

**[High Priority] - H0614 : [COVID-19] Strategies to Minimize Surgical Staff Exposure to COVID-19 [ECRI Exclusive Hazard Report]
Medical Device Hazard Report**

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Geographic Regions: Worldwide

Suggested Distribution: Anesthesia, Cardiology/Cardiac Catheterization Laboratory, Emergency/Outpatient Services, Infection Control, Nursing, Obstetrics/Gynecology/Labor and Delivery, Oncology, OR/Surgery, Orthopedics, Risk Management/Continuous Quality Improvement, Facilities/Building Management, Gastroenterology, Dentistry/Oral Surgery, Otolaryngology, Staff Education, Materials Management

Problem:

1. Extensive community transmission of the SARS-CoV-2 virus has resulted in a patient surge, and has altered care practices in many healthcare facilities.
2. While elective surgical procedures have been deferred, surgical teams may still need to perform procedures on high-acuity patients.
3. Healthcare personnel may be exposed to SARS-CoV-2 while performing non-elective/emergency surgery on a COVID-19 positive patient.

Comment:

1. Many of the recommendations in this report are intended to place an emphasis on diligence and best surgical practices in any situation, regardless of the current pandemic.
2. Though increased diligence may increase overall operative and turnover times, ECRI believes the added benefit of staff and patient safety is paramount.
3. Recommendations that would represent a deviation from standard best practices in light of the COVID-19 pandemic are preceded by an *asterisk.

ECRI Recommendations:

Surgical Team

1. *The anesthesia professional should perform intubation and extubation procedures alone in a dedicated negative-pressure space separate from the operating room (OR), because of the high risk of aerosolization during these procedures (2). Other members of the care team should observe this procedure from outside the room in case of emergency. After intubation, the team can move the patient to the OR, perform the procedure, and then move the patient back to the negative-pressure space for extubation. For reference, most ORs are positive-pressure spaces so they protect the room from adjacent airborne pathogens.

1. If your facility has a negative-pressure OR, intubation and extubation procedures could be performed (by the anesthesia professional alone) in the OR space; however, this may lead to an increased risk of surgical site infection.

*Some studies suggest following measures adapted during the 2003 SARS outbreak, including converting existing ORs into negative-pressure spaces, or similar current U.K. and Ireland SARS-CoV-2 guidelines to halt positive-pressure ventilation during the procedure and for at least 20 minutes after the patient has been removed from the room (3). Keep in mind the risk of increased surgical site infection in these instances.

- 2.
2. *Assign a dedicated OR space for procedures on suspected or confirmed COVID-19 positive-patients (2).
 1. This room should be appropriately filtered and ventilated per standard requirements, with high air exchange rates of at least 20 exchanges per hour.
 2. *Plan patient routes to minimize environmental exposure when moving the patient.
 3. *Where possible, minimize the equipment inside the dedicated OR, keeping only what the procedure requires. ECRI acknowledges that it may not be feasible to move a majority of equipment (e.g., boom-mounted devices, suture racks), and recommends draping them to minimize contamination.

Designate a runner to acquire unanticipated equipment from outside the OR as needed, while minimizing entry into the room (3).

- 4.
3. *Only staff essential to the procedure should be in the OR (2).
 1. *Perform pre-operative huddles before entering the room.
 2. *Unless they are performing as a first assistant, consider not including resident trainees for COVID-19 surgical cases.

*Do not exchange OR staff (e.g., no shift or nursing team breaks) unless it is considered urgent.

- 3.
4. *Follow the personal protective equipment (PPE) recommendations for aerosol-generating procedures, including N95, eye protection, gowns, and gloves, as outlined in previous ECRI COVID-19 reports (2,4).
 1. Standardize PPE donning and doffing procedures in a designated area. Perform procedures the same way every time (2).

Practice double-gloving for surgical procedures (2).

- 2.
5. *Where possible, limit the use of electrosurgery and other smoke-generating devices, including monopolar electrosurgery, laser, and ultrasonic dissectors.

1. Use the ESU on the lowest possible power setting to achieve the desired surgical effect.

Use a smoke evacuation system with ULPA level filtration. For more information, refer to ECRI's COVID-19 report on surgical smoke evacuation, "[COVID-19] Considerations for Smoke Evacuation during Non-Deferrable Surgery" (5).

- 2.
6. For laparoscopic procedures, minimize the risk of carbon dioxide (CO₂) leakage into the OR (1).
 1. Use small and secure incision ports.
 2. To the extent possible, do not allow for leakage around the ports. Once the port is placed, do not vent it.
 3. Pressurized intraperitoneal aerosol chemotherapy (PIPAC) techniques may be effective for minimizing CO₂ leakage, including (2,3):
 1. Using Veress needle or optical trocar insertion techniques instead of open Hasson techniques, which may contribute to a larger fascial defect and a less secure seal (3).
 2. Using a balloon trocar, which creates a more secure seal around the trocar and tissue, reducing inadvertent trocar displacement during instrument exchange (3).
 4. Use the lowest insufflation pressure required to maintain the pneumoperitoneum. Higher pressures are more likely to leak through port seals (2).
 5. *Lay the patient flat and desufflate the pneumoperitoneum via the least critical laparoscopic port through an ULPA filter whenever peritoneal access is required. Remember to close all valves during desufflation to avoid release of CO₂ into the OR (2,3). Situations requiring desufflation include:
 1. Trocar removal and port closure
 2. Specimen extraction – a specimen retrieval bag can also help to minimize exposure
 3. Converting to an open procedure

*After desufflation, close incision ports under direct vision. Do not use a closure device that requires an insufflated pneumoperitoneum to facilitate closure (3).

- 6.
7. For endoscopic procedures:
 1. Follow the laparoscopic recommendations above.

*Patients presenting with emergent gastrointestinal (GI) symptoms should be treated as particularly high COVID-19 infection risk, because SARS-CoV-2 has been found in the GI tract of affected patients (2).

- 2.
8. Clean and disinfect mobile equipment before removing it from the OR.

Background:

1. There is currently very little evidence to suggest that open surgery has fewer COVID-19 contamination risks than minimally invasive surgery, and vice versa (1).
 1. An open surgery does not require a pressurized pneumoperitoneum; a pressurized pneumoperitoneum may be more likely to yield uncontrolled release of potentially viral CO₂ particles into the room.
 2. While minimally invasive surgery does require a pressurized pneumoperitoneum, the patient's abdomen is sealed, which can potentially minimize not only CO₂ particles released into the air, but also confine surgical smoke plume and any aerosolized SARS-CoV-2 to within the patient's peritoneal cavity.
 3. Minimally invasive surgery has traditionally been linked with a shorter hospital length of stay, minimizing the risk of exposure to SARS-CoV-2.
2. Professional organizations are beginning to offer roadmaps to resuming elective procedures during and after the pandemic. Notable examples include:
 1. American Association of Nurse Anesthetists (AANA) "Resuming Elective, Non-Urgent Surgical Procedures during the COVID-19 Pandemic." (6)
 2. "Roadmap for Resuming Elective Surgery after COVID-19 Pandemic" with input from American College of Surgeons (ACS), American Society of Anesthesiologists (ASA), Association of periOperative Registered Nurses (AORN), and American Hospital Association (AHA) (6).

References & Source Documents:

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2. Safe management of surgical smoke in the age of COVID 19

3. Mowbray NG, Ansell J, Horwood J, Cornish J, Rizkallah P, Parker A, Wall P, Spinelli A, Torkington. "Safe management of surgical smoke in the age of COVID-19." *BJS*. 3 May 2020. Available: <https://doi.org/10.1002/bjs.11679> .
4. ECRI:
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 - "[COVID-19] Strategies for Addressing Expected or Known Eye Protection Shortages." ECRI, 16 Apr 2020, Accession no. H0584, <https://assets.ecri.org/PDF/COVID-19-Resource-Center/COVID-19-Clinical-Care/COVID-Alert-Eye-Protection-Shortages.pdf>
 - "[COVID-19] Strategies for Addressing Expected Glove Shortages." ECRI, 16 Apr 2020, Accession no. H0586, <https://assets.ecri.org/PDF/COVID-19-Resource-Center/COVID-19-Clinical-Care/COVID-Alert-Expected-Glove-Shortages-2.pdf>
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 - "[COVID-19] Considerations for Smoke Evacuation during Non-Deferrable Surgery." ECRI, 18 May 2020, Accession no. H0613, <https://www.ecri.org/www.ecri.org/Components/Alerts/Pages/TrackingUser/AlertDisplay.aspx?AId=1643206>
5. "Resuming Elective, Non-Urgent Surgical Procedures during the COVID-19 Pandemic." American Association of Nurse Anesthetists, 2020, [https://www.aana.com/docs/default-source/marketing-aana-com-web-documents-\(all\)/2020_reopening_elective_surgery_infographic_v2_fnl.pdf](https://www.aana.com/docs/default-source/marketing-aana-com-web-documents-(all)/2020_reopening_elective_surgery_infographic_v2_fnl.pdf)
6. "Joint Statement: Roadmap for Resuming Elective Surgery after COVID-19 Pandemic." American College of Surgeons, American Society of Anesthesiologists, Association of periOperative Registered Nurses, American Hospital Association, 17 Apr 2020, <https://www.aorn.org/guidelines/aorn-support/roadmap-for-resuming-elective-surgery-after-covid-19>

Comments:

- This alert is a living document and may be updated when ECRI receives additional information.

Source(s):

- 2020 May 18. ECRI researched report