Procedures to Consider for Pre-Procedure COVID-19 Testing & Procedural Personal Protective Equipment (PPE) Recommendations

Context

This guidance is tied to:

1) Our understanding of disease transmission
2) Case prioritization (ACS Tiers 1-2-3)
3) Patients' symptoms, exposure histories, and vaccination status
4) Our current testing strategies and capacity
5) Current local COVID epidemiology (eg case rates)

Any organization's policies will be influenced by local community epidemiology (disease prevalence). This guidance will be updated as scientific evidence evolves.

The CDC considers at least three aspects of performing procedures which influence risk of transmission. One is the anatomic region being operated on, for instance areas where viral load might be higher (e.g., nose and throat, oropharynx, respiratory tract). The second aspect is the likelihood that the procedure will generate aerosols. Per the CDC, procedures that are often considered aerosol generating procedures (AGP), or that create uncontrolled respiratory secretions, include: open suctioning of airways, sputum induction, cardiopulmonary resuscitation, endotracheal intubation and extubation, non-invasive ventilation (e.g., BiPAP, CPAP), bronchoscopy, and manual ventilation. A third aspect would be other issues related to source control, for instance the use of smoke evacuation devices. As stated by the CDC, "Development of a comprehensive list of AGPs for healthcare settings has not been possible" (see page 9). _https://www.cdc.gov/coronavirus/2019-ncov/hcp/faq.html

Controversy remains within the healthcare and surgical communities as to whether other procedures should also be considered higher risk for aerosol generation or transmission, such as (but not limited to): any procedures on the aerodigestive tract(s), laparoscopy, thoracoscopy, other endoscopy or procedures involving insufflation/desufflation, procedures involving significant smoke generation, procedures involving powered drills/saws or other powered equipment on tissues likely to be infected with COVID-19. This guidance gives consideration to such concerns.

Procedures to Consider for Pre-Procedure COVID-19 Testing – Detail

- Providers should consider using telemedicine for pre-procedure visits. All patients should be clinically screened on the day of the procedure for symptoms of COVID-19 (including new cough, shortness of breath, fever in the last 7 days, full list of screening criteria, known exposure to a COVID-19 positive person). An oral temperature of 100.4 °F or less is recommended in order to proceed with a non-emergent procedure.
- Pre-procedure COVID testing is recommended for many patients prior to their procedure. However, as testing capacity is constrained, there could be additional need to identify the highest risk cases to further prioritize for testing, and the lowest risk cases to forego testing. Even for an individual procedure where testing might be recommended, timing or capacity could preclude testing, the patient could refuse testing, or clinicians might, after careful assessment, use their best judgement to forego testing. For individual procedures proceeding without COVID-19 testing, whether due to timing, capacity, or clinician judgement, PPE and precautions should be selected based on standard and transmission-based precautions relevant to the procedure and patient.
- For the purposes of this BJC/WUSM guidance, pre-procedural COVID-19 PCR or Antigen tests (where available) are acceptable, but antibody or serology tests are not. PCR based testing should still be used for all symptomatic patients; antigen testing may be used for asymptomatic preprocedural screening.
- Preprocedural testing should be accomplished within 4 days prior to the procedure, unless there are extenuating circumstances. In Illinois, this must be within 72 hours (see below for notes on IL).
- Following testing, patients should be instructed to self-quarantine as much as possible, to avoid close contact with people other than immediate household members, and to notify their medical provider immediately if they have close contact with someone with COVID-19 or develop any symptoms.
- While some health systems, including BJC/WUSM previously, have waived preprocedural testing for fully vaccinated asymptomatic patients, such exceptions are NOT currently in effect across BJC/WUSM. Preprocedural patients should be tested according to the considerations described in this document **regardless of vaccination status**. The American Society of Anesthesiologists currently recommends perioperative testing of all patients irrespective of vaccination status [https://www.asahq.org/about-asa/newsroom/news-releases/2021/08/asa-and-apsf-statement-on-perioperative-testing-for-the-covid-19-virus].

Notes for Illinois from Illinois Department of Public Health (IDPH):
[https://dph.illinois.gov/topics-services/diseases-and-conditions/diseases-a-z-list/coronavirus/health-care-providers/elective-procedures-guidance]

- "IDPH states that pre-procedure testing for SARS-CoV-2 is ***required*** for all patients who are not fully vaccinated prior to the planned procedure, but that universal pre-procedure testing is ***recommended*** for all patients, regardless of vaccination status, given the duration of protection from vaccination, and the efficacy against emerging variants is unclear."
- "Patients are considered fully vaccinated for COVID-19 two weeks after they have received the second dose in a two-dose series (Pfizer-BioNTech or Moderna), or a single-dose vaccine (Johnson and Johnson/Janssen)."
- "Testing must be completed within 72 hours of a scheduled procedure using a test authorized for emergency use by the U.S. Food and Drug Administration (FDA) for the detection of SARS-CoV-2. Tests with emergency use authorizations (EUAs) can be found on the FDA website."
- IDPH differentiates that "high-risk procedures must be tested using a Nucleic Acid Amplification Test (NAAT). For purposes of this guidance, all procedures that involve the upper aero-digestive

tracts and lower respiratory tract, including anesthesia administered by mask or intubation, should be considered high risk. NAATs may be point of care (POC) tests, including rapid POC tests."

- "While a NAAT remains the gold standard for SARS-CoV-2 testing, patients undergoing low-to-moderate risk procedures may, based on clinical judgment, be tested using a rapid POC antigen test. For purposes of this guidance, low-to-moderate risk procedures are those that do not involve the upper aero-digestive tracts and lower respiratory tract, and do not involve anesthesia via mask or intubation (e.g., procedures conducted under local or regional anesthesia outside the high-risk areas)."

Procedures that do not involve intubation or general anesthesia, or are not otherwise in one of the categories listed, can be candidates to forego pre-procedure COVID-19 testing.

Procedures where testing is recommended include:

- Procedures involving intubation, extubation, general anesthesia, prolonged manual ventilation
- Procedures on the naso-oro-pharynx, including dentistry, laryngoscopy, endoscopy
- Procedures on the respiratory tract (airways, lungs), including bronchoscopy
- Transesophageal echo (TEE) - see Interventional Cardiology section below

The decision to test is left to the discretion of the attending clinician for certain specialties, where there is potential for aerosol generation, or other circumstances of concern. These include:

- Interventional Radiology
- Obstetrics
- Ophthalmology

Note on procedures necessitating use of smoke evacuation devices:

A recent study (https://www.nature.com/articles/s41586-020-2196-x) did not find evidence of viable viral particles outside of the respiratory tract nor in serum. Thus, using electrocautery on tissues not considered infected with virus, such as muscle tissue, represents no known risk. While some professional organizations identify smoke as a risk for transmission, this might not be the case. However, even in the absence of COVID-19, smoke generation can represent an environmental hazard independently warranting the use of N95 respirators and eye protection.

Please see the consensus specialty guidance which follows for:

- Gastroenterology - Endoscopy & Interventional
- Interventional Cardiology

Specialty consensus statements on pre-procedural testing

Recommendations developed with input of system-wide specialists including anesthesiology leaders.

Gastroenterology - Recommendations for Endoscopy and Interventional Procedures Testing

- Asymptomatic patients undergoing the following procedures do not need a COVID-19 test:
  - Colonoscopy, Lower endoscopic ultrasound, Sigmoidoscopy, and similar
- Testing continues for any patients scheduled for intubation (not simply at risk of intubation).
- Procedures involving the aerodigestive tract, such as EGD, ERCP, and Upper endoscopic ultrasound, are considered intermediate risk. Local facility guidance and clinician discretion will determine pre-procedural COVID testing requirements.
- Pediatric patients, with potentially higher asymptomatic carriage, may warrant universal testing.
- Pre-procedure COVID-19 testing will continue where required by state regulations.
- Updated AGA guidance from August 2021:
  - [An AGA] "…panel considered the certainty of the evidence, weighed the benefits and harms of routine preprocedure testing, and considered burden, equity, and cost using the Grading of Recommendations Assessment, Development and Evaluation framework. Based on very low certainty evidence, the panel made a conditional recommendation against routine preprocedure testing for SARS-CoV2 in patients scheduled to undergo endoscopy. The panel placed a high value on minimizing additional delays in patient care, acknowledging the reduced endoscopy volumes, downstream impact on delayed cancer diagnoses, and burden of testing on patients." https://doi.org/10.1053/j.gastro.2021.05.039

Interventional Cardiology - Recommendations for Cardiology Suite Procedural Testing

- Asymptomatic patients undergoing the following procedures do not need a COVID-19 test:
  - Left or Right/Left Heart Catheterization, PCI DES Major Coronary-RCA
  - Event Monitors/Loop Recorder insertion/removal
  - Other procedures involving isolated vascular access (i.e. groin punctures)
- Testing continues for any patients scheduled for intubation (not simply at risk of intubation).
- Procedures involving the aerodigestive tract, such as TEE, would continue to be recommended for pre-procedural COVID testing.
- Cardioversion procedures are considered intermediate risk by some providers. Local facility guidance will determine pre-procedural COVID testing requirements.
- Pediatric patients, with potentially higher asymptomatic carriage, may warrant universal testing.
- Pre-procedure COVID-19 testing will continue where required by state regulations.

Note: For many specialties (e.g., Cardiac, Thoracic, Vascular, Neurosurgery, open abdominal or laparoscopic surgery, Orthopedics) a large proportion of procedures involve intubation or general anesthesia, and thus are candidates for pre-procedure testing as above. For special populations that might have higher asymptomatic carrier rates, such as pediatrics, more universal approaches to testing may be warranted when feasible.

Additional Screening and Testing Process Reminders

For pre-procedure screening and testing:

- Phone-based or other virtual/remote screening of patients for COVID-19 symptoms or exposures should be performed consistently several days ahead of surgery.
- ***For preop testing, patients should be tested within 4 days prior to their procedure, unless there are extenuating circumstances. For Illinois, this must be within 72 hours, as described above.***
- Patients should be handled through outpatient test centers and processes whenever possible.
- ***Patients should ideally mask and self-quarantine to the maximum possible extent between testing and their procedure.***
- ***Patients must be rescreened for symptoms and exposure history on presentation for surgery.***

As noted, even for a procedure where testing might be recommended, timing or capacity could preclude testing, the patient could refuse testing, or clinicians might, after careful assessment, use their best judgement to forego testing.

- If the patient is **symptomatic, or their status is unknown,** they are likely best handled as a COVID-19 **PUI**. If they are not to be handled as a PUI, the medical record should reflect the reasoning for this.
- If the patient is **asymptomatic** with a negative screen, precautions should be determined by the attending clinician and multidisciplinary team, based on a thorough assessment of the patient, and in the context of prevailing local epidemiology and recommended guidance above.

In all instances, the attending clinician(s) and multidisciplinary team should work collaboratively on the care plan and follow standard and transmission-based precautions relevant to the patient and case.

For patients who have been previously identified as COVID-19 positive, the issue of discontinuation of precautions is addressed in additional sources:

- https://www.cdc.gov/coronavirus/2019-ncov/hcp/disposition-hospitalized-patients.html
- https://covid19.bjc.org/Portals/0/PDF%20Documents/Medical%20Guidelines%20for%20Staff/Interim_Guidance_for_Infection_Prevention_and_Clinical_Management_2.pdf?ver=PdJd9PKBy4T7e9qRQAmrqg%3d%3d

For inpatients who during their admission have tested negative, and for whom new or worsening symptoms have not developed, repeat testing is not warranted. (See BJC ICC Guidance “Retesting Patients During an Inpatient Stay”, 5/14/20).

The table “Rescheduling Postponed Tier 1 & 2 Procedures” reinforces guidance on the issue of re-testing, which is not generally recommended nor necessary.

Procedural Use of PPE – Detail

This section references the American College of Surgeons Elective Surgery Acuity Scale describing levels of acuity, interpreted as below. [https://www.facs.org/covid-19/clinical-guidance/triage]

Tier 3 - High acuity, "emergency"
Tier 2 - Intermediate acuity; with higher time-sensitivity ("urgent"), or lower time-sensitivity ("non-urgent," "semi-elective")
Tier 1 - Low acuity case, low time-sensitivity, "elective"

Tier 3 "Emergency" cases:

Tier 3 cases should not be delayed. This includes former Tier 2 (time-sensitive) cases which are now judged to qualify as Tier 3 or can otherwise no longer be delayed.

- *Screening*: Screen all patients for symptomatology and exposure history (if possible).
- *COVID-19 Testing*: Send COVID-19 PCR or Antigen test as guided by the Epic order (antigen may be used for asymptomatic screening; PCR still preferred for symptomatic patients) for patients who will be managed with intubation or general anesthesia, where intraoperative aerosol generating procedure is anticipated, or in other categories described above, if there is time (i.e., not crashing into OR), and if there is testing capacity. If there is not time nor capacity, or if the attending clinician's judgement is to forego testing, proceed with the case using infection prevention precautions and PPE based on standard and transmission-based precautions relevant to the procedure and the patient's screening and clinical status.

- If patient (symptoms, exposures) **screens negative (asymptomatic and low risk)**
  - **COVID-19 PCR or Antigen Positive**: Assuming this category of case cannot be delayed: All OR personnel should wear N95 respirator and eye protection, and gown and gloves.
  - **COVID-19 PCR or Antigen Negative or No Test**: Usual care is recommended: surgical masks and eye protection for all staff.
    - If there is residual concern about the case, only those personnel present during any AGP or higher-risk portion of the procedure would be considered at significant risk based on CDC guidance. Consider limiting PPE escalation (i.e., N95 respirator, eye protection, gown and gloves) to these personnel. Nonetheless, wearing N95 level protection remains at individual discretion. Personnel present, and foot traffic, should be minimized per CDC guidance.

- If patient (symptoms, exposures) **screens positive or unknown (symptomatic or high risk)**
  - **COVID-19 PCR Positive**: Assuming this category of case cannot be delayed: All OR personnel should wear N95 respirator and eye protection, and gown and gloves.
  - **COVID-19 PCR Negative or No Test**: Assuming this category of case cannot be delayed: consider treating this patient as a PUI (preferred option). In this case, all OR personnel should wear N95 respirator and eye protection, and gown and gloves.

- If the clinical team does not consider this patient a PUI (e.g. COVID test is negative and symptoms attributed to another cause), this should be clearly reflected in the medical record. Usual care is then recommended: i.e., surgical masks and eye protection for all staff. If there is residual concern about the patient or case, only those personnel present during any AGP or higher-risk portion of the procedure would be considered at significant risk based on standard CDC guidance. Consideration can be given to limiting PPE escalation to these personnel and segments, but wearing N95 level protection remains at individual discretion. Personnel present, and foot traffic, should also be minimized as per CDC guidance.

Tier 2 "Urgent" or "Semi-elective" and Tier 1 "Elective" cases:

Tier 2 cases are often seen as time-sensitive, but Tier 2 cases which cannot be delayed are handled with Tier 3 cases above. This section applies to Tier 2 cases for which some discretionary delay remains feasible, as well as Tier 1 truly elective cases.

- *Screening*: Screen all patients for symptomatology and exposure history (if possible).
- *COVID-19 Testing*: Send Covid-19 PCR or Antigen test as guided by the Epic order (antigen may be used for asymptomatic screening; PCR still preferred for symptomatic patients) for patients who will be managed with intubation or general anesthesia, where intraoperative aerosol generating procedure is anticipated, or in other categories of concern described above, if there is testing capacity. Patients presenting symptomatic or screening positive can be delayed without COVID testing. If the case is deemed to be low risk, and the patient screens negative (symptoms, exposures), the attending clinician may choose to forego testing. If testing is not performed, proceed with the case following standard and transmission-based precautions relevant to the patient and case.

- Patient (symptoms, exposures) **screens negative (asymptomatic and low risk)**
  - **COVID-19 PCR or Antigen Positive**: Assuming this case can be delayed, delay case for at least 15 days from positive test result. If the patient is then re-confirmed as asymptomatic and re-screens negative for exposures, proceed with surgery/procedure, usual surgical attire. Additional testing is not required nor recommended.
    - If the patient must have surgery before that time, treat as a COVID-19 positive case as for Tier 3 emergencies above.
  - **COVID-19 PCR or Antigen Negative or No Test**: Proceed with case. Providers can wear usual surgical attire: surgical masks and eye protection.

- Patient (symptoms, exposures) **screens positive or unknown (symptomatic or high risk)**
  - Delay the case (testing not required). Wait until the patient has been asymptomatic for at least 14 days or at least 14 days have passed since exposureat , and has re-screened negative. At this point the patient can undergo preprocedural COVID testing if indicated and proceed with scheduling as otherwise described. A case that cannot be delayed or becomes mandatory is handled as a Tier 3 case.

Please refer to the Table "Rescheduling Postponed Tier 1 & 2 Procedures" at the end of the document for focused guidance on rescheduling Tier 1 & 2 Surgeries.

Additional Note on Tier 2 and Tier 1 Cases:

Some Tier 2 and many Tier 1 cases might be of low procedural risk – not falling in the categories of procedures where testing is recommended, as described above. After careful assessment, if the patient is asymptomatic and screens negative, testing could be foregone. Follow standard and transmission-based precautions relevant to the patient and case. This could include many cases under local anesthesia or not involving intubation or general anesthesia. Institutions and providers can work locally to determine qualifying cases.

Notes from the CDC

https://www.cdc.gov/coronavirus/2019-ncov/hcp/faq.html

Care of COVID-19 infected patients:
"If shortages exist, N95 or higher-level respirators should be prioritized for procedures involving higher risk techniques (e.g., that generate potentially infectious aerosols) or that involve anatomic regions where viral loads might be higher (e.g., nose and throat, oropharynx, respiratory tract). As part of routine practice, healthcare providers should also be using appropriate engineering controls for source control (e.g., smoke evacuation devices)."… "In regions with high community COVID-19 incidence, N95 respirators could be prioritized for the care of all patients who are undergoing procedures that might pose higher risk (e.g., those generating infectious aerosols or involving anatomic regions where viral load might be higher), regardless of COVID-19 testing results."

"Which procedures are considered AGP in the healthcare setting?"
"Some procedures performed on patients are more likely to generate higher concentrations of infectious respiratory aerosols than coughing, sneezing, talking, or breathing. These aerosol generating procedures (AGPs) potentially put healthcare personnel and others at an increased risk for pathogen exposure and infection."
"Development of a comprehensive list of AGPs for healthcare settings has not been possible, due to limitations in available data on which procedures may generate potentially infectious aerosols and the challenges in determining if reported transmissions during AGPs are due to aerosols or other exposures. There is neither expert consensus, nor sufficient supporting data, to create a definitive and comprehensive list of AGPs for healthcare settings."

"Commonly performed medical procedures that are often considered AGPs, or that create uncontrolled respiratory secretions, include:

- open suctioning of airways
- sputum induction
- cardiopulmonary resuscitation
- endotracheal intubation and extubation
- non-invasive ventilation (e.g., BiPAP, CPAP)
- bronchoscopy
- manual ventilation

Based on limited available data, it is uncertain whether aerosols generated from some procedures may be infectious, such as: high flow O_2 delivery, or nebulizer administration (aerosols generated by nebulizers are derived from medication in the nebulizer. It is uncertain whether potential associations between performing this common procedure and increased risk of infection might be due to aerosols generated by the procedure or due to increased contact between those administering the nebulized medication and infected patients)."

COVID-19 Testing Pre-Procedure: Abbreviated Table

Procedures where testing is recommended include:

- Procedures involving intubation, extubation, general anesthesia, prolonged manual ventilation
- Procedures on the naso-oro-pharynx, including dentistry, laryngoscopy, endoscopy
- Procedures on the respiratory tract (airways, lungs), including bronchoscopy
- Transesophageal echo (TEE)- see interventional cardiology section below
- Procedures necessitating use of smoke evacuation devices

The decision to test is left to the discretion of the attending clinician for certain specialties, where there is potential for aerosol generation, or other circumstances of concern. These include:

- Interventional Radiology
- Obstetrics
- Ophthalmology

Please see the consensus specialty guidance for

- Gastroenterology- Endoscopy & Interventional
- Interventional Cardiology

***Note: For many specialties (e.g., Cardiac, Thoracic, Vascular, Neurosurgery, open abdominal or laparoscopic surgery, Orthopedics) a large proportion of procedures involve intubation or general anesthesia and thus are candidates for pre-procedure testing as* above.**

For special populations that might have higher asymptomatic carrier rates, such as pediatrics, more universal approaches to testing may be warranted when feasible.

Procedures that do not involve intubation or general anesthesia and are not otherwise in one of the categories listed can be candidates to forego pre-procedure COVID-19 testing.

Note pertaining to Illinois Cases Only

IDPH requires testing within 72 hrs of the procedure and differentiates high-risk procedures as requiring NAAT/PCR testing, while low- and moderate-risk procedures can use antigen testing. For full details see: [https://dph.illinois.gov/topics-services/diseases-and-conditions/diseases-a-z-list/coronavirus/health-care-providers/elective-procedures-guidance]

Procedural Use of PPE: Abbreviated Table

PPE Recommendations for surgical / procedural cases during COVID-19

Case Type	Patient Status	Test Result	PPE Recommended
Emergency cases and time-sensitive cases that cannot be delayed			
	Patient is asymptomatic & screens negative		
		COVID-19 Test Positive	Wear N95's, eye protection, gown & gloves.
		COVID-19 Test Negative / No Test	Usual surgical attire; use N95's at discretion.
	Patient is symptomatic, screens positive, or unknown status		
		COVID-19 Test Positive	Wear N95's, eye protection, gown & gloves.
		COVID-19 Test Negative / No Test	Default is PUI: Wear N95's, eye protection, gown & gloves. IF NOT PUI: Usual surgical attire; use N95's at discretion.
Time sensitive cases that can still be delayed, and elective cases			
	Patient is asymptomatic & screens negative		
		COVID-19 Test Positive	Delay case. (Emergencies addressed above).
		COVID-19 Test Negative / No Test	Usual surgical attire; use N95's at discretion.
	Patient is symptomatic, screens positive, or unknown status		
		COVID-19 Test Not Indicated	Delay case. (Emergencies addressed above).

For details, see full document "Procedures for COVID-19 Testing & Procedural PPE"

Rescheduling Postponed Tier 1 & 2 Procedures: Table

NOTE: Patients who cannot be postponed for the specified periods should be treated as urgent/emergent (ACS Tier 3).

Patients with a COVID-19 PCR or Antigen Positive test needing surgery can be rescheduled for surgery after the EPIC "COVID19" flag has turned into a "COVID: Recovered" flag.
Patients with a "COVID: Recovered" flag should not be retested and can be managed with standard precautions.

Patient type	When to reschedule surgery
Asymptomatic COVID + outpatients	Schedule surgery starting day 15 after + COVID test (if immunocompromised, consider extending to 20 days). Repeat testing not needed.
Symptomatic COVID + outpatients	Schedule surgery starting day 15 after + COVID test (if more severe disease (required O2), persistent fever, immunocompromised, consider extending to 20 days and until symptomatically improved). Repeat testing not needed.
Symptomatic or recently exposed outpatients, not COVID tested.	These procedures can be delayed without COVID testing. Wait until the patient has been asymptomatic for at least 14 days or at least 14 days have passed since exposure, and patient has re-screened negative. At this point the patient can undergo preprocedural COVID testing if indicated and proceed with scheduling.
COVID + inpatients, now discharged	Schedule surgery starting day 15 after COVID hospitalization discharge (if need for earlier surgery and patient meets criteria for isolation discontinuation*, call IP to remove COVID flag). Repeat testing not needed.

* Patient must be afebrile x 24 hours without use of antipyretics and improvement in symptoms AND >10 days have passed since symptom onset; extend to 20 days for severely immunocompromised or if requiring supplemental O2.

Revised: September 8, 2021