

Infection Prevention and Control (IPC) Protocol for Adult Surgical Procedures During the COVID-19 Pandemic

Updated: May 11, 2022

This guidance is intended for health-care providers. It is based on known evidence as of February 2022.

Contents

Guiding Principles	2
Approach to Infection Prevention and Control (IPC) Includes	2
Background/Current Status	2
Scope.....	4
COVID-19 Immunization	4
When to Proceed with Surgery in Patients with Confirmed, Suspected or Recovered COVID-19.....	4
When Does Perioperative Morbidity and Mortality Decrease in a Patient with COVID-19?.....	5
Management of Patients Recovered from COVID-19 Infection	6
Guidance for Testing Patients Pre-Operatively for COVID-19	6
Implementation of Risk Factor Assessment and Symptom Screening.....	7
Protocol for Management of Surgical Patients – Adult.....	8
Appendix 1: COVID-19 Surgical Patient Assessment Form - Adult.....	9
Key Informants.....	11
Literature Review.....	12
References for Evidence Review (Endnotes)	13



Guiding Principles

- Provider safety
- Patient safety

Approach to Infection Prevention and Control (IPC) Includes

- Patient COVID-19 assessment
- Surgical risk assessment
- Personal protective equipment (PPE) recommendation

Background/Current Status

The protection of both patients and health-care workers (HCW) is the basis of ethical guidelines established for the management of the COVID-19 pandemic. Health-care facilities must continue to ensure that they meet all current public health orders and IPC recommendations. This applies to all staff, patients, families and visitors.

This guidance is based on the latest available best practice and scientific evidence and may change as new information becomes available. For COVID-19 variants of concern, recommended IPC measures remain the same and should be strictly followed and reinforced. See [Guidance on SARS-CoV-2 Variants of Concern](#) for more information.

This guidance is a progression based on lessons learned and emerging evidence to allow for the real-time application of the surgical protocol in dealing with the pandemic. Emphasis should be placed on institutional knowledge, experience and clinical decision-making. This guidance is meant to be implemented as part of the hierarchy of controls (see figure 1) to reduce the risk of COVID-19 in health-care facilities. Health authorities, under the guidance of public health, may choose to implement additional controls in select hospitals (e.g., management of surgical volumes and testing of certain high-risk patient populations) based on local or regional COVID-19 epidemiology.

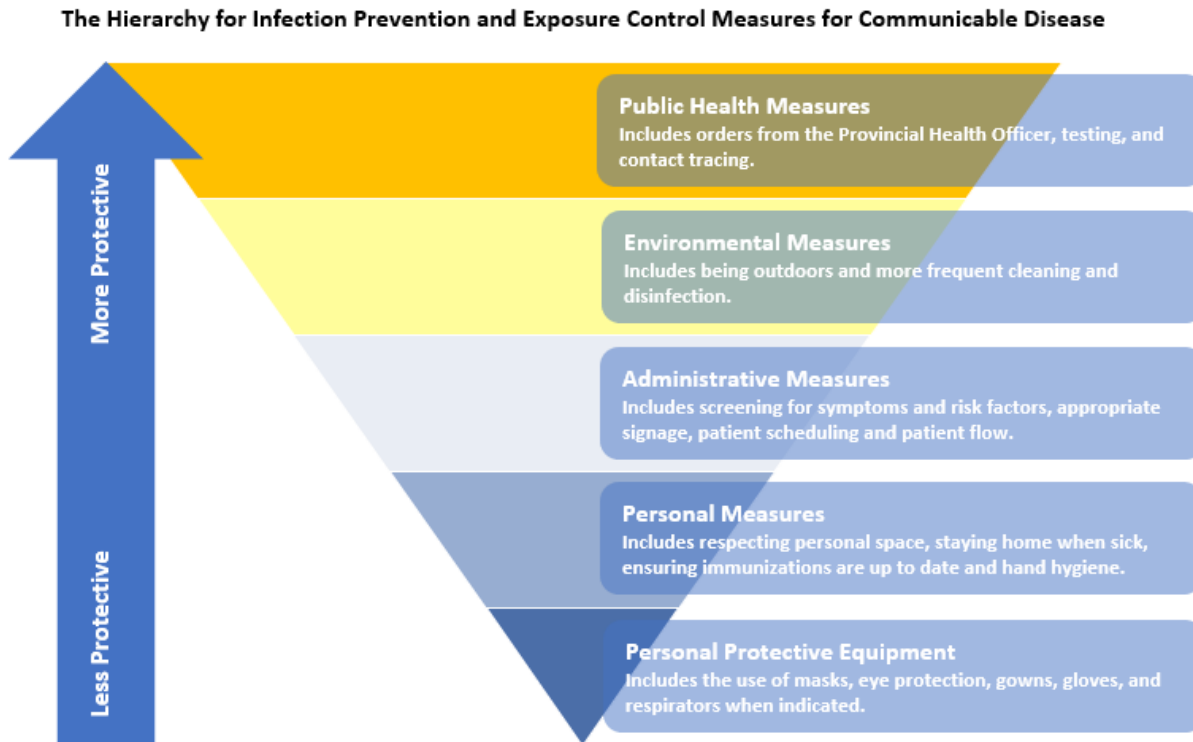
How to proceed with an elective, urgent or emergent surgical procedure, including the selection of appropriate personal protective equipment (PPE), should be based on a patient's COVID-19 risk assessment which includes:

- Assessing for risk factors;
- Screening for symptoms; and,
- COVID-19 testing of patients with any signs or symptoms of COVID-19 infection and as clinically indicated; please see the [Guidance for Testing Patients Pre-Operatively for COVID-19](#) section for more information.



For general guidance outlining the IPC measures to provide care safely in acute care settings, including those with confirmed and suspected COVID-19, please see [COVID-19 Infection Prevention and Control: Guidance for Acute Health-Care Settings](#) for more details.

Figure 1: Hierarchy for Infection Prevention and Exposure Control Measures for Communicable Disease



This guidance includes a patient risk assessment screening tool, which separates patients into different risk categories of green (low risk), yellow (unknown or moderate risk), or red (highest risk) based on the level of risk specific to COVID-19. There are many other infectious diseases which should continue to be vigilantly managed using established institutional protocols and clinical decision-making.

The entire surgical team including anesthesiologist, surgeon, assistant, nurse, etc. is responsible for deciding the patient risk category together.

Risk categorization provides direction for:

- PPE for those providing care, those providing aftercare and those responsible for cleaning and preparing the operating room;
- Different anesthesia approaches;
- Management of surgeries with high risk of aerosolization; and,
- Patient disposition.

Scope

This protocol applies to all adults undergoing a surgical procedure in B.C. facilities during the COVID-19 pandemic. An individual patient risk assessment is universal and should be applied to every surgical patient, when possible. See the provincial [point-of-care risk assessment](#) for more information.

This protocol does not apply to other infectious diseases which may or may not have overlapping symptoms.

Obstetric and pediatric populations have additional considerations and hospitals should also refer to these guidance documents for specific recommendations:

- [IPC protocol for pediatric surgical procedures during COVID-19](#)
- [IPC protocol for obstetrical procedures during COVID-19.](#)

COVID-19 Immunization

The continued roll-out of [B.C.'s COVID-19 immunization plan](#) has resulted in strong protection against SARS-CoV-2. We are continuing to learn about the impact that immunization has on SARS-CoV-2 transmission and its effectiveness against variants of concern. As the evidence evolves, public health and IPC guidance for individuals who have received their COVID-19 immunizations will be updated as needed.

Active or previous COVID-19 infection has been shown to increase perioperative morbidity and mortality.^{i,ii,iii} There is also emerging evidence that immunization against COVID-19 reduces the risk of perioperative morbidity and mortality.^{iv} Therefore, it is important to discuss with patients the recommendation for getting fully vaccinated prior to surgery.

More evidence is needed on the full impact vaccines have on a patient's risk of transmission, perioperative risk and long-term immunity prior to implementing any change in practice. Therefore, all patients, regardless of immunization status, should continue to be screened based on the current patient risk assessment.

Vaccination status does not impact the risk-stratification in the symptom screening algorithm of this document.

When to Proceed with Surgery in Patients with Confirmed, Suspected or Recovered COVID-19

The decision to proceed with elective, urgent or emergent surgical procedures in a patient with confirmed, suspected or recovered COVID-19 infection requires consideration of the following factors:

- Potential for COVID-19 transmission to HCWs and other patients;
- Increased risk of patient morbidity and mortality in the context of active or recent infection;
- The risk associated with delaying surgery (e.g., urgent or oncology); and



- Options for alternative anesthesia (e.g., local/regional vs general).

Scheduling and proceeding with surgery is a clinical decision and all these considerations need to be balanced with the impact in delaying care. In some cases, discussion with perioperative colleagues, medical microbiology and infectious disease may help with a decision regarding timing of surgery.

Urgent, Oncology and Emergent Surgical Procedures:

- **Do not delay necessary urgent, oncology or emergent surgical procedures for COVID-19 testing or test results.** Patients should be screened for symptoms when the patient is admitted to hospital and again upon arrival to the pre-operative area.
- The decision to test should be based on the risk factor assessment and symptom screening. Individual health authorities or institutions may initiate other testing based on local prevalence and impacts on inpatient care. Pending tests results should not delay care.
- See also [Options for Operating Room Configuration and Use When a Patient with Suspected or Confirmed COVID-19 Requires Emergent Surgery](#) for more information.

Elective Surgical Procedures:

- Elective surgical patients should self-monitor for symptoms prior to surgery as per the BCCDC's [symptoms of COVID-19](#) webpage.
- If a patient develops COVID-19 while awaiting surgery, they should inform the surgeon's office so a decision on the timing of surgery can be discussed.
- Elective surgical patients who develop new symptoms or worsening chronic symptoms consistent with COVID-19 up to 10 days before surgery should contact their surgeon's office. High-risk patients may require testing. See BCCDC's [Viral Testing Guidelines for more information](#).

When Does Perioperative Morbidity and Mortality Decrease in a Patient with COVID-19?

Multiple studies have confirmed that patients undergoing major surgery with concurrent COVID-19 infection have a higher risk of respiratory complications and a higher associated perioperative mortality within the first six weeks of diagnosis.^{1,2,3} Increased risk has been demonstrated in both emergency and elective unvaccinated surgical patients, with risk returning to baseline when surgery is delayed for at least seven weeks.

Trials demonstrating increased morbidity and mortality with preoperative COVID-19 infection were performed prior to vaccines and the emergence of newer variants of concern. Recent evidence has found that fully vaccinated patients do not have the same risk⁴. More studies are ongoing. Health authorities and institutions may develop further guidelines based on experience and as new evidence comes forward (e.g., minor vs. major surgeries, severity of illness).



The decision to proceed with **urgent, emergent or cancer-related surgery** in a patient with concurrent or recent COVID-19 infection must be based on each patient’s pre-operative risk assessment and current health status, while factoring in surgical invasiveness, patient co-morbidities and the risk/benefit of further delaying surgery.

Management of Patients Recovered from COVID-19 Infection

Recovered patients can continue to have non-replicating COVID-19 RNA detected in their upper respiratory specimens for up to 12 weeks. Therefore, the B.C. Centre for Disease Control (BCCDC) does not recommend a test-based strategy, as it results in unnecessarily prolonged isolation of patients who are non-infectious despite having detectable levels of COVID-19 RNA.

Patients can persistently test positive for SARS-CoV-2 PCR – this is sometimes called a “residual positive”. According to the SIREN study,⁴ the rate of reinfection is approximately 0.67% with a median duration of 160 days from the primary infection. Local epidemiological data has shown that reinfection can occur as early as 60 days. During this 60 day period, the primary infection conveys relative immunity such that the risk of reinfection is low. After this period, however, the risk of reinfection increases.

When risk assessing a patient recovered from COVID-19, consider the following:

- Severity of the primary infection;
- Risk of delaying surgical intervention to the patient;
- Perioperative morbidity associated with recent COVID-19 infection; and,
- Risk of reinfection.

Guidance for Testing Patients Pre-Operatively for COVID-19

IPC practices within the province, including the diligent use of symptomatic screening and appropriate PPE selection has prevented significant transmission from patients to health-care providers. Staff safety is improved by following these practices diligently, including working in a well ventilated operating theatre, hand hygiene, gown, glove and eye protection, along with surgical mask at all times, or N95 respirator with a COVID-19 positive or suspected patient. Vaccination of HCWs is another layer of protection.

Testing of all asymptomatic patients prior to surgery to mitigate the risk of exposure to staff has not been proven to significantly increase the margin of safety. Testing for inpatients may be considered by the health authority to prevent transmission to other patients and prevent outbreaks.

[Testing](#) is not meant to replace clinician assessment, and providers should continue using their clinical judgement in determining whether a COVID-19 test is required. Health authority protocols may also adapt to changing experience and evidence.

What Type of Testing Should Be Used?

Testing guidelines and options continue to evolve. Polymerase chain reaction or PCR is considered the gold standard, but there are numerous point-of-care tests available for use. The BCCDC website has [current recommendations and details on types of test for SARS-CoV-2](#). The inherent benefits and limitations of the tests should be considered by the clinicians when considering testing surgical patients.

Implementation of Risk Factor Assessment and Symptom Screening

Pre-operative risk factor and symptom screening should occur for every surgical patient (Appendix 1).

The 48 to 72 hour pre-screen is no longer required due to the speed at which variants lead to symptoms. Same-day screening is appropriate.

Prior to any patient interaction, all HCWs must conduct a point-of-care risk assessment (PCRA) to assess the infectious risks posed by a patient, situation or procedure to themselves, other HCWs, staff, other patients and visitors.

The PCRA is based on professional judgment about the clinical situation, as well as up-to-date information on how the specific health-care facility has designed and implemented appropriate physical (engineering) and administrative controls, and the use and availability of PPE.

- [See BCCDC COVID-19 patient screening tool for direct care interactions](#) and [routine PCRA tool](#) for guidance on conducting a PCRA.
- IPC risk categories have been developed to guide PPE use before, during and after a surgical procedure (see Patient Risk Category Table, Appendix 1).
- Risk categories are designated as green (low risk), yellow (unknown or moderate risk) and red (highest risk) – See [Protocol for Management of the Surgical Patient – Adult](#).

Consider alternatives to general anesthesia when possible. Procedures performed under local or regional anesthesia, including spinal and epidural, can be performed using institutional precautions for all risk category patients. For yellow and red risk category patients, the risk of conversion to general anesthesia must be discussed at the pre-surgical huddle to help guide appropriate PPE (in the event of an unanticipated aerosol generating medical procedure (AGMP)).

Patients may be categorized as green for COVID-19 and continue to require enhanced protections to mitigate the risk from other disease states (e.g., isolation of suspected influenza, use of enhanced PPE for patients with known or suspected tuberculosis).



Infection Prevention & Control Risk Category			
	Green (Low risk)	Yellow (Unknown or Moderate risk)	Red (Highest Risk)
Intubation & Extubation Team <i>Limit personnel in the operating room (OR) to anesthesiologist, registered nurse +/- anesthesia assistant</i>	Follow Routine Practices.	All staff in OR suite don: <ul style="list-style-type: none"> • Fit-tested N95 respirator • Eye protection • Gown and gloves 	All staff in OR suite don: <ul style="list-style-type: none"> • Fit-tested N95 respirator • Eye protection • Gown and gloves
Surgical Team	Follow Routine Practices.	All staff in OR suite don: <ul style="list-style-type: none"> • Fit-tested N95 respirator • Eye protection • Gown and gloves 	All staff in OR suite don: <ul style="list-style-type: none"> • Fit-tested N95 respirator • Eye protection • Gown and gloves
Phase 1 Recovery	<ul style="list-style-type: none"> • No need to delay moving patient to recovery area following extubation. • Follow Routine Practices. • Patients should wear a mask on transport to the recovery area. 	<ul style="list-style-type: none"> • Use droplet and contact precautions (surgical mask, eye protection, gown and gloves). • Patient may be transferred to the recovery area based on local protocols. • Patients should wear a mask on transport to the recovery area. 	<ul style="list-style-type: none"> • Patient may be moved to appropriate isolation room without delay. Keep OR door closed and movements to a minimum while awaiting appropriate air exchanges. • In the isolation room use droplet and contact precautions, or airborne precautions if an AGMP is performed. • Patients should wear a mask on transport to the recovery area.
Air Exchange	<ul style="list-style-type: none"> • Cleaning and disinfecting may begin immediately. • No minimum air exchanges required. 	<ul style="list-style-type: none"> • Cleaning and disinfecting may begin immediately. • No minimum air exchanges required. 	<ul style="list-style-type: none"> • Begin cleaning and disinfection after period of appropriate air exchanges** • If staff enter OR earlier, keep door closed and use appropriate PPE (e.g., N95).
Disposition	Return patient to appropriate inpatient unit.	Return patient to appropriate inpatient unit based on further patient risk assessment.	Return patient to appropriate inpatient unit if confirmed or suspected positive, or to isolation room if unknown.

* Any member of the surgical team may choose to wear an N95 respirator. Individual decisions shall be respected by the surgical team but need not change the patient risk category.

** See also [Options for Operating Room Configuration and Use When a Patient with Suspected or Confirmed COVID-19 Requires Emergent Surgery](#).



Appendix 1: COVID-19 Surgical Patient Assessment Form - Adult

Health Authority LOGO

Patient Information

Name:
Date of Birth:
Language:
PHN:

Nurse or medical assistant screen:

Able to obtain patient history? Yes No
Previous COVID-19 test(s) performed? Yes No
(If multiple, note positives and/or last performed)

If no, go to "final team assessment"
Date: _____
Result: Negative Positive

Risk factor for COVID-19 exposure:

In the last 10 days, has the patient been in close contact with anyone diagnosed with lab confirmed or suspected COVID-19? Yes No

Does the patient have any of the following symptoms? (new onset within the last 10 days or worsening of chronic symptoms)?¹

Date/Time: _____

Fever or chills Yes No
Cough Yes No
Loss of sense of smell or taste Yes No
Difficulty breathing Yes No
Sore throat Yes No
Loss of appetite Yes No
Extreme fatigue or tiredness Yes No
Headache Yes No
Body ache Yes No
Nausea or vomiting or diarrhea Yes No

Screened by: _____

Signature: _____

¹ BCCDC: [Viral Testing](#), February 9, 2022



Final surgical team assessment:

COVID-19 risk factor? Yes No Unknown
 COVID-19 like symptoms? Yes No Unknown
 COVID-19 test result? Positive Negative Pending N/A

Patient Risk Category Table:

Step One			Step Two (If COVID-19 results available)*	
Must have this information prior to surgery		COVID-19 risk category	COVID -19 test results	COVID-19 risk category
COVID-19 exposure	COVID-19 symptoms			
No	No	Green	Negative	Green
No/unknown	Yes/unknown	Yellow		Green
Yes	No	Yellow		Green
Yes	Yes/unknown	Yellow		Yellow
			Positive	Red

*Risk categorization of patients with COVID-19 tests pending should proceed based on step one information above. A negative PCR test may facilitate downgrading a “yellow” risk patient from step one to a “green” risk in step two when test results become available. Rapid tests should NOT be used to downgrade a “yellow” risk patient with respiratory symptoms.

PATIENT RISK CATEGORY (CIRCLE ONE):

Green	Yellow	Red
-------	--------	-----

Physician Signature: _____ Date: _____

(Surgeon or Anesthesiologist)



Key Informants

Dr. Titus Wong (PICNet) – Co-Lead
Dr. Dave Konkin (FH) – Co-Lead
Dr. Marcel Dvorak (VCH) – Co-Lead
Dr. Tonia Tauh (FH) – Co-Lead
Dr. Jacqueline Trudeau (VCH) – Co-Lead
Miles Hart (MOH)
Brian Sagar (MOH)
Dr. Linda Hoang (BCCDC)
Dr. Troy Grennan (BCCDC)
Dr. Mohamedali Feisal (FH)
Dr. Elizabeth Brodtkin (FH) – Medical Health Officer
Dr. Susan Roman (FH)
Dr. Daniel Chan (FNH)
Dr. Amanda Wilmer (IH)
Dr. Mark Masterson (IH)
Dr. Ramesh Sahjapaul (LGH, RSEC)
Deanna Hembroff (NH)
Dr. Shannon Lockhart (PHC)
Dr. Jim Kim (PHC, RSEC)
Dr. Jock Reid (PHC)
Dr. Victor Leung (PHC)
Darlene Emes (PHC)
Camille Ciarniello (PHC)
Dr. Ellen Giesbrecht (PHSA, BCCH)
Dr. Eric Skarsgard (PHSA, BCCH)
Dr. Alison Lopez (PHSA, BCCH)

Dr. Laura Sauve (PHSA, BCCH)
Dr. Simon Whyte (PHSA, BCCH)
Dr. Chelsea Elwood (PHSA, B.C. Women's Hospital)
Dr. Norbert Froese (PHSA, BCCH)
David Walker (PHSA, B.C. Women's Hospital)
Trish Page, PHSA (BCCH)
Vladlena Abed (PHSA, B.C. Women's Hospital)
Dr. Andrea Brovender (VCH)
Andrea Bisailon (VCH)
Dr. David Schaeffer (VCH)
Dr. Keith Baxter (VCH)
Dr. Andrew Hurlburt (VCH)
Dr. Donald Griesdale (VCH)
Juliet Batke (VCH)
Dr. Jens Lohser (VCH)
Dr. William Henderson (VCH)
Dr. David Evans (VCH)
Dr. Marthe Kenny Charles (VCH)
Dr. Pamela Kibsey (VIHA)
Alison Dormuth (VIHA)
Dr. Chris Taylor (VIHA)
Dr. Cedric Ho (UBC)
Dr. Roanne Preston (UBC)
Dr. Gary Redekop (VCH)
Tara Donovan (PICNet, PHSA)

BCCDC – B.C. Centre for Disease Control
BCCH – B.C. Children's Hospital
FHA – Fraser Health
FNHA – First Nations Health Authority
IHA – Interior Health
LGH – Lions Gate Hospital
MOH – Ministry of Health
NHA – Northern Health
PICNet – Provincial Infection Control Network of British Columbia
PHC – Providence Health Care
PHSA – Provincial Health Service Authority
RSEC – Rehabilitation Sciences Student Executive Committee
VCH – Vancouver Coastal Health
VIHA – Vancouver Island Health Authority



Literature Review

Ai, Jing-Wen et al. "Optimizing Diagnostic Strategy for Novel Coronavirus Pneumonia, A Multi-Center Study In Eastern China." *MedRxiv* (2020): n. pag. Web. 23 Mar. 2021.

Cook, T. M. et al. "Consensus Guidelines for Managing the Airway In Patients With COVID - 19." *Anaesthesia* 75.6 (2020): 785-799. Web. 23 Mar. 2021.

COVID-19: Emergency Prioritization in a Pandemic Personal Protective Equipment (PPE) Allocation Framework, Provincial COVID-19 Task Force, March 25, 2020 http://www.bccdc.ca/Health-Professionals-Site/Documents/COVID19_ppe_allocation_framework.pdf

Fang, Yicheng et al. "Sensitivity of Chest CT for COVID-19: Comparison To RT-PCR." *Radiology* 296.2 (2020): E115-E117. Web. 23 Mar. 2021.

Givi, Babak et al. "Safety Recommendations for Evaluation and Surgery of the Head and Neck During the COVID-19 Pandemic." *JAMA Otolaryngology–Head & Neck Surgery* 146.6 (2020): 579. Web. 23 Mar. 2021.

Lui, Rashid N et al. "Overview of Guidance for Endoscopy During the Coronavirus Disease 2019 Pandemic." *Journal of Gastroenterology and Hepatology* 35.5 (2020): 749-759. Web. 23 Mar. 2021.

Ng, Kangqi et al. "COVID-19 and the Risk to Health Care Workers: A Case Report." *Annals of Internal Medicine* 172.11 (2020): 766-767. Web. 23 Mar. 2021.

"Preoperative Nasopharyngeal Swab Testing and Postoperative Pulmonary Complications in Patients Undergoing Elective Surgery During the SARS-Cov-2 Pandemic." *British Journal of Surgery* 108.1 (2020): 88-96. Web. 23 Mar. 2021.

Ren, Xiaoshuai et al. "Application and Optimization Of RT-PCR in Diagnosis of SARS-Cov-2 Infection." *MedRxiv* (2020): n. pag. Web. 23 Mar. 2021.

Repici, Alessandro et al. "Coronavirus (COVID-19) Outbreak: What the Department of Endoscopy Should Know." *Gastrointestinal Endoscopy* 92.1 (2020): 192-197. Web. 23 Mar. 2021.

Soetikno, Roy et al. "Considerations in Performing Endoscopy During the COVID-19 Pandemic." *Gastrointestinal Endoscopy* 92.1 (2020): 176-183. Web. 23 Mar. 2021.

Tse, Frances, Mark Borgaonkar, and Grigorios I Leontiadis. "COVID-19: Advice From the Canadian Association of Gastroenterology for Endoscopy Facilities, as of March 16, 2020." *Journal of the Canadian Association of Gastroenterology* 3.3 (2020): 147-149. Web. 23 Mar. 2021.



Wang, Wenling et al. "Detection of SARS-Cov-2 in Different Types of Clinical Specimens." *JAMA* (2020): n. pag. Web. 23 Mar. 2021.

Workman, Alan D. et al. "Endonasal Instrumentation and Aerosolization Risk in the Era of COVID-19: Simulation, Literature Review, and Proposed Mitigation Strategies." *International Forum of Allergy & Rhinology* 10.7 (2020): 798-805. Web. 23 Mar. 2021.

Yang, Yang et al. "Laboratory Diagnosis and Monitoring the Viral Shedding of SARS-Cov-2 Infection." *The Innovation* 1.3 (2020): 100061. Web. 23 Mar. 2021.

Yao, Wenlong et al. "Emergency Tracheal Intubation In 202 Patients With COVID-19 in Wuhan, China: Lessons Learnt and International Expert Recommendations." *British Journal of Anaesthesia* 125.1 (2020): e28-e37. Web. 23 Mar. 2021.

Zhang, Yafei et al. "Suggestions for Infection Prevention and Control in Digestive Endoscopy During Current 2019-Ncov Pneumonia Outbreak In Wuhan, Hubei Province, China." *Endoscopy* 52.04 (2020): 312-314. Web. 23 Mar. 2021.

References for Evidence Review (Endnotes)

ⁱ COVIDSurg Collaborative. Mortality and pulmonary complications in patients undergoing surgery with perioperative SARS-CoV-2 infection: an international cohort study. *Lancet*. 2020;396(10243):27-38.

ⁱⁱ COVIDSurg Collaborative. Delaying surgery for patients with a previous SARS-CoV-2 infection. *Br J Surg*. 2020;107(12): e601-e602.

ⁱⁱⁱ COVIDSurg Collaborative. Timing of surgery following SARS-CoV-2 infection: an international prospective cohort study. *Anaesthesia*. 2021.

^{iv} (Ann Surg. 2022. Jan 1 | 275(1):31-36) <https://journals.lww.com/annalsofsurgery/toc/2022/01000>

