Personal Protective Equipment Guidance
For Health Care Workers: Ebola Virus

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Suspected EVD is immediately reportable to the Department of Health according to Florida Law (Chapter 64D-3, F.A.C)

This guidance is intended for health care workers who come into contact with individuals either potentially or actually infected with Ebola virus. The entire risk continuum, from initial presentation of a person with suspect symptoms to ongoing care of a seriously ill person should be considered when selecting appropriate PPE. Examples of lower risk PPE and higher risk PPE are given. At all risk levels, however, every assurance should be made that health care personnel caring for the patient have no exposed skin, hair, or mucous membranes. The consideration of specific PPE materials should be based on duration of contact and severity of patient symptoms. Rigorous, repeated PPE training and demonstrated competency is required by those using PPE in care of an Ebola patient.

Patient Encounter Risks:

Lower Risk – no direct or potential direct contact with patient's blood or bodily fluids (e.g., sweat, vomit, feces, urine) and/or contact with linens, objects and environmental surfaces contaminated with the patient's blood or bodily fluids. No participation in aerosol generating medical procedures (e.g., endotracheal intubation, airway suctioning, bronchoscopy, aerosolized or nebulized medication administration, etc.). Patient is in early, mildly symptomatic stage of illness, when virus levels are low.

Higher Risk – direct or potential direct contact with the patient's blood or bodily fluids (e.g., sweat, vomit, feces, urine), processing of laboratory specimens, and/or contact with linens, objects and environmental surfaces contaminated with the patient's blood or bodily fluids. Also includes participation in aerosol generating medical procedures (e.g., endotracheal intubation, airway suctioning, bronchoscopy, aerosolized or nebulized medication administration, etc.). Patient is in a later stage of illness, significantly symptomatic when virus levels are high.

PPE for Lower Risk Encounters

All persons entering the patient room or transporting patients should wear at least:

- Fluid impermeable single use head-to-toe coverall
- Single use nitrile gloves (double glove with smaller size as base layer and larger size as outer layer)
- Single use impermeable shoe/boot covers
- Eye protection (tight fitting goggles or face shield)
- Fluid resistant facemask or N-95 respirator

PPE for Higher Risk Encounters

- Durable single use fluid impermeable head-to-toe coverall suit, such as Tyvek®
- Fluid impermeable leg covers/surgical booties
- Single use nitrile gloves (double glove with smaller size as base layer and larger size as outer layer). Outer gloves should have extended cuffs.
- Taping/sealing of outer gloves and footwear edges/openings to coverall suit
- Single-use fluid impermeable apron that covers the torso to the level of the mid-calf should be used if Ebola patients have vomiting or diarrhea. If a PAPR will be worn, consider selecting an apron that ties behind the neck to facilitate easier removal during the doffing procedure
- Use a full face piece air purifying respirator (APR) or, if more practical, a full face piece powered air purifying respirator (PAPR)
    - APR is generally practical only for short durations (e.g., one hour or less)
    - Requires appropriate cleaning/disinfection prior to reuse

Important General Guidance and Resources

- Use of any respirator (e.g., N-95, full face piece APR or PAPR) requires proper medical clearance, training and fit testing if applicable per OSHA standards for healthcare workers found at: https://www.osha.gov/SLTC/healthcarefacilities/standards.html
- Follow correct donning/doffing low-risk and high-risk checklist procedures with strict hand hygiene
- PPE donning is done prior to entering patient room/location
- Use separate dedicated areas for donning and doffing of PPE
- Use a well-trained monitor and/or assistant for observation of donning and doffing PPE
- An additional trained staff with appropriate PPE may be needed to aid those donning and doffing PPE. Additional exposed staff must be kept to a minimum number.
- Appropriately clean/disinfect PPE during doffing procedures
- Links to the FDOH training videos for proper donning and doffing of PPE are high-risk PPE http://youtu.be/9BNQ56-RXLI and low-risk PPE http://youtu.be/SvkiSKiwvQQ
- Re-useable full face piece respirators must be cleaned and disinfected according to the manufacturer's reprocessing instructions and hospital policies that meet the requirements of CFR, Title 29, Part 1910, Appendix B-2 to §1910.134: Respirator Cleaning Procedures (Mandatory), found at: http://www.ecfr.gov/cgi-bin/text-idx?rgn=div6&node=29:5.1.1.1.8.9.
- FDOH guidance for disinfection of reusable PPE
- Additional infection prevention/control guidance from the U.S. Centers for Disease Control and Prevention is available at: http://www.cdc.gov/vhf/ebola/hcp/infection-prevention-and-control-recommendations.html

Checklist for Donning and Doffing Personal Protective Equipment (PPE)

Low Risk

Employee_____

Don Time_____ Donning Vitals_____

Doff Time_____ Doffing Vitals_____

The goal in using this PPE is that no skin be exposed while caring for a patient.

Pre-donning: (with a trained monitor)

- € Staff can be in their usual work clothing; Shoes should be of a type that can be disinfected.
- € Complete an equipment inventory.
- € Verify the size of the coverall suit is correct for your use.
- € Perform a vitals health check and record on this checklist.
- € Remove all jewelry and watches.
- € Long hair should be pulled back and secured using a hair net or hair band.
- € Hydrate with at least a few ounces of water.
- € Wash hands with soap and water or use hand sanitizer.

Donning: (with a trained monitor)

- € Don the inner nitrile gloves.
- € Put on the coverall suit, and zip to mid chest.
- € Be sure the cuffs are over the inner gloves.
- € Be seated and pull on the shoe cover booties.
- € The N-95 face mask is then donned as it will need to stay in place under the hood.
- € Pull the hood up over the head and zip the coverall suit fully. If any skin is still exposed, then an additional separate hood should be used.
- € At this point, an optional outer plastic apron can be worn and tied by your monitor.
- € The full face shield should then be donned and adjusted for fit.
- € The next step is to put on the outer nitrile gloves, pulling the glove over the cuffs of the coverall. Taping the outer gloves to the cuffs is optional.
- € With assistance, stretch to ensure the fit of the garments and gloves by reaching up and over the head and to the left and right.
- € If your gloves have moved, tape the outer gloves to the cuffs of the coverall. Leave a tab for tape removal later.
- € Record the time, and complete the safety checklist of the PPE with your monitor.

Remember, while using PPE:

• Keep gloved hands away from face
• Avoid touching or adjusting the PPE
• Limit surfaces and items touched
• Seek immediate assistance if any part of gloves, coverall or detachable hood becomes torn

Doffing: (with a trained monitor in appropriate protective equipment to observe and assist)

- The removal of PPE using the appropriate methods is critical to preventing an infection from occurring.
- Remember, in general, the outside and sleeves of the coverall suit, the outside of the additional hood, and the external gloves are considered “contaminated,” regardless of whether there is visible soil.
- The areas considered “clean” that can be touched when removing PPE include inside the gloves, inside of the coverall suit and the inside of the additional hood.

  - € Have a monitor in place with appropriate protective equipment to observe your doffing process and assist if needed. You will need a seat to complete the doffing.
  - € Using ***bleach wipes**, clean the outer gloves.
  - € Then, using bleach wipes and starting at the top, wipe the full face shield, the additional hood, and the coverall suit.
  - € Using bleach wipes, again, clean the outer gloves.
  - € Remove the face shield, lifting up and to the front, and hand to your monitor for further disinfection.
  - € Using bleach wipes, again, clean the outer gloves.
  - € Remove outer gloves and dispose of along with the bleach wipes in the biohazard bag.
  - € Using bleach wipes to clean the inner gloves.
  - € Then, grasping at the top of the head, gently pull the additional hood up and to the front, away from your head, and place the hood into the biohazard bag.
  - € Then use bleach wipes to clean the inner gloves.
  - € Unzip and carefully remove the coverall suit, starting at the neckline, folding and rolling inside out, away from the body and down to the ankles.
  - € Be careful that your gloved hands touch only the inside of the suit.
  - € Sit down.
  - € While seated, continue to roll the suit down and away from your shoes. The outer shoe cover booties will stay on the suit to be thrown away with the coverall. Place the suit and booties into the biohazard bag.
  - € Bleach wipe the inner gloves again.
  - € Remove the N-95 mask and place in the biohazard bag.
  - € Bleach wipe the internal gloves again.
  - € Slowly remove the inner gloves using the glove in glove technique and place into the biohazard bag.
  - € Use hand sanitizer immediately, followed by hand washing with soap and water.
  - € Rehydrate, then take and record vitals and the time on your safety checklist.

***In place of bleach wipes,** other disinfectant wipes approved by the hospital and PPE manufactures may be used, so long as they are labeled as a U.S. Environmental Protection Agency (EPA)-registered hospital disinfectant with a label claim for a non-enveloped virus (e.g., norovirus, rotavirus, adenovirus, poliovirus).

Checklist for Donning and Doffing Personal Protective Equipment (PPE)

Long Duration-Higher Risk

Employee_____

Don Time_____ Donning Vitals_____

Doff Time_____ Doffing Vitals_____

Pre-donning:

- € Staff should be in scrubs or other hospital/clinic approved clothing to begin; Shoes should be of a type that can be disinfected.
- € Complete an equipment inventory and verify that the PAPR has a fully charged battery and perform an airflow check (per manufacturer's recommendations).
- € Verify the size of the coverall suit is correct for your use.
- € Perform a vitals health check and record on this checklist.
- € Remove all jewelry and watches.
- € Long hair should be pulled back and secured using a hair net or hair band.
- € Hydrate with at least a few ounces of water.
- € Wash hands with soap and water.

Donning: (with a trained monitor)

- € Put on the internal shoe cover booties that cover the lower leg.
- € The coverall is a full body, bonded seam impermeable suit, with a hood and booties attached.
- € Step into the coverall suit and zip up to waist level.
- € While seated, put on external shoe cover booties and tape to the coverall suit, folding over the end of the tape to create a tab for removal later. Pre-cutting measured strips of tape will speed the donning process.
- € Put on the inner nitrile gloves.
- € Pull the coveralls onto your upper body and arms, zipping above the waist.
- € Pull the cuffs down over the gloves.
- € Have your monitor tuck the coverall hood inside the neck of the coverall suit.
- € Your monitor should assist in securing the vinyl PAPR belt with the battery pack against small of your back and adjust the belt for a secure fit.
- € Your monitor can now attach the air tube to the battery pack and the hood.
- € Power on the battery pack.
- € Don the hood, holding the outer layer of the cowl up. Your monitor can now tuck the inner layer of the cowl inside the neck of the coverall suit.
- € The outer layer can now be lowered. Air should be comfortably flowing into the hood.
- € Zip up the coverall suit fully and, starting at the bottom of the zipper, pull away the strip covering the built-in adhesive on the flap and seal the flap against the coverall.
- € Don the outer Nitrile gloves, over the cuffs of the coverall suit, and tape to the coveralls, leaving a tab for tape removal later.

- € Your monitor can now place the plastic apron over the hood (over the PAPR tubing) and tie it in the back, over the PAPR tubing.
- € To ensure the fit of the equipment and tape, stretch first by squatting, then placing one knee to the ground and with hands stretched up and over head, lean to both the right and left.
- € Your monitor should record the time on this safety checklist.

Remember, while using PPE:

• Keep gloved hands away from face
• Avoid touching or adjusting the PPE
• Limit surfaces and items touched
• Seek immediate assistance if any part of gloves or coverall becomes torn

Doffing: (with a monitor in the same PPE)

- € Remember, in general, the outside and sleeves of the coveralls and outside front of the PAPR hood, and the external gloves are considered "contaminated," regardless of whether there is visible soil.
- € The areas considered "clean" that can be touched when removing PPE include inside the gloves, inside of the coverall suit and the inside of the PAPR hood.
- € The PAPR hood should always be removed outside the patient room, after the door is closed.
- € The most contaminated garments are the apron, the outer gloves and the shoe cover booties, so they will be removed inside the patient's room.
- € Use ***bleach wipes** to clean the outer gloves.
- € Using both hands on one side of the neck ring of the apron, gently pull to break the neck ring and fold down the upper part of the apron; then using the same motion, break the back tie on the same side and pull the apron away. Place the apron in biohazard bag inside the patient's room.
- € Remove tape from the outer shoe cover booties and, rolling down and away, remove the booties.
- € Dispose of tape and booties in the biohazard bag inside the patient's room.
- € Again use bleach wipes to clean the outer gloves.
- € Then, using bleach wipes, starting with the top of the hood, wipe clean the PAPR hood, and the coverall suit.
- € Use bleach wipes once more to clean the outer gloves. Remove the tape and gloves, using glove in glove technique and dispose of in the biohazard bag inside the patient's room.
- € Using bleach wipes, clean the inner gloves.
- € Directly outside of the patient's door, a tub lined with a biohazard bag should be stationed along with your monitor, who is also in appropriate PPE.
- € Step directly into the tub with the biohazard bag, keeping your arms close to your sides over the bag.
- € Your monitor should use bleach wipes on both your gloves and their gloves.
- € All disposable items should be dropped directly into the biohazard bag in the tub.
- € Keeping the PAPR powered on, your monitor should then remove the vinyl PAPR belt and place the battery pack onto a stable surface.
- € The monitor will then clean the exterior of the battery pack, belt and tubing thoroughly with bleach wipes, not allowing the tubing to come in contact with the coverall suit and being careful not to get the battery pack and inlet/outlet ports wet with the bleach solution.

- € Your monitor should then roll the outer layer of the PAPR hood up, first in the back and then the front.
- € Then unzip the coverall suit and, starting at the neck, assist with removal by folding and rolling the suit inside out, away from the body, pushing down to the ankles into the bottom of the tub.
- € Once the coverall suit is pushed down as far as it will go, bleach wipe both persons' gloves.
- € Next, with the monitor holding the coverall suit down into the tub, carefully step out of the tub onto the floor, being careful not to touch the inside of the biohazard bag.
- € Bleach wipe both of your gloves once more.
- € You can now remove the hood using an up and over motion to the back. Your monitor then can take the hood, remove the air tube and place it into the tub.
- € Both should bleach wipe their gloves again.
- € Your monitor can then switch off the PAPR, and disconnect the air tubing from the battery pack.
- € You can now remove the internal shoe cover booties and place in the biohazard bag.
- € Bleach wipe your gloves once more.
- € Remove the inner gloves using the glove in glove technique and place into the biohazard bag in the tub.
- € Your monitor should then seal and dispose of the biohazard bag and attend to the reusable items.
- € Use hand sanitizer immediately, followed by hand washing.
- € Rehydrate, then take and record vitals and the time on your safety checklist.
- € Proceed to the shower.

***In place of bleach wipes,** other disinfectant wipes approved by the hospital and PPE manufactures may be used, so long as they are labeled as a U.S. Environmental Protection Agency (EPA)-registered hospital disinfectant with a label claim for a non-enveloped virus (e.g., norovirus, rotavirus, adenovirus, poliovirus).

How to Disinfect Personal Protective Equipment

These procedures are provided for employer use when cleaning respirators. They are general in nature and the employer, as an alternative, may use the cleaning recommendations provided by hospital and/or the manufacturer of the respirators used by their employees, provided such procedures are as effective as those required by *CFR, Title 29, Part 1910, Appendix B-2 to §1910.134: Respirator Cleaning Procedures (Mandatory)*, found at http://www.ecfr.gov/cgi-bin/text-idx?rgn=div6&node=29:5.1.1.1.8.9. Equivalent effectiveness simply means that the procedures used must accomplish the objectives set forth in appendix B-2. (i.e., must ensure that the respirator is properly cleaned and disinfected in a manner that prevents damage to the respirator and does not cause harm to the user).

Procedures for Cleaning/Disinfecting Reusable Air-Purifying Respirators (APR)

1. The Florida Department of Health recommends cleaning the respirator after each use.
2. Remove and discard filters, cartridges, or canisters. Disassemble face pieces by removing speaking diaphragms, demand and pressure-demand valve assemblies, hoses, or any components recommended by the manufacturer. Discard or repair any defective parts.
3. Wash components in warm (110 ℉ [43ºC] maximum) water with a mild detergent that includes a disinfecting agent, a cleaner recommended by the manufacturer, or a 10% bleach solution. A bleach wipe can also be used to wash the components. Alternately, the components can be submerged in a cleaning solution for a minimum of two minutes to achieve the same result.
4. Rinse components thoroughly in clean, warm (110 ℉ [43ºC] maximum), preferably running water. Drain. The importance of thorough rinsing cannot be overemphasized. Detergents or disinfectants that dry on face pieces may result in dermatitis. In addition, some disinfectants may cause deterioration of rubber or corrosion of metal parts if not completely removed.
5. Components should be hand-dried with a clean lint-free cloth or air-dried.
6. Reassemble face piece, replacing filters, cartridges, and canisters where necessary.
7. Test the respirator to ensure that all components work properly.

Procedures for Cleaning/Disinfecting Powered Air-Purifying Respirators (PAPR)

1. Discard the PAPR hood. It will not be reused.
2. Remove and discard filters, if necessary (see manufacturer's instructions).
3. Remove the tubing from the battery pack/blower unit and, using a lint-free cloth, clean with a mild detergent that includes a disinfecting agent, a cleaner recommended by the manufacturer or a 10% bleach solution. A bleach wipe can also be used to wash the components. Alternately, the tubing can be submerged in an approved cleaning solution to achieve the same result.
4. Wipe down the battery pack/blower unit with a bleach wipe, including the outer surface, the belt, the clip, the outlet/inlet ports, and the battery pack connector pins (being careful not to bend).
5. Do not allow liquid to enter the air outlet and inlet ports. This could damage the unit.
6. Allow both the tubing and the battery pack/blower unit to completely dry before reuse or storage.
7. Be sure to inspect the unit and tubing for damage before reuse.

Procedures for Cleaning/Disinfecting Reusable Rubber Boots

1. After removing boots, clean with a mild detergent that includes a disinfecting agent, a cleaner recommended by the manufacturer, or a 10% bleach solution. A bleach wipe can also be used. Alternately, the boots can be submerged in an approved cleaning solution for a minimum of two minutes, to achieve the same result.
2. It is not recommended to scrub the boots with a brush because it causes splashing.

8. Allow the boots to dry before reuse or storage. If submerged when cleaned, hanging them upside down will allow them to dry faster.

Other Important Information

Those cleaning/disinfecting reusable PPE need to protect themselves from skin and mucous membrane contact with contaminated items and splashes, by use of water impermeable gown and head covering, gloves, face mask and goggles or face shield.

Note that bleach has a shelf life. Only use bleach that is prior to the expiration date when making the cleaning solution. A 10% bleach solution requires one volume of bleach (e.g., one cup) added to 9 volumes of water (e.g., nine cups).

Other disinfecting agents used for PPE contaminated by Ebola virus should be those effective against non-enveloped viruses (e.g., norovirus, rotavirus, adenovirus, poliovirus).

3M has a guidance document on how to clean and disinfect their respirator products found at: http://multimedia.3m.com/mws/mediawebserver?mwsId=SSSSSuH8gc7nZxtUPYten8_BevUge17zHvTSevTSeSSSSSS--&fn=RR%20and%20PAPR%20cleaning%20Ebola%20appro