

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

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Reducing Chemotherapy Waiting Times Using a Design Thinking Approach





waitlist for first visit chemo listing

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
- Variability in regimen Slot availability •Complexity

Scheduling

Drugs

•Safety checks

• Prep time

• Stability

•Cost

Patients • Fitness for chemo Venous access



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

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.



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Interventions Chosen

P A T I E N		If No Appt Triage		REGISTER TAKE-HOME MEDS	Problem	Intervention	Date
Value Stre	еат Мар ВLOOD ROOM NURSE DOCTOR	REGISTER CHEMOTHERAPY PREPARATION PROCESS LISTING COUNTER PSA TRIAGE NURSE	WAIT VENUT PHARMACY PORTER	EMOTHERAPY CHAIR PREMEDS CHEMO CHEMO NURSE DISPENSING PHARMACIST	Chemotherapy on same day as consult / blood tests or missing chemo order results in long preparation time due to safety checks and waiting	 No chemo on same day as appt / blood tests to reduce triage time. SMS reminder for doctors to order chemo day before chemo (D-1). 	Feb 2020 1 May 2020
PROCESS 1. Greet patient 2. Assist with Q number 3. Scan NRIC 4. Screening questions 5. SAP registration 6. Payment information 7. Rank payment sources 8. Create queue journey 9. Send queue to triage 9. Send queue to triage 1. Take vitals 1. Take vitals 1. Take vitals 1. Take vitals 1. Take vitals 2. Manually key in 3. Screening question 4. Assess falls risk (5) Put pt in wheele 6. Send queue to triage 1. Self-registration kiosk is not a "true" kiosk 1. Self-registration no level 9 and 10 are different	 I. Check blood order Check CDOC to see if orders missing Print sticky labels Gather requried equipment Take blood Dispatch blood in pneumatic tube system Flush CVAD and do dressing Send queue to consult room I. End queue I. End queue I. End queue I. Inform listing Get appt from listing I. Inform patient 	 Can be dong MS mail t-person hone call anscribe details neck DOC neck slot duration neck slot duration Nergistratin Nergistratin Nergistratin Nergi	ne D-1 tof patients tof patients 1. Checklist & CIMR order (2) Create checklist/phone doctor if not done fety checklist 3. Send queue to Pharm2 (4) 3-7 on left if not done 3. Walk across 5. Send queue to tx nurse 6. Bring form to clean area 7. Find drug components 8. Chemo compounding 9. Final chemo check 10. Supply & billing 10. Supply & billing 9. End queue 11. Call patie 2. Obtain volt 12. Collect meds from 1. Dilute, la 13. Walk across 1. Go back to pharm 14. Place meds in 1. Chemo compounding 9. Final chemo check 10. Supply & billing 10. Supply & billing 9. End queue 11. Sit in pharmacy 1. Call patie 12. Goldect meds from 1. Billing issues - many different modes of billing for chemo - CIM 13. Billing issues - many different modes of billing for chemo - CIM 14. Billing account for various take-home meds. 2. Manual workflow contribute count for various take-home meds.	 Paper registration to create new account for patient (separate from clinic / chemo account) Screen thhrough prescription to determine which drugs can be claimed from Medisave, depending on indication (manual screen) Bring paper to PSA for account creation Type prescription into dispensing computer Print prescription labels Sort prescriptions - compassionate drugs, SAP items (obtained from separate pharmacy) Packing of prescription by pharm tech Dispense 	for lab results at triage. No way to systematically evaluate outcomes of interventions or identify problem areas due to	Relevant targets discussed & agreed, visualized in dashboard updated daily, accessible to all job groups.	1 May 2020
 a. the second mean state of the time field were stated as the field were stated as the field were stated as a to what the appointment is for b. the second mean state of the time state is a stat					Low proportion of premade chemotherapy adds to waiting time on the day of treatment due to complex compounding	Increase proportion of pre- makes by changing pharmacy workflows and reorganizing manpower to create a dedicated premix	1 May 2020
 Decrease Waiting Time? Premade chemo the day before. Start the morning on time. Use morning to make short-expiry chemo. 	 Ensure timely prescriptions? Schedule consults at least 24hrs ahead of chemo. Reminder SMS to prescribe chemo the day before. 	 List Only Premakes in the Morning? Dedicated scheduling team. Digitised, searchable rules. Ideal slot recommended by algorithm. 	 Advance Chemo Preparations? No same-day consults / labs: allows orders to be reviewed in advance. Dedicated premake team. 	 Track Progress and Identify Issues? Standardised, agreed outcome measures. Tracked daily. Visualised via a dashboard available to staff. 	process. 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	team. 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	1 May 2020
System	Doctors	Schedule	Pharm (E	Data	complexity and domain knowledge required.	morning slots for pre- makes.	

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

— Time from Appointment to Treatment (Morning)

— Treatment within 1h

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.