CLINICAL PROCEDURES AS A TOOL FOR TEACHING REGION-SPECIFIC GROSS ANATOMY TO FIRST-YEAR MEDICAL STUDENTS

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Background

Integration of clinical procedures into the pre-clinical basic science curriculum is a unique teaching tool that allows for experiential learning within the framework of clinical skills development. Although time available to properly teach the curriculum is restricted, there has been a call for a more direct relation of gross anatomy content to clinical application.[1] Few studies addressing the benefits of the incorporation of clinical procedures into first-year gross anatomy have been completed, but it is clear that students overwhelmingly agree that early introduction of clinical skills into the medical curriculum is beneficial to their learning.[2] We hypothesize that the addition of clinical procedures to the gross anatomy lab will facilitate deeper learning and provide clinical context and relevance, while not adding appreciably to the time required for instruction.

Objectives

The overall aim of implementation of a clinical procedure (i.e. central line placement) into a first-year gross anatomy lab consisted of three goals:

1) to teach gross anatomy related to central line placement (Figure 1a)
2) to introduce students to clinicians, and familiarize students with clinical procedures (Fig. 1b)
3) to gauge student perceptions of standard vs. procedure-based learning.

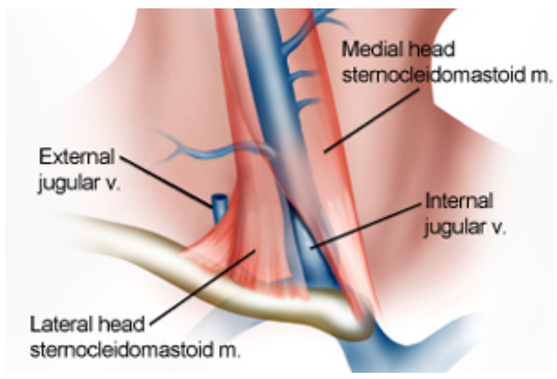

Figure 1a (left): Anatomical region and structures associated with central line procedure. **Figure 1b (right):** Central line kit typically used in clinical setting, and utilized in procedure-based session of gross anatomy. [3]

Methods

During the 2017-18 school year, Duke University School of Medicine implemented the clinical procedure of inserting an internal jugular central line as part of the "head and neck" section of gross anatomy. Students were instructed to watch 3 preparatory videos—one covering consent to treat, one regarding professionalism, and one detailing the procedure of central line placement. The students then took an online pre-assessment with questions pertaining to medical knowledge and professionalism, anatomical knowledge, and their perceptions and opinions of the standard gross anatomy lab. During the laboratory session, lab groups were assigned a clinician that guided the students through the procedure and supervised as students participated in the insertion of the central line. Finally, students were requested to complete an online post-assessment, containing the same set of questions. Analysis of pre- and post-assessments were recorded, compared, and statistically analyzed.

Results

Student perceptions and opinions of the procedure were overwhelmingly positive and significantly different from those associated with the standard gross anatomy lab ($\chi^2 = 53.18$; $p < 0.001$) – see Figure 2. Additionally, medical knowledge and professionalism, though not statistically significant ($t = 1.86$; $p = 0.17$), trended in the direction of better overall understanding of the material. Questions regarding anatomical knowledge did not significantly improve.

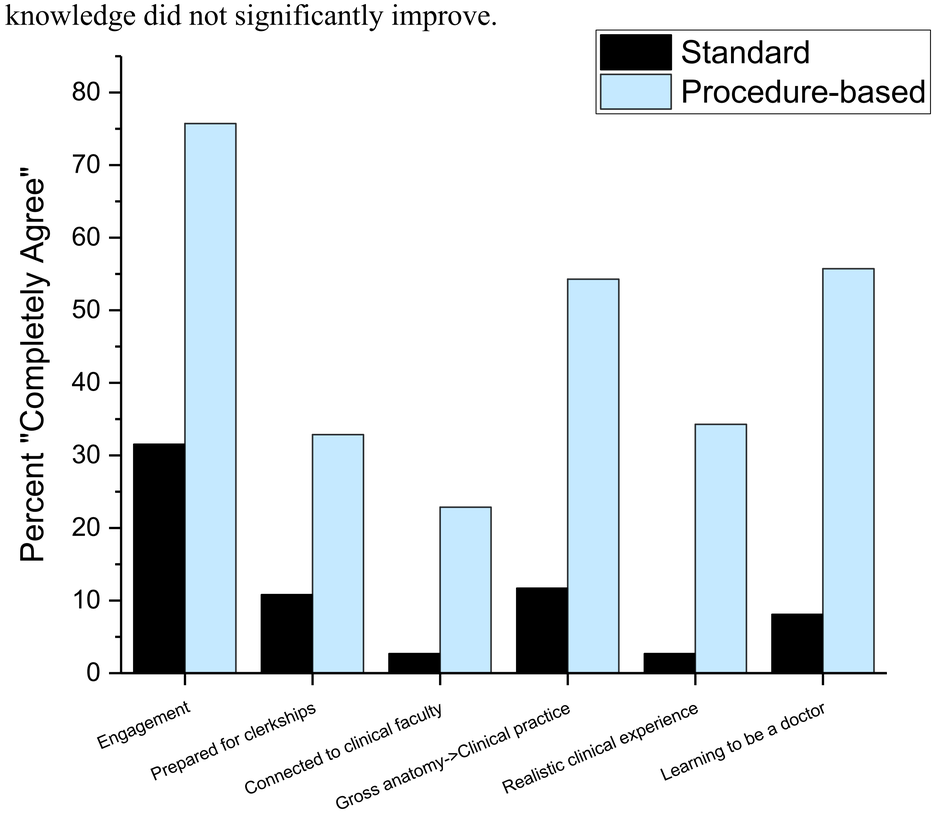

Figure 2. Percent of students that answered "completely agree" to questions addressing perceptions of learning in both conditions (e.g. "During the learning activity, I felt like I was learning to be a doctor").

Significance

The observed improvement in student perceptions, in addition to the growth in understanding of medical knowledge and professionalism, suggest that expanding the gross anatomy curriculum to include medical procedures may have significantly beneficial effects to medical education. Follow-up to this project would ideally include implementation of one or more different procedures, which would allow a more thorough comparison of clinical procedures versus standard anatomical education.

References

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2. *Lam T, Irwin M, Chow L, Chan P. Early introduction of clinical skills teaching in a medical curriculum plus factors affecting students' learning. Med Eval 2002;36:233–240.*

3. *Images courtesy of Duke infection control outreach network, dicontraining.medicine.duke.edu.*