



COVID-19

Thoracic Surgical Procedures in the COVID-19 Era

Open, thoracoscopic and robotic chest operations, particularly those involving the lung, pose a HIGH RISK of exposing surgeons, operating room (OR) personnel, and nursing staff to SARS-CoV-2 from patients infected with the virus. The virus is known to target the lung, with the potential to cause severe or fatal pneumonia in susceptible individuals. Lung resections pose several unique challenges relative to potential aerosolization of viral particles and their release into the surrounding environment, including:

- The need for double-lumen endotracheal tubes and single-lung ventilation, whereby the contralateral lung is ventilated (in a closed system) while the ipsilateral lung is vented to the open atmosphere (without filtration);
- Transection of lung tissue, with or without the use of stapling devices, with potential release of virus during or after surgery, especially if “air leaks” persist;
- The need for a chest tube that vents air leaked from the lung to the open atmosphere (without filtration). While a Pleur-evac or similar collection device, including a “water-seal” chamber, is generally attached to the tube, the effectiveness of these devices at filtering viral particles is unknown;
- The use of CO2 during some thoracoscopic and robotic operations, with the potential to vent into the atmosphere through or around ports. The risk of exposure to surgeons and OR staff during minimally invasive surgery (MIS) procedures (including robotics) where insufflation is utilized is unknown. The theoretical risks of MIS must be balanced against the risks inherent in open surgery, including challenges in suction/filtration of aerosolized particles, as well as the benefits of MIS including less pain, decreased lengths of stay, and a favorable complication profile.

Given the risks to both the patient and to hospital personnel posed by thoracic procedures on patients with COVID-19, all patients undergoing lung operations should be tested for SARS-CoV-2 prior to surgery, assuming the availability of testing resources. For any patient testing positive, it is STRONGLY RECOMMENDED that surgery be delayed if clinically reasonable. Given the known risk of false-negative test results for SARS-CoV-2, we make the following recommendations for ALL lung operations at this time:

- Movement of staff in/out of the operating room should be minimized and limited to those essential to the conduct of the procedure. (Please refer to OR policies regarding essential personnel and equipment set-up procedures.)
- All Staff will wear the proper Personal Protective Equipment (PPE) for the ENTIRETY of the procedure. Proper PPE includes an **N95 mask or Powered Air-Purifying Respirator (PAPR), face shield or goggles, gown, and gloves**. (Please refer to policies regarding the proper procedures for donning/doffing of PPE).
- To evaluate whether a PAPR is necessary, the following should be considered:
 - If the procedure is elective, reschedule for a time when the patient is no longer infectious.
 - If the reason for being unable to wear an N95 is related to facial hair, refer to Occupational Health and Human Resources Policy.



COVID-19

- Consider replacing the person unable to wear an N95 by an equally qualified individual who can wear a surgical N95 respirator
- If it is determined that a PAPR is necessary:
 - The shroud/hood can and should be tucked into the surgical gown as long as the blower is still receiving proper airflow
 - The belt/blower should be worn inside of the gown as long as the blower is reaching proper airflow
 - The airflow should be checked at the blower at the end of the hose (while being donned inside of the gown) prior to attachment to the hood
 - The blower needs to reach proper flow (at least 6 CFM for all units)
 - Disinfect the unit at the end of each case with an approved disinfectant active against COVID-19
- When inspecting the blower unit of the PAPR, prior to use, test the blower unit to ensure air flow is greater than six (6) cubic feet per minute (CFM). To test airflow:
 1. Connect the breathing tube to the blower unit
 2. Connect the breathing tube to the float monitor.Turn on blower unit and measure air flow using the float monitor. Air flow should be greater than 6 CFM
- For all procedures, blood/fluid droplet spray should be minimized.
- For open cases, a **smoke evacuator** should be used (when available).
- **FOR THORACOSCOPIC AND ROBOTIC PROCEDURES IN WHICH CO2 INSUFFLATION WILL BE UTILIZED:**
 - Make port incisions as small as possible to avoid leakage of insufflated gas around them.
 - Use the lowest insufflation pressures (e.g. 5-8 mmHg) to achieve adequate visualization.
 - Anesthesiologists should maintain the patient in a deep neuromuscular blockade to avoid increased intraabdominal pressures.
 - Minimize leakage of CO2 through trocars. (Check seals in reusable trocars or use disposable trocars).
 - Electrosurgical and ultrasonic devices should be utilized in a manner that minimizes production of plume, with the lowest effective power setting and avoidance of long desiccation times.
 - When available, a **closed smoke evacuation/filtration system with Ultra Low Particulate Air (ULPA) Filtration capability should be employed.**
 - Avoid rapid desufflation, particularly at times of instrument exchange or specimen extraction.
 - A thoracoscopic suction may be used to remove surgical plume and desufflate the pleural space prior to port removal, specimen extraction, or conversion to an open operation. **DO NOT VENT CO2 INTO THE ROOM.**



COVID-19

When an urgent/emergent thoracic surgical procedure is performed in a COVID-19 (+) patient, COVID-19 precautions should continue in the postoperative period. Thus, the patient should be placed in a negative air flow room and staff caring for the patient should wear the appropriate PPE when in the room. **Patients testing negative preoperatively for COVID-19 do not require COVID-19 precautions in the postoperative period.**