



# The Effect of a Flipped Classroom Learning Model versus Traditional Lecture Model on Residents' Decision-Making on Lumbar Spine Imaging for Non-Traumatic Back Pain in the Emergency Department

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## INTRODUCTION

- Previous studies have shown that the flipped classroom model of education improves resident satisfaction by increasing learner engagement. However, there is currently little data on whether this approach promotes a significant change in knowledge acquisition or in resident clinical practice above traditional learning methods.
- The ACEP "Choosing Wisely" Campaign suggests that lumbar imaging should be avoided for non-traumatic back pain in the absence of red-flag exam findings or risk factors. This is an optimal topic for an educational intervention involving chart review.
- This study will contribute to improved understanding of the role of flipped classroom in clinical medical education pertaining to common conditions treated in the ED.

## PRIMARY AIM

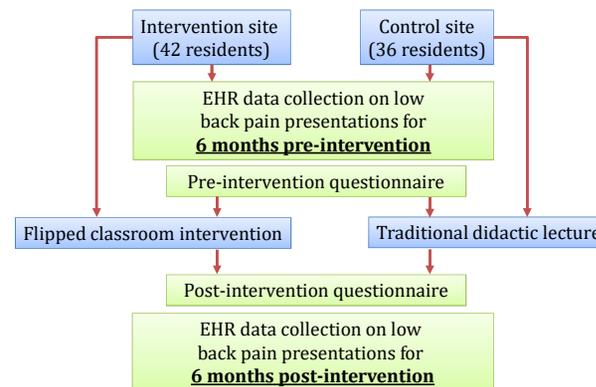
- To determine whether implementation of a flipped classroom intervention results in significant changes in resident decision-making relating to lumbar spine imaging for non-traumatic back pain in the emergency department (ED) when compared to a traditional didactic lecture.

## SECONDARY AIM

- To determine whether the flipped classroom model improves knowledge acquisition for learners when compared to a traditional lecture.

## METHODS

- Resident physicians at the intervention site will receive the flipped classroom intervention while residents at the control site will receive a traditional didactic lecture. Both the intervention and control lecture will be facilitated by the same faculty member who is unaware of the study goals.
- We will perform a retrospective review of the electronic health record (EHR) for patients presenting to two academic urban EDs with a primary complaint of non-traumatic back pain over a 12 month study period (June 2019-June 2020) including the 6 months before and after the intervention. Only patients treated by a resident physician will be reviewed.
- Patient management outcomes (i.e. appropriateness of lumbar spine imaging) will be extracted from the EHR and compiled into an electronic REDCap database. Outcomes will be compared before and after the flipped classroom intervention to measure the potential impact of the intervention.
- Residents at both sites will also complete a brief test two weeks before and two weeks after the intervention including questions related to the content of the intervention to measure the degree of knowledge acquisition and retention. Test data will be de-identified and matched by a faculty member who is not involved in the delivery of the intervention prior to analysis.



## RESULTS

- We have completed the educational intervention and control lecture including a total of 78 resident physicians (36 at the control site and 42 at the intervention site). Participants at both sites have completed the pre- and post-intervention questionnaires and these responses have been de-identified and paired. A total of 58 (70.7%) subjects completed both questionnaires.
- We are currently scoring the questionnaires and compiling the data for analysis. The EHR chart review has been begun, but is not yet completed. Once we have completed the data extraction and compilation, we will progress to the data analysis phase of the study.

## CONCLUSIONS

Pending completion of data collection.