Submitted from

E-DIP: Early Discharge Project. A Model for Throughput and Early Discharge for 1-Day Admissions

Hyung J Cho, Neil Desai, Angelita Florendo, Christine Marshall, Jaime Michalski, Nathan Lee, Andrew Dunn

To cite: Cho HJ, Desai N, Florendo A, *et al.* E-DIP: Early Discharge Project. A Model for Throughput and Early Discharge for 1-Day Admissions. *BMJ Quality Improvement Reports* 2016;**5**:u210035.w4128. doi:10.1136/bmjquality.u210035.w4128

Received 26 April 2016
Revised 4 May 2016

ABSTRACT

Short stay admissions that are outside of observation unit models hold challenges for throughput and decreasing length of stay (LOS). In our institution at Mount Sinai Hospital in New York City, United States, we noticed a lack of communication about potential next-day discharges from the day and night admission teams to the inpatient teams. Our hospitalist division started the Early Discharge Initiation Project (E-DIP), a system of flagging and communicating potential discharges to improve this problem. We used a multidisciplinary approach with PDSA cycles, engaging members of all teams involved in this process, including the nocturnists. We utilized a paper list, an EHR notification order, and email communication to relay potential next-day discharges. We created an awareness and educational campaign to reinforce the process and its importance. We then used a text paging system to remind the inpatient teams for early discharge. After the initiation of E-DIP, the average number of 1-day admissions per day increased from 0.9 to 1.6 (78% increase). Percentage of discharge orders before 11AM increased from 28% to 42%. Mean discharge time improved to 28 minutes earlier. E-DIP was successful in increasing 1-day admissions and mean discharge times.

PROBLEM

In our hospitalist division, we noticed a lack of communication about potential discharge plans from the admission teams to the next-day inpatient teams. Mount Sinai Hospital is an urban 1171-bed tertiary care hospital affiliated with the Icahn School of Medicine. The inpatient teams often prioritized daily workflow without this necessary information. This led to later visits during the day, and subsequent lost opportunity for early discharge planning on otherwise stable patients. Subsequently, this resulted in late discharges and extra day in LOS.

Verbal handoff between the admission team and next-day inpatient team did not occur in the existing system. Written handoff regarding patient information resided in the EHR in the admission and sign-out notes. Reviewing these

required multiple steps, including opening individual patient charts and various tabs, which can be time-consuming for a clinician in the morning with a full patient panel.

The admitting team included the physician assistants and nocturnists (night hospitalists). They did not regularly partake in patient care beyond the admission day, and in particular, the discharges. Unfamiliarity with these processes likely created an underappreciation for the complexity and needed expediency of early discharge planning.

BACKGROUND

Improving throughput and length of stay is essential for hospitals to operate efficiently and cost effectively. Hospitalists have shown to decrease LOS, cost, and throughput.^{1 2} However, 1-day admissions who are not placed into observation status hold specific challenges for hospitalists. High quality and efficient care can be achieved through observation units.³ Various models of physical or virtual observation units exist, but our hospital did not have one in place at the time of this project.⁴ In addition, literature and existing guidelines for inpatient handoffs do not include recommendations for early discharges and 1-day admissions, which made this process even more challenging.⁵

BASELINE MEASUREMENT

Baseline data was measured for all admissions to the medicine services without housestaff in Mount Sinai Hospital from 1/1/13 to 6/30/13. This included medicine admissions for hospitalist, gastroenterology, pulmonary, and other medicine private attendings. Total number of 1-day admissions was 169. Average number of 1-day admissions per day was 0.9. Of these admissions, percentage of discharge orders before 11AM was 28%. Mean discharge time for 1-day admissions was 3:58pm. [See [table 1](#)]

CrossMark

Mount Sinai Health Systems,
United States

Correspondence to

Hyung J Cho
hyung.cho@mountsinai.org

DESIGN

To improve this process, it became clear that we needed to design a better handoff process from admitting teams to next-day inpatient teams for conveying potential discharges. It needed a process outside of the EHR notes. We gathered a multidisciplinary team, including members of the admission teams (day physician assistants, nocturnists) and inpatient teams (day hospitalist, day nurse practitioners) to discuss potential improvements. We proposed that a system of flagging and communication from the admitting team to the following inpatient team regarding a plan for discharge would promote early and short (1?day LOS) discharge for these patients. Our aim was to increase 1-day admissions by 25% and to make mean discharge times 30 minutes earlier in five months.

STRATEGY

PDSA Cycle 1: Our hypothesis on the initial PDSA cycle was that the handoff from the admission team to the next-day inpatient teams needed to discuss possible discharges. We created an early discharge admission sheet where admission teams would list potential next-day discharges. It was handed from the day admission team to the night admission team, and then to the nurse practitioners on the inpatient teams in the mornings, Monday-Friday. The nurse practitioners were then instructed to send a group email to the day hospitalists with the list of patients to prioritize for early discharge planning. In addition, we asked the admitting teams to place a EHR order to signify potential discharges for the next day. This bundle created an marked improvement in the measured data.

PDSA Cycle 2: We had some verbal feedback from providers on compliance with this process, we hypothesized that an education and awareness regarding this project was necessary to improve compliance. We started an education and awareness campaign about the importance of the initiative to the members of the admission and inpatient teams. This was done at various forums, including divisional grand rounds, faculty meetings, nurse practitioner meetings and physician assistant meetings. Nocturnists were engaged individually. The data did not show continued gains after this effort, and but we felt that more providers recognized the importance of this project.

PDSA Cycle 3: The workgroup members raised concerns that the emails were inconspicuous and construed as non-urgent. We hypothesized that pages to the day

teams were needed to create a sense of urgency and improve prioritization about early discharges. We asked the day physician assistants were asked to text page individual reminders to the day hospitalists who were assigned the patients listed for next-day discharge. This was done in the morning, between 8:30 to 9:00 am. No return call was expected. This did show benefit in earlier mean discharge times.

RESULTS

During the post-intervention period, 7/1/13-11/3/13, the total number of 1-day admissions was 154. Average number of 1-day admissions per day was 1.6 (78% increase). Percentage of discharge orders before 11AM was 42% (14% increase). Mean discharge time was 3:30pm (improvement of 28 minutes). We exceeded our aim in increasing 1-day admissions. We improved discharge times by 28 minutes, which is close to our goal of 30 minutes.

LESSONS AND LIMITATIONS

Engagement of multidisciplinary teams was paramount to this project. The coordination of care needed for early discharge required high amount of effort, and a workgroup incorporate a member of each team was crucial for this project's success. In particular, nocturnists needed representation and engagement because discharge planning was not a part of their culture and workflow. Many nocturnists did not rotate as a part of the day inpatient teams, and they lacked experience with working with social workers and case managers in setting up home services or skilled nursing facility transfers.

Potential discharges listed by the nocturnists were often inaccurate, as they required further medical workup and treatment, or additional ancillary staff input which took additional time to set up. This led to less reliability in this identification system. However, the system was helpful and effective in creating an awareness and alerting the teams to be vigilant in review new admissions.

PDSA 1 showed much larger improvements that were not sustained through the other PDSA cycles. This was likely secondary to the awareness and energy created by the new initiative and multifaceted bundle of interventions at the start. We recognized this wane in momentum and focused on education and awareness for PDSA 2. PDSA 3 improved mean discharge times, which was

Table 1

	Date Range	Average Number of 1-day admissions per day	% Discharge Orders Before 11AM	Mean Discharge Time
Pre-Intervention	1/1/13-6/30/13	0.9	28%	3:58PM
Post-PDSA 1	7/29/13-8/11/13	1.9	69%	2:18PM
Post-PDSA 2	9/9/13-9/22/13	1.5	38%	4:16PM
Post-Intervention Final	7/1/13-11/3/13	1.6	42%	3:30PM

likely from an increased urgency with the pages from the physician assistants. Further data is needed to demonstrate sustainability, but the incorporation of a new observation unit to our hospital diverted many of the 1-day admissions into the unit. This initiative may be more generalizable for hospitals that do not have a physical observation unit.

CONCLUSION

Early discharge initiation project was successful in improving the number of 1-day discharges and earlier discharge times for those discharges. The interdisciplinary workgroup was crucial for getting input and engagement of the different teams involved in this process. Our system of flagging and communicating next-day discharges allowed for better prioritization for the next-day inpatient teams, and it engaged the nocturnists in the discharge planning, a process often ignored during the night admitting shifts. An initiative focusing on 1-day admissions for throughput is lacking in literature, and there is an opportunity for improving efficiency and communication in this process. Our next step is to incorporate this concept as a bridge from admissions from the new observation unit.

Acknowledgements None.

Declaration of interests Nothing to declare.

Ethical approval The institutional review board of the Icahn School of Medicine at Mount Sinai evaluated this project and full review was waived.

Open Access This is an open-access article distributed under the terms of the Creative Commons Attribution Non-commercial License, which permits use, distribution, and reproduction in any medium, provided the original work is properly cited, the use is non commercial and is otherwise in compliance with the license. See:

- <http://creativecommons.org/licenses/by-nc/2.0/>
- <http://creativecommons.org/licenses/by-nc/2.0/legalcode>

REFERENCES

1. Diamond HS, Goldberg E, Janosky JE. The Effect of Full-Time Faculty Hospitalists on the Efficiency of Care at a Community Teaching Hospital. *Annals of Internal Medicine*. 1998;129:197–203.
2. Wertheimer B, Jacobs RE, Bailey M, Holstein S, Chatfield S, Ohta B, et al. Discharge before noon: an achievable hospital goal. *J Hosp Med*. 2014;9:210–4.
3. Baugh CW, Venkatesh AK, Bohan JS. Emergency department observation units: A clinical and financial benefit for hospitals. *Health Care Manage Rev*. 2011;36:28–37.
4. Macy ML, Hall M, Shah SS, Hronek C, Del Beccaro MA, Hain PD, et al. Differences in designations of observation care in US freestanding children's hospitals: Are they virtual or real? *Journal of Hospital Medicine*. 2012;7:287–93.
5. Arora VM, Manjarrez E, Dressler DD, Basaviah P, Halasyamani L, Kripalani S. Hospitalist handoffs: A systematic review and task force recommendations. *Journal of Hospital Medicine*. 2009;4:433–40.