

## A VIRTUAL CASE-BASED LEARNING MODULE ON ACUTE ISCHEMIC STROKE FOR PRE-CLINICAL MEDICAL STUDENTS. TC Browne

Acute ischemic stroke represents the fifth leading cause of death in the United States and affects nearly 800,000 patients annually. Recognizing this massive impact on healthcare, The University of Colorado School of Medicine lists the ability to identify stroke symptoms and anatomically localize associated brain lesions as core competencies for all graduates. As the curriculum shifts away from the traditional lecture to small group learning, a need for cases and small group facilitators has been recognized in the pre-clinical core. Furthermore, the COVID-19 pandemic has created a novel problem for medical education as virtual learning has replace in-person learning for all pre-clinical courses. A survey of MedEd Portal shows a paucity of case-based learning modules on acute ischemic stroke, so an interactive case-based learning module was created to address this gap in resources for second-year medical students. This learning module was designed for students in medical programs to integrate knowledge from current and previous classes with a real-world example.

The learning module was created using anatomic donor medical records and brain images for reference which were approved by the Colorado State Anatomic Board and the donor family prior to creation. User interface utilizes Powerpoint, which allows learners to follow the clinical case in slides and provides a platform which is compatible with on Macintosh and Windows machines. This module contains 74 slides and takes approximately 60 minutes to complete. Students should use this module in small groups (3-4 people) to facilitate discussion. It is an interactive learning experience where students must choose which tests are appropriate for an acute ischemic stroke patient based on clinical presentation. The clinical recommendations

are based on the American Heart Association and American Stroke Association 2018 Guidelines for the care of acute ischemic stroke. Students view the results taken from the patient's medical records and use those results to determine a care plan. Students are also presented with questions based on the test results with opportunity to discuss whether the patient should receive particular medical interventions. At the end of the module, students observe images and a 3D model of the donor's brain to show the morphological changes that the brain aneurysm caused. Students use the models and their knowledge of the underlying neuroanatomy and gross anatomy to answer questions about the structures that were injured as a result of the stroke. 22 multiple choice and 13 discussion questions are distributed throughout the module.

Meta-analysis studies of case-based learning and closely related problem-based learning show significant increase in measures of students' program evaluations and students' clinical performance. This case-based learning module, developed using a real patient's medical records as well as donor post-mortem brain images and interactive 3D models, provides a novel and authentic clinical learning experience to supplement basic science training. A pilot test in the Phase II Nervous System course was conducted which allowed for evaluation of the overall efficacy of the module and focused on improvements to immediate recall as well as the students' attitudes toward the experience. 38 students completed the learning module during the pilot and 27 surveys were completed. 100% of respondents indicated that the learning module was a valuable experience (48% agree, 52% strongly agree), 100% of respondents indicated that they would utilize other modules like this (41% agree and 59% strongly agree).