

Letter: Academic Neurosurgery Department Response to COVID-19 Pandemic: The University of Miami/Jackson Memorial Hospital Model

To the Editor:

Coronavirus disease (COVID-19) is an extremely infectious, life-threatening viral illness that has constituted a global public health emergency. A pandemic disease that the World Health Organization reports has caused 179 111 confirmed cases in 140 countries, COVID-19 confers a 2% to 5% mortality rate causing 7426 deaths globally as of March 18, 2020.^{1,2} Despite massive strain on the health-care system, academic neurosurgery departments must balance multiple obligations, including urgent and emergent neurosurgical disease processes, public health concerns regarding disease transmission through the community, and the safety of department staff. Here, we have outlined our strategy to maximize our ability to provide excellent care of neurosurgical patients while minimizing risk to health-care providers (Table).

SURGICAL SCHEDULING

Neurosurgeons often treat patients with conditions in which time is of the essence and delaying surgery may negatively affect outcome. We have halted all elective cases, but will continue to schedule urgent and emergent cases. Emergent cases such as head and spine trauma, cauda equina syndrome, embolic stroke, ruptured aneurysms, and acute hydrocephalus are relatively noncontroversial; however, urgent cases such as malignant brain tumors and progressive cervical spondylotic myelopathy may require a more nuanced discussion. Therefore, we have empowered a small neurosurgery COVID team consisting of senior neurosurgeons with multidisciplinary backgrounds who review a brief history and select imaging studies and make decisions for urgent surgical cases. The presence of an independent adjudicating body will improve surgical decision-making consistency and decrease suboptimal use of hospital resources and unnecessary exposure of staff to disease. Additionally, screening all surgical cases preoperatively for COVID-19 is critical. We impose a 14-d delay for cases with this concern. Finally, to minimize the need to physically return to clinic, we use dissolvable sutures.^{3,4} This step allows postoperative patients to be seen via our telemedicine protocols noted below.

CLINIC SCHEDULING

All elective clinic visits have been canceled. Postoperative visits are only performed if sutures need to be removed; otherwise these have also been cancelled. These visits have been replaced by

telemedicine clinic visits, which have previously been validated in the neurosurgery population.⁵⁻⁹

We have implemented Health Insurance Portability and Accountability Act (HIPAA)-compliant telehealth technology integrated into our electronic medical record (Epic, Epic Systems Corporation, Verona, Wisconsin). Neurosurgeons and their patients can communicate via secure video-conference feed using a computer, mobile device, or tablet. Properly documented video conferencing, email, and phone call visits are now reimbursable, meaning that telehealth clinic visits may be financially and medicolegally viable for remote neurosurgical clinical care.

We continue to schedule clinic visits to evaluate potentially urgent surgical patients, which are determined during a clinic prescreen. After appropriate screening questions and temperature evaluation, only the patient is allowed to enter the clinic. Since implementation, we have decreased the number of clinic visits by 80%; however, we continue to see and evaluate the same number of patients prior to this protocol.

CONFERENCES AND RESIDENT EDUCATION

All in-person conferences such as grand rounds, resident education conferences, and multidisciplinary board meetings have been replaced by video teleconferences. Multiple software products exist to enable video teleconferences and are easily implemented with devices and applications currently in use. These conferences continue with the use of visual sharing of radiographic images and pathological images via these teleconference applications. Thus far, we have been able to cover the same amount of material and patient cases as we have done in the past.

RESIDENT SAFETY

Only the minimal number of residents and/or fellows required for patient care are allowed to come to the hospital. Rotating resident schedules have been devised to minimize resident viral exposure and burnout. We have designated a healthy “second responder” or “off shift” group to stay home, unless the active “first responder” group becomes sick. This will ensure enough providers to be continuously available for the duration of the pandemic. All residents seeing consults are provided with appropriate personal protective equipment (PPE).

ATTENDING SAFETY

The overall volume of neurosurgical cases has diminished by about 75%, but the on-call obligations for many hospitals and individual sub-specialties have not. To minimize faculty exposure, we have re-organized the call schedules so that one provider covers multiple hospitals and sub-specialties – with appropriate at home

TABLE. Summary of University of Miami Department of Neurosurgery COVID-19 Pandemic Preparedness Measures

Departmental priority	Key measure taken
Surgical scheduling	<ul style="list-style-type: none"> All elective surgeries canceled All emergent surgeries are scheduled
Clinic scheduling	<ul style="list-style-type: none"> Multidisciplinary physician panel determines which surgeries are urgent enough to schedule Elective clinic visits canceled HIPPA-compliant telehealth visits for follow-up visits Pre-screened patients likely to require urgent surgery are scheduled
Conferences and resident education	<ul style="list-style-type: none"> All in-person conferences canceled Video teleconferences are effective and facilitate social distancing
Resident safety	<ul style="list-style-type: none"> Minimal resident coverage Designated a healthy "off shift" group to stay home, unless the active "first responder" group becomes sick PPE for residents including N95 masks
Attending safety	<ul style="list-style-type: none"> Re-organized call schedules so that 1 provider covers multiple hospitals and sub-specialties with appropriate at home 2nd and 3rd call back-up No attending over the age of 60 is on the call schedule as this represents as higher risk group for symptomatic COVID-19 infection and mortality
Administrative staff	<ul style="list-style-type: none"> 100% remote home working
Intensive care unit	<ul style="list-style-type: none"> Routed positively screened COVID-19 patients to an ICU setting that is physically separated from the neurosciences ICU Postoperative care for uncomplicated craniotomies and endoscopic endonasal cases in stepdown unit rather than ICU Emphasize discharge home on postoperative day 1

second and third call back-up. No attending over the age of 60 is on the call schedule as this represents as higher risk group for symptomatic COVID-19 infection and mortality. Special attention is being taken for surgical patients with especially high risk of patient-to-physician viral transmission including those undergoing endoscopic skull base surgery.^{10,11}

ADMINISTRATIVE STAFF

We have purchased multiple laptop computers for the department enabling 100% of our administrative staff to work at home.

INTENSIVE CARE UNIT CARE

Postoperative neurosurgical patients are often medically fragile; thus exposure to COVID-19 may be extremely deleterious. We screen patients who may be COVID-19 positive either upon entrance to the hospital. If they require intensive care unit (ICU) level of care they are routed to an ICU setting that is physically separated from the neurosciences ICU in order to limit exposure to our neurosurgery patients and team. Additionally, visitors to the ICU are currently limited to 1 person per day. However, there are ongoing discussions to transition to no visitors in the ICU.

We have also begun transferring patients that are status post uncomplicated craniotomies and endoscopic skull base patients from the operating room to the step down unit rather than the ICU, in order to maximize the number of available ICU beds


for potential COVID-19 patients. We also make every effort to optimize patients for discharge home on postoperative day 1.¹²

CONCLUSION

During the COVID-19 pandemic, emergent and urgent neurosurgical procedures should continue to be performed, while deferring elective surgeries. Appropriate PPE for all staff, and minimal resident coverage in the hospital, should be the norm. Video teleconferencing for both clinical patients and conferences should be utilized. Minimizing exposure for residents, attendings, and staff will benefit all involved. With appropriate strategy, it is possible for an academic neurosurgical department to maintain its commitments to neurosurgical patients as well as their community at large and provide safe and effective neurosurgical treatment.

Disclosures

The authors have no personal, financial, or institutional interest in any of the drugs, materials, or devices described in this article.

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