

“Cadaver –Based Surgical Education Curriculum”

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Introduction

Surgical education is of paramount importance in an environment of reduced resident work hours and rising medical costs. The cadaver-based surgical simulation provides an adjunct towards training safe, efficient and competent surgeons. A recent analysis of resident education under the Accreditation Council of Graduate Medical Education (ACGME) demonstrated no negative impact on operative experience in the era of reduced resident hours. However, new 2011 mandates will limit resident work hours even further and programs are actively seeking alternatives to traditional surgical education. In light of this, we have implemented a curriculum for learning and performing common operations done by plastic and hand surgeons. We have used three separate preparatory pathways based on proven methods of adult learning. We chose carpal tunnel release as our teachable operation, given its defined anatomic landmarks and widely available modes of task learning. Our objective was to determine whether participants who used multiple means of learning benefited more than those who prepared with a surgical textbook alone.



Figure 1. cadaver simulation flow sheet

Method

Participants from various levels of training were randomly assigned to one of three groups (A-C) such that each group consisted of a medical student, a plastic surgery PGY2, and a PGY5 resident. Groups received up to three progressive levels of instruction, with group A reading from Green's chapter, "Median nerve compression at the wrist", while group B additionally viewed a narrated video of the surgery, and group C additionally observed an attending surgeon perform the cadaver surgery. All participants were then videotaped performing decompression of the median nerve at the carpal tunnel on a fresh, frozen cadavers. Three blinded CAQ surgeons subsequently scored each participant's video using the Global rating scale of operative performance (GAS). Participants were also subjected to a pre- and post-surgery survey detailing their confidence level for performing various aspects of the operation.

Figure 2. GRS for operative performance

Results

A comparison of pre- and post-surgery confidence tests revealed a median gain score of 1 (on a scale of 1-5) for each question. This was unrelated to training level or level of preparation, although absolute confidence scores (both pre- and post-) increased with training level and instruction level. Global assessment scores had acceptable inter-rater reliability, and were positively correlated with training level, but not instruction level.

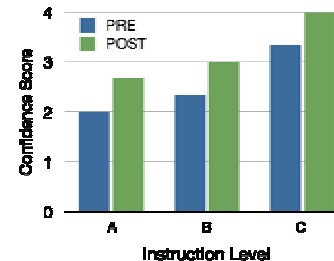
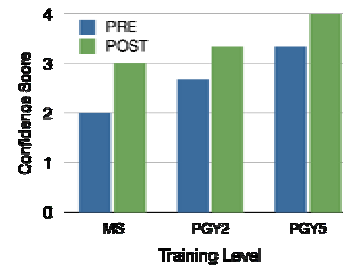
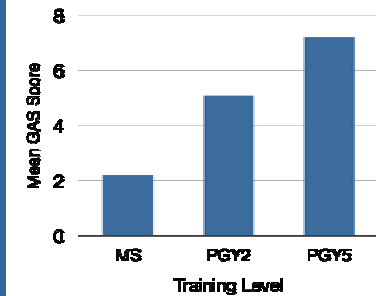


Figure 3. Pre and Post confidence scale by training and instruction level

Figure 4. Composite Confidence Gain Scores by Training Level



Conclusion

Despite prior surgical trainees can benefit from a cadaver-based surgical skills curriculum. While additional multimedia and attending instruction may reinforce surgical concepts, much benefit can be derived from pre-reading alone, raising the prospect of a resident-initiated and administered cadaver-based curriculum.

1. Jamal et al. Effect of the ACGME duty hours restrictions on surgical residents and faculty: a systematic review. *Acad Med* (2011) vol. 86 (1) pp. 34-42
2. Agnew and Dumanian. A Simple Test: Please Draw the Incision. *It Is Not as Easy as We May Think*. *YJHSU* (2011) vol. 33 (10) pp. 1894-1898
3. Mackinnon SE, Novak CB. *Compressive Neuropathies*. In: Green DP, Hochkins RN, Pederson WC, Wolfe SW, (eds.). *Operative Hand Surgery*: 5th ed. (2004) pp. 1009-1017
4. <http://www.vumedi.com/video/157374>

Acknowledgements

Mark Urata, MD USC Cadaver Lab Staff
Wesley Schooler, MD USC medical student and surgical resident participants