Innovation in Neurosurgical Exam Simulation

Wafa Alduais\textsuperscript{1}, Uladzislau Ulasavets\textsuperscript{1}, Nabeel S. Alshafai\textsuperscript{1}
\textsuperscript{1}Alshafai Neurosurgical Academy (A.N.A), Toronto, Ontario, Canada.
Disclosure

- No disclosure
- No conflict of interest
Introduction

• Neurosurgical education is one of the most exciting topics in contemporary neurosurgery. Passing the final boards is a real challenge. The CCN Review was designed to help as many candidates as possible master the art and required skills of passing oral exam no matter which system it belongs to.
• We have created a simulated environment that allows repetitive learning to correct mistakes and fine-tune skills to optimize the outcomes.
• In order to proof its efficacy, we created a validation process.
Method

• We conducted a prospective study of 48 candidates who attended the hot-seat sessions (Oral exam simulation) during CCN review over three years. Detailed statistical analysis was conducted on two groups. Those who attended the Hot seats (Group 1) and those who didn’t (Group 2).

• The neurosurgery exam simulation was conducted using both MCQ and Oral simulated exams with clinical cases led by world expert faculty in a lecture format for the MCQ and 15-minute mock oral sessions which was video-taped scoring candidates in a standardized fashion for their performance. Finally, a continuous daily instructional feedback was given by course director.
• Total number of candidates over the three years period was 240 and 20% were female neurosurgeons. As expected the majority of attendees were from Europe (60%), however the number of candidates from other continents such as north America and Australia started to increase (from 6% in 2015 to 19% in 2017). We can also notice from the graphs that the course became more popular among junior residents as well as certified neurosurgeons.
• Our data indicated that in 2015 the MCQ performance of candidates in Group 1 was better than those in Group 2, however in the following years there was no big difference in performance.
• In 2015, candidates performed the Best at Skull base and Neuro-oncology and worst in cerebrovascular interestingly in 2017 the best MCQ performance was in cerebrovascular session.
• Generally, candidates were more skilled at gathering data with proper interpretation and giving a good range of differential and reaching a final diagnosis. However, they were less skilled at using operative and technical knowledge and patient follow up.
• In 2015 as seen in Fig. 7 the best performance during hot-seat sessions was among Europeans, however by 2016 candidates from other continents (North America and Australia) did better and by 2017 the level was almost the same.
• The one interesting phenomenon that was observed repeatedly over the period of 3 years is that candidates with high MCQ performance had either low or moderate Hot Seat performance while candidates with moderate MCQ performance had a high Hot Seat performance!!.
Discussion

We will point to only two major issues that need to be highlighted in the current neurosurgical teaching:

1. The oral exam skills that our candidate showed are usually expected to be gained at 3rd level residency while by the 4th level (graduation level) residents are expected to independently formulate a treatment plan and perform complex surgeries as proposed by the Accreditation Council for Graduate Medical Education (ACGME) and ABNS milestones.

2. It might be logical that people who have a high performance at MCQ would have a high performance at the hot seats but our data didn’t support this logic. We might conclude that it is essential to have a baseline knowledge in order to pass an oral exam however it’s not necessary that a reasonably knowledgeable resident would pass an oral exam.
• Our preliminary results showed that simulation of board exams is an effective method to help neurosurgery residents pass their board exams, and sometimes achieve the best oral exam scores.