

Project Title: **OPTICS: Optimizing Processes for Treatment, Improving Care & Satisfaction**

Department: Ophthalmology

Period: Feb 2025 – Dec 2025

Facilitator/s: Lee Lay Pei, Goh Shi Min, Tania (Advisor: Jay Tan)



Sponsors (HODs): Prof Victor, Dr Charmaine, Perrine Lee

Team Leader/s: Dr David Chen

1. Reasons for Action

The outpatient clinic is experiencing significant challenges in patient satisfaction and service delivery, primarily centred around **extended wait times**, **complex workflow**, **multiple touchpoints**, and **communication issues** between staff and patients. Despite receiving a considerable number of compliments for service standards, the clinic faces recurring problems that negatively impact the overall patient experience. Furthermore, the **processes and manpower are not optimized**, leading to **long turnaround times (TAT)**, which exacerbate the existing issues and contribute to patient dissatisfaction.

2. Initial State

Turn Around Time (TAT)		Service Experience Score	
Metrics	Baseline data	Metrics	Baseline
Total TAT from registration till consultation	50th percentile – 116 min	To improve <b>wait time update</b> :-	44% (Mar – May 2024)
Consultation wait time (including consultation time)	50th percentile – 70 min	If you/ your family had to wait longer than expected, you/ your family was/ were updated about the status and reason for the wait	
VA wait time	50th percentile – 7 min 95th percentile – 32min	To improve <b>consultation wait time satisfaction</b> :-	77% (Mar – May 2024)
		After your registration and preliminary tests (if any) were completed, the waiting time to see doctor was reasonable	

3. Target State

Turn Around Time (TAT)		Service Experience Score	
Metrics	Target	Metrics	Target (50th percentile)
Total TAT from registration till consultation	To improve by 10% to 105 min	To improve <b>wait time update</b> :-	61%
Consultation wait time (including consultation time)	To improve by 10% to 63 min	If you/ your family had to wait longer than expected, you/ your family was/ were updated about the status and reason for the wait	
VA wait time	95th percentile to be no more than 300% of 50% percentile	To improve <b>consultation wait time satisfaction</b> :-	88%
		After your registration and preliminary tests (if any) were completed, the waiting time to see doctor was reasonable	

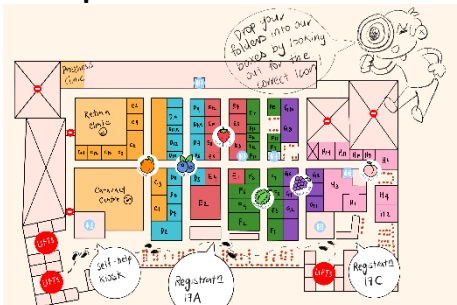
4. Problem Analysis



5. Solution Approach

Tools used as follows  
✓ Lean methodologies: Gap Analysis, Cell concepts, Standard Work  
Design thinking: Persona, VSEM  
✓ Future VSM

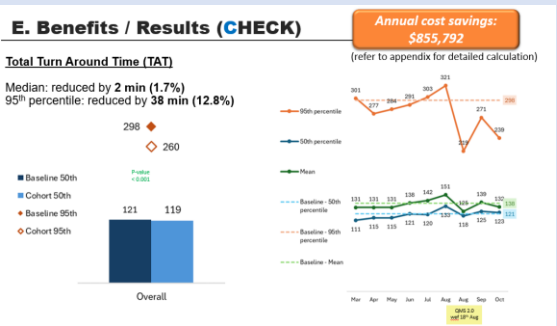
6. Rapid Experiment and Prototype



7. Completion Plan

Task	Implementation plan	When	Where
Implement	For doctors, nurses, ANPs, to refer to EPIC notes as source of truth in the event of discrepancy.	Dr David	17/03/2025
Implement	Create template to text patients manually that they have missed their queue in the consult room	Sarah Q	10/03/2025
Implement	PCAs to remind Drs minimally once within 5 working days of appointment date if EPIC notes and Active Requests are mismatched. Sarah Q PCA to follow EPIC documentation if no response from doctors after 5 working days from first reminder (when not on absence).	Sarah Q	10/03/2025
Implement	To generate standardised script for counter staff to inform IV patient on what to expect for their journey.	May	10/03/2025
Implement	For Pharmacist: Refer to EPIC documentation for medication, identify, dose, laterality. To refer next TCU date for duration and quantity. PCAs to remind patients of need to scan IC if receiving medications at Level 17 Pharmacy. To remove Q ticket from patient if not receiving medications	Dr David	17/03/2025
Implement	To develop standard scripts for allied staff (PSAs, technicians) at all stations. To brief patients at important steps (registration for IV, investigation rooms, treatment rooms)	Sarah Q	10/03/2025
Implement		Xiao Min	17/03/2025
Implement	Pass folder to patients only after VA test is done	May, Sr Purni, Gladys	11/03/2025
Implement	AUT device for automated VA testing – track efficacy, efficiency, and reliability	Dr Zhi Wei	24/03/2025

8. Confirmed State



9. Insights



# Project Team Composition

## Sponsor:

- A/Prof Victor Koh (HoD, Ophthalmology)
- Dr Charmaine Chai (Senior Consultant, Ophthalmology)
- Perrine Lee (Head, Operations, Ophthalmology)

## QI Sponsor:

- Roy Ngong (Asst COO, Plans and Strategy)

## Facilitators:

- Lee Lay Pei (Senior Assistant Manager, Quality Improvement)
- Goh Shi Min (Head, Ops & Planning Section, Ophthalmology)
- Tania Miglani (Manager, Corporate Infrastructure Office)

## QI Advisors:

- Jay Tan (Senior Manager, Quality Improvement)

## Team Leader:

- Dr David Chen Ziyu (Consultant, Ophthalmology)

## Members (max. 14 excluding 1 leader):

- Clinician : Dr Lim Zhi Wei (Resident, MOHH)
- Nurses : Sister Punithavathi, Sister Bing Caixia
- Optometrist: Keli Lor, Jacquelin Liew
- Technician : Gladys Loh, Germaine Lau
- PSA/STL : May, Sarah Qurratu'aini
- Scheduler : Iris Guo
- Operation : Neo Xiaomin, Lin Zhaoting, Samuel Tay
- Pharmacist : Sarah Serrano

## Invitees:

- Pauline Chua, Tan Ban Thong, Alvin Yong, Sandy Koh (NUHS Corp HR)
- Corene Poh (NUHS Corp, Group digital office)
- Angela Heng, Quek Mei Yin, Kimberly (Service Transformation)

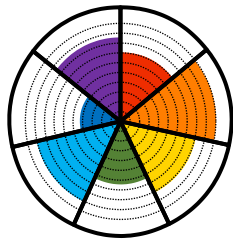
## A. Define the Problem (PLAN)

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The outpatient clinic is experiencing significant challenges in patient satisfaction and service delivery, primarily centred around **extended wait times, complex workflow, multiple touchpoints, and communication issues** between staff and patients. Despite receiving a considerable number of compliments for service standards, the clinic faces recurring problems that negatively impact the overall patient experience. Furthermore, the **processes and manpower are not optimized**, leading to **long turnaround times (TAT)**, which exacerbate the existing issues and contribute to patient dissatisfaction.

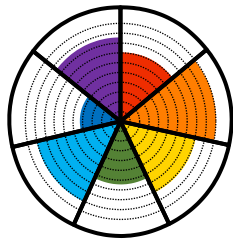
B. Goal (PLAN)

Set SMART goals | Specific, Measurable, Achievable, Relevant, Time-based |



Turn Around Time (TAT)

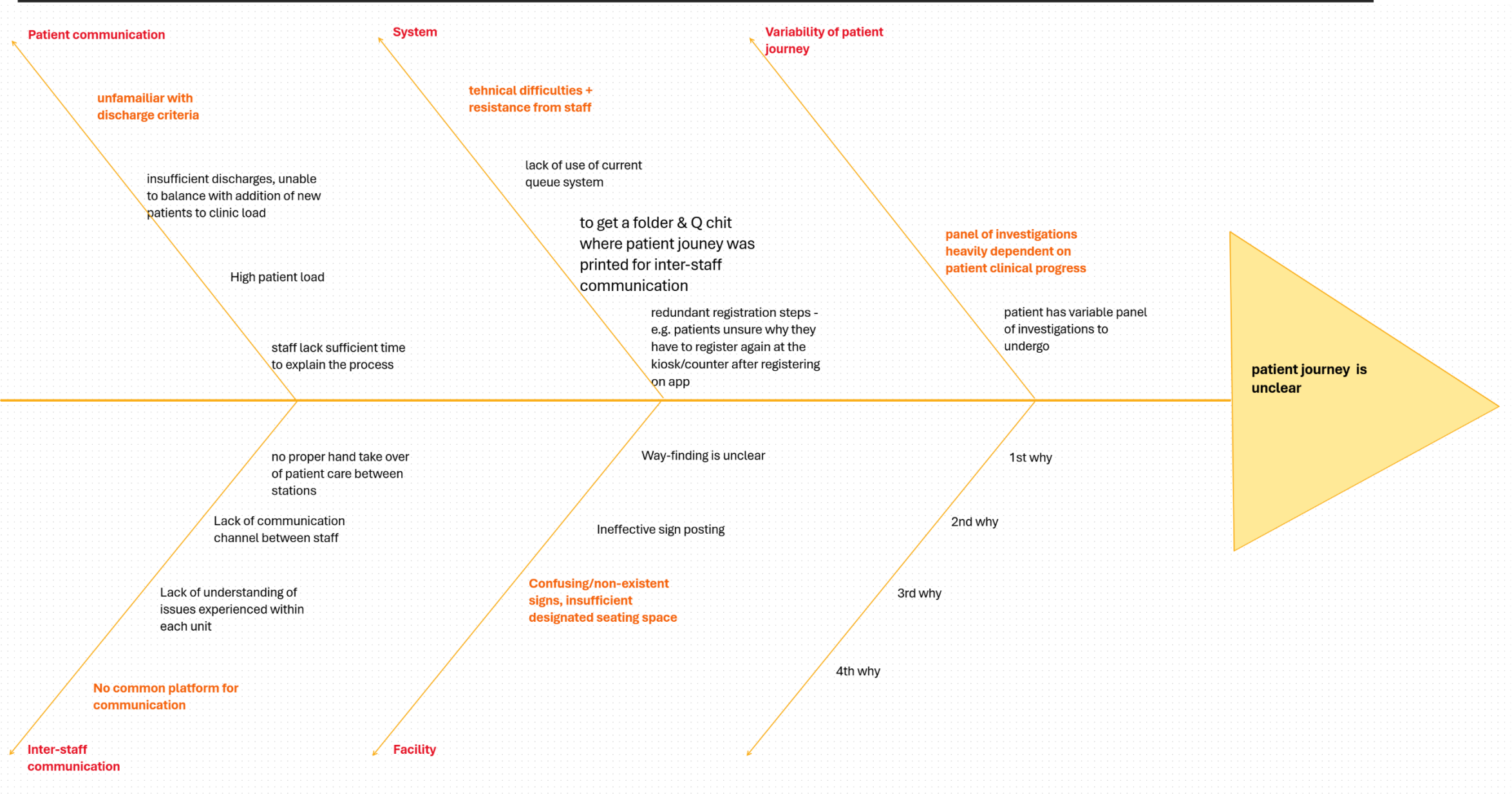
Metrices	Baseline data	Target
Total TAT from registration till consultation	50th percentile – 116 min	To improve by 10% to 105 min
Consultation wait time (including consultation time)	50th percentile – 70 min	To improve by 10% to 63 min
VA wait time	50th percentile – 7 min 95th percentile – 32min	95th percentile to be no more than 300% of 50% percentile



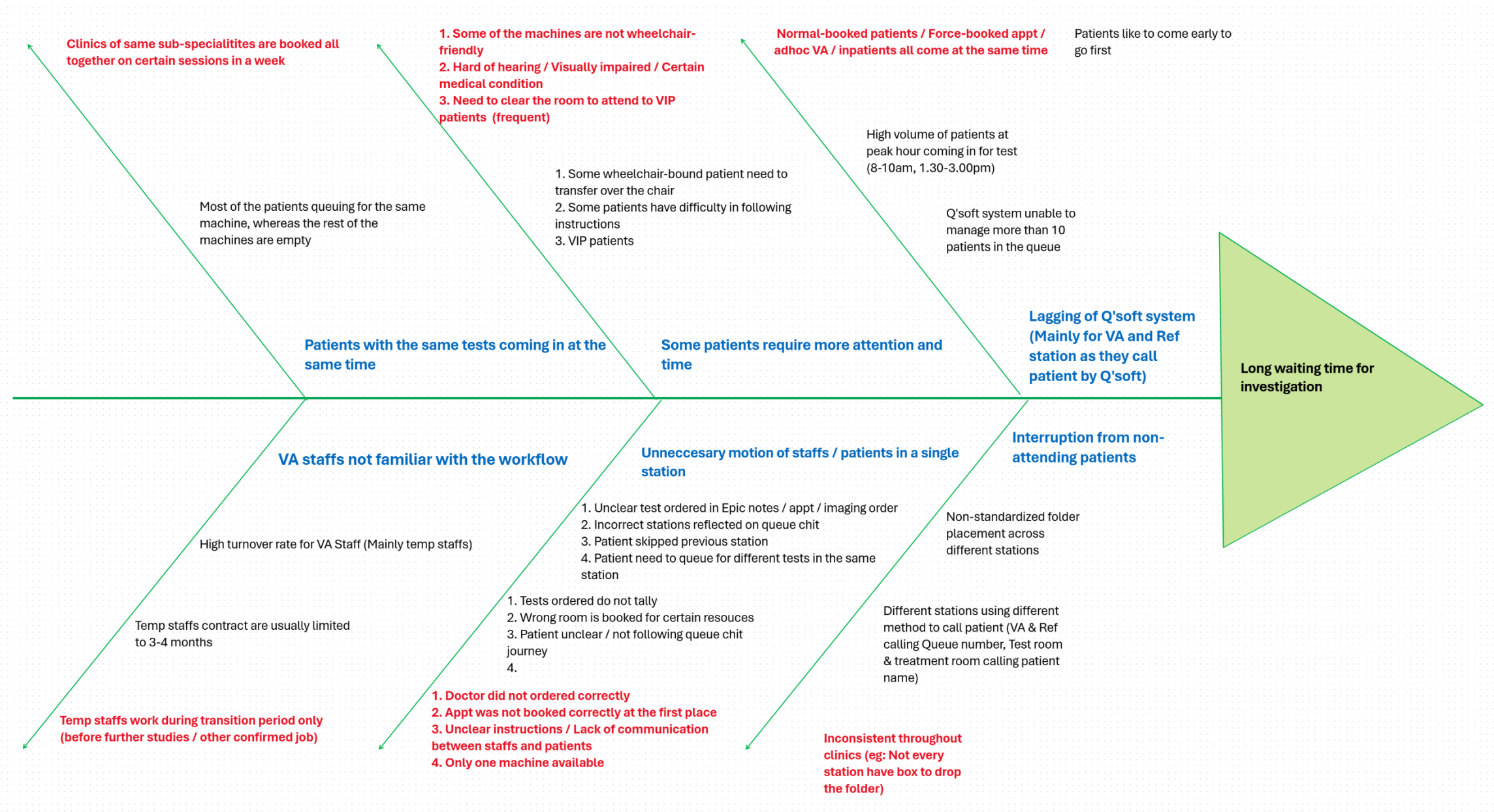
Service Experience Score

Metrices	Baseline	Target (50th percentile)
To improve <b>wait time update</b> :-  If you/ your family had to wait longer than expected, you/ your family was/ were updated about the status and reason for the wait	51% (Mar – May 2024)	61%
To improve <b>consultation wait time satisfaction</b> :-  After your registration and preliminary tests (if any) were completed, the waiting time to see doctor was reasonable	(Mar – May 2024)	88%

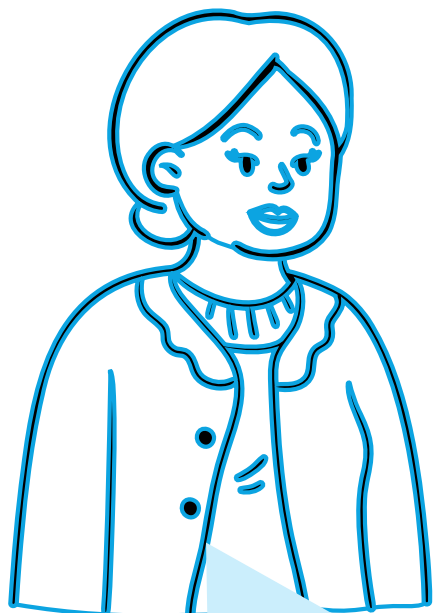
# C. Problem Analysis (PLAN) Gap Analysis



# C. Problem Analysis (PLAN) Gap Analysis







## Overlooked Olivia

**Repeat Visit**, suffers from glaucoma, blurry vision, hard of hearing

Values comfort and empathetic service for elderly patients like herself.

“I missed my turn because I **couldn't see and hear clearly**. I also **didn't understand when or where to drop folder**.

There is **no space for me to wait** outside the room as the corridor is very crowded.”

### NEEDS

I need more **empathy, care** and **comfort** due to my condition.

During the visit, I need a better way **to be informed** about my turn, what to do, where to go or wait for my turn.

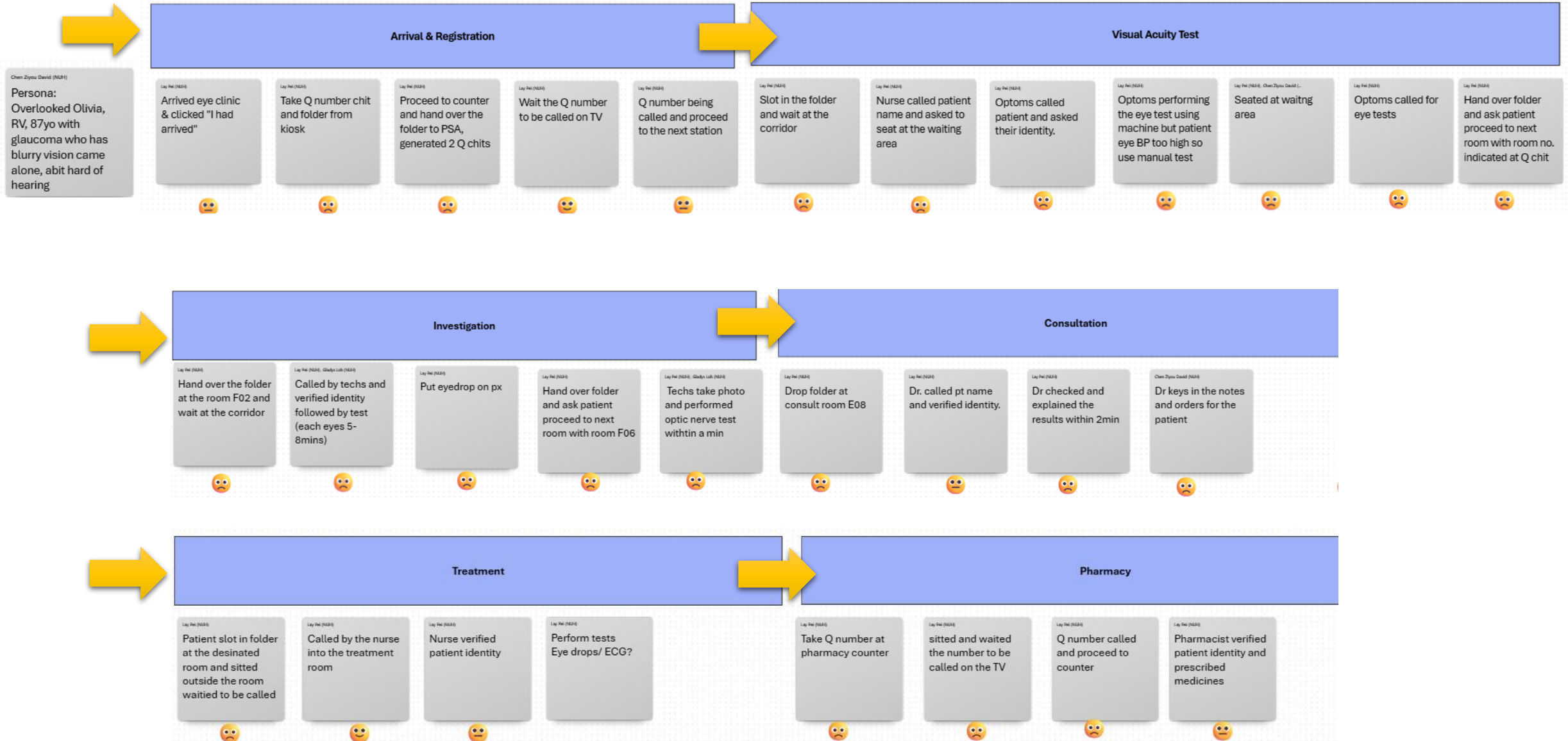
### PAIN POINTS

- **Can't see clearly** the Q no. on the TV in the waiting area.
- **Can't hear clearly** the staff calling her name in the noisy environment. No Q no. display along corridor.
- **Can't find a seat** at the corridor to wait nearer to the VA and consult room.



# C. Problem Analysis (PLAN) Value Stream Map

## Patient's Journey



## D. Interventions & Action Plan (DO)

PICK	Implementation plan	Who	When
Implement	For doctors, nurses, AHPS, to refer to EPIC notes as source of truth in the event of discrepancy.	Dr David	17/03/2025
Implement	PCAs to remind Drs minimally once within 5 working days of appointment date if EPIC notes and Active Requests are mismatched. PCA to follow EPIC documentation if no response from doctors after 5 working days from first reminder (when not on absence).	Sarah Q	10/03/2025
Implement	To generate standardised script for counter staff to inform FV patient on what to expect for their journey.	May	10/03/2025
Implement	For Pharmacist: Refer to EPIC documentation for medication, identity, dose, laterality. To refer next TCU date for duration and quantity.	Dr David	17/03/2025
Implement	PCAs to remind patients of need to scan IC if receiving medications at Level 17 Pharmacy. To remove Q ticket from patient if not receiving medications	Sarah Q	10/03/2025
Implement	To develop standard scripts for allied staff (PSAs, technicians) at all stations. To brief patients at important steps (registration for FV, investigation rooms, treatment rooms)	Xiao Min	17/03/2025
Implement	Pass folder to patients only after VA test is done	May, Sr Puni, Gladys	11/03/2025
Implement	AVAT device for automated VA testing – track efficacy, efficiency, and reliability	Dr Zhi Wei	24/03/2025

# D. Interventions & Action Plan (DO)

PICK	Implementation plan	Who	When
Choose	Paeds Refraction patients to go D02 instead of D01. Workflow already in place, work offline to ensure all PSAs are aware.	Sarah Q	10/03/2025
Choose	Remind doctors to not order VA if patient requires refraction.	Dr David	17/03/2025
Choose	Counter to generate specialised itinerary for FV patient.	May	10/03/2025
Choose	To remove written notes indicating "Pharm/Home" on queue chit for patients with investigations as their last station.	Gladys	17/03/2025
Choose	To improve SOP for ad hoc room changes - Room SAs to map room changes, to communicate to counter IC.	Iris	24/03/2025
Choose	Pharmacy Standardised workflow: Teams message to Dr > wait 5 mins > if no response, to call on mobile 1X. If unable to reach > send back to clinic immediately.	Dr David Sarah (Pharmacist)	17/03/2025
Choose	To identify trend in frequent/ common room change requests and propose to Dr Charmaine for future changes.	Iris	24/03/2025
Choose	Pharmacy: To work with pharmacy ops to improve the visibility of the signage at pharmacy counter.	Sarah (Pharmacist)	24/03/2025

## D. Interventions & Action Plan (DO)

PICK	Implementation plan	Who	When
Plan	Standardized default sequence of patient calling. Only patients in immediate sequence (e.g. 2-3 pts) are let in to waiting area outside rooms. Bulk of patients to wait at main waiting area	Dr David Sarah Q	17/03/2025
Plan	To identify which machine is wheelchair friendly - work with vendors to explore if machines can be fitted on wheelchair friendly table	Germaine	02/06/2025
Plan	To improve on patient folders. - Add mini map of the clinic and factsheet, and paste on the back of the clear folders. - To reword instructions on folder on folder dropage - To ensure that it is updated timely, with time/date stamp of last update.	Xiao Min	02/06/2025
Plan	Establish strict window period for registration (e.g. 1 hour before appt time) to discourage patients from arriving unnecessarily early	May	05/01/2026

# E. Benefits / Results (CHECK)

Annual cost savings:  
**\$855,792**

(refer to appendix for detailed calculation)

## Total Turn Around Time (TAT)

Median: reduced by **2 min (1.7%)**

95<sup>th</sup> percentile: reduced by **38 min (12.8%)**

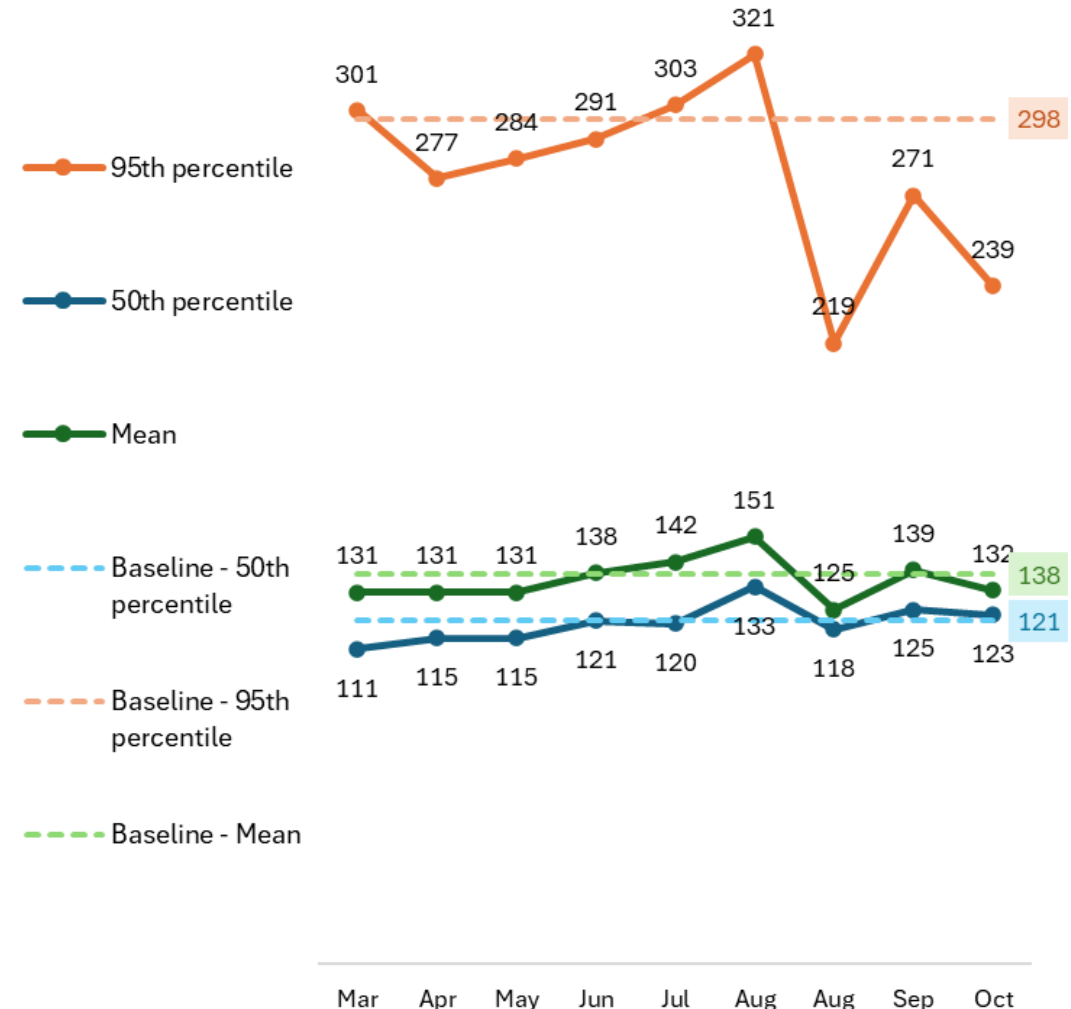
298   
260 

■ Baseline 50th  
■ Cohort 50th  
◆ Baseline 95th  
◆ Cohort 95th

P-value  
< 0.001

121 119

Overall

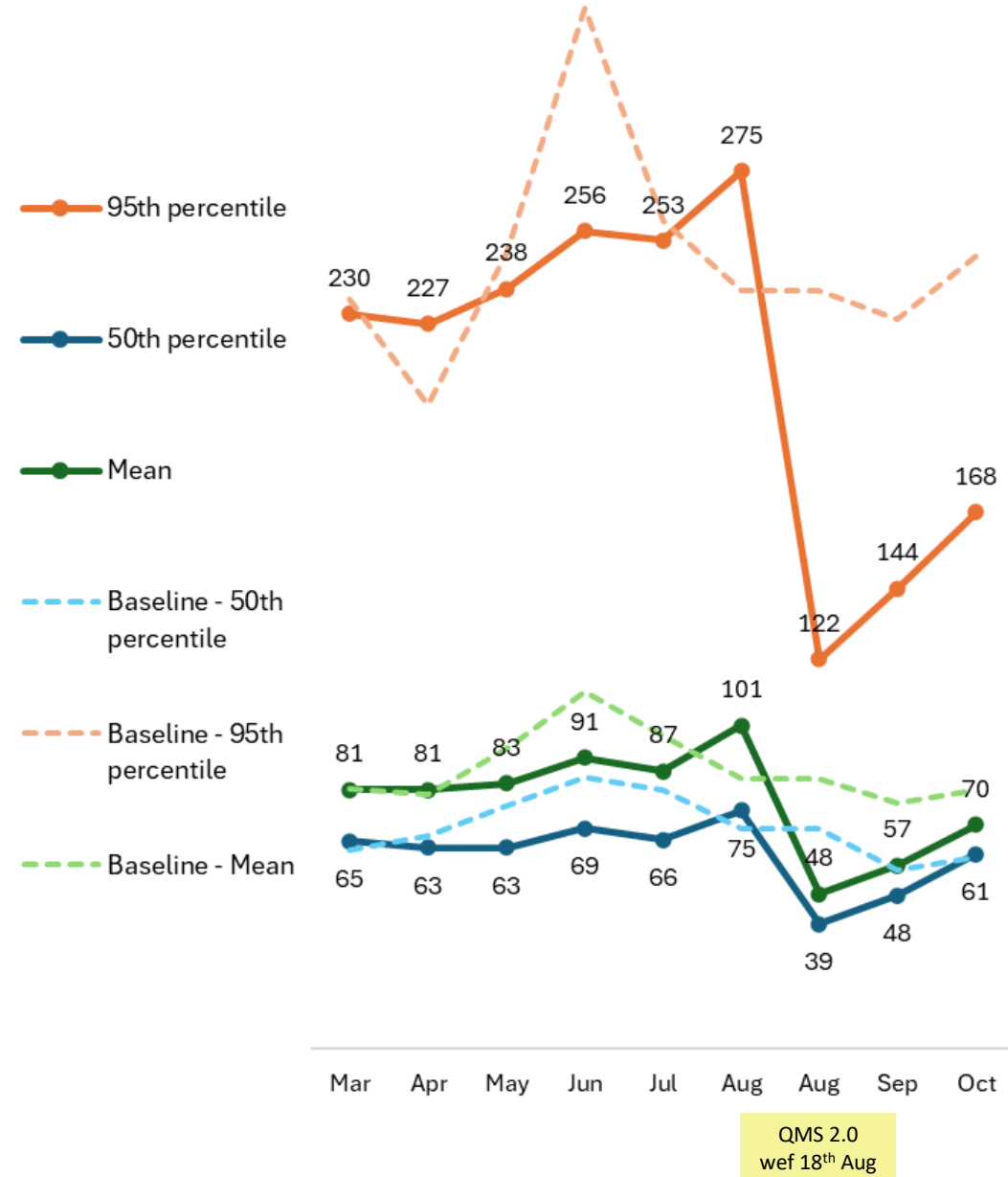
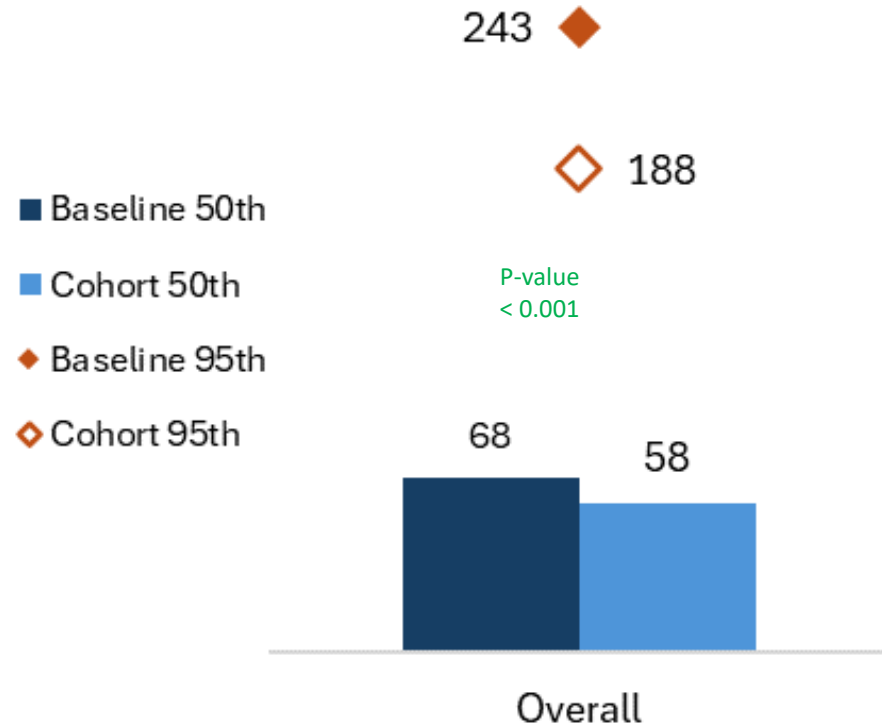


QMS 2.0  
wef 18<sup>th</sup> Aug

# E. Benefits / Results (CHECK)

## Consultation wait time

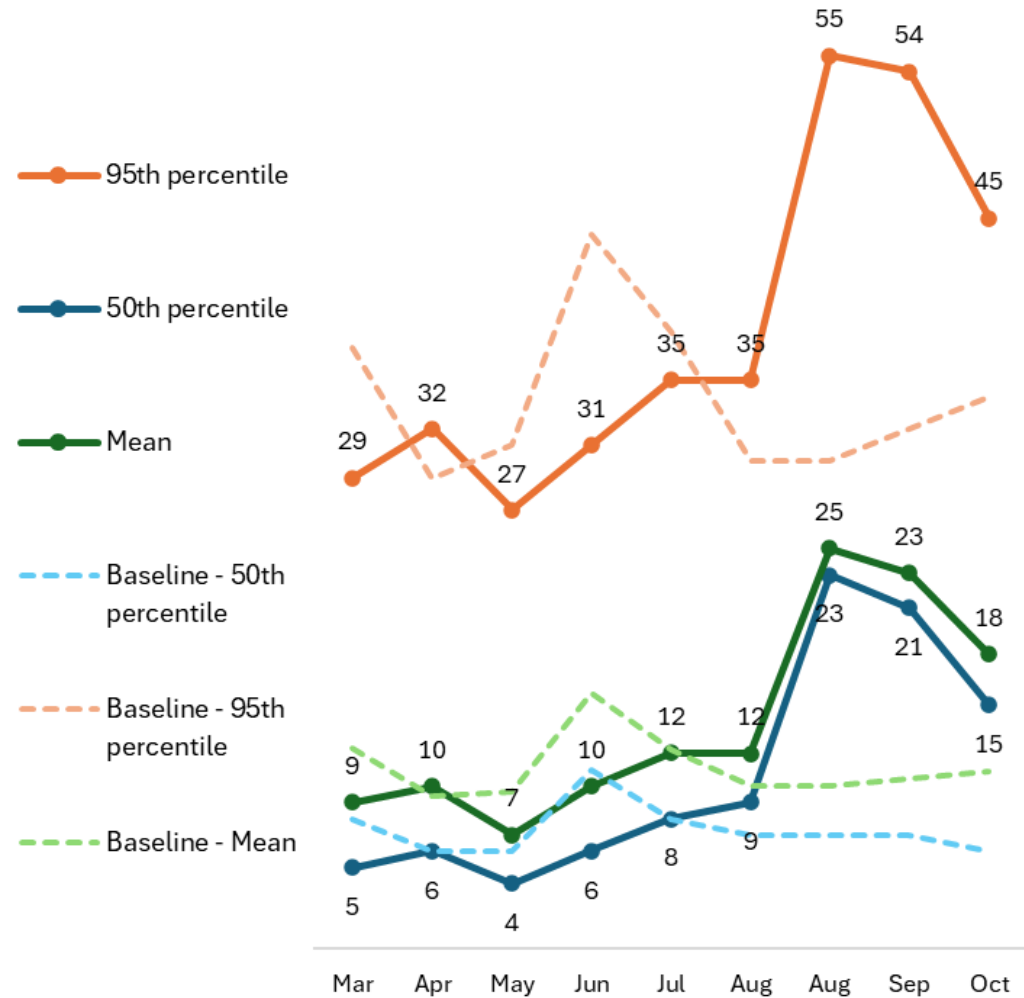
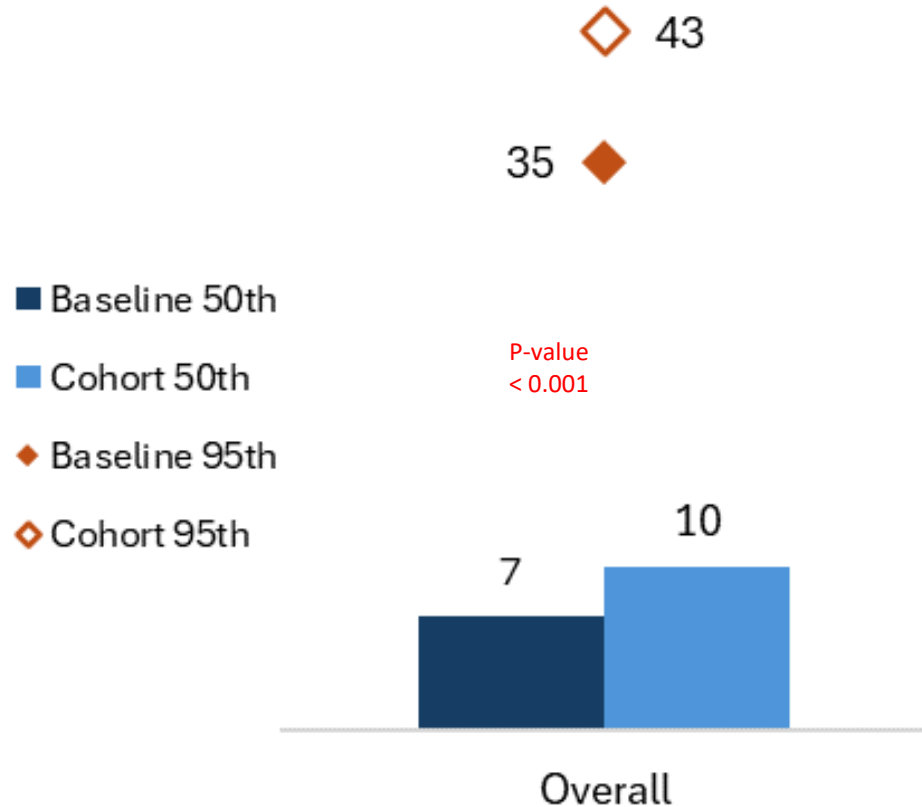
Median: reduced by **10 min (14.7%)**  
95<sup>th</sup> percentile: reduced by **55 min (22.6%)**



# E. Benefits / Results (CHECK)

## VA wait time\*

Median: increased by **3 min (42.8%)**  
95<sup>th</sup> percentile: increased by **8 min (22.8%)**



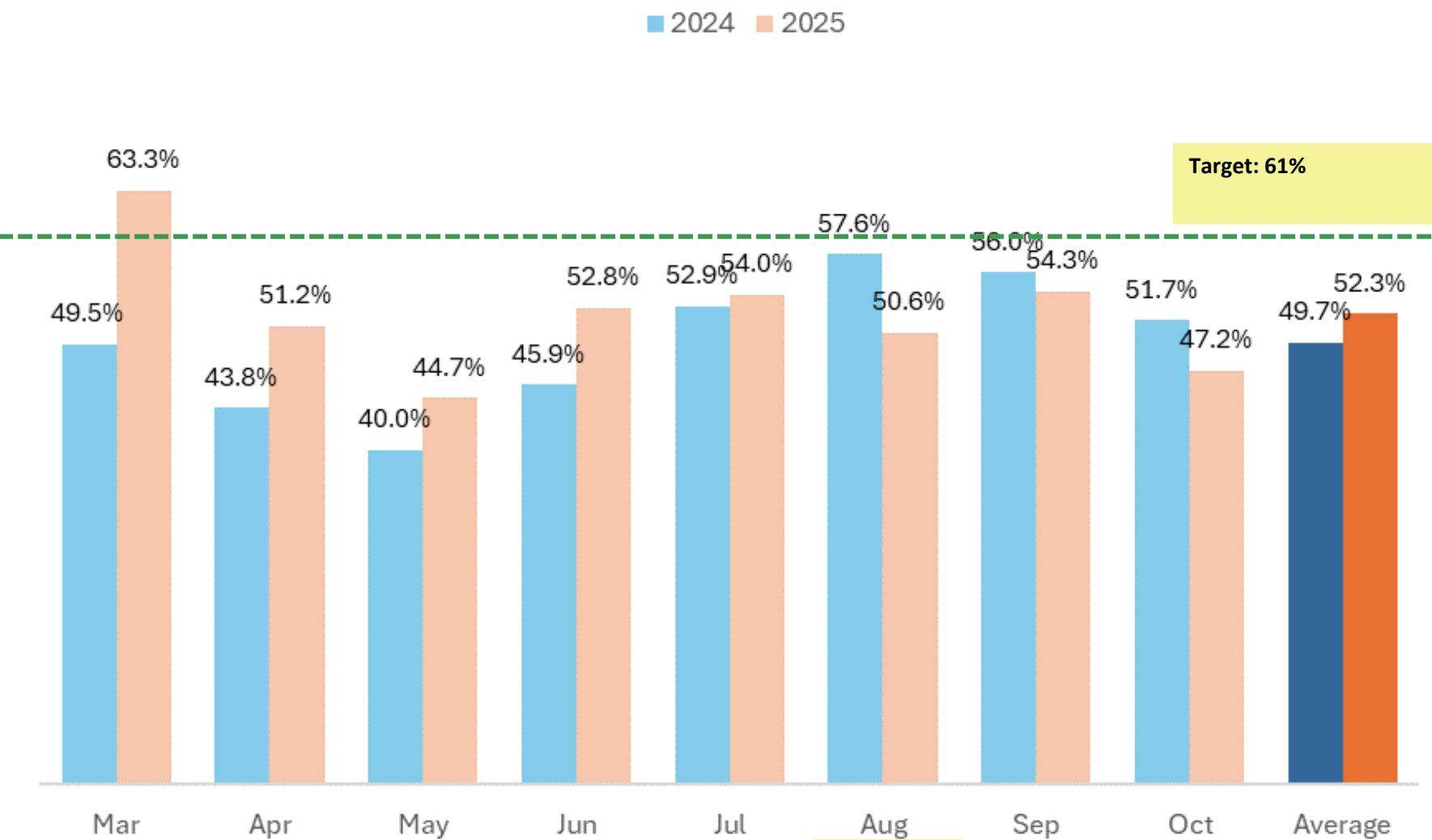
QMS 2.0  
wef 18<sup>th</sup> Aug

\*Baseline data may have been spuriously low as it was discovered that prior to QMS2.0, staff were transferring queue number out **before** patients were done with the station.



# E. Benefits / Results (CHECK)

## Service Experience Score (Wait Time Update)

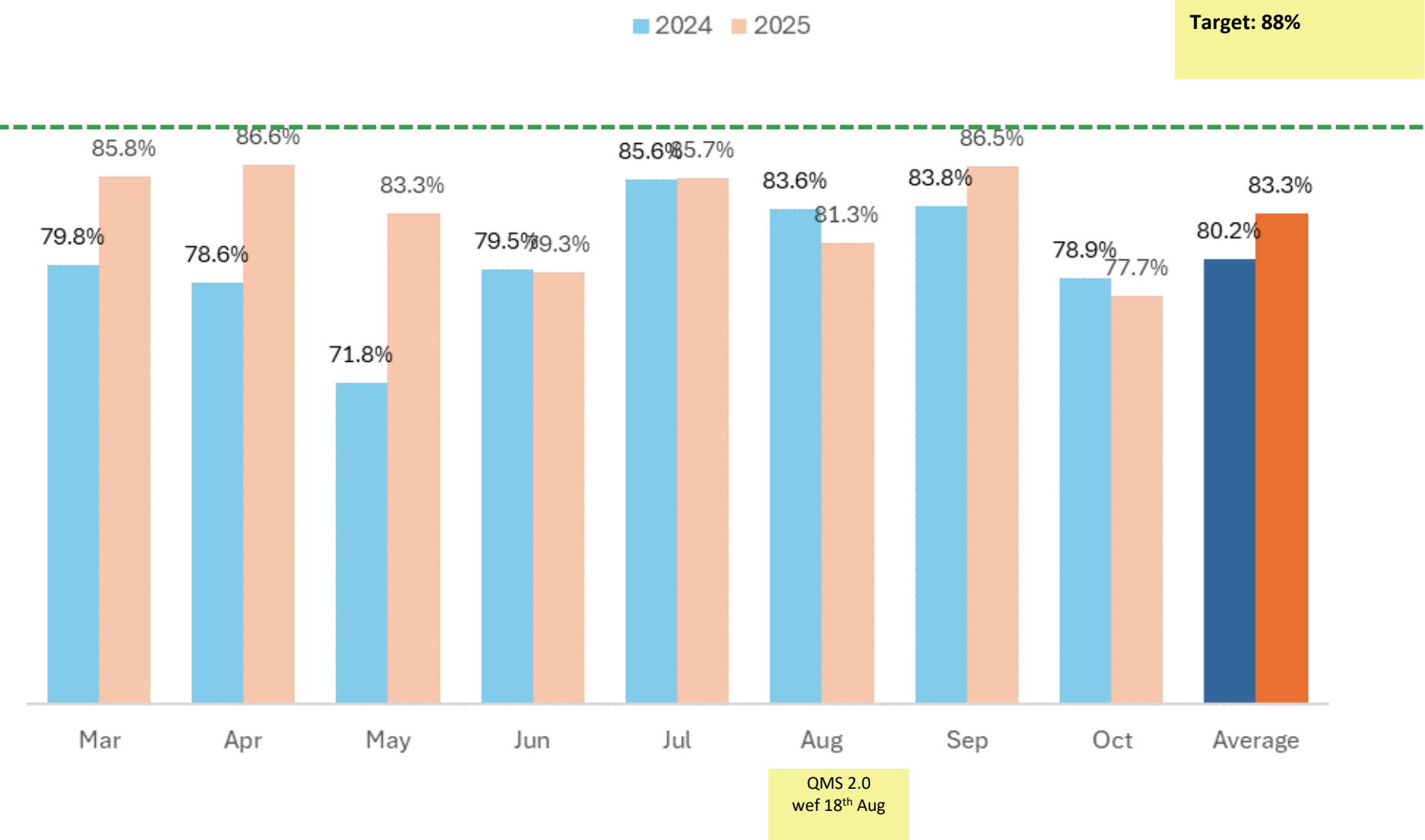


QMS 2.0  
wef 18<sup>th</sup> Aug

The introduction of QMS2.0 might have adversely affected the Service Experience Score temporarily

# E. Benefits / Results (CHECK)

## Service Experience Score (Consultation Wait Time Satisfaction)



# F. Strategy for Spreading/ Sustaining (ACT)

What actions are required for continuous improvement? How will the results be sustained for the long run? Will the project be spread to other areas?

## Education & Training

- Your content in this location
- More text placed here
- Add your content in this spot

## Audit Checks

- Your content in this location
- More text placed here
- Add your content in this spot

## Presentations

- Your content in this location
- More text placed here
- Add your content in this spot

## Communications

- Your content in this location
- More text placed here
- Add your content in this spot



## Standard Works

- Standard Scripts

## Systems

- Your content in this location
- More text placed here
- Add your content in this spot

## Staff

- Your content in this location
- More text placed here
- Add your content in this spot

## Patient

- Your content in this location
- More text placed here
- Add your content in this spot

# Appendix

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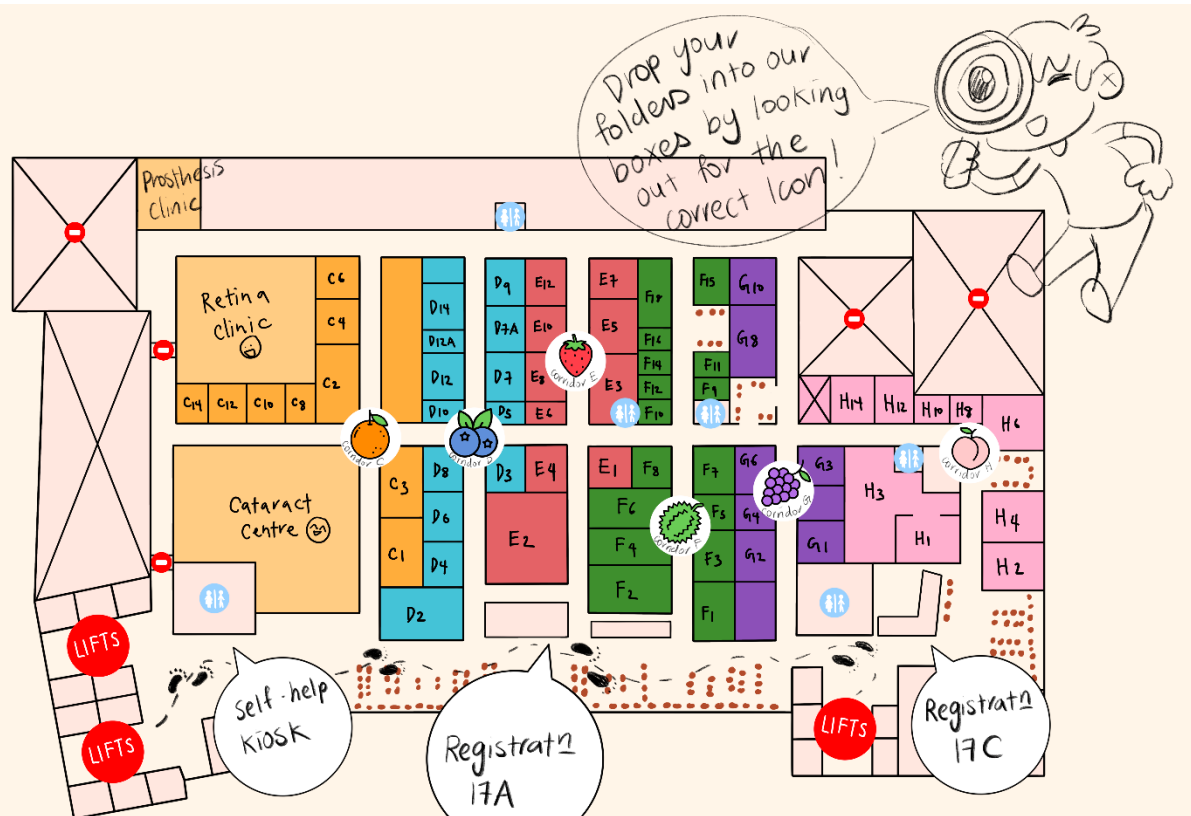


Group photo during **Improvement sprint**  
from 24-26 Feb 2025



Group photo during **closure meeting** on  
1 Dec 2025

# Appendix



## Rapid Prototyping:

Feedback from patients in early testing for improvement in future iteration: Increase the legibility, e.g. font size

Highlight recognisable iconic landmarks to aid sense of orientation

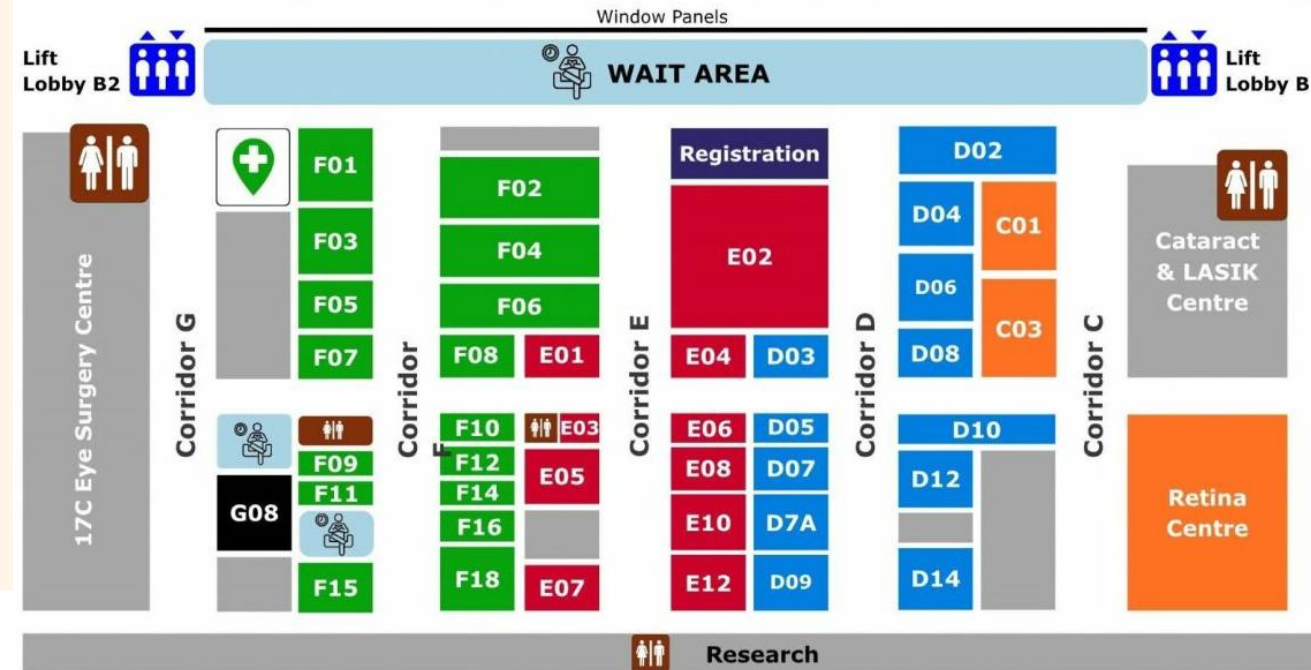
Use lighter shades of color to increase contrast of font for legibility



## Welcome to 17A NUH Eye Surgery Centre

Please remember to:

- Insert the folder in the boxes located outside the rooms.
- You will **not be called** if your holder is not inserted.
- For Room E07 and F15: Pass your folder to the counter opposite E07.
- For F09, F10, F11, F14: Pass your folder to the counter beside F11.



## Final version of mini map at Medical Centre Eye Clinic Level 17



# Appendix

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**Acrylic was installed at Satellite Pharmacy**



**Deployment of AVAT device for automated VA testing**

# Appendix (Cost saving calculation)

Total TAT (registration to consultation completion): 116 min baseline → 114 min (2 min reduction)

**Cost Savings:**

Median TAT Improvement (2 minutes reduction)

Cost per patient visit = \$656

Monthly average patient load = ~6,300 (based data from Feb25 to Nov25)

Time saved per patient: 2 minutes

Annual time saved: 6,300 x 12 x 2 min = 151,200 minutes (2,520 hours)

Cost per minute across full patient journey: \$656/116 min (baseline) = \$5.66/min

**Annual cost savings:** 151,200 min x \$5.66 = \$855,792

FY24 Bed Day and Visit Costs	
	FY24
	Cost per Patient Day (\$)
Class A	\$3,479
Class B1	\$3,370
Class B2	\$2,889
Class C	\$2,577
	Cost per Attendance (\$)
SOC Private	\$685
SOC Subsidised	\$656
EMD	\$571
	Cost per episode (\$)
DS Private	\$2,799
DS Sub	\$2,269