Guiding Principles for Intubation:

1. Patient Safety is a higher priority than prevention of aerosolization during airway management, when using proper PPE.
2. Avoid mask ventilation, if possible.
3. Consider videolaryngoscope with disposable blade for intubation.
4. Most experienced anesthesia provider (anesthesia attending) to perform intubation.
5. Perform an airway timeout to assign roles and establish plan, prior to securing airway.
STAFF PROTECTION

**BEFORE**

- Hand Hygiene
- Full Personal Protective Equipment***
  1. Per Dept of Anesthesia guidelines under Pulse COVID tile
  2. Post sign on door: patient known or suspected COVID
- Minimize Personnel During Aerosol Generating Procedures****
  ONLY Anesthesia Attending and 1 other designated assistant present in the room
- Airborne Infection Isolation Room (if available)
  1. Use portable HEPA filter if in OR
  2. Designate a person to stand outside the procedural room to obtain additional supplies if necessary during intubation

**PREPARATION**

- Early Preparation of Drugs and Equipment
- Meticulous Airway Assessment
- Use Closed Suctioning System
- Formulate plan Early
- Connect Viral/Bacterial Filter to Circuits and Manual Ventilator
- Use Video Laryngoscopy (Disposable if available)

**DURING**

TECHNICAL ASPECTS

- Airway Management by Most Experienced Practitioner Anesthesia Attending
- Tight Fitting Mask with Two Hand Grip to Minimise Leak
- Ensure Paralysis to Avoid Coughing
- Rapid Sequence Induction and Avoid Bag-Mask Ventilation When Possible
- Positive Pressure Ventilation Only After Cuff Inflated

TEAM DYNAMICS

- Clear Delineation of Roles
- Clear Communication of Airway Plan
- Closed-loop Communication Throughout
- Cross-monitoring by All Team Members for Potential Contamination
AFTER

1. Use filter during transport - should be between the ETT and Jackson Reese/Ventilator connector
2. Turn off O2 flows on anesthedia machine after extubation

- There are regional and institutional variations on definition of a suspected/reportable case. Please refer to your own institutional practice.
- Personal Protective Equipment according to your own institutional recommendation, may include: Particulate Respirator, Cap, Eye Protection, Long-sleeved Waterproof Gown, Gloves

How to respond to a code:

- No chest compressions until a two-handed mask seal is in place.
- Chest compressions should pause for intubation by an anesthesia attending; consider early intubation to protect staff.
SEQUENCE FOR PUTTING ON PERSONAL PROTECTIVE EQUIPMENT (PPE) WITH PAPR

NOTE: PAPR is the preferred PPE due to ability to reuse. Save disposable masks (N95), for time-sensitive situations, such as a code.

1. SHOE COVERS

2. PREPARATION

   • Hand Hygiene
   • Gloves
   • Clean PAPR with Sani-wipes
   • Discard Gloves
   • Hand Hygiene

3. PAPR

   • Connect hose to battery pack and mask
   • Turn PAPR on by pressing and holding small button until unit vibrates
   • Put on hood and attach belt - hose should run up the middle of your back
4. GOWN

- Place head loop over PAPR
- Fully cover torso from neck to knees, arms to end of wrists, and wrap around back
- Fasten in back of waist

5. GLOVES

- Extend to cover wrist of isolation gown
- Double gloves for airways
- Use outer glove for laryngoscope disposal Gloves

6. PPE TIME OUT

USE SAFE WORK PRACTICES TO PROTECT YOURSELF AND LIMIT THE SPREAD OF CONTAMINATION

- Keep hands away from face
- Limit surfaces touched
- Change gloves when torn or heavily contaminated
- Perform hand hygiene
EXAMPLE 2: WITH N95 RESPIRATOR

SEQUENCE FOR PUTTING ON PERSONAL PROTECTIVE EQUIPMENT (PPE) WITH N95

1. SHOE COVERS

2. PREPARATION
   - Hand hygiene
   - Gloves
   - Clean goggles with Sani-wipes
   - Discard gloves
   - Hand hygiene

3. GOWN AND HAT
   - Fully cover torso from neck to knees, arms to end of wrists, and wrap around back
   - Fasten in back of neck and waist
4. N95 RESPIRATOR
- Secure elastic bands at middle of head and neck, above and below ears
- Fit flexible bend to nose bridge
- Fit snug to face and below chin
- Fit-check respirator

5. GOGGLES OR FACE SHIELD
- Place over face and eyes; adjust to fit

6. GLOVES
- Extend to cover wrist of isolation gown
- Double gloves for airways
- Use outer glove for laryngoscope disposal

7. PPE TIME OUT

USE SAFE WORK PRACTICES TO PROTECT YOURSELF AND LIMIT THE SPREAD OF CONTAMINATION
How to Safely Remove PPE with PAPR

**Example 1: PPE with PAPR**

**1. Inside Room - Clean PAPR**
- Using alcohol based wipe, clean PAPR face mask and hood

**2. Remove Gown and Gloves**
- Gown front and sleeves and the outside of gloves are contaminated!
- If your hands get contaminated during gown or glove removal, immediately wash your hands or use an alcohol-based hand sanitizer.
- Grasp the gown in the front and pull away from your body so that the ties break, touching outside of gown only with gloved hands.
- While removing the gown, fold, or roll the gown inside-out into a bundle.
- As you are removing the gown, peel off your gloves at the same time, only touching the inside of gloves and gown with your bare hands. Place the gown and gloves into a waste container.

**3. Hand Hygiene**

**Note:** Remove all PPE before exiting the patient room except a respirator or PAPR. Remove the respirator after leaving the patient room and closing the door. Remove PPE in the following sequence:
4. **EXIT ROOM AND RE-GLOVE**

5. **REMOVE AND CLEAN PAPR**
   - Loosening elastic or using tab under chin, remove hood from front to back.
   - Holding the PAPR hood in one hand, unbuckle PAPR belt with the other hand.
   - Gently drop the PAPR hood (avoid contaminating your back with the contaminated PAPR).
   - Place PAPR on “dirty” surface to clean.
   - Using alcohol-based wipe, clean the PAPR beginning with the inside of the hood.

6. **REMOVE SHOE COVERS**
   - Sanitize gloves.

7. **DISCARD GLOVES AND HAND HYGIENE**

8. **CONSIDER CHANGING SCRUBS**

**PERFORM HAND HYGIENE BETWEEN STEPS IF HANDS BECOME CONTAMINATED AND IMMEDIATELY AFTER REMOVING ALL PPE.**
HOW TO SAFELY REMOVE PPE WITH MASK OR N95 RESPIRATOR

NOTE: Remove all PPE before exiting the patient room except a respirator or PAPR. Remove the respirator after leaving the patient room and closing the door. Remove PPE in the following sequence:

1. REMOVE GOWN AND GLOVES
   - Gown front and sleeves and the outside of gloves are contaminated!
   - If your hands get contaminated during gown or glove removal, immediately wash your hands or use an alcohol-based hand sanitizer
   - Grasp the gown in the front and pull away from your body so that the ties break, touching outside of gown only with gloved hands
   - While removing the gown, fold, or roll the gown inside-out into a bundle
   - As you are removing the gown, peel off your gloves at the same time, only touching the inside of gloves and gown with your bare hands. Place the gown and gloves into a waste container

2. HAND HYGIENE

3. EXIT ROOM AND RE-GLOVE
4. REMOVE SHOE COVERS  
- Sanitize gloves

5. REMOVE AND CLEAN GOGGLES  
- Grasping goggles from sides remove without touching front
- Place on “dirty” surface for cleaning
- Clean goggles using an alcohol-based wipe

6. REMOVE N95  
- Using 2 hands, grasp N95 at corner with one hand and twist rubber bands around finger of second hand and remove N95
- Without touching front of N95, place in trash
- If your hands get contaminated during respirator removal, immediately wash hands

7. DISCARD GLOVES AND HAND HYGIENE

8. CONSIDER CHANGING SCRUBS

PERFORM HAND HYGIENE BETWEEN STEPS IF HANDS BECOME CONTAMINATED AND IMMEDIATELY AFTER REMOVING ALL PPE
COVID-19 Personal Protective Equipment (PPE) Guidelines

- **NOTE:** Precautions for Specific Infections and Conditions, Inpatient and Infection Control, and Infection Prevention and Transport Control Manual, and CDC recommendations
- **Audience:** Applies to all Department of Anesthesiology clinical personnel
- **Precautions for suspected and confirmed COVID-19 Patients**
  - **Patients undergoing testing for COVID-19 / suspected COVID-19 (Rule-out COVID-19 infection patients, contact and droplet precautions):**
    - To be performed prior to entering the patient's room, continuously while in the patient's room, and during patient transport
    - Hand hygiene prior to donning PPE
    - PPE to include gloves, gown, mask, and eye protection
    - For mask - N95 mask or PAPR only required if aerosolizing procedure (intubation, extubation, mask ventilation, CPR, High-flow nasal cannula, bronchoscopy (almost all operative cases)).
    - For eye protection - Eye protection must include side protection. Eyeglasses are not adequate.
    - Immediately replace any PPE that becomes soiled.
    - Use care to avoid cross-contamination when doffing PPE.
    - Hand hygiene after doffing PPE
  - Additional precautions for patients with confirmed COVID-19 infection (Contact and Airborne precautions):
    - Mask must be N95 mask (if fit tested) or PAPR.
- **Considerations to reduce personnel exposure:**
  - Minimize personnel in the patient care area. Minimize traffic into and out of the patient care area. If Rule-out COVID-19 infection patient with intubation or any other aerosolizing procedure, or confirmed COVID-19 patient (essentially all operative cases):
    - All personnel transporting the patient, or in the room, should use Contact and Airborne Precautions PPE including N95 or PAPR, for the duration of the case.
    - Negative pressure room (none of the ORs) or HEPA room air filter should be utilized for confirmed cases, or if patient under investigation and aerosolizing procedure, if available.
  - Provider scrubs should be exchanged upon completion of the case.
- **Considerations to reduce aerosolization:**
  - Non-intubated patients should wear a mask. Avoid HFNC. Avoid mask ventilation.
Airway management should be performed by the most experienced provider with one designated assistant. All other providers (resident, scrub, circulator, surgeon) should leave the room. One provider is assigned to watch the intubation through the window and respond if the intubating team needs assistance.

- Use disposable equipment wherever possible (like the portable GVLs).
- Minimalist approach: only bring items into the room that are known to be necessary. (No difficult airway carts in the room, for example.)
- NO PPV unless an ETT is in place with the cuff inflated. The exception is in an unanticipated difficult airway: LMA and BMV may be used to try to avoid cricothyrotomy.
- Place the circuit filter on the PATIENT side of the circuit elbow. Consider a second filter on the expiratory connector as a backup if the patient side filter becomes disconnected with it being noticed.
- Turn off the ventilator prior to disconnecting the circuit.
- Closed suction devices should be used over open suction catheters.

**Other considerations:**
- All PPE are single patient use items. N95 masks (and regular surgical masks) are in limited supply. Please do not waste or hoard them.
- The CDC says regular surgical masks are an acceptable alternative if N95 masks are not available.

**Quarantine, COVID-19 testing, or treatment** is not indicated for asymptomatic providers, as long as PPE and disinfection guidelines are followed.

### Airway Management Guidelines for COVID-19

- Use expiratory filter on ventilator circuits (already the current standard) and add expiratory filter to Ambu-bags.
- All PPE are single patient use items. N95 masks (and regular surgical masks) are in limited supply. Please do not waste or hoard them.
- The CDC says regular surgical masks are an acceptable alternative if N95 masks are not available.
Notes for Printing and Binding:

- Pages are 4.5” x 7”. This will allow the overall booklet to easily fit into a scrub pocket.

- Print on "water resistant paper", so that pages can be disinfected by medical personnel between patients. This product is available at most print shops, including FedEx-Kinkos, allowing your facility to produce these very rapidly.

- Print in color, 2 sided.

- Spiral bind on top edge.

- The first page is the cover, with the subsequent pages opening like a book.

- This document can be easily edited using Adobe Acrobat DC to personalize for your institution.