Team Based Learning in a PA Gross Anatomy Course
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INTRODUCTION
With increased interdisciplinary patient care, it is essential that health profession students demonstrate group problem solving and develop positive attitudes towards teamwork. Foundational science courses provide an opportunity to foster problem-solving skills, communication, and teamwork. Team-based learning (TBL) is a student-centered teaching approach developed to help foster these professional responsibilities. The purpose of this UAMS IRB approved study is to determine the effect of TBL in a gross anatomy laboratory on academic performance, quality of learning in team interactions, and student perceptions of teamwork and TBL.

BACKGROUND
Human gross anatomy is an integral part of the foundational sciences for students of health science professions. For many years, educators have been developing alternatives to the “traditional” method of human gross anatomy education, which involves didactic lectures and full-time cadaveric dissection and prossection by all students. A number of these approaches have been utilized by anatomy educators to augment and, in some cases, replace cadaveric experience by students.

The approach that we have developed and modified specifically for the gross anatomy course in our program is based on the team-based learning (TBL) methodology. First adapted for medical education in 2001, TBL utilizes group discussions and “active learning” to foster a knowledge of factual content, development of higher-level cognition, and the ability to work in teams2 while promoting problem-solving skills, communication, and teamwork.2, 4, 5. TBL has been used previously in medical gross anatomy education to replace the didactic lecture format.2, 3. However, there is only one study to date reporting its use in the graduate gross anatomy laboratory setting. Moreover, there are currently no known reports of its use in physician assistant education.

PARTICIPANTS
We are currently conducting an UAMS IRB approved study to determine the impact that TBL has on physician assistant student performance in gross anatomy using the following outcome measures: active learning, deep learning, teamwork, academic performance, and knowledge retention.

A total of 87 PA students enrolled in the Physician Assistant Studies program at UAMS participated in this study. A mixed within-design was used for this study. Students were divided into two groups:

Comparison (traditional, non-TBL) Group: 54 PA students received a traditional cadaveric prossection lab during the Summer of either 2013 or 2014. In this lab, students participated in forty five hours of active prossection.

Experimental (TBL) Group: 33 PA students received a hybrid gross anatomy lab in the Summer 2015. In this lab, students spent thirty hours in prossection and fifteen hours in TBL.

METHODS
TBL Learning modules
Both groups encountered a traditional lecture (forty five hours) and lab activities once per week. The comparison group spent all lab sessions in prossection activities, whereas the TBL group alternated between prossection activities and TBL learning modules. The TBL learning modules consisted of three stages: 1. Phase 1 (pre-class): Step 1: Individual study of assigned objectives 2. Phase 2 (in-class): Step 2: Individual Readiness Assurance Test (I RAT) Step 3: Group Readiness Assurance Test (GRAT) Step 4: Instructor feedback and clarification 3. Phase 3 (in-class): Step 5: Application activity with instructor facilitation

TBL Learning Survey
The main survey was developed by the TBL team to assess a successful student. TBL survey data were used to examine if the TBL group was better at preparing for exams, understanding the lecture content, and working collaboratively. The survey was given to students in the TBL group at the beginning of each TBL session. The survey was given to students in the traditional group at the beginning of each traditional lab session. The survey was given to students in both groups at the beginning of each exam prep session.

Immediate Feedback Assessment Technique (IF-AT)
• Used for GRAT step of phase 2 • Provides immediate feedback of correct answer for every question • Allows students to earn partial credit for missed questions

Team Performance Survey (TPS)
An 18 question TPS (6 point Likert scale) was administered to the experimental group at midterm and the end of the course to assess the quality of team interactions.

TBL Student Survey
In order to determine student perceptions of TBL, course preparedness, critical thinking, teamwork and collaboration, a 5 point Likert scale TBL survey was administered to the comparison group once in the summer 2015; either one or two years after the students had completed gross anatomy (Control; 1yr post; Control 2 yrs post). The experimental group completed the survey two times, both before (Pre-TBL) and after (Post-TBL) the course.

TBL Team Observation Rubric
We developed a rubric to guide an objective assessment of teamwork interactions during the GRAT and application phases of TBL. Individual students were assessed on frequency of verbal contributions, and teams were assessed for conflict management, communication, and leadership.

RESULTS AND CONCLUSIONS
Team Performance Survey (TPS) Data
The experimental group completed the TPS at midterm and at the end of the course. Ratings on 18 questions were summed for a possible total of 108 points. At both time points, the TBL group rated teamwork interactions as being good (98.87 midterm, 100.79 final). Although there was no difference between the two time points, the positive rating at both time points indicates that teams were well designed and highly functional.

TBL Team Interaction Data:
Ongoing analysis to determine reliability of the instrument and provide objective verification of student qualitative data.

ACKNOWLEDGEMENTS
• UAMS, CHP Department of Physician Assistant Studies
• UAMS PA class of 2015, 2016 and 2017
• Dr. Anita Killins, PT, PhD, DPT, NCS, CNDT

REFERENCES