

## Introduction

- Grand round conferences are an integral part of residency education, particularly in emergency medicine (EM), and play a crucial role in teaching residents knowledge, competency, and practice of EM.
- The primary teaching method utilized in these conferences has been the traditional lecture model (TLM)<sup>1</sup>. Recently the TLM has been questioned due to its lack of learner engagement<sup>2</sup>. The flipped classroom model (FCM) - an instructional strategy that encourages learning at home and practice in the classroom - has gained popularity due to its student-centered approach<sup>3,4</sup>.
- Although studies on FCM's use in medical education have found evidence of increased satisfaction among residents, there is a lack of evidence for improved medical management or knowledge acquisition<sup>5</sup>.

## Purpose

The aim of the project is two-fold:

1. The primary objective is to determine whether FCM, when compared to the TLM, results in a significant change in a resident's medical management of atraumatic back pain in the emergency department (ED).
2. The secondary aim is to determine whether FCM, when compared to TLM, results in a significant change in resident education, as measured by knowledge acquisition in residents.

## Methods

- A retrospective electronic medical records (EMR) review of atraumatic back pain (ABP) patients, who were treated by residents, will be conducted.
- All residents training at Sinai Grace Hospital (SGH) and Detroit Receiving Hospital (DRH) EDs during the 2019-2020 academic year will be included in the study.
- SGH residents will be educated on ABP management via TLM, and DRH residents via FCM.
- To assess the primary aim, we will compare how closely residents' medical management of ABP patients aligns with the American College of Emergency Physicians' guidelines.
- To assess the secondary aim, we will administer a multiple-choice quiz relating to ABP diagnosis and management to all residents before the teaching intervention, and then again six months afterwards.

## Analysis Plan

- Data for the primary aim will be retrospectively collected from the EMR at both SGH and DRH.
- All patient data will be de-identified and then analyzed by a statistician using standard statistical techniques.
- Data for the secondary aim will be transcribed onto an EXCEL spreadsheet and stored on a secure WSU server.
- Unique identifiers from pre- and post-intervention data sets will be compared to verify the same participants in each group.
- Data will be analyzed using standard EXCEL statistics functionality.

## Conclusions

- This study will investigate whether a flipped classroom model, compared to the traditional learning model, results in a significant change in resident medical management and knowledge acquisition. We anticipate our study will contribute to a better understanding of FCM's effectiveness in medical education and inform future studies on this subject.
- By improving learner engagement and transforming residency education to be more student-centered, we hope to simultaneously enhance resident satisfaction and competency, ultimately leading to better patient outcomes.

## References

1. Cooper AZ, Richards JB. Lectures for Adult Learners: Breaking Old Habits in Graduate Medical Education. *Am J Med.* 2017;130(3):376-381.
2. Hurst JW. The overlecturing and underteaching of clinical medicine. *Archives of internal medicine.* 2004;164(15):1605-1608.
3. Khanova J, Roth MT, Rodgers JE, McLaughlin JE. Student experiences across multiple flipped courses in a single curriculum. *Med Educ.* 2015;49(10):1038-1048.
4. Moraros J, Islam A, Yu S, Banow R, Schindelka B. Flipping for success: evaluating the effectiveness of a novel teaching approach in a graduate level setting. *BMC Med Educ.* 2015;15:27.
5. Chen F, Lui AM, Martinelli SM. A systematic review of the effectiveness of flipped classrooms in medical education. *Med Educ.* 2017;51(6):585-597.