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Increasing Intern Admissions Through a Quality Improvement Workshop

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Abstract

Medical education is often structured in ways that do not support early autonomy in clinical decision making. At one internal medicine residency with 74 categorical residents, 17% of admissions were performed by interns; senior residents engaged in clinical decision making for new patients in isolation while interns performed delegated tasks. We focused our intervention on increasing intern admissions to foster senior resident teaching and allow interns deliberate practice in making major clinical decisions. Four workshops were conducted with 73 categorical residents, with an average of 18 residents per session. Residents were instructed on fish-bone diagrams and listed factors that contributed to the lack of intern admissions. Residents presented and discussed aim statements with one another with the majority proposing to increase intern admissions by a set date in time. Residents employed these techniques at an Academic Half Day workshop in Spring 2022 to address why only 17% of admissions were done by interns. Aim statements written by groups of residents at these workshops were recorded; the majority of statements focused on increasing intern admissions by a set date with a discussion on the ways the senior and intern expectations would change. Reflecting these proposals, a program guideline was outlined by the program for increasing intern admissions in July 2022. The primary endpoint for evaluation was intern admissions. At the start the number of admissions performed by interns rose to 41%, with a sustained increase over one year later at an average of 74% for the 2023-34 Academic Year. Focusing resident dialogue on the problem of low intern admissions unified resident efforts to resist external influences focused on productivity and an insular team culture that protected interns at the expense of their development.

Residency programs with low intern admissions may benefit from using our model of a quality improvement program to develop a durable increase in intern admissions.

BACKGROUND:

In the seminal 2015 report “Improving Diagnosis in Health Care” the Institute of Medicine (IOM) highlighted structures in medical education that result in an unacceptable level of diagnostic error in clinical decision making.[1] One, residents do not receive enough feedback for deliberate practice.[2] Two, hierarchies among residents prevent junior team members from speaking up about errors.[3] Finally, trainees who learn from prototypical case studies, such as those used in boards preparation, may struggle with diagnosis when faced with the complexities of real patients.[2]

Residency programs and national GME leadership acknowledge the challenges caused by time constraints on residents managing high-complexity patients at teaching hospitals in the 2023 ACGME Common Program Requirements section on Clinical Responsibilities (VI.E.1).[4] While few would advocate increasing the number of hours worked by trainees, multiple studies describe a reported decline in the educational environment after the implementation of duty hours.[5,6] A 2014 survey of 237 internal medicine program directors found that after duty hour restrictions, 60% of respondents felt that resident education was worse and 70% felt that resident preparation for senior roles was worse.[7] A 2006 survey of 202 internal medicine residency programs found that after implementing duty hour restrictions programs did not reduce time on inpatient services but redistributed workload, with 31% of programs reporting that interns did fewer admissions on long-call.[8] This highlights a fundamental problem: can residents improve clinical decision making and spend more time with patients without sacrificing well-being?

Our residency program reflected these national trends after enacting duty-hour restrictions. Admissions on the inpatient medicine service went from being performed by interns to being performed by senior residents. This structure was a result of changes that improved education in other ways: moving from call to a shift-based schedule, adopting a dedicated ambulatory block schedule, and adding inpatient off-service coverage on weekends. But excluding interns from the admissions process resulted in the deficiencies highlighted in the IOM report: minimal teaching and feedback, rigid hierarchy with top-down delegation, and less time spent with patients.

Residents and leadership were dissatisfied, yet after program and resident-led initiatives to increase intern admissions in 2018 and 2020 only 17% of admissions were performed by interns. We conducted a workshop to elicit solutions from the residents with a durable increase in intern admissions over subsequent years.

SETTING AND PARTICIPANTS:

Our internal medicine residency program of 74 categorical residents is based out of an urban teaching hospital serving an underinsured population. In 2021, an internal survey of the residents revealed two categories in which our program was performing worse over consecutive years. Namely, respondents disagreed with the statements, “the program is organized in a way to meet my educational needs,” and “the variety of patients I see is sufficient for meeting my educational needs.”

Elected resident representatives highlighted the current team structure as a major problem within the program. Daytime admissions to the six inpatient teams were performed by each team's senior resident with discussion of major clinical decision making with the attending. Three senior residents performed admissions on a rotation at night with distribution based on team census; seniors presented admissions to other residents in the morning after signing out. Senior residents supervised interns and medical students on adherence to a plan where most clinical decisions were already made.

In the spring of 2022 the residency program director, associate program directors, and chiefs conducted a workshop during academic half day on quality improvement techniques.

PROGRAM DESCRIPTION:

Four separate sessions comprising 73 categorical residents were conducted with an average of 18 residents per session; one categorical resident in the program was not included due to absence. Each session was approximately 2 hours and began with a five-minute introduction to studying quality improvement with emphasis on “every system is perfectly designed to get the results it gets.”[16] We presented ACGME milestones on inpatient management[11] and presented the problem: the educational goals of the program leadership and residents to increase admissions performed by interns were aligned, yet admissions were still done by seniors. Addressing the real and perceived barriers to this was the focus of our workshop.

Each session was divided into groups of 3-4 residents, comprising representatives from each year. Residents were given 15 minutes in small groups to identify contributing factors that led to the majority of admissions being performed by senior residents using Ishikawa[12] or fish-bone diagrams.

They were then given 20 minutes to present to one another and identified several themes. Seniors described being unwilling to burden inexperienced categorical PGY-1 residents or other team members including medical students, as well as preliminary residents, Psychiatry, and Podiatry residents. Ensuring team members were able to leave on time was a priority. Interns and senior residents identified factors related to efficiency including the high volume of admissions on a shift, advancing patient care, and prioritizing early discharges. Frequent bidirectional communication from nursing and consulting services generated new tasks. The volume of admissions close to the end of the shift was cited as a factor preventing the team from leaving on time.

A 10-minute lecture was delivered on the concept of an aim statement (an explicit summary), with advice on using SMART criteria (specific, measurable, actionable, realistic, timely).[13] Over the next 15 minutes, residents developed aim statements in their groups to propose an intervention meant to address one of the factors they identified. Aim statements were then presented over a period of 20 minutes to their peers and recorded by program leadership.

While data from the first workshop was not obtained, 14 of 16 aim statements proposed increasing admissions performed by interns at a set date. Two statements proposed a structured orientation on teaching and a focused teaching rotation.

At each workshop, resident-led dialogue centered around concerns related to time constraints; many interns wanted to practice doing more admissions and seniors offered to manage nursing messages and inpatient care. When experience was cited as a concern, many interns noted that they could not gain experience without doing admissions.

As the aim statements generated and discussed by residents mostly set a goal for increasing intern admissions the program leadership announced new team guidelines to have the majority of admissions performed by interns after July 1st, 2022. This was announced one month before to rising PGY-2's and PGY-3's through the monthly medicine council meeting, noon conferences, and email. The orientation presentation delivered to interns in late June included these new recommendations.

No mandates or requirements were made regarding managing inpatient tasks; senior residents were given autonomy when determining what was best for the learning environment for their team. Semi-annual evaluation of senior residents after the first 6 months of implementation included a focus on resident teaching.

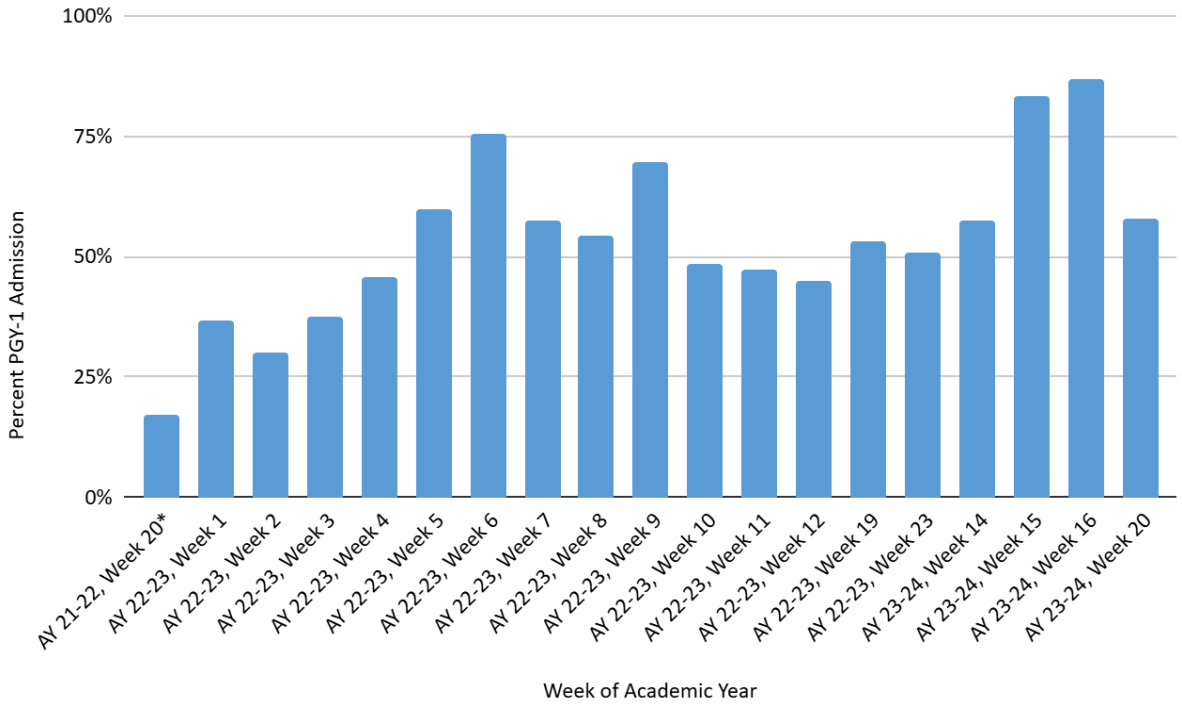
RESULTS

The percentage of admissions performed by interns was the primary endpoint used to evaluate our intervention. An increase in admissions was sustained over six months of the 2022-23 year with intern admissions in December 2022 of 53% (table). A repeat audit in four separate weeks using the same methods was conducted in the 2023-24 Academic Year from October to November. Over that time 74% of admissions were supervised, marking a sustained increase over 17 months in the number of PGY-1 admissions, as well as an increase over the same reporting period as the prior academic year.

Admissions were based on a total census of six inpatient medicine teams on a day of the week and were stratified by who wrote the admission note. We chose Thursday, since this was the day the team census was often highest allowing capture of the most admissions, residents were not aware we were collecting this data. Admissions were stratified by date of admission. This evaluation was performed for 12 consecutive weeks starting in July 2022 and at a single point once in November and December of 2022 as well as four times in October and November 2023 for a total of 1366 admissions. There were 783 supervised admissions performed by PGY-1s, 573 admissions performed by seniors. Only 28 admissions were performed by medical students during the times surveyed and did not substantively change over reporting periods.

Patients who remained on the census for over one week were not counted in subsequent weeks. Patients initially admitted to the ICU and transferred to medicine

were evaluated on who wrote the transfer note. Notes written by medical students were counted as intern admissions during the study period. Admissions conducted before 7/1/2022 prior to our goal for admissions were not formally counted.


100%
75%
50%
25%
0%
Percent PGY-1 Admission
AY 21-22, Week 20*
AY 22-23, Week 1
AY 22-23, Week 2
AY 22-23, Week 3
AY 22-23, Week 4
AY 22-23, Week 5
AY 22-23, Week 6
AY 22-23, Week 7
AY 22-23, Week 8
AY 22-23, Week 9
AY 22-23, Week 10
AY 22-23, Week 11
AY 22-23, Week 12
AY 22-23, Week 19
AY 22-23, Week 23
AY 22-23, Week 14
AY 23-24, Week 15
AY 23-24, Week 16
AY 23-24, Week 20
Week of Academic Year

DISCUSSION;

All six program directors in a 2010 comparative study of program design strongly agreed in involving stakeholders in the process of change when implementing service redesign.[9] Our program gave residents a key role in how the inpatient service was restructured. Fish-bone diagrams helped residents identify external pressures driving them to productivity such as bidirectional communication, volume of admissions, and team dynamics that interfered with teaching. Senior residents adopted a protective role as team leaders, but later recognized how this limited the growth of the interns on their team. After writing aim statements, interns identified that while they valued leaving on time, doing admissions was crucial to their development. Measuring a steady increase in admissions over time supports the value of this intervention.

Official program policy change began on July 1st, but our data shows a period of transition where new senior residents were adjusting to a team structure focused on teaching. Twelve consecutive weeks of admission data from 7/1/2022 to 9/26/2022 were collected for a total of 867 admissions. In the first four weeks of the 2022-2023 academic year, only 41% of admissions were done by PGY-1s. Six months later, 53% of admissions were done by seniors. One year later over a similar time period, the average number of intern admissions was 72%. In the 2010 comparative study of 6 major academic programs, PGY-1s were capped at 5 admissions per PGY-1 call shift at five out of six programs which is consistent with ACGME restrictions.[9] Percent admissions were not broken down by PGY year in this study but achieving an average of 72% of intern admissions is comparable.

Program level information was shared with the resident representatives, who shared it with all residents. Individual admissions data was shared with program leadership who used this to discuss competencies in teaching and education with senior residents at their semi-annual reviews starting in December 2022.

CONCLUSION

There are several limitations to our conclusions. Our focus was on improving resident education based on declining scores on our internal survey, yet survey results in subsequent years did not demonstrate improvement after our intervention. The most likely explanation is the closure of our hospital and the absorption of our residency program into another with many unexpected changes. Productivity and efficiency were not measured as part of this educational evaluation. Preliminary residents were not included in our workshops due to availability. Evaluation in 2024 was not performed after our program was merged with another program due to adoption of a different admitting system located at another hospital. Finally, data collection on a weekly basis was time-intensive so our data contains gaps that may not accurately describe aggregate trends.

In the January 2024 issue of the New England Journal of Medicine, cardiologist and medical educator Lisa Rosenbaum wrote an essay highlighting the difference between necessary and unnecessary discomfort in medical training as residents push back against historically exploitative practices and hierarchies.[14] To return to the question

posed at the beginning: can residents improve their clinical decision making and spend more time with patients without violating duty hours?

A national decline in admissions performed by PGY-1s reflects this challenge. By focusing on PGY-1 admissions and giving residents the ability to participate in restructuring, our program demonstrates a successful approach to voluntarily increasing those admissions. Programs with low rates of PGY-1 admissions stymied by a lack of deliberate practice and senior resident teaching may benefit from adapting the approach we describe here.

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Internal Review Board and Ethics Approval:
Per United States Code of Federal Regulations, this research meets criteria for exemption from the Department of Health and Human Services Policy for Protection of Human Research Subjects because it was conducted in an established educational setting and involved only normal educational practices that are not likely to adversely impact students opportunities to learn required educational content or the assessment of educators who provide instruction.
45 CFR 46.104(d)(1) https://www.ecfr.gov/current/title-45/subtitle-A/subchapter-A/part-46#46.104

Human Ethics and Consent to Participate Declarations:
Conducted as part of an established educational setting that involved normal educational practices and exempt from ethics review and consent to participate under United States Code of Federal Regulation. 45 CFR 46.104(d)(1)

Accordance Statement:
The authors state that all procedures contributing to this work comply with the ethical standards of the relevant national and institutional committees on human experimentation and with the Helsinki Declaration of 1975, as revised in 2013.

Clinical Trial Number: Not applicable.

Consent for Publication: Not applicable.

Data Availability: The datasets during and/or analyzed during the current study available from the corresponding author on reasonable request.

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