Transforming Ward Processes and Admission Flows to Improve Emergency Department Congestion and Wait Time to Admission

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Introduction

Emergency department (DEM) congestion is a product of patient arrivals, patient complexity, operational processes, and the supply of and demand for inpatient beds. It is associated with increased patient morbidity and mortality.

We analyzed processes affecting DEM congestion and found out that DEM admissions were waiting for an average of 4:18hrs before their transfer to the inpatient ward. In our system, a bed is assigned according to a bed allocation algorithm. The Bed Management Unit (BMU) reserves a suitable bed based on differing priority levels for each admission source (DEM, SDA, Non-SDA Electives & Direct SOC Admissions), and that reservation is acknowledged by the inpatient wards prior to inpatient transfer.

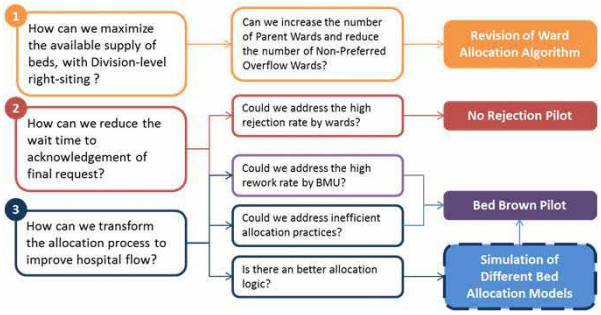
The DEM wait time to admission, defined as wait time from disposition (initiation of bed request) to arrival at final allocated inpatient ward bed, is an institutional key performance indicator tracked by the Ministry of Health.

Mission Statement

To reduce the average wait time to admission for DEM patients from 4:18 hours to 2 hours within 1 year.

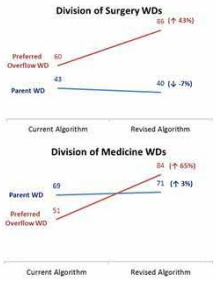
Analysis

All work processes were mapped, and extensive data analysis of >100,000 admission cases from all admission sources was done. These allowed the team a global view of the constraints and challenges involved, and identify opportunities for improvement. Improving DEM congestion and wait time to admission required a broad, multi-faceted hospital-wide approach, focusing on people and processes.



Major Initiatives Implemented

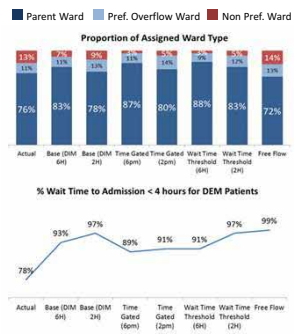
Updating the Legacy Ward Categorization



To maximize the availability of Parent Ward and Preferred Overflow beds, the legacy ward (WD) categorization algorithm was reviewed and updated accordingly with ground feedback. This allowed patients to be right sited to wards of the same clinical division more readily.

With more Parent and Preferred Overflow wards available, there was less rejections of BMU allocation requests from the wards, and less overflows to the Non-Preferred Overflow wards.

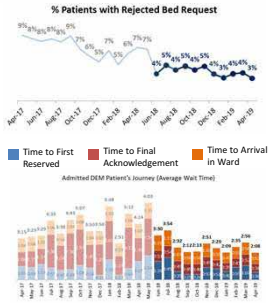
Improving the Bed Allocation Logic through Simulation



Various allocation models were created and simulated to identify the impact of ring-fencing on wait times. The Wait Time Threshold (2H) model achieved the best balance between inpatient right siting and wait time performance.

Due to technical limitations, the WTT (2H) model could not be implemented within the window of this project. However, we continued to work to achieve the ideal state assumptions used in the simulation, leading to the initiation of the bed brown search pilot.

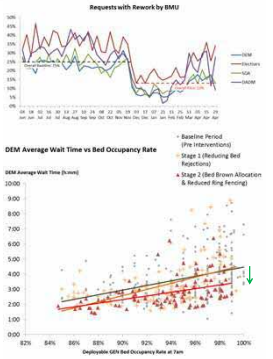
No Rejection of Bed Requests by Wards



A major cause of prolonged wait time to admission was due to rejections of beds allocated by BMU by inpatient wards. With the consensus from Inpatient Nursing that the practice of arbitrary rejections should be eliminated, a policy of no rejections by ward staff for allocated inpatient beds was instituted.

With significant improvement in the wait time to final bed request acknowledgement, efforts could be focused on factors affecting the time to the reservation of the first bed request, and the time taken for patients to be transferred to the wards.

Bed Brown Pilot



The practice of reserving beds based on a "Pending Discharge" status gave rise to increased frequency of bed cancellations and re-work, resulting in over-processing by both BMU and Ward staff.

The concept of reserving beds after an actual patient discharge (Bed Brown) was piloted, allowing bed allocation to follow a Just-in-Time, First-In-First-Out model. Subsequent interventions to reduce "ring-fencing" of beds, and tailor work-flows for specific sub-specialties were also made to further optimize the bed allocation process during this PDSA cycle.

Rework for bed requests by BMU reduced markedly. On days when bed occupancy rate is below 95%, the system outperforms the baseline state (Jun 2018 to Nov 2018) significantly for both outcomes of wait time to admission and inpatient right siting.

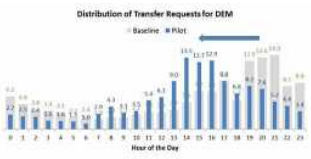
Results

With the Ward Categorization updated and institution of No-Rejection Policy:

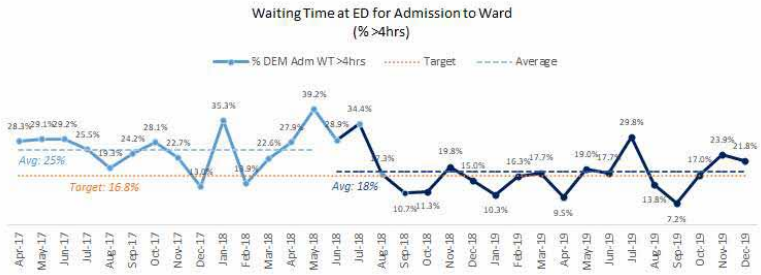
- Overall wait time to acknowledgement of final bed request reduced from an average of 2:19hrs to 1hr.
- Patients with at least 1 rejected bed request decreased from 7% to 4%.
- Wait time to admission improved for patients when BOR was not elevated.

With the subsequent implementation of the "Bed Brown" Pilot:

- Overall BMU rework rate improved from 25% to 13%.
- BMU man-hour savings equivalent to 22 FTEs ($3,096,000 in cost savings)
- Wait time to admission improved further for patients, across all BOR levels.



- Average DEM wait time to admission reduced from 4:18hrs to 2:35hrs.
- Organizational %>4hrs KPI showed sustained improvements (25% to 18%)
- DEM congestion improved, with the transfer of admitted patients to inpatient wards more evenly spread across the day.



Future Plans

- Automation of Bed Management System with enhanced allocation logic.
- Singular control of bed management by BMU instead of current fragmented state.
- Addressing imbalances in specialty bed demand and Primary Ward bed supply.
- Optimizing patient transport from admission sources to inpatient wards.