
REFLECTION

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Reflections on medical education: An innovative near-peer led initiative using online media to teach the neurological exam

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ABSTRACT

The move to virtual learning due to the COVID-19 pandemic has resulted in fewer opportunities for medical students to participate in bedside teaching and encounter patients presenting with characteristic clinical findings of various neurological disorders. We describe an interactive, peer-taught learning-session on Zoom teleconference wherein upper-year students developed learning cases using online videoclips of neurological examinations and corresponding findings. A post-session survey revealed an overwhelmingly positive response, especially regarding the sessions' case-based and peer-taught structure. Overall, considering the dual benefits of peer-teaching, and the opportunity to see a wide range of findings from the videos, this initiative may be a valuable supplemental learning activity for existing undergraduate neurology rotations.



KEYWORDS

Medical Education, Neurological Exam, Videos

The move to virtual learning due to the ongoing COVID-19 pandemic has resulted in fewer opportunities for medical students to participate in bedside teaching and encounter patients presenting with characteristic clinical findings of various neurological disorders. The use of video clips demonstrating positive examina-

tion findings has significant advantages in medical education. In addition to providing an experiential component to learning when in-person opportunities are limited, (1) incorporating videos into lectures has been found to help students better visualize concepts, apply knowledge, and increase acquisition of clinical skills.

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(2) In neurology education, supplementing face-to-face teaching sessions with blended learning that makes use of videos showing examination techniques has been effective in teaching the neurological examination to medical students. (3) The use of videoclips integrated into learning modules and lectures have also improved trainees' ability to identify epileptic seizures, read electroencephalograms, and enhance knowledge of various movement disorders while providing standardized virtual exposure to patients and learning. (4-6) Peer-teaching has been shown to be effective in promoting learning in various components of medical neuroscience courses and neurology clerkship, while also having a dual effect whereby student-teachers benefit academically from doing the teaching. (7,8)

At McGill University, second-year medical students complete a 2-week neurology course in which they refine their neurological examination skills and develop an approach to diagnosing common neurological problems. In response to learning gaps created by the pandemic, we developed a peer-taught online learning activity using video clips of patients aimed at providing students with opportunities to observe components of the neurological examination, identify abnormalities, and develop hypotheses for lesion localization. We designed and delivered case-based learning sessions over Zoom tele-

conference for 180 second-year medical students using videos of the neurological examination performed on patients with detectable abnormalities. Videos were selected from public sources (e.g. YouTube) by two third-year medical students and reviewed for quality and accuracy of examination technique by a staff neurologist. Videos were then categorized and corresponding interactive cases were created using the Medical Council of Canada learning objectives (e.g. Diplopia, Stroke, Ataxia, Seizures, etc.) as a content blueprint. A total of 8 topics were divided across two 2-hour learning sessions for approximately 60 students at a time. The topics presented included seizures, vertigo, diplopia, weakness, sensory disturbance, ataxia, movement disorders, speech, and language disorders. During these sessions, the student-tutors presented cases with corresponding videos and encouraged students to share their observations using the chat function and attempt to localize lesions based on the identified abnormalities. The staff neurologist was present to provide expert opinion to supplement the student-tutors' explanations. Following the sessions, we invited students to share their feedback via an anonymous voluntary survey.

We received 39 out of 180 possible responses. Most students agreed that the peer-learning aspect was effective (85%), that the videos were useful in case-based

Video Case-Based Learning Session Feedback

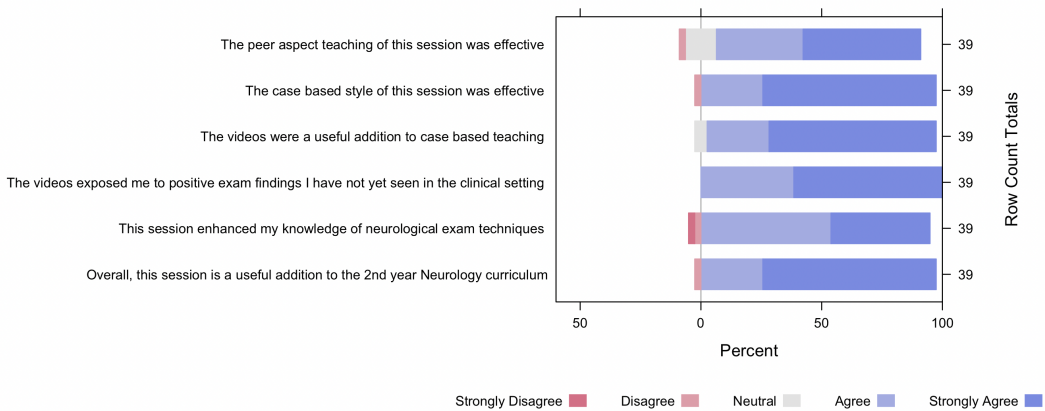


FIGURE 1 Session feedback survey responses for N = 39 participants

teaching (95%), and that the sessions enhanced their knowledge of examination techniques (95%) (Fig. 1). All respondents indicated that the videos exposed them to findings they had not yet seen in the clinical setting (Fig. 1). Overall, this format to teach neurological examination and neuroanatomical localization received positive feedback from students and was successful at enriching the clinical learning experience. While this session cannot replace the hands-on experience gained during in-person clinical rotations, it did provide certain advantages. It offered a baseline standardized experience for all students, whereas exposure to different neurological disorders may otherwise have varied based on chance and site-related characteristics. Students had the opportunity to observe a complete range of common and “rarer” findings, from hyperreflexia to internuclear ophthalmoplegia. The peer-teaching format allowed for information to be presented in a relatable manner appropriate to the students’ training level. The ability to replay the videos with commentary and expert insight, a feature not necessarily available in the clinical setting, was valued greatly. Given this teaching format’s simplicity and the public availability of materials used, it can be cost-effectively implemented as a supplemental learning activity for existing undergraduate neurology education programs, especially those intending to maintain a hybrid (on-line/on-site) educational format in the post-COVID era. It may also be of particular value for those programs that lack mandatory clinical neurology rotations. Future directions may include using videos filmed at individual academic institutions to further enhance and ensure quality of materials.

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