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## Letter to the Editor: "Medical Student Concerns Relating to Neurosurgery Education During COVID-19"



### LETTER:

The world is now facing an existential global health crisis: a coronavirus disease 2019 (COVID-19) pandemic, which has swept the world with alarming levels of morbidity and mortality.<sup>1</sup> These are unprecedented times. The development of the COVID-19 pandemic has serious implications for medical education. As already evidenced, medical schools in the United Kingdom have fast-tracked qualifications for final-year medical students, waiving requirements for clinical examinations, and using alternative assessments to expedite their transition into the workforce against the COVID-19 pandemic as doctors.<sup>2</sup>

This pandemic presents practical and logistical challenges, and concerns for patient safety. Clinical rotations are crucial elements in providing authentic patient care environments for medical students, but in the context of a pandemic, it must be recognized that students are at risk of becoming potential vectors for transmission. Alongside the lack of COVID-19 testing, shortages of personal protective equipment, and the diminished value of hospital-based experiences (from the inevitable cancellations of clinics and elective surgeries), social distancing remains the most effective strategy in flattening the epidemiologic curve, while we await the manufacture of vaccines and antiviral therapies.<sup>3</sup> Hospitals have suspended medical students from attending clinical attachments, and this inadvertently limits exposure to specific specialties, which potentially could have a detrimental effect on specialty applications.

In the midst of this pandemic, the timely nationwide survey by Guadix et al.<sup>4</sup> has highlighted the concerns of medical students interested in neurosurgery. The authors employed a nationwide survey to assess how COVID-19 has affected neurosurgical education among neurosurgery-minded medical students, and to identify educational interventions that might better respond to their evolving educational needs.

Of the 127 responses, the most frequently cited concerns among M1 to M4 students were related to conferences and networking opportunities (63%), clinical experience (59%), and board examination scores (42%), subinternships (39%), and clinical research experience (38%). Cancellation or postponement of neurosurgery rotations seemed to be a widespread issue and was identified across 25 different institutions. The majority of M3 students reported cancellation of home (56%) and away (62%) neurosurgical subinternships, with 76% reporting  $\geq 1$  cancelled or postponed neurosurgical rotations.

Virtual mentorship pairing was the highest rated educational intervention suggested by M1 and M2 medical students to ensure trainee development during this trying time. M3 and M4 medical students cited virtual surgical skills workshops most frequently. Other suggestions, such as neurosurgery education webinars and virtual research symposia, were also cited. The study findings by Guadix et al.<sup>4</sup> are invaluable for neurosurgery organizations, such as the American Association of Neurological Surgeons (AANS), the

Congress of Neurological Surgeons (CNS), and the World Federation of Neurosurgical Societies (WFNS), when considering targeted plans for students to continue their education and development toward neurosurgery. The AANS already has an established mentorship program, in which student members can match with mentors according to their needs and interests. As suggested by the students, this program is particularly valuable for M1 and M2 students who have not yet found mentors in neurosurgery. Establishing mentorship early in a medical student's education can be beneficial in many ways, including increasing career satisfaction and lowering burnout rates, as well as increasing academic productivity through encouraging positive learning attitudes and stellar work ethic.<sup>5,6</sup>

The past decade has witnessed the development of a plethora of digital tools. Due to resource constraints, medical schools have already been transforming pedagogy by using technology to replace or enhance face-to-face teachings and to encourage self-directed learning.<sup>7,8</sup> It would be apt to use these strategies now to remediate the consequences of this COVID-19 pandemic. Medical educators worldwide have promptly responded, swiftly transitioning the entire clinical curriculum to online formats. Small tutorial groups convene online to attend clinical didactic sessions and to discuss virtual cases. Neurosurgery institutions have already started to employ such channels to deliver education webinars.<sup>9</sup> In addition, extracurricular online neurosurgery resources from the likes of Neurosurgery Atlas,<sup>10,11</sup> Ebrain,<sup>12,13</sup> and Brainbook<sup>14</sup> have already attained global engagement and have proven that web-based platforms can be an effective method of not only disseminating neurosurgical knowledge, but activating and engaging medical students and neurosurgeons.

Results from this survey demonstrated that basic or translational research was terminated in 41% of cases, and hindered in 35% of cases, whereas clinical research projects were stopped in 21% of cases and slowed in 36% of cases. As a result, a significant number of students have expressed they are more inclined to undertake a research year to make up for the lost opportunities during this ordeal. The drop in research productivity is a natural consequence of substantially increased processing times for ethics approval and longer review times for non-COVID-related articles due to the more hectic schedules of peer reviewers and editors in this period. Hence we suggest that students could adapt by utilizing this time to acquire research-relevant skills, such as different research methodologies and statistical methods. In addition, students who are highly motivated could continue to conduct meaningful research activities through literature and systematic reviews, which can provide valuable insights on the current evidence for a given topic.

The key challenge remains providing authentic patient experiences for medical students—a key component of medical education—under these circumstances. Uncertainty looms over the duration of quarantines and social distancing. The panic in the community is real and palpable. Acknowledging this, the COVID-19 pandemic represents an era for active curricular innovation and transformation. It is crucial that the academic neurosurgery community continues to reflect and evaluate the impact these changes introduced in response to COVID-19 have on neurosurgery education, health, and safety, as well as future career progression.

**Keng Siang Lee<sup>1</sup> and John J.Y. Zhang<sup>2</sup>**

From the <sup>1</sup>Bristol Medical School, Faculty of Health Sciences, University of Bristol, Bristol, UK; and <sup>2</sup>Yong Loo Lin School of Medicine, National University of Singapore, Singapore  
To whom correspondence should be addressed: Keng Siang Lee  
[E-mail: [kl17746@bristol.ac.uk](mailto:kl17746@bristol.ac.uk)]

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