Best Practices in Protecting HCWs from Exposure to SARS CoV-2
(or what to do when 135 negative pressure rooms is not enough)
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The findings, observations and recommendations presented here are those of the author and do not necessarily represent the views of the University of Maryland Medical Center.
The University of Maryland Medical Center is a 789-bed academic medical center located in the heart of Baltimore, MD. UMMC is the flagship of the 13 hospital UMMS

- MAGNET Designated
- Approximately 8,900 staff and 1,200 faculty members
- 29,316 admissions, 56,184 emergency/OBS visits, 319,529 outpatient visits, 18,024 outpatient surgeries (2018)
- Full range of services including trauma, heart and vascular care, NCICC (cancer care), NeuroCare, women’s and children’s health, organ transplantation and psychiatry.
- Partner with UMB Schools of Medicine, Nursing, Pharmacy, Dentistry, Social Work, Law and Allied Health
Objectives

• Define what a negative pressure room is
• Discuss why negative pressure rooms should be considered for SARS CoV2
• Discuss how negative pressure rooms and wards could be implemented
  • Operational and Safety considerations
Negative pressure rooms – aka Airborne Infection Isolation Rooms (AIIRs)

Negative pressure rooms are rooms designed to prevent airborne microorganisms in the room from entering hallways and corridors.

Design specifications

- Direction of airflow is into the room
- -0.01” water gauge (-2.5 Pa)
- >12 ach (for renovations and new construction)
- Directly exhausted to the outside (avoiding reentrainment) or HEPA filtered if recirculated
- No anteroom is required (FGI)
CDC recommendations (or why do I need an AIIR?)

CDC no longer requires a negative pressure room (AIIR) for SARS CoV2 to save these rooms for aerosol generating procedures

- Understand the rationale - CDC is acknowledging that AIIRs are a finite commodity and may not be available to all settings

- SARS CoV2 patients are constantly generating aerosols – coughing, sneezing, talking, being suctioned (airway maintenance).

- SARS CoV2 is an airborne, contact, droplet spreader. CDC guidance has changed to recommend an N95 (if available) for all patient contact

- SARS CoV2 patients get in trouble quickly often necessitating emergent life sustaining interventions (i.e., intubation and ventilation) – intubation/extubation are among the most hazardous procedures from the aerosol generation perspective

 Recommendation - Use of negative pressure rooms for SARS CoV2+ patients should be considered whenever possible.
How to implement negative pressure rooms and wards

Talk to your plant engineer to take advantage of existing building design features

Option 1 - utilize existing AIIRs

- Pros – Already operational
- Cons – Often occupied and/or in geographically disparate locations creating staffing & PPE burn rate issues; may not have anterooms

Option 1a – create AIIRs (and anteroom)

- Pros – can locate where needed (e.g., clustered)
- Cons – it’s not as easy as it looks

Option 2 – create negative pressure wards

- Pros – may be the most efficient use of resources
- Cons – staff are in the hot zone for prolonged periods of time

Option 3 – use non-negative pressure options
Option 1a - DIY AIIR

Left photo – use of a hospital grade HEPA Machine. Right photo – use of an industrial scrubber unit

Considerations – noise, patient safety
Considerations

• Barriers can be rigid or flexible. If you use poly, use FR poly
  • Windows are desirable for observation

• Doors – make sure they’re wide enough for beds. Hard doors are more durable than zipper doors
  • Need a cleaning plan for zipper doors
  • Reinforce zippers = consider mechanical fasteners

• Consider pressure monitoring (flexible barriers are obvious, rigid walls are not)

• Exhausting through a window? Make sure it is safe

• Fans should be tamper proof

• Fire and patient safety plan - ILSM
Types of containment
Example of a Negative Pressure Ward

N13W is a 15-bed, acute care medicine unit. In the pandemic plan, N13W converts to a 27-bed negative pressure capable, acute care unit

• 2 existing AllIRs

• North Building was designed with once-through air (air is not recirculated). Exhausted air is discharged vertically via two high velocity stacks away from air intakes

• Created a negative pressure capable zone with a poly barrier on back corridor and an anteroom using existing smoke door and new hard all door.

• Negative pressure is created by adjusting exhaust off of floor >> supply. Pressure is monitored by magnahelic gauge and BAS
ZONE N13-01
EXISTING HEALTH CARE
COMPLETE SPRINKLER PROTECTION
12386 SQ FT

ZONE N13-02
EXISTING HEALTH CARE
COMPLETE SPRINKLER PROTECTION
11742 SQ FT
IV pumps located out of room
Vent monitoring
Remote monitoring
Questions?
Remember - Social distancing and hand hygiene