Project Title

Reducing Chemotherapy Waiting Times using a Design Thinking Approach

Project Lead and Members

Project lead: Dr Jen Wei Ying, Associate Consultant

Project members:

- Dr Chee Yen Lin, Senior Consultant
- Dr Chee Cheng Ean, Senior Consultant
- Mr Chan Zhi Yao, Senior Clinical Pharmacist
- Ms Chong Lee Moy, Nurse Clinician
- Ms Melinda Khoo, Senior Executive
- Ms Siew Woon Lim, Consultant Pharmacist
- Ms Judith Kaylene Lee, Nurse Manager
- Mr Lee Meng Tuck, Deputy Director and Head
- Dr Lee Yee Mei, Assistant Director of Nursing
- Mr Ng Kian Han Noel, Assistant Manager
- Ms Tan Lian Eng Belinda, Senior Nurse Clinician
- Ms Tay Rui Xian, Senior Manager
- Ms Teo Hui Ling, Constance Jeanne, Principal Clinical Pharmacist
- Ms Wong Yuet Peng, Senior Principal Clinical Pharmacist

Organisation(s) Involved

National University Cancer Institute, Singapore

Project Period

Start date: October 2019

Completed date: Ongoing

Aims

To reduce chemo wait to <45 minutes from appointment time, >75% treated within 1 hour

Background

See poster attached/ below

Methods

See poster attached/ below

Results

See poster attached/ below

Lessons Learnt

We have shown that a multi-disciplinary working group using a human-centred, empathetic, and collaborative approach through design thinking can reduce waiting times for chemotherapy in the ambulatory setting. These measures increased staff job satisfaction and perceptions of care delivery. The project was undertaken with no added expenditure, during a raging pandemic, which resulted in manpower constraints due to team segregation. We also showed that even though chemotherapy scheduling is complex, staff unfamiliar with regimens and their administration can perform scheduling accurately when information is consolidated and presented accessibly.

The journey from ideation to implementation took six months. The COVID pandemic was partly responsible, but more importantly, getting buy-in from all stakeholders and staff on the ground took time and personalised engagement. Ownership of the ideas was critical to the success of the project, and if we were to repeat it, we would want to ensure that change management was prioritised from the conceptualisation phase, so as to garner more support initially.

Conclusion

See poster attached/ below

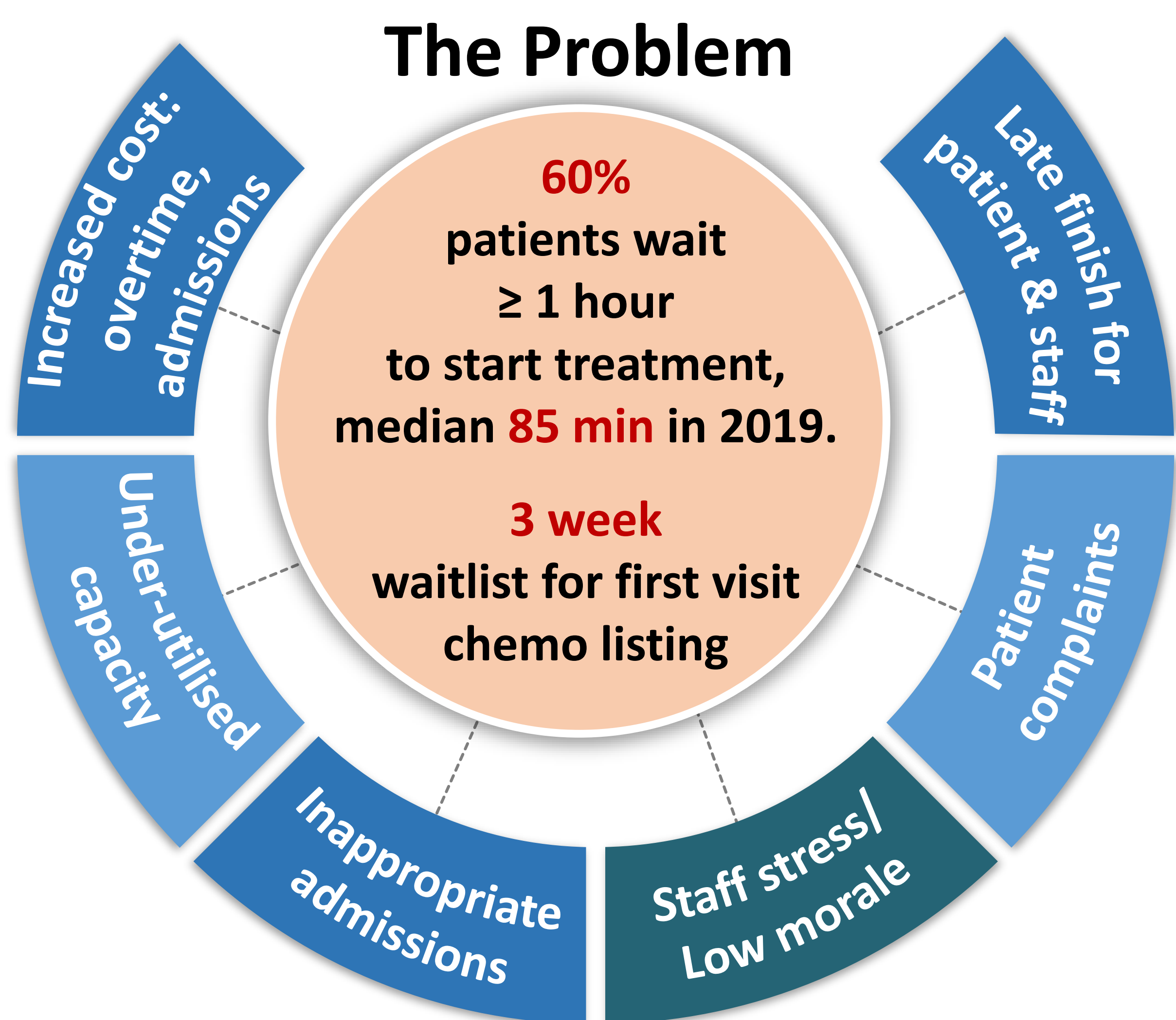## Project Category

Care & Process Redesign

Keywords

Care & Process Redesign, Quality Improvement, Design Thinking, Value Stream Mapping, Outpatient Care, Access to Care, Waiting Time, Multi-Disciplinary Team, Nursing, Pharmacy, Healthcare Administration, National University Cancer Institute Singapore, Outpatient Chemotherapy

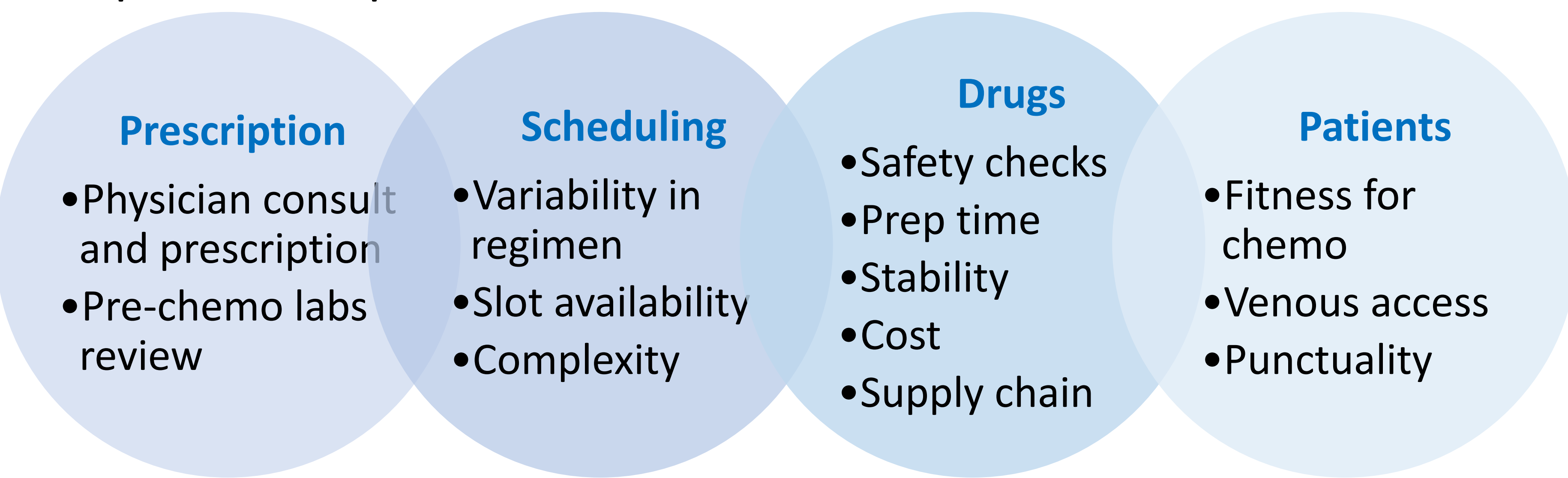## Name and Email of Project Contact Person(s)

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Reducing Chemotherapy Waiting Times Using a Design Thinking Approach

NCIS RIGHT SITING GROUP
Simple, sustainable, innovative care & technology transformation

National University Cancer Institute Singapore

The Problem

60% patients wait **≥ 1 hour** to start treatment, median **85 min** in 2019.

3 week waitlist for first visit chemo listing

- Increased cost: overtime, admissions
- Late finish for patient & staff
- Under-utilised capacity
- Patient complaints
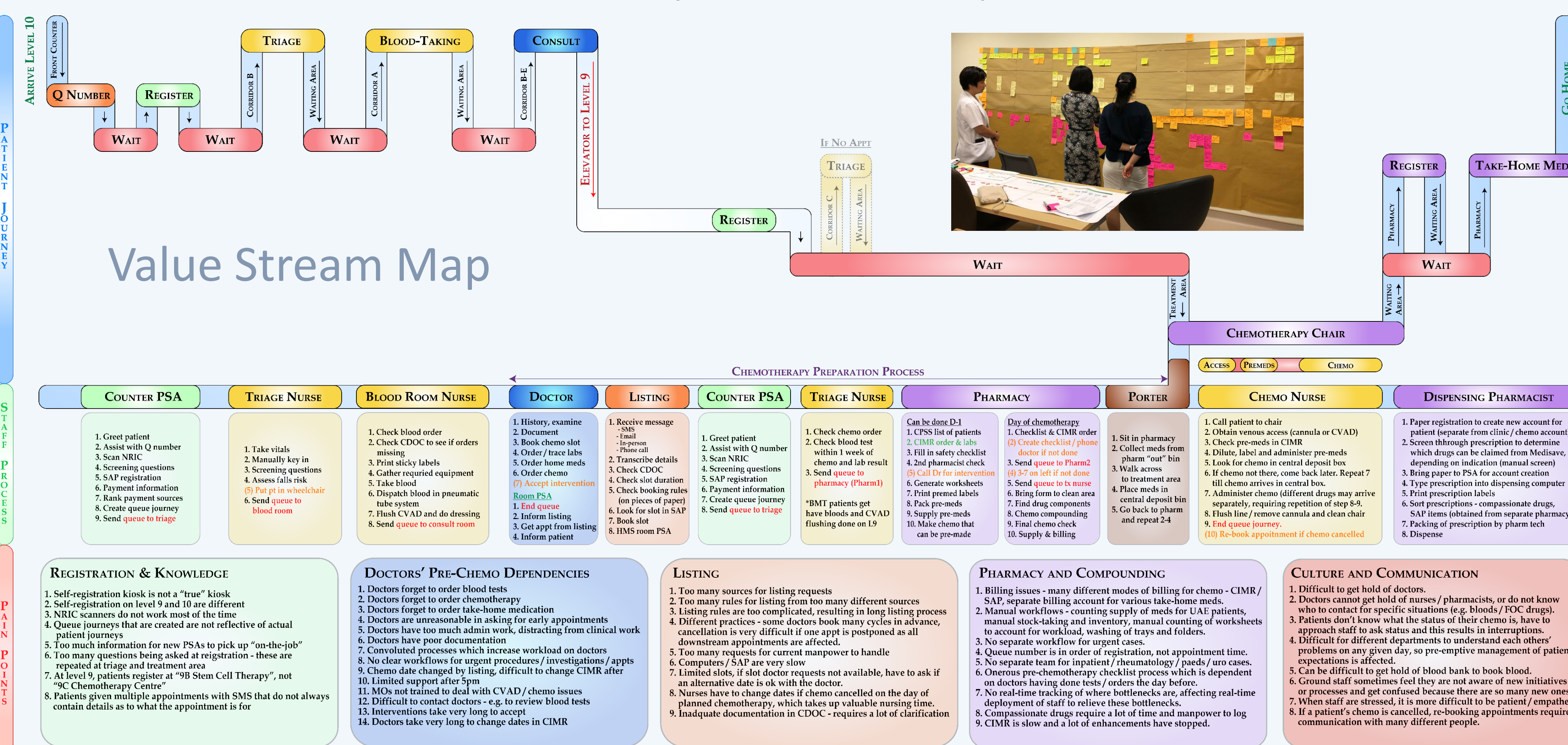- Inappropriate admissions
- Staff stress/ Low morale

Why? Chemotherapy is Complex

Chemotherapy preparation and delivery is complex with multiple healthcare teams involved. Teams often work in silos with specialised software that does not integrate and have no good means of inter-team communication. Cost and patient factors compound the problem.

Prescription
- Physician consult and prescription
- Pre-chemo labs review

Scheduling
- Variability in regimen
- Slot availability
- Complexity

Drugs
- Safety checks
- Prep time
- Stability
- Cost
- Supply chain

Patients
- Fitness for chemo
- Venous access
- Punctuality

Goal: Reduce chemo wait to **<45 minutes** from appointment time, **>75%** treated within 1 hour

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Problem Analysis.
A multi-disciplinary value stream mapping and job shadowing exercise was done in Oct 2019 to understand and critically evaluate our processes. All staff were invited to give feedback and suggestions.
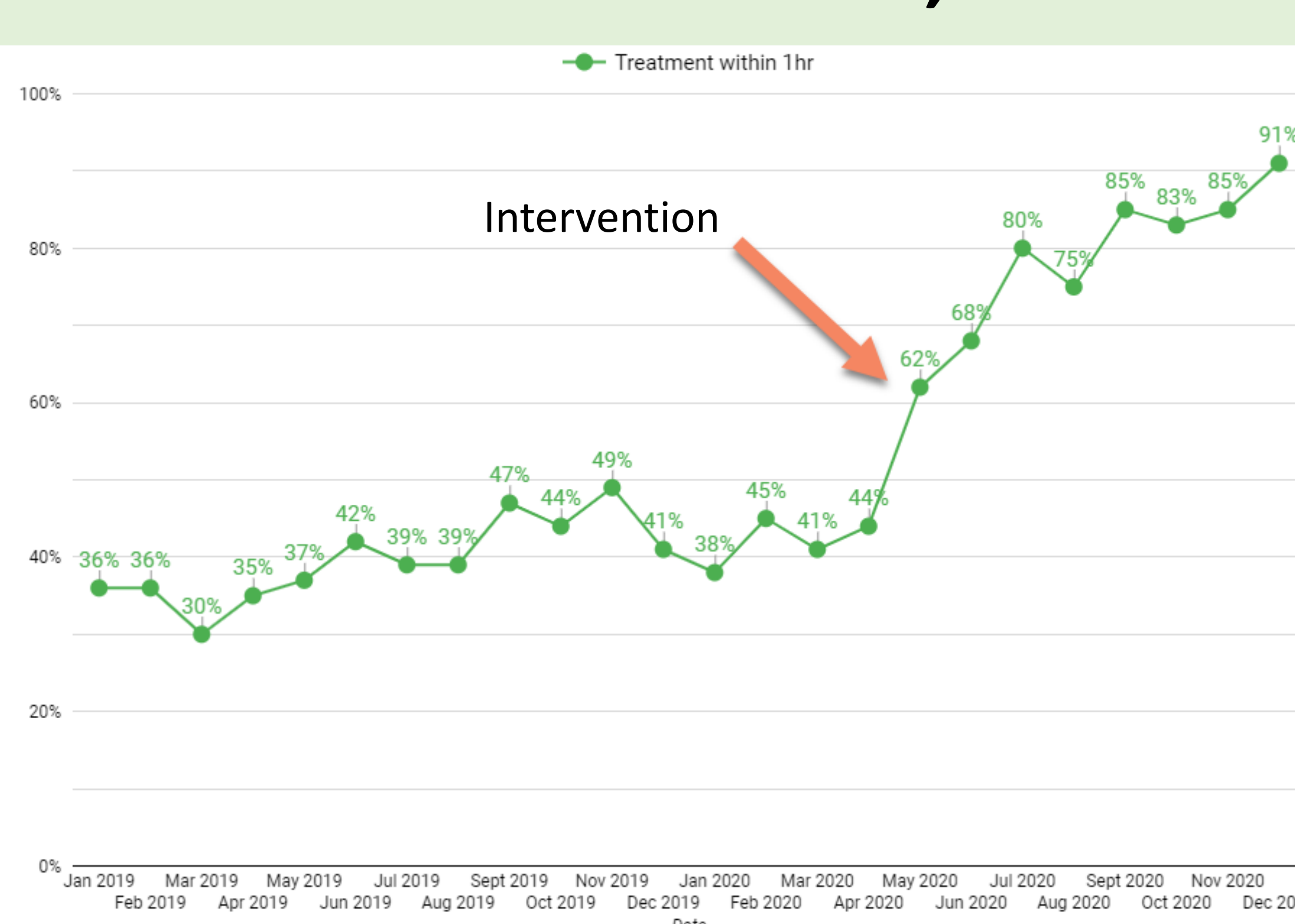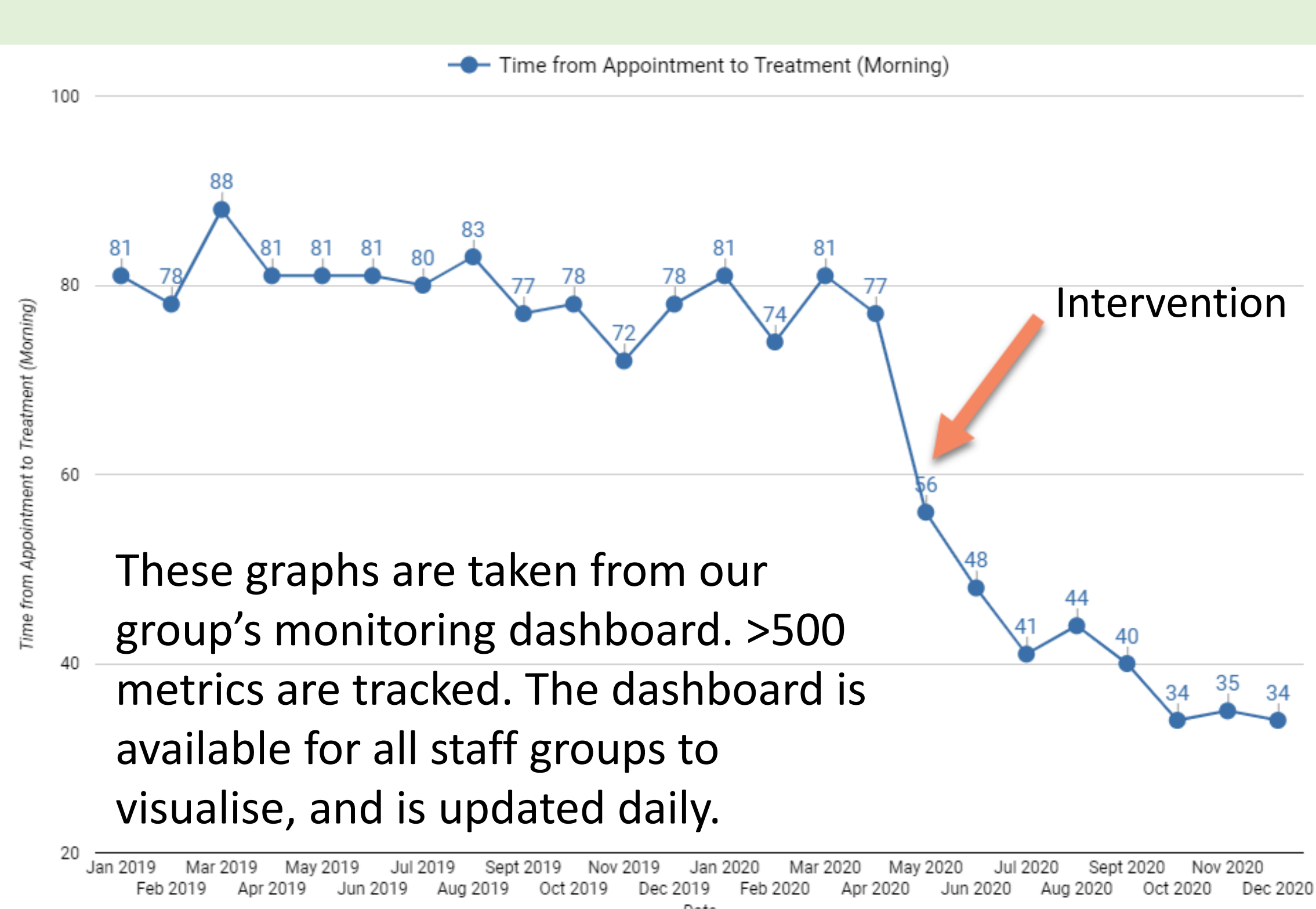
Value Stream Map

Interventions Chosen

Problem	Intervention	Date
Chemotherapy on same day as consult / blood tests or missing chemo order results in long preparation time due to safety checks and waiting for lab results at triage.	1. No chemo on same day as appt / blood tests to reduce triage time. 2. SMS reminder for doctors to order chemo day before chemo (D-1).	Feb 2020 / 1 May 2020
No way to systematically evaluate outcomes of interventions or identify problem areas due to isolated IT systems.	Relevant targets discussed & agreed, visualized in dashboard updated daily, accessible to all job groups.	1 May 2020
Low proportion of premade chemotherapy adds to waiting time on the day of treatment due to complex compounding process.	Increase proportion of pre-makes by changing pharmacy workflows and reorganizing manpower to create a dedicated premix team.	1 May 2020
Scheduling of high-cost / short-expiry chemo in the morning results in backlog as cannot be premade. Morning patients wait longer with knock-on on following patients' start time. Nurses rostered to do scheduling because of complexity and domain knowledge required.	Specialised listing team of PSAs, with nurses no longer required to schedule. All 400+ regimens and their scheduling properties were tabulated. This was then made searchable via Excel-based algorithm to provide ideal slots and prioritise morning slots for pre-makes.	1 May 2020

Solving the Problem: Ideation – *"How might we… ?"*

Decrease Waiting Time?
- ↑ Premade chemo the day before.
- Start the morning on time.
- Use morning to make short-expiry chemo.

System

Ensure timely prescriptions?
- Schedule consults at least 24hrs ahead of chemo.
- Reminder SMS to prescribe chemo the day before.

Doctors

List Only Premakes in the Morning?
- Dedicated scheduling team.
- Digitised, searchable rules.
- Ideal slot recommended by algorithm.

Schedule

↑ Advance Chemo Preparations?
- No same-day consults / labs: allows orders to be reviewed in advance.
- Dedicated premake team.

Pharm

Track Progress and Identify Issues?
- Standardised, agreed outcome measures.
- Tracked daily.
- Visualised via a dashboard available to staff.

Data

Results: 60% reduction in wait times to 34 min in Dec 2020, 91% within 1 hour. Sustained.

Time from Appointment to Treatment (Morning)

These graphs are taken from our group's monitoring dashboard. >500 metrics are tracked. The dashboard is available for all staff groups to visualise, and is updated daily.

Treatment within 1hr

Intervention

Other Results:
- Morning scheduling accuracy increased to **95%** from 75%.
- **92%** chemo orders pre-made the day before (from 75%).
- **80%** of chemotherapy pre-made post-intervention (from 25%).
- **9.8%** finish after 6pm (from 20%).
- >50% of staff feel patients are happier with chemo, >40% say that their job is easier now.

Conclusion:
A multi-disciplinary working group using a human-centred, empathetic, and collaborative approach through design thinking can reduce waiting times for chemotherapy in the ambulatory setting.