

# Protecting Surgical Patient Safety During the Coronavirus Disease 2019 (COVID-19) Pandemic



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**Abstract:** As elective surgery slowly reopens across the country, it is paramount that surgeons recognize and take responsibility for their roles in protecting patient safety during the coronavirus disease 2019 pandemic. Namely, these include (1) to prevent further spread of the severe acute respiratory syndrome-CoV-2 virus, (2) to understand the shift in injuries that has occurred as a result of altered lifestyles led by our patients, and (3) to leverage our platforms to disseminate information regarding how individuals can maintain musculoskeletal health during the pandemic. Efforts taken to reduce the spread of severe acute respiratory syndrome-CoV-2 virus can be focused on 3 broad categories of provider–patient interaction: preoperative and clinic visits, surgical encounters, and postoperative care.

The coronavirus disease 2019 (COVID-19) pandemic has wreaked havoc on our most vulnerable members of society, our economy, and our way of life. With no immediate end in sight, Americans look to establish a “new normal” way of conducting business. As surgeons, we must safely deliver high-quality care to our patients without placing undue burden on an already-stressed health care system. As such, our responsibilities as surgeons are (1) to prevent further spread of the severe acute respiratory syndrome (SARS)-CoV-2 virus, (2) to understand the shift in injuries that has occurred as a result of altered lifestyles led by our patients, and (3) to leverage our platforms to disseminate information regarding how individuals can maintain musculoskeletal health during the pandemic. Finally, we must heed the timeless adage of Hippocrates, *Primum non nocere*, or

“First do no harm.” As we indicate patients for elective or urgent procedures, we do so in the context of a potentially lethal virus to patients with significant comorbidities.

As clinics begin to reopen and elective surgeries resume, the most important role surgeons have is to prevent further spread of SARS-CoV-2 and to protect our patients’ health. The potential for transmission of SARS-CoV-2 exists at every interaction for patient care. Efforts taken to reduce the spread of SARS-CoV-2 can be focused on 3 broad categories of provider–patient interaction: preoperative and clinic visits, surgical encounters, and postoperative care (Table 1).

## Preoperative and Clinic Visits

The first step in limiting the spread of SARS-CoV-2 during in-person clinic visits is to decide whether an in-person meeting is necessary for providing comprehensive patient care. Visits that have been scheduled to review results from imaging that was obtained or to discuss management plans can often be performed via telemedicine platforms, which reduces the risk of patient and clinic staff exposure. If an in-person office visit is deemed necessary, patients should be instructed to don a mask and provide answers to screening questions regarding recent travel, occupation, and contact with infected persons.<sup>1-4</sup> Patients also should be screened for symptoms of COVID-19, including fever, shortness of breath, cough, loss of smell and taste, diarrhea, headache, or sore throat.<sup>5</sup> Clinics may limit the entry of family members and other visitors.

The use of waiting rooms should be minimized, with social distancing guidelines enforced. At Rush Sports

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**Table 1.** Measures to Reduce the Spread of SARS-CoV-2 Based on the Category of Provider–Patient Interaction

Preoperative and Clinic visits	<ul style="list-style-type: none"> <li>• Limit In-person Meetings by Maximizing use of Telemedicine Platforms</li> <li>• Screen Patients for Symptoms of COVID-19 before Entry into Clinic</li> <li>• Require Effective Mask Wearing inside Clinic at all times</li> <li>• Limit Entry of Family Members and Other Visitors to Clinic</li> <li>• Implement Social Distancing Guidelines throughout Clinic, Especially in Waiting Rooms</li> <li>• Space out Clinic Appointments to Prevent Overcrowding of Waiting Rooms and to Allow for Proper Cleaning of Examination Rooms/waiting Areas</li> <li>• Consider Deferring Patients who are at High Risk for Postoperative Complications as a Result of Medical Comorbidities</li> </ul>
Surgical encounter	<ul style="list-style-type: none"> <li>• Test Surgical Patients 3-7 days before Surgery with an RT-PCR Test</li> <li>• Require operating room with ventilation system operating at 20 air changes/hour, fitted with HEPA filters</li> <li>• Negative air pressure rooms are not required</li> <li>• Reduce equipment in OR to what is essential to perform operation</li> <li>• Limit the number of personnel in the OR, especially during intubation and extubation</li> <li>• Avoid closing surgical incisions with staples or nonabsorbable sutures</li> <li>• Update family via phone or video at conclusion of surgical encounter</li> </ul>
Postoperative care	<ul style="list-style-type: none"> <li>• Minimize length of stay for inpatients, when safe</li> <li>• Conduct postoperative rounds via telemedicine when feasible</li> <li>• Home PT should be recommended over inpatient PT, when feasible</li> <li>• Minimize in-person postoperative visits to patients with concerns or complications, and otherwise perform via telemedicine</li> <li>• No need for alterations in standard antibiotic or VTE prophylaxis</li> </ul>

COVID-19, coronavirus-19; HEPA, high-efficiency particulate air; OR, operating room; PT, physical therapy; RT-PCR, reverse transcription polymerase chain reaction; SARS, severe acute respiratory syndrome; VTE, venous thromboembolism.

Medicine, all providers have been mandated to space clinic appointments such that only 1 patient may be scheduled per 15-minute block during the day. In addition, in an effort to limit crowding of waiting rooms, patients have been asked to remain in their car in the parking lot until the staff is ready for them for on-site imaging appointments. Finally, it goes without saying that high-traffic areas such as waiting rooms and examination rooms should undergo frequent cleaning.

As elective procedures resume across portions of the country, consideration should be given to risk-stratifying patients and potentially deferring those who are greater risk. Greater-risk patients, such as those older than the age of 75 years and with comorbidities including diabetes, uncontrolled hypertension, chronic obstructive lung disease, obstructive sleep apnea, congestive heart failure, or those who are immunocompromised,<sup>6</sup> have an increased risk of postoperative complications requiring hospitalization, which is likely to strain already-limited hospital resources. Those patients scheduled for surgery should be tested for SARS-CoV-2 at 3 to 7 days before their scheduled procedure via the reverse-transcription polymerase chain reaction test, which has, so far, demonstrated high sensitivity and negative predictive value.<sup>7</sup> While current limitations in testing capacity restrict the ability to test all patients preoperatively, testing is crucial in areas of high disease prevalence.<sup>8,9</sup>

As surgeons, we cannot underestimate the importance of making a realistic and critical risk/benefit assessment for patients indicated for surgery, especially for those with significant comorbidities. We should

consider how patients would tolerate an infection from COVID-19 postoperatively, and we should ask ourselves if we would recommend the same procedure for one of our family members. Understanding our patients' social milieus and understanding their capacity to cope with postoperative requirements has never been more essential.

### Surgical Encounter

Surgeons should ensure that their operating rooms are equipped to minimize exposure to viral particles by ensuring the ventilation system is operating at a minimum of 20 air changes per hour and is fitted with high-efficiency particulate air filters, which are designed to remove aerosol and droplet particulate.<sup>10-12</sup> At this time, there are no data to support using negative-pressure rooms over conventional positive-pressure operating rooms to perform procedures on patients who have a negative SARS-CoV-2 reverse-transcription polymerase chain reaction test. During the operation, equipment in the operating room should be reduced to that which is essential for the surgical case. It is important to limit the number of personnel in the operating room, especially during intubation and extubation.<sup>13,14</sup> Closure of surgical incisions with staples or nonabsorbable sutures, which require the patient to return to the office to be removed, should be avoided.<sup>13</sup> Finally, at the conclusion of the case, the surgeon should update the family via phone or video conferencing in lieu of in-person consultations.

## Postoperative Care

For those patients who required admission to a hospital following their procedure, their length of stay should be minimized whenever possible to reduce the burden on the health care system and reduce their chances of exposure to SARS-CoV-2. Furthermore, postoperative rounds should be done via telemedicine when possible. Upon discharge, home physical therapy should be recommended over inpatient rehabilitation, and patients should be provided with the necessary information to do so. In-person postoperative visits should be minimized to patients with issues or complications, and otherwise performed via telemedicine. If a patient subsequently becomes sick with COVID-19, antibiotic and venous thromboembolism prophylaxis does not need to be adjusted.<sup>13</sup>

This is by no means an exhaustive list of all measures that can be taken to prevent the spread of SARS-CoV-2. In addition, as new information becomes available regarding the transmission mechanism of SARS-CoV-19 and as best practices evolve, the presented information is subject to change. For a more complete list of recommendations, we urge readers to reference the Guidelines on Resuming Elective Orthopaedic Surgery During the COVID-19 Pandemic, compiled by the International Consensus Group and Research Committee of the American Association of Hip and Knee Surgeons,<sup>13</sup> as the most comprehensive and current compilation of recommendations surrounding operating clinical practices during the COVID-19 pandemic directed at orthopaedic surgeons currently available.

The COVID-19 pandemic has dramatically altered how people across the globe live their lives. This shift includes changes in exercising and traveling habits, workload for those who perform manual labor, and competitive sporting schedules, all of which will likely impact the volume and nature of orthopaedic injuries that present to sports medicine clinics. While there are no immediate data to support that changes in injury patterns are taking place, anecdotal evidence is growing.<sup>15,16</sup> Sports medicine surgeons can likely anticipate fewer injuries resulting from organized sports and manual labor but an increase in injuries related to patients trying new exercises or activities while gyms and other outlets for physical exercise remain closed.

It will therefore be crucial for physicians to use their platforms to disseminate accurate information regarding methods for injury prevention and ways for patients to remain physically active without compromising musculoskeletal health. Sending out a newsletter or submitting a public service announcement to a local radio or news outlet may be a practical means by which to reach one's community and help keep patients healthy and out of clinic.

In conclusion, we must each keep our sights focused on preventing the spread of SARS-CoV-2 during interactions with our patients, taking note of evolving injury patterns and remaining active in providing information on methods to maintain musculoskeletal health. In doing so, we can each do our part in keeping our communities safe and prevent further burdening our health care system as we each try to establish our "new normal" in the context of the evolving pandemic.

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