

Navigating the COVID-19 Pandemic

“Disclaimer: This document is for informational purposes only and is not intended to serve as specific guidance with recommendations. Individuals should continue to follow the Centers for Disease Control and Prevention (CDC), and relevant federal, state and local public health guidance”.

Background

As the COVID-19 pandemic continues to spread across our country, it is increasingly apparent that there are significant differences in disease incidence and prevalence in each state and locale. Multiple models have been developed and they vary widely on when each state is expected to reach its peak prevalence, but we are optimistic that as more data is received a clearer picture will emerge. As some states or locales determine that they may be reaching their peak, or have reached their peak, attention will move beyond prevention of disease and resumption of clinical activities. For many orthopaedic surgeons, this can include the reopening of facilities for elective surgery.

Given the current circumstances, much remains unknown about COVID-19. It is important that individuals continue to follow Centers for Disease Control and Prevention (CDC) guidance, as well as relevant federal, state and local public health determinations. That said, the American Academy of Orthopaedic Surgeons (AAOS) would like to share some important considerations that individuals should consider before making any decisions.

Guiding Principles:

1. **First Priority:** The safety of patients is and must be of the highest priority when considering the provision of health care services, items and procedures during the COVID-19 pandemic.
2. **Second Priority:** The safety of health care personnel and staff should be of next highest priority, after accounting for patient safety, when considering the provision of health care services, items and procedures.
3. Adhere to Centers for Disease Control Prevention (CDC), and relevant federal, state and local public health guidance and recommendations; the safety of our patients and staff members is paramount.
4. Decisions should be locally based, as factors vary by locale; this includes incidence, prevalence, patient and staff risk factors, community needs, and resource availability (to include intensive care unit (ICU) beds, hospital beds, ventilators, and personal protective equipment (PPE)).
 - a. It is imperative to accurately determine if the disease burden curve trajectory in your local community is increasing, flattening, or decreasing, as well as the reproductive number; greater than, equal to, or less than one.
5. Follow legal restrictions: many states and locales have mandated shutdowns and stay-at-home orders; it is important to adhere to these legal requirements.

Other Important Considerations:

- Has your area seen a sustained reduction (i.e more than or equal to 14 days) in new cases of COVID-19?

- Are all patients in your area with COVID-19 symptoms able to access testing?
- Is your state able to conduct active monitoring of confirmed or suspected cases and their contacts?
- Are you able to verify if your patients have undergone testing?
- Should different criteria apply to patients with higher risk of severe consequences from a COVID-19 infection, specifically those over 65 or with significant comorbidities?

Testing for COVID-19 (See Appendix 1)

Classification	Description	
Who:	Patients and Health Care Providers	
When:	Patients: 72 Hours Prior or Day of Surgery	Providers: Prior to Patient Contact
Detection Test:	Reverse Transcriptase PCR (RT-PCR): Detects SARS CoV-2 viral RNA (ANTIGEN) in oropharynx and nasal pharynx: Highly sensitive. Detects non-viable RNA segments. Patients may remain positive for up to one months after onset of disease. “False Positives” are an issue. Test is readily available and results can be gleaned in 2-3 hours.	
Antibody Test:	ELISA Antibodies against Spike protein is ideal. There is an increasing number of tests available and the FDA has relaxed the rigorous evaluation process. Accuracy remains undetermined. At 14 days after onset of symptoms nearly 100% of patients will have antibodies. Thought to provide immunity and prevent spread to others. Unknown for how long immunity lasts. At some point the serum Elisa antibody test will likely be the GOLD standard.	

Risk Stratification

It may be helpful to separate out activities that are inherently of greater or lower risk. The chart below outlines a possible framework for thinking about clinical activities that may or may not be worthwhile to conduct based on appropriate state and local level public health guidance.

Activities may be separated into the following categories:

Health Care Service Type	Risk	Description
Telehealth Services	None	This includes new patient visits, routine check-in’s, activities where an in-person appointment is not required
Socially Distant In-Person Services (Non-Surgical)	Lowest	This includes activities that need to be done in an office and do not require being within six feet of the patient
Non-Socially Distant In-Person Services (Non-Surgical)	Greater	This includes activities that need to be done in an office and require being within six feet of the patient
Elective Surgery	Greatest	Any surgical activity that can be scheduled (i.e. elective)

Telehealth Services

Guidance on Medicare Patients:

- The Centers for Medicare and Medicaid Services (CMS) released guidance on telehealth services during the COVID-19 pandemic, which will be compensated the **same as in-person services** ([March, 2020: Medicare Learning Network Guidance](#)).

Guidance on Commercial Patients:

- The American Academy of Orthopaedic Surgeons (AAOS) compiled a guide on commercial insurer coverage policies for telehealth services during the COVID-19 pandemic ([March, 2020: AAOS Telemedicine Policy Tracker](#)).

In-Person Services & Elective Surgery

Health care practices should take into consideration the following aspects before moving forward with in-person services and elective surgery.

Safety, Urgency and Resource Considerations

Initial Analysis	Other Details
Patient Safety Considerations	
Patient Health and Risk Profile Positive/Negative Indication of COVID-19	Has the Patient Been Tested? *If Yes, what is the sensitivity and specificity of that test and is it deemed to be accurate, reliable and significant? *If No, what can you do to ensure the administration of a test?
Patient Health and Risk Profile Associated with Exposure to COVID-19	What is the patient's morbidity and mortality associated exposure risk? What are the criteria for an appropriate and/or inappropriate level of risk for a patient?
Staff Safety Considerations	
Staff Member Health and Risk Profile Positive/Negative Indication of COVID-19	Has the Staff Member come into contact with other individuals (patients, and other staff) that have tested positive or are under investigation? Has the Staff Member been tested? *If Yes, what is the sensitivity and specificity of that test and is it deemed to be accurate, reliable and significant? *If No, what can you do to ensure the administration of a test?
Staff Member Health and Risk Profile Associated with Exposure to COVID-19	What is the staff member's morbidity and mortality associated exposure risk? What are the criteria for an appropriate and/or inappropriate level of risk for a staff member?
Urgency Considerations	

Patient Health and Risk Profile Indicative of Greatest/Least Need	Need = Who stands to have the most significant long-term quality of life (QOL) impairment from not undergoing elective surgery
Patient Health and Risk Profile Indicative of Greatest/Least Benefit	Benefit = Who stands to have most significant long-term quality of life (QOL) improvement from undergoing elective surgery
Resource Considerations	
Facility Availability	Are respective facilities safely able to treat patients without crisis standards of care? Are there sufficient facility beds to safely treat patients?
Medical Supply Availability	Are there adequate Personal Protective Equipment (PPE) to support the facility caseload while adhering to current precautions? Are there adequate PPE for a safe surgical intervention?
Staff Member Availability	Are there adequate staff personnel to provide health care services for a safe surgical intervention?

Other Considerations

COVID-19 Free Hospitals or Ambulatory Surgical Centers (ASCs)

1) Singapore experience (JBJS Article)

- a. ASC that was closed and did not treat known COVID-19 patients.
- b. Single Specialty Hospital that did not treat known COVID-19 patients.
- c. “Sanitized” hospital that once treated COVID-19 patients.

Synopsis: The issue is that many hospitals and ASCs likely treated asymptomatic COVID patients at some point. Also, many single specialty hospitals were repurposed or had their equipment repurposed to treat COVID patients. In many areas a COVID “free” hospital or ASC is not an option. COVID patients need to be segregated.

Citation: Liang, Z. C., Wang, W., Murphy, D., & Hui, J. H. P. (2020). Novel coronavirus and orthopaedic surgery: early experiences from Singapore. JBJS.

2) Velocity of Return

- a. Cancelled/Postponed Surgeries.
 - i. Categorized based upon urgency “need” and “benefit” considerations (above).
- b. Ambulatory Cases First (avoid Hospitalization and COVID-19 exposure).
- c. Inpatient Cases (ASA I and II).
- d. Inpatient cases (ASA III and IV).
 - i. Once COVID exposure as inpatient is minimized and testing is perfected.

Note: Being able to answer these questions is a critical first step to ensuring the safety of patients, health care staff, and the American public. These questions and considerations are not meant to serve as an exhaustive list, but rather a framework for helping practices to understand the implications of restarting health care operations during this present time. Guidance from the Centers for Disease Control and Prevention (CDC), and relevant federal, state and local public health agencies should be adhered to as the safety of our patients and staff members is paramount.

Appendix 1

COVID-19 Diagnostic Background and Limitations

PCR:

- PCR may remain positive for ~3 weeks in a patient with SARS-CoV-2 (Covid-19).
- Pharyngeal virus shedding is highest during first week of symptoms with peak on day four [1].
- Presymptomatic (1-2 days prior to symptoms) may account for 6% of overall transmissions [2].
- Though viral RNA may be detected in nasopharynx after day five of illness, active viral replication was not detected in upper respiratory tract (as detected by viral subgenomic messenger RNA)[1].
- PCR isolated from stool, also not considered infectious (as detected by viral subgenomic messenger RNA) in individuals with mild disease [1].
- Infectious virus not detected in blood or urine[1].
- Negative PCR tests may result from improper sampling techniques, low viral load in area sampled, or mutations in viral genome. Minimal or no virus has been detected from blood and urine samples [3].

Antibody:

- Less than 40% of individuals are antibody positive at seven days post symptom onset and nearly all are positive by 14 days [4].
- Total antibody is more sensitive and rises faster than IgG and could be considered as a recent infection marker similar to IgM [4].
- Higher antibody titer was independently associated with a worse clinical classification [4]. Implication: If negative PCR and high COVID clinical suspicion, may send antibody testing to confirm diagnosis.
- Seroconversion may not be followed by a rapid decline in viral load [1]. Implication: antibody may not be reflective of immune protection (may be T cell-mediated).
- ELISA assays provide a level of antibody detected and are more sensitive and specific than linear flow assays.

References

1. Wolfel, R., et al., *Virological assessment of hospitalized patients with COVID-2019*. Nature, 2020.
2. Wei, W., Li, Z, Chiew C, Yong S, Toh M, Lee VJ. , *Presymptomatic Transmission of SARS-CV-2- Singapore, January 23-March 16, 2020*. MMWR Morb Mortal Wkly Rep, 2020. **69**.
3. Wang, W., et al., *Detection of SARS-CoV-2 in Different Types of Clinical Specimens*. JAMA, 2020.
4. Zhao, J., et al., *Antibody responses to SARS-CoV-2 in patients of novel coronavirus disease 2019*. Clin Infect Dis, 2020.