

Improving Knowledge Retention and Clinical Reasoning Skills in Second-Year Medical Students with Physiology Review Videos

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Introduction: Teaching students how to think logically about disease processes is essential to increasing retention of their physiology knowledge base and developing effective clinical reasoning skills. At the University Of South Florida Morsani College Of Medicine, students are taught normal structure and function of the human body in four integrated organ system-based courses during the first year. In the second year, students learn about abnormal structure and function in three integrated organ system-based courses. We found that many second-year medical students were either not retaining physiology knowledge or were not able to apply it in a clinical context when learning about diseases. Consequently, these students were relying on rote memorization of signs/symptoms of disease and the relevant pharmacological treatments, were not performing well on the Step 1 USMLE, and did not have effective clinical reasoning skills as they entered clerkships.

Objective: To design a series of eight physiology review videos that were directly related to pathophysiology content being taught in the second-year courses.

Material and Methods: The videos were not meant to teach any new material or serve as a complete review of physiology; instead, the focus was on i) emphasizing key points about normal physiology and reminding students to review Year 1 content, ii) teaching students how to use their knowledge base in physiology to analyze and synthesize information as it relates to a patient case, and iii) teaching students how to develop an effective diagnosis and treatment plan based on the disordered physiology. The videos were implemented into Year 2 courses during academic year 2017-2018.

Results: Students who chose to watch the videos (n=72) scored an average of 2.2 percentage points higher on internal course exams and 1.6 percentage points higher on faculty-selected NBME shelf exams reflective of the course content compared to students that did not watch the videos (n=96). Students who watched the videos also scored higher on their first attempt at the Step 1 USMLE compared to those that did not (237.0 vs 233.1, respectively). To assess if students who chose to watch the videos were stronger

students in general, we looked at scores from a required comprehensive exam given at the end of Year 1. We found minimal differences between groups (85.7% vs 85.2%), suggesting that the improvement in test and Step 1 scores was more likely, at least in part, a result of knowledge and skills gained by watching the videos. Feedback from students who watched the videos has been very positive and many commented on the fact that they feel more confident in thinking through patient cases.

Conclusions: The physiology review videos were effective at helping students retain physiology knowledge, apply it in clinical context, and develop effective clinical reasoning skills that not only allowed them to score higher on the Step 1 USMLE, but will ultimately better prepare them for the clerkship years.

Keywords: Teaching, video, knowledge, student, teaching methods

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