Pandemic Response: COVID – 19 Surgery Clinical Operations & Practice

Introduction: The abrupt introduction of the COVID-19 pandemic in the United States has given health systems limited time to prepare. The pandemic has several unique characteristic that impact the care of surgical patients. Foremost, is that coronavirus is highly infectious with two main routes of transmission, inoculation of mucosa with virus-laden bodily secretions or inhalation of infectious respiratory particles. Respiratory droplet transmission is considered to be the dominant mode of contagion in the community. Less is known about transmission in hospital settings. For this reason, precautions in the procedural setting must be designed for maximal protection of Mission Partners with respect to contact and respiratory modes of transmission.

Another critical issue is the potential for sudden exponential expansion of the number of critically ill patients in a community that may put pressure on critical resources, notably negative pressure hospital rooms and intensive care beds and personal protection equipment (PPE). As will be discussed below, there has been uniform agreement among regulatory bodies and professional societies that conservation measures should be enacted prior to the explosive growth of cases to reduce the possibility of resource exhaustion before the end of the pandemic. For this reason, projections of the timing of infectious spread in a region should look at the impact on resources all the way to the *back side* of the bell curve of infectious spread in the community. For these reasons, the Center for Disease Control (CDC), the World Health Organization (WHO), the American College of Surgeons (ACS), and the American Society of Anesthesiologists (ASA) are in agreement that significant limitations on elective surgery should be implemented immediately to conserve resources.

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Overarching procedural decision making considerations, American College of Surgeons (ACS) (2020):

- **I.** Hospitals and surgery centers should consider both their patients' medical needs, and their logistical capability to meet those needs, in real time.
- **II.** The medical need for a given procedure should be established by a surgeon with direct expertise in the relevant surgical specialty to determine what medical risks will be incurred by case delay.
- **III.** Logistical feasibility for a given procedure should be determined by administrative personnel with an understanding of hospital and community limitations, taking into consideration facility resources (beds, staff, equipment, supplies, etc.) and provider and community safety and well-being.
- **IV.** Case conduct should be determined based on a merger of these assessments using contemporary knowledge of the evolving national, local and regional conditions, recognizing that marked regional variation may lead to significant differences in regional decision-making.
- **V.** The risk to the patient should include an aggregate assessment of the real risk of proceeding and the real risk of delay, including the expectation that a delay of 6-8 weeks or more may be required to emerge from an environment in which COVID-19 is less prevalent.

Reference: American College of Surgeons (ACS) (2020). *COVID-19: Guidance* for *Triage of Non-Emergent Surgical Procedures.* https://www.facs.org/covid-19/clinical-guidance/triage

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Guidelines for Scheduling Procedures

- ***Any surgical procedure that may be deferred without effecting the welfare of a patient in the next 60 days should be delayed***.
  - Examples are cosmetic surgery, surgery for benign masses, and hernia without incarceration.

- In contrast, the presence of suspected or known COVID-19 infection ***should not*** alter the decision to provide life-saving surgery (example: ruptured ectopic pregnancy), ***unless*** the infection is so advanced that survival is deemed highly unlikely.

- **The indications for surgery should be documented in the operative note to clearly articulate why the surgery is urgent and cannot be postponed.**
  - Documentation should consider the possibility of future regulatory audit of individual surgeons or hospitals.
  - Hospitals may choose to use a justification form (Attachment 1).
  - An Epic build of smart phrases to incorporate this justification form into the surgical consent will be provided at a later time.

- The CDC decision table below can be used to consider all surgical procedures not further defined in the subspecialty guidelines below.

	Definition	Action to Consider
Tier 1	Low Acuity treatment or service	Consider postponing service Consider follow up using telehealth, virtual check-in, or remote monitoring
Tier 2	Intermediate acuity treatment or service Not providing the service has the potential for increasing morbidity or mortality	Consider initial evaluation via telehealth; triage to appropriate sites of care as necessary If no current symptoms of concern, consider follow up with virtual check in
Tier 3	High acuity or treatment or service Lack of in person treatment or service would result in patient harm	Not recommended postponing in-person evaluation; consider triage to appropriate facility/level of care as necessary

Reference: Centers for Medicare & Medicaid Services. (CMS) (2020). *Non-Emergent, Elective Medical Services, and Treatment Recommendations.* https://www.cms.gov/files/document/cms-non-emergent-elective-medical-recommendations.pdf

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Guidelines for Safe Intubation

- Anesthesia providers are among the most at-risk staff in the management of coronavirus-infected patients, with multiple reports of COVID infection among faculty and resident anesthesiologists.
- Risk factors include: High viral load in the oropharynx and laryngopharyx and the high frequency of cough during intubation/extubation.
- For these reasons, the process for initiation of intubation and initiation of anesthesia should be carefully orchestrated.

For all patients:

- Person performing intubation should wear enhanced PPE: Standard precautions plus N95/Face Shield or PAPR only if not able fit tested to N95
- ***During Covid-19 pandemic situation, routine (non-Covid) use of video laryngoscopy not indicated***
    - ***Video laryngoscopy needs to be prioritized for COVID patients and other patients where clinically indicated***

For suspected or confirmed Covid-19 patients:

- If intubation can be performed in an AII room prior to moving patient to the OR, this is ideal.
- At the time of intubation, the operating room staff should be ***minimized*** to those essential for intubation:
    - All staff who are in the room during intubation will don appropriate PPE prior to patient entry into the operating room.
        - Gown, Gloves, N95/Face Shield plus surgical attire indicated per the procedure
        - PAPR should only be used as an alternative, if unable to fit test to an N95. Caution should be used when utilizing a PAPR during procedures.
    - A second circulator should be available to ferry supplies to the OR during the cases, if needed.
    - Recovery should occur in the operating room. No suspected or confirmed COVID patients will be brought to the pre-operative holding area or recovery room.
        - Don PPE for extubation: Gown, Gloves, N95/Face Shield plus standard precautions
        - PAPR should only be used as an alternative if unable to fit test to an N95
        - Limit staff in room during extubation to those essential to the patients immediate care
            - *Scrub personnel would not be considered essential and every attempt should be made to have instruments already prepared for transport to SPD.*
    - If respiratory support is needed, plan ahead in order to avoid emergent intubations
    - Surgery should be performed in a negative pressure room when available
        - Altering existing ventilation is not suggested due to the potential to contaminate HVAC system

Please Review Attachment 2 Carefully

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Guidelines for Triage of Surgical Procedures by Specialty

- These guidelines are tiered with respect to minimal, moderate and severe community COVID-19 prevalence and the potential resource impact that each prevalence tier has on hospital system resources.
- The ACS (2020) subspecialty guidelines for specific surgical cases are quite detailed and should be followed in surgical decision making.
- Guidelines cannot replace clinical judgement, ***however***, in extraordinary circumstances such as these, adherence to guidelines established by respected societies is logical and later defensible to regulatory audit.

	Decision Making Guidance - Link to Guidelines	Comments
Orthopedic	https://www.facs.org/covid-19/clinical-guidance/elective-case/orthopaedics	*All members of the committee agreed that the table below for orthopedic surgery guidelines should be accepted across the Ministry.*
Pediatric	https://www.facs.org/covid-19/clinical-guidance/elective-case/pediatric-surgery	
Vascular	https://www.facs.org/covid-19/clinical-guidance/elective-case/vascular-surgery	*The ACS guidelines are detailed, structured and simple to interpret.*
Ophthalmology	https://www.facs.org/covid-19/clinical-guidance/elective-case/ophthalmology	
Acute Care General Surgery	https://www.facs.org/covid-19/clinical-guidance/elective-case/emergency-surgery	*Guidelines for the management of patients requiring emergency general surgery consultation and possible surgical procedures.*
Breast Cancer	https://www.facs.org/covid-19/clinical-guidance/elective-case/breast-cancer	
Colorectal Cancer	https://www.facs.org/covid-19/clinical-guidance/elective-case/colorectal-cancer	
Thoracic Oncologic	https://www.facs.org/covid-19/clinical-guidance/elective-case/thoracic-cancer	
Gynecology & Gynecologic Oncology	https://www.facs.org/covid-19/clinical-guidance/elective-case/gynecology	

COVID-19 Guidelines for Triage of Cancer Surgery Patients overarching comments: *https://www.facs.org/covid-19/clinical-guidance/elective-case/cancer-surgery*

	Decision Making Guidance	Action
Plastic	All elective cosmetic surgery should be deferred until after the pandemic. Urgent plastic reconstructions may include patients with traumatic and burn related defects, coverage of major cancer excisions, and coverage of a vital organ (example: sternal infection), skull or vascular structure.	In cases that are uncertain, discussion with the hospital surgeon-in-chief and/or CMO should occur the day prior to surgery, if possible Documentation of these decisions should be included in the operative note.
Otorhinolaryngology	The upper respiratory tract and nasopharynx have documented high viral loads. Many procedures risk aerosolization of tissue from areas with high viral load. Head and Neck Surgeons are at significant risk with reports of ENT surgeons experiencing life-threatening COVID infection. Assess decision on a case by case basis Urgent cases include retropharyngeal abscess, uncontrolled hemorrhage from the nasopharynx, and life-threatening airway emergencies. Surgeons and OR personnel should wear N-95 masks during aerosolizing procedures. At this time PAPR hoods are in critical short supply. Head and neck cancer should be assessed on a case by case basis.	The specialty society has recommended that head and neck surgeons should: • Delay all elective ambulatory provider visits • Reschedule elective and non-urgent admissions • Delay inpatient and outpatient elective surgical and procedural cases • Postpone routine dental and eyecare visits *Those which can be defensibly delayed with chemo radiation protocols should be deferred.* ***These decisions are best done in a multi-disciplinary tumor board and the results of those decisions should be documented in the operative note if surgery is performed and the medical oncology and radiation oncology medical record, as well.***

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Recommendations for specific Procedures, COVID suspected or confirmed:

Tracheostomy: should be delayed for 2-3 weeks, hemodynamically stable patients only

ECMO: Yes. Age<50, no pre-COVID conditions that compromise survival, no rescue from cardiac arrest

Surgery Operations and Safe Practice

Safe Operating Room Environment

Safe Environment Element	Potential Risk(s)	Mitigation of Risk Considerations
Staff should be don PPE prior to patient entry All personnel assigned to the room will don appropriate PPE as indicated in table for the procedure	- Scrubbing and circulating may be tiring - Fatigue leading to breaks in technique	- Staff relief should be planned for longer cases - OR technicians and circulating nurses should receive breaks more frequently
Evacuation of smoke and CO2 during laparoscopy	- There is currently no proof that smoke or venting of peritoneal insufflation during laparoscopic surgery generates infectious COVID-19 particles or droplets	- Smoke evacuators (example: Stryker Product number 0703046000) should be attached to the electrocautery if available. Systems for microparticle filtration of the insufflation gas should be considered to prevent venting of unfiltered of laparoscopic insufflation gas into the operating room. Filtration systems such as the Neptune 3 filtration system has a Hepa fitration system that will catch microdroplets.
Use of Hub Operating Rooms	- Hospitals with a substantial community prevalence (Level III) of COVID-19 infection whom can no longer perform urgent surgical procedures	- Offer referral of patients to areas of the Ministry or outside the Ministry that have low community prevalence. - This is particularly true for cancers that cannot be reasonably deferred.

Traffic Control:

- All doors must remain closed.
- All traffic not involved with the scheduled case will be redirected away from the dedicated isolation room.
- All personnel will first enter the anteroom before entering the OR/procedure room and will don their PPE as applicable.
- The only exceptions to directly entering the room will be the patient and at the end of the procedure the cleaning staff.
- There will be one nurse assigned in the Anteroom to deliver supplies through the anteroom hall for the procedure room, check in blood, and assist in the donning of PPE.

Limiting personnel in the OR. The following is recommended:

- 2 RN circulators, one in the room, one available to ferry supplies
- 1-2 surgical technicians
- 1 Anesthesia provider
- 1 Surgeon/Proceduralists
- 1 Experienced assistant or co-surgeon

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Preparation of Equipment/Supplies: Preparation of the OR environment is key to the safe conduct of the surgery

- Staff should plan on extra time to prepare
- Inspect all equipment and supplies
  - *If a product is defective, or has compromised integrity, do not use and remove, label it as defective, and report the defect*
- After all preparations are made, staff should **pause** and do the "big think" to consider what they haven't thought of.

Workflow surgical case posting:

- To schedule a suspected or confirmed COVID -19 patient, call the Operating Room charge nurse and Anesthesia Charge for the day.

DIRECTIONS SHOULD BE POSTED ON THE WALL OF THE DESIGNATED OR FOR GUIDANCE

Trigger	Role	Action
Patient scheduled for procedure	Charge Nurse/Manager	▪ Make assignments that include extra circulator and extra relief. ▪ For staff present for aerosolizing procedures, ensure staff have been fitted for the N95 or call to arrange the just in time fitting. ▪ If fit testing is needed: During day hours, call Occupational Health During off hours, call the House Supervisor ▪ Each person fit tested has a card that designates mask needed ▪ Communicate with the floor and ICU staff to include a briefing on the patient condition and necessary steps for safe transport
Patient needs transported to procedural area		▪ Patients will be transported directly from the patient room into the OR/procedure room ▪ Patients should not be taken to a Pre-Op holding area, the room and Mission Partners in the OR should be ready to receive the patient ▪ Patients will wear a mask or if intubated, the patient must be connected to a ventilator circuit per policy
	Scrub Person	▪ Perform surgical scrub and re-enter the OR, donning sterile surgical attire through the anteroom door. ▪ The scrub person will remain scrubbed in until the patient leaves the OR/procedure room.
Flagged COVID – 19 patient received from sending unit	Circulating Nurse	▪ Enter the procedure/OR room through the patient door ▪ The patient cart/bed will be covered with a sheet and remain in the procedure/OR room until patient is ready to be transported to postoperative nursing unit.
	Anesthesia provider, Staff, Surgeons/Proceduralists	▪ Enter the OR through the anteroom door after donning PPE as indicated. ▪ If wearing a PAPR, ensure it is turned on and working prior to entering the patient room.
Need to scrub	Surgeons/Proceduralists	▪ Remove the isolation gown and gloves before exiting the OR through the anteroom hall door ▪ Gel hands and proceed to the scrub sink ▪ Once hand scrub is completed, re-enter the OR/procedure room through the anteroom hall door and don sterile gown and gloves

ONCE DONNING OF PAPR/N95 MASK IS COMPLETE, ALL PERSONNEL MUST REMAIN WITHIN THE ISOLATION SUITE.

Workflow surgical case posting continued on next page

Workflow surgical case posting (continued):

Trigger	Role	Action
Procedure is completed and the patient has been transferred to a cart/bed	Personnel who are ready to leave and not return	▪ Remove sterile gowns and gloves ▪ Gel hands, apply clean gloves and exit the anteroom hall door ▪ If wearing the PAPR hood, keep it turned on until in the anteroom ▪ Close the anteroom hall door ▪ Follow instructions for removal and disposal of N95 mask ▪ If wearing the PAPR hood, follow directions for removal, cleaning and storage ▪ Once all PPE has been removed, the PAPR cleaned and stored properly or N95 disposed of/stored, wash hands and exit the suite through the anteroom
Recovery period – Patient will be extubated	Anesthesia provider and the circulating nurse	▪ Remain in the OR for the recovery period. ▪ After extubation, place a regular surgical mask on the patient.
Recovery period – Patient will remain intubated		▪ Patient is transported on a ventilator with respiratory therapy (RT) directly to the ICU ▪ RT will meet in hall outside the OR/Procedure room.
Prior to leaving OR	Circulating nurse	▪ Performs hand hygiene, dons gloves, and uses disinfectant wipes to wipe side rails / head of cart. ▪ A clean sheet is placed over the patient.
Ready to move the patient out of the OR/procedure room	Anesthesia and circulating nurse	▪ Remove isolation gown and gloves, gel hands and put on a clean pair of gloves. ▪ Step out of the door with the patient, remove PAPR/N95 and put on floor just inside the OR/procedure room. ▪ Close the door. ▪ Gel hands and proceed with transport.

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Personal Protective Equipment

- ***All procedures should be evaluated for the risk of aerosol generation of respiratory droplets and/or aerosols of respiratory track secretions***
- Intubation
- Extubation
- Suctioning of airways
- Bronchoscopy
- Any of the following surgical procedures or methods *when involving the respiratory/nasopharyngeal track*
  - Tracheostomy
  - Endoscopy
  - Laproscopy
  - Thoracic procedures
  - Electrocautery
  - Use of high speed powered equipment (drills, saws)
  - Intraoperative debridement devices with irrigation

Perioperative Team Role	Mandatory Precautions- during Aerosol generating procedures	Mandatory Precautions- NO Aerosol generating procedures	Special considerations
Anesthesia Provider	N95 and face shield, isolation gloves PAPR if cannot be fit tested	Surgical Mask, gown, gloves	Anesthesia will recover the patient in the OR with the assistance of the circulating nurse.
Surgeon(s)/Proceduralist(s)	N95 and face shield, gown gloves PAPR if cannot be fit tested	Surgical Mask, gown, gloves	Will need to wear isolation gown and gloves (PPE) in addition while in the room before scrubbing. Then remove PPE, gel hands and scrub in as usual.
Circulating Nurse	N95, gown, gloves and face shield PAPR if cannot be fit tested	Surgical Mask, gown, gloves	Will wear all PPE while in the OR. Will remain in the OR/procedure room for the duration of the procedure and recovery period with anesthesia. Second circulator to pass supplies into the OR.
Surgical Technologist	N95 mask, isolation gown, gloves and face shields PAPR if cannot be fit tested	Surgical Mask, gown, gloves	Will open supplies before patient enters the room. Will scrub hands and don sterile attire. Will remain in the OR/procedure room for the duration of the procedure. Case cart, equipment and all supplies from the case remain in the room until cleaning can begin.
Support/Housekeeping	Surgical Mask, gown, gloves while cleaning operating room	Surgical Mask, gown, gloves while cleaning operating room	OR/procedure room doors are kept closed after patient leaves the room. Initiate terminal cleaning 30-60minutes, dependent on air exchanges, after the patient has left the room

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Future role COVID – 19 pre-surgical testing, once more widely available:

- This section describes a near- or mid-term future state when in-house rapid viral PCR testing is available with a one to two hour turnaround time.
- It is anticipated that viral testing will be available within OSF Healthcare in the near term.
- Testing should be dedicated to pre-surgical patients as soon as practical.

- Benefits of pre-surgical testing include:
  1. Reduction in the use of PPE, equipment and additional personnel to perform procedures by allowing a surgical case to revert to standard precautions.
  2. Allow focus of precautions where they are needed on cases with documented infection.
  3. Prevent initiation of surgical procedures on patients who may have a poor outcome as a consequence of asymptomatic infection. Example: kidney transplantation, high temperature intraperitoneal chemotherapy for debulking of ovarian/appendiceal carcinoma.

- We recommend that all patients having urgent surgical procedures receive PCR testing immediately prior to surgery (evening prior).
  - Examples include but are not limited to hip fracture, colonic obstruction, cancer patients completing neoadjuvant therapy where timing is critical, deceased donor transplant recipients, scheduled C-sections.

When the test becomes widely available, this document will be updated to provide a list of specific indications for pre-operative testing and the exact timing of testing relative to planned surgery.

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References:

1. American College of Surgeons (ACS). (2020). *COVID-19: Elective Case Triage Guidelines for Surgical Care.* https://www.facs.org/covid-19/clinical-guidance/elective-case

2. Centers for Medicare & Medicaid Services. (CMS) (2020). *Non-Emergent, Elective Medical Services, and Treatment Recommendations.* https://www.cms.gov/files/document/cms-non-emergent-elective-medical-recommendations.pdf

3. American College of Surgeons (ACS). (2020). *Peer-Reviewed Publications*. https://www.facs.org/covid-19/publications

4. American Society of Anesthesiologists (ASA). (2020). *COVID – 19 Information.* https://www.asahq.org/in-the-spotlight/coronavirus-covid-19-information

5. American Academy of Otolaryngology – Head & Neck Surgery. (2020). *Academy Supports CMS, Offers Specific Nasal Policy*, [Blog]. https://www.entnet.org/content/academy-supports-cms-offers-specific-nasal-policy

6. American Academy of Otolaryngology – Head & Neck Surgery. (2020). *Tracheotomy Recommendations During the COVID-19 Pandemic.* [Blog]. https://www.entnet.org/content/tracheotomy-recommendations-during-covid-19-pandemic

7. Centers for Disease Control and Prevention (CDC). (2020). *Coronavirus Disease 2019 (COVID-19): Infection Control Guidance.* https://www.cdc.gov/coronavirus/2019-ncov/hcp/infection-control-recommendations.html

8. Imamura, Rui – Safety of Laryngoscopy in COVID-19 Era – (Open Forum response posted on 3/16/20 on https://entconnect.entnet.org)

9. Patel, ZM; Fernandez-Miranda, J; Hwang, PH; Nayak, JV; Dodd, R; Sajjadi, H; Jackler, RK – Precautions for Endoscopic Transnasal Skull Base Surgery During the COVID-19 Pandemic – (article has been accepted for publication in Neurosurgery) complete report posted March 19, 2020 at https://www.entnet.org/sites/default/files/uploads/covid-19_endosb_lettertoeditor_neurosurgery_update3.23.20.pdf

10. World Health Organization (WHO). (2020). *Clinical Management of Severe Acute Respiratory Infection (SARI) when COVID-19 Disease is Suspected – Interim Guidance* https://www.who.int/publications-detail/clinical-management-of-severe-acute-respiratory-infection-when-novel-coronavirus-(ncov)-infection-is-suspected

11. Zheng, MH., Boni, L., & Fingerhut, A. (2020). Minimally Invasive Surgery and the Novel Coronavirus Outbreak: Lessons Learned in China and Italy. *Annuals of Surgery*. [Epub ahead of print] PMID: 32221118

12. ELSO Guidance Document: ECMO for COVID-19 Patients with Severe Cardiopulmonary Failure; ELSO GUIDANCE DOCUMENT: USE OF ECMO IN COVID-19 PATIENTS DURING THE PANDEMIC (Document Final 3/24/2020)