

## **American Society of Anesthesiologists and Anesthesia Patient Safety Foundation Joint Statement on Elective Surgery and Anesthesia for Patients after COVID-19 Infection March 9, 2021**

Since hospitals are able to continue to perform elective surgeries while the COVID-19 pandemic continues, determining the optimal timing of procedures for patients who have recovered from COVID-19 infection and the appropriate level of preoperative evaluation are challenging given the current lack of evidence or precedent. The following guidance is intended to aid hospitals, surgeons, anesthesiologists, and proceduralists in evaluating and scheduling these patients. It is subject to change as new evidence emerges.

In general, all *non-urgent* procedures should be delayed until the patient has met criteria for discontinuing isolation and COVID-19 transmission precautions and has entered the recovery phase. Elective surgeries should be performed for patients who have recovered from COVID-19 infection only when the anesthesiologist and surgeon or proceduralist agree jointly to proceed.

### **What determines when a patient confirmed to have COVID-19 is no longer infectious?**

The Centers for Disease Control and Prevention (CDC) provides guidance for physicians to decide when transmission-based precautions (e.g., isolation, use of personal protective equipment and engineering controls) may be discontinued for hospitalized patients or home isolation may be discontinued for outpatients.

Patients infected with SARS-CoV-2, as confirmed by reverse transcriptase-polymerase chain reaction (RT-PCR) testing of respiratory secretions, may be asymptomatic or symptomatic. Symptomatic patients may be further sub-classified into two groups depending upon symptom severity. Table 1 provides definitions of these COVID-related illness levels of severity.

- Patients with mild to moderate symptoms\* (generally those without viral pneumonia or oxygen saturation below 94 percent)
- Patients who experienced severe or critical illness\*\* due to COVID-19 (e.g., pneumonia, hypoxemic respiratory failure, septic shock).

Severely immunocompromised patients\*\*\*, whether suffering from asymptomatic or symptomatic COVID-19, are considered separately.

Current data indicate that, in patients with mild to moderate COVID-19, repeat RT-PCR testing may detect SARS-CoV-2 RNA for a prolonged period after symptoms first appear. However, in these patients, replication-competent virus has not been recovered after 10 days have elapsed following symptom onset. Considering this information, the CDC recommends that physicians use a time- and symptom-based strategy to decide when patients with COVID-19 are no longer infectious.

For patients with confirmed COVID-19 infection who are not severely immunocompromised and experience mild to moderate symptoms\*, the CDC recommends discontinuing isolation and other transmission-based precautions when:

- 1) At least 10 days have passed since symptoms first appeared.
- 2) At least 24 hours have passed since last fever without the use of fever-reducing medications.
- 3) Symptoms (e.g., cough, shortness of breath) have improved.

For patients who are not severely immunocompromised and have been asymptomatic throughout their infection, isolation and other transmission-based precautions may be discontinued when at least 10 days have passed since the date of their first positive viral diagnostic test.

In approximately 95 percent of severely or critically ill patients (including some with severe immunocompromise), replication-competent virus was not present after 15 days following the onset of

symptoms. Replication-competent virus was not detected in any severely or critically ill patient beyond 20 days after symptom onset.

Therefore, in patients with severe to critical illness\*\* or who are severely immunocompromised\*\*\*, the CDC recommends discontinuing isolation and other transmission-based precautions when:

- 1) At least 10 days and up to 20 days have passed since symptoms first appeared.
- 2) At least 24 hours have passed since the last fever without the use of fever-reducing medications.
- 3) Symptoms (e.g., cough, shortness of breath) have improved.

Consultation with infection control experts is strongly advised prior to discontinuing precautions for this group of patients. Clinical judgment ultimately prevails when deciding whether a patient remains infectious. Maintaining transmission-based precautions and repeat RT-PCR testing may be appropriate if clinical suspicion of ongoing infection exists. The utility of repeat RT-PCR testing after improvement in symptoms is unknown as patients will frequently remain at least intermittently positive for weeks to months.

If a patient suspected of having SARS-CoV-2 infection is never tested, the decision to discontinue transmission-based precautions can be made using the symptom-based strategy described above.

Other factors, such as advanced age, diabetes mellitus, or end-stage renal disease, may pose a much lower degree of immunocompromise; their effect upon the duration of infectivity for a given patient is not known.

Ultimately, the degree of immunocompromise for the patient is determined by the treating provider, and preventive actions are tailored to each individual and situation.

### **What is the appropriate length of time between recovery from COVID-19 and surgery with respect to minimizing postoperative complications?**

The preoperative evaluation of a surgical patient who is recovering from COVID-19 involves optimization of the patient's medical conditions and physiologic status. Since COVID-19 can impact virtually all major organ systems, the timing of surgery after a COVID-19 diagnosis is important when considering the risk of postoperative complications.

There are limited data now that address timing of surgery after COVID-19 infection. One study found a significantly higher risk of pulmonary complications within the first four weeks after diagnosis<sup>(1)</sup>. A multi-country (116 countries), multi-center (1674 hospitals) study of more than 140,000 patients, with 3,127 having COVID-19 infection before surgery, suggested that when possible, surgery should be delayed for at least 7 weeks following SARS-CoV-2 infection and that patients with ongoing symptoms at  $\geq 7$  weeks from diagnosis may benefit from further delay.<sup>(2)</sup> However, the study did not differentiate outcomes for patients who were asymptomatic for their illness in the time periods less than 7 weeks.

An upper respiratory infection within the month preceding surgery has previously been found to be an independent risk factor for postoperative pulmonary complications<sup>(3)</sup>. Patients with diabetes are more likely to have severe COVID-19 disease and are more likely to be hospitalized<sup>(4,5)</sup>. Studies conducted during the 2009 influenza A H1N1 pandemic found that pulmonary function continues to recover up to three months after ARDS<sup>(6)</sup>.

Given this current knowledge base, wait times before surgery can be reasonably extrapolated and are a suggested starting point in the preoperative evaluation of the COVID-19-recovered patient.

The timing of elective surgery after recovery from COVID-19 utilizes both symptom- and severity-based categories. Suggested wait times from the date of COVID-19 diagnosis to surgery are as follows:

- Four weeks for an asymptomatic patient or recovery from only mild, non-respiratory symptoms.
- Six weeks for a symptomatic patient (e.g., cough, dyspnea) who did not require hospitalization.
- Eight to 10 weeks for a symptomatic patient who is diabetic, immunocompromised, or hospitalized.
- Twelve weeks for a patient who was admitted to an intensive care unit due to COVID-19 infection.

These timelines should not be considered definitive; each patient's preoperative risk assessment should be individualized, factoring in surgical intensity, patient co-morbidities, and the benefit/risk ratio of further delaying surgery.

Residual symptoms such as fatigue, shortness of breath, and chest pain are common in patients who have had COVID-19 <sup>(7,8)</sup>. These symptoms can be present more than 60 days after diagnosis <sup>(8)</sup>. In addition, COVID-19 may have long term deleterious effects on myocardial anatomy and function <sup>(9)</sup>. A more thorough preoperative evaluation, scheduled further in advance of surgery with special attention given to the cardiopulmonary systems, should be considered in patients who have recovered from COVID-19 and especially those with residual symptoms.

### Is repeat SARS-CoV-2 testing needed?

At present, the CDC does not recommend re-testing for COVID-19 within 90 days of symptom onset <sup>(10)</sup>. Repeat PCR testing in asymptomatic patients is strongly discouraged since persistent or recurrent positive PCR tests are common after recovery. However, if a patient presents within 90 days and has recurrence of symptoms, re-testing and consultation with an infectious disease expert can be considered.

Once the 90-day recovery period has ended, the patient should undergo one pre-operative nasopharyngeal PCR test ideally  $\leq$  three days prior to the procedure.

### References

1. COVIDSurg Collaborative. Delaying surgery for patients with a previous SARS-CoV-2 infection. *BJS* 2020; 107: e601–e602. <https://doi.org/10.1002/bjs.12050>
2. Nepogodiev D, Simoes JFF, Li E, et al: Timing of surgery following SARS-CoV-2 infection: an international prospective cohort study. *Anaesthesia* (in press as of Mar 3, 2021)
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10. <https://www.cdc.gov/coronavirus/2019-ncov/hcp/duration-isolation.html> Accessed Oct 28, 2020

**Table 1: Definitions for Severity Levels of COVID-Related Illness**

The studies used to inform the guidance in this joint statement do not clearly define “severe” or “critical” illness. The definitions in the National Institutes of Health (NIH) COVID-19 Treatment Guidelines (cited under references below) are suggested to categorize disease. The highest level of illness severity experienced by the patient at any point in their clinical course should be used.

- \* Mild Illness: Signs and symptoms of COVID-19 (e.g., fever, cough, sore throat, malaise, headache, muscle pain) without shortness of breath, dyspnea, or abnormal chest imaging.
- \* Moderate Illness: Evidence of lower respiratory disease by clinical assessment or imaging and oxygen saturation (SpO<sub>2</sub>) ≥94 percent on room air at sea level.
- \*\* Severe Illness: Respiratory rate >30 breaths per minute, SpO<sub>2</sub> <94 percent on room air at sea level (or, for patients with chronic hypoxemia, a decrease from baseline of >3 percent), a ratio of arterial partial pressure of oxygen to fractional inspired oxygen (PaO<sub>2</sub>/FiO<sub>2</sub>) <300 mmHg, or lung infiltrates involving >50 percent of the lung fields.
- \*\* Critical Illness: The presence of respiratory failure, septic shock, and/or multiple organ dysfunction.
- \*\*\* The studies used to inform this guidance did not clearly define “severely immunocompromised.” For the purposes of this guidance, “severely immunocompromised” refers to patients:
  - Currently undergoing chemotherapy for cancer.
  - Within 1 year of receiving a hematopoietic stem cell or solid organ transplant.
  - Having untreated HIV with a CD4 T lymphocyte count <200.
  - Having a combined primary immunodeficiency disorder.
  - Treated with prednisone >20mg/day for more than 14 days.

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Reference sources from CDC and NIH websites as of 22 Sept 2020:

Interim Clinical Guidance for Management of Patients with Confirmed Coronavirus Disease (COVID-19)

<https://www.cdc.gov/coronavirus/2019-ncov/hcp/clinical-guidance-management-patients.html>

Overview of testing

<https://www.cdc.gov/coronavirus/2019-ncov/hcp/testing-overview.html>

Discontinuation of Transmission-Based Precautions and Disposition of Patients with COVID-19 in Healthcare Settings (Interim Guidance)

<https://www.cdc.gov/coronavirus/2019-ncov/hcp/disposition-hospitalized-patients.html>

Duration of Isolation and Precautions for Adults with COVID-19

[https://www.cdc.gov/coronavirus/2019-ncov/hcp/duration-isolation.html?CDC\\_AA\\_refVal=https%3A%2F%2Fwww.cdc.gov%2Fcoronavirus%2F2019-ncov%2Fcommunity%2Fstrategy-discontinue-isolation.html](https://www.cdc.gov/coronavirus/2019-ncov/hcp/duration-isolation.html?CDC_AA_refVal=https%3A%2F%2Fwww.cdc.gov%2Fcoronavirus%2F2019-ncov%2Fcommunity%2Fstrategy-discontinue-isolation.html)

National Institutes of Health (NIH) COVID-19 Treatment Guidelines

<https://www.covid19treatmentguidelines.nih.gov/whats-new/>