

# Crouch, Touch, Hold, Engage... Chemotherapy Redesign



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Melbourne**











# Victorian Chemotherapy Services Redesign Project (VCSR) 2013

## Objectives

To improve the patients experience of the Chemotherapy Day Unit(CDU)

To increase the capability of Victorian CDU management teams to employ lean business improvement techniques and consistent performance measures to support locally lead service improvement

To develop a CDU redesign toolkit and suite of performance measures to be made available to all Victorian day chemotherapy services for use as an improvement guide

To improve efficiency of participating CDU's and share learnings promptly through a community of practice

*Danielle Murray, Alexander Marliese – Final Report, April 2014*

# Health Improvement Capability Survey

- Survey was completed as a baseline and at project completion
- Purpose of Survey was to evaluate the existence of organisation systems and structures to support success in self management of ongoing improvement
- Results identified 6 out of 10 sites reported limited or no IT systems or data support for developing CDU measures
- Only 1 site collected chair utilisation and wait data
- Only 1/10 reported anything regularly to Executive



# Diagnostic Phase

- 9 out of 10 sites completed a 3-4 week chair side audit of patient throughput data and common delay reasons for delay (using the CDU Flow Manager database)
- One site used their own tool



# Key Findings at Baseline

- Lower than expected Chair Utilisation Rate – Median 48% (range 38-72%)
- Value added chair time accounted for only 83% of total chair time (17% of time in the chair being “idle”)
- 11.4% of appointments were cancelled on the day with a significant impact on utilisation (range 2-15%)
- Total patient waiting time in (inclusive of waiting to get into the chair and then waiting idle in the chair) averaged 34 minutes with a range of 0-120 minutes
- Non oncology work being performed in CDU chairs averaging 9% of total treatment hours, and one site the outlier at 30%

# Key Findings (cont)

- Most units rostered 1 direct care nurse to manage 3 chairs
- The majority of sites identified complex manual scheduling practices as the number one reason for sub optimal chair utilisation and prolonged waiting times.
- The reasons patient wait was dependent on numerous issues related to e.g. treatment orders, product availability, Pathology, Medical review, Nursing

# Solutions Design

## Some of the solution examples

- Improve chemotherapy product availability
- Improve use of data management systems
- Improve role clarity, and standard operating procedures
- Improve environmental design
- Improve standardisation of chemotherapy education

# Key Results from Pilot

- 4 out of 9 sites achieved a statistically significant improvement in one or more key measures
- 6/10 sites now report to Executive; 9/10 measure and report chair utilisation; 9/10 measure and report waiting times; all now have data support
- All sites combined achieved modest but significant improvement in the 2 key areas
  - 4% improvement in value added chair time (83-87%)
  - 9% increase in median CDU utilisation (49-58%)

# ONJ Project

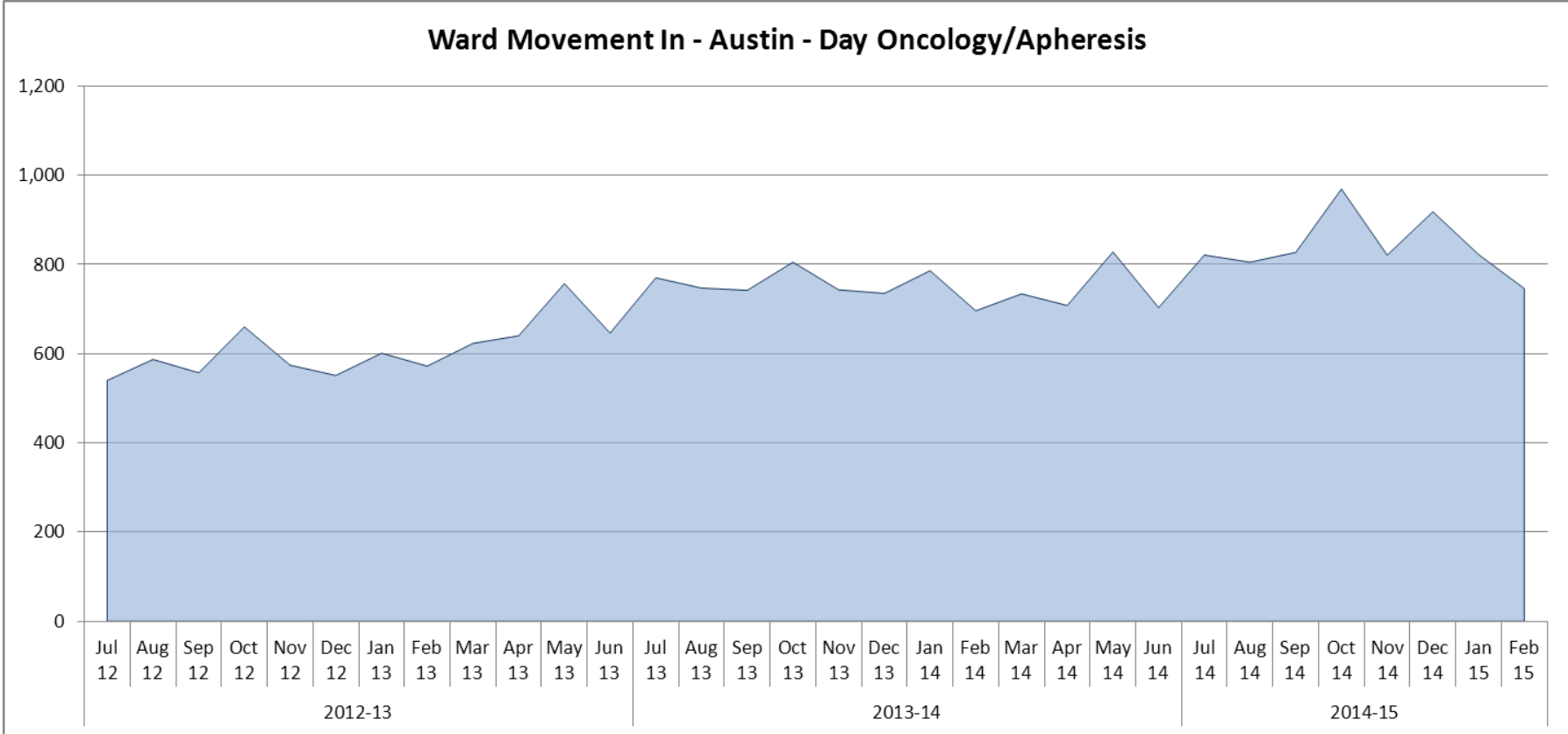
- November 2012 – Austin Health was accepted as pilot site to undertake redesign in the Chemo Day Unit
- April 2014 – Austin reinitiated the project with assistance from Austin By Design team
- Increasing demand/complexity and length of treatments
- Increasing number of Clinical Trials treatments
- Variation in access to treatment times

A black and white portrait of Albert Einstein, showing him from the chest up. He has his characteristic wild, white hair and a mustache. He is looking slightly to the right of the camera with a thoughtful expression. His hands are clasped together in front of him, with his fingers interlaced. The background is dark and out of focus.

*" If I had one hour to save the world I would spend fifty-five minutes defining the problem and only five minutes finding the solution"*

# Growth and Capacity

Ward Movement In - Austin - Day Oncology/Apheresis





# Overall Aim - Patient Experience



**85% patients  
wait 15 mins  
or less**

# How we collected the Data..

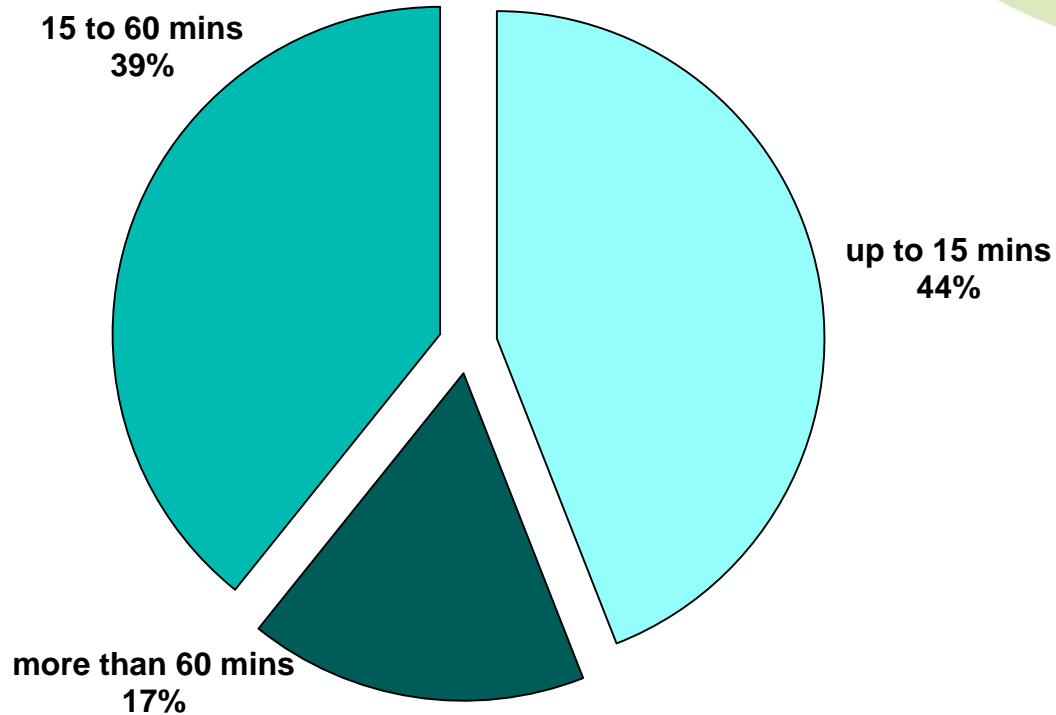
- Help of Austin Redesign Team – Lean Methodology
  - Patient shadowing
  - Staff engagement – culture and values exercise
  - Patient Questionnaire
  - Value stream mapping
  - Data collection and analysis – Scheduler
  - Patient and carer experience - interviews/feedback

# Data Collection Definitions and Results

Data Diagnostic	Data Definition	Baseline Measure	KPI
Access to Specialist R/V	Days b/w referral and FSA	Average 10 days/Median 2 days	TBA
Access to CDU Treatment	Days b/w DTT(RFC) to Treatment commencement	12 days	TBA
CDU Activity	Average patients/day	33.1	
CDU Capacity	Total hrs/week = chairs/beds/staffing hours	765 hours 18 x 8.5 x 5	
Chair Utilisation	Total available hours/actual patient TMT time	65%	80%
Patient Waiting Time	Appointment time - TMT	56% > 15 mins	85%

# Initial data from Day Oncology Web-scheduler

Time to Treatment Start

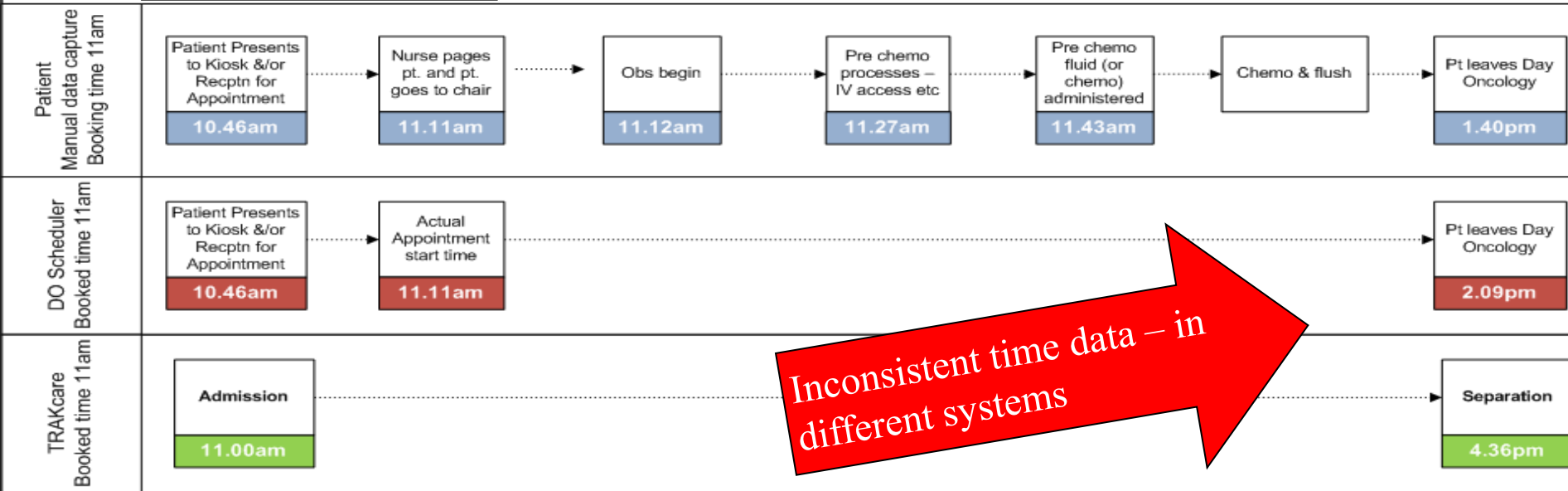


**56% of patients experience a delay of > 15mins**



# Day Oncology Patient Shadowing Exercise

Date 4/4/13. [REDACTED]



## Length of Stay Summary

Manual data capture from registration time = 174 mins. From paging time = 149 mins

DO Scheduler from registration time = 203 mins. From Appointment start time = 178 mins

TRAKcare = 336 mins. \*\*\*\*note patient attended another appointment in the afternoon

## Patient Perspective:

Patient happy with service, said there is usually a very minimal waiting time, on average he estimates this to be between 2-5 minutes. And a maximum of 10 minutes. Patient's daughter is a bookings clerk at Peter Mac Radiotherapy section. She expressed she felt Austin Health Day Oncology was a much nicer (aesthetically) environment.

Both her dad as patient and her as a support for him love the concept of and to attend the wellness centre.

Mr R said Would prefer continuity with doctors rather than different ones being seen. Did have some contact with a nursing liaison type person at some stage (via the wellness centre) during treatment and really valued having someone to call and discuss any concerns over treatment, side effects, and any other issues – was important to have someone to who to speak to who listened and understood their individual needs i.e. a more personalised service

Date: 11/6/13

Chair number 24

Clerk Name:

Nurse Name:

Please record 'Time' in 24Hr Clock to the nearest minute

Clerk Name:

Nurse Name:

Patient 306	Clerical Admission		Scheduled Tx /Procedure	Procedure Cancelled?	Med review today	Blood test today	Sched Appt Time	Nursing /Patient Assess			Treatment / Procedure		Discharge from chair Time
	Time patient presents to clerical staff	Time Clerical Admission Is Complete						Start Time	End Time	IVT Cannula inserted	Start Time	End Time	
	9.42	9.45.	Onc related Tx? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<input checked="" type="checkbox"/> No	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes	<input type="checkbox"/> No <input checked="" type="checkbox"/> Yes	10.00	10.45	10.00	11.00	11.10	11.15	11.20
UR Number/ Insert Bradma Sticker <div style="background-color: #003366; width: 100%; height: 40px;"></div>			If Yes (✓ main cause only) <input checked="" type="checkbox"/> Chemo/IVT <input type="checkbox"/> Chemo Non IVT <input type="checkbox"/> Blood/IVIG <input type="checkbox"/> CVAD <input type="checkbox"/> Bisphosphonate <input type="checkbox"/> Iron Infusion <input type="checkbox"/> Clinical Trial IV drug <input type="checkbox"/> Clinical Trial non- IV drug <input type="checkbox"/> Patient Education	If Yes (✓ main cause only) <input type="checkbox"/> Toxicity <input type="checkbox"/> Inpatient <input type="checkbox"/> Ceasing Tx <input type="checkbox"/> Patient failed to attend <input type="checkbox"/> Other (reason in comments)	Was Nursing/ Patient Assess start time delayed? <input type="checkbox"/> No <input checked="" type="checkbox"/> Yes (✓ main cause only) Patient late (reason in comments) <input type="checkbox"/> Waiting for pathology <input type="checkbox"/> Waiting for med review <input type="checkbox"/> Waiting for nurse <input type="checkbox"/> Waiting for chair <input type="checkbox"/> Waiting for orders <input type="checkbox"/> Waiting for product			Was treatment start time delayed? <input checked="" type="checkbox"/> No/ No further delay Yes (✓ main cause only) <input type="checkbox"/> Waiting for Pathology <input type="checkbox"/> Waiting for med Review <input type="checkbox"/> Waiting for Nurse <input type="checkbox"/> Waiting for Orders <input type="checkbox"/> Waiting for drug		Was D/C delayed? <input checked="" type="checkbox"/> No / No further delay Yes (✓ main cause only) <input type="checkbox"/> Waiting for nurse /disconnection <input type="checkbox"/> Waiting for D/C Orders <input type="checkbox"/> Waiting D/C Drugs <input type="checkbox"/> Other			
Clerical Checklist <input checked="" type="checkbox"/> Scheduler <input checked="" type="checkbox"/> Q-Manager <input type="checkbox"/> Medtrak ( IV Tx only)													

Comments:(e.g. patient stayed longer: hypersensitivity reaction) Pt. came on time. Neither Scheduler nor Q man showed that pt. was in. Checked x4 since 09.55.

Clerical

Nursing



# Appointment / Treatment Day Chemotherapy

**Value Stream Map 1**  
**Title:** Chemo Day  
**Onc**  
**Scope:** All chemotherapy pts.  
**Date:** 17/6/13  
**Validated By:**

**E- Queuing**  
 Web scheduler  
 Medtrak

**Pt education**  
 labour  
 intensive..needs  
 repeating

**Pts late**  
 (46/450)=10%



**Scheduling**  
 lengthy – error  
 ...no streaming

**Pathology TAT**  
 on the day...not  
 taken earlier  
 errors

**Pts unwell**

**Medical**  
 Review....Drugs  
 Pharmacy  
 (51/450) = 11%

**Clerical**  
 Admission

**Nursing**  
 Assessment

**Treatment**

**Nursing**  
 Discharge  
 Completed

**VALUE Q = 73%**

**Main Causes for delays:**  
 Nurse Busy  
 Medical Review  
 Patient Late

High = 2 hrs 9m  
 Low = 0  
 Avg = 4 min 21s

High = 8 hrs 20m  
 Low = 0  
 Avg = 23 mins 30s

High = 7hrs 25m  
 Low = 0  
 Avg=1 hr 27m 38s

High = 3 hrs 23m  
 Low = 0  
 Avg = 7 min 46s

High = 2hrs 30 m  
 Low = 0  
 Avg = 15 min

High = 3 hrs 35s  
 Low = 0  
 Avg = 19 min 34s

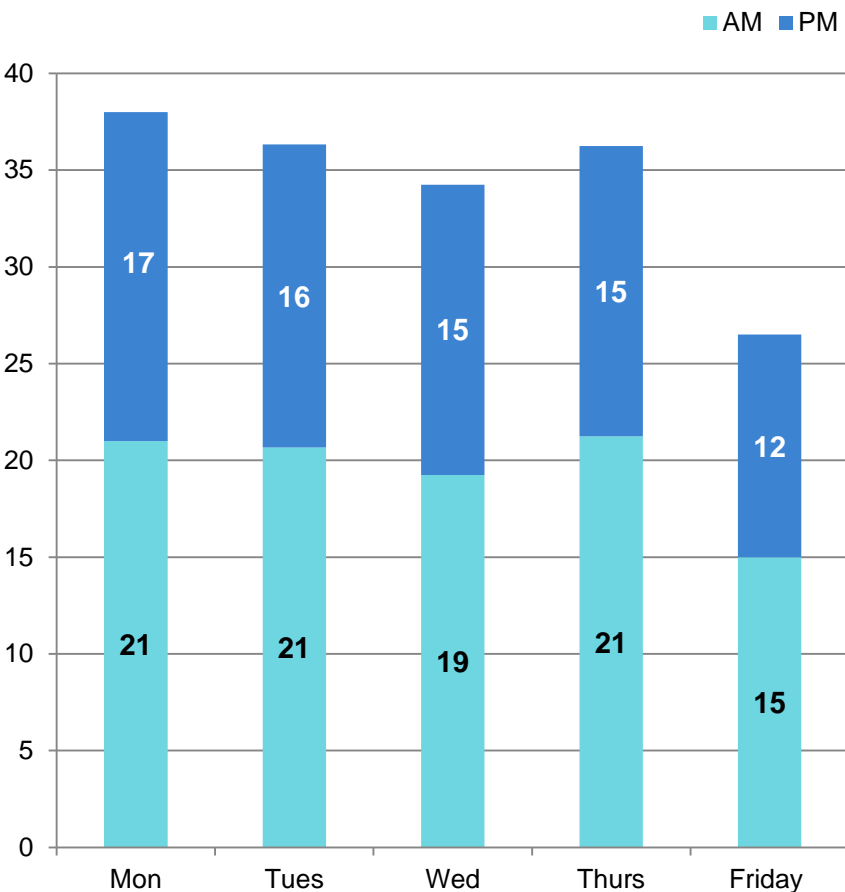
**Nurses busy ++**  
 Working over  
 ratio.....cummulative  
 effect other factors

**Cannulation access**  
 issues (13/450)

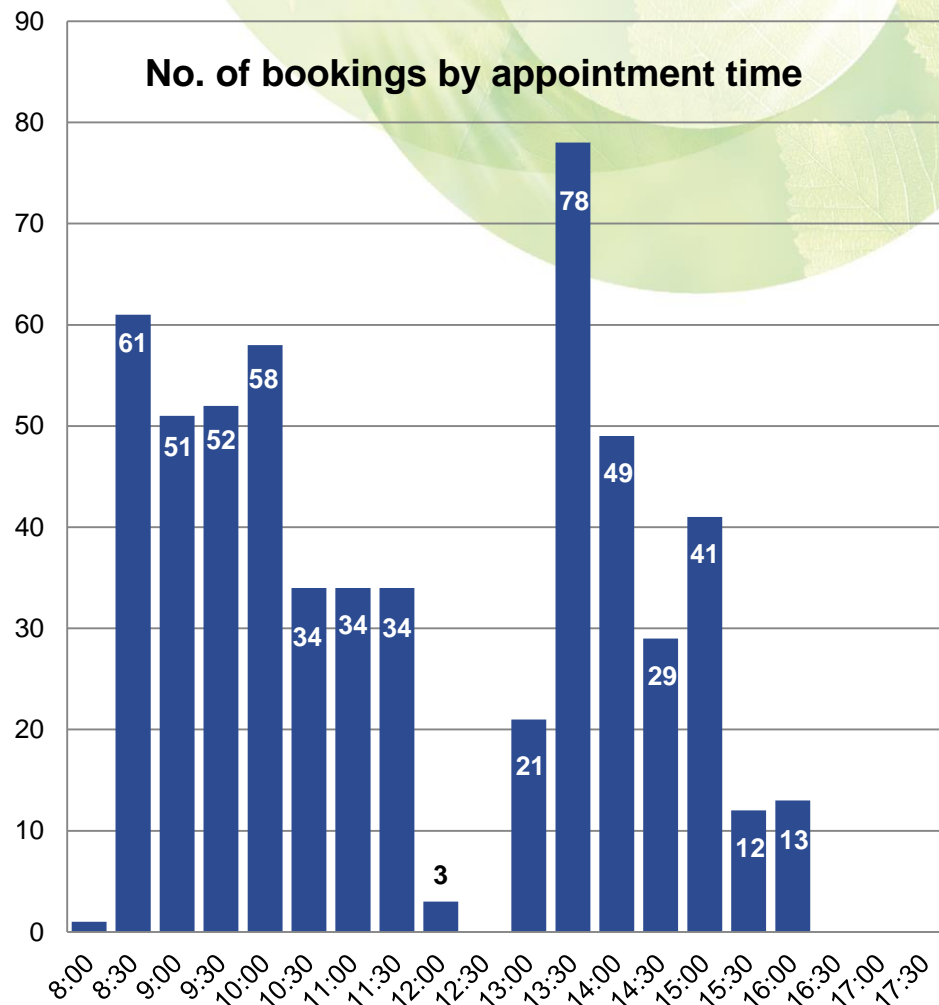
**Other ..ED/ ward/  
 temp of drug/ late  
 to lunch etc**

# Booking Patterns

Average no. bookings by day of week



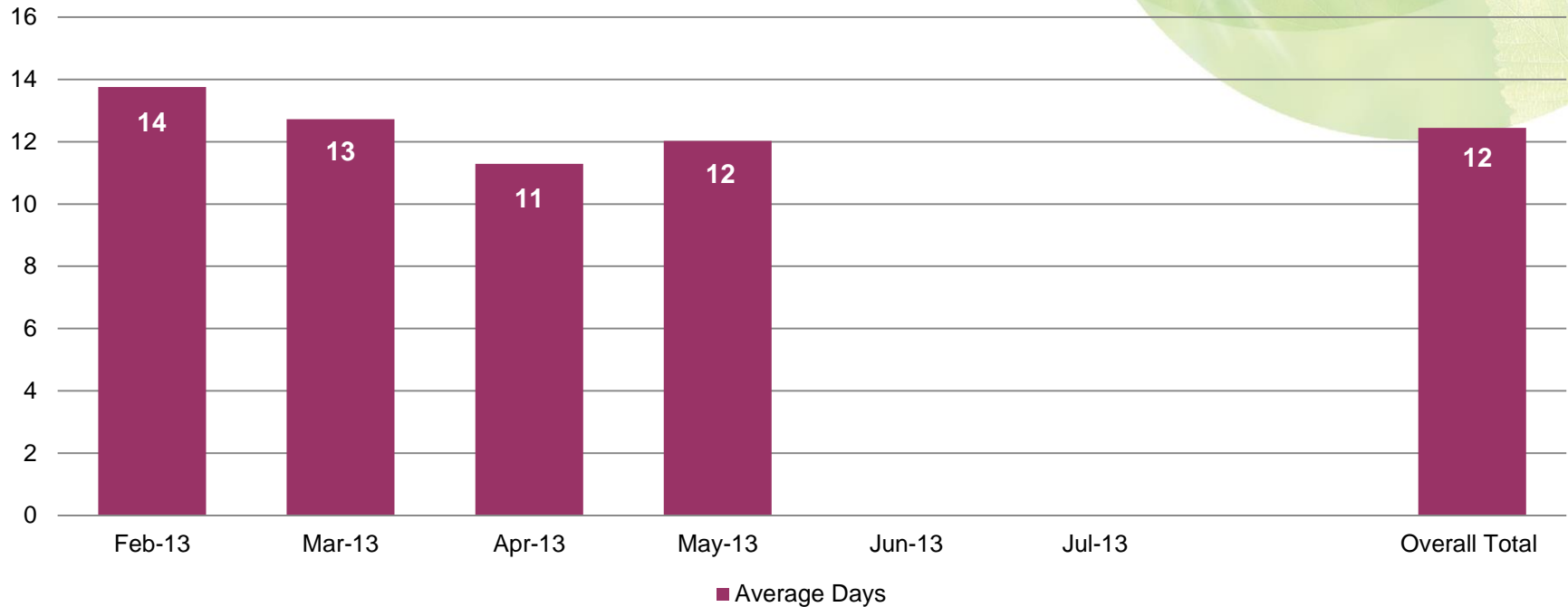
No. of bookings by appointment time





# Referral to First Appointment

## Days btwn referral & first appt in Day Oncology



Concern re scheduling **'urgent'** cases

Ward admissions

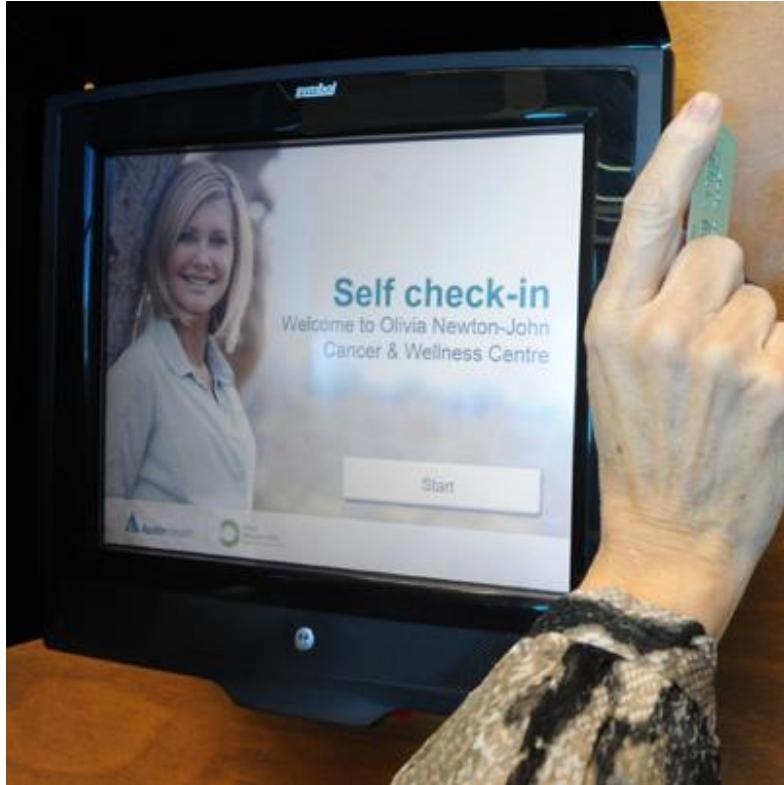


Costs



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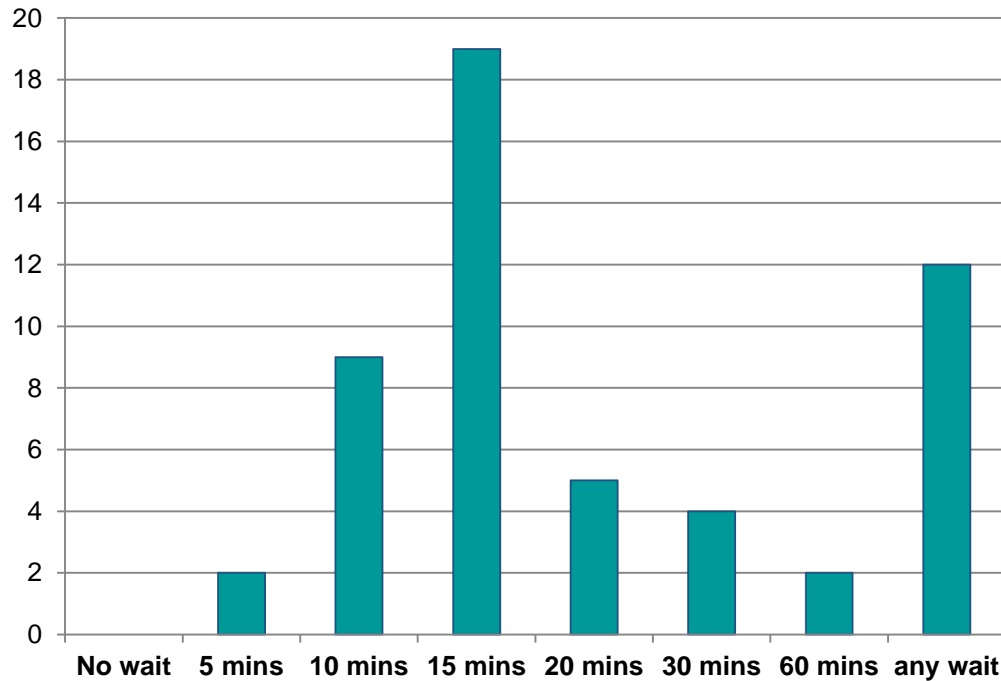
# Patient Experience - Survey



1. Time of day that suits you best for appointments?
2. Acceptable time to wait for your treatment?
3. Other suggestions or Feedback

# Patients Expectations re Waiting

## Waiting Time Expectations



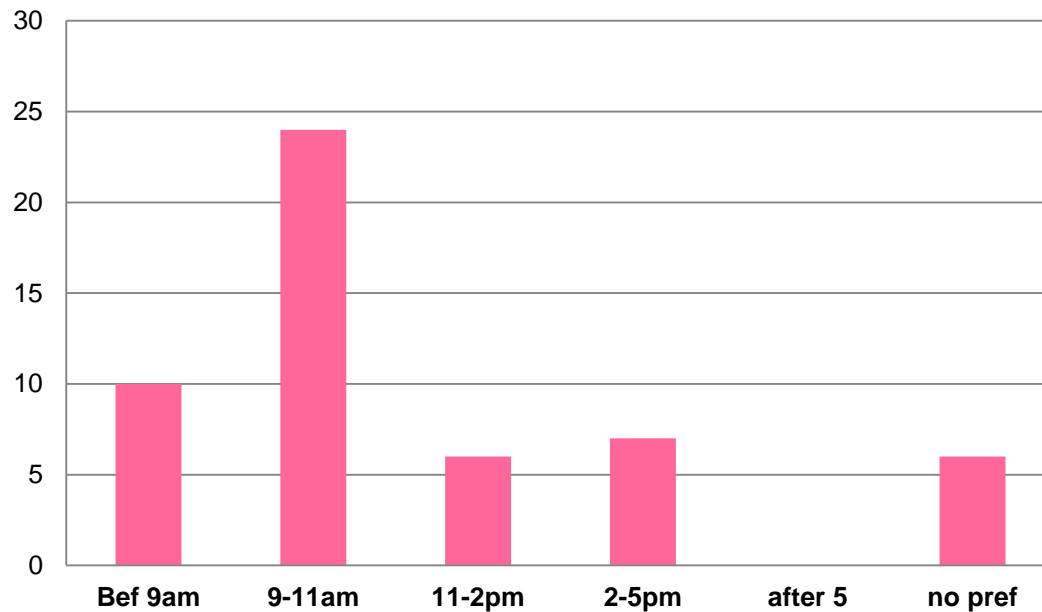
Majority of patients expect to wait 15 mins or less



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Cancer & Wellness Centre

# What Appointment time patients prefer....

Patient appointment time preference



# What patients said.....

50% Comments VERY POSITIVE

“I find the nurses very caring & attentive to me at a difficult time in my life”

## Scheduling of Appointments

“As a patient receiving an injectable treatment which is quick compared to most patients – could a discreet line be made for quick patients?”

“..waiting time is dependent on how your allocated nurse is tracking, so there needs to be some back up system to ensure someone else can take you & get your treatment started in a timely manner”

“We would like an early appointment as otherwise it makes it so late to get home to Nagambie”



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# What patients said.....

## Patient Experience

“Understanding staff (would be a suggestion to improve) - I sometimes have nurses/staff that are no help at all, they do not understand or take into consideration how I might be feeling or the circumstances at the time or after the treatment.”

## Patient management between appointments

“I find it hard to think of appointments/blood tests that I need to make for the future. Would a simple reminder checklist print out cover most patients? I always just forget because all I want to do after treatment is go home, so I do not chase up appointments, referrals or blood tests.”



# Value Proposition

*If we Achieved 80% Chair Utilisation we could -*

- Improve Productivity by 37 pts/week = \$1.7M revenue
- Do this with minimal cost and resources
- Improve access and experience for patients

i'm not telling you it is going to be easy, i'm telling you it's going to be worth it.

# Issues Prioritised for Intervention

1. Scheduling
2. Pathology  
Turnaround Times
3. Streaming/Fast Track
4. Treatment Regimens
5. Patient Education  
Process





# 1. Scheduling

- Reduce “buffer” times that had been built into the scheduler over time – e.g. meal times, start up, patient education
- Introduced Team Nursing to cover meal breaks
- Realign schedule times to reflect agreed treatment (protocol) times – consistent times better aligned to actual times
- Upgrade scheduler to improve functionality
  - » Reports
  - » Multiple appointment changes

	Chair 1	Chair 2	Chair 3
0800 -0830	Set Up		
0830-0900			
0900-0930			
0930-1000			
1000-1030			
1030-1100			
1100-1130			
1130-1200			
1200-1230			
1230-1300	Lunch		
1300-1330	Set Up		
1330-1400			
1400-1430			
1430-1500			
1500-1530			
1530-1600			
1600-1630			
Total add value mins (per chair)	420	360	300
	82%	71%	59%
	7.0	6.0	5.0

• Adjusted available capacity = 513 hrs/ week (765hrs)

- -90hrs/ set up / week
- -45hrs lunch/ week
- -90hrs staggered starts/week
- -18hrs pt education /week
- -9hrs staff meetings/ week

### TREATMENT HOURS

Opportunities are .....

+45hrs set up time

+18hrs pt education

+23 hrs lunch

(clinical standards for LOS/regime)

=86 hrs/ week could be reinvested...

**Current utilisation: 73% Reality utilisation: 65%**

**Target utilisation:80%**

**Gap = 15%**

**37 additional pts that  
could be treated/ week**

**Before**

Booking Date: 03/09/2013

Display Type: Day

- Red /Green (A)
- Grey/Purple/Blue (B)
- Consulting Rooms
- Apheresis
- CTC
- extras
- Extra trial chairs

Day Oncology Appointments

Daily Schedule

Time	Chair 13	Chair 15	Chair 16	Chair 23	Chair 24	Chair 27	Chair 25	Chair 26	Chair 30
8:00am		ALLOCATION, Allocation 222222			ALLOCATION, Allocation 222222			ALLOCATION, Allocation 222222	
8:15am									
8:30am									
8:45am								CHEN, Hong fei 2122983	
9:00am			NGUYEN, Kim 2130331	NGUYEN, Kim yen 2130331			WILLIS, Neil 844013	TCH (Docetaxel, Cyclophosphamide, Trastuzumab) c1/d1	
9:15am			5FU c3/d15	Rectal Cancer 5FU c3/d15			VCD (Bortezomib, cyclophosphamide (oral), Dexamethasone (oral)) c2/d1		YONAN, Naidai 2137405
9:30am	LAZAREVIC, Milka 2073700	SIERS, Peter 2127079							FOLFOX (Oxaliplatin, Fluorouracil, Leucovorin), Bevacizumab c5/d1
9:45am	Port insertion	c8/d1							
10:00am									
10:15am									
10:30am					SCRIVENS, Thomas 2125676				
10:45am					ABT-414 c1/d1				
11:00am									
11:15am									
11:30am	ROWE, Violet 783716								
11:45am	Herceptin								
12:00pm									
12:15pm									
12:30pm									
12:45pm									
1:00pm			ELLIOTT, Stephen 760672						
1:15pm			FCR Day 2 (Fludarabine, Cyclophosphamide) c4/d2						
1:30pm									
1:45pm						DOWNIE, Patricia 346890	MCLEOD, Colleene 2125461		
2:00pm						Aclasta	Gemcitabine c5/d15		
2:15pm					KIRKE, Daphne 221778			NGUYEN, Tin 555376	
2:30pm								5FU, De Gramont (5FU, Leucovorin, 5FU 46 hr infusion) c8/d1	
2:45pm				ALLOCATION, Allocation 222222	ALLOCATION, Allocation 222222	ALLOCATION, Allocation 222222			
3:00pm		DE RECHTER, Andree 2125504							SULLIVAN, Joan 2102566
3:15pm		Bevacizumab c6/d1							Carboplatin, Etoposide c3/d2
3:30pm									

**After**

Booking Date: 12/09/2014  
 Display Type: Day

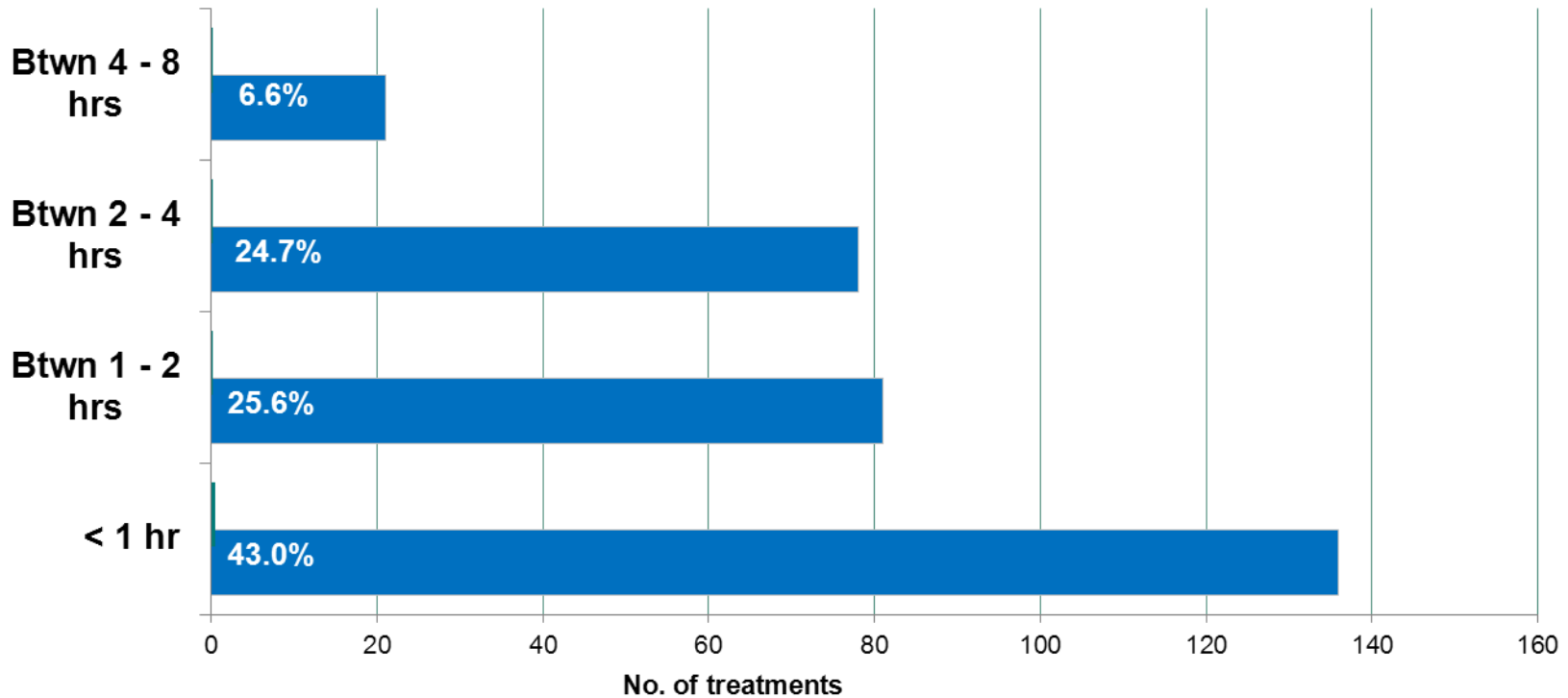
- Red /Green (A)
- Grey/Purple/Blue (B)
- Consulting Rooms
- Apheresis
- CTC
- extras
- Extra trial

**Daily Schedule**

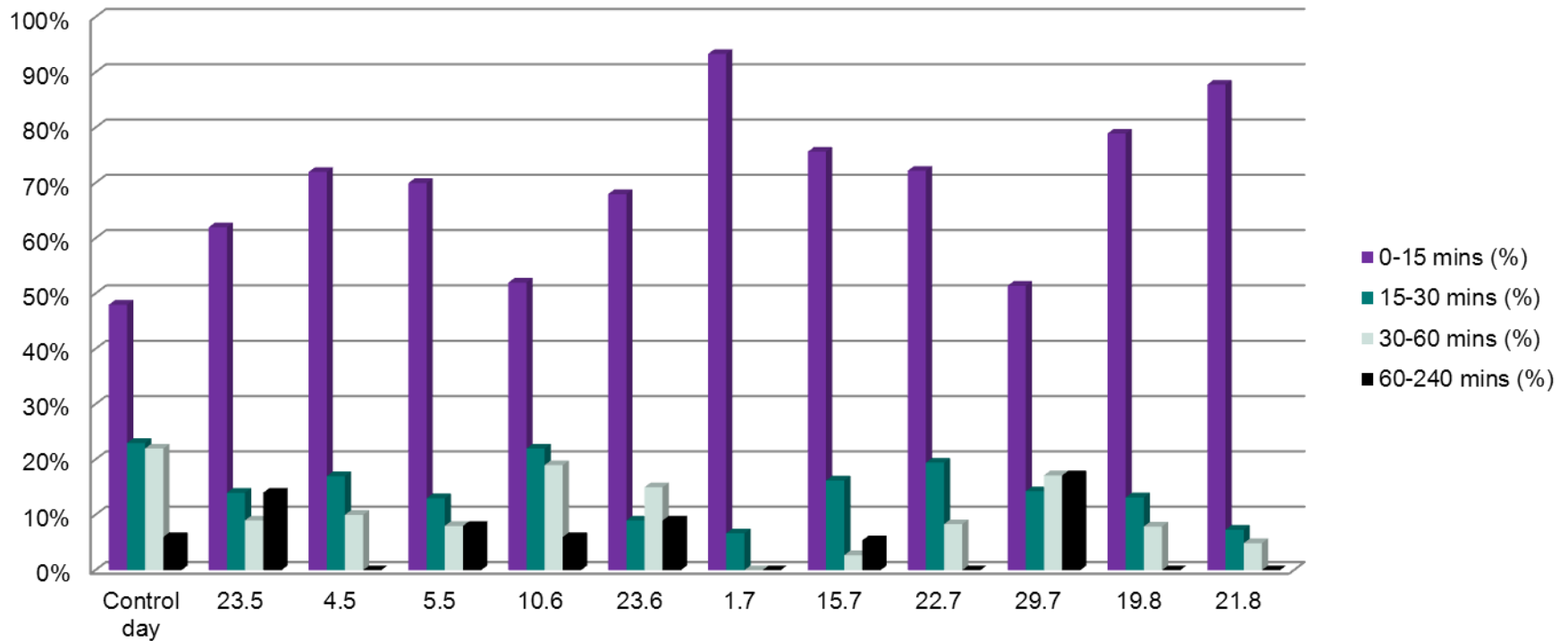
Time	Chair 4	Chair 5	Chair 12	Chair 8	Chair 14	Chair 17	Chair 20	Chair 21	
8:00am	UNA, Una CA00001			UNA, Una CA00001 Unknown [leezgz, 21/07/2014]		no bookings			
8:15am									
8:30am									
8:45am									
9:00am		LAMB, Roma Joy 138088		DOUGHERTY, James 609290 Cyclophosphamide c8/d1					
9:15am		Cisplatin-Etoposide 1-3 Day 3 (Cisplatin < 40mg/m2, Etoposide) c4/d3		COOGAN, Carmel 2185728 TCyclo (Docetaxel, Cyclophosphamide) c1/d1					
9:30am									
9:45am									
10:00am									
10:15am			RUGGIERI, Salvatore 651672 R-CHOP (Doxorubicin, Vincristine, Cyclophosphamide, Prednisolone) c6/d1						
10:30am	COTTIER, Shirley 2081353 Azacitidine c1/d2			PAPPAS, Jackie 2187829 Carboplatin-Paclitaxel 3 weekly (Carboplatin, Paclitaxel) c2/d1		BYRNE, Wendy 677607 Docetaxel c2/d1	BODERA, Margaret 2175940 Paclitaxel weekly c2/d1		
10:45am									
11:00am									
11:15am									
11:30am	TERRANOVA, Salvatore 2184583 Nivolumab c4/d1								
11:45am									
12:00pm									
12:15pm									
12:30pm									
12:45pm									
1:00pm									
1:15pm									
1:30pm	LONGSMITH, Norma 335233 Bortezomib 2 weekly (Bortezomib, Dexamethasone (oral)) c24/d1				DIFIORE, Michael 2125494 Rituximab, Bendamustine c5/d2				
1:45pm									
2:00pm		BAXTER, Anne 2140610 Cisplatin-Vinorelbine Day 8 (Vinorelbine) c2/d8				SKINNER, Helen 2130706 Bevacizumab/Capecitabine (Bevacizumab, Capecitabine) c4/d1			
2:15pm									
2:30pm									
2:45pm									
3:00pm									
3:15pm									
3:30pm	PATIENT, Education 0000 Patient	PATIENT, Education 0000	PATIENT, Education 0000 Patient Education	PATIENT, Education 0000 Patient Education	PATIENT, Education 0000 Patient Education	PATIENT, Education 0000 Patient Education	PATIENT, Education 0000 Patient Education	UNA, Una CA00001 Azacitidine	

## 2. Streaming – Fast Track

- Dedicated “Fast Track” area developed to manage those patient’s with TMT 1 hour or less – separate from more complex longer stay patients



## Day Oncology Access to Treatment – Streaming Days (All Pts)



# 3. Protocol Review

## Variation in treatment times – scheduled and actual – Evidenced Based

- Folfox high volume of treatment numbers - provided treatment to the last 62 pts quicker than planned by 10 mins = 620 minutes (10 Hrs)
- R-CHOP longer treatment- we provided the last 46 pts treatment quicker than planned by 30 mins (23 Hrs)

# 4. Patient Education

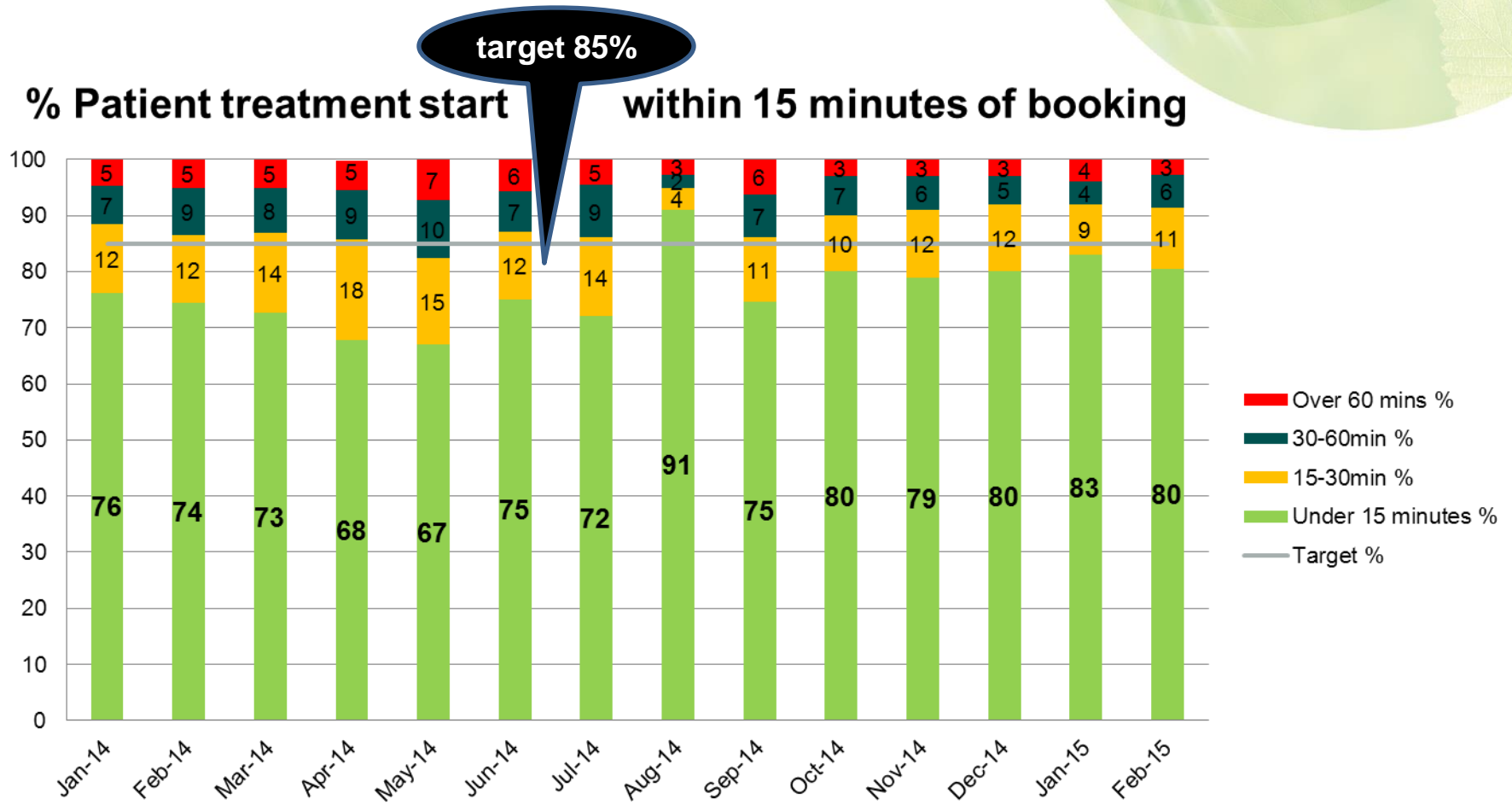
- Review of how pre chemotherapy patient education is provided to improve the quality of the experience and maximise available capacity for treatments
- 3 chairs blocked to deliver 1:1 patient education
- Making scheduling more difficult...can delay first treatment
- Education also occurring in chair (repeated effort)
- Potential funding opportunity cost?

	<b>Pt. Education 1 hr</b>	<b>3 hrs chair treatment</b>	
	<b>O/P allied health (prev VACs)</b>	<b>WIES Equiv.</b>	<b>Diff</b>
Per session Pt Revenue	\$70	\$916	<b>\$846</b>
3 Education sessions /week	\$210	\$3,206	<b>\$2,996</b>
48 weeks per year	\$10,080	\$153,888	<b>\$143,808</b>

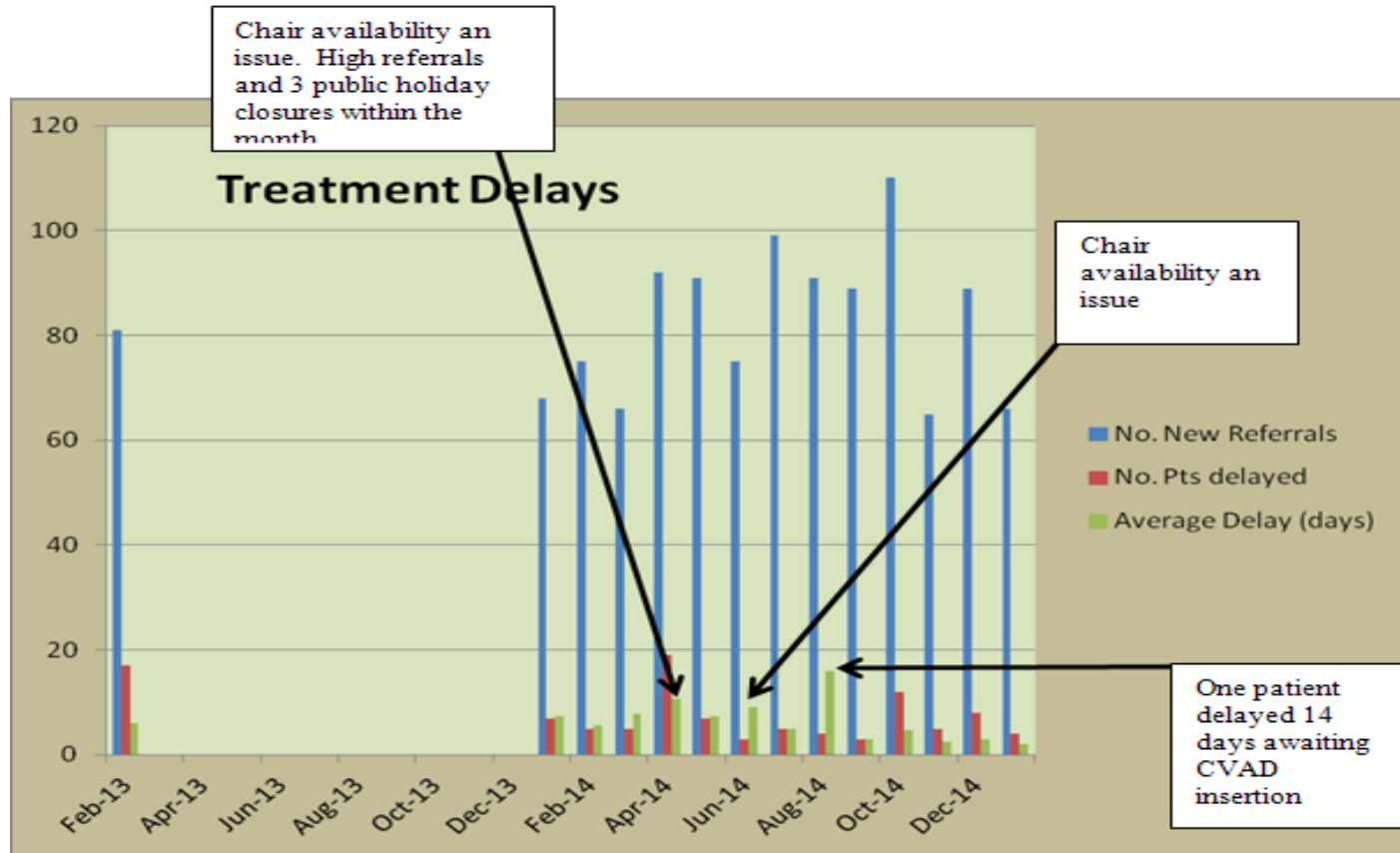




# Waiting Time Results



# Treatment Delay



# Chemotherapy Prioritisation Criteria

- Category 1: Urgent
  - Treatment to commence within 2 days
- Category 2: Semi Urgent
  - Treatment to commence within 7 days
- Category 3: Next Available appointment
  - Treatment to commence within 14 working days (95% of patients, who are not in the above criteria)

# Chair Utilisation Data

DAY ONCOLOGY CHAIR UTILISATION	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Actual Chair Utilisation %	66%	64%	66%	67%	68%	60%	63%	68%	68%	70%	69%	68%
Adjusted Utilisation % (impact of same day cancellations removed)							82%	89%	91%	89%	91%	90%
Est No. of cancellations (same day or unallocated)							53	87	81	N/A	49	66
Average Tx Time per day Hrs (all chairs)	95	88	94	95	96	85	88	96	98	101	100	101
Average Tx Time per day Hrs (per chair)	5.3	4.9	5.2	5.3	5.3	4.7	4.9	5.3	5.4	5.6	5.6	5.6
Average Unused daily capacity (hrs) all chairs	17	19	17	16	14	24	19	11	10	12	10	11
Average Unused daily capacity (hrs) per chair	1.0	1.1	0.9	0.9	0.8	1.3	1.0	0.6	0.6	0.7	0.6	0.6

# Sustainability and Ongoing Improvements

- Good ongoing results around Waiting Times and Streaming of patients
- Ongoing review of TMT Regimens – CERNER/electronic prescribing
- Patient Education – new project to redesign pre chemotherapy education in partnership with RMIT Design team
- Integration of Wellness
- Team work – Education/Professional Development Time (locked in to 3 chair mentality)
- Prioritisation criteria and definitions – work with MONC
- SURC – Symptom Management – Linked to Education redesign

# Thank You

