CHARLES COUNTY EMERGENCY SERVICES

SPECIAL ORDER 2014-01

Transport of Infectious Disease Patients Under Investigation for Ebola

EMERGENCY MEDICAL SERVICES

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Expiration Date: N/A

I. OVERVIEW

With the annual occurrence of influenza season, and with the recent developments regarding the Ebola virus, we are all reminded that the manner in which we approach infection control incidents is of the utmost importance. Many within the Charles County Department of Emergency Services (CCDES), Charles County Association of Emergency Medical Services (CCAEMS) and the Office of the Medical Director are remaining vigilant to emerging issues related to infection control. Of particular concern is the Ebola outbreak in western Africa, and the subsequent cases that have occurred here in the United States. This policy and procedure outlines the preparation, mobilization, and demobilization required for care and transport of suspected and known Ebola infectious disease patients.

II. DEFINTIONS

- **Close Contact** - Close contact is defined as being within four (4) feet of an EVD patient, or being within the patient's care area or room for a prolonged period of time. Brief interactions such as walking by a person or moving past their room do not constitute close contact *(4)*.

- **Ebola -** Ebola Viral Disease (EVD). Ebola is caused by infection with a virus of the family *Filoviridae*, genus *Ebolavirus*. There are five identified Ebola virus species, four of which are known to cause disease in humans. Ebola is transmitted by contact with blood or body fluids, including blood, urine, feces, sweat, saliva, vomit, of an infected and symptomatic patient. The Ebola virus can remain active on contaminated surfaces for up to six (6) days in optimal conditions. The Ebola virus can be killed by using hospital grade disinfectants or 1:10 bleach solution.

- **Enterovirus D68 -** It spreads by cough, sneeze, or by common contact with virus-contaminated surfaces. PPE includes face masks for droplet protection, unless aerosolized medication is given, then use of an N-95 mask is indicated *(2, 3)*.

- **Intermediate Contact** - Intermediate contact is defined as being outside of the four (4) feet perimeter of an EVD patient. This is the type of contact support personnel operating on the edge of the patient's care area or room for a brief period of time. Brief interactions such as walking by a person or moving past their room constitute intermediate contact (4).

- **Person Under Investigation (PUI)** - A person who meets the CDC established criteria for EVD 1) symptoms and two (2) epidemiological risk factors. Symptoms include a fever, severe headache, muscle pain, vomiting, diarrhea, abdominal pain, and or unexplained bleeding. Epidemiological risk factors include travel within the past twenty five (25) days to current Ebola outbreak countries (Liberia, Sierra Leone, or Guinea. Senegal and Nigeria remain on the World Health Organization (WHO) list as well, however no new cases have been identified for over a month in either of those two countries, and their status may soon be changing (9)), or exposure to body fluids of a known EVD patient within the past twenty five (25) days (4).

- **Respiratory Droplet PPE -** Standard (routine) PPE with the addition of a surgical mask to protect against respiratory droplets and fluid splashes. When nebulizer treatments of advanced airway procedures are being performed, an N95 mask is sometimes indicated.

- **Seasonal Flu -** Influenza is spread by cough, sneeze, or by common contact with virus-contaminated surfaces. PPE includes face masks for droplet protection, unless aerosolized medication is given, then use of an N-95 mask is indicated *(1)*.

- **Standard (Routine) PPE -** Gloves, and a surgical mask and eye protection if advanced airway procedures are instituted.

- **Trained Observer** - The trained observer is a dedicated individual with the sole responsibility of ensuring adherence to the entire donning and doffing process. The trained observer will be knowledgeable about all PPE recommended in the EMSOP's protocol and the correct donning and doffing procedures, including disposal of used PPE, and will be qualified to provide guidance and technique recommendations to the healthcare worker. The trained observer will monitor and document successful donning and doffing procedures, providing immediate corrective instruction if the healthcare worker is not following the recommended steps

III. GENERAL

The information contained in this procedure is intended to be consistent with the EMS and PSAP interim guidance given by the Centers for Disease Control (CDC) and Prevention for management of patients with known or suspected EVD *(5)*. In some cases, our local implementation of infection control procedures will exceed those recommended by the CDC.

A. PATIENT SCREENING:

Utilizing the State's *Emergency Infectious Diseases Surveillance Tool*, the Charles County 911 Communications Center will begin to screen callers requesting emergency medical services for possible Ebola symptoms AND travel or connection to someone who has travelled to an Ebola outbreak country within twenty five (25) days as well as risk of exposure to someone who has been positively diagnosed with Ebola.

1. Possible Identified Symptoms Include:

   - Fever,
   - Severe headache;
   - Muscle pain;
   - Vomiting;
   - Diarrhea;
   - Abdominal pain;
   - And unexplained bleeding.

2. Current Ebola outbreak countries per the WHO include (10-20-14):

   - Liberia
   - Sierra Leone
   - Guinea
   - Senegal
   - Nigeria

3. An incident involving a patient that has been identified as satisfying both inclusion criteria shall be considered a PUI incident.

4. The Charles County 911 Communications Center will assign the EMSSECURE channel to units operating on a PUI incident. All patient information and communications related the PUI incident should be transmitted via EMSSECURE.

B. RESPONSE:

1. When the Charles County 911 Communications Center determines there is a patient that conforms to the Ebola PUI criteria, an Ebola Task Force will be dispatched:

2. Public safety personnel and units will be dispatched on FEMAIN for a "Suspected PUI Incident". Dispatched units will then switch to EMSSECURE for pertinent call data and patient information.

3. The Ebola Task Force consists of the following assignment:

Public Safety Asset	Role	Location
First Due EMS Transport Unit	The first due EMS transport unit is assigned to assist with donning of PPE, non-close contact patient care and driving the primary transport unit.	Incident address
PA-168 (Co. 60)	Primary patient care and transport of the PUI patient.	Incident address
Medical Duty Officer	Incident management, EMS support and perform duties as the Trained Observer.	Incident address
Hazmat Decon Unit	Decon of personnel, equipment and apparatus.	Charles Regional Medical Center
First Due Engine Company to CRMC (Co. 01)	Decon support.	Charles Regional Medical Center

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4. All personnel who are dispatched to the scene of a known or suspected Ebola PUI must don the appropriate PPE prior to entering the scene. The donning of PPE should be performed under the guidance of a Trained Observer.

5. For patient encounters where a PUI Incident has not been dispatched yet on-scene providers suspect the patient may be a PUI candidate, prior to establishing close contact; personnel should remotely interview and assess the patient from outside of a four (4) feet perimeter to determine whether the patient meets the criteria for being an Ebola PUI. If the patient meets the established criteria; immediately back out of the scene and don the appropriate PPE.

6. If however, a crew establishes close contact with a PUI patient prior to donning the appropriate PPE personnel should act accordingly:

a) If life-saving interventions are indicated for the patient and other care providers are on the scene:

- The initial care team should in a professional and compassionate manner, explain to the patient that additional PPE precautions are necessary and remove themselves from the patient's room. The initial care team should then be sequestered (ideally in a private area) and prepped for decontamination.
- A second patient care team should be dispatched and or formed, don the appropriate PPE and provide the life-saving patient care as quickly as possible.

b) If other care providers are NOT on the scene:

- The initial care team should don their appropriate PPE and provide life-saving treatment to the best of their abilities. Once other care providers arrive on scene they should transfer patient care and remove themselves from the patient's room, sequester as directed and prepare for decon.

c) If life-saving interventions are NOT required for the patient:

- The initial care team should in a professional and compassionate manner, explain to the patient that additional PPE precautions will need to be taken given the patient's situation, that there will be a slight delay to their care and remove themselves from the patient's room. This initial care team should then be sequestered (ideally in a private area) and prepared for decontamination.
- A second patient care team should be dispatched and or formed, don the appropriate PPE, access the patient and provide care as needed.

d) Personnel from the initial care team who are contaminated (were in close contact without appropriate PPE) will undergo a full decon process on scene.

- Once decontaminated, personnel will be medically assessed and treated. In certain cases, further actions may be directed by the Charles County Health Officer and Health Department. Actions taken will be in accordance with CDC recommendations and the best available scientific evidence. In some cases, it is possible that some level of quarantine may be indicated.

e) The Charles County 911 Communications Center should immediately be notified of the situation as well as the Medical Duty Officer (MDO).

f) Personnel having close contact with the patient should be limited to the absolute minimum manpower necessary to safely to treat the patient.

g) Attempt to sequester family members and or bystanders that have already been in close contact with the patient.

h) Ask family members (if possible) to quarantine any pets in a room.

i) It is the responsibility of the Charles County Health Department to determine and enforce if necessary the quarantine of family members, pets and or bystanders. Personnel on-scene should not distract their efforts on patient care to deal with non-compliant persons or pets.

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C. INCIDENT COMMAND:

1. Incident command shall be established for an incident involving an Ebola PUI.

2. Once Ebola PUI criteria is confirmed by the EMS crew or MDO:

a) Command shall insure that all providers making patient contact are properly protected and wearing the appropriate PPE ensemble.

b) Command shall insure that the Charles County 911 Communications Center is immediately aware of the situation (if not already).

c) Command shall establish communications with Charles Regional Medical Center to insure that the appropriate resources and facilities are prepared.

(1) If the patient requires a specialty care center, Command will make notifications to that facility immediately prior to the patient leaving the scene. The specialty care center may not be prepared to accept PUI patients.

(2) Charles Regional Medical Center (301) 609-4160

d) Hazmat Decon assets will be dispatched to the receiving hospital or the scene if deemed necessary. Command will need to direct Decon resources if they are needed on the scene.

e) 911 Communications Center shall insure that EMRC is notified prior to the patient leaving the scene (410) 706-0036.

f) 911 Communications Center shall notify the Charles County Health Officer (Health Department) directly, (301)609-6810 & (301)-932-2222.

g) The 911 Communications Center shall notify Animal Control if the quarantine of pets and other animals are requested.

D. PROVIDER PPE:

1. CCDES and CCAEMS have elected to provide the capacity to exceed the current minimum CDC recommendations for PPE protection against EVD. PPE elements that exceed the current CDC recommendations are denoted with an asterisk (*).

2. All personnel that don PPE and experience intermediate or close contact with a known or suspected EVD patient shall strictly adhere to the outlined PPE doffing and decontamination procedures.

3. **Intermediate contact** is contact of a nature that does not meet the definition for "close contact" but where there is concern for some level of contamination from a patient suspected or known to have EVD infection. Current CDC guidance for this situation is that there is no risk of infection from an Ebola PUI unless close contact occurs.

4. Standard (routine) PPE for **intermediate contact** shall consist of:

- Base layer exam gloves
- Second (outer) layer exam gloves*
- N95 HEPA Mask
- Eye protection
- Impervious gown
- Shoe covers*
- Hair cover*

5. For **close contact** with a patient suspected or known to have the EVD infection where "copious amounts of blood, other body fluids, vomit, or feces" are present in the environment (6),

- Base layer exam gloves
- Second (outer) layer exam gloves
- Tyvek coveralls
- Overboots
- Air Purified Respirator with P 100 Filter*
- Powered Air Purified Respirator with dual P 100 Filters* (offered)

6. While high risk/low benefit resuscitative efforts are not recommended for PUI patients, there may be times where resuscitative efforts for a suspected or "unconfirmed" PUI patient are warranted. For **resuscitation situations** or **close contact** with those patients who may have the EVD infection where copious blood, vomit, feces, or body fluids are in the environment (6).

- Base layer exam gloves
- Second (outer) layer exam gloves

- Tyvek coveralls
- Overboots
- Air Purified Respirator with P 100 Filter*
- Powered Air Purified Respirator with dual P 100 Filters* (offered)

7. CCDES is deploying several powered air purifying respirators (PAPRs) to EMS supervisor vehicles and to decontamination team vehicles. While use of these devices further exceed the current CDC recommendations for respiratory protection for possible Ebola patients, the devices are being made available for use at the discretion of the provider and Incident Commander. These devices utilize the Scott AV-3000 face masks and a belt-mounted powered filtration unit to provide filtered air to the provider.

8. Significant attention must be given to the PPE donning and doffing process in order to prevent accidental contamination. Each step of every PPE donning/doffing procedure must be supervised by a Trained Observer to ensure proper completion of established PPE protocols. A Trained Observer will read aloud to the healthcare worker each step in the procedure checklist and visually confirm and document that the step has been completed correctly. The Trained Observer is a dedicated individual with the sole responsibility of ensuring adherence to the entire donning and doffing process. See Decontamination of Personnel section.

E. PREPERATION OF EMS TRANSPORT UNIT PATIENT COMPARTMENT:

1. Stow any equipment that is not necessary in the patient compartment in compartments that have outside access only or inside sealed compartments, particularly high-value electronic equipment (where decontamination may cause damage) or equipment that would be difficult to decontaminate (e.g. with cloth parts or with irregular non-smooth surfaces).

2. Any items that need to remain in the patient compartment should be placed inside a sealed bag and protected as much as possible.

3. Turn on patient compartment exhaust fan.

4. Keep cabinet doors closed unless supplies are needed. Once a cabinet has been opened, the entire interior must be disinfected.

5. Consider use of a disposable impervious blanket (if available) on the cot, underneath patient, and consider covering patient and their clothing with either the same or an additional disposable impervious blanket.

6. Be proactively prepared to contain potential body fluids.

F. CREW CONFIGURATION:

1. An ambulance operator, who shall not have close patient contact, shall be assigned to drive the ambulance to the hospital.

2. No one having had close contact with the patient should drive or be seated in the front seats of the ambulance. All care providers that establish close contact with the patient should remain in the patient compartment of the ambulance, or be transported in the patient compartment of another ambulance. These areas can be completely decontaminated.

3. There are no scientific grounds for there to be a risk of transmission to a person in the driver position. However, ambulance drivers may choose to don PPE in accordance with the Intermediate contact guidelines within this policy or at a minimum N95 mask and eye protection. In all cases, drivers should never sacrifice their field of vision or the ability to safely operate the vehicle. The risk profile does not substantiate this decision.

4. Risk analysis indicates that personnel with the following medical conditions should not be utilized to treat PUI patients:

- Pregnancy
- Insulin dependent diabetic
- Immune-compromised

5. Personnel who do not possess a current annual respiratory fit test for their APR and N95 mask should not make contact with PUI patients.

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G. PATIENT CARE:

1. Place a surgical mask on the patient if possible.

2. Have patient utilize alcohol-based hand cleaner if feasible.

3. All persons in the patient compartment shall be using appropriate PPE.

4. Potential limitation of procedures (6):

   a) Patients should be provided the care they need, and the procedures that are indicated.

   b) Limit use of needles and other sharps as much as possible.

   c) Aerosolized (nebulizer) treatments should be avoided.

   d) Non-essential (life-saving) interventions, such as elective IVs or elective advanced airway procedures should be deferred to the hospital setting when treatment indications are such that deferral of those procedures is appropriate.

   e) Life-saving procedures that are indicated by protocol shall be instituted by providers using the appropriate PPE.

   f) Aeromedical transport is not recommended.

5. Once the transport unit arrives at the emergency department (ED) with proper notification, personnel should NEVER enter the ED. ED staff will triage the patient in the ambulance and then transfer them to a specialized isolation bed in the parking lot of the ED.

6. Because of the specific relationship and procedural demands of a PUI incident, in Charles County; Charles Regional Medical Center will be the transport facility for known or suspected PUI patients.

7. Priority four (4) patients are to be left at the scene.

   a) 911 Communications will notify the County Health Officer

   b) The Tactical Response Team will be dispatched to the scene to assist with Health Department.

H. DECONTAMINATION OF PERSONNEL:

1. An appropriate CCDES decontamination team shall be assembled at the receiving hospital to assist primary patient care personnel in carefully following the recommended PPE doffing procedure.

2. Primary care personnel will enter the Charles Regional Medical Center's (CRMC) decontamination room through the exterior door and await decon instructions by the CCDES decon team.

3. Adherence to proper PPE doffing procedures is critical (7). In general, work from clean to dirty.

4. If effective PPE has been in place, once PPE is effectively removed, the only decontamination typically required is hand washing. A change of uniform to include footwear is recommended.

5. If effective PPE was not in place for a portion of the incident, and a provider was in close contact with an Ebola PUI, decontamination measures for that provider will be commensurate with the level of contamination.

a) Any known areas of contamination should be washed with soap and water (8). Do not use bleach or hospital disinfectant on skin. An alcohol-based gel or foam can be used following washing with soap and water. Shower as required.

b) Clothing should be removed and placed in double red biohazardous waste bags.

c) The bags shall be marked with the provider's name, and placed in an overpack drum clearly labeled "FIRE DEPARTMENT - QUARANTINED - DO NOT YET DESTROY".

d) The overpack drum will be supplied by the CCDES Tactical Response Team, and placed in the CRMC's decontamination room. If the patient ends up not to have Ebola, the clothes could be released.

e) Once decontaminated, a person cannot spread the virus unless they actually contract the virus (develop an infection) and then begin to show symptoms. If infection occurs, symptoms can develop in 2 to 21 days from exposure, with 8-10 days being typical.

6. Because of the high stress of and heavy demand on the body during confined PPE operations, post the decon process, the primary care and transport team shall be permitted a minimum of two (2) hours for rest and rehab.

7. The rest and rehab process will consist of the following:

a) Vitals

b) Fluid resuscitation (oral or intravenous)

c) Medical attention if necessary

d) Changing of clothes and or shower (provider's choice)

I. DECON OF APPARATUS AND EQUIPMENT:

1. The CDC suggested procedure for decontamination of transport units can be found at http://www.cdc.gov/vhf/ebola/hcp/environmental-infection-control-in-hospitals.html (8). Although this is listed for hospitals, the principles and cleaning solutions remain the same.

2. Summary of suggested decontamination procedure:

a) Don contact and droplet PPE.

b) Carefully remove any plastic coverings used in efforts to reduce contamination and place in biohazard red bags.

c) Carefully bag any linens used in red biohazardous waste bags.

d) All exposed surfaces must be decontaminated, including the interior of any cabinets or compartments opened and any equipment that was present in the patient compartment area.

e) Use an appropriate cleaning solution.

- An Environmental Protection Agency (EPA) registered hospital disinfectant with the label claim for disinfection of non-enveloped organisms (e.g. norovirus, rotavirus, adenovirus, poliovirus). If a commercial disinfectant is used, follow the direction set forth by the manufacturer.

- A freshly mixed 1:10 bleach solution, made by using 5-6% (household) bleach that is less than one year old mixed with cold water in a spray bottle. This solution will remain effective as a disinfectant for 24 hours, then discard.

f) Clean up any visible body fluids.

g) Spray all surfaces with an appropriate cleaning solution, allow to sit for at least five (5) minutes and to completely dry.

h) Wipe remaining solution as necessary.

i) Wipe all surfaces with hospital disinfectant cloths. This provides a further level of decontamination.

j) Double-bag any red biohazardous waste bags generated.

k) If sharps were generated, seal sharps container and process as biohazardous medical waste.

3. Quarantine Area and Guidelines:

a) Equipment

- Equipment shall be disinfected according to CDC guidelines.
- Equipment that cannot be decontaminated shall be appropriately secured within double red biohazardous waste bags or overpack drums in the decontamination area at the hospital. The overpack drum shall be clearly labeled "FIRE DEPARTMENT - QUARANTINED - DO NOT YET DESTROY". The overpack drum will be supplied by the CCDES Tactical Response Team, and placed in the CRMC's decontamination room. If the patient ends up not to have Ebola, the equipment could be released.

b) Apparatus

- Apparatus and patient compartments shall be disinfected according to CDC guidelines.
- Apparatus that cannot be decontaminated shall be secured and appropriately marked by the incident commander. Custody of the apparatus shall be maintained at all times until further direction is received.

4. Waste Disposal Guidelines

a) CRMC will assist CCDES with biohazardous waste disposal.

5. Hospital Decontamination Rooms/Areas

a) Medical waste shall be appropriately secured in double red biohazardous waste bags or overpack drums and secured in designated decontamination areas. Notification to the charge nurse shall be made that waste is present in the decontamination room.

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J. REPORTING PROCEDURES:

1. Personnel that are part of close contact treatment and transport teams for suspected or known EVD patients shall document their position, function, and other aspects of the incident. This shall be done using the First Report of Injury Form with an attached memo if necessary. The provider shall confer with their direct supervisor and EMS supervisor in creating the documentation. Within the documentation, at least the following shall be included:

   a) Provider's role for the incident.

   b) Approximate elapsed time in close contact with the patient.

   c) PPE utilized.

   d) If copious body fluids were present.

   e) Classify the situation as one of the following: a high-risk exposure, a low-risk exposure, or a significant treatment event with intact PPE.

2. The MDO shall submit a copy of the Ebola Check List

3. There are three categories of exposure

   a) High Risk Exposure (4)

   - Percutaneous (e.g. needle stick) or mucous membrane exposure to blood or body fluids of an EVD patient.
   - Direct skin contact with, or exposure to, blood or body fluids on an EVD patient without appropriate PPE.
   - Processing blood or body fluids of an EVD patient without appropriate PPE or standard bio safety precautions.

   b) Low Risk Exposure (4).

   - Having brief contact (e.g. shaking hands) with an EVD patient while not wearing appropriate PPE
   - Having been in close contact with an EVD patient while not wearing appropriate PPE. Close contact is defined as being within one meter of an EVD patient, or being within the patient's care area or room for a prolonged period of time. Brief interactions such as walking by a person, or moving past their room, do not constitute close contact.

c) Significant Treatment Event with Intact PPE.

- Either of the above situations where appropriate PPE is believed to have been in place, and appropriate decontamination and doffing procedures were adhered to. While this is not considered an exposure, for tracking purposes this will document the event.

K. PROVIDER PERSONAL PREPARATION:

1. Providers should familiarize themselves with some of the many reputable resources regarding EVD and infectious diseases (see References section). As with all things that can be dangerous to us while on-duty, learn about EVD and infectious disease, and how the risks they present can be minimized.

2. Ensure your issued infection control PPE is in ready condition.

3. Ensure your assigned unit has adequate supplies of PPE and decontamination supplies.

4. Ensure the contents of your issued PPE bag are in ready condition. It is a good idea to have a simple change of clothes stowed in it. This is useful practice for a host of possibilities that might occur during a duty shift.

5. Ensure the information contained in your personal communications devices is frequently backed up. If you choose to carry your phone (or other belongings) on your person while on-duty, anticipate the potential need to have them be quarantined or for them to be possibly damaged during decontamination.

6. Plan for the possibility that you might be called upon to care for an Ebola PUI. Familiarize yourself with equipment available to you to manage this situation.

IV. REFERENCES

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(2) (EV-D681) Enterovirus D68 in the United States, 2014. (October 10, 2014). CDC. Retreived from http://www.cdc.gov/non-polio-enterovirus/outbreaks/EV-D68-outbreaks.html

(3) (EV-D682) Enterovirus D68 for Health Care Professionals. (October 1, 2014). CDC. Retrieved from http://www.cdc.gov/non-polio-enterovirus/hcp/EV-D68-hcp.html

(4) (MIEMSS1) Alcorta, R. A. (October 12, 2014). Emerging Infectious Diseases Update 1.

(5) (Ebola1) 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.

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(9) Ebola Situation Assessment 2014 October 14, World Health Organization, Retrieved from http://www.who.int/mediacentre/news/ebola/14-october-2014/en/

(IAFF Ebola Page) http://client.prod.iaff.org/#page=Ebola

(IAFC Evola Page) http://www.iafc.org/ebola?utm_source=Informz&utm_medium=Email&utm_campaign=IAFC+Homepage

V. APPROVAL

Approved: _____ Date: _____

William D. Stephens, Director

Approved: James Mitchell MD Date: 10/29/2014

James Mitchell, MD; JMD

Approved: _____ Date: _____

Brent Huber, Chief; CCAEMS

VI. ATTACHMENTS

1. Us Army Public Health Command, *Decontamination of Vehicles & Equipment Used for Transportation of Potential Ebola Virus Disease (EVD) Patients or Related Equipment,* 10-2014

2. Recommended Donning & Doffing Procedures for Close Contact PPE Ensemble, 2014

3. Local Protocol PUI Check List, 2014

4. Local Protocol PUI QA Form, 2014

Decontamination of Vehicles & Equipment Used for Transportation of Potential Ebola Virus Disease (EVD) Patients or Related Equipment

Technical Information Paper 13-031-0914

1. Purpose. This information paper provides guidance for decontaminating vehicles used to transport personnel or equipment in the Area of Operations (AO) impacted by Ebola virus disease (EVD). It is not intended to change any existing Department of Defense (DoD) directives, policies, or procedures provided by Combatant Commands, CONPLANS, or OPORDs in the AO or the AFRICOM AOR.

2. Applicability. This information is applicable to DOD-owned vehicles and equipment. This is preliminary information based upon limited available data. This document is not intended to be a step-by-step instruction and should be read and understood in its entirety prior to commencing any vehicle decontamination activity. Hence, there is an expectation that personnel involved with decontamination activities have familiarity with the proper use of personnel protective equipment, respirator protection program, working with hazardous materials, hazards associated with working with infected persons and remains, and waste management and disposal practices.

3. Background. The U.S. Centers for Disease Control and Prevention (CDC) notes that the 2014 outbreak is the largest outbreak of EVD in history and the first in West Africa. There may be instances during responses to the outbreak when DOD vehicles may be used for the transport of suspected and/or confirmed EVD patients, equipment, or medical waste.

4. References. Established military procedures for decontamination of several types of military equipment are found in Field Manual (FM)3-11.5/MCWP 3-37.3/NTTP 3-11.26/AFTTP(I)3-2.60, CBRN Decontamination: Multiservice Tactics, Techniques, and Procedures for Chemical Biological Radiological and Nuclear Decontamination, April 2006. Additional references are listed at the end of this document.

5. EVD transmission.

a. Body fluids and tissue from individuals who develop symptoms of EVD are very infectious. EVD spreads in the community through human-to-human transmission, with infection resulting primarily from direct contact (through broken skin or mucous membranes) with the blood, secretions, organs or other bodily fluids of infected people, and indirect contact with environments contaminated with such fluids. According to the limited research available, isolation of cases, disease contact tracing, proper handling of blood/body fluids and remains of the deceased, and proper use of personal protective equipment when in contact with EVD-infected persons is required to stop further spread.

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b. Persons in contact with suspected and/or confirmed EVD patients must consistently apply appropriate infection control procedures (standard, contact and droplet precautions). These include basic hand hygiene, respiratory hygiene, personal protective equipment (PPE) to reduce the risk from splashes or other contact with infected materials, and patient isolation. Prevention guidelines for medical and transport personnel who may come in contact with EVD patients or their bodily fluids are available at: http://www.cdc.gov/vhf/ebola/hcp/index.html.

c. Given the apparent low infectious dose, potential for high virus titers in the blood of ill patients, and disease severity, higher levels of precaution are warranted to reduce the potential risk posed by contaminated surfaces in the patient care environment.[1]

d. Infection control guidelines addressing procedures to disinfect healthcare settings are readily available from the CDC. The CDC also provides guidance for decontamination procedures for air medical transport of EVD patients and disinfection for airport cargo and cleaning personnel. This document is intended to augment these resources by providing decontamination information specific to DOD vehicles deployed to EVD affected areas.

6. Vehicles in the AO where EVD is present or suspected. Vehicles in the AO that do not come in contact with persons ill with EVD or items potentially contaminated with Ebola virus do not require special decontamination but should follow normal wash/rinse protocols for military vehicles as established in DoD Regulation 4500.36, Management, Acquisition, and Use of Motor Vehicles.

7. Vehicles that have transported a suspected and/or confirmed EVD patient. As soon as possible after transport, decontaminate vehicles exposed to a suspected and/or confirmed Ebola patient as follows:

a. Select PPE. Personnel cleaning and disinfecting vehicles should wear PPE. Reusable PPE items will require proper cleaning and disinfection after use.

(1) Donning and doffing of PPE are critical steps in the prevention of exposure and it is imperative that personnel carefully remove PPE after working in potentially contaminated environments to avoid exposure of non-protected skin and mucous membranes. It is highly recommended that donning and doffing of PPE is performed in pairs or with supervision to minimize potential for unprotected exposures. Instructions for putting on and removing PPE are available at http://www.cdc.gov/HAI/prevent/ppe.html and http://www.cdc.gov/vhf/ebola/pdf/ppe-poster.pdf.

(2) At minimum, PPE should include disposable gloves, gown (fluid resistant/ impermeable), eye protection (face shield), and facemask to protect against direct skin

and mucous membrane exposure of cleaning chemicals, contamination, and splashes or spatters during cleaning and disinfection activities. Additional barriers (e.g., leg covers, shoe covers) should be used in cases where the vehicle contains visible bodily fluids. Consider double-gloving if cleaning large amounts of blood or other body fluids.

(3) For more heavily contaminated environments or where there is a greater risk of splashes or splatters during cleaning and disinfection activities, consider utilizing full Tyvek® coverall suit, and overboots, heavy gauge rubber gloves over disposable gloves taped to the coverall suit, along with surgical mask and goggles or splash shield to protect against direct skin and mucous membrane exposure. Additional respiratory protection, such as a personal air purifying respirator (PAPR), should not be needed, but may provide additional physical comfort to personnel wearing PPE in warm climates due to airflow occurring within the mask. (Tyvek® is a registered trademark of E.I. DuPont de Nemours and Company.)

b. Surface Preparation. Before disinfecting a surface, cleaning should be performed to remove all bodily fluids, trash and dust build-up. In contrast to disinfection where specific chemicals are used, soap and water can be used for the cleaning process. Gross debris, if contaminated, is and will likely remain potentially infectious, so its management is important. Use disposable cleaning cloths, mop cloths, and wipes to manually clean the surfaces with the soap and water solution. Dispose of used materials along with any trash and debris in leak-proof bags. Use a rigid waste receptacle designed to support the bag to help minimize contamination of the bag's exterior. Care should be taken to prevent splashes and/or spread of fluids beyond the area of contamination.

8. Selection of decontamination method. There are a number of procedures and materials that can be used to decontaminate surfaces suspected of Ebola virus contamination. Not all decontamination methods are suitable or amenable to the material/item that is suspected of contamination. The best method to use will depend on the type of material that is contaminated, how the material is contaminated, the ability to obtain decontamination supplies, and other factors specific to the location. One key element impacting decontamination is the type of material (porous or non-porous) and whether electronics are present.

a. Porous. These are materials that will allow liquid and gas to pass through them. These will vary in hardness, density and porosity. As a result, liquids spilled or applied to these will absorb into the material making it more difficult to remove or decontaminate. Examples of porous materials include paper, fabric, and wood.

b. Non-porous. These are materials that will limit or prevent liquid and gas from passing through them. Liquids spilled or applied to these materials will pool or run off the material. Examples of non-porous materials include glass, metals and plastics.

c. Electronics. These are items containing electronic circuitry, switches, batteries, wiring, and so forth. These may or may not be installed or manufactured in a manner to prevent exposure to vapors and liquids such as contaminants and materiel used for decontamination.

9. Chemical decontamination. Selected disinfectants and bleach are recommended for killing the Ebola virus. Note that while alcohol is part of any hand sanitation/infection control program (alcohol-based hand sanitizer), it is not effective for decontaminating objects that have been in contact with the Ebola virus.

a. Commercial disinfectants. The U.S. Environmental Protection Agency (EPA) has identified a number of disinfectants suitable for Ebola virus decontamination. The disinfectants on *List G: EPA's Registered Antimicrobial Products Effective Against Norovirus* have been identified as being acceptable for use against Ebola virus. A large number of these are peroxide and acidic/alkaline-based cleaners.[2] Prepare and use commercial disinfectant per the directions on the package.

Table. National Stock Numbers for Some EPA-Approved Disinfectants

NSN	Trade Name	Nomenclature
6840-01-389-6088	Dispatch®	Disinfectant-Detergent, General Purpose
6840-01-491-4889	Dispatch	Disinfectant-Detergent, General Purpose
7930-01-084-3103	Spray Nine®	Cleaner, Industrial, Multi-Purpose
7930-01-177-0795	Spray Nine	Cleaner, Industrial, Multi-Purpose
7930-01-346-5280	Spray Nine	Cleaner, Industrial, Multi-Purpose
7930-01-346-5281	Spray Nine	Cleaner, Industrial, Multi-Purpose
7930-01-346-5284	Spray Nine	Cleaner, Industrial, Multi-Purpose
7930-01-393-6747	Spray Nine	Cleaning Compound Solvent Detergent Liquid Disinfectant 25oz 12s

Notes:
Dispatch is a registered of The Clorox Company.
SprayNine is a registered trademark of the U.S. EPA.

b. Bleach. Dilute bleach is highly effective at decontaminating surfaces and items contaminated with the Ebola virus. Non-porous surfaces that are relatively free of debris and caked or pooled material can be decontaminated with a solution of 1% bleach [1:100 (~8 teaspoons of bleach added to 1 gallon of water or 10 mL of bleach to 990 mL of water)]. For unclean, soiled, dirty and porous surfaces, or when decontaminating an item via immersion, a solution of 10% bleach solution should be used [1:10 (1 cup of bleach added to 9 cups of water or 100 mL of bleach added to 900 mL of water)].[3] Even at the higher concentration of bleach solution, disinfection will be more successful if gross debris is removed prior to disinfection. Organic matter will neutralize bleach solution. Bleach solution should remain in contact with surfaces/items for at least 10 minutes.

(1) Full strength bleach emits toxic vapors and should never be used in small or enclosed spaces. Ideally, mix your solution outside. If that is not an option, go to a large, well-ventilated room and open the windows.

(2) Carefully pour the bleach into the container first, and then add cold water. Mixing the solution in this order will prevent the bleach from splashing up on you. If you do get any bleach on your skin, wipe it off immediately with a damp cloth.

(3) Place the lid on the container and gently invert the container back and forth a few times to mix. The solution is now ready to use. Never add any other ingredients to the bleach solution because many substances, including vinegar, create harmful fumes when mixed with chlorine bleach.

(4) Chlorine bleach solution begins to lose its disinfectant power quickly when exposed to heat, sunlight, and evaporation. To ensure the solution is still strong enough to kill germs, mix a fresh batch each day using cold water and discard whatever amount you don't use at the end of the day.

c. MicroChem Plus™ solution. MicroChem Plus solution is highly effective at decontaminating surfaces and items contaminated with the Ebola virus. Approximately 190mL of MicroChem Plus solution can be added to 1 gallon of water to achieve the correct dilution for decontaminating surfaces. The MicroChem Plus solution should remain in contact with the surfaces/items for at least 15 minutes. An advantage of MicroChem Plus is that it is not believed to be degraded by organic matter to the degree that bleach is. (Micro-Chem Plus™ is a trademark of National Chemical Laboratories, Inc.).[4]

10. Decontamination of non-porous surfaces (e.g., glass, metal, painted surfaces, plastics).

a. Clean the surface of loose debris, fluids and caked material using soapy water. (See surface preparation section above.)

b. Spray the surface with disinfectant and let stand for 10-30 minutes. Ensure the surface remains visibly wet for at least 10 minutes. During this time, a disinfectant saturated media (i.e., sponge, rag, wipe) can be used to gently spread the disinfectant across and around the surface.

c. Wipe clean with a moistened towel or sponge and let dry. Repeat if disinfectant residue is apparent.

11. Decontamination of porous surfaces. For porous surfaces (e.g., removed clothing, bedding, mattresses, seat cushions), decontamination will require a decision as to whether the item will be reutilized.

a. Items with porous surfaces that WILL NOT be reutilized. Saturate items with disinfectant and place into a leak-proof biohazard bag and secure for disposal.

b. Items with porous surfaces that WILL BE reutilized:

(1) Remove debris and free liquids/solids from the item and place in a leak-proof biohazard bag, saturate with disinfectant, and dispose as described below.

(2) Immerse the items in disinfectant for 10-30 minutes depending on the size and volume of the item being disinfected.

(3) Remove the items from the disinfectant and allow excess fluids to drain.

(4) Immerse the items in clean rinse water and allow sufficient time to remove excess disinfectant. One or more rinses may be required depending on the absorbent qualities of the material.

(5) Remove the items from the rinse water and allow to dry.

NOTE: If the item is such that it cannot be immersed due to size or detached from a mount, the item will need to be saturated with disinfectant in place. The item would then be rinsed in the same manner one or more times to remove disinfectant residuals.

12. Disposal of wastewater.

a. Although decontamination is intended to destroy or inactivate Ebola virus, it is possible that wastewater from decontamination of vehicles could still contain some active virus. Disposing of the wastewater through sanitary sewers is only a good option if additional disinfection occurs as part of the wastewater treatment process. However, in the areas of Africa where EVD has been found recently, functioning modern sewers with disinfection prior to discharge are not routinely available.

b. Using a soakage pit is an option if the site selected is completely isolated from any surface water or any subsurface source of drinking water. If soakage pits are used, after the rinse water enters, add enough lime to achieve a pH of 12 or above and maintain it at that level for 2 hours without adding more lime. Each time the pH slips below 12, add more lime and wait a full 2 hours from the time the additional lime was added.[5] After the pH has successfully been maintained for 2 hours as described above,

cover the area with earth and secure the area so that it is not used for farming, irrigation, digging of wells, and so forth.

c. Lime is usually available at farm supply stores in the United States as a soil pH adjustment and may be available in less developed areas of the world. The lime addition rate to the pit should be approximately a 50 pound (23 kilograms) bag per 1,000 gallons (3785 liters) of rinse water. The lime will react with water to produce heat. It is best to add the lime as a slurry to the pit by premixing it with other water (NOT the rinse water), rather than pouring powdered lime directly into the rinse water.

13. Encapsulated treatment. This method requires encapsulating an item, or area to be decontaminated, within a sealed enclosure whereupon all items within the enclosure are subjected to treatment. Treatment may be in the form of heating, vaporized chemical oxidizers (e.g., hydrogen peroxide vapor, chlorine dioxide), or disinfectant bombs/fogs (e.g., formaldehyde/paraformaldehyde fumigation). The amount of time required to effectively decontaminate the area depends on the concentration used, the contact time, environmental controls (maintaining the temperature and/or concentrations), the size of the space (this will be a factor for reaching the desired concentration), and the integrity of the encapsulation (maintained positive pressure, sealed, and so forth). Failure of any one of these may compromise the decontamination process. Additionally, it will be necessary to validate the treatment process to demonstrate all locations within the enclosed area were adequately subjected to the particular treatment used.

The drawback to encapsulation is the potential for the treatment itself to adversely impact sensitive items contained within the enclosure (i.e., corrosion of electronics, melting of plastics, chemical residues). This form of treatment should only be used in those instances where surface decontamination or disposal of the contaminated item is not feasible due to the total area requiring treatment, when contamination is not limited to the surface, and/or when the cost to replace the item is excessive. Specialized equipment for dispersing reagents, PPE, and controlling the environment will be required.

14. Management and disposal of surface preparation and decontamination solid waste.

a. Waste generated from vehicle decontamination (to include PPE) should be placed in leak-proof bags and disposed as infectious waste.[6] To minimize contamination of the exterior of the waste bag, place this bag in a rigid waste receptacle designed for this use.

b. Incineration is the preferred and most effective disposal method for this waste stream; however, incineration options may be limited. Some possible options include:

(1) Collaborating with local hospitals which have incineration capabilities.

(2) Determining whether there are DOD Mediburn incinerators in the AO and coordinating for their use.

c. DoD Instruction (DoDI) 4715.19, *Use of Open-Air Burn Pits in Contingency Operations*, prohibits the disposal of waste in open-air burn pits during contingency operations except in circumstances in which no alternative disposal method is feasible as determined in accordance with the procedures in this document. Refer to DoDI 4715.19 for details.

d. The World Health Organization provides the option of burying the waste in a designated pit of appropriate depth (2 meters (m) or about 7 feet (ft)) and filled to a depth of 1–1.5 m (about 3–5 ft). After each waste load, the waste should be covered with a layer of soil 10 –15 centimeters (4-6 inches) deep.[7]

15. Point of contact. The point of contact for this document is the Army Institute of Public Health Waste Management Program at 410-436-3651 or DSN 584-3651.

References:

[1]http://www.cdc.gov/vhf/ebola/hcp/environmental-infection-control-in-hospitals.html
[2]http://www.epa.gov/oppad001/list_g_norovirus.pdf
[3]http://www.phac-aspc.gc.ca/lab-bio/res/psds-ftss/ebola-eng.php
[4]http://www.nclonline.com/products/view/MICRO_CHEM_PLUS_
[5]Title 40 Code of Federal Regulation, Part 503, Rules on lime stabilization of biosolids
[6]http://www.cdc.gov/vhf/ebola/hcp/environmental-infection-control-in-hospitals.html-
[7]http://www.who.int/csr/resources/who-ipc-guidance-ebolafinal-09082014.pdf, page 9

DONNING & DOFFING

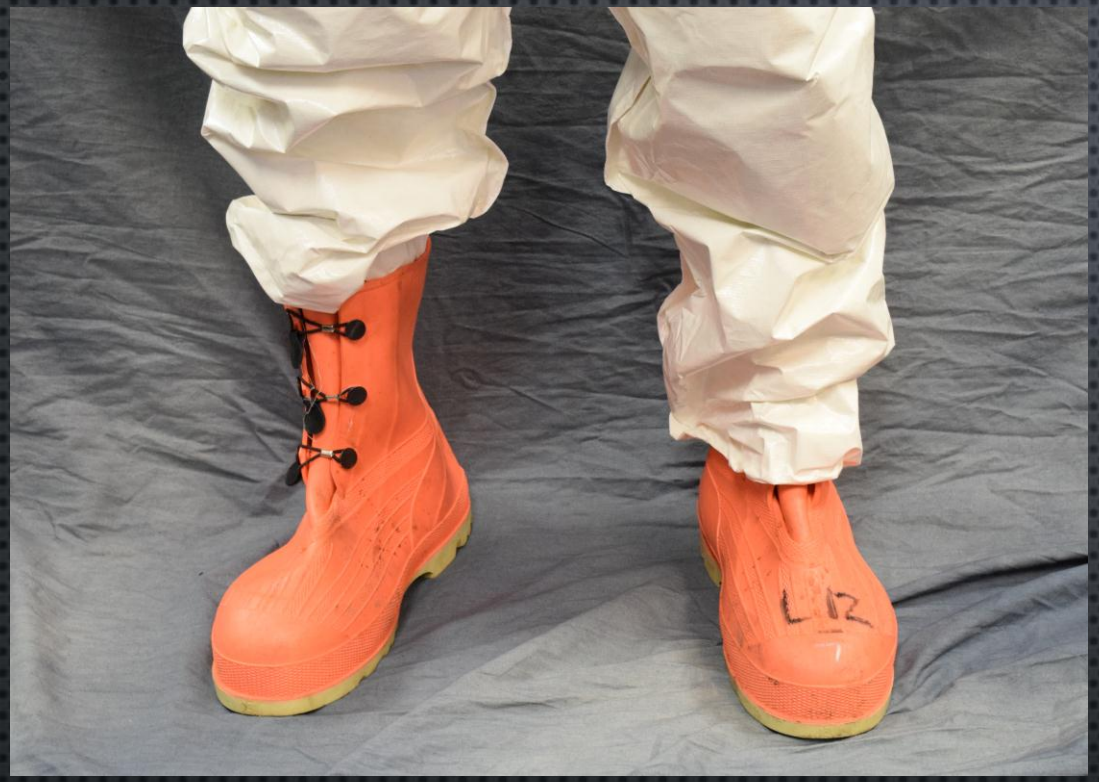
CLOSE & INTERMEDIATE CONTACT PPE ENSEMBLE FOR PUI RESPONSE

DONNING of Close Contact PPE Ensemble

Step 1: In a clean and safe environment, remove personal items such as keys, cell phones and wallets from your pockets.

Step 2: In a clean and safe environment, pull the protective coverall up around the lower half of your body.

Step 3: Pull the coverall up around your upper body and don the inner layer nitrile gloves.



Step 4: Don outer boots.

Step 5: Tape seams using “buddy tabs” at the end of each wrap.

Step 6: Roll excess material over taped seams.

Step 7: Don middle layer glove (separate color from base layer)

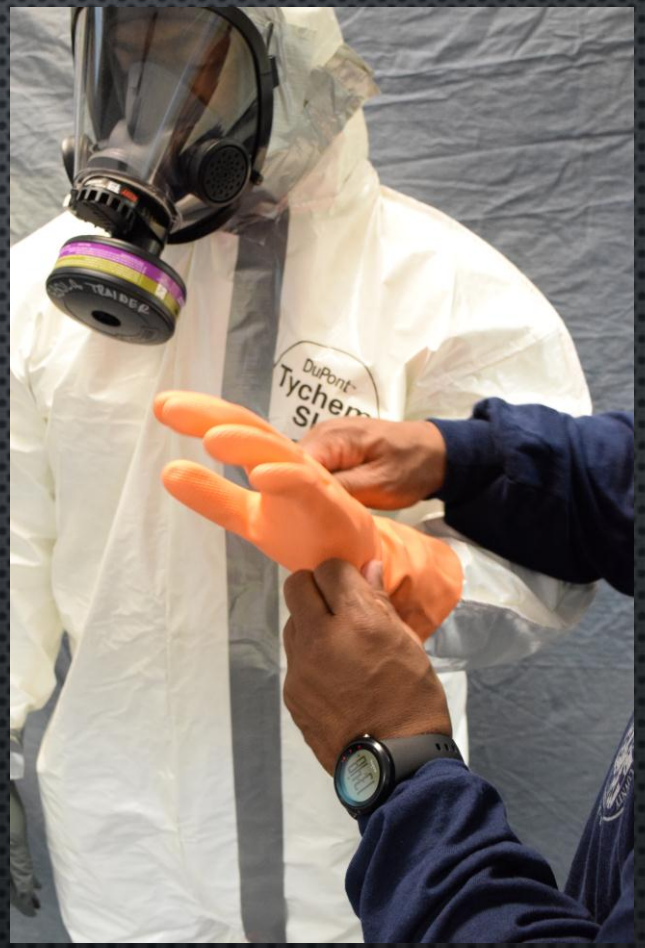
Step 8: Tape seams circumferentially, remember to apply "buddy tabs".

Step 9: Don mask.

Step 10: Zip up coverall and seal adhesive seams.

Step 11: Tuck all loose hair and elastic straps under hood.

Step 12: Tape hood and mask seams.



Step 13: Don outer gloves.


DuPont
TyChem
SL


DuPont
TyChem
SL

Doffing

Step 1: In the decon process, decon personnel will inspect your PPE for compromise and instruct you to stand in clean designated biohazard bag.

Step 2: Decon personnel in PPE will Remove your hood and mask seams.

Step 3: Decon personnel will cut away your hood and peel begin peeling your suit away from you.

Step 4: Decon personnel will cut the coverall away from your body.

Step 5: Decon personnel will peel away your coverall and outer gloves.

Step 6: Do not tough anything and Follow the instructions of the decon personnel while they cut and peel away your coverall and roll it down into the biohazard bag.

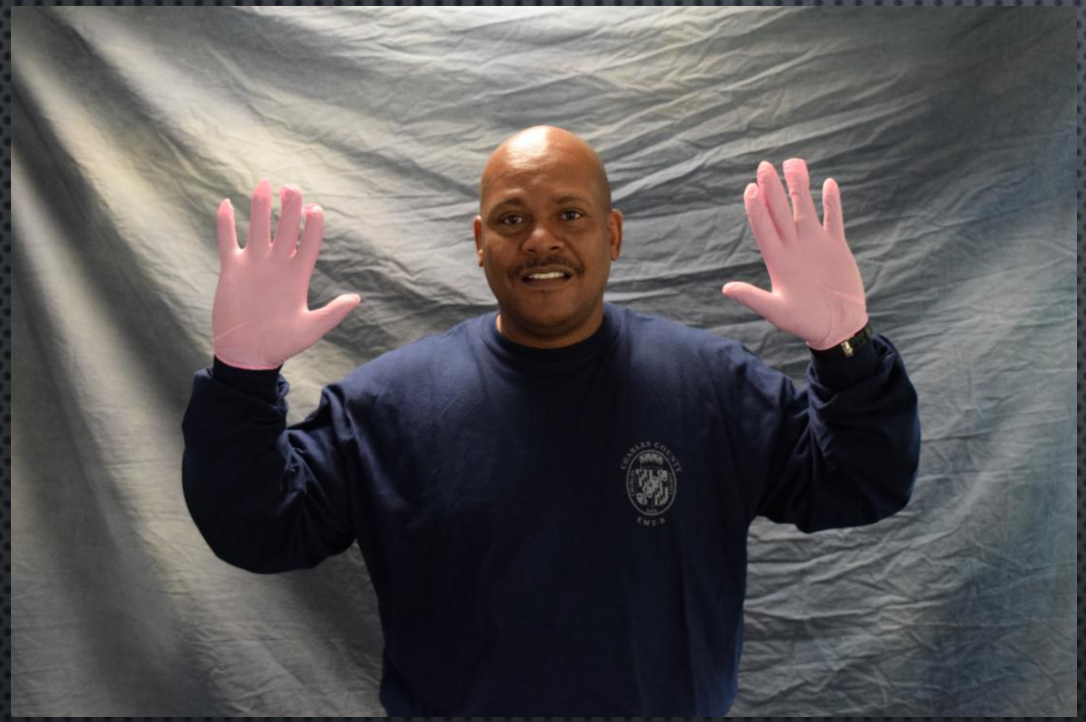
Step 7: Remove your mask.

Step 8: Remove your inner gloves and step out of the bag.


WASH YOUR HANDS!

DONNING of Intermediate Contact PPE Ensemble

Step 1: In a clean and safe environment, remove personal items such as keys, cell phones and wallets from your pockets.



Step 2: Don inner exam gloves.

Step 3: Don fitted N95 face mask.

Step 4: Don impervious gown.

Step 5: Don cap and protective eye wear.

Step 6: Slip boot covers over duty boots.

Step 7: Don outer layer gloves.

Intermediate contact PPE is for support role personnel operating outside of the 4 ft. exclusion area. Since there should be no direct patient contact, doffing should follow established standard BSI/PPE procedures.

MDO PUI CHECKLIST

- ✓ Provide Donning/Doffing Oversight Using Dialog Sheet
    - Close Contact
    - Intermediate Contact
    - Driver
- ✓ Confirm patient meets screening criteria for Person Under Investigation (PUI)
- ✓ Contact 911 if event not dispatched as PUI
- ✓ Contact CRMC and notify of PUI and insure they are monitoring EMSSecure
- ✓ Prepare Ambulance for Transport
    - Place all porous items (medication bag, stat pack, cardiac monitor) in plastic bags or outside compartment
    - Remove personal items such as purses and cell phones
- ✓ Identify Driver of Transport Unit (Cannot be part of patient care team)
- ✓ Ensure patient is prepared for transport
    - Don with surgical mask unless oxygen is required
    - Have patient cleanse hands with alcohol
- ✓ Request HazMat Decontamination Team to scene if positive on-scene exposure occurs
- ✓ Evaluate Family or Bystanders who have close contact with PUI for signs and symptoms
- ✓ Respond to hospital to evaluate patient transfer and decontamination of personnel, ambulance and equipment
- ✓ Ensure personnel with close patient contact have changed uniform, footwear and shower post event
- ✓ Complete First Report of Injury form
- ✓ Complete PUI QA Form

CHARLES COUNTY EMERGENCY SERVICES

Incident No					Incident Date				
Location									
Dispatched as PUI	Yes		No		Disposition as PUI	Yes		No	

Qualifying Signs and Symptoms (Circle All That Apply)

Fever ____° Severe Headache Muscle Pain Vomiting

Diarrhea Abdominal Pain Unexplained Hemorrhage

Qualifying Epidemiologic Risk

___ Travel to West Africa (Liberia, Nigeria, Sierra Leone, Guinea, Senegal or other county with reported EDV transmission) within the last 25 days

___Contact with patient in the previous 25 days who has been positively diagnosed with Ebola

Identify All Units on Event (Check one role for each Unit)

Unit ID	Primary EMS	Secondary EMS	MDO	HazMat Decon	Support	On Scene	At Hospital

List All Providers on Scene

Name	Type of Patient Contact			Type of PPE Worn			
	Close Contact	Intermediate Contact	No Contact	PAPR with Tyvek Suit	APR with Filter and Tyvek Suit	N95 with Appropriate PPE	No PPE Worn

CHARLES COUNTY EMERGENCY SERVICES

Identify Decontamination Team and Tasks Performed		
Name	Decon Personnel	Decon Unit and/or Gear

Any Known Or Suspected Exposure? If so, explain in comment box below	Yes		No	
Donning Check-Off Used and Verbalized	Yes		No	
Doffing Check-Off Used and Verbalized	Yes		No	

List All Equipment, Gear and Clothing Decontaminated or Quarantined		
Item Description	Decontaminated	Quarantined

Person Contacted at Receiving Facility	
MDO Completing Report	

Comments

_____ _____

Signature Date