

Redesigning bed assignment principles: Reducing bed wait time through overflows



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Background

Timely access to care is an integral part of delivering patient-centric care and experience. Long wait time may hinder this and cause:

- Delay in access to inpatient amenities, affecting continuity of patient care.
- Congest ED which stretches the management of patients at their site.
- Potential extension of length of stay through increased risks of hospital-acquired infection, iatrogenic harm, physiological and psychological deconditioning. ^[1]

^[1] Jones S, Moulton C, Swift S, et al. Association between delays to patient admission from the emergency department and all-cause 30-day mortality. *Emergency Medicine Journal* 2022; 39:168-173.

Current State

The median monthly percentage of ED patients with bed wait time more than 4 hours, for General Medicine (GM) specialty was 85.1%, from Jan to Jun 2023. This has an effect of amassing higher number of lodgers at ED (daily average of 79), resulting in patient discomfort and further stress on the ED team.

Aims / Objectives

To double the number of ED admitted patients, under GM specialty, receiving a bed within 4 hours, over a 6-month period.

Root Cause Analysis

Using the Ishikawa Diagram (Figure 1), a root cause analysis was performed and 15 possible root causes were identified, contributing to wait time for admission.

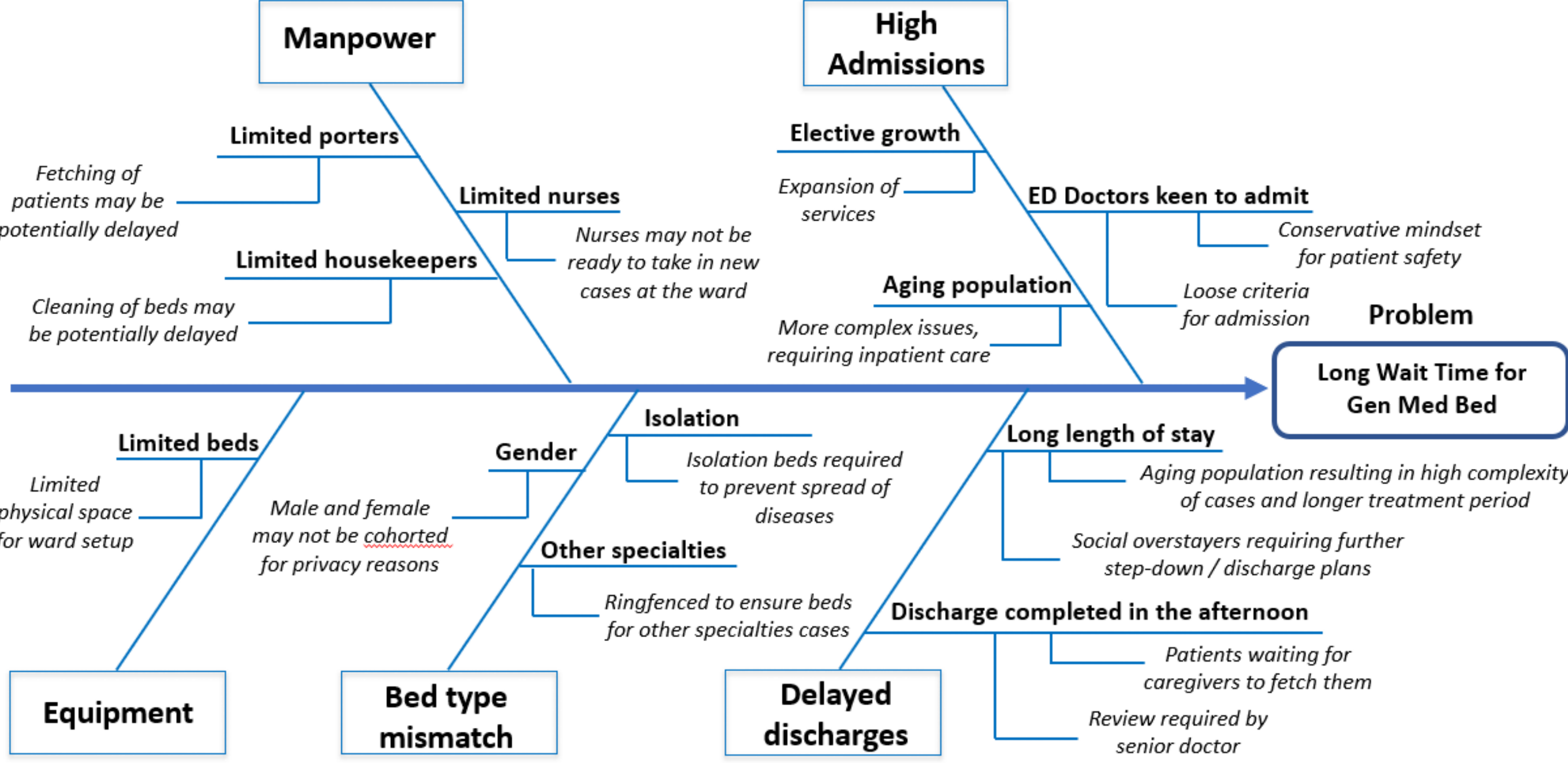


Figure 1: Ishikawa Diagram breaking down root causes for wait time to admission

Interventions / Initiatives

From the root causes, the team brainstormed and assessed 7 viable solutions via the driver diagram and prioritization matrix (Figure 2).

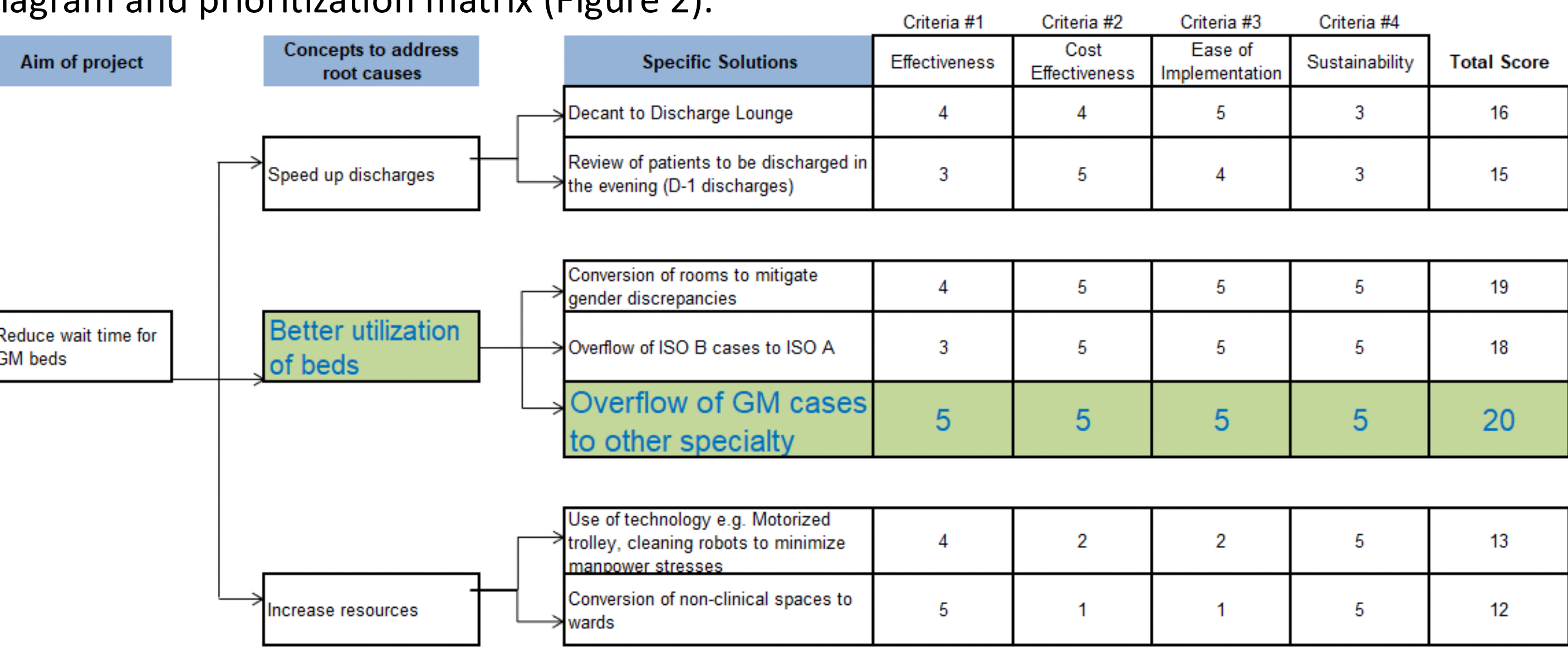


Figure 2: Driver Diagram and Prioritization Matrix

The intervention to overflow GM patients to other specialty wards was selected to be piloted based on the scoring of the matrix.

Implementation Plan

Discussions were held with General Surgery (GS) and Orthopaedics Surgery (Ortho) teams to establish the extent of overflow to their wards. Nurses were also informed on accepting cases assigned by BMU. With the workflows established, the pilot was implemented on 04 July 2023.

PDSA Cycle 1 Jul 2023

Implementation of overflow to GS and Ortho wards

PDSA Cycle 2 Aug 2023

Implementation of tracking file to monitor utilization of overflows

PDSA Cycle 3 Dec 2023

Enhance tracking file with visual cues on overflow usage, to facilitate monitoring and maximizing of bed resources

Results / Follow up

Date:	21/1/2024	Time:	7am	Utilization:	88.1%
Ward	Overflow Quota	Current No. Vacant Beds	Current No. of GM Overflow	Available for Overflow	Utilization Breakdown
Subsidised	30	25	27	3	90.0%
WQ18 - GS	5	2	5	0	100.0%
WQ19 - GS	5	6	5	0	100.0%
WQ28 - GS	5	3	2	3	40.0%
WQ29 - GS	5	2	5	0	100.0%
WQ16 - Ortho	5	7	5	0	100.0%
WQ25 - Ortho	0	0	0	0	100.0%
WQ26 - Ortho (GFU)	5	5	5	0	100.0%
Private	40	15	32	5	86.5%
WQ110 - GS	10	4	10	0	100.0%
WQ210 - GS	10	5	10	0	100.0%
WQ17 - Ortho	10	2	5	2	71.4%
WQ27 - Ortho	10	4	7	3	70.0%

Figure 3: Example of improved overflow utilization tracking file

Green indicates that bed resources are fully maximized for overflow

Key Outcomes^[2]

- 23.8%-pt reduction in GM bed wait time (Figure 4)**
Faster access to inpatient amenities leading to improved patient care & experience
- 15.6%-pt reduction in overall ED admission bed wait time (Figure 5)**
Improvement towards achieving SingHealth KPI
- Daily average ED lodgers reduced from 79 to 30**
Eased ED congestion, improving patient management at ED
- GS and Ortho bed wait time did not worsen**
Balancing measures of GS & Ortho bed wait time were monitored to have no significant wait time increase
- ~768 bed days saved per month**
Optimize the utilization of bed resources

^[2] Outcomes were based on observations made over 8 months post implementation period.

Figure 4: Run chart for % of GM patients admitted via ED with wait time >4 hours

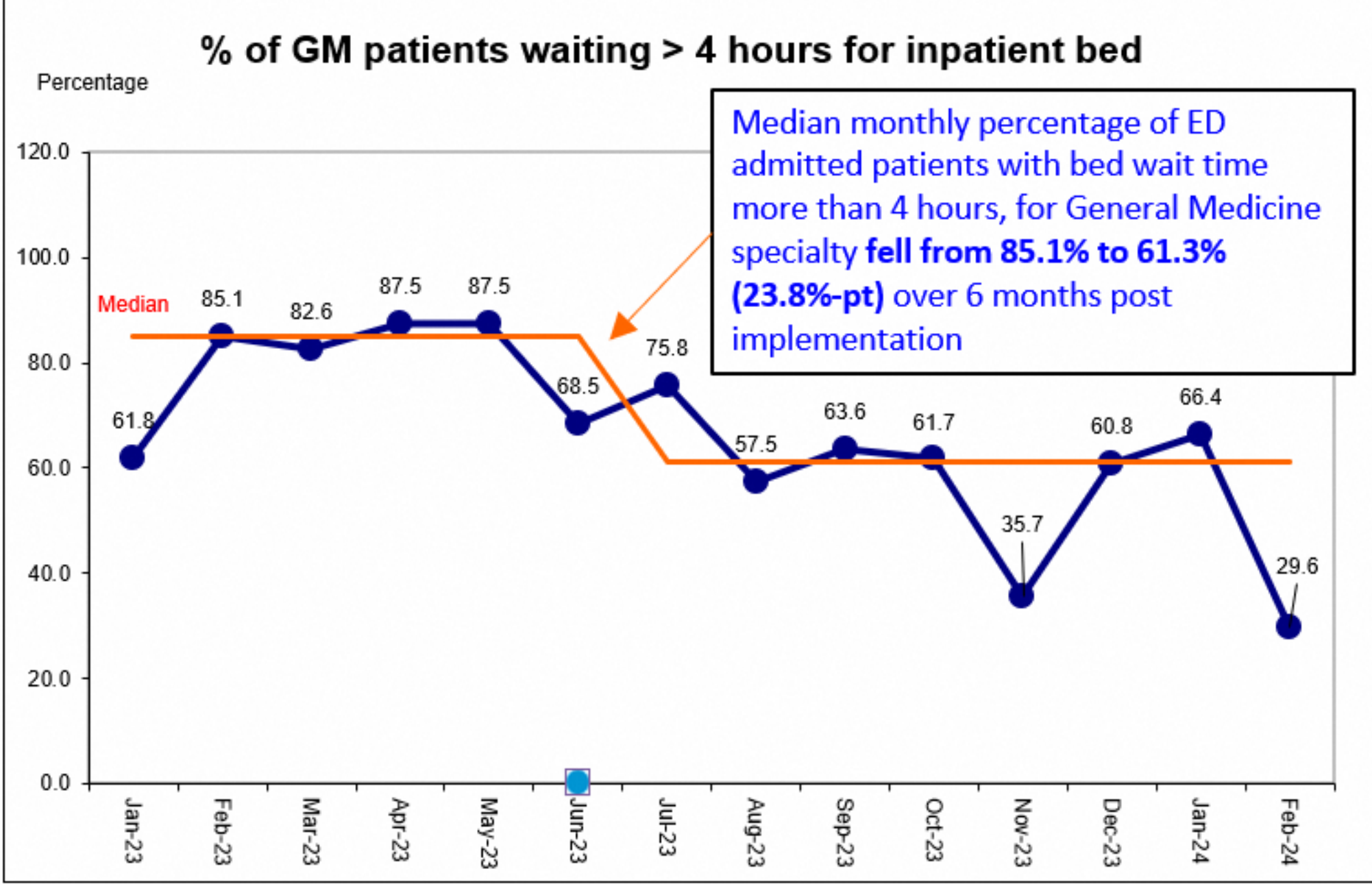


Figure 4: Run chart for % of GM patients admitted via ED with wait time >4 hours

Figure 5: SKH ED Wait Time for Admission to Ward against SingHealth KPI (less than 45% of all patients with wait time >4hrs)

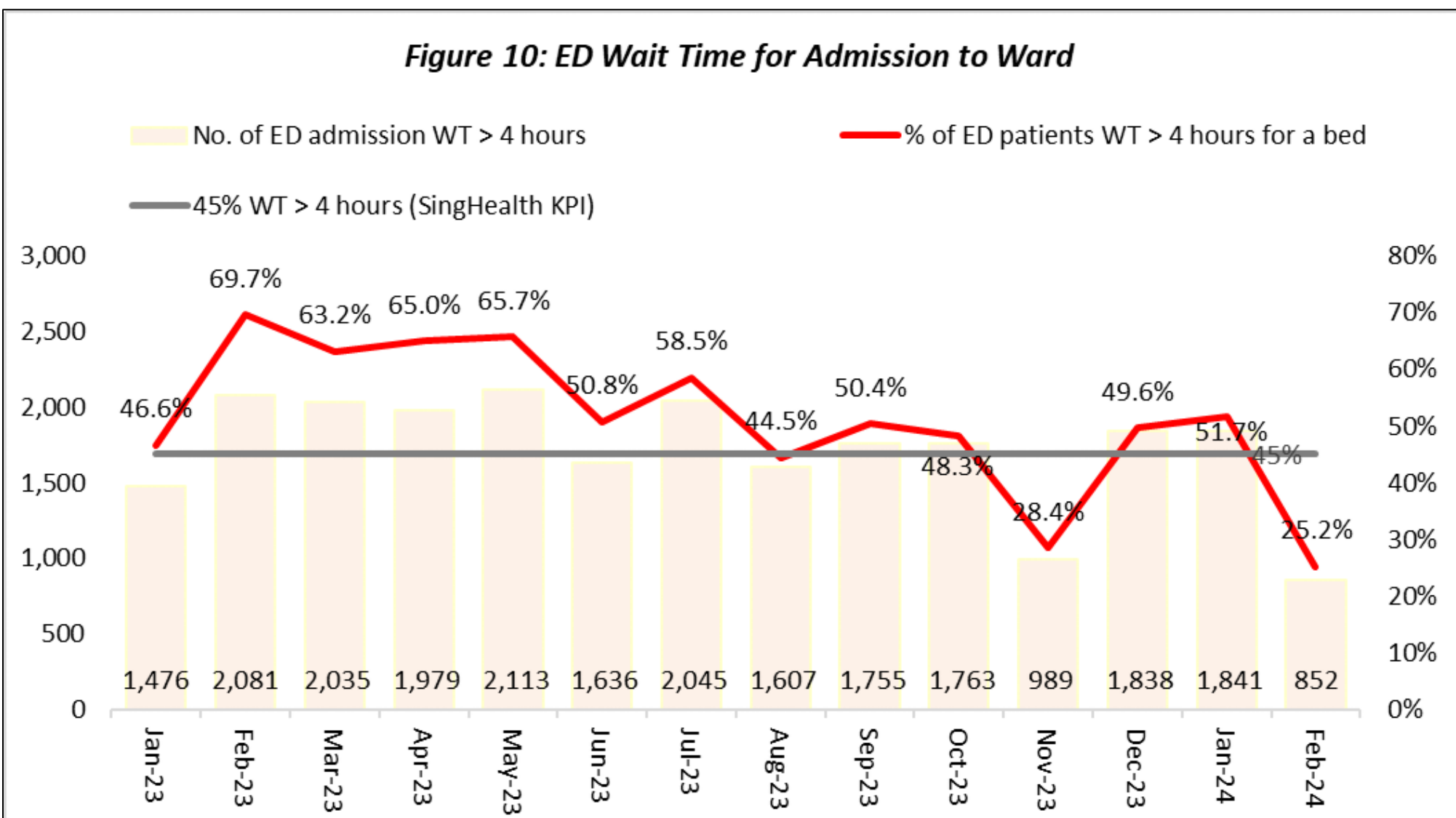


Figure 5: SKH ED Wait Time for Admission to Ward against SingHealth KPI (less than 45% of all patients with wait time >4hrs)

Conclusion

Given the success of the initiative, overflow process has been integrated into daily bed assignment workflow and reviewed periodically as part of bed planning strategies.

Bed management is a complex issue requiring collaborative effort on clinical and operational domains. Through a concerted effort, the project demonstrates the ability to reduce wait time, improving patients' access to continuous inpatient care and amenities, as well as decongesting ED. These progress are crucial to our efforts to provide timely access to care, as part of the overall patient-centric care and experience.