

# Personal Protective Equipment (PPE) for Airway Management Procedures

## Site Applicability

Providence Healthcare, Mount Saint Joseph Hospital and Saint Paul's Hospital

## Practice Level

All Registered Nurses (RNs) and Registered Respiratory Therapists (RRTs) who actively participate in intubation/extubation procedures should receive training on how to safely don and doff Airborne and Droplet/Contact PPE. If RNs or RRTs intend to participate with intubation or extubation procedures and be within 2 meters of the head of bed, they also require training on donning/doffing at least one of the Airway Management PPE (i.e., Gown vs Coverall; see [Appendix A](#)).



## Need to Know

1. Minimize the number of staff that are in the room during intubation or extubation.
2. All members of the team should don PPE for intubation or extubation (and other aerosol generating medical procedures [AGMP]), which at **minimum** should include **airborne, and droplet/contact precautions PPE** (i.e., N95 mask, eye protection such as goggles or face shield, gloves, and a water resistant gown) before entering the room.
3. For team members **who will be intubating/extubating or assisting within 2 meters of the head of bed** (i.e., MD, RRT and +/- RN), there are 2 variations of the Airway Management PPE (i.e., gown and coverall versions). These require additional training, practice, and simulation to ensure safe donning and doffing processes.
4. Both variations of the Airway Management PPE offer equivalent protections, therefore the decision of which PPE to use should be dependent on PPE availability, staff training, and staff's competency with the process of donning and doffing.
5. The greatest risk of exposure occurs during the doffing of contaminated PPE. Strategies to mitigate these risks include:
  - practice donning and doffing of PPE to maintain familiarity with the process;
  - don/doff PPE with an independent observer to reduce the risk of self-contamination;
  - minimize additional layers of PPE as they do not enhance protection, and may increase the complexity of doffing, and therefore the risk of self-contamination;
  - perform hand hygiene after removing each item of PPE.
6. The BCCDC recommends against wearing double masks (i.e., a surgical mask with visor worn over an N95 mask). This practice may significantly increase the risk of the second mask interfering or disturbing the seal of the N95 mask, especially during donning and doffing.
7. Extubation: in addition to appropriate Airway Management PPE, consider using a clear plastic sheet to minimize dispersion of body fluids during extubation.
8. Immediately after an AGMP has occurred in the room, the room itself should be considered contaminated for a period of time, and staff entering the room during that period should don

airborne, and droplet/contact PPE. The duration of that period of time is dependent on the air exchange rate. If the air exchange rate is NOT KNOWN, consider the room contaminated for at least 1 hour.

## Equipment and Supplies

Airway management PPE (i.e., gown, or coverall version), is for staff who are assisting with airway management procedures (i.e., intubation or extubation) and will be within 2 meters of the head of the bed.

Gown	Coverall
	
<b>N95 Mask</b> <b>Eye Protection</b> OR Hood (optional) <b>Surgical Gown (i.e., fluid resistant gown)</b> <b>Extended Cuff Gloves</b> Face Shield (Optional)	<b>N95 Mask</b> <b>Eye Protection</b> <b>Coveralls</b> <b>Surgical or Extended Cuff Gloves</b> Second pair of gloves (Optional) Face Shield (Optional)
<b>Preferred in ICU, CICU, &amp; CSICU</b>	<b>Preferred in PACU &amp; ED</b>

## General Principles for Donning and Doffing (All Types)

1. Don and Doff with an independent observer or partner.
2. Always begin donning or doffing procedures by performing hand hygiene first.
3. N95 mask and eye protection are always the first items to be donned.

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4. Doff PPE in reverse order of donning PPE.
5. Eye protection and N95 mask are always the last items to be doffed.
6. Perform hand hygiene after removing each individual item of PPE.
7. If an anteroom is available, doff PPE in the anteroom. If an anteroom is not available, doff from the neck down (i.e., hand & body coverings) inside the patient's room, and from the neck up outside the patient's room in a doffing zone.

## Airway Management PPE – Gown

See instructional poster in [Appendix B](#).

### Donning

Having an independent observer assist you when donning PPE will help ensure PPE is donned appropriately. If possible, don in pairs to assist each other.

1. Remove any personal items (i.e., pens, pagers, phones, glasses, etc.) as needed.
2. Wash hands and identify an independent observer.
3. Don N95 Mask and conduct a seal check.
4. Don Eye Protection.
5. Don OR Hood (optional), wrapping straps under chin and around to protect neck area.
6. Don Face Shield (optional).
7. Don Surgical Gown (i.e., fluid resistant gown).
8. Don Surgical/Extended Cuff Gloves.



### Doffing

Identify an independent observer to assist with doffing appropriately. If possible, doff in pairs to assist each other. If an anteroom is available, doff in the anteroom. If an anteroom is not available, doff from the neck down in the patient's room, and from the neck up, outside the patient's room in a doffing zone.

1. Doff and discard gloves by pulling down and turning inside out from the cuff and perform hand hygiene.
2. Doff and discard gown carefully by pulling down from shoulders, turning inside out to avoid self-contamination, and perform hand hygiene.
3. If required, doff and discard Face Shield with eyes closed, grasping strap from sides to gently lift over your head and leaning forward over garbage container (so Face Shield falls away from your face) and perform hand hygiene.
4. If required, doff and discard the OR Hood carefully (with eyes closed, grasping hood from crown and lifting up, and leaning forward) to avoid self-contamination and perform hand hygiene.
5. Doff and discard or decontaminate goggles (with eyes closed, leaning forward, and handling sides of goggles) and perform hand hygiene. Be careful not to lose personal glasses in the process.

6. Doff N95 Mask, carefully removing bottom strap and then top strap - one at a time and gently pulling mask away from face, (with eyes and mouth closed and leaning forward) and then perform hand hygiene.
7. Collect any personal items (i.e., pens, pagers, phones, etc.) you removed as needed.
8. Shower and change into new scrubs (optional).

## Airway Management PPE - Coveralls

There are minor procedural differences between the doffing process for PACU and ED teams. Refer to the local Donning & Doffing Posters for specific step-by-step guidance.

### Donning

1. Remove all personal items (i.e., phone, pager, etc.), then wash hands and identify an independent observer to assist with donning PPE.
2. Don N95 Mask and conduct a seal check
3. Don Eye protection
4. Don Coveralls with hood, zip up fully and fold over flap
5. Don Surgical/Extended Cuff gloves, ensuring the cuffs of the gloves go over the cuffs of the coveralls.
6. Don second pair of gloves (optional).
7. Don Face Shield (optional).

### Doffing

Generally PPE is doffed in reverse order of donning with hand hygiene being done between each step. Identify an independent observer to assist with doffing appropriately. If possible, doff in pairs to assist each other. If an anteroom is available, doff in the anteroom. If an anteroom is not available, doff gloves and coverall in the patient's room, and doff eye protection & N95 mask, outside the patient's room in a doffing zone.

1. If the optional second pair of gloves were donned, remove and discard the outer gloves and perform hand hygiene on the inner gloves.  
*NOTE:* hand hygiene on gloves is not routine practice. Gloves are not designed to maintain integrity after being exposed to hand hygiene products such as alcohol based agents, therefore should be discarded.
2. If only one set of gloves are being used, remove and discard gloves and perform hand hygiene.
3. If required, remove and discard Face Shield (with eyes closed, and leaning forward over garbage container so Face Shield falls away from your face) and perform hand hygiene.
4. Have a buddy assist with removing hood, fully unzip coveralls, and shrug coveralls off shoulders as needed.
5. Continue to roll the coveralls down your body, and once below the knees, step out of the coveralls, and then perform hand hygiene. One may also consider removing coveralls and gloves in one step (i.e., preferred in ED)

6. Remove and discard (or decontaminate) eye protection (with eyes closed and leaning forward) and perform hand hygiene.
7. Remove N95 Mask, carefully removing lower strap first and then top strap - one strap at a time and gently pulling mask away from face (with eyes and mouth closed and leaning forward), and then perform hand hygiene.
8. Shower and change into new scrubs (optional).

### **Extubation of Patients Requiring Airborne Isolation**

Extubation is as high risk of an aerosol generating procedure as intubation therefore always don the appropriate PPE for extubation procedures. Using a clear plastic barrier to help reduce the spread of bodily fluids (both droplet and potentially aerosol spray) during extubation. Consider using the following method.

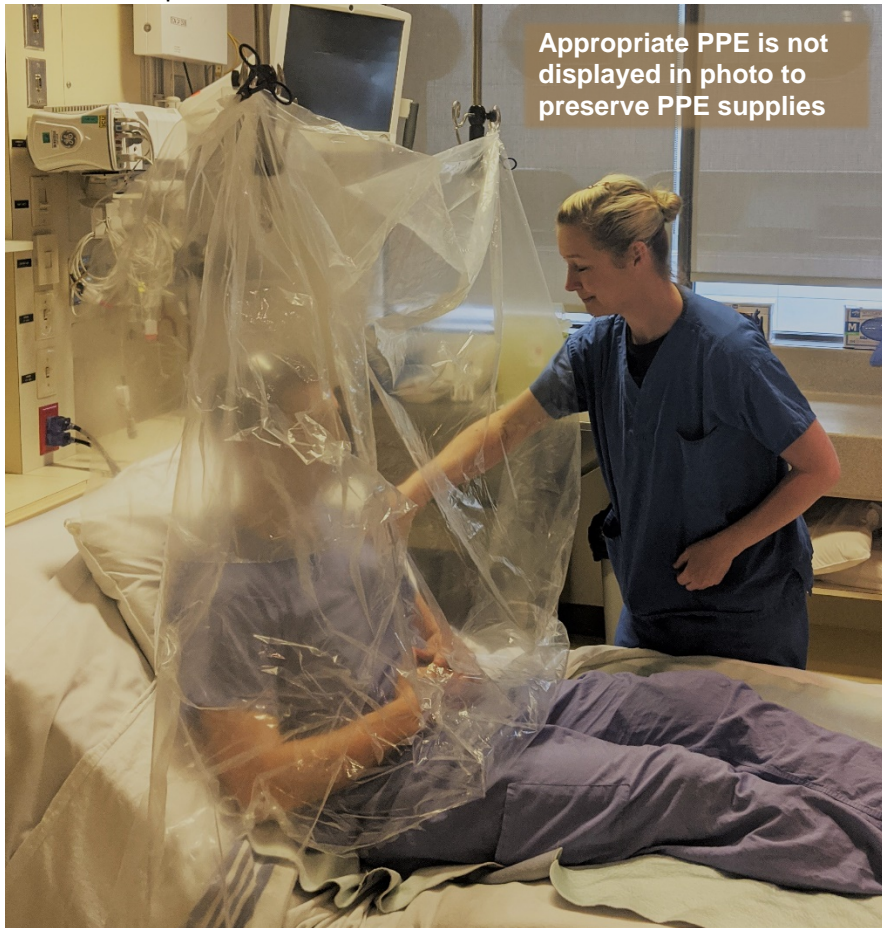
1. Don the appropriate PPE.
2. Collect equipment and prepare patient for extubation.
  - a. Place blue pad on patient's chest.
  - b. Place yankauer suction, scissors, and supplemental oxygen on blue pad.
  - c. Attach syringe on pilot balloon.
  - d. Suction both above and below cuff.
  - e. Prepare oxygen device (nasal prongs, or Optiflow).
  - f. Review extubation procedure with patient.
  - g. Place oxygen device near the patients head, but do not turn on yet.
3. Hang clear plastic drape to IV poles or ceiling lift and secure with blue plastic clamps (ETT clamps are too heavy)



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4. Extubate the patient:



- a. Stand behind the plastic drape (used to prevent gross contamination from patient coughs).
  - b. Remove OETT from securement device.
  - c. Place vent in standby.
  - d. Deflate cuff.
  - e. Extubate with circuit still attached and place on blue pad behind drape.
  - f. Encourage the patient to cough and clear using yankauer.
  - g. Place oxygen device on patient and turn on oxygen flow.
  - h. Continue to stand behind the drape until the patient stops coughing.
5. Remove and discard contaminated equipment.
- a. Remove yankauer from patient's chest
  - b. Disconnect OETT from circuit and cap vent circuit
  - c. Take down drape, folding contaminated side down over blue pad and dirty ETT.
  - d. Roll up blue pad and ETT in the drape, rolling away from your body and dispose.

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## Related Documents and Resources

[#B-00-07-13079](#) - Aerosol Generating Medical Procedures in the Context of COVID – Infection Prevention and Control

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## Appendix A – “Which PPE?” Posters

### Gown Version

**Which PPE?**

Droplet/Contact	Airborne & Droplet/Contact	Airway Management PPE (Intubation/Extubation)
<b>Routine Patient Care</b>	<b>Suspected/Confirmed COVID-19</b> <ul style="list-style-type: none"> <li>Mechanical Ventilation</li> <li>CPR &amp;/or BVM Ventilation</li> <li>CPAP/BiPAP, High Flow Nasal Cannula (Optiflow)</li> <li>Nebulized Therapy</li> <li>Open Airway suctioning</li> <li>In room BUT further than 2 meters away during intubation/extubation</li> </ul>	<b>Intubation</b> (Team includes 1 MD, 1 RRT, and +/- RN*)  <b>Extubation</b> (RRT +/- second RRT*, or RN*)  <b>*IF within 2 meters of the head of bed during procedure</b>

**What Do You Need to Wear?**

Droplet/Contact	Airborne & Droplet/Contact	Airway Management PPE
 <p>Surgical Mask Eye Protection  Gown  Gloves</p>	 <p>N95 Mask Eye Protection  Gown &amp; Gloves</p>	 <p>N95 Mask Eye Protection Extended Cuff Gloves  Surgical Gown  <i>Optional</i> OR Hood Face Shield</p>

February 9, 2021






## Coverall Version

**Which PPE?**

Droplet/Contact	Airborne & Droplet/Contact	Airway Management PPE (Intubation/Extubation)
<b>Routine Patient Care</b>	<b>Suspected/Confirmed COVID-19</b> <ul style="list-style-type: none"> <li>• Mechanical Ventilation</li> <li>• CPR &amp; /or BVM Ventilation</li> <li>• CPAP/BiPAP, High Flow Nasal Cannula (Optiflow)</li> <li>• Nebulized Therapy</li> <li>• Open Airway suctioning</li> <li>• In room BUT further than 2 meters away during intubation/extubation</li> </ul>	<b>Intubation</b> (Team includes 1 MD, 1 RRT, and +/- RN*)  <b>Extubation</b> (RRT +/- second RRT*, or RN*)  <b>*IF within 2 meters of the head of bed during procedure</b>

**What Do You Need to Wear?**

Droplet/Contact	Airborne & Droplet/Contact	Airway Management PPE
		<b>Coverall Version</b> 

February 9, 2021

## Appendix B – Airborne Management PPE – Gown Version

### DONNING


**Airway Management PPE  
(Gown Version)**

Feb. 9, 2021

**Don PPE with a Partner**

- 1 Hand Hygiene
- 2 N95 Mask & Seal Check
- 3 Eye Protection
- 4 OR Hood (Optional)  
Cross over the ties under the chin & make single knot in back.
- 5 Face Shield (optional)
- 6 Surgical Gown  
Tie gown in back
- 7 Extended Cuff Gloves

**Airway Management PPE**



### DOFFING

**Airway Management PPE  
(Gown Version)**

Feb. 9, 2020

**Do off PPE with a Partner**

**Do offing (Neck Down) In Anteroom or Inside Patient's Room**

Airway Management PPE

- 1 Gloves & HH
- 2 Gown & HH  
Do off by leaning forward & pulling away from you at gown shoulders & discard

**Do offing (Neck UP) In Anteroom or Outside Patient's Room**

- 3 Face Shield\* & HH  
Do off by leaning forward & discard
- 4 OR Hood\* & HH  
Do off by leaning forward & pulling away from you & discard
- 5 Goggles & HH  
Do off with eyes closed by leaning forward & pulling away from you. Discard or decontaminate goggles.
- 6 N95 Mask & HH  
Do off with eyes closed by leaning forward & pulling away from you
- 7 Hand Hygiene
- 8 Proceed to Shower (Optional)

Note: \* Remove optional face shield & OR hood as needed.

### Persons/Groups Consulted

Professional Practice Lead Respiratory Therapy  
RT Education Lead  
Executive Director, People  
Nurse Educators Emergency Department SPH  
Nurse Educator, Emergency Department MSJ  
Infection Prevention and Control  
Nurse Educators ICU SPH  
Nurse Educator CICU  
Nurse Educator CSICU  
Nurse Educator MSJ HAU  
Nurse Educator Cardiac Interventional Suite  
Nurse Educator PACU, MSJ  
Nurse Educator PACU SPH  
Nurse Educator /CNL Interventional Radiology

### Developed By:

CNS Critical Care  
Infection Control Practitioners

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<b>Owners:</b>	PHC
	Critical Care Respiratory Therapy