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## Appendix I

### **Medically Necessary Orthopedic Surgery During the COVID-19 Pandemic: Safe Surgical Practices and Alternative Strategies**

Due to COVID-19 illness, many patients that have orthopedic pathology will not be candidates for surgery, even with otherwise medically-necessary surgery. This situation may arise due to critical illness but could also arise due to limitations of medical resources. Alternative approaches to patient management will need to be employed.

For patients with fractures that would be best treated surgically, but that cannot proceed with surgery during the pandemic must be carefully managed. Fracture patients with active disease should have medically necessary surgeries postponed while being medically optimized to avoid cardiopulmonary complications. Appropriate prophylaxis for deep vein thrombosis (DVT) prevention should be used. We advocate for initial fracture immobilization and consideration of non-surgical fracture care when appropriate. We advocate for multimodal pain management with an emphasis on non-opioid medicines when delaying surgery.

For non-emergent situations, many alternatives to initial surgery are available. Non-emergent infections, such as with an indolent prosthetic joint infection of the shoulder, may be managed with oral antibiotics until safe definitive surgery can be performed in a delayed fashion. Certain cases of spinal pathology with mild neurologic compromise should have consideration of nonsurgical management with corticosteroid injection and oral medications. Bracing complex ligamentous pathology (e.g., ACL and concomitant posterolateral corner injury) can help patients temporarily tolerate the ligamentous laxity when paired with use of crutches or a walker. Physical therapy—whether in person or via virtual visit—should be a strong consideration for patients delaying surgery or pursuing nonsurgical management. Many serious orthopedic problems will need to be postponed during the COVID-19 pandemic. Utilizing the appropriate alternative treatment methods will help support your patients during this challenging time.

## Appendix II.

### **Medically Necessary Orthopedic Surgery During the COVID-19 Pandemic: Safe Surgical Practices and Alternative Strategies**

During this pandemic, numerous reports of suboptimal PPE use has been circulated due to lack of reserves, supply-chain limitations and high global demand, but medically necessary surgery and healthcare must continue. Additionally, many facilities that do have N95 mask supplies have limited resources that must be allocated to nurses, doctors and the healthcare team directly treating COVID-19 patients; these supply limitations often do not allow for N95 mask or PAPR use by orthopedic surgeons, even when supported by the literature. We recommend that hospital leadership be educated about the growing data to support orthopedic surgeon and perioperative team use of PAPR or N95 respirators as part of a strict PPE protocol. In these hopefully rare situations, optimal PPE may not be available and alternative options will need to be considered to best protect the perioperative team.

We recommend consideration of this alternative approach to limit surgical team exposure if a medically necessary surgery must be performed on a high-risk patient when recommended PPE is not available, acknowledging the risks involved. Prior to surgery, PCR testing should be performed for all patients to avoid surgical procedures on asymptomatic carriers unknowingly. The authors advocate for intubation and post-surgical extubation outside of the OR to limit aerosolization<sup>47</sup>. Surgery should be done in a negative-pressure, laminar flow room with an advanced particle filtration system if available. The surgeon and team should wear a standard surgical mask with a sterile, positive pressure toga be donned in a sub-sterile room outside of the OR prior to the surgery<sup>35</sup>. Limited use of electrocautery and high-speed tools should be emphasized to avoid droplet formation and potential aerosolization<sup>31-34</sup>. After normal post-surgical hand washing, we advocate for scrub exchange and showering immediately in the locker room after surgery prior to treating other patients or leaving the hospital. Shoes worn during the surgery should be left in the hospital or exchanged for a fresh pair of shoes as soon as possible due to possible contamination.