

Do Residents Matter? An exploratory study on the impact of residents on practice patterns in an academic Emergency Department

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HERS program

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HERS program

- Health Education Research Scholarship
- Year long program to guide new researchers in the art of educational research
- MERC earned
- Develop a research project from start to finish
- Goal of publication



Background

- Minimal prior research on the effects of residents
 - Older studies, community ED
 - No change cost of care with residents (1992)¹
 - No change in ancillary test utilization (1998)²
 - Conflicting data
 - No change in number of patients seen, 43K volume (2010)³
 - Increase in patients/hour seen when a resident was present, uncertain if varies with level of learner (2014)⁴
- Variation exists in ordering practice in the Emergency Department
 - Potential pros: educational/experiential growth of learner
 - Potential cons: cost, test utilization, time spent

1. McNamara RM, Kelly JJ. Cost of care in the emergency department: Impact of an emergency medicine residency program. *Ann Emerg Med* [Internet]. 1992 Aug 1 [cited 2018 Mar 1];21(8):956–62.

2. Sexton JD, Heller MB, Patterson JD, Pronchik D, Melanson SW. Impact of emergency medicine residents on ancillary test utilization. *Am J Emerg Med* [Internet]. 1998 May [cited 2018 Mar 1];16(3):245–8.

3. McGarry J, Krall SP, McLaughlin T. Impact of resident physicians on emergency department throughput. *West J Emerg Med*. 2010;11(4):333-335

4. Bhat B, Dubin J, Malov K. Impact of Learners on Emergency Medicine Attending Physician Productivity. *West J Emerg Med* [Internet]. 2014 [cited 2017 Dec 7];15(1):41–4



Research Question

- How do residents impact practice patterns in a large academic level 1 trauma center Emergency Department?
- Are attending physicians aware of practice pattern changes when a learner is present?



Aims & Hypotheses

1. To determine if a difference truly exists in resident practice patterns throughout their three years of residency (PGY1, PGY2 and PGY3)
 - Resident practice patterns evolve throughout training
2. To determine attending practice patterns and any changes resulting from the presence of a learner
 - Attendings practice differently in the presence of a learner
3. To determine the accuracy of attending physician perception of their practice patterns
 - Attendings accurately perceive their own practice changes and the effects of a learner



Method

- N= 86,000 visits to our urban academic level 1 trauma center Emergency Department (ED) between July 1, 2017, and June 30, 2018
 - EMR data (n=45,379)
- Emergency medicine attending physician group was individually administered a self report practice survey via REDCap (n=45)
- Exclusions: Patients cared for by an attending provider who did not complete REDCap survey, PA/NP/off service resident patients



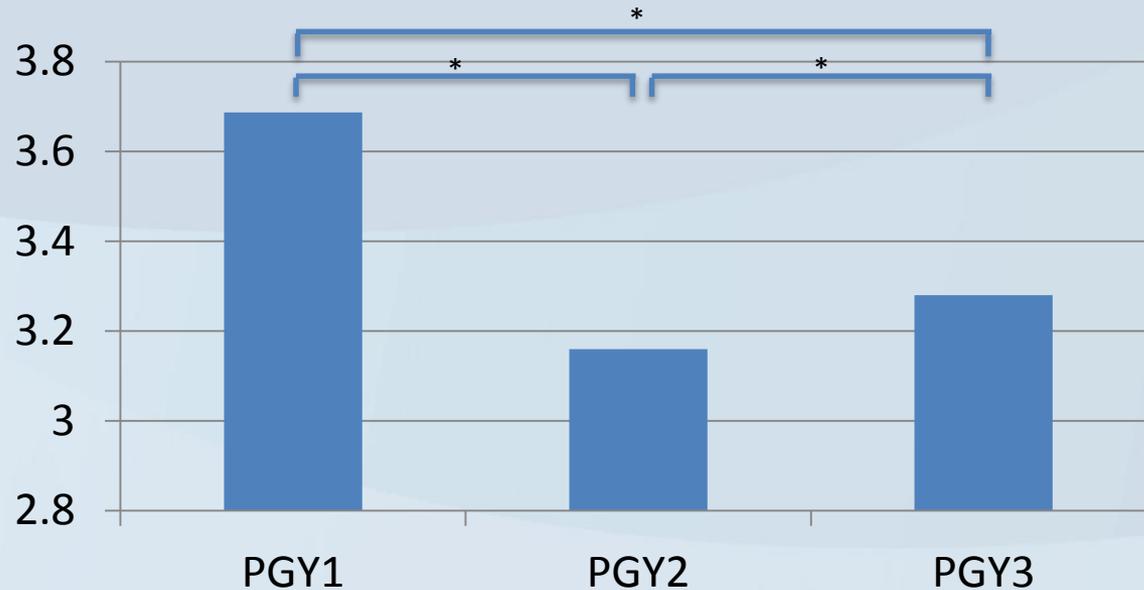
Method: Analysis

- t test, ANOVA, Chi²
- Dependent variables
 - Orders for CT imaging for patients presenting with one of the top 3 chief complaints (abdominal pain, chest pain or shortness of breath)
 - Admission rates for all patients and those with chest pain/shortness of breath
 - Utilization of cardiology consultation with a chief complaint of chest pain.
 - Disposition time variability of overall patients



Results- Learner variation

Time to Disposition in hours (n=45,379)

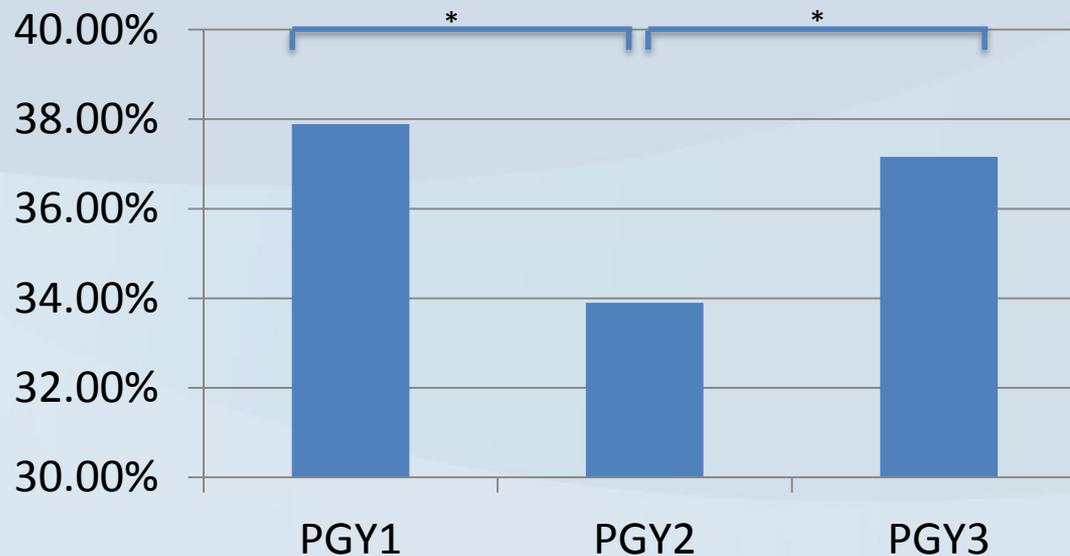


- PGY1 had longer time to disposition compared to PGY2 or PGY3 ($p < 0.0001$)
- PGY 3 had longer time to disposition compared to PGY2 ($p < 0.0001$)



Results- Learner Variation

Overall Admission Rate (n=45,379)

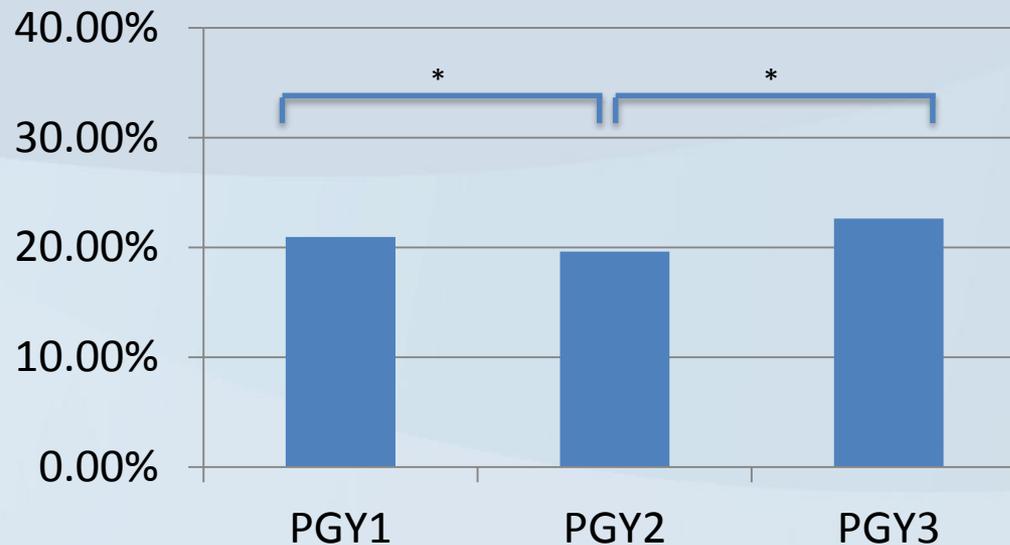


- PGY2 had lower admission rate when compared to other learners ($p < 0.0001$)



Results- Learner variation

CT utilization overall (n=45,379)



- PGY2 ordered less CT overall than other learners ($p < 0.0001$)



Results- Learner Variation

CT ordering rates for chest pain/shortness of breath (n=6,479)

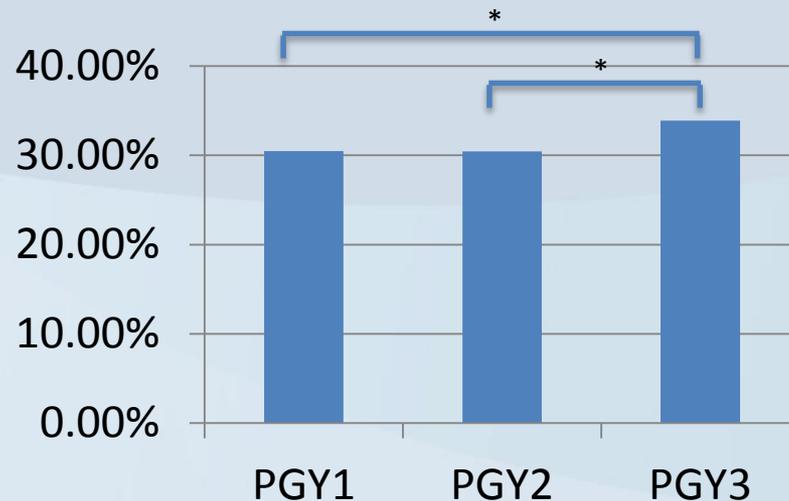


- PGY3 order more CT images when assessing patients with chest pain or shortness of breath ($p=0.0336$)



Results- Learner Variation

Cardiology Consultation Rates (n=3,721)



- PGY3 had more consultations to cardiology than other learners ($p=0.0011$)

Post Hoc Analysis for Acuity of Chest Pain patients

- PGY3 had more immediate acuity patients with chest pain than other learners ($p=0.0435$)



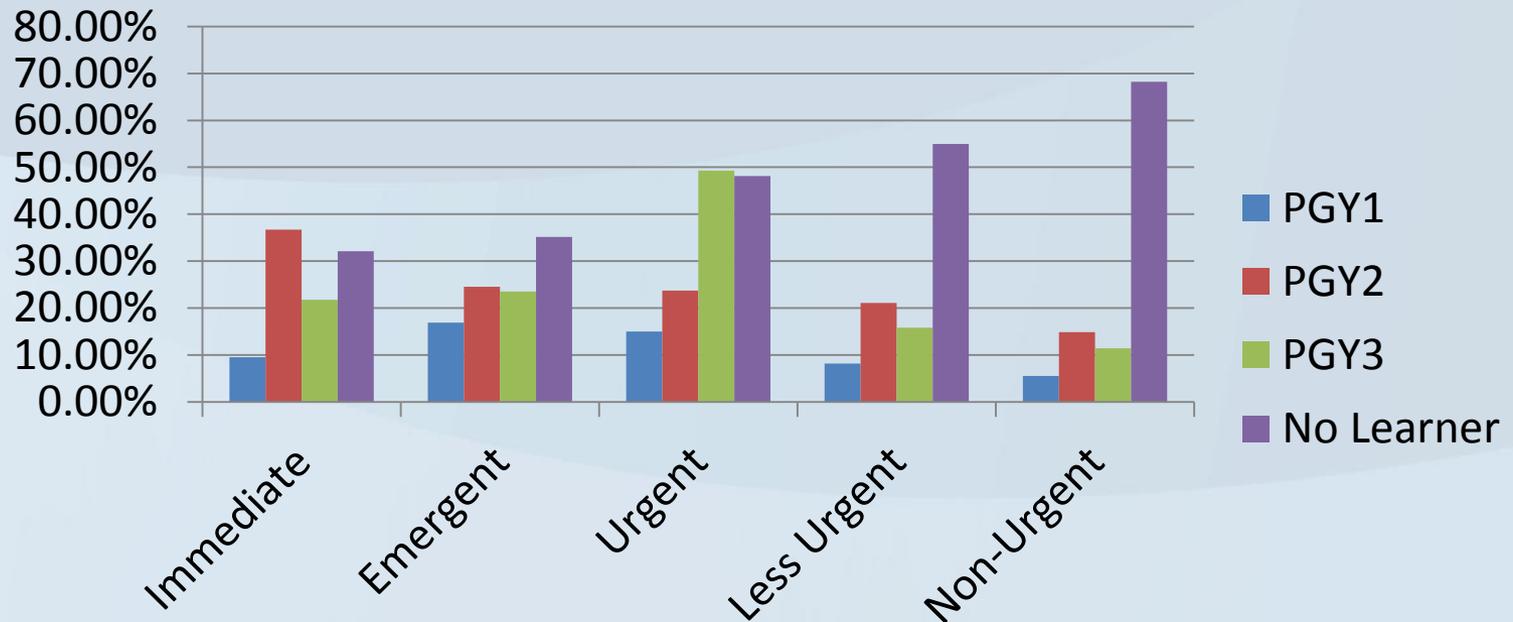
Results- Learner Variation

- Nonsignificant findings
 - Rates of CT orders for abdominal pain are similar across all learners (n=4,227)
 - $p=0.1348$
 - Average 38%
 - Rates of admission for patients with chief complaint of chest pain or shortness of breath (n=6,479)
 - $p=0.6261$
 - Average 50%



Results – Post Hoc Analysis of Learner Variation

- Acuity



- Urgent patients seen rather equally across PGY2, PGY3, no learner
- PGY1 sees more urgent than the others relative to their own patients seen



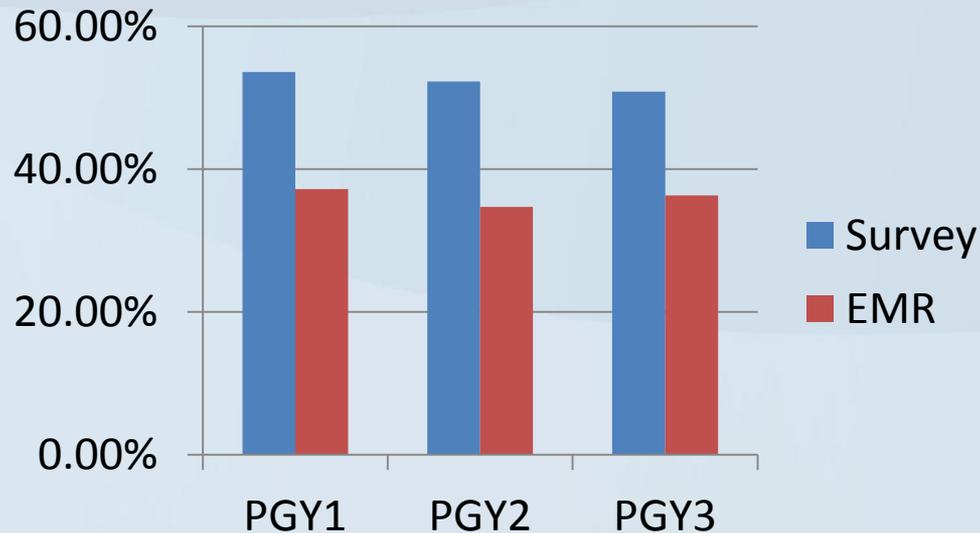
Results – Attending Practice Patterns

	Attending alone	Learner present
Overall CT orders ($p < .0001$)	22.98%	27.79%
CT cp/sob ($p = 0.0362$)	18.84%	21.05%
CT abdominal pain ($p = 0.0614$)	41.39%	38.74%
Cardiology consult ($p = 0.0005$)	18.2%	21.89%
Cp/sob admit ($p = 0.2714$)	48.5%	49.94%
Overall admit ($p < 0.0001$)	26.06%	35.99%
Disposition time ($p < .0001$)	2.87 hours	3.33 hours



Results- Attending Perception

- Attendings overestimated the impact of learners on increase in ordering than was present per EMR data ($p < .0001$)
- Admission rate, example consistent with all data



Conclusion

1. Variability exists amongst emergency medicine residents practice patterns
2. Attending physicians are practicing differently when without a learner.
3. However, their perceptions of precisely *how* different they practice with a learner were not accurate



Discussion: Learner Variation

- Learner variations exist
- Learners overall seeing less non-acute patients
- PGY1
 - Longest time to disposition
- PGY2
 - Least overall CT rate
 - Lowest overall admission rate
 - Lowest cardiology consult rate
 - Shortest time to disposition
- PGY3
 - Most CT consults
 - Highest CT for cp/sob rate



Discussion: Attending Practice Patterns

- Attending practice patterns change when working without a learner
 - Lower admission rates, CT for cp/sob and overall, cardiology consultation rates
- Attendings inaccurately perceived and overestimated the impact of learners
 - Chose similar rates of effect down the line of a survey as if it was an evaluation
 - Truly believe their practice is affected this drastically by learners



Educational Impact

- Awareness of these findings could be utilized to guide the education and efficiency of the residents
 - Zoning/staffing
 - Attendings in triage seeing non-acute patients
 - Department podded
 - Acuity within patient population
 - Focus of education
 - Volume of patients seen
 - Guide staffing for greater educational experience



Future Research

- Determine contributing factors to differences
 - Staffing, layout, education platform
- Determine any changes in practice patterns with awareness of prior data
- Further adjustment for breakdown of acuity by learner in each measured practice pattern could lead to greater understanding of inter-learner differences shown in our study



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