

# Follow that Microbe!

## Understanding viral exposures during complex PPE doffing

The PEACH research team

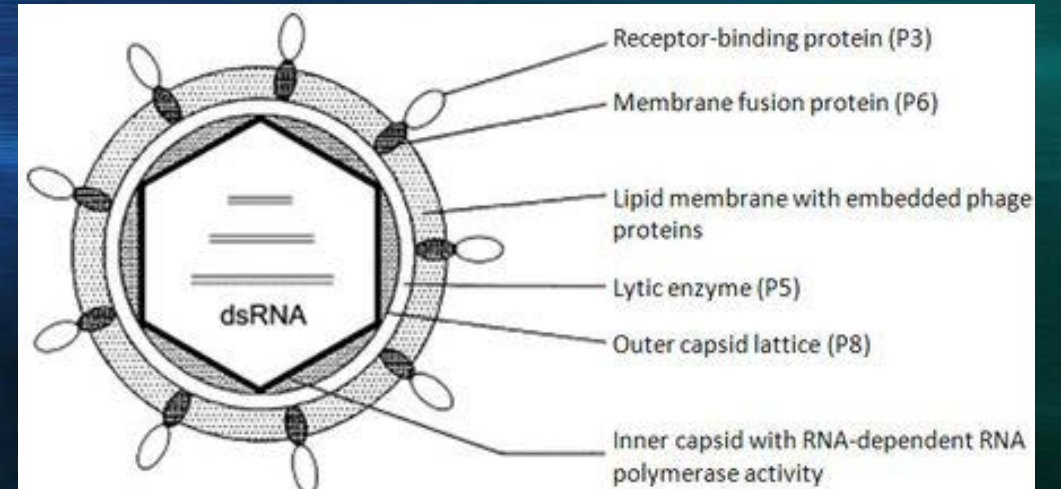
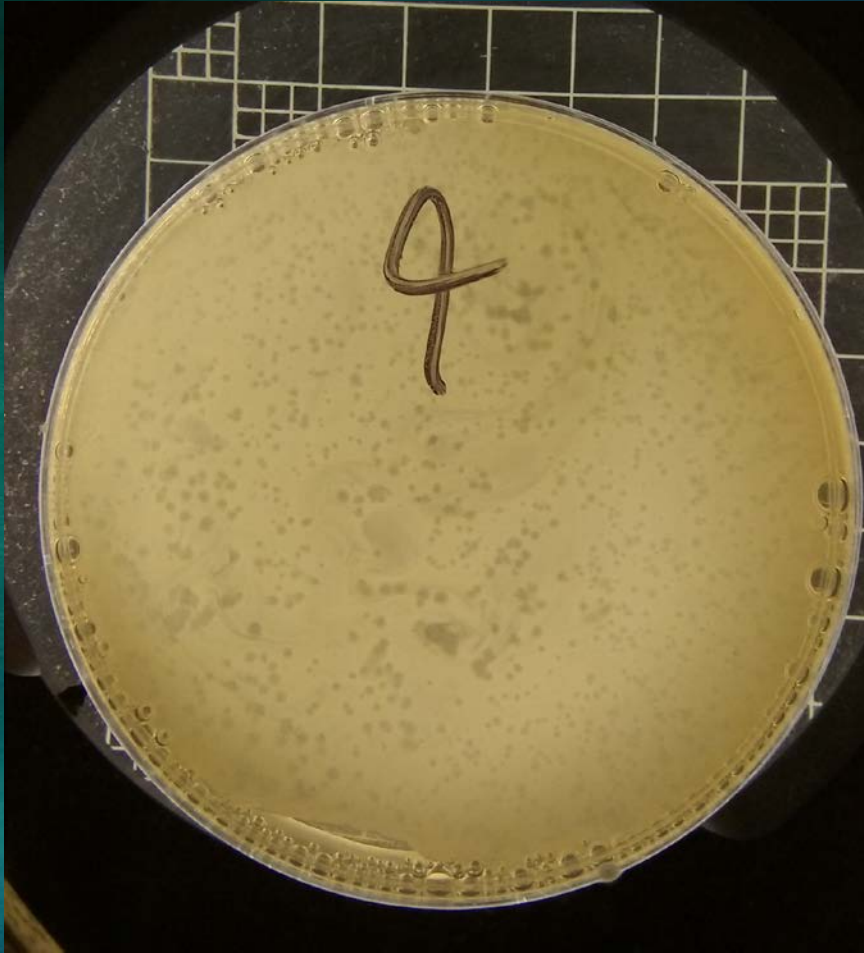


# Understanding exposures

- Complex pathways
- Dependent events
- Challenging to observe under real conditions
- Difficult to evaluate interventions that interrupt transmission



# Surrogate organisms



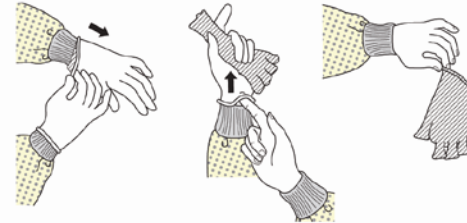
# PPE as protection and fomite

## SEQUENCE FOR REMOVING PERSONAL PROTECTIVE EQUIPMENT (PPE)

Except for respirator, remove PPE at doorway or in anteroom. Remove respirator after leaving patient room and closing door.

### 1. GLOVES

- Outside of gloves is contaminated!
- Grasp outside of glove with opposite gloved hand; peel off
- Hold removed glove in gloved hand
- Slide fingers of ungloved hand under remaining glove at wrist
- Peel glove off over first glove
- Discard gloves in waste container



### 2. GOGGLES OR FACE SHIELD

- Outside of goggles or face shield is contaminated!
- To remove, handle by head band or ear pieces
- Place in designated receptacle for reprocessing or in waste container



### 3. GOWN

- Gown front and sleeves are contaminated!
- Unfasten ties
- Pull away from neck and shoulders, touching inside of gown only
- Turn gown inside out
- Fold or roll into a bundle and discard



### 4. MASK OR RESPIRATOR

- Front of mask/respirator is contaminated — DO NOT TOUCH!
- Grasp bottom, then top ties or elastics and remove
- Discard in waste container



PERFORM HAND HYGIENE IMMEDIATELY AFTER REMOVING ALL PPE



# Simulation approaches

- Understanding complex exposures
- Understanding exposures as processes
- Understanding how real people do real things

# Focus: PPE doffing

- Contamination during wearing
- Doffing: protective gear becomes a fomite
- Examination of a complex process
- Are recommendations working?

# Contact/respiratory PPE

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PERFORM HAND HYGIENE IMMEDIATELY AFTER REMOVING ALL PPE



# Ramping up the complexity: Ebola

- Multiple overlapping items of PPE
- Many not routinely worn in healthcare
- Goal: No exposed skin or mucus membranes
- Doffing becomes an even more complex process



# Ramping up the complexity

<u>Step</u>	<u>Required Action</u>
1	Wash gloved hands with water and chlorhexidine (CHG)
2	Step into Chlorine Bath <ul style="list-style-type: none"><li>• one minute contact time</li><li>• step off to absorbent pad</li></ul>
3	Perform PPE integrity check in designated doffing area
4	Remove 1 <sup>st</sup> set of gloves <ul style="list-style-type: none"><li>• Check integrity of inner glove</li></ul>
5	Clean gloved hands with Alcohol Based Hand Rub (ABHR).
6	Remove impervious blue gown <ul style="list-style-type: none"><li>• Grab impervious blue apron at the shoulder and pull forward to remove</li></ul>
7	Clean gloved hands with ABHR

<u>Step</u>	<u>Required Action</u>
8	<p>Remove Tyvek Suit</p> <ul style="list-style-type: none"><li>• HCP should locate naval and follow along zipper line until they locates “pull tie” on the suit</li><li>• Unzip fully</li><li>• Grab the suit on the shoulders, or bend forward and grab chest area of the suit, and pull it off shoulders.</li><li>• Take caution to minimize touching the outside of the suit</li><li>• Push the suit down past the top of the boots touching only the inside of the suit and not the boots.</li><li>• Stand up and step out of the suit -Without letting the suit touch your scrubs, pick it up, touching only a place on the inside where you did not step and place in the waste container.</li></ul>
9	Clean gloved hands with ABHR



<u>Step</u>	<u>Required Action</u>
10	<p>Remove Hood, mask and face shield</p> <ul style="list-style-type: none"> <li>• During the following step, please keep eyes and mouth closed.</li> <li>• After removal immediately join hands together and do not touch your skin, face or clothing.</li> <li>• Reach gloved hands to either side of the back of the Tyvek hood.</li> <li>• Gripping both elastic ties and hood, bend forward and gently pull until Tyvek hood, N95, face-shield &amp; bouffant cap (if worn) are off.</li> </ul>
11	Clean gloved hands with ABHR
12	Remove inner gloves using aseptic technique
13	Clean hands with ABHR
14	<p>Step into Chlorine Bath</p> <ul style="list-style-type: none"> <li>• one minute contact time</li> <li>• step off to absorbent pad</li> </ul>
15	<p>Remove boots</p> <ul style="list-style-type: none"> <li>• boots should remain in the Hot Zone</li> </ul>
16	Clean hands with ABHR

# What are we learning?

- Viral contamination
- Human factors
- Built environment