

## **Title: Peer-Led Case-Based Learning in Pulmonary Infections**

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**Background:** Case-based learning is an increasingly utilized method of teaching in health professions education. Case-based learning emphasizes the relevance of concepts to clinical care and aids in connecting knowledge to practice. Interactivity further enhances knowledge acquisition and impacts clinical practice. Opportunities exist to integrate more peer-led teaching and case-based learning in the pre-clinical MD curriculum to reinforce retention and application of clinical knowledge.

**Objective:** This study sought to assess the effectiveness of peer-led didactics and case-based learning on medical students' confidence and comprehension of pulmonary infectious disease topics during pre-clinical education.

**Methods/Design:** A mixed qualitative and quantitative study was conducted using case-based learning theory and sampling of second-year medical students (M2s) enrolled at Wake Forest School of Medicine. Peer-led, pre-recorded lectures were created and uploaded so that the students could review the material at their leisure before the in-person, case-based learning session. Cases were written to reflect key information about distinguishing between pulmonary infections, pathophysiology, and treatment plan. Students participated in the case-based learning exercise by entering their answers to questions via Poll Everywhere.

Data collection consisted of emailed pre and post-activity surveys with free text answer choices and numeric rating scores. The survey sampled understanding of students' baseline knowledge of pulmonary infections, their expectations for lecture, and their perceived benefit of the case-based activity. Thematic analysis was used to analyze the qualitative data. For this analysis, responses were coded based on themes expressed such as "interactive" or "high-yield".

**Results:** 145 students were surveyed before and after the pulmonary infectious disease lectures for the M2 curriculum. Of those surveyed, 58 (40%) responded to the pre-activity survey and 20 (14%) responded to the post-activity survey. Forty-five percent of students rated their confidence in identifying pulmonary infections as 1-4 (low confidence) in the pre-activity survey, and the remaining rated their confidence as 5-10. In the post activity survey 10% of students rated their confidence as 1-4, and 90% rated their confidence as 5-10. In the pre-activity survey, students identified "clarity of information" and "interactive nature of activity" as factors that make a lecture beneficial. In the post-activity survey, students identified "case-based presentation" and "highlighting of important information" as benefits from the learning activity.

**Conclusions:** Students reported benefit in the peer-led pre-recorded lecture and interactive case-based learning. Students reported increased confidence in characterizing different pulmonary infections after completing an interactive case-based session on pulmonary infections. Students reported satisfaction with the clarity of information presented during the

peer-led teaching lecture. Further investigations should explore the impact of peer-led and case-based learning sessions on student performance and how curriculum design committees can incorporate more peer-led teaching sessions into medical education curriculum.