
Date: May 28, 2020

Note: the following guideline incorporates CDC recommendations and data available at this time. It is subject to change based upon the information received and assessment of resource availability.

I. Preface

Access to COVID-19 testing initially was limited to symptomatic patients and workforce. Given improved access to testing supplies and reagents, the system now has the opportunity to expand its criteria for testing. Aerosol-generating procedures (AGP) are a mode of viral spread with the potential to infect staff at a distance beyond 6 feet despite the usage of regular surgical masks. In order to protect our surgical and procedural teams as well as to limit admission of COVID-19 positive patients after elective procedures, guidance regarding expansion of testing to preprocedural patients is now required.

PCR Testing

UMass Memorial now offers standard and rapid RNA assays in house. Results may be obtained within 6-12 hours for standard assays and approximately 1 hour for a limited number of rapid studies. To date, standard assays remain the gold standard given significant differences in testing capacity and sensitivity.

The relationship between nasopharyngeal RNA load and clinical infectivity appears to be complex. Limited studies suggest high rates of live viral isolation during the first week of symptoms but limited isolation from sputum samples later in a clinical course, despite ongoing measurable viral RNA. Elective surgical candidates posing the greatest risk include those individuals with detectable viral loads on PCR despite being asymptomatic.

Procedure Risk Stratification

The CDC has released general guidance regarding AGP that require COVID PPE. Certain surgeries and procedures have been identified as posing an elevated risk to surgeons and proceduralists (Table 1). Such procedures necessitate additional protective measures defined as COVID PPE Plus in this document. The COVID algorithm at the end of this guideline reviews the specifics of when such protection is required and when standard of practice (SOP) may be used instead (Figure 2). For this document, SOP is defined by the use of a routine surgical procedure mask with appropriate eyewear protection as well as other appropriate procedural attire for all patients. Please note that SOP corresponds to “Mask Level C” as described in previous PPE mask clinical practice guidelines.

<table>
<thead>
<tr>
<th>Table 1. Surgical and Procedural Risk Stratification with Recommended PPE for COVID-19 Patients</th>
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<tbody>
<tr>
<td>Tier 1:</td>
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<tr>
<td>COVID PPE Plus</td>
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</table>
### Tier 1: Basic PPE
- All oropharyngeal and nasopharyngeal surgery
- All sinus surgery
- Any dental procedure with a drill
- All thoracic surgery involving air leak or tracheal/pulmonary resection
- Subglottic airway procedures (including tracheostomy)

### Tier 2: COVID PPE
- “Fully fit” N95 (Mask Level A) AND PAPR
- Gloves
- Gown

### Tier 3: COVID PPE
- Bronchoscopy (rigid or flexible)
- Intubation
- GI Endoscopy
- TEE (+/- cardioversion)
- ECT
- PEG placement
- Scheduled cesarean section or other planned regional anesthetics with high likelihood of conversion to GA during the procedure

### Ambulatory Preprocedural COVID-19 Testing
All ambulatory, preoperative patients should be screened for symptoms of COVID-19 as well as known exposures. In addition, patients must be referred for a nasopharyngeal swab 48 hours prior to their planned procedure at one of the ambulatory testing sites and isolate at home until day of surgery.

Ambulatory workflow including both identification of patients for testing and follow-up of test results primarily will be managed by the office of the surgeon or proceduralist. Please refer to the separate protocol, *Departmental SARS-CoV2 (COVID-19) Testing: Recommendations for Surgical and Procedural Workflow*, for further details. Additional symptom and result review will be completed at time of preoperative or preprocedural nursing assessment.
call within 24 hours of the scheduled case (Figure 1). PreSurgical Evaluation (PSE) will continue to provide support by reviewing all surgical and procedural cases 24 hours in advance and reminding surgeons’ and proceduralists’ offices of positive results only.

**Figure 1. Ambulatory Workflow Preprocedural COVID-19 Testing**

<table>
<thead>
<tr>
<th>Step 1: Identify &amp; Contact</th>
<th>Step 2: Test</th>
<th>Step 3: Follow Up</th>
<th>Step 4: Check</th>
</tr>
</thead>
<tbody>
<tr>
<td>Surgeon, proceduralist, or affiliated staff</td>
<td>Ambulatory testing (University, Marlborough, &amp; Health Alliance)</td>
<td>Surgeon, proceduralist, or affiliated staff</td>
<td>SACU staff or preoperative nursing staff</td>
</tr>
</tbody>
</table>

**Who:**
- Identify surgeries and procedures for week
- Call patients and families
- Screen for symptoms and exposures
- Place COVID policy order
- Give instructions for ambulatory testing
- Instruct to begin self-quarantine 5 days prior to procedure

**What:**
- Perform preoperative COVID nasopharyngeal swabs (standard assay PCR) prior to 12 pm
- Preoperative tests run in single batch after morning collection
- Follow-up testing results
- Call patient with results
- Screen for symptoms and exposures
- Make changes in procedure scheduling or postponement
- Second follow-up of testing results during routine preop phone call
- Second symptom and exposure screening
- Notification of surgical or procedure team if results are positive

**When:**
- 1 week prior to scheduled case
- 48 hours prior to surgery or procedure
- 24 hours prior to surgery
- 24 hours prior to surgery

**Inpatient Preoperative COVID-19 Testing**
All patients, currently admitted or under evaluation in the emergency department, are required to undergo symptom and exposure screening within 24 hours of their planned procedure. Nasal swabs must be completed within 48 hours of urgent or elective cases by the inpatient teams. Inpatients that have had previous COVID-19 testing do not need repeat testing if (1) last test was within 5 days, (2) they have no new symptoms, and (3) they have stayed an inpatient continuously since the time of testing. While emergent procedures should not be delayed for specimen collection, a nasal swab should be obtained preoperatively on inpatient units or in the ED if possible. It is recognized these cases may be time sensitive, requiring a modification of workflow.

**II. COVID-19 Procedural Algorithm**
After symptom/exposure screening and return of COVID test results, an informed decision can be made regarding the need for COVID PPE protections and location for postoperative care. Previously identified “Tier 1” surgeries and procedures necessitate COVID PPE Plus precautions for anesthesia, nursing, and surgical teams regardless of preoperative COVID testing results (Table 1). Determinations for all other surgeries and procedures can be made with the assistance of the following algorithm (Figure 1). “Exposure” is defined as contact with a known COVID positive individual (within 6 feet for at least 10-15 minutes) within the past 14 days prior to a scheduled surgery or procedure.
**Special Consideration: Prior COVID Positive Patients**

Those patients who have a historical positive COVID test warrant special consideration in selecting appropriate PPE and determining the location of postoperative admission (Figures 3 & 4). Please note the significant distinction in management of patients less than or greater than 6 weeks since date of PCR positivity. All untested patients or those with historical negative tests should follow the algorithm in Figure 2.
Prior Untested or COVID Negative Patient:

Figure 2. Untested or Prior COVID Negative Patient: Symptom and Exposure Stratification

- Patient Requiring Procedure: Screened for Symptoms and Exposures
  - Asymptomatic or Symptomatic?
    - Asymptomatic
      - COVID Exposure?
        - No Known Exposure
          - See Figure 2a. Asymptomatic and No Known Exposure
        - Known Exposure
          - See Figure 2b. Asymptomatic and Known Exposure
    - Symptomatic
      - Emergent?
        - Yes
          - Test ASAP
          - Treat as presumptive COVID Positive
        - No
          - Proceed (see left)

Anesthesia PPE:
- Tier 1 Case: COVID PPE Plus
- Tier 2 Case: COVID PPE
- Tier 3 Case: COVID PPE

Surgical/Nursing PPE:
- Tier 1 Case: COVID PPE Plus
- Tier 2 Case: COVID PPE
- Tier 3 Case: COVID PPE

Post-op: COVID Unit if Admitted
Figure 2a. Untested or Prior COVID Negative Patient: Asymptomatic & No Known Exposure

Asymptomatic Patient without Known Exposure

Emergent?

Yes/Unknown COVID Status

No

COVID Status?

Positive

Negative

Anesthesia PPE:
- Tier 1 Case: COVID PPE Plus
- Tier 2 Case: COVID PPE
- Tier 3 Case: COVID PPE

Surgical/Nursing PPE:
- Intubation Req: COVID PPE
- No Intubation: SOP

Post-op: COVID Unit if Admitted

Consider deferring procedure – see figure 8. If not possible, proceed (see left).

Proceed (see right)

Post-op: Non-COVID Unit if Admitted.

Test ASAP
- Treat as presumptive COVID Positive

Anesthesia PPE:
- Tier 1 Case: COVID PPE Plus
- Tier 2 Case: COVID PPE
- Tier 3 Case: COVID PPE

Surgical/Nursing PPE:
- Tier 1 Case: COVID PPE Plus
- Tier 2 Case: COVID PPE
- Tier 3 Case: SOP**

Post-op: Non-COVID Unit if Admitted.

**Anesthesia to select COVID PPE precautions for intubation and extubation only. They should then switch to SOP for duration of case. Surgical and nursing staff to leave room for intubation and extubation, otherwise selecting SOP for case. No need for room entry delay among surgeons and nurses after intubation.
Figure 2b. Un-tested or Prior COVID Negative Patient: Asymptomatic & Known Exposure

**Anesthesia to select COVID PPE precautions for intubation and extubation only. They should then switch to SOP for duration of case. Surgical and nursing staff to leave room for intubation and extubation, otherwise selecting SOP for case. No need for room entry delay among surgeons and nurses after intubation.**

- Asymptomatic and Known Exposure
- Emergent?
- Yes/Unknown COVID Status
- No
- COVID Status?

**Anesthesia PPE:**
- Tier 1 Case: COVID PPE Plus
- Tier 2 Case: COVID PPE
- Tier 3 Case: COVID PPE

**Surgical/Nursing PPE:**
- Tier 1 Case: COVID PPE Plus
- Tier 2 Case: COVID PPE
- Tier 3 Case: COVID PPE

**Test ASAP**
- Treat as presumptive COVID Positive
- Proceed (see left)
- Post-op: COVID Unit if Admitted

**Anesthesia PPE:**
- Tier 1 Case: COVID PPE Plus
- Tier 2 Case: COVID PPE
- Tier 3 Case: COVID PPE

**Surgical/Nursing PPE:**
- Tier 1 Case: COVID PPE Plus
- Tier 2 Case: COVID PPE
- Tier 3 Case: SOP**

**Positive**
- Consider deferring procedure – see figure 3. If not possible, proceed (see left).
- Post-op: COVID Unit if Admitted

**Negative**
- Proceed (see right)
- Post-op: Non-COVID Unit if Admitted.
Figure 2c. Untested or Prior COVID Negative Patient:
Symptomatic and Non-Emergent

- Symptomatic Patient with Non-Emergent Procedural Need

- COVID Status?
  - Positive
    - Consider deferring procedure – see Figure 3. If not possible, proceed (see left).
  - Negative
    - Postpone if possible and retest 14 days later. If urgent case, contact ID for guidance.

Anesthesia PPE:
- Tier 1 Case: COVID PPE
- Tier 2 Case: COVID PPE Plus
- Tier 3 Case: COVID PPE

Surgical/Nursing PPE:
- Tier 1 Case: COVID PPE
- Tier 2 Case: COVID PPE
- Tier 3 Case: COVID PPE

Post-op: COVID Unit if admitted
Prior COVID Positive Patient:

Figure 3. Prior COVID Positive Patient: <6 Weeks from PCR Positivity

- Patient Previously COVID Positive <6 Weeks from PCR Positivity
- Emergent?
  - Yes
    - Test patient at time of procedure or ED admit
    - Proceed (see left)
    - Post-op: COVID Visit
  - No
    - Able to Delay 6 Weeks from PCR Positivity?
      - Yes
        - See Figure 4
      - No
        - See Figure 3a

Anesthesia PPE:
- Tier 1 Case: COVID PPE Plus
- Tier 2 Case: COVID PPE
- Tier 3 Case: COVID PPE

Surgical/Nursing PPE:
- Tier 1 Case: COVID PPE Plus
- Tier 2 Case: COVID PPE
- Tier 3 Case: COVID PPE
Figure 3a. Prior COVID Positive Patient: <6 Weeks from PCR Positivity
Procedure Unable to Be Postponed to 6 Weeks

**At least 10 days have passed since symptoms first appeared AND at least three days have passed since resolution of fever without use of fever reducing medications AND improvement in respiratory symptoms. If not all conditions are met: follow immunocompromised pathway.

*Immunocompromised patients defined as those who have received a bone marrow transplant or with equivalent levels of immune suppression.

- Immune Status?
  - Yes
  - No

- Immune competent**
  - Obtain PCR Testing x1
  - Anesthesia PPE:
    - Tier 1 Case: COVID PPE Plus
    - Tier 2 Case: COVID PPE
    - Tier 3 Case: COVID PPE
  - Surgical/Nursing PPE:
    - Tier 1 Case: COVID PPE Plus
    - Tier 2 Case: COVID PPE
    - Tier 3 Case: COVID PPE

- Negative
  - Post-op: COVID Unit
  - Post-op: Non-COVID Unit if admitted.

- Positive
  - Post-op: COVID Unit

- Obtain PCR Testing >2 (Separated by 24 Hours Minimum)
  - Immune compromised?
    - Yes
    - Anesthesia PPE:
      - Tier 1 Case: COVID PPE Plus
      - Tier 2 Case: COVID PPE
      - Tier 3 Case: COVID PPE
    - Surgical/Nursing PPE:
      - Tier 1 Case: COVID PPE Plus
      - Tier 2 Case: COVID PPE
      - Tier 3 Case: COVID PPE
    - Any Positive: Speak to ID
    - Post-op: Non-COVID Unit if admitted.
    - Post-op: COVID Unit

Treat as Emergent Procedure and Presumptive COVID Positive (See Left)
Figure 4. Prior COVID Positive Patient: ≥6 Weeks from PCR Positivity

Immune-compromised?†

Yes

No

Emergent?

Yes

Test ASAP
Proceed (Left)

Post-op: COVID Unit

Yes: Speak to ID

No: Proceed
(see right)

Post-op: Non-COVID Unit if Admitted.

No

Obtain PCR Testing x 2 (Separated by 24 Hours Minimum)

Positive PCR Result?

Anesthesia PPE:
- Tier 1 Case: COVID PPE Plus
- Tier 2 Case: COVID PPE
- Tier 3 Case: COVID PPE

Surgical/Nursing PPE:
- Tier 1 Case: COVID PPE Plus
- Tier 2 Case: COVID PPE
- Tier 3 Case: COVID PPE

Anesthesia PPE:
- Tier 1 Case: SOP
- Tier 2 Case: SOP
- Tier 3 Case: SOP

Surgical/Nursing PPE:
- Tier 1 Case: SOP
- Tier 2 Case: SOP
- Tier 3 Case: SOP

†Immune-compromised patients defined as those who have received a bone marrow transplant or with equivalent levels of immune suppression.