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Patient Progression: A Hospital-Wide, Multi-Disciplinary, Data-Driven Approach to Moving Patients Safely, Timely & Efficiently

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Abstract

High emergency department length of stays (ED LOS), emergency department (ED) crowding and inefficient management of hospital patient throughput can negatively impact patient safety, patient care, and patient satisfaction [1]. In addition, patients who leave an ED without being seen by a medical provider can lead to potentially harmful outcomes. Duke Regional Hospital (DRH) set a strategic priority to improve hospital-wide patient progression. Our goals were to provide safe, efficient and timely movement of patients from admission to discharge. Our additional goal was to decrease patient wait times at transition points. DRH used a multi-disciplinary, data-driven approach to improve hospital-wide patient progression. Hospital staff in multiple departments across various disciplines impacts the moving of patients within a hospital during an admission, from Care Management, to Environmental Service, registered nurses and physicians.

Keywords:*Patient Flow, Patient Safety, Emergency Medical Services*

Introduction

Duke Regional Hospital (DRH) is an acute care community hospital with 369 licensed beds and is located in Durham, North Carolina, United States. The hospital is a part of the Duke University Health System. DRH provides inpatient, outpatient, surgical and emergency care. In fiscal year (FY) 2016, DRH had 63,111 ED visits, 15,792 inpatient admissions and 13,700 surgeries.

From fiscal year (FY) 2014 through FY 2017, DRH saw a gradual growth and increase in several hospital operational statistics. Patient volume through the ED, the average daily census for all services, and outside hospital transfers to DRH each averaged an increase of 8%-10% per year. In FY15, the DRH ED treated 44,301 patients. The budgeted volume had been set at 43,468. For FY17, the DRH ED treated 60,000 patients. It is important to note that the DRH ED has the phyiscal capacity to accommodate 40,000 patients per year. DRH's ED experienced an increase in patients' lengths of stay (ED LOS) to 6.7 hours. The target for this metric was 5.8 hours. There was also an increase in patients who left without being seen (LWBS) to 4.2%, with the target being 1.9%. Patients who LWBS are those who check into the ED but leave before being seen by a physician. According to the Agency for HealthCare and Quality (AHRQ) [2], the national average for Left Without Being Seen is 2%. Despite the increase in ED and outside hospital transfer volume, DRH's daily hospital occupancy was only 65% for FY16. To put all of this information into perspective, the ED was seeing more patients, the ED LWBS was high, the ED LOS for admitted patients was high, but the hospital was not operating at full capacity. An initial comprehensive review of our existing data indicated that our internal processes to move patients through the facility, from ED presentation to inpatient admission, was not efficient.

Journal reviews of the literature indicated multiple impacts to patient delays in the ED and inefficient patient flow processes. Some of these implications include increased lengths of stay, higher intensive care unit mortality, increased mortality, delayed orders, missed orders, medication-related delays [3], and increased adverse events [3,4,5,6]. Long waits and delays are not just an ED issue, it is a hospital-wide issue and can be indicative of inefficient internal processes [7].

Upon the completion of our comprehensive review of existing data and journal reviews, DRH initiated and implemented a plan to resolve our patient flow issues. Our primary goal was to provide safe, efficient and timely movement of patients from admission to discharge. Additionally, we aimed to decrease patient wait times at transition points. The key performance indicators we chose to monitor in order to evaluate results were 1) ED LOS, 2) ED LWBS and 3) Physician admission order to inpatient bed assigned. These three measures are indicated in the literature as recommended and being essential for improvement to achieve results with hospital-wide flow [7].

Methods

DRH used a multi-disciplinary team approach to improve patient progression. Hospital staff in multiple departments across various discinplines impact the moving of patients during an admission, from Care Management, Patient Safety, and Nursing to Environmental Services and physicians. Our team included all of these discinplines, in addition to our hospital president and vice president of operations (*see Figure 1*). Our executive leadership made patient progression a hospital strategic priority. The Institute for Healthcare Improvement (IHI) indicates that achieving system-wide

hospital flow requires patient flow being made a strategic priority, in addition to strong leadership. Executive leadership's role on the implementation team is critical to the success of the operational challenges inherrant with resolution [6].

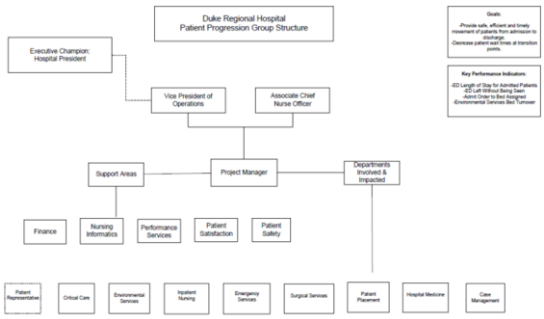

Figure 1– DRH Patient Progression Group Structure

After our initial kick-off of the strategic priority concluded, our multi-disciplinary team spent several months completing a strength, weaknesses, opportunities and threats analysis (SWOT), in addition to a deep dive into understanding patient flow at our facility. This deep dive included mapping out flow process for both admission and dicharge, detailing inputs, outputs, bottlenecks and barriers (*see Figure 2, 3*).

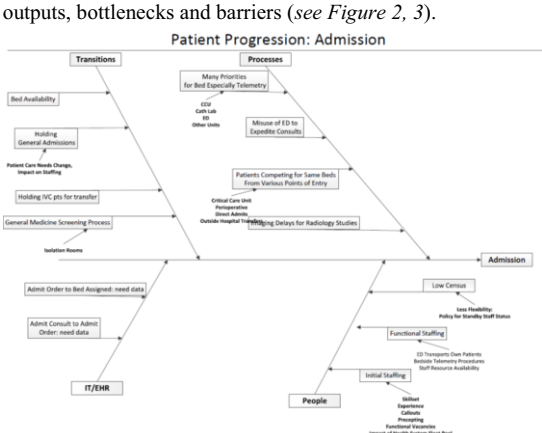

Figure 2– DRH Admission Process Mapping

A secondary comprehensive review of the hospital's existing ED data was completed (*see Figure 3*). The graphic represents key performance indicators for ED length of stay for admitted patients. Each color on the graphic indicates a patient wait point in time.

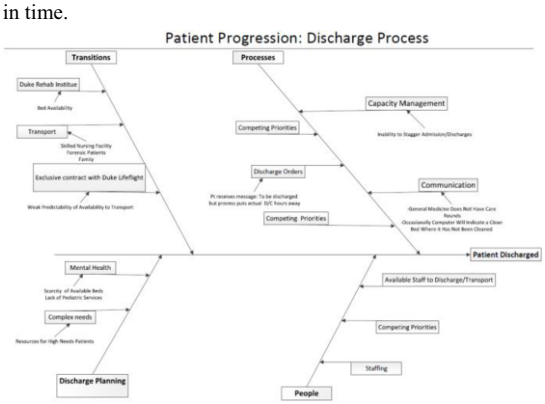

Figure 3– DRH Discharge Process Mapping

Once the processes, barriers and issues were identified, our team created an action plan to focus on our improvement efforts. Through our deep dive into the barriers, the action items were noted to be, if completed, the most impactful to improving the hospital's patient flow. The creation of an action plan with high-level strategies guides organizational efforts to improvement [7]. DRH's action items included:

- The creation of a General Medicine unit
- Clarification of step-down and Telemetry admission criteria
- Transition Care Unit pilot
- Admissions/Discharge (ADT) Registered Nurse pilot
- Bed Placement process pilot
- Development of plan to minimize time between when patient leaves the facility to when its marked in the electronic health record (EHR)
- Plan with EVS to ensure rooms marked clean in EHR are actually clean
- Development of dashboards and reports with key performance metrics
- Creation of the ED Navigator Role that manages patient flow and throughput within the Emergency Department.

The creation of a General Medicine unit was lead by DRH's chief of hospital medicine. The work completed with this action item included the hiring of a physician general medicine director, the designation of both a case manager and pharmacist for the unit, the hiring of additional RN full time employees (FTE), training of staff on general medicine processes and working with learners, implementation of multi-disciplinary rounds and the co-horting of appropriate patients for general medicine admission.

Clarification of step-down and Telemetry admission criteria was lead by our associate chief nursing officer. Through our deep dives, it was discovered that confusion among various clinical disciplines, departments and patient placement staff on the criteria caused significant delays in patient flow. This work included both a hospital medicine and nursing review of all criteria. All disciplines reviewed, provided feedback, approved and completed staff re-education throughout their departments.

For our Transition Care Unit and ADT RN pilots, these efforts were combined. We utilized an un-used, completely furnished six bed observation unit. In-house RNs were designated to staff the unit Monday-Friday. Leadership also approved the hiring of travel RNs to supplement unit staffing.

Two of our action items were quick wins. The development of a plan to minimize time between when patient leaves the facility to when its marked in the (EHR) and the plan with EVS to ensure rooms marked clean in the EHR are actually clean simply required a re-education of staff on processes and procedures.

The development of dashboard and reports with key performance indicators encompassed several months of work and iterations to achieve reports that fulfilled needs for executive leadership, department management, and front line staff.

The ED Navigator Role was developed by ED leadership to improve patient flow within the Emergency Department. The Navigator Nurse is responsible for departmental flow in conjunction with the charge nurse; ensuring patients arrive in front of providers as quickly as possible, and to produce quality care that is safe and efficient for all patients.

This role serves as the bridging gap between the waiting room and other patient care areas. The navigator serves as a departmental leader and collaborates with others to ensure the safest and highest quality care is provided to our patient population through efficient movement.

Results

The results of the work completed through the action plans and multi-disciplinary workgroups were both significant and consistent. Year over year, for our key performance indicators the results were as follows.

ED LWBS dropped from 4% in FY16 down to 3.4% in FY18, year to date (YTD). At peak and prior to the completion of work, ED LWBS was at 6.7% (*see Figure 4*).

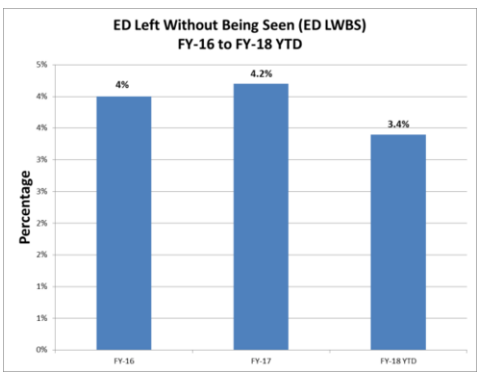

Figure 4 –ED LWBS by Fiscal Year to Date

ED LOS remained consistent year over year. In FY16 the LOS was at 6.5 hours, or 390 minutes. For FY17 LOS finished the year at 6.3 hours, or 378 minutes. In FY18 year to date, LOS remains at 6.3 hours, or 379 minutes (*see Figure 5*).

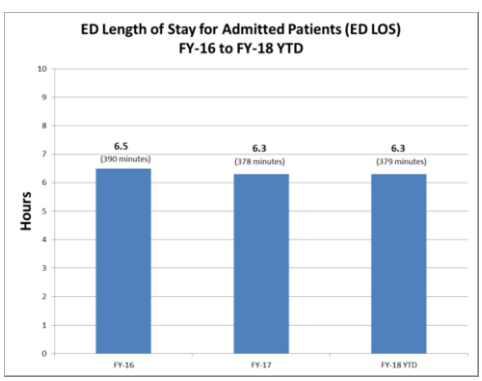

Figure 5 –ED LOS by Fiscal Year to Date

The physician admission order to inpatient bed assignment metric had significant results. DRH improved this time by over 30 minutes. At peak, the time from physician order to bed assignment was almost 90 minutes. The average run rate from April FY17 through August FY18 was 55 minutes (*see Figure 6*).

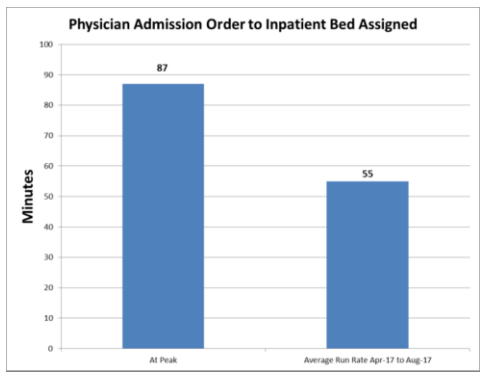

Figure 6 – Physician Admission Order to Inpatient Bed Assigned

To ensure we were looking at quality and taking safety into consideration regarding patient flow, a detailed analysis was completed over a six month timeframe. We looked at all ED admissions from April FY17 through September FY17 and noted of those, patients who moved to a second bed assignment within the first 12 hours after admission. Those movements within the first 12 hours were divided into two categories for reason for movement: 1) Increase in level of care and the bed changed, 2) Change in service type and the bed changed. To note further, an increase in level of care means one of three things happened with the bed change: 1) The patient moved from an intermediate bed to the intensive care unit (ICU), 2) the patient moved from an intermediate bed to a stepdown bed, or 3) the patient moved from a stepdown bed to the ICU. Out of 4,940 admissions, there were 63 total patients who moved to a higher level of care (LOC) or had a service type change within the first 12 hours of admission. Furthermore, of those 63 patients, 0.3% had an increase in the LOC. Of the remaining 46, 0.9% had a change in service and the bed changed (*see Figure 7*).

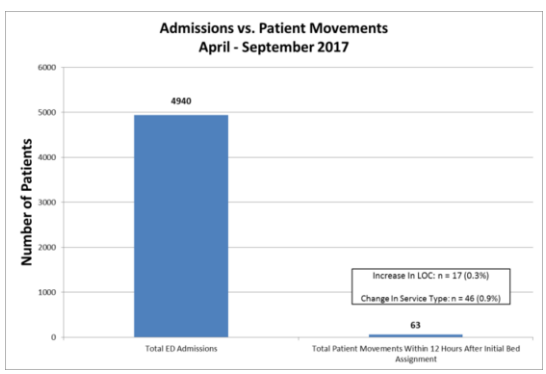

Figure 7 – Admissions vs. Patient Movements

Discussion

During this study, the key preformance metrics were greatly impacted with all of the interdisciplinary work that was implemented. The ED LWBS metric was greatly improved, the physician admission order to inpatient bed assignment metric was also greatly improved. The ED Admission LOS remained

consistent, this is an area that is still in need of improvement measures.

The development of dashboards and reports with key performance metrics allowed daily analysis of the length of stay and patient progression metrics. Multi-displinary partnering with the General Medicine unit, patient placement and environmental services, allowed for organizational improvement with patient transition.

The limitations to these quality improvement action items are that this only focused on the specifics of one community hosptial, therefore these action items may not produce the same outcomes at a different organization. A portion of the data analyzed was six months of ED admission volume, this may be difficult to compare to organizations with higher admission volumes.

In the Emergency Department the ED nurse navigator is a program that was piloted over the course of a year. This program focuses on patient flow within the ED itself. The goal is to have the patients move more efficeiently through the Emergency dpartment, thus increasing overall ED capactiy and bed utilization

Conclusion

In conclusion, the action items yielded significant improvement in certain areas of ED flow and consistency with length of stay metrics. The support of our hospital leadership toward improving patient flow was a mitigating factor in the success of this project. These efforts continue to be an area of priority in our hospital's stragetic plan.

Acknowledgements

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