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Growth and development of a neurological surgery residency cadaveric spine simulation training program: OHSU experience

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Keywords

Neurosurgery; Neurological Surgery; Cadaveric; Simulation; Learners; Residents; Trainees

Abstract

Objective

Cadaveric and dry, 3D model-based simulation training is a valuable education tool for neurosurgical residents. Such simulation training is an opportunity for residents to hone technical skills and decision-making, and enhance neuroanatomy knowledge. We describe the growth and development of OHSU, Department of Neurological Surgery resident-focused hands-on spine simulation surgery courses and provide details of course evaluations, layout, and setup.

Methods

A four-part spine surgical simulation series, including two human cadaveric and two dry, 3D model-based courses, was created to provide resident spine procedure(s) training. Residents participated in the spine simulation series (years 2017–2021) and completed annual course curriculum and anonymous course evaluations. Evaluations included both Likert scale items and free text responses. Responses to Likert scale items were analyzed in Python. Free text responses were quantified using Valence Aware Dictionary for sEntiment Reasoning (VADER). Descriptive statistics were calculated and plotted using Python's Seaborn and Matplotlib library modules.

Results

Analysis included 129 spine (occipitocervical, thoracolumbar, and spine model fusion I and II) simulation course evaluations. Likert responses demonstrated high average responses for evaluation questions (4.67 ± 0.90 and above). Average compound sentiment value was 0.59 ± 0.060.

Conclusion

This is the first time Likert responses and sentiment analysis have been used to demonstrate how neurosurgical residents positively value a hands-on spine simulation training. Simulation is an essential component of neurosurgical resident education training. We encourage other neurosurgical education programs to develop and leverage spine simulation as a teaching tool.