AEROSOL GENERATING PROCEDURES (AGPs)

INTENDED AUDIENCE: Clinical and Operational Leaders Responsible for COVID-19 Planning and Response

BACKGROUND
- Participating in certain aerosol generating procedure (AGP) increases the risk of viral transmission
- The World Health Organization (WHO) has defined which AGPs are known to increase risk of respiratory pathogen transmission versus which AGPs possibly increase risk of respiratory pathogen transmission

PURPOSE
- Clearly define and confirm which AGPs are known to increase risk of respiratory pathogen transmission versus which AGPs possibly increase risk of respiratory pathogen transmission

POSITION STATEMENT
The following 4 lists were used for reference in determining use of a respirator (N95):

- AGPs Known to Increase Risk of Respiratory Pathogen Transmission
- AGPs that Possibly Increase Risk of Respiratory Transmission
- AGPs not commented on by either WHO or CDC but have been reviewed and approved by Infectious Disease/Infection Prevention team
- Evidence does not currently exist to discern whether or not aerosols are generated during these procedure

These lists should remain consistent with current evidence to reduce confusion and constant iteration based on requests to acquire respirators for specific procedures.

Patients testing negative or previously positive and meet the desolation criteria, TM/provider should use universal mask & eye protection when conducting an AGP. Negative airflow room is not required.

For patients of unknown* COVID-19 status or are non-desolated COVID positive, and conducting an AGP, follow PPE Resource guide. Face shields are the preferred eye protection to prevent mask contamination and extend the life of the N95 mask. *Unknown status refers to patients that have not been tested or have been tested >72 hours, including those asymptomatic.

- Use of negative pressure room is preferred for any AGP for patient of unknown COVID-19 status and for COVID-19 positive patients who have not met desolation criteria. If negative pressure room is not available, ensure that door remains closed.
- AGP in progress signage should be placed on the outside of door for duration of AGP treatment including timeframe for air-exchange completion
- Once the actual AGP is completed and the patient is masked. The designated time for air exchange begins.
- The time to complete air exchange is dependent on the number of exchanges the room is able to generate.
- Contact the site Facilities Management department to identify air exchanges, if unknown. See Air Contaminate Removal Grid in reference section of this document and for additional guidance.
- Room turnover and cleaning may occur with door closed and appropriate PPE during this air exchange time.
- Clean and disinfect surfaces after procedure.

1. Aerosol Generating Procedures (AGPs) Known to Increase Risk of Respiratory Pathogen Transmission per WHO and CDC guidelines:
- Intubation/extubation
- Cardiopulmonary resuscitation
- Manual ventilation
- Open suction catheter via tracheostomy, endotracheal tube, nasotracheal intubation
- Open suctioning of airways (in-line suctioning should be used to reduce risk of aerosolization)
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- Bronchoscopy*
- Autopsy when bone saw drills are in use
- CPAP/BiPAP (non-invasive mechanical ventilation)
- Sputum Induction

2. Aerosol Generating Procedures (AGPs) that Possibly Increase Risk of Respiratory Pathogen Transmission per WHO and CDC guidelines:
   - High-frequency oscillating ventilation
   - Nebulized treatments (MDI should be used unless clinically contraindicated)

3. Aerosol Generating Procedures (AGPs) Not Commented on by WHO or CDC (Discerned through internal ID/IP):

   Respiratory
   - Placing or exchanging tracheostomy tubes
   - Opening a ventilator circuit
   - High flow nasal cannula oxygen therapy
   - Continuous aerosol therapy
   - RT interventions which cause aerolization by design (i.e., IPV/Metaneb)
   - Pulmonary Function Test*
   - Spirometry*

  Speech and Language
  - Dysphagia treatment, evaluations using mechanical or nonmechanical intervention
  - Instrumental assessment of swallowing or voice via endoscopy with or without stroboscope
  - Assessment and management of laryngectomy, including voice restoration using voice prosthesis and stoma care

  Gastroenterology/Digestive Health Institute:
  - Endoscopy/EGD/colonoscopy
  - ERCP/EUS
  - Flex sigmoidoscopy
  - Anorectal Manometry
  - Esophageal Manometry

  Cardio diagnostic/Cardiovascular
  - TEE
  - Exercise stress/exercise Echo
  - ABI w/exercise

  Obstetrics/Gyn
  - Vaginal delivery (2nd stage labor)

  Peri-op Services
  - Laparoscopy
  - Oropharyngeal surgery
  - Chest tube Insertion/removal*(chest tube with or without air leak connected to a closed system drainage is not aerosolizing)
  - Electrocautery smoke plumes specifically in the aerodigestive tract includes the airway (pharynx and larynx), pulmonary tract (trachea, bronchi, and lungs), and upper digestive tract (esophagus).
  - Surgery in which high speed drills and bone saws are used
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Head and Neck
- Flex Nasolaryngoscopy
- Nasal endoscopy
- Oral cavity/oropharyngeal biopsy
- Tracheobronchoscopies
- Nasopharyngoscopies
- Nasolaryngoscopies
- Tracheostomy tube changes
- Tongue and Lip tie releases
- Cautery for recurrent nose bleeds with silver nitrate

Imaging Studies and Procedures
- Biopsy, lung, Pleura or mediastinum (perc needle)
- Pulmonary tumor ablation
- Pleural drainage (insertion of indwelling catheter)
- Thoracentesis (needle or catheter aspiration pleural space)
- Bronch artery ablation
- Bronchoscopy/tracheal stent, dilatation
- Pulmonary vent/perf

Occupational Health
- Breath alcohol testing (BAT) Breathalyzer

4. Evidence Does Not Currently Exist to Discern Whether or Not Aerosols Are Generated During These Procedures:
N95 is not required for the following:
- Normal oral or nasal suctioning, including NG or OG tube insertion
- Toilet flushing
- Vomiting
- Non-rebreather facemask

*Procedure crosses service lines*

CDC Air contaminate removal (air exchange per hr./time for room to be vacant), it is recommended to follow the 99.9% efficiency timeframe as viewed in column two below.
1. Airborne Contaminant Removal

Table B.1. Air changes/hour (ACH) and time required for airborne-contaminant removal by efficiency *

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* This table is revised from Table 53.1 in reference 4 and has been adapted from the formula for the rate of purging airborne contaminants presented in reference 1435.

+ Denotes frequently cited ACH for patient-care areas.

References

https://www.cdc.gov/infectioncontrol/guidelines/environmental/appendix/air.html


https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3338532/#pone.0035797-Raboud1


https://www.cdc.gov/coronavirus/2019-ncov/hcp/infection-control-recommendations.html#take_precautions

https://www.cdc.gov/sars/guidance/i-infection/healthcare.html

https://www.shea-online.org/images/guidelines/061209_H1N1_on_Letterhead.pdf