

Team-based learning (TBL): a highly interactive teaching strategy successfully used in the Plains medical school curriculum

Purpose: In 2021, CUSOM embarked on a longitudinally integrated curriculum based on the metaphor of climbing a mountain, ascending from the plains to the summit. The Hematologic & Lymphatic Systems course happens during Fall of the Plains (first) year, early in students' medical school journey and is the first systems-based course of their curriculum covering the basic science and clinical concepts underlying normal function and related disease states of the hematologic and lymphatic systems. A guiding principle for the new curriculum was to use evidence-based educational strategies that promote active learning and deeper retention of material. The purpose of this presentation is to describe the creation of a unique aspect of this course and present initial outcome data.

Methods: One of the goals of the course was to have students apply information they were learning to problem solve like a practicing physician, taking clues from a patient's history, physical exam, and laboratory studies to solve clinical problems. Team-Based Learning (TBL) was chosen as an evidence-based teaching modality to achieve this goal. With TBL, students review material beforehand and take an individual pre-test before the session. Students are then assigned to stable small groups and take the same 'pre-test' together, this time while sharing information and teaching each other. The groups then move on to clinical cases that they work through together. An audience response system is used to promote discussion. The cases involve patients with anemia (week 1), bleeding or clotting problems (week 2), and immunodeficiency (week 3). Students do not receive formal lectures on these subjects; rather there is assigned 'pre-work' with brief videos made by experts on campus along with accompanying materials that students work through at their own pace. On Mondays, students receive lectures on normal physiology, learn about related lab studies and are presented with an algorithm to help them take this basic information to develop a differential diagnosis. On Tuesdays, this knowledge is applied in the TBL sessions.

Results: The course and TBL sessions have been delivered twice. Feedback from students has been positive, and students have performed well on their assessments. Between 67% and 85% of students responded that the TBL sessions were very or extremely effective. Evaluation comments revealed that students enjoyed the active learning from the TBL sessions while also sometimes struggling as the activity pushed them just out of their comfort zone. Scores on the various assessments showed an increase from the individual pre-test (range 48-72% correct) to the group pre-test (range 90-95% correct), indicating the positive effects of peer teaching.

Discussion: Our findings indicate that TBL is an innovative and practical active teaching method that can be successfully implemented and well-received even by very junior medical students. While TBL is challenging for students, requiring self-motivation and application of facts rather than just memorization, it allows students to see the relevance of the material they are learning through direct application, to consolidate the information, to identify areas of weakness or misunderstanding and to enjoy problem solving and thinking like a physician."