Personal Protective Equipment

For Ebola and other viral hemorrhagic fevers

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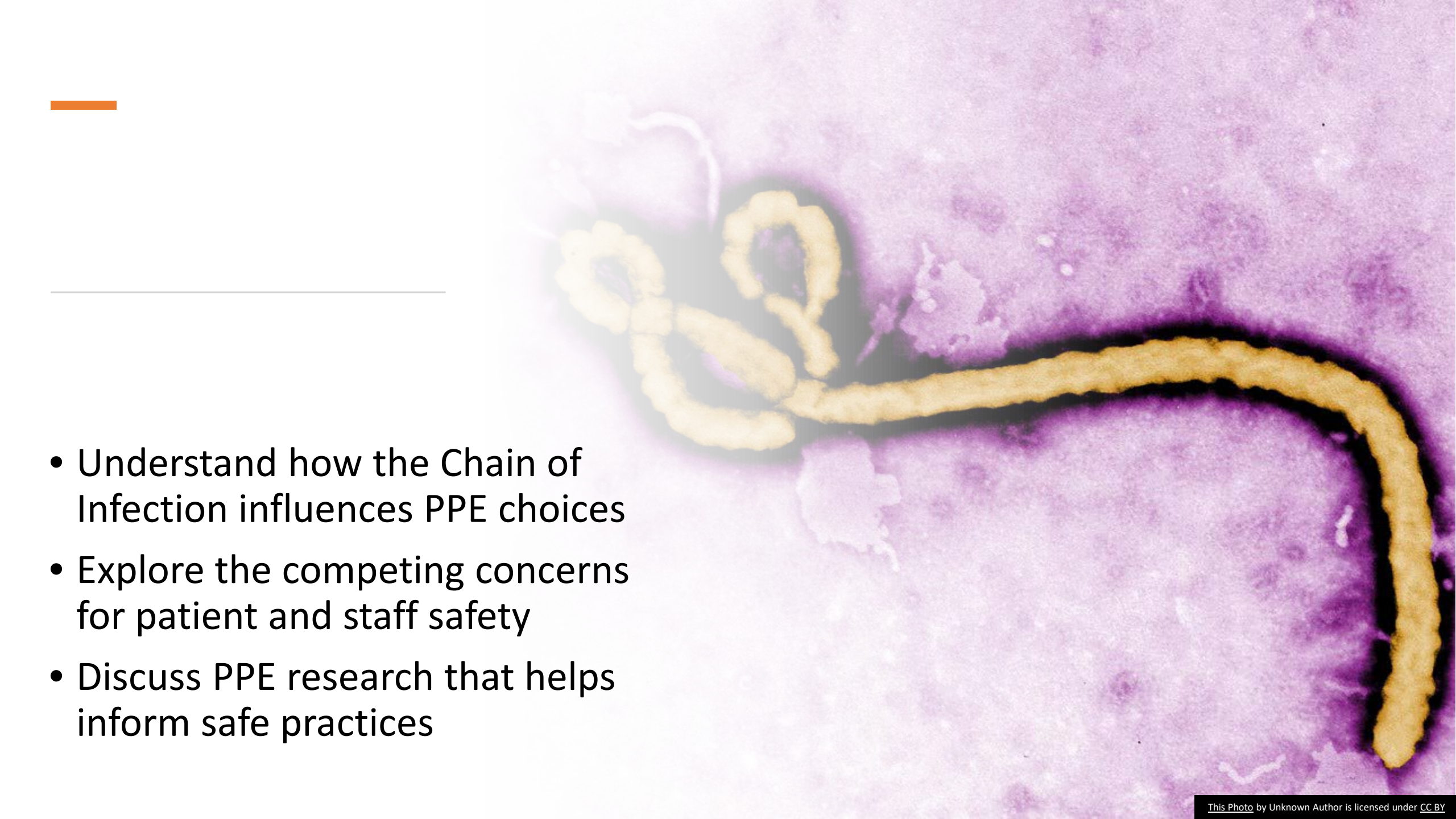
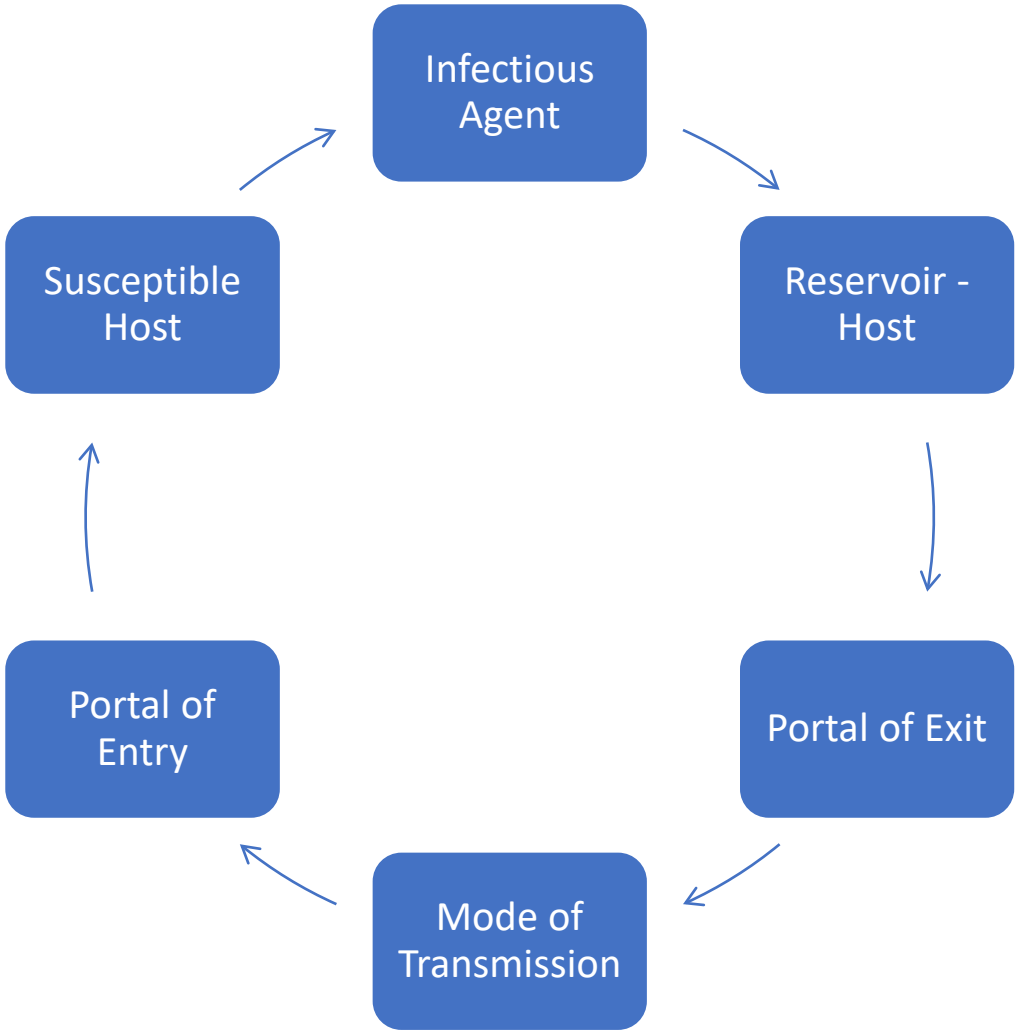
Project ECHO



- Understand how the Chain of Infection influences PPE choices
- Explore the competing concerns for patient and staff safety
- Discuss PPE research that helps inform safe practices



Which infectious agents can cause viral hemorrhagic fever in humans?

Four Virus Families

Arenaviruses

Argentine, Bolivian, Venezuelan HF

Lassa

Bunyaviruses

CCHF, Hantavirus Pulm Syndrome, Rift Valley

Filoviruses

Ebola, Marburg

Flaviviruses

Omsk, Kyasanur (also cause non-VHF human diseases such as Yellow fever, Dengue, West Nile, Zika)

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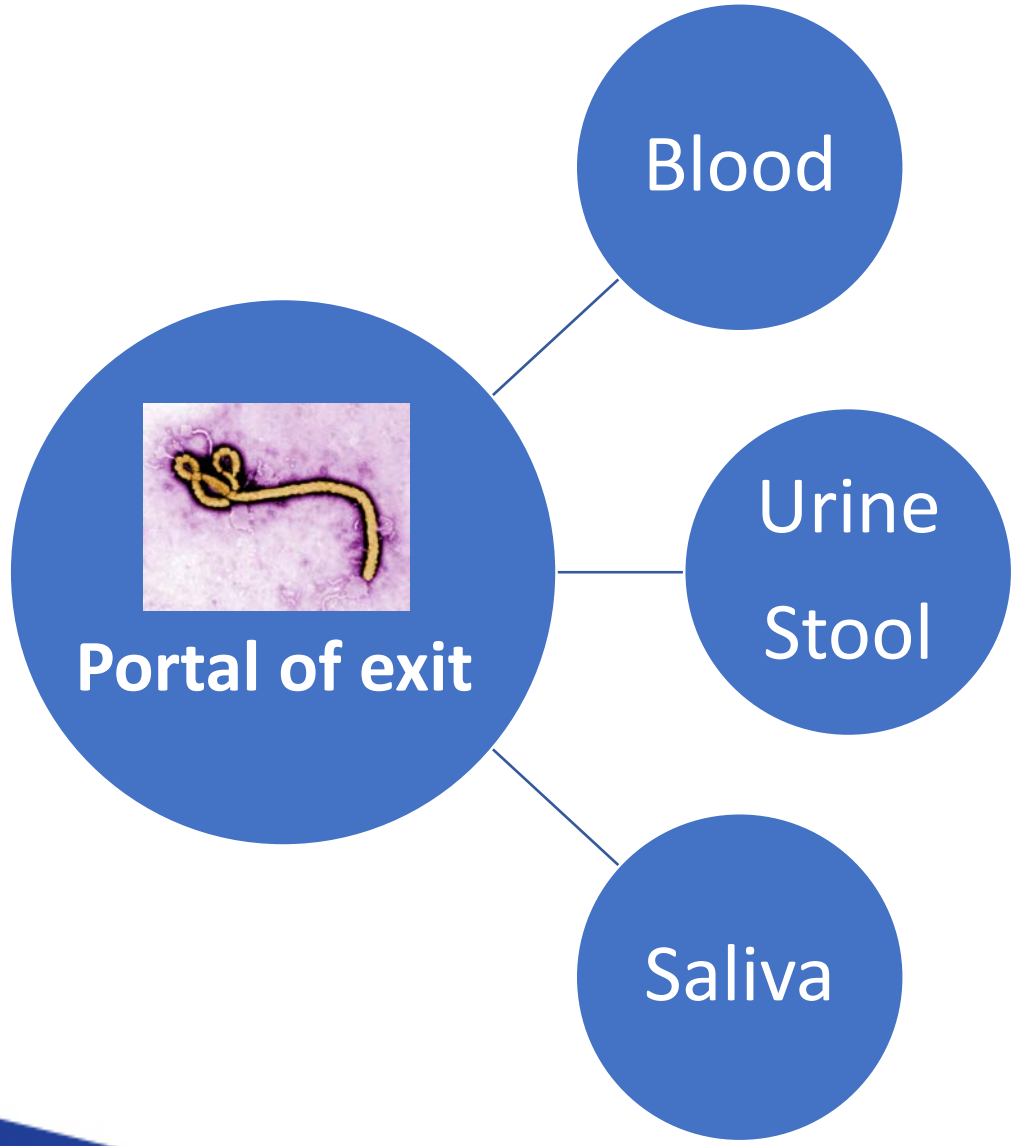

Not always known

List may expand as outbreaks emerge/research allows

Sweat
Tears
Semen

CSF
Intraocular

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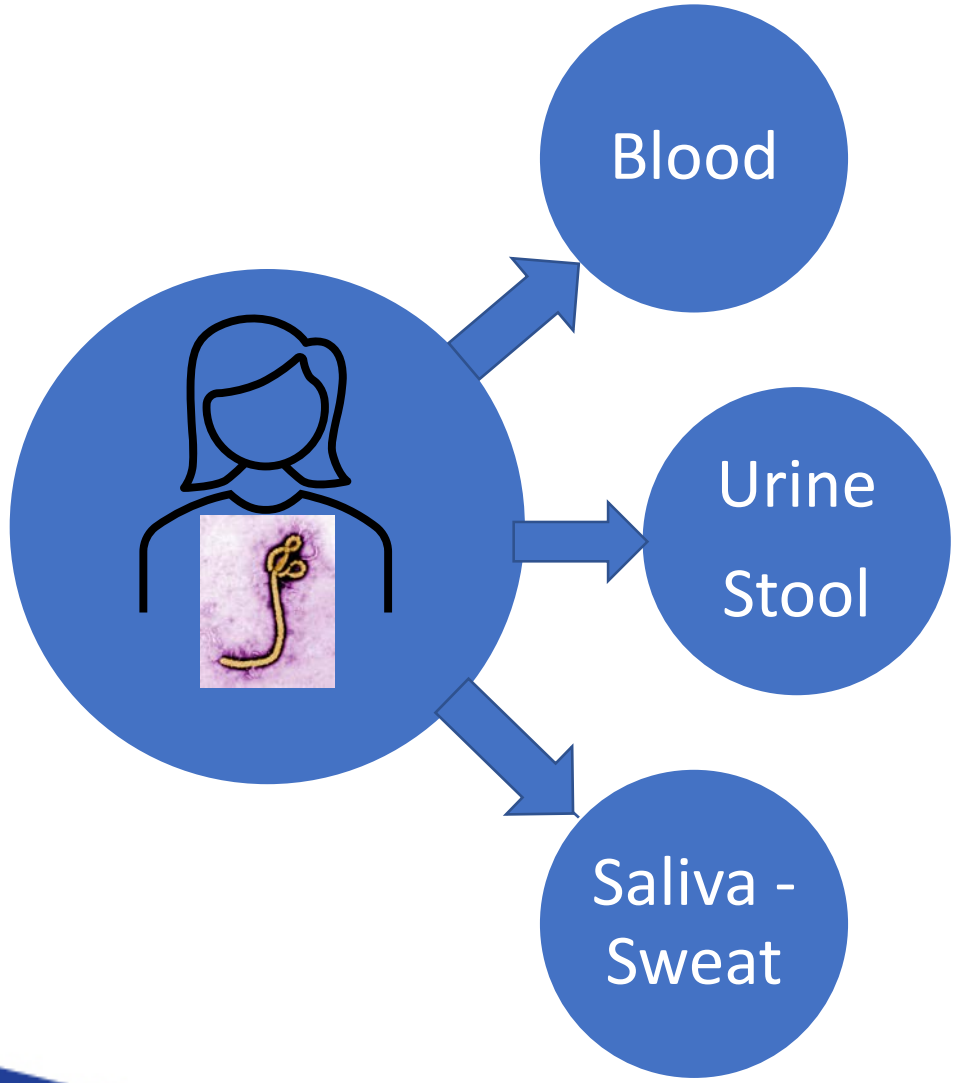

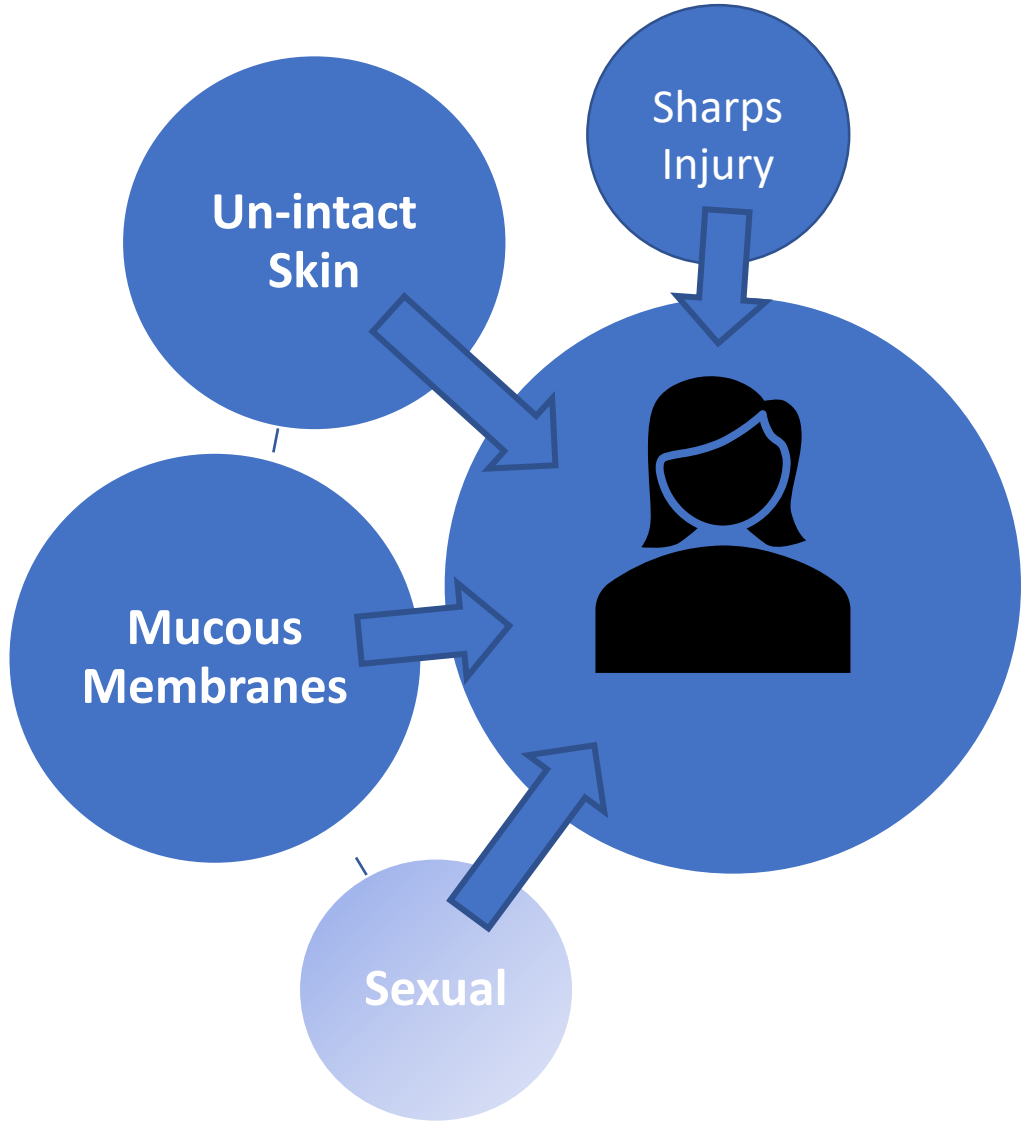

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Personal protective equipment (PPE) ensembles are designed to protect from potential exposures

Knowing modes of transmission is critical to choosing appropriate protection

When transmission modes are well-established – sound eerily familiar? – protect against all

Contact

Droplet

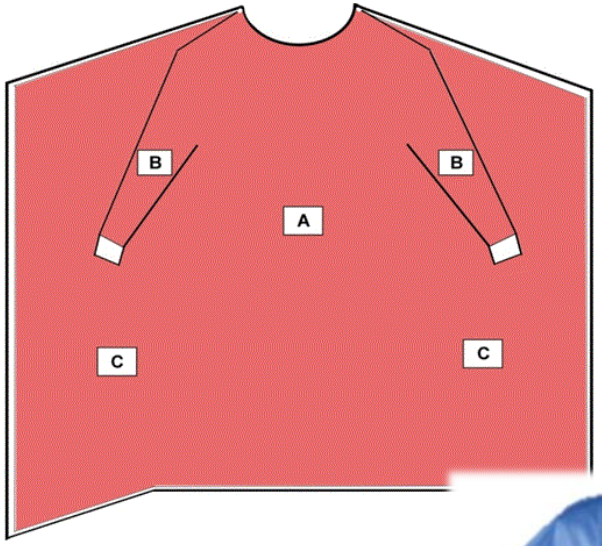
Airborne

The importance of knowing the Purpose of the Piece

Gown or coverall? What kind of gown?
Face shield? Safety glasses?
PAPR or N95?
Double gloves? Triple gloves?

And how those parts of the ensemble work, and work together

Gown levels
Surgical vs. Isolation gowns
Safe doffing of complex ensembles



Level	Test Methods Used	Expected Barrier Effectiveness
1	Impact Penetration	Minimal water resistance
2	Impact Penetration & Hydrostatic Pressure	Low water resistance
3	Impact Penetration & Hydrostatic Pressure	Moderate water resistance
4	ASTM F1670 Synthetic Blood & ASTM F1671 Viral Penetration Test	Blood and viral penetration resistance

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Recommended PPE for Dry Patients

- Single Use (Disposable) Face Shield
- Single Use (Disposable) Surgical Mask
- Single use (disposable) fluid-resistant gown that extends to at least mid-calf or coverall without integrated hood
- Single use (disposable) gloves with extended cuffs. Two pairs of gloves should be worn. Outer gloves should have extended cuffs

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‘Wet’ Patient PPE

Single use face shield, surgical hood extending to shoulders, and N95

Single use fluid-resistant or impermeable gown that extends to least mid-calf **OR** coverall without integrated hood (not shown

Two pairs of single use, disposable gloves. At a minimum, outer gloves should have extended cuffs.

Single use fluid-resistant **OR** impermeable apron that covers the torso to the level of the mid-calf

Single use fluid-resistant or impermeable boot covers that extend to at least mid-calf **OR** single-use fluid-resistant or impermeable shoe covers, which are acceptable only if used with a coverall with integrated socks (not shown)

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What do we mean by a patient being either Wet or Dry?

Can be a judgement call, importance of team involvement

Can move either direction depending on disease course

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Emory ensemble decision based upon:

- Unable to leave the patient alone
- Unsafe to enter room without PPE
- Minimize number of staff in room per day
- Minimize potential contamination by minimizing doffing events
- Comfort and total impervious coverage

Complex ensembles require training to use and remove safely

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