Outcomes of a Resident-Led Early Hospital Discharge Intervention

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ABSTRACT:

BACKGROUND: Early morning patient discharge from the hospital is increasingly being recognized as a key dimension of quality of care. At our institution, there is a significantly lower early discharge rate on the teaching hospitalist teams in comparison with the non-teaching teams.

OBJECTIVE: To implement a resident-driven intervention in the teaching medical services to increase overall discharge order rate before 11 am (DOB-11) and assess the effect of this intervention on hospital length of stay (LOS), 30-day readmission rates (RR), and resident perception.

DESIGN: Interrupted time series as well as controlled before-after designs.

PARTICIPANTS: All inpatients discharged from general medicine units.

INTERVENTIONS: We implemented an educational didactic in conjunction with resident-attending daily walk rounds followed by resident-led multidisciplinary discharge huddles to identify next-day discharges.

MAIN MEASURES: The primary outcome was DOB-11 rates 18 months pre- and 12 months post-intervention. Secondary outcomes: LOS and RR. Additionally, we assessed residents' perception of the early discharge protocol.

KEY RESULTS: The DOB-11 rate increased from 12 to 29% ($p < 0.001$), LOS increased by 1.47 days ($P < 0.001$), and RR increased by 0.32% ($P = 0.84$), respectively, on the teaching teams. Compared with the non-teaching (control) teams, the teaching teams registered a greater increase in DOB-11 rate (by 17%, $p < 0.001$; ratio of adjusted ORs 2.16; 95% CI, 1.65, 2.85; p value < 0.001), small increase in LOS (by 0.74 day, $p = 0.39$; ratio of adjusted post-/pre-intervention ratio [teaching] and post-/pre-intervention ratio [non-teaching] = 1.05, 95% CI, 0.97, 1.14, $p = 0.23$), and relative increase in RR (by 3.98%, $p = 0.07$, and ratio of ORs = 1.35, 95% CI, 1.03, 1.8), $p = 0.03$). Approximately 55% (16/29) of the

residents agreed that the early discharge initiative helped in understanding the importance of prioritizing patients for early discharge. Additionally, 55% (20/36) of the residents "agreed" that the early discharge initiative compromised their learning during teaching rounds.

CONCLUSION: Our study demonstrates that DOB-11 is an achievable goal, not only for non-teaching teams but also for resident-run teaching teams.

KEY WORDS: early hospital discharge; length of stay; readmission.

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INTRODUCTION

Late afternoon hospital discharges are associated with emergency department (ED) overcrowding,¹ delayed inter-unit patient transfers, lower patient satisfaction, and longer emergency room length of stay.^{2,3} Concerns about safety and quality of care impacted by delayed patient transfer from ED to inpatient beds have led the Joint Commission to implement a "patient flow standard"⁴ to prevent crowding and prolonged boarding of patients in the ED and other temporary locations. Early morning discharge of inpatients is suggested as one solution to increase bed availability and timely inter-unit patient transfer.^{5–7} Consequently, early patient discharge from the hospital is progressively being integrated into physicians' performance measures. Despite these efforts, it remains challenging for many institutions to meet these expectations. At our institution, there has been a consistently low rate of early discharges in the teaching teams staffed by residents, interns, and a supervising hospitalist as compared with non-teaching hospitalist teams staffed by an advanced practice provider and a hospitalist. Historically, much of the emphasis is placed at the attendings/hospitalists level in terms of discharge time and rates across institutions. Less emphasis is placed on the analysis of teaching units' workflow and resident participation and leadership in increasing early discharge rates. To our knowledge, there are no studies that focused on specifically promoting residents as frontline champions charged with implementing early discharges. To this end, we implemented and assessed the impact of a resident-driven initiative to increase DOB-11 rates on the teaching teams, and whether this

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will impact LOS, 30-day readmission rates (RR), and resident perception in terms of impact on workflow and learning.

METHODS

Setting

The study took place at Stony Brook University Hospital, a tertiary care academic medical center in Long Island, NY. The study was approved by our Institutional Review Board, and no informed consent was required. The general medicine service is comprised of 4 teaching teams with a census of 15 patients, and 10 non-teaching teams with a census of 17 patients each. Each teaching team is staffed with two interns, two medical students, one resident, and a supervising hospitalist. An advanced practice provider and a hospitalist staff each non-teaching team. Both teaching and non-teaching teams consist of a similar population of general medicine patients.

Intervention

Educational Workshop: Definition of Responsibilities and Instructions for Walk Rounds Checklist Tool. Prior to intervention, a mandatory educational workshop was given to all 96-medicine residents, Post Graduate Year (PGY) one to three. The workshop included education on the importance of early discharge and impact on patient flow. Roles of the resident discharge protocol with a corresponding walk rounds checklist tool and discharge huddle guided template were reviewed (Table 1).

We implemented an early discharge protocol which consists of a two-part resident-led discharge process: Part A: attending-resident walk rounds using a rounding checklist tool and Part B: a multidisciplinary discharge huddle using a guided template.

Table 1 Discharge Walk Rounds Checklist of Tasks

Task	Responsible team member	When task should be completed
Identify and communicate with the attending—next-day potential discharges	Resident	During DC rounds
Patient education	Resident with attending supervision	After DC rounds
Identify transportation/home services/PT	Resident will discuss in multidisciplinary DC huddle	During DC rounds
Discharge paperwork and medication reconciliation for identified next-day discharges	Intern	After DC rounds
Discharge order in EMR	Resident	Early am of DC
Patient assessment for change	Resident and attending	Early am of DC
Final lab tests/review (this should be ordered for 4am)	Resident and attending	Early am of DC

PT physical therapy, DC discharge, EMR electronic medical record

Attending-Resident Walk Rounds. Attending and the senior resident for the team are required to conduct 20–30-min brief walk rounds between the hours of 2–4 pm to identify next-day discharges. During the walk rounds, senior resident and attending select patients that are appropriate for next-day discharges and conduct the following: (1) Discussion with the patient and family members about the plan for early morning of the following day, (2) Identifying if there are pending needs such as transportation, home care set up, physical therapy, etc. The checklist is to be completed by the resident after discussion with the supervising hospitalist during walks rounds (Table 1).

Multidisciplinary Discharge Huddle. After walk rounds, the senior resident attends 4 pm multidisciplinary discharge huddle with the case managers, social workers, and physical therapist to inform the team of the next-day potential discharges based on the completed checklist and discussion with the attending hospitalist. In order to guide the resident discussion during multidisciplinary rounds, a guided template was created to keep the discussion succinct with a focus on barriers to the next-day discharges identified (Online Appendix A). By the end of the day, the senior resident is responsible for supervising the interns and ensuring that the discharge paperwork and medication reconciliation are pre-planned and ready for next-day early discharge.

On the day of discharge, the patients identified from the previous day are prioritized for discussion on morning rounds at 9 am. After verbal discussion and patient evaluation with the supervising hospitalist, the senior resident places the early discharge order before 11 am.

Resident Buy-in/Ongoing Reminders and Weekly Feedback. The discharge educational workshops given prior to the intervention focused on emphasis on the positive impact of early discharge on workflow. A PGY 3 resident volunteered to be the designated early discharge resident champion. The resident champion sent daily pager or in-person reminders for walk rounds and discharge huddle. Additionally, the residency program directors emphasized the importance of early discharges during weekly resident reports.

Engaging the Hospitalists. Ongoing meetings took place with all teaching hospitalists with leadership (Chair of medicine and Division director) to educate faculty members on the early discharge protocol.

Data Collection and Analysis

Primary Outcome: Calendar Months Discharge Order Before-11 Percentages (DOB-11). To match our organizational criteria for early discharge, we recorded the date and time of the discharge order in the electronic medical record (EMR). We excluded patients categorized as “observation” status and deaths, and patients who left against medical advice. We analyzed 13, 781 patient visits during the pre-intervention

(January 1, 2016 to June 30, 2017) and post-intervention (August 1, 2017, through July 31, 2018) periods and excluded the transitional month of July 2017.

Secondary Outcomes: LOS and 30-Day RR. For secondary outcomes, we compared the LOS and 30-day RR during the periods before and after the intervention, and between teaching and control non-teaching teams.

Resident Trainee Perception. We assessed resident perception on the impact of the early discharge protocol in terms of their learning and change in daily workflow. A 4-question Likert scale electronic survey was sent to 58 residents who participated in the early discharge protocol 6 months after the intervention. Surveys were anonymous and voluntary and consisted of a free text field to allow residents the opportunity to identify any perceived barriers faced with the early discharge initiative (Online [Appendix B](#)).

Statistical Analysis. The Interrupted Time Series (ITS) regression analysis was performed to assess the secular trends in the outcomes during pre- and post-intervention periods. Although the intervention was introduced in the teaching teams only, we included a comparable control series (non-teaching teams) in a comparative design using multi-interrupted time series analysis (MITSA) to strengthen the result and interpretation of the single ITS analysis (SITSA).

The interrupted time series analysis cannot adjust for covariates; therefore, we additionally performed a controlled before-after intervention analysis by adjusting covariates in a multivariable mixed effect regression analysis.

“Univariate” mixed effect models were initially utilized to examine the marginal association between variables and the outcomes. Beside baseline variables, the “univariate” mixed effect model also included teaching vs. non-teaching and pre- and post-intervention and the interaction between teaching team status and pre-/post-intervention. For DOB-11 and 30-day RR, logistic mixed effect models were used. LOS was log-transformed to have better normality, and a linear mixed effect model was used. Factors that were significantly associated (p value < 0.05) with the outcome based on univariate mixed effect model were included in the final multivariable mixed effect model. The interaction terms between pre-/post-intervention and teaching/non-teaching were included in the final models regardless of its significance.

All statistical analyses were performed using SAS 9.4 (SAS Institute Inc., Cary, NC). Significance level was set at 0.05.

RESULTS

Demographics and Baseline Characteristics

Table 2 shows patient demographics and baseline characteristics according to the pre- and post-intervention as well as teaching and non-teaching team status. The baseline

characteristics of the study population were identical between teaching and non-teaching teams except for minor differences in the racial/ethnic compositions. The patient population during the post- vs. pre-intervention period had higher mean Charlson comorbidity score in both the teaching (2.9 vs. 2.5, $p < 0.001$) and the non-teaching teams (2.8 vs. 2.6, $p = 0.002$).

Primary Outcome: Rate of DOB-11

The DOB-11 rate increased from a pre-intervention baseline rate of 12 to 29% ($p < 0.001$). The ITS analysis (Fig. 1) showed that there was a significant boost in the DOB-11 rate in both teaching (increased by 25%, $p < 0.001$) and non-teaching teams (increased by 8%, $p = 0.001$) after the intervention was introduced to the teaching teams. The increase in DOB-11 is calculated by the predicted early discharge rate at month 20 (the month after intervention) and month 18 (the month before intervention). However, the post-intervention period increase in DOB-11 rate was significantly larger in the teaching teams compared with the non-teaching teams (difference of 17%, $p < 0.001$). Additionally, the controlled before-after analysis of the DOB-11 (Table 3) further confirmed the results of the ITS analysis. In a multivariable logistic model, both teaching and non-teaching teams registered increased rates of DOB-11 (teaching teams OR = 3.16, 95% CI, 2.48, 4.03, $p < 0.001$; non-teaching teams OR = 1.46, 95% CI, 1.29, 1.66, $p < 0.001$) but the increase in DOB-11 in the teaching teams was more than double that of the non-teaching teams (ratio of ORs = 2.16, 95% CI, 1.65, 2.85, $p < 0.001$).

Secondary Outcomes: LOS and 30-Day RR

The observed LOS during the post-intervention period increased by 1.47 days ($p < 0.001$) in the teaching teams and by 0.73 day ($p = 0.38$) in the non-teaching teams (Fig. 2). However, the difference in the increase for teaching vs. non-teaching teams was not statistically significant (teaching teams registered 0.74 day more increase in LOS than the non-teaching teams, $p = 0.39$).

Most of the findings from ITS analysis were replicated in the controlled before-after analysis (Table 3). In a multivariable linear regression model, there was an increase in LOS in the teaching teams (1.12, 95% CI, 1.05, 1.20, $p = 0.004$) but the non-teaching teams also showed an increase (1.07, 95% CI, 1.03, 1.12, $p = 0.01$). However, consistent with the ITS analysis, there was no statistically significant difference in the relative increase in LOS between teaching and non-teaching teams (ratio = 1.05, 95% CI, 0.97, 1.14, $p = 0.23$).

We found no statistically significant difference in the average 30-day RR between post-intervention vs. pre-intervention periods in the teaching teams (increased by 0.32%, $p = 0.84$, and OR = 1.08, 95% CI, 0.87, 1.35 $p = 0.49$) but the non-teaching teams registered a statistically significant reduction in 30-day RR during the post-intervention period (decreased by 3.67%, $p = 0.02$, and OR = 0.80, 95% CI, 0.68, 0.95, $p =$

Table 2 Patient Demographics and Baseline Characteristics According to Pre- and Post-intervention as well as Teaching and Non-teaching Group Status

Variable	All	Non-teaching (n = 8730)		Teaching (n = 5051)		p value			
		Pre (n = 6061)	Post (n = 2669)	Pre (n = 2430)	Post (n = 2621)	Non-teaching, pre vs. post	Teaching, pre vs. post	Pre, non-teach vs. teach	Post, non-teach vs. teach
Age (mean ± SD)	67 ± 19	67 ± 19	67 ± 19	67 ± 19	66 ± 19	0.23	0.20	0.52	0.08
Female, n (%)	6988 (50.7)	3061 (50.5)	1376 (51.6)	1214 (50.0)	1337 (51.0)	0.37	0.47	0.65	0.69
Race, n (%)	Asian	261 (1.9)	112 (1.9)	47 (1.8)	36 (1.5)	0.002	0.06	0.01	0.02
	Black	927 (6.7)	436 (7.2)	165 (6.2)	151 (6.2)				
	Hispanic	388 (2.8)	177 (2.9)	69 (2.6)	68 (2.8)				
	Other	1278 (9.3)	598 (9.9)	222 (8.3)	215 (8.9)				
	White	10,927 (79.3)	4738 (78.2)	2166 (81.2)	1960 (78.7)				
BMI (mean ± SD)	28.3 ± 7.7	28.4 ± 7.8	28.3 ± 7.8	28.4 ± 7.5	28.2 ± 7.6	0.78	0.39	0.87	0.64
Comorbidity score (mean ± SD)	2.7 ± 2.6	2.6 ± 2.6	2.8 ± 2.7	2.5 ± 2.5	2.9 ± 2.7	0.002	< 0.001	0.07	0.43
Discharge Location, n (%)	AMA	215 (1.6)	98 (1.6)	48 (1.8)	28 (1.2)	0.002	0.03	0.18	0.12
	Home	9980 (72.4)	4429 (73.1)	1861 (69.7)	1809 (74.4)				
	Other	246 (1.8)	105 (1.7)	62 (2.3)	37 (1.5)				
	Skilled facility	3086 (22.4)	1315 (21.7)	645 (24.2)	512 (21.1)				
	Transfer	254 (1.8)	114 (1.9)	53 (2)	44 (1.6)				
Admission source, n (%)	ED	11,496 (83.4)	5222 (86.2)	2123 (79.5)	2101 (86.5)	< 0.001	< 0.001	0.58	0.41
	Other	45 (0.3)	16 (0.3)	16 (0.6)	3 (0.1)				
	Referral	835 (6.1)	265 (4.4)	182 (6.8)	137 (5.6)				
	Transfer	1405 (10.2)	558 (9.2)	348 (13.0)	189 (7.8)				
DOB-11, n (%)	4840 (35)	2429 (40)	1367 (51)	294 (12)	750 (29)	< 0.001	< 0.001	< 0.001	< 0.001
Length of stay, days (mean ± SD)	7.1 ± 18.9	7.36 ± 19.1	8.5 ± 30.7	5.65 ± 6.4	6.52 ± 7.3	0.07	< 0.001	< 0.001	0.001
30-day Readmission, n (%)	1573 (11.4)	702 (11.6)	258 (9.7)	283 (11.7)	330 (12.6)	0.01	0.31	0.94	< 0.001

p values are based on linear mixed effect model (age, BMI, comorbidity score, and length of stay), logistic mixed effect model (gender and teaching group), or ordinal mixed effect model (race, discharge location, and financial class). Since some patients have multiple visits, mixed effect models were used to take into account within-subject correlation

0.01) (Fig. 3: ITS analysis and Table 3: controlled before-after analysis). As a result of the aforementioned opposite trends, there was a relative increase in 30-day RR in the teaching teams compared with non-teaching teams (the difference was 3.98%, $p = 0.07$, and ratio of ORs = 1.35, 95% CI, 1.03, 1.78) ($p = 0.03$).

Secondary Outcome: Trainees Perception of Early Discharge Intervention

29 out of 58 (50%) internal medicine residents participated and completed the post-intervention survey. Sixteen (16) out of 29 (55%) of the residents “strongly agreed” or “agreed” that the early discharge initiative helped in understanding the importance of prioritizing patients for early discharge. Conversely, the same percentage of the residents “strongly agreed” or

“agreed” that the early discharge initiative compromised their learning during teaching rounds. The most commonly cited reasons for compromised learning were as follows: (1) prioritization of early discharge took away valuable time from teaching during more active teaching cases, (2) inappropriate focus on stable patients that are ready for discharge. Overall, 12 out of 26 (41%) of the residents reported that prioritizing early discharge is likely to have a positive impact on future clinical practice.

DISCUSSION AND LIMITATIONS

In this relatively large observational study, we used complementary study designs and analytical approaches to demonstrate that increasing early morning patient discharge can be

Fig. 1 Interrupted time series analysis results for the rate of discharge orders before 11 am (DOB-11), before and after the intervention, by teaching groups and non-teaching groups (control).

Table 3 Controlled Before-After Intervention Multivariable Mixed Effect Analysis of the Primary and Secondary Outcomes: Post-intervention vs. Pre-intervention Period Changes in Outcomes Were Assessed for the Teaching Teams and Compared with Changes in the Non-teaching Teams

Variable	Levels	Value ¹ (95% CI)	p value
Early discharge before 11 am ²	Post-intervention vs. pre-intervention (teaching)	3.16 (2.48, 4.03)	< 0.0001
	Post-intervention vs. pre-intervention (non-teaching)	1.46 (1.29, 1.66)	
	OR of Post-intervention vs. pre-intervention (teaching) vs. OR of post-intervention vs. pre-intervention (non-teaching)		
	Ratio of ORs = 2.16 (1.65, 2.85), p value	< 0.0001	
LOS (length of stay) ³	Post-intervention vs. pre-intervention (teaching)	1.12 (1.05, 1.20)	0.004
	Post-intervention vs. pre-intervention (non-teaching)	1.07 (1.03, 1.12)	0.01
	Ratio of post-intervention vs. pre-intervention (teaching) vs. ratio of post-intervention vs. pre-intervention (non-teaching)		
	Ratio of ratios = 1.05 (0.97, 1.14), p value	0.23	
Readmission ²	Post-intervention vs. pre-intervention (teaching)	1.08 (0.87, 1.35)	0.49
	Post-intervention vs. pre-intervention (non-teaching)	0.80 (0.68, 0.95)	0.01
	OR of post-intervention vs. pre-intervention (teaching) vs. OR of post-intervention vs. pre-intervention (non-teaching)		
	Ratio of ORs = 1.35 (1.03, 1.78), p value	0.03	

¹Values are odds ratio (early discharge and readmission) or ratio (LOS)

²Logistic mixed effect models adjusted for age, admission source, comorbidity score (early discharge before 11 am) or adjusted for discharge location, admission source, and comorbidity score (readmission)

³Linear mixed effect model for log-transformed LOS (length of stay). Adjusted for age, gender, race, discharge location, financial class, admission source, and comorbidity score

achieved by implementation of a multidisciplinary discharge process. Although the DOB-11 rate in our study was increased in both the intervention (teaching teams) and the comparison non-teaching teams, the increase in DOB-11 rate was significantly larger in the teaching teams compared with the non-teaching teams, strongly indicating an effect attributable to the intervention independent of secular trends and baseline characteristics. We noted an initial rapid rise in DOB-11 trend immediately after the intervention, followed by a gradual decline over time. A decrease in adherence to the protocol is a potential explanation for the observed trends in DOB-11. This highlights the importance of sustainability planning (e.g., direct oversight of compliance and feedback) to maintain outcome achievements following quality improvement initiatives. Although similar effective interdisciplinary initiatives were shown to increase early morning discharges,⁸ our intervention was unique in that it placed residents in our teaching medical services as champions of the initiative.

One of the common concerns raised with early morning discharge initiative is its impact on other hospital outcomes such as LOS and 30-day RR. Our finding showed no significant change in the 30-day RR during the post-intervention period in the teaching teams. Consistent with a previous report,⁸ this finding suggests a neutral impact of the initiative on the 30-day RR. However, this assertion is not supported by the result showing a significant reduction in the 30-day RR in the non-teaching (control) team during the post-intervention period. There was no initiative that could account for the reduction in the 30-day RR in the non-teaching teams. Therefore, this outcome must be closely monitored in future studies. We found an increased LOS during the post-intervention period in the teaching teams. However, the non-teaching teams which were not subjected to the intervention also showed an increase in LOS that was comparable with the increase in LOS

Fig. 2 Interrupt time series analysis results for length of stay (LOS), before and after implementation of intervention, by teaching group and non-teaching group (control).

registered in the teaching teams, suggesting that the intervention per se might not be responsible for this trend. Although the post-intervention period patient population had higher comorbidity index, our multivariable adjusted analysis also demonstrated longer LOS in the post-intervention period. It is unclear what unmeasured confounder could have accounted for this trend. Two prior studies that evaluated the impact of a successful early patient discharge initiative on LOS had contrasting results. Wertheimer et al.⁸ found a small decrease in observed over expected LOS following its intervention. Contrasting the report by Wertheimer et al.,⁸ a retrospective study of 38,365 medical and surgical patients by Rajkomar et al.⁹

showed an association between longer LOS and early morning hospital discharge (adjusted odds ratio 1.04, 95% CI 1.00–1.09). Taken together, these studies evaluating the impact of early discharge interventions on LOS show contrasting results, which are likely due to differences in institutional settings, interventions, patient populations, research methodology, and research analysis as well as the presences of other unmeasured co-interventions.¹⁰

Our intervention was carried out in teaching hospitalist services and required revision of the resident workflow in order to integrate early discharge as part of the routine daily flow. Resident trainees are frontline providers and are well

Fig. 3 Interrupt time series analysis results for 30-day readmission rate, before and after implementation of intervention, by teaching group and non-teaching group (control).

suiting to identify and conduct early morning discharges of hospitalized patients. Teaching hospitals are charged with ensuring that trainees acquire meaningful and measurable skills in order to meet the increasing demand for efficiency upon graduation. To our knowledge, this is the first report on early morning discharge initiative engaging trainees as champions and assessing the impact of early morning discharge initiative on the learning environment or perception of trainees.

We believe that the early discharge initiatives are highly replicable at other institutions.

We believe the success of our program was reliant on 4 important factors: (1) identification of resident champions to promote peer leadership, (2) revision of the resident workflow to accommodate afternoon walking rounds and discharge huddles, (3) utilization of tools to standardize communication for prioritization of early discharges, (4) engagement of the leaders of the residency program to ensure the alignment of the hospital initiative with residency training. By incorporating all four factors, we were able to ensure buy-in and compliance with the intervention from all participating members. The social workers and case managers were key players in implementing the discharge huddle. They had a strong desire to participate since obtaining communication about discharge planning on the day prior was very helpful for their preparation of patient discharges.

There are several limitations of this study, beyond the inherent limitations of a pre-and post-retrospective observation design. First, it was a single center study at a large academic residency program, thus limiting its generalizability. We also acknowledge the limitation of the non-teaching teams as control group since there are substantial differences with the teaching teams with respect to the composition of team members and patient census. The hospital-wide heightened awareness of the importance of DOB-11 and increased emphasis on DOB-11 as a key performance measure for hospitalists may have elicited the Hawthorne effect, and this may be responsible for measurable changes in outcomes in the control non-teaching teams. We did not consider other important outcomes such as patient satisfaction and adverse events. Our focus for this study was to assess the impact on the intervention on early discharge rates and corresponding LOS, RR, and resident perception.

Although the early discharge initiative had perceived positive impact on clinical practice, a sizable fraction of surveyed trainees perceived the intervention had a negative impact on their learning. However, the sample size for the resident survey was small and the response rate was low which limits our ability to make a strong conclusion. Therefore, it is difficult to ascertain as to whether the early discharge initiative truly impacted education. Future studies can measure change in

residents' In-Training Exam Scores or overall medical knowledge milestones to assess changes in learning outcomes. We also did not conduct surveys to assess perceptions of the attending physicians. Therefore, we cannot make a comparison of the attending's perception with the trainee's perception.

Another limitation of the study is the lack of direct observation of compliance rate as part of the initiative's sustainability planning. Finally, we believe future research should look at more long-term impacts of early morning discharge interventions on ED crowding, boarding time, patient safety, cost, and both trainees' and attending physicians' perception.

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Compliance with Ethical Standards:

The study was approved by our Institutional Review Board, and no informed consent was required.

Conflict of Interest: The authors declare that they have no competing or conflict of interest.

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