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Silver Lining During COVID-19: Transformation in Neurosurgery Education

William J. Kemp III, Pablo F. Recinos, Edward C. Benzel, Richard P. Schlenk

In December 2019 a novel coronavirus, SARS-CoV-2 (COVID-19), emerged in Wuhan, China. This respiratory virus, easily transmitted via aerosolized droplets among the population, quickly spread across the world.¹ In late January 2020, the first documented American case was seen in Washington state. By April 2020, the United States had become the global epicenter, with nearly a third of the world's documented infections and over a quarter of the mortalities.² Individual state governments decreed stay-at-home orders to slow the spread and colloquially “flatten the curve.”

The American educational system was affected drastically as schools and universities suspended in-person classes and switched to virtual mediums. Neurosurgery was not spared. Medical students considering a potential neurosurgery career were especially affected by COVID-19. At the Cleveland Clinic and other institutions, medical student rotations were ceased upon stay-at-home order decrees.³ The Society of Neurological Surgeons determined there would be no further external medical student rotations for this Match cycle. This eliminated the possibility for letters of recommendation external to the student's home institution. Although suboptimal, resident candidates will likely interview virtually later this year.⁴ Overall, the COVID-19 pandemic has altered the application process for entry into the neurosurgical field.⁵

The neurosurgery resident experience at the Cleveland Clinic changed significantly upon spread of COVID-19 into the United States. The residency program pivoted from a large elective volume to urgent/emergent surgery only and prioritized clinical availability for possible redeployment to care for COVID-19 patients. Significant efforts were made to reduce COVID-19 spread and preserve personal protective equipment for a potential surge. The in-hospital neurosurgery resident roster was streamlined to reduce transmission risk. Senior residents were on reserve in case others became ill. The hands-on elective operative schedule that defines a neurosurgery residency was paused. Finally, the residency changed gears from traditional in-person lecture learning to a focus on virtual education and communication.

Across the country during the COVID-19 pandemic, neurosurgery program directors have sought to strike a balance between maximizing resident safety and caring for patients, while also promoting education. At the Cleveland Clinic, we were prepared for a potential patient surge that necessitated more available health care workers. Additionally, we remained committed to our neurosurgical educational pursuits via lectures, research opportunities, and quality improvement projects. Programs across the country reportedly implemented similar strategies.^{6,7} This letter focuses on the “silver lining” impact of COVID-19 on transformation of neurosurgery education practices and implications for the future.

TELE-EDUCATION

The Cleveland Clinic Neurosurgery Residency Program has always prioritized resident education. With the outbreak of the COVID-19 pandemic, the residency adapted to comply with social distancing practices and limited in-person social contact in mid-March 2020. Our in-person didactic resident lectures abruptly ended, and we quickly pivoted. We developed a new faculty lecture curriculum presented on the virtual platform Zoom. Starting March 23, 2020, we scheduled daily virtual Zoom lectures presented by the neurosurgical faculty.⁸ The department essentially had a daily 1- to 2-hour “grand rounds” lecture that frequently inspired faculty and resident debate. The residents were granted a golden opportunity to benefit from the faculty wisdom via lecture every day. The roster of interested lecturing faculty grew weekly. This was extremely heartening, as during normal times, the availability of faculty to give such lectures at a steady frequency did not exist. Continuing medical education was granted to faculty participating as presenters or audience. For future resident education, these lectures were recorded and archived. These virtual educational experiences were even extended to mortality and morbidity conferences, journal clubs, tumor boards, and board reviews. In a period where anxieties are rising, these sessions helped nurture resident camaraderie, boosted morale, and provided a healthy forum for voicing opinions and concerns. In light of the success and increased faculty participation of these virtual didactic lectures, they will likely continue in our department following COVID-19.

Do these adapted virtual techniques represent a pivotal moment for general neurosurgical education? There may be a similar shift in virtual communications among neurosurgeons across the country and world. It may become more common to have virtual interinstitutional conferences, virtual guest professor lectureships, and perhaps even virtual national or global conferences. Several months ago, these propositions may have seemed far-fetched. Since COVID emerged, the virtual platforms have been used daily for educational purposes. The American Board of Neurological Surgery is also adapting to the pressures of the COVID-19 pandemic. Its primary examination, originally scheduled for March 13, 2020, was rescheduled for May 15, 2020 with provisions for remote home administration.⁹ This may present an opportunity to change the oral boards format for remote administration as well. Remote test administration would certainly be more convenient and more cost-conscious for all involved parties. The examination integrity could be maintained under the right conditions.

Education in the patient clinic has changed as well. In recent years, neurosurgery has observed a gradual increase in telehealth patient conferencing. During this pandemic period, these virtual patient appointments have skyrocketed for urgent and nonurgent visits.¹⁰ At the Cleveland Clinic Neurosurgery Residency Program, residents and fellows assisted faculty in virtual patient encounters

via 3-way virtual platforms. This may represent a long-term shift in patient care where certain patients may be more appropriate for a virtual visit. If virtual appointments will comprise a large portion of future clinic visits, a working knowledge of this technology will likely become a necessary addition to resident education.

CONCLUSIONS

Similar to the impressive scientific collaboration in the global effort to develop a COVID-19 vaccine, this experience may give

birth to greater collaboration among neurosurgery departments and institutions across the country and world. No virtual interaction can completely replace the in-person meetings and networking that we all miss when we “shake hands” (now wave 6 feet away) with colleagues at national conferences. However, the silver lining of COVID-19 is that our field is actively adapting to incorporate a new virtual paradigm for the future of neurosurgery education. Using virtual platforms for greater collaboration and education has the potential to be far more viral than a mere virus.

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Department of Neurosurgery, Cleveland Clinic Foundation, Cleveland, Ohio, USA

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<https://doi.org/10.1016/j.wneu.2020.05.148>