Guidance for Developing a Plan for Interfacility Transport of Persons Under Investigation or Confirmed Patients with Ebola Virus Disease in the United States

What this is for: Developing plans for personnel, including ground and air medical transport providers, managers of EMS agencies, EMS medical directors, local and state EMS systems, local and state health departments, healthcare facilities, and others involved in the interfacility (including intrastate or interstate), transport of persons under investigation (PUIs) or patients with confirmed Ebola virus disease (Ebola).

Who this is for: Managers of emergency medical services (EMS) agencies, EMS medical directors, local and state EMS systems, EMS personnel, including ground and air medical transport providers, local and state health departments, and healthcare coalitions.

How to use: State EMS officials and regional and state EMS planners can use this information to develop regional transport networks, local transport plans, and standard operating procedures. Managers and medical directors can use this guidance to develop procedures and protocols for their services to conduct interfacility transport (including intrastate or interstate) of PUIs and patients with confirmed Ebola. They may also use the information to prepare, educate, and train EMS personnel. Individual providers may use this information to stay safe when responding to and transporting PUIs or patients confirmed to have Ebola.

Background

The Ebola outbreak in West Africa increased the possibility of patients with Ebola traveling from countries with widespread transmission or uncertain control measures to the United States.[1] The likelihood of contracting Ebola is extremely low unless a person has had direct, unprotected contact with blood or body fluids (including but not limited to urine, saliva, sweat, feces, vomit, breast milk, and semen) of a person who is sick with or has died from Ebola.[2] Symptoms of Ebola include fever, severe headache, muscle pain, weakness, fatigue, diarrhea, vomiting, abdominal pain, and unexplained hemorrhage (bleeding or bruising).[3]

PUIs or patients with confirmed Ebola[4] may need to be transported to a designated Ebola treatment center (ETC)[a] for further management and care, particularly if they initially present at a frontline healthcare facility or Ebola assessment hospital. [5] Coordination is needed to facilitate patient transfers to a designated ETC.

To address the needs of America's EMS providers, CDC and partners from the Federal Interagency Committee on Emergency Medical Services (FICEMS) developed *Interim Guidance for Emergency Medical Services (EMS) Systems and 9-1-1 Public Safety Answering Points (PSAPs) for Management of Patients with Known or Suspected Ebola Virus Disease in the United States*. An accompanying algorithm for EMS and 9-1-1 centers/Public Safety Answering Points (PSAPs) was also developed that illustrates the process of patient management and care from 9-1-1/PSAPs to the scene, then to the hospital and afterwards, including addressing key topics such as disinfection and waste disposal. Partner conference calls with EMS stakeholders highlighted a need for interfacility transport guidance. As planning for regional ETCs[b], state- or jurisdiction-designated ETCs, and Ebola assessment hospitals is ongoing, much of the success of this strategy will depend on the ability to safely and efficiently transport patients to the appropriate facility.[5,6] This will require coordination and collaboration among many groups, including state and local public health, state and local EMS agencies, private and public providers (which includes fire-based delivery models), ground and air medical transport agencies, emergency management, healthcare, healthcare coalitions, and others.

---

[a] Acute healthcare facilities can serve one of three roles: as a frontline healthcare facility, Ebola assessment hospital, or Ebola treatment center. Frontline healthcare facilities should be prepared to promptly identify and isolate patients who may have Ebola and promptly inform the hospital/facility infection control program and state and local public health agency. Frontline healthcare facilities, in accordance with the state's plan, should consider immediately transferring patients who have a higher probability of Ebola or are more severely ill to either an Ebola assessment hospital or to an Ebola treatment center that can provide Ebola testing and care for the higher risk patients until an Ebola diagnosis is either confirmed or ruled out. Ebola assessment hospitals are facilities prepared to receive and isolate PUIs and care for the patient until a diagnosis of Ebola can be confirmed or ruled out and until discharge or transfer is completed. Because it may take 72 hours or longer after symptom onset to definitively confirm or rule out an Ebola diagnosis (with an additional 12 to 24 hours for specimen transport, testing, and identification of another facility for transfer if needed), Ebola assessment hospitals should be prepared to provide care for PUIs for up to 96 hours. Ebola treatment centers are facilities that plan to care for and manage a patient with confirmed Ebola for the duration of the patient's illness. State and local decisions to designate Ebola treatment centers are informed by the results of a CDC site visit conducted by an interdisciplinary team of subject matter experts. Additional information about the tiered approach is available at http://www.cdc.gov/vhf/ebola/healthcare-us/preparing/hospitals.html.

[b] HHS' Office of the Assistant Secretary for Preparedness and Response (ASPR) awarded approximately $20 million through its Hospital Preparedness Program (HPP) to enhance the regional treatment centers' capabilities to care for patients with Ebola or other highly infectious diseases. Regional ETCs are part of a national network of ETCs, but have enhanced capabilities to treat a patient with confirmed Ebola or other highly infectious disease.

The purpose of this document is to provide guidance for developing plans for personnel, including ground and air medical transport providers, as well as managers of EMS agencies, EMS medical directors, local and state EMS systems, local and state health departments, healthcare facilities, and others involved in the interfacility (including intrastate or interstate) transport of PUIs or patients with confirmed Ebola.[c] While each jurisdiction is different, regional and state EMS planners can use this planning guidance to assist with increasing coordination, developing regional transport networks, local transport plans, and standard operating procedures (SOPs), and engaging partners to prepare and conduct interfacility transports of PUIs or patients with confirmed Ebola. A variety of stakeholders from the jurisdiction, region, and/or state should be involved in the development of the plans. Jurisdictional needs and resources should be taken into consideration and planners should clarify the level of engagement expected from local EMS agencies.[6] The guidance is presented at a level of detail that will afford local planners and operators the flexibility to develop procedures that are suitable for their environment. This guidance document is to be used as a supplement to other published guidance.[7,8,12]

In this document the term "EMS transport agency" refers to EMS agencies and ambulance services that are conducting the interfacility transport of a PUI or patient with confirmed Ebola.

Of note, the air transport aspects of this guidance are focused on fixed-wing transport and not rotor-wing. In addition, this guidance does not address the transportation of human remains that may contain Ebola virus. CDC developed separate guidance about postmortem preparation, transportation of human remains, mortuary care, and disposition of remains.[39]

Three separate standard operating procedures (SOPs) are appendices to this guidance. They include:

1. Example: Standard Operating Procedure (SOP) for Patient Handoff between a Healthcare Facility and a Transporting Ambulance
2. Example: Standard Operating Procedure (SOP) for Decontamination of an Ambulance that has Transported a Person under Investigation or Patient with Confirmed Ebola
3. Example: Standard Operating Procedure (SOP) for Air-to-Ground (Air-Ground) Patient Handoff

These SOPs can be used as templates or guides for the development of local/state/jurisdiction level SOPs. Other resources may also be used for the development of SOPs.

[c] This guidance does not address the transportation of human remains that may contain Ebola virus. Guidance has been developed by CDC about postmortem preparation, transportation of human remains, mortuary care, and disposition of remains (http://www.cdc.gov/vhf/ebola/healthcare-us/hospitals/handling-human-remains.html).

Acknowledgments

Listed below are the people who provided input into or reviewed this guidance document.

Subject Matter Experts from Associations and Federal Agencies

U.S. Department of Health and Human Services
Centers for Disease Control and Prevention (CDC)
Office of Public Health Preparedness and Response (OPHPR)
Division of State and Local Readiness
CDR Amy Valderrama (U. S. Public Health Service)
Sherline Lee
CAPT Deborah Levy (U. S. Public Health Service)
Jean Randolph
CAPT Dahna Batts (U. S. Public Health Service)
Kelly Dickinson
John Donohue
Sabrina Harper

OPHPR, Office of the Director
LCDR Stephanie Griese (U. S. Public Health Service)

National Center for Emerging and Zoonotic Infectious Diseases (NCEZID)
Division of Healthcare Quality Promotion
Matthew Arduino

National Center on Birth Defects and Developmental Disability (NCBDDD)
Cynthia Hinton

National Institute for Occupational Safety and Health (NIOSH)
CAPT Renee Funk (U. S. Public Health Service)
CDR Jill Shugart (U. S. Public Health Service)

U.S. Department of Health and Human Services
Assistant Secretary for Preparedness and Response (ASPR)
Office of Policy and Planning
Division of Health Systems Policy
Kevin Horahan
Gregg Margolis

Office of Emergency Management
Operations Division
Ken Hopper

Joseph Lamana

U.S. Department of Transportation
CAPT Lynn Slepski (U. S. Public Health Service)

National Highway Traffic Safety Administration (NHTSA)
Office of Emergency Medical Services
Drew Dawson
Gamunu Wijetunge

Pipeline and Hazardous Materials Safety Administration (PHMSA)
Eileen Edmonson
John Heneghan
Adam Horsley

U.S. Department of Homeland Security, Office of Health Affairs
Hayley Hughes
Raymon Mollers

Health Resources and Services Administration, Maternal and Child Health Bureau
Elizabeth Edgerton
Theresa Morrison-Quinata

U.S. Department of Labor, Occupational Safety & Health Administration
Christopher K. Brown

U.S. Environmental Protection Agency, Office of Solid Waste and Emergency Response
Erica Canzler
Francisco J. Cruz
Betsy Devlin
Schatzi Fitz-James
Mike Nalipinski

Association of State and Territorial Health Officials (ASTHO)
Steven Blessing
Jim Craig
Christopher Rinn
Eric Sergeant

American Academy of Pediatrics (AAP)

Sherman J. Alter
Jane Marie Carnazzo
H. Dele Davies
Margaret C. Fisher
Robert George Holcomb, Jr.
Mary Anne Jackson
Michael T. Meyer
Gordon E. Schutze

American College of Emergency Physicians (ACEP)
James J. Augustine
Stephen V. Cantrill
Robert A. De Lorenzo
Jeffrey M. Goodloe
Jon Mark Hirshon
Alexander Isakov
Kristi L. Koenig
Peter T. Pons
Fred A. Severyn

National Association of Emergency Medical Technicians (NAEMT)
Jeff Beeson

National Association of State EMS Officials (NASEMSO)
Howard Backer
Paul Patrick
Joseph Schmider
Leslee Stein-Spencer

National EMS Management Association (NEMSMA)
MONOC, New Jersey's Hospital Service Corporation
Peter I. Dworsky
Care Ambulance Service
Troy Hagen

Association of Air Medical Services (AAMS)

Emergency Nurses Association (ENA)

International Association of Fire Chiefs (IAFC)

National Association of EMS Physicians (NAEMSP)

The InterAgency Board

Individuals:

Emory University School of Medicine
Department of Emergency Medicine, Section of Prehospital and Disaster Medicine
Alexander Isakov

University of Nebraska Medical Center, Nebraska Biocontainment Patient Care Unit
John Lowe

Grady Emergency Medical Services (Atlanta)
Aaron Jamison
Wade Miles

Indiana University, School of Public Health-Bloomington
Shawn G. Gibbs

Phoenix Air Group, Inc.
Michael Flueckiger

Wyoming Department of Health, Office of Emergency Medical Services
Andy Gienapp

Contents

1. Coordination, Planning, and Partners — Before, During, and After the Transport

Key Points

- Coordination among public health, healthcare, EMS, healthcare coalitions, law enforcement, and emergency management should occur during all phases of preparation and planning, and throughout the interfacility transport, as appropriate.
- Multidisciplinary coordination is an essential element of safe and effective interfacility transport and is strongly emphasized in this planning guidance.
- Existing relationships between healthcare facilities and EMS providers should be respected and encouraged. A strong EMS/hospital interface, with training, exercises, and development of SOPs that involve both healthcare and EMS providers, will contribute to confusion-free operations and development of best practices. A strong EMS/hospital interface will also provide optimal care for the patient, while providing for the safety of the healthcare providers, both in and out of the hospital.
- Planners may consider adopting a phased approach due to the complexity of coordination for this event. A deliberate, measured approach may be helpful when developing these plans and procedures, while allowing stakeholders to think critically about each phase of the process, including before, during, and after the transport.
- Some jurisdictions may choose to stand up an Emergency Operations Center (EOC) or Incident Command System (ICS) using Unified Command during the transport process.

Considerations

Pre-transport planning

Coordination with public health, state/local EMS, emergency management, and healthcare coalition

Relationship-building

- Identify and coordinate with state/local governments, state/local public health, state/local EMS, emergency management, healthcare coalitions, law enforcement, unions, and others as appropriate to the jurisdiction who should be involved in planning for interfacility transport of a PUI or patient with confirmed Ebola.
- Identify and define the role of the state/local public health official(s) and ensure they are integrated into the planning and coordination of these transports, with particular emphasis on EMS system coordination.
- Coordinate with state and local public health agencies and other government entities (local, county, state) on training, planning, and transport activities.
- Coordinate with state/local law enforcement on planning and transport issues, such as airport security, facilitating transport, security at receiving facility, etc.
- Coordinate with state/local authorities on planning and transport, specifically pre-approval of roadway routes and ensuring proper authorities are available to respond to any issues related to the route during transport. Determine who will establish primary transport routes and alternatives, including security and maintenance of the routes (e.g., plowing or salting during a snow event).
- Identify and build relationships with authorities at the local airport.

- Ensure involvement in healthcare coalition planning efforts by EMS, emergency management, law enforcement, and others with roles in interfacility transport of the PUI or confirmed patient
- For interstate transport, pre-identify and coordinate with the primary liaison(s) or contact(s) in other state(s) involved with transport.

Notification and decision-making

- Verify whether your jurisdiction has a state/local infectious disease transport plan and what agencies are responsible for implementing the plan. Ensure all efforts in the jurisdiction are aligned to this transport plan, if available.
- Determine which agencies have the responsibility and authority for the following:
    - Developing a coordinated Unified Command through each stage of the event. Determine if any modifications to the ICS structure will be needed for the response.
    - Providing notification to public health, healthcare agencies, hospitals, EMS, emergency management, and law enforcement that a PUI or patient with confirmed Ebola is in their jurisdiction, determining how this notification will occur, and coordinating the transfer with the facilities.
    - Deciding which facility will receive the patient and whether this is the assessment hospital (for PUIs) or regional, state, or jurisdiction-designated ETC. This discussion should include the possible length of time for the transport and staffing needs.
    - Identifying an alternative receiving facility in the event that the designated ETC is unavailable to accept patients.
    - Deciding which EMS transport agency will conduct the transport. Check with the receiving facility and with local EMS agencies to see if there is already a dedicated ambulance and/or transport team identified. All EMS agency staff should be trained to screen for symptoms of Ebola, including during transport. Due to the extensive training necessary and the equipment and supplies that may be needed both for transport and training, one EMS agency may be selected or volunteer to take the responsibility of being the designated transport team.
- For interstate transports, determine which state will be the lead for the transport. This may impact financial responsibility and chain of command.
- Verify your jurisdiction's plan and the designated ETCs for caring for patients with Ebola.
- Determine who has financial responsibility for the transport services.
- Ensure that protocols are in place for notifying and activating the EMS transport agency. Engage state/local public health and designated healthcare facilities in these discussions.
- Determine the medical authority for the patient while in transit. This will generally be the transporting EMS agency medical director or designee.
- Determine contacts among law enforcement required for escort.
- Determine the process for establishing routes and alternate routes if needed.
- If a transport team from the ETC will be used, determine how long it will take for the team to arrive and how they will be activated.
- Determine which staff will conduct the transfer (e.g., a specially trained group of prehospital providers, trained hospital staff, etc.). Consider how many and what level of staff will be involved, their necessary training, and the vehicle configuration and capabilities.
- Engage the person(s) responsible for worker safety and infection control of EMS transport crew.

- Determine who will conduct monitoring[22] of the EMS transport agency personnel that have direct contact with the patient.
- Discuss appropriate level of personal protective equipment (PPE) based on risk of exposure and patient symptoms.
- Discuss PPE supply and availability for the transport teams through local partners, including healthcare coalitions and other non-EMS external partners.
- Ensure that policies and protocols exist for transporting pediatric patients.
- Consider coordinating with social services to assist with additional support for the patient's family and significant others.
- Ensure there are capabilities for patients with functional or access needs (e.g., hearing, vision, limited mobility), device dependence, and limited English proficiency, and for pediatric or elderly patients.
- Work with partners to review existing plans or to develop plans for
    - Addressing the needs of the patient's family and significant others, including communication, education, transport to the patient's destination, etc.
    - Managing a patient who is under a diplomatic visa/passport and determining how this will affect transport procedures and communication.
    - Assessing the need for security during transport, at the sending and receiving facility, and along the transport route, as needed.
    - Managing the death of a patient during transport, either during ground or air transport, and within or outside the EMS transport agency's jurisdiction.
    - Contingencies in the event that primary transport service is unavailable.
    - Contingencies for other issues, such as vehicle malfunction or failure prior to arrival at the destination, medical equipment failure, unavailable or closed route for transport, motor vehicle collision, breach in PPE during the transport, provider unable to continue duties, and/or hostile/combative patient.
    - Equipment and medication needed during the transport and where these will be located.
    - Medical waste containment and disposal.
    - Packaging and transportation of the waste for disposal pursuant to federal requirements, including the Hazardous Materials Regulations (HMR, 49 C.F.R., Parts 171-180).[35]
    - Ambulance and equipment disinfection and decontamination, and where this will be done (e.g., location at the receiving facility).
    - Patient tracking, particularly for multiple patients.
    - Local EMS and/or transport agency personnel documentation and tracking.
    - Personnel monitoring, as appropriate.
- Work with the agency and partners on plans that cover the following for employees involved in these patient transports:
    - Employer time off policies,
    - Quarantine (if needed/mandated),
    - Isolation precautions,
    - Housing,
    - Worker compensation,
    - Salary replacement,

    - Healthcare expenses, and
    - Return to family/home contacts.
- Decide on plans for communicating with personnel since some staff may be reluctant to provide care for PUIs or those confirmed to have Ebola. Provide details on what staff are required to do and what is voluntary.
- For interstate transport, coordinate with the primary liaison or contact in other state(s) involved with transport, including state health officials. If ground-to-ground transport handoff is necessary, determine the location for handoff, and ensure that it can be secured and waste can be managed. Develop clear/concise guidelines for providers if ground-to-ground transport is necessary. Verify that any containment equipment and devices to be used during the transport that are specific to a state can fit within the load-carrying dimensions of all planned transport vehicles. Verify that all providers are still operating under their licenses as needed in any states involved, if the transport crosses state lines.

Communications

- Develop a communications plan that describes if and when the EMS transport agency, emergency management, law enforcement, public health, and the sending and receiving facilities will need to communicate with each other and how they will communicate (e.g., cell phones vs. radios that could be monitored by scanners).
- Ensure that the communications plan includes communication between the transport vehicle and command throughout the transport.
- Ensure standardized, secure, and redundant communication between transport partners, including standardized turnover or handoff communication.
- Determine to whom changes in the patient's status will be communicated, how this will be communicated, and by whom.
- Ensure that all communications plans and technologies adequately protect the patient's identity and comply with HIPAA (Health Insurance Portability and Accountability Act).
- Determine who will provide the patient's family and significant others with information about the receiving facility.
- Designate a media staging area for air–to-ground transports. **Note:** Media staging and public information are major components of air-to-ground patient handoff for both military and civilian airports. The airport authority or local law enforcement should designate and maintain a perimeter for the media staging area.

Education and training

- Develop a plan for the ongoing training of personnel who will be involved in interfacility transports. The plan should delineate who should receive initial education, what education is needed, and how and by whom the education will be delivered. The plan should establish the competency criteria and documentation requirements. Training should include real-time exercises about:
    - Communications
    - Patient care during transport
    - Infection control practices
    - PPE selection
    - Donning, doffing, and PPE use

    - Decontamination
- Determine criteria for sufficient documentation of competencies, including requiring healthcare workers and others involved in patient transport to demonstrate competency in donning and doffing proper PPE. In addition, monitor training to ensure it is delivered as intended.
- Consider sharing the EMS agency's education and training plan with facilities.

Coordination with sending and receiving facilities

- Ensure that plans/protocols for transfer of a PUI or confirmed patient are in place for each facility in the planning jurisdiction. Ensure that transportation plans have been developed, exercised, and validated, including those for managing and transporting used/contaminated PPE and waste generated from patient care.
- Delineate the roles and responsibilities of medical personnel at the sending and receiving facilities (e.g., upon patient arrival).
- Determine when and where patient handoff will take place for the receiving facility and at what specific point the patient transport responsibility will transfer from ground transport crew to receiving facility; verify and secure entry points. Discussions should include whether the EMS transport crew will move the patient to the isolation room, conduct patient handoff at facility entrance and remain outside of the institution, or other. Include in plans whether procedures will vary for ambulatory or non-ambulatory patients.
- Determine the location for donning and doffing of PPE at each facility and location for waste management and shower facilities, if available, at receiving facility for personnel engaged in the interfacility transfer process.
- Ensure that the EMS transport crew is aware of and familiar with donning and doffing location, patient handoff location at sending and receiving facilities, route for transport, and location for disinfection/decontamination.
- Determine where and how affected staff will be disinfected/decontaminated if PPE is breached.
- Determine the location for decontamination of transport vehicle and disinfection of equipment at the receiving facility.
- Determine how the waste materials generated during patient care will be packaged and transported for disposal.
- Ensure that doffed PPE is properly packaged for disposal with disinfectant, and that proper packaging materials and disinfectant are available at all doffing locations.

Coordination with ground transport crew

- Designate the handoff location for transferring the patient from the facility to the ground transport service and from the ground service to the receiving facility.
- Ensure there is a plan in place for security at the handoff location, particularly when ground-to-ground transfers are necessary.
- Develop contingency plans for vehicle malfunction or failure prior to arrival at destination, medical equipment failure, motor vehicle collision, breach in PPE during transport, provider inability to continue duties, or hostile/combative patient.

Coordination with air transport crew

- Designate the handoff location. Obtain input and approval from airport authority.
- Determine when and where the patient handoff will take place and at what specific point the patient transport responsibility will transfer from ground transport crew to receiving facility. Include in plans whether procedures will vary for ambulatory or non-ambulatory patients (e.g., how patient will deplane and who will be assisting).
- Identify an EMS staging area on and/or off airport property. This area will allow for EMS to pre-stage while waiting for aircraft arrival and to don PPE.
- Evaluate local airport capabilities (e.g., vertical lift to assist with non-ambulatory patients) and ability to receive the type of aircraft to be used (e.g., military aircraft such as a C-17, if necessary).
- Establish who will have command and control of patient care, transport, and convoy while on airport property.
- Establish methods of communication with the airport authority.
- Establish methods of communication with ground transport crew and the receiving facility and determine how and to whom updates on patient status will be communicated.
- Develop a protocol for notifying airport authorities and EMS transport crews located at the receiving airport.
- Ensure there is a plan in place for security at the airport and handoff location.
- Develop contingency plans for aircraft malfunction or failure prior to arrival at the destination, medical equipment failure, breach in PPE during air transport, handling spills during transport or transfer of patient from air to ground crew, provider inability to continue duties, and/or hostile/combative patient. Include a protocol for times when severe weather makes it impossible to fly or land a plane.
- Develop plans for emergency diversion from the intended destination airport. Develop emergency landing procedures.
- Develop plans for managing waste materials generated when caring for the patient while in flight, and for packaging and transporting these waste materials after transport. Ebola waste carried by air during dedicated air ambulance, firefighting, or search and rescue operations is excepted from the HMR under § 175.9(b)(4), but once the aircraft is at a location where decontamination is performed, any suspected Ebola waste offloaded must be packaged and transported in accordance with the HMR, or transported under a special permit granted by the Pipeline and Hazardous Materials Safety Administration (PHMSA).

Pre-event activities

Coordination with public health, state/local EMS, emergency management, and healthcare coalition

- Notify state, county, and local governments, including health departments, if not already aware, of impending patient transport.
- For interstate transport, coordinate with the primary liaison or contact in other state(s) involved with transport.

Coordination with ground transport crew

- Establish methods of communication and determine how, when, and to whom updates on patient status will be communicated.

Coordination with air transport crew

- Ensure that the receiving ambulance is staged and prepared to accept the patient(s) from the air transport crew.
- Determine when and where the patient handoff will take place and at what specific point (e.g., off the stairs/ramp) the patient transport responsibility will transfer from air transport crew to ground transport or other receivers.
- Develop plans for aircraft decontamination consistent with current guidelines.[8]

During transport

Coordination with public health, state/local EMS, emergency management, air transport, and healthcare coalition

- Maintain situational awareness for appropriate state and local government agencies, such as health departments, emergency management, state warning point, and others.

Coordination with sending and receiving facilities

- Notify facilities of expected time of arrival; however, all should be aware and prepared for that time to change rapidly.
- Ensure that the EMS transport crew is aware and familiar with how the waste and other materials generated during patient care will be prepared for disposal.
- Ensure that doffed PPE is properly packaged for disposal with disinfectant and that proper packaging and disinfectant are available at all doffing locations.

Coordination with ground transport crew

- Maintain appropriate methods of communication for relaying patient status updates.

After transport completed

Coordination with public health, state/local EMS, emergency management, air transport, and healthcare coalition

- Communicate plans for decontamination of the transport vehicle.
- Provide behavioral/mental health resources to people involved with patient transport, as well as the patient's family members and significant others, as needed.
- Consider the rehabilitation needs of the transport staff following transport and decontamination (e.g., fluids, food).
- Evaluate coordination among public health, healthcare facilities, EMS agencies (ground and air), emergency management, law enforcement, local elected officials, state elected officials, airport authorities, neighboring state officials (if applicable), and others (if applicable).
- Complete an After Action Report for each patient transport within an appropriate time frame (e.g., 30 days).
- Consider conducting a multi-agency hotwash in order to evaluate the entire process of the patient transport, including coordination among the agencies involved.
- Compile lessons learned/best practices.
- Define a system-wide, method for quality improvement, including a determination of what issues will be addressed, how quality improvement will be implemented/measured, and through what mechanisms

issues will be resolved. Ensure that the EMS transport agency and local/state EMS are involved and the process addresses such issues as appropriate destination for the patient, safety, patient tracking, patient care documentation, PPE, waste materials generated while caring for the patient, etc.

Coordination with sending and receiving facilities

- Ensure appropriate packaging, transport, and disposal of PPE and waste materials generated while caring for the patient to facilities authorized to process and dispose of the waste. Waste generated while performing emergency medical services on a PUI or patient with confirmed Ebola is excepted from the HMR under §177.823(a)(3), but once an ambulance or emergency motor vehicle is at a location where decontamination of the vehicle is performed, any suspected Ebola waste offloaded from the vehicle must be packaged and transported in accordance with the HMR or transported under a special permit granted by PHMSA. Several waste transportation companies hold party status to Department of Transportation (DOT) Special Permit 16279, which allows for transportation of Ebola-contaminated waste. For a current listing of permit holders, please refer to PHMSA's special permit database.
- Ensure completion of proper decontamination of the ambulance and equipment.

2. Medical Oversight

Key Points

- Medical oversight is the medical authority and responsibility for all medical care provided by the EMS service, including active day-to-day role in the function and management of the service as it relates to patient care activities.[12] Medical oversight ensures that care is provided by competent medical professionals, consistent with accepted standards.[9]
- Medical oversight of patient care during the interfacility transfer is essential to ensure quality patient care throughout the transport of the PUI or patient with confirmed Ebola. Medical oversight includes online medical direction, such as direct observation of treatment and communication with the transport crew, or offline medical direction, such as protocols and standing orders, or a combination thereof. The authority and responsibility of medical directors varies by state.
- Medical oversight should be consistent with all states' legal authorities, pre-planned with each facility, institutionalized by pre-established Memoranda of Understanding (MOUs) among the sending/receiving facilities and the transporting agencies, and well-known among all partners including healthcare coalitions.
- The primary role of the medical director is to ensure quality patient care, with responsibilities including the ongoing design, operation, evaluation, and revision of the EMS system from initial patient access to final patient care destination, the development of medical policies and procedures, and ensuring that patient care activities performed by EMS providers are appropriate and within their scope of practice.[9,10,11]
- Generally, medical oversight during transport will reside with the medical director of the EMS transport agency, but this may vary depending on the jurisdiction. In some instances, the transport agency may not have a medical director and authority may come from a jurisdictional (e.g., county) EMS medical director.
- The medical director or appropriate person providing medical oversight should be actively involved in planning/preparation and available for consultation during interfacility transport of PUIs or patients with confirmed Ebola.
- EMS transport agency providers will generally use clinical care guidelines/protocols developed and/or approved by the agency medical director or as otherwise directed by their local jurisdiction. This helps to ensure the appropriate training and competencies of the providers. Patients with Ebola often require specialized clinical protocols and management strategies that balance clinical requirements and patient needs with the safety of responders and the public.

Considerations

Role of medical director (or appropriate person providing medical oversight)

- Participate in pre-planning with state EMS directors and state/local system medical directors for states in which transports may cross state lines. This will help to ensure consistency of protocols, clearly define who has what authority to practice and under what conditions, and clarify other issues that may be involved with the interstate transport of the patient and actions needed to address these issues.
- Collaborate with the sending facilities, receiving facilities, and transporting agencies to ensure that pre-established MOUs/agreements are in place and include the delineation of responsibilities and authorities for medical oversight of the transport and pre-determined modes of secure communication.

- Consider the level of care of the ambulance and its crew and the minimum number of staff needed during the transport in order to reduce possible risk of exposure.
- In conjunction with the state office of EMS, determine who has legal authority for medical oversight of providers practicing in geographical areas outside of their normal operating area and who assumes the liability for care they provide.
- Consider the role of medical oversight following transport, including continuous quality improvement and evaluation of metrics (e.g., transport times, equipment failure, educational opportunities, etc.).

Protocol development

- Develop protocols for the management of the patient during transport. This should include any invasive procedures (e.g., suctioning, resuscitation) that should or should not be performed during transport in order to reduce the potential risk of exposure (see Section 8: Clinical Care during Transport). Consider including a medical ethicist, infectious disease physicians with expertise in this area, and labor unions in these conversations. Determine if scope of practice of the transport providers is affected with interstate transports.

3. Standard Operating Procedures (SOPs)

Key Points

- Ensure that SOPs are developed for interfacility transport, including intrastate and interstate transports. Involve appropriate partners during the development of the SOPs.
- Review all policies and procedures on a regular basis (e.g., yearly) and update as needed.

Content of SOPs

- Issues to be addressed in the SOPs for an EMS transport agency likely to conduct interfacility transport may include the following:
    1. Education, training, exercises, and refresher training
    2. Notification, decision-making, logistical support, and communication[12,13,14,15]
        a. Mission profile, including point of origin, destination, responsibilities of all players, identification of who is the medical director for the transport and what are their responsibilities, etc.
        b. Staffing plan, including which EMS agency personnel and medical personnel from the transferring facility, if any, will accompany the patient
        c. Security at the transferring facility, during the transport, and at the receiving facility
        d. Determination of appropriate engineering, administrative, and work practice controls as part of comprehensive worker infection control program
        e. Determination of transport vehicle configuration, what type of equipment will be on-board (e.g., type 1 vehicle), and any special equipment necessary
        f. Contingency plan for vehicle/aircraft malfunction or failure prior to arrival at destination, medical equipment failure, unavailable or closed route for transport, breach in PPE during the transport, provider inability to continue duties, and/or a hostile/combative patient
        g. Determine if anyone is allowed to accompany the patient (i.e., parent, family member, or significant other)
        h. Handoff of the patient to the receiving facility
        i. Considerations for pediatric patients[16,33] and patients with disabilities or functional and access needs
        j. Determination of appropriate PPE ensemble[17,18], including donning/doffing procedures, utilization, and decontamination for ground and air transport crews
            i. Trained observers to monitor for correct PPE use and adherence to protocols for donning and doffing PPE
            ii. Training on selected PPE, including donning/doffing. This should include fit testing per Occupational Safety and Health Administration (OSHA) Respiratory Protection Standard (29 CFR 1910.134)[19]
            iii. Demonstration of competency in donning and doffing PPE once training has been delivered
            iv. Content and frequency of refresher training, as needed
            v. Work/rest cycles for personnel wearing PPE
            vi. Proper disposal of PPE as hazardous material

vii. Decontamination for those accompanying the patient

k. Determination of appropriate disposal of waste materials[20] generated during patient care, including training staff, ground and air crew on how to transport these materials under applicable federal and local regulations[21]

l. Communication plan, including methods for communication between EMS agency (or agencies), transport crew, sending facility, receiving facility, medical director, law enforcement, road authorities, airport authorities, pilot, public health, emergency management, healthcare coalition (if applicable), between states (if interstate transport), and with the patient's family

i. Communication considerations for patients with limited English proficiency (e.g., printed materials, consent forms, use of interpreters, etc.)

ii. Ensuring patient privacy and compliance with HIPAA

m. Documentation/logs to be kept throughout the transport

3. Transferring facility to EMS transport agency

a. Hospital point of entry and exit, including site of patient handoff with considerations for patient and personnel safety, security needs, and access to isolation unit

b. Patient handoff procedure, including transfer of patient and belongings

4. During transport

a. Patient assessment before and throughout transport

b. Determination of whether an isolation unit will be used during transport

c. Treatment protocols, including procedures that will or will not be performed during the transport (i.e., invasive and aerosol generating procedures)

d. Protocol in the event that a provider sustains an exposure during transport

5. EMS transport agency to receiving facility

a. Hospital point of entry and exit, including site of patient handoff with considerations for patient and personnel safety, security needs, and access to isolation unit

b. Patient handoff procedure, including transfer of patient and belongings

c. Plans for family members and significant others upon arrival at the receiving facility

6. Air transport

a. See "Example: Standard Operating Procedure (SOP) for Air-to-Ground (Air-Ground) Patient Handoff"

b. Use of air medical services, including transfer and receipt of patient[8]

i. Decisions to be made about when air support will or will not be used

ii. Staffing needs

iii. Specific point of patient transfer and support needed (e.g., staff who will assist patient down air vehicle stairs/ramp)

iv. Type of aircraft to be used

v. Patient isolation needs

vi. Communication methods (e.g., to whom and how patient status will be communicated from aircraft medical team)

7. Waste, decontamination, and disinfection

a. Location for decontamination and disinfection of ambulance, transport crew, equipment, including reusable PPE (e.g., Powered Air-Purifying Respirators [PAPRs]), and aircraft
    i. Decontamination of patient property/belongings
    ii. Decontamination of corridor/route through the facility, if applicable
    iii. Provision of clothing (i.e., scrubs), if needed, for EMS crew following decontamination
b. Procedures and standards for decontamination and disinfection of ambulance
c. Procedures and standards for decontamination and disinfection of equipment
d. Procedures for securing and disposing of waste under applicable federal and local regulations
e. Procedures for decontamination of other types of vehicles that may be used during transport

8. Patient death during transport
    a. Determine a process for making the decision on where the patient should be transported (e.g., receiving facility) if the patient dies during the transport.
    b. Procedure for notifying patient's family members and significant others
    c. Procedure for ensuring appropriate decontamination of ambulance after patient remains are removed
    d. Procedures for securing, packaging, and disposition of human remains under applicable federal and local regulations
    e. Consult CDC's "Guidance for Safe Handling of Human Remains of Ebola Patients in U. S. Hospitals and Mortuaries."[39]
9. Follow-up activities
    a. Monitoring/surveillance of transport team (i.e., 21-day monitoring[22] for EMS providers potentially exposed to Ebola)
    b. Provision of food and fluids to transport team after decontamination
    c. Mission debriefing with the transport team, including a review of how the transport went, challenges, safety issues, suggestions for improving the process with future transports, etc., immediately following the transport
    d. Provide voluntary debriefing, employee assistance program (EAP) services, and/or counseling, as needed, for transport crew, family members, and significant others. Ensure that providers are aware of available behavioral health resources and refer them to behavioral/mental health providers as needed.
    e. Plan for quarantine of transport crew, if necessary, including leave time, compensation, housing, and when personnel can return to normal work duties (i.e., during or after completion of monitoring period).

4. Personnel

Key Points

- Selecting transport staff is an important part of the planning process and should meet the medical needs of the patient(s). The education, experience, and legal authorities of the transport personnel are important considerations.
- Staff participation in the transport of PUIs or patients with confirmed Ebola has generally been voluntary. However, staff participation is dependent on training and skillset.
- Sufficient and consistent PPE for all transport personnel is required.
- Regular training and exercising is necessary.
- A post-transport and post-event medical monitoring/follow-up system is essential.

Considerations

Staff selection

- When selecting transport staff, take the following into consideration:
    - The medical needs of the patient and the authority, education, and experience of personnel to meet those needs
    - Type and number of staff (e.g., EMTs, paramedics, nurses, advanced practice providers, and physicians) and education
    - Length of transport
    - Patient condition
- Determine the staffing requirements (i.e., EMS providers, facility personnel) for the transport. Consider whether staffing needs may be altered for transports of pediatric patients or patients with special healthcare needs.

Staff education, training, and exercises

- Determine a process for educating, training, and exercising staff who may be involved in interfacility transports. Include a timeframe for and content of refresher training (e.g., at least yearly). Include how competency will be evaluated.
- Consider pathogen-specific education of initial staff selected and in the determination of existing competencies.
- Ensure that training includes the following components:
    - Appropriate PPE selection
    - Donning and doffing of PPE with appropriate supervision
    - Decontamination and maintenance procedures, including for reusable PPE
    - Documentation of potential exposures to staff and procedures to follow in the event of an exposure
    - Procedures for transporting infectious waste and hazardous materials transport regulations
- Participate in exercises with partners in the healthcare coalition and others in the community.
- Determine what specific personnel roles should be included in training simulations (e.g., EMS providers, patients [adult/children/special needs], emergency management, law enforcement, public health, hospital staff, etc.).
- Identify funding, if available, for the cost of training and exercises.

- Determine who is responsible for follow-up activities such as development and implementation of an improvement plan.

Post-event monitoring and support

- Determine the process for staff follow-up and monitoring[22]after transport, including procedures for exposures. Consider the use of posters to aid in following these procedures.
- Determine who will be conducting post-event staff monitoring (e.g., the employer, local public health department, hospital personnel).
- Identify procedures for managing staff exposures and their follow-up.
- Educate staff on post-event monitoring procedures, travel restrictions, etc.
- Select a point-of-contact for family of transport crew members in case there are questions or concerns.
- Provide voluntary debriefing, EAP services, and/or counseling, as needed, for transport crew, family members, and significant others. Ensure that providers are aware of available behavioral/mental health resources and refer to behavioral/mental health provider as needed.

Equipping personnel

- Ensure that all transport personnel and others who may be exposed have similar PPE, including fit testing, appropriate training, as indicated by their level of exposure/risk, that is consistent across facilities and states, as well as training on when and how to put on, use, remove, and clean and maintain the PPE (for reusable PPE items).
- Develop a plan for identifying infection control breaches and corrective actions to be taken, if necessary.
- Supply compliance monitoring logs/worksheets for equipment to be used and for care during transport.
- Conduct regular inspections of equipment to ensure functionality, including checking expiration dates on all equipment.

5. Infection Control – Personal Protective Equipment (PPE)

Key Points

- Develop an infection control SOP.
- An essential step to appropriate infection control is ensuring that there is a sufficient supply of PPE for EMS transport agency providers.

Considerations

Overview of basic infection control strategies

- Designate an infection control officer/specialist and determine his or her role during the transport based on CDC guidelines and supported by the EMS agency medical director. Determine if multiple infection control officers/specialists will be involved (e.g., from sending facility, from receiving facility, from EMS transport agency) and which infection control officer has responsibility/authority as the patient is moved from sending facility to receiving facility.
- Identify a protocol for how to respond in the event of a PPE breach.[23]
- Ensure that a plan is in place for storage and disposal of waste and disinfection of PPE and contaminated equipment/facilities.
- Be familiar with decontamination procedures following transport.
- Ensure that sufficient decontamination agents are available and in stock.

Supply chain

- Ensure that there is a sufficient supply of PPE for EMS transport agency providers and protocols for obtaining additional PPE supplies.
- Be cognizant of expiration dates of certain PPE, including respirators.
- Collaborate with state EMS office and public health, emergency management, sending and receiving facilities, and other healthcare organizations or systems to address any potential supply chain issues.
- Coordinate with partners (e.g., state and local public health, healthcare coalitions, private partners).
- Determine the role of state/federal public health authorities in assisting the healthcare sector in prioritizing orders with manufacturers/suppliers.

Appropriate PPE

- Determine the appropriate level of PPE for each member of the transport team based on patient condition and symptoms, length of transport, operating environment, provider competencies, availability of supplies, and guidelines provided by CDC and supported by the EMS agency medical director. Involve stakeholders in these discussions, including EMS, public health, and clinical care providers. The determination should also consider a worker's ability to wear certain types of PPE (e.g., medical clearance, and fit testing).
- Select PPE that is appropriate for use in healthcare infection control scenarios. If EMS personnel plan to use PPE and procedures based on HAZMAT training, encourage them to review the appropriateness of these processes with the state or local health department and to consider that OSHA recommends avoiding cleaning techniques, such as using pressurized air or water sprays, that may result in the generation of bioaerosols.[24]
- Determine work/rest cycles for personnel wearing PPE.

- Be familiar with infection control guidance from federal agencies and organizations.[25,26,27]
- Review lessons learned from previous transports of patients with Ebola.[29,30,31]

PPE donning/doffing

- Identify the location where donning/doffing will occur. Provide geographic-specific information to EMS transport agency providers.
- Develop standardized criteria on who can serve as an official observer for donning and doffing. Verify the process for donning/doffing and how supervision will be recorded. Ensure that current guidelines[25] are being followed, with a checklist used by the trained observer to guide healthcare workers at each point during every donning and doffing procedure.
- Ensure that doffed PPE is properly packaged for disposal with disinfectant and that proper packaging and disinfectant are available at all doffing locations.
- Ensure that staff decontamination materials are available at donning/doffing locations, and verify the process for decontamination and how supervision will be recorded.

6. Ambulance Preparation and Configuration

Key Points

- Configure the ambulance and carry equipment in a manner that minimizes the risk of exposure, protects the ambulance from contamination, and facilitates disinfection.
- It is essential to have enough appropriate equipment and supplies in the ambulance to provide emergency care during patient transport, if necessary. Maintain additional equipment in closed containers, when possible.
- Minimum ambulance equipment varies and is regulated by each state.
- Additional equipment may be included in the transport vehicle or an additional vehicle but may be dependent on the EMS system structure and resource capability, state requirements, patient needs, and transport vehicle configuration and capabilities.[28]
- Transport agencies should be prepared to put any equipment through a thorough disinfection process or dispose, if appropriate.

Considerations:

Ambulance preparation

- Consider the following when developing plans for ambulance preparation: patient symptoms, length of time required for the patient transport, whether the driver compartment is isolated from the patient, and whether a designated transport vehicle will be used.[29,30]
- Determine the resources needed to prepare the ambulance for transfer of a PUI or a patient with confirmed Ebola.[31]
- Determine if a designated vehicle will be used for these transports.
- Determine what type of vehicle and capabilities will be used for these transports (e.g., Type I).
- Consider the use of a step-by-step checklist during ambulance preparation.

Minimum equipment

- Some agencies may have a designated transport vehicle for transporting patients with Ebola. Carry all equipment in compliance with state minimum requirements for an ambulance, but in a manner that protects from contamination. Meet equipment requirements necessary for the patient transfer (and approved by the medical director) and provider protection that are consistent with state/local licensing regulations.
- Consult state recommendations on minimum ambulance equipment.[32] Consider whether the minimum equipment list is consistent with the recommended equipment for ground ambulances, or if additional equipment and supplies should be included.
- Coordinate the list of minimum equipment with the state EMS office and local medical director to address consistency with state law/rules or obtain a waiver from them, if required. These may vary by state. Depending on the jurisdiction, the state EMS regulatory agency may need to approve a waiver if certain equipment not deemed necessary for the transport is removed from the ambulance.

Transport resources and staff

- Determine recommended specialized items that may be necessary during transport, as well as their availability. Items may include:

    - Diapers (adult and pediatric)
    - Medications (e.g., antidiarrheal/antiemetic)
    - Barrier sheets or body bags
    - Patient PPE
    - Large capacity emesis containers
    - Disposable stethoscopes and blood pressure cuffs
    - Red biohazard waste bags
    - EPA-registered disinfectant wipes (for spills during transport)
    - Fluid administration guidelines
    - Sedation and/or pain control guidelines
    - Additional gear, as needed, based on condition of the patient
    - SOPs to prevent contamination of environmental surfaces
- Address ambulance licensing and patient care personnel licensing requirements within, and between, the states in which the transports will be occurring. Determine if there are reciprocity requirements (if needed) for EMS transport (ambulance) licensing and patient care personnel licensing and if there are provisions for an occasional transport with the states in which the ambulance and personnel may not be licensed.
- If transport resources are limited, develop a contingency plan for appropriate isolation and/or quarantine. Include who will provide medications, equipment, supplies, and provisions for the quarantined patient and their wastes.
- For interstate transports, determine if there are requirements for licensed staffing in ambulances or if a waiver is needed to deviate from the standard. Determine if all transport staff crossing state lines meet these requirements, or if other legal workarounds have been provided in advance.

7. Patient Preparation

Key Points

- Patient preparation for transport may depend on resources, EMS structure, state requirements, and patient status.
- Patients should be prepped for transport in order to minimize the risk of disease transmission and environmental contamination. Consider dressing the patient in an impervious suit or draping the patient in impervious drapes as tolerated to limit exposure of the transport team or environmental surfaces to infectious body fluids.
- Stabilize the patient's condition, including management of signs and symptoms (e.g., nausea, vomiting) to maximize the likelihood of an event-free transport. Any required interventions (e.g., aerosol generating procedures) should be performed before or after transport in a controlled manner to minimize transport team interactions during transport.

Considerations

- Include plans for patients with functional or access needs (e.g., hearing, vision, limited mobility), device dependence, and limited English proficiency, and for pediatric or elderly patients. Consider the developmental stage of the patient, especially with pediatric patients, when addressing fears associated with PPE, fears of not having family members present, and an understanding of the transport process.
- Determine if patient isolation units will be used during transport. If they are available, develop guidance for providers on when these should be used. Consider patient comfort and symptoms when making these decisions.
- Educate the patient, family members, and significant others, as appropriate, on why the patient is being transferred, the destination, and the transport process and procedures.

8. Clinical Care during Transport

Key Points

- There is considerable state variation in legal authorities of local, state, and regional medical authorities and the ability to implement various clinical care guidelines; therefore, clinical procedures during transport will vary by state.
- Discussions between the EMS medical director, state EMS official, and public health need to take place regarding protocols that apply and procedures that could be performed or will not be considered during transport (e.g., resuscitation, intubation, other invasive procedures). Plans should consider patient symptoms, required devices and medication needs, type of PPE necessary, and length of transport time.
- Consider what will be done if the patient's condition deteriorates prior to reaching the destination facility.

Considerations

Procedures during transport

- The transporting agency's medical director, state EMS and public health officials, transport teams, and hospital-based treatment teams should discuss which protocols and procedures could be performed and which will not be considered during the transport (e.g., resuscitation, intubation, or other invasive procedures). Plans should consider patient symptoms and condition, required devices and medication needs, types of PPE necessary, and length of transport time.
- Consider unique requirements for patients with functional or access needs (e.g., hearing, vision, limited mobility), device dependence, and limited English proficiency, and for pediatric or elderly patients.

9. Additional Considerations during Transport

Route

- Discuss the planned transport route with state/local law enforcement and emergency management, and determine how to secure the route. Determine whether a security escort will be needed during the transport and, if so, who will provide the escort (e.g., local, state, tribal, federal law enforcement).
- Verify planned transport route with the state department of transportation.t (e.g., determine any detours, etc.).
- Determine the mode of transport (i.e., the use of red lights and sirens).
- Develop a contingency plan/route in case of vehicle failure, inclement weather, route restrictions, motor vehicle crash, and/or deterioration in patient condition prior to reaching the destination facility.
- For long transports, consider a plan for refueling; may identify multiple possible refueling points on the designated route.

Other

- Determine if there will be a vehicle following the ambulance and who will staff that vehicle (e.g., additional EMS staff, medical director, physician, law enforcement).
- Consult current infection control guidance[25] and establish a plan to manage provider exposure (e.g., fluid exposure, needlestick) occurring during the transport.
- For long transports, consider crew and patient comfort and necessities (e.g., meals, restroom, staff change). Consider conducting staff changes at a hospital (e.g., parking lot), fire station, or law enforcement headquarters.
- Determine where ground-to-ground patient handoff will occur, how the scene will be secured, procedures for donning/doffing, decontamination, and waste disposal.
- Determine how the transporting unit will communicate during transport (e.g., hand operated radio microphone, cellular phone, secure radio channel, video link) with pre-defined entities, such as the receiving facility, command center, law enforcement, mutual aid, etc.
- Determine appropriateness of parental/guardian presence for children as well as for adults and children with special needs.[33]

10. Arrival at Destination

Key Points

- Communication with the receiving facility's hospital administration and medical staff before and during the transport is important during these patient transports.
- See example SOPs: "Example: Standard Operating Procedure (SOP) for Patient Handoff between a Healthcare Facility and a Transporting Ambulance" and "Example: Standard Operating Procedure (SOP) for Air-to-Ground (Air-Ground) Patient Handoff"

Considerations

Transfer of patient care to receiving facility

- Determine who will provide communication and information with the receiving facility's administration and medical staff; communicate with them before and during the transport.
- Determine a safe and secure location to transition care. Identify a primary and back-up location for transfer of care to take place. Ensure these locations are away from the media.
- Prepare for media presence before, during, and upon arrival at the receiving facility. Develop a plan for the protection of patient and family identification from media.
- Notify and work with security and law enforcement to secure the scene at sending and receiving facilities.
- Consider plans for restricting access to the receiving area by facility staff. Determine a method for informing facility staff of restrictions related to receiving a PUI or patient with confirmed Ebola.
- Follow procedures for patient handoff, including transfer of patient medical records.
- Consider additional staff who may be needed for assistance during handoff.
- Maintain a patient care record for patient management during transport.
- Determine the process for handoff of patient belongings, if any.
- Verify the location for donning and doffing PPE.
- Verify the location for decontaminating ambulance and equipment.
- Notify the patient's family and significant others of arrival at the destination facility. Coordinate with the receiving facility to notify the family of where they should go upon arrival at the facility.
- Follow procedures for donning and doffing at the receiving facility, decontamination, and waste disposal.

11. Waste

Key Points

- Waste generated in the care of PUIs or patients with confirmed Ebola is subject to local, state, and federal regulations.[35]
- Protocols for handling waste are dependent on local practices. Hospitals often receive EMS infectious waste and should continue to do so if accommodated in the local SOP.
- Transportation of Ebola waste for disposal by government employees is excepted from the requirements of the HMR under § 171.1(d)(5), but transportation by government contractors is fully regulated. States regulate landfills.

Considerations

- Establish plans/protocols for handling waste that are consistent with the state plan, including how medical waste will be packaged at the receiving facility, how long waste will be held at the facility, who will transport the waste to the medical waste disposal facility, which medical disposal facilities are used, and what documentation will be required.
- Ensure staff are educated on and follow local, county, state, and federal regulations and guidance regarding biohazard waste disposal.
- Collaborate with sending and receiving facilities and air and ground EMS agencies to discuss disposal of waste.
- Determine if infectious waste will be managed by the receiving facility or establish a relationship with an approved waste management agency.
- Identify an approved Ebola waste disposal process (including hospital on-site inactivation or movement by a waste vendor with a special permit, etc.).
- Identify the need for and acquisition of appropriate permits for biohazard waste disposal.
- Determine who will be responsible for EMS transport agency medical waste costs.
- Suspected Ebola waste generated while performing emergency medical services on a PUI or a patient with confirmed Ebola is excepted from the HMR under §177.823(a)(3). This exception applies to all segments of emergency transport: from the pick-up of a patient in an ambulance to the hospital; after delivery of the patient and until the ambulance arrives at a decontamination site; and during the transfer of a patient from one medical facility to another. Once an ambulance or emergency motor vehicle is at a location where decontamination of the vehicle is performed, any suspected Ebola waste offloaded from the vehicle must be inactivated on-site (e.g., through the use of disinfectant, autoclave, or incineration) or properly packaged as a Category A infectious substance for movement in transportation to a disposal site pursuant to federal requirements, including the Hazardous Materials Regulations (HMR; 49 CFR parts 171-180). This includes medical equipment, sharps, linens, used healthcare products such as soiled absorbent pads or dressings, kidney-shaped emesis pans, portable toilets; and used PPE (gowns, masks, gloves, goggles, face shields, respirators, booties, etc.) or byproducts of cleaning contaminated or suspected of being contaminated with a Category A infectious substance.[34,35]
- Hazardous materials, including suspected Ebola waste, carried by air and used during dedicated air ambulance, firefighting, or search and rescue operations are also excepted from the HMR under § 175.9(b)(4), but once the aircraft is at a location where decontamination is performed, any suspected

Ebola waste offloaded must be packaged and transported in accordance with the HMR, or transported under a special permit granted by PHMSA.

12. Decontamination/Disinfection of Ambulance, Equipment, and Personnel

Key Points

- Cleaning and disinfection of materials in various vehicles depends on several factors, including finishes, materials (e.g., carpets, upholstery, hard non-porous surfaces), and compatibility with disinfectants. Additional regulations and guidance (e.g., IATA) may also need to be considered for specific vehicles.
- Consider patient symptoms (e.g., vomiting, diarrhea) and risk of exposure to blood or body fluids when preparing for decontamination of the vehicle.
- See example SOP: "Example: Standard Operating Procedure (SOP) for Decontamination of an Ambulance that has Transported a Person under Investigation or Patient with Confirmed Ebola"

Considerations

Training and education

- Ensure that staff are educated, trained, and have completed exercises on decontamination/disinfection procedures.

Decontamination/disinfection of vehicle and equipment

- Develop a plan and standards for disinfection/decontamination of the vehicle and determine whether this will vary due to the presence of patient symptoms, risk of exposure to blood or body fluid, and types of waste. Determine what type of supplies will be necessary (e.g., disinfectants, disposable cleaning cloths, etc.).[38]
- Determine the location where decontamination of the vehicle will take place. Consider using a well-ventilated, large, enclosed structure and not an open space due to possible weather conditions and media.
- Determine who will supervise decontamination activities.
- Develop a plan and standards for decontamination/disinfection of used equipment that adheres to federal and state regulations. Determine what type of supplies will be necessary (e.g., disinfectants, disposable cleaning cloths, etc.).
- Determine who will provide and/or pay for the decontamination of the ambulance, equipment and supplies.
- For patients exhibiting bleeding, vomiting, diarrhea, or hemorrhage, use a U.S. Environmental Protection Agency (EPA)-registered hospital disinfectant with a label claim for a non-enveloped virus (norovirus, rotavirus, adenovirus, poliovirus) to disinfect ambulances used for transport of a PUI or patient with confirmed Ebola.
- The basic principles for blood or body substance spill management are outlined in the OSHA Bloodborne Pathogen Standards (29 CFR 1910.1030).[36] CDC guidelines recommend removal of bulk spill matter, cleaning the site, and then disinfecting the site.[37] For large spills, a chemical disinfectant with sufficient potency is needed to overcome the tendency of proteins in blood and other body substances to neutralize the disinfectant's active ingredient. An EPA-registered hospital disinfectant with label claims for non-enveloped viruses (norovirus, rotavirus, adenovirus, poliovirus)[38] and instructions for cleaning and decontaminating surfaces or objects soiled with blood or body fluids should be used according to those instructions.

Crew to perform the decontamination/disinfection procedures

- Include in the plans whether a designated crew will be used for the decontamination procedures or if the transport crew will conduct the decontamination procedures. Select and provide workers with appropriate PPE and training on how to don/doff, use, clean, and maintain the PPE necessary for the decontamination/disinfection procedures. Also give consideration to hazards posed by cleaning and disinfection chemicals.
- Ensure that doffed PPE is properly packaged for disposal with disinfectant and that proper packaging materials and disinfectant are available at all doffing locations.
- Develop a plan for medical follow-up and monitoring of staff who performed the decontamination/disinfection procedures, and include local public health in the planning.
- Identify a plan for either isolation and/or quarantine of EMS personnel who may have been exposed. This may be necessary in the event of a crew member not wanting to go home to family members if there was a potential for exposure during the transport.
- Determine who will educate the transport crew's family, if needed, while ensuring that patient confidentiality is maintained.

13. Patient Death During Transport

Key Points

- Develop a plan in the event that the patient dies during the transport.[39]
- Ensure that only personnel trained in handling infected human remains and wearing recommended PPE touch or move any remains that contain Ebola virus.
- Ebola virus can be transmitted in postmortem care settings through unsafe handling of remains.

Considerations

- Coordinate with the regional ETC to determine if they will accept the body of a patient who dies in the ambulance during transport.
- Ensure that agreements are in place with mortuary facilities.
- Collaborate with healthcare and public health officials to determine who will perform postmortem preparation of the body.[40]
- Follow CDC guidelines for transportation of human remains once sealed in body bags.[39]

14. Pediatric Considerations

Key Points

- The presence of a guardian/parent might be needed in caring for these children so that the child can continue to be nurtured and supported while ill. Such caregivers should only travel with a child if the child is not exhibiting obvious bleeding, vomiting, or diarrhea. In the event that a parent or legal guardian cannot be present for transport, they may designate an alternative adult caregiver. The caregiver must use a face shield and surgical face mask, an impermeable gown, and two pairs of gloves.[33]

Considerations

- Determine appropriateness of parental/guardian presence for children.
- Ensure that capabilities and protocols exist for transporting pediatric patients, with details for how to handle those with special healthcare needs, those who are device dependent, or those with access and functional needs.[14,16,33,41,42,43] Coordinate with relevant state/local social services agencies.
- Ensure that equipment to meet both basic and advanced life support needs of children is available.
- Consider staffing requirements and if these will change for the transport of a pediatric patient.
- Review the most current guidance regarding PPE use for the pediatric patient and caregiver.[33]
- Discuss the use of isopods[d] with medical authorities to determine if these will be used when transporting pediatric patients.
- Provide the patient's family with information about what to expect during and after the transport.
- Infants and young children can have difficulty in managing body fluids. A diapered child shedding Ebola virus in the stool poses a risk to others in a care setting. There should be adequate availability of diapers of different sizes.

[d] An isopod (isolation transport unit) is described as equipment that allows full air circulation or negative pressure and access for up to three persons to provide patient care.

Abbreviations

AAR	After Action Report
ASPR	Assistant Secretary for Preparedness and Response
CDC	Centers for Disease Control and Prevention
CFR	Code of Federal Regulations
CSC	Crisis Standards of Care
DOT	Department of Transportation
EAP	Employee Assistance Program
EMS	Emergency Medical Services
EMT	Emergency Medical Technician
EMTALA	Emergency Medical Treatment and Labor Act
EOC	Emergency Operations Center
EPA	Environmental Protection Agency
ETC	Ebola Treatment Center
FICEMS	Federal Interagency Committee on Emergency Medical Services
HIPAA	Health Insurance Portability and Accountability Act
HMR	Hazardous Materials Regulations
IATA	International Air Transport Association
ICS	Incident Command System
MOU	Memorandum of Understanding
NHTSA	National Highway Traffic Safety Administration
OSHA	Occupational Safety & Health Administration
PAPR	Powered Air-Purifying Respirator
PHMSA	Pipeline and Hazardous Materials Safety Administration
PPE	Personal Protective Equipment

PSAP	Public Safety Answering Point
PUI	Person Under Investigation
SOP	Standard Operating Procedures

References

[1] CDC. 2014 Ebola Outbreak in West Africa - Outbreak Distribution Map. http://www.cdc.gov/vhf/ebola/outbreaks/2014-west-africa/distribution-map.html

[2] CDC. Ebola (Ebola Virus Disease). Transmission. http://www.cdc.gov/vhf/ebola/transmission/index.html

[3] CDC. Ebola (Ebola Virus Disease). Signs and Symptoms. http://www.cdc.gov/vhf/ebola/symptoms/index.html

[4] CDC. Case Definition for Ebola Virus Disease (EVD). http://www.cdc.gov/vhf/ebola/healthcare-us/evaluating-patients/case-definition.html

[5] CDC. Interim Guidance for U.S. Hospital Preparedness for Patients Under Investigation (PUIs) or with Confirmed Ebola Virus Disease (EVD): A Framework for a Tiered Approach. http://www.cdc.gov/vhf/ebola/healthcare-us/preparing/hospitals.html

[6] CDC, ASPR. Ebola Concept of Operations (ConOps) Planning Template. http://www.cdc.gov/phpr/documents/ebola-concept-of-operations-planning-template-8-20-2015.pdf

[7] CDC. Ebola (Ebola Virus Disease). http://www.cdc.gov/vhf/ebola/

[8] CDC. Guidance on Air Medical Transport (AMT) for Patients with Ebola Virus Disease (EVD). http://www.cdc.gov/vhf/ebola/healthcare-us/emergency-services/air-medical-transport.html

[9] FEMA. Handbook for EMS Medical Directors, 2012. https://www.usfa.fema.gov/downloads/pdf/publications/handbook_for_ems_medical_directors.pdf

[10] American College of Emergency Physicians. Policy Statement: Medical Direction of Emergency Medical Services. http://www.acep.org/Content.aspx?id=29570

[11] American College of Emergency Physicians. Policy Resource and Education Paper: Medical Direction of Emergency Medical Services PREP. http://www.acep.org/Clinical---Practice-Management/Medical-Direction-of-Emergency-Medical-Services-PREP/

[12] National Highway Traffic Safety Administration (NHTSA). Guide For Interfacility Patient Transfer, 2006. http://www.nhtsa.gov/people/injury/ems/Interfacility/

[13] CDC. Interim Guidance for Emergency Medical Services (EMS) Systems and 9-1-1 Public Safety Answering Points (PSAPs) for Management of Patients Under Investigation (PUIs) for Ebola Virus Disease (EVD) in the United States. http://www.cdc.gov/vhf/ebola/healthcare-us/emergency-services/ems-systems.html

[14] CDC. Identify, Isolate, Inform: Emergency Medical Services (EMS) Systems and 9-1-1 Public Safety Answering Points (PSAPs) for Management of Patients Who Present with Possible Ebola Virus Disease (Ebola) in the United States. http://www.cdc.gov/vhf/ebola/pdf/ems-911-patients-with-possible-ebola.pdf

[15] CDC, ASPR. Detailed Emergency Medical Services (EMS) Checklist for Ebola Preparedness. http://www.cdc.gov/vhf/ebola/pdf/ems-checklist-ebola-preparedness.pdf

[16] Emergency Nurses Association, Society of Trauma Nurses, the Emergency Medical Services for Children (EMSC) Program and the EMSC National Resource Center. Interfacility Transfer Tooklit for the Pediatric Patient. http://www.emscnrc.org/EMSC_Resources/Interfacility_Transfer_Toolbox.aspx#resources

[17] CDC. Guidance on Personal Protective Equipment (PPE) To Be Used By Healthcare Workers during Management of Patients with Confirmed Ebola or Persons under Investigation (PUIs) for Ebola who are Clinically Unstable or Have Bleeding, Vomiting, or Diarrhea in U.S. Hospitals, Including Procedures for Donning and Doffing PPE. http://www.cdc.gov/vhf/ebola/healthcare-us/ppe/guidance.html

[18] CDC. For U.S. Healthcare Settings: Donning and Doffing Personal Protective Equipment (PPE) for Evaluating Persons Under Investigation (PUIs) for Ebola Who Are Clinically Stable and Do Not Have Bleeding, Vomiting, or Diarrhea. http://www.cdc.gov/vhf/ebola/healthcare-us/ppe/guidance-clinically-stable-puis.html

[19] OSHA. Respiratory Protection Standard 29 CFR 1910.134. https://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=STANDARDS&p_id=12716

[20] CDC. Ebola-Associated Waste Management. http://www.cdc.gov/vhf/ebola/healthcare-us/cleaning/waste-management.html

[21] DOT. Transporting Infectious Substances Safely. http://www.phmsa.dot.gov/pv_obj_cache/pv_obj_id_54AC1BCBF0DFBE298024C4C700569893C2582700/filename/Transporting_Infectious_Substances_brochure.pdf

[22] CDC. Interim U.S. Guidance for Monitoring and Movement of Persons with Potential Ebola Virus Exposure. http://www.cdc.gov/vhf/ebola/exposure/monitoring-and-movement-of-persons-with-exposure.html

[23] Siegel JD, Rhinehart E, Jackson M, Chiarello L; Health Care Infection Control Practices Advisory Committee. 2007 Guideline for Isolation Precautions: Preventing Transmission of Infectious Agents in Health Care Settings. Am J Infect Control. 2007 Dec;35(10 Suppl 2):S65-164.
[24] OSHA. OSHA Fact Sheet: Cleaning and Decontamination of Ebola on Surfaces. Guidance for Workers and Employers in Non-Healthcare/Non-Laboratory Settings. https://www.osha.gov/Publications/OSHA_FS-3756.pdf
[25] CDC. Personal Protective Equipment (PPE). http://wwwdev.cdc.gov/vhf/ebola/healthcare-us/ppe/index.html
[26] InterAgency Board for Equipment Standardization and Interoperability (IAB). Recommendations on Selection and Use of Personal Protective Equipment for First Responders against Ebola Exposure Hazards. https://iab.gov/Uploads/IAB%20Ebola%20PPE%20Recommendations_10%2024%2014.pdf
[27] OSHA. PPE Selection Matrix for Occupational Exposure to Ebola Virus. https://www.osha.gov/Publications/OSHA3761.pdf
[28] FEMA. FEMA 508-3 Typed Resource Definitions - Emergency Medical Services Resources (March 2009). http://www.fema.gov/media-library-data/20130726-1849-25045-2727/fema_508_3_typed_resource_definitions_emergency_medical_services_resources_2009.pdf
[29] Isakov A, Miles W, Gibbs S, Lowe J, Jamison A, Swansiger R. Transport and management of patients with confirmed or suspected Ebola virus disease. Ann of Emerg Med. 2015; 66(3):297-305.
[30] Lowe JJ, Jelden KC, Schenarts PJ, Rupp LE, Hawes KJ, Tysor BM, Swansiger RG, Schwedhelm SS, Smith PW, Gibbs SG. Considerations for safe EMS transport of patients infected with Ebola virus. Prehosp Emerg Care. 2015 Apr-Jun;19(2):179-83.
[31] Isakov A, Jamison A, Miles W, Ribner B. Safe Management of Patients With Serious Communicable Diseases: Recent Experience With Ebola Virus. Ann Intern Med. 2014;161:829-830.
[32] American Academy of Pediatrics; American College of Emergency Physicians; American College of Surgeons Committee on Trauma; Emergency Medical Services for Children; Emergency Nurses Association; National Association of EMS Physicians; National Association of State EMS Officials. Equipment for ground ambulances. Prehosp Emerg Care. 2014 Jan-Mar;18(1):92-7.
[33] CDC. Q&A's about the Transport of Pediatric Patients (< 18 years of age) Under Investigation or with Confirmed Ebola. http://www.cdc.gov/vhf/ebola/healthcare-us/emergency-services/transporting-pediatric-patients.html
[34] DOT. Guidance for Transporting Ebola Contaminated Items, a Category A Infectious Substance. http://phmsa.dot.gov/hazmat/phmsa-provides-guidance-for-transporting-ebola-contaminated-items
[35] DOT. Hazardous Materials Regulations [49 CFR Parts 100-1999; 49 CFR 172.700; 49 CFR 173.134(a)(5)). http://www.ecfr.gov/cgi-bin/text-idx?tpl=/ecfrbrowse/Title49/49cfrv2_02.tpl
[36] OSHA. Bloodborne Pathogen Standard (29 CFR 1910.134). https://www.osha.gov/SLTC/bloodbornepathogens/standards.html
[37] CDC. Guidelines for Environmental Infection Control in Health-Care Facilities: Recommendations of CDC and the Healthcare Infection Control Practices Advisory Committee (HICPAC). http://www.cdc.gov/hicpac/pdf/guidelines/eic_in_HCF_03.pdf
[38] EPA. Disinfectants for Use Against the Ebola Virus. http://www.epa.gov/oppad001/list-l-ebola-virus.html
[39] CDC. Guidance for Safe Handling of Human Remains of Ebola Patients in U. S. Hospitals and Mortuaries. http://www.cdc.gov/vhf/ebola/healthcare-us/hospitals/handling-human-remains.html
[40] Jelden KC, Gibbs SG, Smith PW, Schwedhelm MM, Iwen PC, Beam EL, Hayes AK, Marion N, Kratochvil CJ, Boulter KC, Hewlett AL, Lowe JJ. Nebraska Biocontainment Unit patient discharge and environmental decontamination after Ebola care. Am J Infect Control. 2015 Mar 1;43(3):203-5.
[41] Peacock G, Uyeki TM, Rasmussen SA. Ebola virus disease and children: What pediatric healthcare professionals need to know. JAMA Pedatr. 2014 Dec; 168(12): 1087-8.
[42] Kourtis AP, Appelgren K, Chevalier MS, McElroy A. Ebolavirus disease: Focus on children. Pediatr Infect Dis J. 2015 Aug; 34(8): 893-7.
[43] CDC. Resources for Parents, Schools, and Pediatric Healthcare Professionals. http://www.cdc.gov/vhf/ebola/children/index.html