaust.
- Seal any conduit between the driver compartment and the passenger compartment with plastic sheeting.
- Protect floor and benches with clear plastic sheets (at least 6mil), cutting holes for stretcher locks. At this point all surfaces should be protected by plastic. A large bag or plastic sheeting may be used for the "jump" seat.
- Protect stretcher with impervious sheet.
- Make immediately available ABHR, emesis bags, and a spill kit/ absorbent disposable rags.
- Stow essential medical equipment in patient compartment sealed inside a clear plastic bag for easy access.
- Pre-pack medical supplies into individual plastic bags. Some may elect to reorganize bags/kits to minimize extra contents and/or to make cleaning easier (e.g., using plastic tray organizers [instead of fabric bags], packing into sliding closure clear plastic bags).
- Stow additional medical equipment in patient compartment behind disposable barriers, protecting it from unnecessary exposure, but available if needed by cutting plastic.
- Stow oxygen delivery kit in patient compartment and sealed inside a clear plastic bag for easy access. Consider manual disposable suction unit.
- Set all climate controls for fresh, non-recirculating air if possible.

EVD-VHF Precautions

- Set ventilation system in driver compartment on high and non-recirculating; crack windows/vents open.
- Set exhaust vent in patient compartment on high.

Prior to Transport

- Ensure EMS personnel have points of contact and means of communication with sending facility, receiving facility, public health authority, emergency management, law enforcement (or agency providing security for the transport), and (if applicable) aviation and regulated (Category A) hazardous waste management and disposal.
- Consider notifying EMS agency's public information officer.
- Consider secure methods of communication to avoid monitoring by the media or public.
- Communicate with the sending facility to confirm patient's clinical condition and risk of contact with infectious body fluids (e.g., bleeding, vomiting, diarrhea) and treatment prior to transport (e.g., anti-pyretic, anti-emetic, intravenous fluids [IVF]).
- Determine if the patient will be ambulatory or non-ambulatory.
- Confirm whether additional passengers are being transported (e.g., loved one, caregiver).
- Ensure adequate inventory of supplies and appropriately sized PPE for the personnel who are assigned to the transport mission using checklists.
- Ensure procedures and training to limit contamination of ambulance environmental surfaces (e.g., isolation of driver compartment, draping).
- Confirm for both origin and destination facility the location for patient hand-off. This location will likely be pre-determined by facilities and chosen to minimize environmental exposure at the facility and prevent exposure of unprotected staff, patients, and visitors.

EVD-VHF Precautions

- Confirm for both origin and destination facility the location for donning and doffing of PPE for transporting ambulance responders and ensure ambulance decontamination and disinfection location established.
- Ensure there is a plan at the destination hospital and ambulance decontamination location for managing regulated (Category A) hazardous waste including used responder PPE.
- Ensure appropriate supervision for the doffing of ambulance responder PPE as hospital PPE and doffing protocols may be different.
- Determine the need for additional security (and related personnel needs) with sending and receiving facility during transport and at the health care facilities.
- Ensure medical director (or appropriate person providing medical oversight) is immediately available for consultation throughout the transport.
- Communicate with sending facility for patient updates and to confirm patient transfer location.
- Contact sending facility to verify patient management steps have been taken to facilitate event-free transport and reduce risk of exposure including sufficient medications and drips for the transport time plus additional waiting/traffic/transfer time.
- Establish guidelines to define the clinical care objectives for patients whose condition deteriorates enroute to the receiving facility.
- Hold mission briefing for transport team to review:
  - Purpose and team primary contacts.
  - Transport provider health check.
  - Patient history and condition.
  - Infection control posture (ambulance configuration and personnel PPE).

EVD-VHF Precautions

- Team member (e.g., paramedic, emergency medical technician [EMT], driver, supervisor/safety officer, EMS physician) roles and responsibilities (including supervision of donning and doffing procedures).
- Relevant clinical care guidelines including appropriateness of interventions or invasive procedures.
- Transportation of patient specimens and medication, if applicable.
- Transfer of paper or electronic ambulance patient care records in a way that avoids contaminating the receiving facility.
- Decontamination and disinfection procedure.
- Waste collection and mission recovery.
- Post-mission surveillance and test result follow up for patient if not confirmed case.
- Interaction with security/law enforcement during the transport and at the receiving facility.
- Special considerations (e.g., length of transport, transfer of patient across state borders, vehicle malfunction and other contingencies).
- Media policies.

During Transport

- Depart for patient location.
- Communicate with designated point of contact at each facility the arrival ETA of transporting ambulance.
- Observe donning of PPE and, when ready, proceed to make patient contact (only the minimum number of providers necessary to manage the patient should be present).

EVD-VHF Precautions

- Conduct brief patient assessment to determine patient's stability, "dry" or "wet" symptoms, and need for intervention before and/or during patient transport. Define appropriate interventions for patient deterioration. Minimize patient contact. For example, consider not obtaining vital signs if patient is "dry," has no visual evidence of distress or shock, and transport time is not prolonged.
- Transport patient in impervious suit if ambulatory, or in impervious sheets if non-ambulatory and stretcher-bound, as tolerated.
- Consider any patient belongings (typically bagged, labeled, and transported with the patient in the patient compartment) to be contaminated.
- Any documents provided by sending facility should be free of contamination. When in doubt, consider them contaminated and package as appropriate for transport by ambulance personnel.
- Report patient's condition and ETA to receiving facility to facilitate their readiness to receive patient from transport agency immediately upon arrival, thus avoiding PPE-induced fatigue/dehydration for patient, ambulance crew, and receiving staff.
- Ensure any changes in patient condition are communicated to the receiving facility enroute.

EVD-VHF Precautions

Arrival to receiving facility

- Confirm arrival with receiving facility and specific route of travel within facility before patient leaves ambulance.
- Ensure route of travel is secured.
- Transport patient to designated location in receiving facility – via the most direct route to isolation room, either ambulatory or via stretcher depending on patient condition. If any concern for stretcher contamination, transfer patient to hospital cart upon exit from ambulance.
- Transfer patient care to receiving facility team as arranged (and exercised).
- Proceed to designated decontamination/disinfection station.
- Package waste from transport prior to doffing PPE. Transfer waste to hospital or appropriate agency as previously arranged and in accordance with applicable regulations.
- If ambulance personnel are performing ambulance cleaning and disinfection and have not exceeded service threshold for time in PPE, they may proceed with cleaning of visibly soiled areas and removal of barrier drapes prior to doffing.
- Ambulance personnel doff PPE under supervision of qualified personnel (transport agency PPE ensemble and hospital PPE may differ).
- After donning of appropriate PPE for disinfection, proceed with disinfection of the ambulance per protocol.
- Conclude mission, debrief responders, and initiate surveillance as appropriate.

EVD-VHF Precautions

AMBULANCE DECONTAMINATION[21]

1. **Identify Decontamination Area:**
   - Select an appropriate site for ambulance decontamination that protects the vehicle and the team from the weather, preferably a well-ventilated, climate controlled, large, enclosed garage/structure.
   - Establish a secure perimeter.
   - Include considerations for waste management, security plan, public perception, and media visibility when selecting decontamination site.
   - Define and mark the clean/dirty zone boundary around the ambulance that requires PPE to cross.
2. **Before Decontamination and Disinfection:**
   - Ensure appropriate supplies available:
     - » Yellow caution tape.
     - » Appropriate sizes of PPE for personnel performing decontamination.
     - » Leak proof biohazard bags.
     - » Garbage bags.
     - » Autoclave bags with rubber bands or alligator clips.
     - » EPA-registered disinfectant wipes.
     - » Bottled water.
     - » Absorbable rags.
     - » Alcohol based hand sanitizer.

[21] Adapted from Example: Standard Operating Procedure (SOP) for Decontamination of an Ambulance that has Transported a Person Under Investigation or Patient with Confirmed Ebola.

EVD-VHF Precautions

  - » Absorbent towels.
  - » Spill kit (absorbent towels, leak proof container, EPA-registered disinfectant).
  - » Bio-safety check-off sheet, briefing template, donning check-off sheet, doffing check-off sheet, point of contact list.
- The vehicle operator and patient care provider may be responsible for decontamination and disinfection of the transport unit or a separate team may be used. Both approaches have advantages.
- All waste, including PPE, drapes, and wipes, should be considered Category A infectious substances, and should be packaged appropriately for disposal.
- Personnel must be in appropriate PPE during decontamination and disinfection. A third person should also be available as a trained observer and to assist as needed.
- PPE should be donned and doffed per previous guidelines.
- PPE selection should consider worker protection for biological exposures as well as based on the disinfectant used.[22]

3. Spill decontamination:

- Grossly contaminated and visibly soiled surfaces must be decontaminated prior to disinfection.
- Gross surface contamination must first be absorbed using absorbent towels and cleaned using an EPA-registered disinfectant.
- Used absorbent materials and cleaning wipes are placed in a labeled leak-proof container.
- After removal of visible contaminants, surfaces require disinfection as described in next step.

[22] PPE Selection Matrix for Occupational Exposure to Ebola Virus

EVD-VHF Precautions

4. Disinfection:

- If test results will be available rapidly, consider waiting to see if the patient rules out, in which case usual practices for decontamination and waste management can be used.
- Disinfect the outside of any bags containing unused medical equipment as well as the stretcher, PAPR motor housings, etc. with an EPA-registered disinfectant according to directions on the label.
- If equipment was removed from a protective bag in transit, assess the equipment to determine if it can be properly decontaminated and disinfected, or disposed of. All non-dedicated, non-disposable medical equipment used for patient care should be cleaned and disinfected according to manufacturer's instructions and agency policies.
- If the interior of the ambulance was draped prior to transport, remove the draping by rolling the drapes down outside in, from the ceiling to the floor of the unit starting at the front of the compartment and moving to the rear.
- Roll flooring drapes from the front to rear of the compartment, rolling drapes outside in.
- To facilitate packaging and transport, drapes can be gently cut into segments. It is important that all drape materials are in sections that are small enough to facilitate the insertion of the biohazard bags into an autoclave or pre-determined Category A infectious substance packaging for disposal.
- Personnel should manually disinfect the interior of the patient care compartment with an EPA-registered disinfectant according to directions on the label. This should include attention to proper contact time and particular detail for high-touch surfaces such as door handles and steps using care to limit mechanically generated aerosols (e.g., no scrub brushes) and using the surface wipe method to disinfect.

EVD-VHF Precautions

- Once the manual interior wipe down has been completed, collect and package all waste as Category A waste. Place waste in biohazard bags for disposal. All bags will be closed using a gooseneck technique and the outer surface disinfected with an EPA-registered disinfectant according to directions on the label. All waste is double-bagged and exterior surfaces disinfected. Biohazard bags may be inserted into autoclave bags provided by the receiving facility.
- Manually wipe with disinfectant the ambulance's exterior patient loading doors and handles, and any areas that may have been contaminated.
- The full exterior of the ambulance does not require a disinfectant wipe down.
- Once all surfaces (including waste bags) have been wiped with disinfectant, then supervised doffing of PPE can occur into a final biohazard bag, which is closed and disinfected.

EVD-VHF Precautions

5. **After disinfection/decontamination:**
    - Dispose of all waste according to organization protocols as well as local and federal regulations for Category A infectious substances. Best practice may be to transfer waste to the hospital for disposition. If the patient rules out for EVD/VHF, the waste can be handled with usual processes.
    - Additional cleaning methods may also be used. While not required, this may provide additional assurance to personnel and the public prior to returning the vehicle to service.
        - » Ultraviolet germicidal irradiation, aerosolized chlorine dioxide, or hydrogen peroxide can be used for an additional disinfection step. However, these should not replace the manual cleaning of visibly soiled surfaces, as their efficacy against organisms in body fluids has not been fully established. Use of these methods may require specialized equipment and PPE.
    - The ambulance can then be returned to service.

EVD-VHF Precautions

RESOURCES

- Bloodborne Infectious Diseases Risk Factors
- Bloodborne Pathogens Standard, 29 CFR 1910.1030
- Considerations for Safe Transport of Patients Infected with Ebola Virus
- Considerations for Selecting Protective Clothing used in Healthcare for Protection against Microorganisms in Blood and Body Fluids
- Example: Standard Operating Procedure (SOP) for Decontamination of an Ambulance that has Transported a Person Under Investigation or Patient with Confirmed Ebola
- Handling VHF-Associated Waste
- Interim Guidance for Environmental Infection Control in Hospitals
- List L: Disinfectants for Use Against the Ebola Virus
- Managing Solid Waste Contaminated with a Category A Infectious Substance
- Port Health Station Contact List
- PPE: Clinically Stable Patients Suspected to have VHF
- PPE: Confirmed Patients and Clinically Unstable Patients Suspected to have VHF
- PPE Selection Matrix for Occupational Exposure to Ebola Virus
- Safe Handling, Treatment, Transport, and Disposal of Ebola-Contaminated Waste
- Transport and Management of Patients with Confirmed Ebola Virus Disease

Special Considerations

HAND HYGIENE[23]

- During the delivery of health care, avoid unnecessary touching of surfaces in close proximity to the patient to prevent both contamination of clean hands from environmental surfaces and transmission of pathogens from contaminated hands to surfaces.
- When hands are visibly dirty, contaminated with proteinaceous material, or visibly soiled with blood or body fluids, wash hands with soap and water.
- If hands are not visibly soiled, or after removing visible material with soap and water, the preferred method of hand sanitizing is with ABHR.
- Wash hands with non-antimicrobial soap or with antimicrobial soap and water if contact with possible norovirus or spores (e.g., C. difficile or Bacillus anthracis) is likely to have occurred. The physical action of washing and rinsing hands under such circumstances is recommended because alcohols, chlorhexidine, iodophors, and other antiseptic agents have poor or variable activity against these pathogens.
- Do not wear artificial fingernails if duties include direct contact with patients at high risk for infections with associated adverse outcomes.

PANDEMIC

- PPE guidance for novel pathogens (e.g., novel influenza, novel coronavirus) may change rapidly. EMS agencies should monitor information from CDC and regulatory organizations at the state and federal level and have established contacts with infection prevention and control professionals.
- Novel influenza and coronavirus strains are usually initially managed according to Special Respiratory (standard + contact + airborne + eye protection) Precautions. If in doubt, the service should apply Special Respiratory Precautions until disease-specific guidance is available.

[23] 2007 Guideline for Isolation Precautions: Preventing Transmission of Infectious Agents in Healthcare Settings

Special Considerations

- Dispatch should update questions to reflect any screening needed for international, domestic, or local cases.
- Responding personnel should have a low threshold to mask the patient and wear appropriate PPE as novel respiratory viruses may be transmissible prior to the onset of symptoms.
- Pandemics can place enormous strain on EMS services due to high call volumes and provider illness. Crisis standards of care plans may need to be implemented, including but not limited to:
  - Adjusting resource assignments based on availability (e.g., police only on reported vehicle crash until non-ambulatory injuries confirmed).
  - Auto-answering and deferring callers to information/prescribing lines for non-emergency situations.
  - Recommending private transport when appropriate.
  - Changing to "closest hospital" transportation or "batch" transports.
  - Deferring select 911 requests for service.
  - Expanding "left at scene" discretion/guidelines and treat and no-transport guidelines.
  - Allowing non-hospital destinations for appropriate patients.
  - Changing staffing, crew configuration, and using novel response structures (e.g., "jump cars," community paramedic response).
  - Adopting N95 respirator conservation or re-use strategies.
- If EPA-registered disinfectants become unavailable or are in short supply during a pandemic, consider diluted bleach solution as per CDC and World Health Organization (WHO) guidance listed under the References section.
- Changes to 911 communications center protocols and EMS responses will require medical director and service director policy development and approval and may require local ordinance and state statutory relief. These policies and supporting governmental actions should be planned prior to an incident that overwhelms EMS resources.

Special Considerations

PEDIATRIC ISSUES

- Children may be very fearful of caregivers in high-level PPE. Ensure the ability to communicate with the child and explain what is happening and why in an age-appropriate manner.
- Caregivers who follow infectious precautions may be kept with the child in the ambulance if they wear appropriate PPE, have been providing care for the child during the current illness, and there is no substantial risk of body fluid exposure during transport.
- Pediatric intravenous access can be difficult and the need for access must be balanced against the potential risk for needlesticks in the setting of potential blood-borne pathogens.
- Appropriate sizes of simple masks should be available for children.
- Consider nasal/oral routes for analgesia and anxiolysis if intravenous access is not obtained.
- Ensure that comfort objects (e.g., blanket, stuffed animal) can accompany the patient during transport.
- Do not avoid indicated procedures and medications for children simply because of a perceived risk of distress.
- Children are able to compensate for hypovolemia much better than adults by increasing their heart rate. However, hypotension and cardiovascular collapse can occur with little warning. Elevated heart rates can also be seen with fever, anxiety, and pain, making a determination of origin difficult. Assess perfusion, history, and other signs before assuming tachycardia is not related to early shock/sepsis.
- When possible, specialized EVD/VHF transport units should include agencies that routinely provide pediatric critical care interfacility transport.
- EVD commonly induces miscarriage. Providers should be aware of this issue and potential exposures and complications.
- Portable pediatric isolation transport units are available but should only be used by personnel trained in their operation and limitations. The use of these units may significantly increase the patient's anxiety during transport.

Special Considerations

AEROMEDICAL TRANSPORT

Note: This section refers to domestic air medical transport providers only.

- Policies on rotor-wing and fixed-wing transport of potentially infectious patients should be in place in each agency and should include questions at the dispatch level and a process for providing information to the crews. Careful consideration should be given to whether aeromedical transport is appropriate for the specific patient. This may include consultation with the service medical director.
- Ensure dispatch provides sufficient information to anticipate potential infectious risks.
- Obtain patient information from original hospital for mission planning including suspect disease, signs/symptoms, appropriate PPE, equipment, and medications.
- Contact destination hospital to ensure appropriate reception planning including isolation room (if required) staff, cart, PPE, and traffic/patient movement plan. Ensure adequate medications are available including drips for transport (taking potential delays into account).
- For flights involving interface with ground transport units, ensure communications plan and confirm appropriately trained and equipped providers (define needs and roles – driver only vs. assuming medical care) as well as special ambulance preparation if there is suspicion for EVD/VHF. Maintain communications to verify arrival times.
- Provide information for ground unit or receiving hospital briefing as required.
- Ensure the transfer of medical records occurs safely and that records are not contaminated (e.g., seal in zippered clear plastic bag which can be wiped with disinfectant prior to hand-off).
- Review general patient care considerations for specific infectious precautions.
- Spill kit, alcohol-based hand disinfectant, emesis bags, suction, disposable rags, biohazard bags, and medical supplies should be organized similar to ground unit recommendations for suspect EVD/VHF transports.
- For long duration flights, consider providing a chemical toilet to ambulatory patients.
- Aeromedical clinical personnel should carefully plan and use PPE similar to ground units (including N95 use – must ensure that the selected disposable or elastomeric mask is compatible with helmets).

Special Considerations

- Aeromedical clinical personnel should carefully plan in-flight medical contingencies and have appropriate medications and equipment available to reduce contamination of non-required materials.
- Intubation should be performed at the hospital of origin if there is any concern about existing or potential respiratory insufficiency. Rapid sequence techniques should be used (as opposed to sedation-only techniques) to mitigate possible generation of infectious aerosols.
- Consider a self-enclosed (e.g., helmet-type) positive airway pressure device if available instead of usual non-invasive ventilation strategies.
- Consider oxygen supply and demand as most portable oxygen supplies are not capable of sustained high flow applications.
- Intubated cases with suspected airborne, droplet, special respiratory, or EVD/VHF diseases should have a HEPA filter in-line or on the ventilator exhaust.
- Responders should anticipate altitude-dependent changes in pulmonary mechanics as well as oxygen delivery. If a patient is not able to maintain oxygenation prior to transport despite intubation, positioning, paralysis, and 100% oxygen delivery, medical control consultation should be obtained.
- Movement of known EVD/VHF patients must be reported to CDC/Federal Aviation Administration (FAA) due to federal quarantine and isolation laws.
- Transports of suspect or confirmed EVD/VHF patients are typically performed by ground units but air ambulance should be considered for long distances. To contain infected materials and minimize contamination of the aircraft, a portable isolation unit is recommended for air ambulance transport. Coordination with the public health authority may help to identify qualified air ambulances through HHS.
- Pilots in rotor-wing aircraft transporting non-intubated airborne or special respiratory precautions patients should wear an appropriately fitted N95 respirator.
- Aeromedical services should ensure availability of medical control consultation during transport.

Special Considerations

OCCUPATIONAL HEALTH/EXPOSURES

- Initial and ongoing training in the types of available PPE and demonstrated proficiency in donning and doffing of PPE is critical to worker safety.
- EMS personnel – both dispatch and responders – should be provided awareness and education about evolving diseases and known outbreaks in the community (e.g., high prevalence of active TB in shelter population, known norovirus outbreak in local nursing home population) and appropriate PPE to protect workers from these risks as part of usual operational processes.
- Significant blood and body fluid exposures should be reported immediately to a supervisor. A medical evaluation should be completed based on organizational recommendations or policy.
  - » Significant exposures for EMS include blood, bloody saliva or urine, amniotic fluid exposure to eyes, mucous membranes, non-intact skin or by needlestick or bites. Any contact with blood or body fluids of EVD/VHF patients may be significant and should prompt decontamination and appropriate reporting.
  - » Appropriate HIV and hepatitis screening/Hepatitis B antibody serology should be available whenever indicated.
  - » Anti-HIV prophylaxis should be available whenever indicated.
  - » An infection prevention and control provider should be available for consultation by the agency as needed and be able to obtain patient test results.
- Contaminated clothing should be washed or discarded in accordance with disease-specific guidelines, generally with hot water, usual detergent, and the addition of household bleach as appropriate for the garment. Discarding contaminated clothing in accordance with regulated waste protocols is preferred when dealing with special pathogens.
- Higher levels of PPE cause increased heat stress as well as increased motor limitations that may lead to injury. These factors should be considered when determining the duties and duration of work while wearing the PPE ensemble.
- Responders should be fit for duty (including appropriate fatigue mitigation) and free of acute illness.

Special Considerations

- Responders should be medically monitored after providing care to a confirmed special pathogen case, even in the absence of a recognized exposure, for subjective illness and fever for the duration of the incubation period to ensure that any developing illness is recognized and swiftly evaluated. TB, hepatitis, and other exposures may require interval employee testing.
- EMS agencies should consider policies ensuring twice daily contact with exposed personnel to discuss potential symptoms and document fever checks for special pathogens.
- Any responder who develops signs of illness should not report to work or should immediately stop working and notify their supervisor.
  - » Prompt medical evaluation should be arranged and notification of local and state health departments should occur as appropriate.
- Responders should be assessed regarding possibility of post-exposure prophylaxis or treatment depending on the agent and exposure. Post-exposure prophylaxis is seldom indicated with the exception of direct contact with patients confirmed to have Neisseria meningitidis or after a needlestick or other high-risk exposure to an HIV positive source patient. Prophylaxis may be considered in unprotected exposures to special pathogens in consultation with infectious disease experts.
- EMS agencies should consider standardizing pre-exposure immunization requirements for personnel in accordance with public health vaccination recommendations.
- Behavioral health effects on responders exposed to or caring for a patient with a rare and highly infectious disease can be significant. Provision of support, resources, and appropriate follow-up is required to improve resiliency. Repeated exposures or a prolonged incident will increase risks of behavioral health consequences.
- Patients suspected of having a contagious disease, particularly one associated with high mortality or stigma, will have significant behavioral health consequences that must be addressed through reassurance, provision of support, timely and accurate information about their condition as well as normal responses to isolation and stress, and access to more specialized and culturally specific behavioral health follow-up and resources.

Special Considerations

In case of PPE breach for EVD/VHF precautions:

- Move immediately away from sources of contamination to an area where the breach can be evaluated and doffing of PPE is possible.
- Assess the nature of the breach.
- Assess the risk of exposure to skin and mucous membranes.
- Doff PPE according to usual protocol – do not create additional risk by rushing doffing or skipping steps.
- Wash thoroughly any exposed skin with soap and water, after which an ABHR can also be used. Care should be taken not to abrade or damage the skin.
- Flush exposed mucous membranes thoroughly with water.
- Note that bleach solutions are not recommended for cleansing of skin as they may damage the protective outer layer of the skin.
- Inform supervisory personnel, occupational health, and public health authorities **immediately** in the case of exposure to bodily fluids.
- Assess responder for the possibility of post-exposure prophylaxis or vaccination.

Special Considerations

RESOURCES

- Blood/Body Fluid Exposure Option
- Bloodborne Infectious Diseases Risk Factors
- Bloodborne Pathogens and Needlestick Prevention
- Collecting, Preserving and Shipping Specimens for the Diagnosis of Avian Influenza A(H5N1) Virus Infection Guide for Field Operations, Annex 7. Disinfection
- Crisis Standards of Care: A Systems Framework for Catastrophic Disaster Response
- Crisis Standards of Care: A Toolkit for Indicators and Triggers
- EMS Pandemic Influenza Guidelines for Statewide Adoption
- Example: Standard Operating Procedure (SOP) for Air-to-Ground (Air-Ground) Patient Handoff
- Guideline for Disinfection and Sterilization in Healthcare Facilities, 2008
- Interim Guidance for Air Medical Transport
- Q&A's about the Transport of Pediatric Patients (<18 years of age) Suspected or with Confirmed Viral Hemorrhagic Fever (VHF)
- Ryan White HIV/AIDS Treatment Extension Act of 2009
- Updated US Public Health Service Guidelines for the Management of Occupational Exposure to Human Immunodeficiency Virus and Recommendations for Postexposure Prophylaxis

References

ASPR and National Association of County and City Health Officials. (2022). Building Workforce Resilience through the Practice of Psychological First Aid: A Course for Leaders and Teams. (Free registration required.)

This course offers community leaders and teams the opportunity to consider and pursue coping and stress management strategies for supporting colleagues during a disaster response as stress levels increase for workers and the demands on organizations become more urgent.

CDC. (2007). 2007 Guideline for Isolation Precautions: Preventing Transmission of Infectious Agents in Healthcare Settings.

This document provides infection control guidelines for healthcare settings across the continuum of care.

CDC. (2007). 2007 Guideline for Isolation Precautions: Preventing Transmission of Infectious Agents in Healthcare Settings, Appendix A.

Though somewhat dated, this table provides a good association of selected infections and conditions with the type and duration of precautions. Note that EMS will not have a diagnosis to work with at the time of the encounter and will need to be conservative when assessing risk.

CDC. (2013). Blood/Body Fluid Exposure Option.

This document assists healthcare facilities in recording health care worker bloodborne pathogen exposures and their management.

CDC. (2024). Handling VHF-Associated Waste.

The information on this webpage helps healthcare providers and facility staff safely handle, transport, and dispose of waste associated with the care of patients with suspected or confirmed viral hemorrhagic fevers.

CDC. (2024). Clinical Guidance for Ebola Disease.

This webpage provides a variety of general resources for health care workers who may manage patients with Ebola Disease.

CDC. (2024). PPE: Clinically Stable Patients Suspected to have VHF.

This document provides guidance to healthcare workers on donning and doffing PPE while evaluating a clinically stable person under investigation for viral hemorrhagic fever who does not have bleeding, vomiting, or diarrhea.

References

CDC. (2024). C. diff: Facts for Clinicians.

This webpage provides answers to frequently asked questions related to C. difficile.

CDC. (2024). PPE FAQs.

This guidance answers frequently asked questions on topics such as the type of PPE to be worn in various situations, training resources, characteristics of different PPE items, donning and doffing protocols, and management of supplies.

CDC. (2024). Interim Guidance for Air Medical Transport.

This document provides guidance to air medical transport services on the safe transportation of patients with Ebola Disease or Marburg Virus Disease.

CDC. (2024). PPE: Confirmed Patients and Clinically Unstable Patients Suspected to have VHF.

This webpage includes guidance on the types of PPE that should be used by those caring for patients with select viral hemorrhagic fevers. It also includes steps for donning and doffing PPE as well as what trained observers should do to ensure these steps are followed.

CDC. (n.d.). Guideline for Disinfection and Sterilization in Healthcare Facilities (2008). (Accessed 6/3/2024.)

This guidance provides an overview of performance characteristics of various disinfectants to assist in selection.

CDC. (2024). Mpox Infection Prevention and Control in Healthcare Settings.

This webpage provides recommendations for Mpox infection prevention in health care settings. EMS responders are included among the health care personnel considered in the recommendations.

CDC. (2024). Interim Guidance for EMS Systems and 9-1-1 Answering Points.

This guidance provides details on the steps EMS providers should take when caring for a patient under investigation for select viral hemorrhagic fevers.

CDC. (2022). Interim Guidance for Infection Control within Healthcare Settings When Caring for Confirmed Cases, Probable Cases, and Cases under Investigation with Novel Influenza A Viruses Associated with Severe Disease.

This webpage provides guidance on avian influenza A (H7N9), Asian H5N1, and newly detected avian influenza H5 viruses in the U.S.

References

CDC. (2022). Infection Control Guidance: SARS-CoV-2.

This guidance provides information on the implementation of infection prevention practices in various health care settings. It includes considerations for EMS vehicle configuration when transporting suspect or confirmed COVID-19 patients.

CDC. (2019). Middle East Respiratory Syndrome (MERS).

This webpage provides background information about MERS, details where cases have been reported, answers frequently asked questions, and provides information for healthcare professionals, laboratories, and travelers.

CDC. (2024). Clinical Safety: Occupationally-acquired Infections and Healthcare Workers.

This web page includes resources to support occupational infection prevention practices and health care worker safety. It includes information on special pathogens, occupational infection prevention and control, bloodborne pathogen exposures and infections, personal protective equipment, immunization, aerosol generating procedures, and links to additional education and training resources.

CDC. (2007). Part III: Precautions to Prevent Transmission of Infectious Agents.

This section of the 2007 Guideline for Isolation Precautions describes the circumstances under which each type of infection control precaution is applied.

CDC. (2024). Port Health Station Contact List.

This page provides information on the 20 CDC Port Health Stations.

CDC. (n.d.). Sequence for Donning and Removing Personal Protective Equipment. (Accessed 6/3/2024.)

This poster includes graphics demonstrating the steps to safely don and doff PPE.

Department of Emergency Health Services. (n.d.). Emerging Infectious Diseases Videos for Prehospital Providers. (Accessed 6/3/2024.) University of Maryland Baltimore County.

This instructional series, comprised of nine modules, includes an introduction to infectious diseases, basic infection control concepts, considerations for personal protective equipment (including donning and doffing), personnel decontamination, patient transport, and transfer of patient care for patients with Ebola and other highly infectious diseases.

References

Environmental Protection Agency. (2023). Disinfectants for Emerging Viral Pathogens (EVPs): List Q.

This page assists users in identifying products whose maker claims have efficacy against difficult to inactivate viruses. The Emerging Viral Pathogens guidance applies to Marburg virus, Ebola virus, Mpox virus, SARS-CoV-2 and its variants, and Rabbit Hemorrhagic Disease virus.

Environmental Protection Agency. (2022). List L: Disinfectants for Use Against Ebola Virus.

The EPA lists products that meet the CDC's criteria for use against the Ebola virus on hard, non-porous surfaces. Products are listed by name and indicate whether they are approved for use in hospital/health care facilities, institutions such as schools and offices, and residences.

Environmental Protection Agency. (2022). Selected EPA-Registered Disinfectants.

This webpage lists antimicrobials registered by EPA as effective against a variety of pathogens.

Food and Drug Administration. (2023). N95 Respirators, Surgical Masks, Face Masks, and Barrier Face Coverings. U.S. Department of Health and Human Services.

This web page describes the characteristics and intended uses of N95 respirators and various types of masks and face coverings.

International Academies of Emergency Dispatch. (2020). Emerging Infectious Disease Surveillance Tool (COVID-19).

This protocol is intended to guide the response of EMS agencies to a patient potentially infected with SARS-CoV-2.

International Academies of Emergency Dispatch. (2020). Protocol 36: Pandemic/Epidemic/ Outbreak.

This protocol is intended to guide the response of EMS agencies during a pandemic, epidemic, or outbreak.

Isakov, A., Miles, W., Gibbs, S., et al. (2015). Transport and Management of Patients with Confirmed Ebola Virus Disease. Annals of Emergency Medicine. 66(3):297-305.

This article describes the partnerships between hospitals and EMS agencies in Nebraska and Georgia to develop policies and practices ensuring the safe transport and management of patients with serious communicable diseases.

References

Jenkins, J., Hsu, E., Russell, A., et al. (2022). Infection Prevention and Control for the Emergency Medical Services and 911 Workforce. U.S. Department of Health and Human Services, Agency for Healthcare Research and Quality.

This technical brief summarizes current evidence related to EMS and 911 workforce exposures to infectious pathogens and practices to prevent, recognize, and control exposures and illness.

Kuhar, D., Henderson, D., Struble, K., et al. (2013). Updated US Public Health Service Guidelines for the Management of Occupational Exposure to Human Immunodeficiency Virus and Recommendations for Postexposure Prophylaxis. Infection Control and Hospital Epidemiology. 34(9):875-892.

This document provides recommendations on the management of health care workers with occupational exposure to blood or other body fluids possibly containing HIV.

Lowe, J., Jelden, K., Schenarts, P., et al. (2014). Considerations for Safe Transport of Patients Infected with Ebola Virus. Prehospital Emergency Care. 19(2):179-183.

This article discusses the coordinated response between the Nebraska Biocontainment Unit and Omaha Fire Department EMS to transport patients with confirmed EVD from West Africa from the airport to the high-level isolation unit.

The National Academies of Science, Engineering, and Medicine. (2012). Crisis Standards of Care: A Systems Framework for Catastrophic Disaster Response.

This report provides a foundation for the underlying principles of crisis standards of care, the steps needed for implementation, and the pillars of the emergency response system that ensures crisis standards of care planning and response occurs.

The National Academies of Science, Engineering, and Medicine. (2013). Crisis Standards of Care: A Toolkit for Indicators and Triggers.

This toolkit includes indictors, triggers, and tactics for EMS pandemic planning in Toolkit Part 2: Emergency Medical Services, pages 145-158.

National Emerging Special Pathogens Training and Education Center (NETEC). (2018). Containment Wrap in a Special Pathogen Isolation Area.

This training video demonstrates how to transfer a patient infected with a special pathogen in a containment wrap.

References

NETEC. (2024). Q&A's about the Transport of Pediatric Patients (<18 years of age) Suspected or with Confirmed Viral Hemorrhagic Fever (VHF).

This webpage provides first responders with information to help protect themselves, younger patients, and patients' family members by answering the most frequently asked questions.

NETEC. (n.d.). Example: Standard Operating Procedure (SOP) for Air-to-Ground (Air-Ground) Patient Handoff. (Accessed 6/3/2024.)

This sample SOP is intended to enable the successful handoff of patients between air and ground ambulance agencies.

NETEC. (n.d.). Example: Standard Operating Procedure (SOP) for Decontamination of an Ambulance that has Transported a Person under Investigation or Patient with Confirmed Ebola. (Accessed 6/3/2024.)

This sample SOP is intended to assist EMS agencies in standardizing procedures and responsibilities related to the decontamination and disinfection of ambulances used to transport patients with EVD.

NETEC. (n.d.). Example: Standard Operating Procedure (SOP) for Patient Handoff between a Healthcare Facility and a Transporting Ambulance. (Accessed 6/3/2024.)

This sample SOP is intended to enable planning between an EMS agency and healthcare facility on the handoff of patients with serious communicable diseases.

NETEC. (2022). EMS Biosafety Transport: Viral Hemorrhagic Fevers: Ebola Virus Disease.

This online course instructs EMS professionals in biosafety considerations when transporting patients suspected or confirmed to be infected with a viral hemorrhagic fever.

NETEC. (2023). EMS Guidelines for Marburg Virus Disease.

This page provides background information on Marburg virus disease, describes the identify-isolate-inform framework, discusses the hierarchy of controls, and provides links to additional resources.

NETEC. (2022). EMS Response to the Current Outbreak of Mpox.

This page provides a situation update on the Mpox outbreak and strategies for EMS to prevent disease transmission.

References

NETEC. (n.d.). NETEC Exercise Templates. (Accessed 6/3/2024.)

This web page includes links to various Homeland Security Exercise and Evaluation Program-compliant templates to assist health care coalitions, frontline facilities, assessment hospitals, state-designated Ebola treatment centers, regional Ebola and special pathogen treatment centers, and their respective response partners in the planning and conduct of exercises on the identification, assessment, treatment, management, transport, and transfer of high-risk patients. The site includes tabletop exercise templates for regional transport plans for both Ebola and airborne special pathogens. There is also a beginners guide to assist users new to exercise planning.

National Highway Traffic Safety Administration. (2007). EMS Pandemic Influenza Guidelines for Statewide Adoption. U.S. Department of Transportation.

This document provides guidance to EMS agencies on the development of pandemic influenza plans and protocols. While the document precedes the 2009 H1N1 pandemic it is still the most comprehensive planning resource for EMS.

The National Institute for Occupational Safety and Health. (2024). Bloodborne Infectious Diseases Risk Factors.

This webpage includes various resources for health care workers potentially exposed to a bloodborne infectious disease through a needlestick or sharps injury.

The National Institute for Occupational Safety and Health. (2020). Considerations for Selecting Protective Clothing used in Healthcare for Protection against Microorganisms in Blood and Body Fluids.

This webpage provides considerations for the selection of PPE items based on their barrier properties and includes links to current standards and specifications for fluid-resistant and impermeable gowns and coveralls.

Occupational Safety and Health Administration. (n.d.). Bloodborne Pathogens Standards, 29 CFR 1910.1030. (Accessed 6/3/2024.)

This page contains the regulatory language for the bloodborne pathogens standard.

Occupational Safety and Health Administration. (2009). Pandemic Influenza Preparedness and Response Guidance for Healthcare Workers and Healthcare Employers.

This document provides an overview of infection control and other standards appropriate for pandemic influenza.

References

Occupational Safety and Health Administration. (2014). PPE Selection Matrix for Occupational Exposure to Ebola Virus.

The U.S. Department of Labor shares information on the type of PPE to be worn in various situations (e.g., normal work activities, casual interaction, providing medical and supportive care, cleaning and disinfecting environments, and dealing with waste).

Occupational Safety and Health Administration. (n.d.). Respiratory Protection Standards. (Accessed 6/3/2024.)

This page contains standards on respirators, respiratory protection, and the medical evaluation program.

Occupational Safety and Health Administration. (2016). Safe Handling, Treatment, Transport, and Disposal of Ebola-Contaminated Waste.

This fact sheet provides a step-by-step summary of actions workers should take from the point Ebola-contaminated waste is generated through final disposal.

Sehulster, L. and Chinn, R. (2003). Guidelines for Environmental Infection Control in Health-Care Facilities: Recommendations of CDC and the Healthcare Infection Control Practices Advisory Committee (HICPAC). Morbidity and Mortality Weekly Report. 52(RR10):1-42.

This report provides recommendations for environmental infection control in healthcare facilities. Note that an erratum to this report is also available.

U.S. Department of Health and Human Services and U.S. Department of Transportation. (n.d.). Guidance for Developing a Plan for Interfacility Transport of Person Under Investigation or Confirmed Patients with Ebola Virus Disease in the United States. (Accessed 6/3/2024.)

This guidance is intended to support EMS agencies in the development of plans and procedures for the interfacility transport of suspected or confirmed Ebola Disease or Marburg Virus Disease patients.

Various Federal Agencies. (2022). Managing Solid Waste Contaminated with a Category A Infectious Substance.

This federal interagency guidance is intended to improve the safe handling of Category A contaminated solid waste.

References

World Health Organization. (2006). Collecting, Preserving and Shipping Specimens for the Diagnosis of Avian Influenza A(H5N1) Virus Infection Guide for Field Operations: Annex 7. Disinfection.

This guide provides information on the preparation of chlorine bleach solutions for disinfection purposes.

World Health Organization. (2007). Standard Precautions in Health Care.

This fact sheet provides healthcare facility recommendations for standard precautions.

Index of Abbreviations

ABHR	alcohol-based hand rub
AIDS	acquired immune deficiency syndrome
AIIR	airborne infection isolation room
ALS	advanced life support
AMT	air medical transport
ASPR	Administration for Strategic Preparedness and Response
BiPAP	bilevel positive airway pressure
BLS	basic life support
BP	blood pressure
CAD	computer aided dispatch
CDC	Centers for Disease Control and Prevention
CPAP	continuous positive airway pressure
CPR	cardiopulmonary resuscitation
ECC	emergency communications center
EMS	emergency medical services
EMT	emergency medical technician
EPA	Environmental Protection Agency
ETA	estimated time of arrival
EVD	Ebola virus disease
FAA	Federal Aviation Administration
GI	gastrointestinal
HCID	high consequence infectious disease
HEPA	high-efficiency particulate air
HHS	U.S. Department of Health and Human Services
HIV	human immunodeficiency virus
IVF	intravenous fluids
MERS	Middle East Respiratory Syndrome
MRSA	Methicillin-resistant Staphylococcus aureus
MVD	Marburg virus disease
NETEC	National Emerging Special Pathogens Training & Education Center
NIH	National Institutes of Health
NIOSH	National Institute for Occupational Safety and Health
PAPR	powered air-purifying respirator
PPE	personal protective equipment

Index of Abbreviations

PSAP	public safety answering point
PUI	persons under investigation
RSV	respiratory syncytial virus
SOP	standard operating procedure
TB	tuberculosis
TRACIE	Technical Resources, Assistance Center, and Information Exchange
VHF	viral hemorrhagic fever
VRE	Vancomycin-resistant enterococci
WHO	World Health Organization

Acknowledgments

This playbook is a project of ASPR TRACIE with initial draft materials developed by **Alexander Isakov**, MD, MPH, Emory University; additional contributions and editing by **John Hick**, MD, HHS ASPR TRACIE and Hennepin County Medical Center; and review by the TRACIE team in 2017. ASPR TRACIE gratefully acknowledges the contribution of materials from CDC, HHS/ASPR, the Emory-Grady EMS Biosafety Transport Program (**Wade Miles, Aaron Jamison, Gail Stallings, John Arevalo, Jim Zerylnick, Sam Shartar**), and the EMS Biosafety Transport Consortium (Emory University/Grady EMS, University of Nebraska Medical Center/Omaha Fire Department, U.S. Department of State/Office of Operational Medicine, National Institutes of Health (NIH) Division of Fire and Rescue Services/NIH Division of Occupational Health and Safety, Fire Department of New York, Phoenix Air Group, American Medical Response). **Dr. Isakov** revised the playbook in 2023 with extensive review and input from **Dr. Hick**; **Chad Bowman**, MSN, RN, CFRN, NR-P, LIFELINE Critical Care Transport Team, The Johns Hopkins Hospital; **Stefanie Lane**, MPH, MS, Massachusetts General Hospital Center for Disaster Medicine; **Chris Laporte**, Mass General Brigham; **Wade Miles**, NRP, Emory University Office of Critical Event Preparedness and Response; **Ben Tysor**, NRP, Omaha Fire and Rescue; and the ASPR TRACIE team.

Additionally, ASPR TRACIE thanks the following subject matter experts for their review of the original and/or Version 2.0 of the playbook: **Eric Alberts**, CEM, FPEM, FPEM-HC, CHPP, CHEP, SEM, Orlando Health, Inc.; **Howard Backer**, MD, MPH, California Emergency Medical Services Authority; **Paul Biddinger**, MD, FACEP, Mass General Brigham; **Paul Brooks**, Department of Homeland Security Office of Health Affairs; **Thomas Breyer**, International Association of Fire Fighters; **Stephen Cantrill**, MD, Denver Health and Hospital Authority; **John Chiaramonte**, Mission Critical Partners, Inc.; **Carol Cunningham**, MD, Ohio Department of Public Safety; **Drew Dawson**, National Highway Traffic Safety Administration Office of Emergency Medical Services (former); **Daniel Dodgen**, PhD, ASPR Office of Policy and Planning; **Chad Dowell**, MS, National Institute for Occupational Safety and Health; **Eileen Frazer,** RN, CMTE, Commission on Accreditation of Medical Transport Systems; **Patricia Frost**, RN, MS, Contra Costa Health Services; **Scott Giberson**, BSPharm, MPH, Centers for Medicare and Medicaid Services; **Jack Herrmann**, MSEd, ASPR Office of Policy and Planning; **Ken Hopper**, ASPR Office of Emergency Management; **Kevin Horahan**, JD, MPH, ASPR Office of Emergency Management; **Rick Hunt**, MD, ASPR Hospital Preparedness Program; **Mark Jarrett**, MD, MBA, MS, Northwell Health; **Rachel Kaul**, LCSW, ASPR Office of Policy and Planning; **Jon Krohmer**, MD, National Highway Traffic Safety Administration; **Pamela Lane**, MA, National Association of Emergency Medical Technicians; **Sherline Lee**, MPH, Centers for Disease Control and Prevention; **Syra Madad**, DHSc, MSc, New York City Health + Hospitals; **Robert McClintock**, International Association of Fire Fighters; **Rick Murray**, EMT-P, American College of Emergency Physicians; **Amber Payne-Gregory**, RN, BSN, MBA, CFRN, CMTE, Airmed International; **Dave Pigott**, MD, The University of Alabama at Birmingham Medicine; **Frank Pratt**, MD, MPHTM, Los Angeles County Department of Public Health; **Angel Rivasrivera**, MSN, BSN, ASPR Office of Emergency Management; **Dennis Rowe**, NREMT-P, National Association of Emergency Medical Technicians; **Terry Schenk**, MS, CEM, Florida Department of Health; **Leslee Stein-Spencer**, RN, MS, National Association of State EMS Officials; **Amy Valderrama**, PhD, RN, Centers for Disease Control and Prevention; **Lynn White**, MS, American Medical Response; and representatives of the National Association of EMS Physicians and the National Association of Emergency Medical Technicians.

.

Brought to you by HHS ASPR, the Technical Resources, Assistance Center, and Information Exchange (TRACIE) was created to meet the information and technical assistance needs of regional ASPR staff, healthcare coalitions, healthcare entities, healthcare providers, emergency managers, public health practitioners, and others working in disaster medicine, healthcare system preparedness, and public health emergency preparedness. Find out more by visiting https://asprtracie.hhs.gov/ or accessing this fact sheet, or email us with any questions or requests for technical assistance.

ASPR
ADMINISTRATION FOR STRATEGIC PREPAREDNESS AND RESPONSE

TRACIE
HEALTHCARE EMERGENCY PREPAREDNESS INFORMATION GATEWAY