# IMPROVING ON EPIDURAL TASK TRAINERS: COMBINING 3D PRINTING AND THE DELPHI METHOD

Justin Upshall, *MD Student*; Peter Collins, *Anesthesia*

## ABSTRACT: Oral Presentation (10:45 a.m.)

**Purpose**: Epidural catheterization is reported to be the most difficult skill for a new anesthesia resident to master. Commercially available epidural task trainers are costly, provide limited anatomic variation, and often have poor haptic feedback. An ideal simulator would be economical, customizable, and provide realistic tactile responses. By combining three-dimensional (3D) printing with a modified Delphi method we hope to create a task trainer that approaches these ideals. 3D printing allows for inexpensive, rapid prototyping and customizability. The Delphi method is an anonymous, efficient methodology for achieving expert consensus on a topic.

**Methods**: This project consists of three phases, the first of which has been completed. The purpose of phase one was to identify the critical elements of an epidural task trainer using a modified Delphi method. It was predetermined that a 2-round modified Delphi method would be used. Eighteen anesthesiologists were recruited via e-mail. The initial survey asked participants to list the elements of an ideal epidural task trainer. In round one, participants were given the list of items created by the group and asked to rate the importance of each item on a 10-point ordinal scale. Means above seven and below three were used to define positive and negative consensus respectively. The results were provided to participants, and items that did not achieve consensus were reassessed in round two.

**Results**: The initial survey identified 47 items. In round one of the modified Delphi method, 27 of those items achieved positive consensus. The remaining 20 items were reassessed in round two, and four achieved positive consensus. Sixteen items did not achieve consensus, and no items achieved negative consensus.

**Conclusion**: With phase one of this project completed, we are currently using 3D printing to create prototypes with graded variations of optimizable items. These prototypes will be assessed by the same group of anesthesiologists to determine the optimal prototype for each item. This will allow for the creation of a single prototype with the most optimal grade of each characteristic. In phase three, the non-optimizable items will be integrated and our final product will be experimentally evaluated alongside a commercially available model.