West Metro Health Service Partnership

WTN Theatre Capacity Utilisation Improvement Project

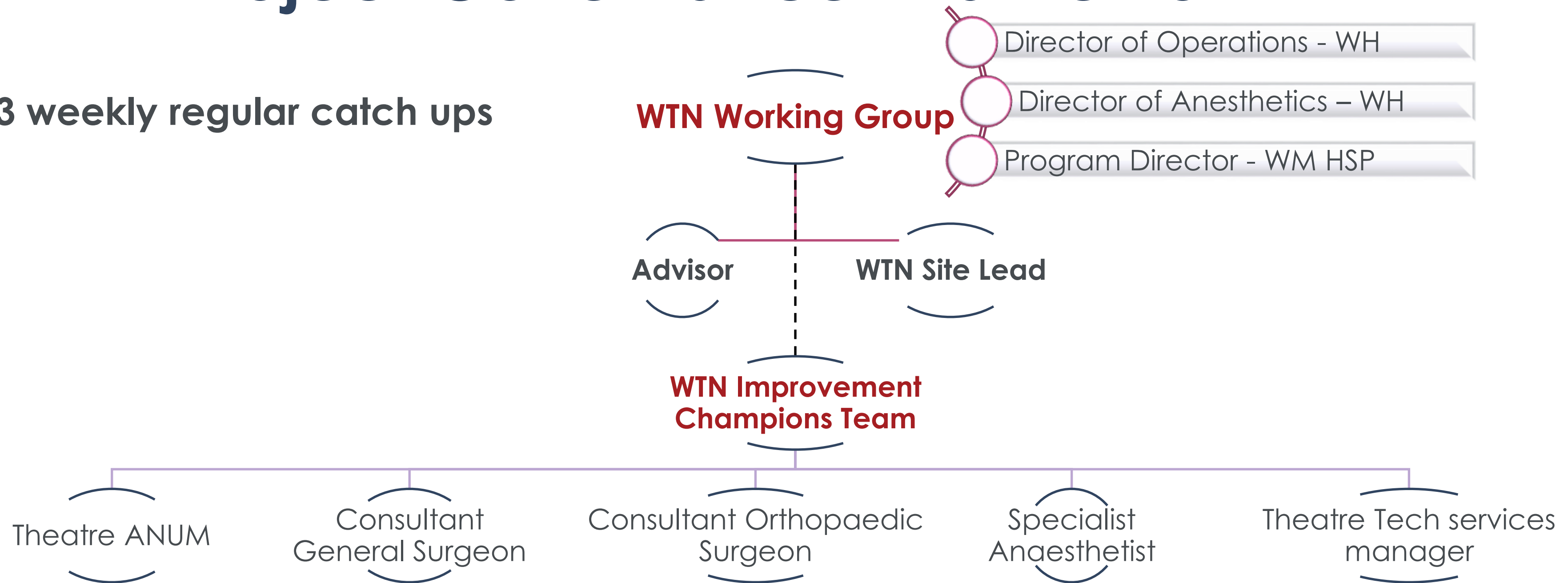
Orthopaedic MDT Presentation: Footscray

13.10.2023 | Kristina Mitreska, PhD, Elective Surgery

Reform Improvement and Innovation Advisor

WTN Project Governance Framework

- 3 weekly regular catch ups



Responsible for active engagement, by:

- Validation of processes, issue identification & data information
- Assisting & identification of the prioritised problem
- Assisting/Validating in undertaking of Root Cause analysis
- Identify the countermeasures
- Implementation of the change
- Follow through the changes & establish reporting mechanisms
- Standardise the change.

Improvement Process Overview – PDCA Steps

Plan (Define/Measure/ Analyse)

Do

Check

Action

1. Set the Objective

2. Problem

3. Activity Plan

4. Background & Problem Breakdown

5. Prioritised Problem

6. Set the Target

7. Root Cause Analysis

8. Develop Countermeasures

9. Countermeasures Implementation

10. Confirm Results

11. Standardise

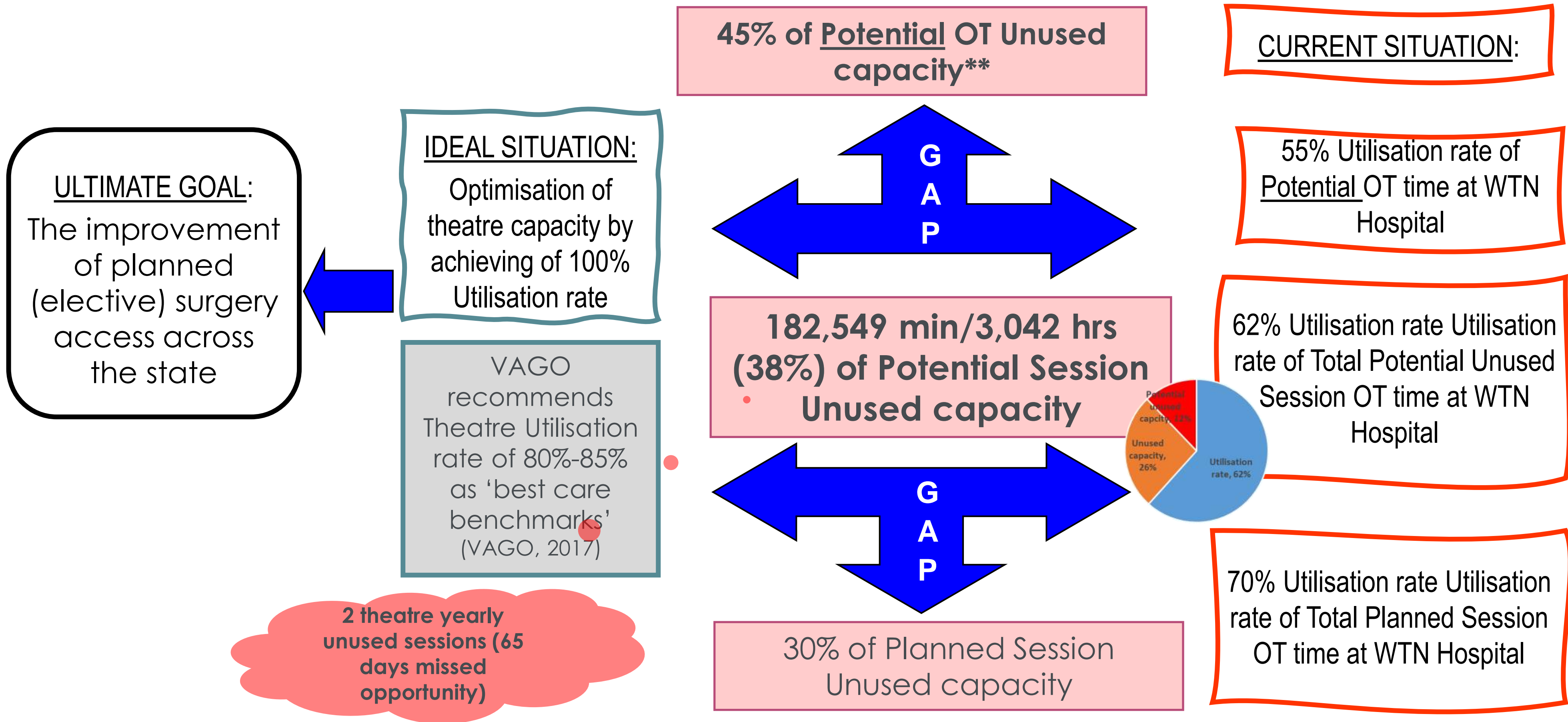
12. Review & Report

3 week | 2 week | 3 weeks | 3 weeks | 4 weeks | 3 wks | 4 wks

Step 1: Objective

To Improve the efficiency and effectiveness or to Optimise the Theatre capacity of Williamstown Hospital Theatre patient journey

Step 2: Problem Identification



- Utilisation rate is based on anaesthetic start (WTN:'into theatre')to anaesthetic stop (WTN: 'Left theatre') timestamps for elective surgery, 1/5/22 – 30/4/23
- Potential OT time takes the approach of planning for theatres (4) to be used as all-day (9hr) sessions for every workday (248) during the year
- Potential Session Unused capacity is if was scheduled 8hr sessions (2 x 4hr sessions) for 4 theatres for every workday (248 working days)

Step 3: Proposed Activity Plan

Activity	Resp.	Timing																								Status
		June'23				July'23				August'23				September'23				October' 23				Nov'23				
		W1	W2	W3	W4	W1	W2	W3	W4	W1	W2	W3	W4	W1	W2	W3	W4	W1	W2	W3	W4	W1	W2	W3	W4	
Background & Problem Breakdown	KM / RG																									√
Prioritised Problem & Set the Target	WG																									√
Root Cause Analysis	KM / WTN team																									√
Develop Countermeasures	KM / WTN team																									√
Implement Countermeasures	WTN team																									^
Confirm Results	KM / WTN team																									^
Review																										TBC
Standardise	KM / WTN team																									TBC
Report	KM/WTN team																									TBC

Plan

Change/Extension of plan

Project Status	
√	Completed
^	Need Improvement / Progressing
X	Failed / Delayed
TBC	To be commenced

Step 4: Background & Problem Breakdown

Scope: WTN Theatre Patient Journey

Problem: 30%-45% of WTN Theatre Unused Capacity

In order to identify the non-value activities

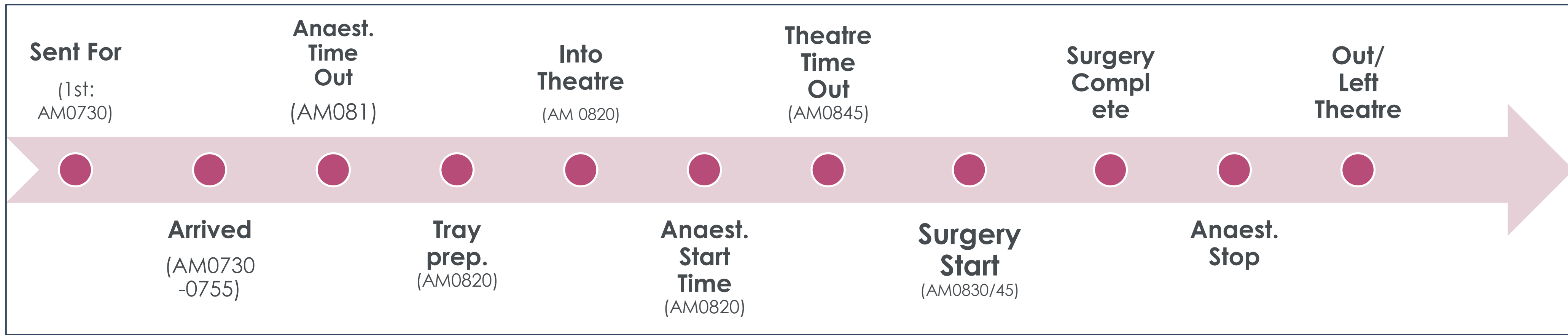
Activities	Status
Process Mapping & Validation	√
Established WTN Improvement team	√
Stakeholder engagement	√
Data Analysis: - Utilisation Capacity - Time Analysis - Morning / First case start on time - Surgical efficiency - Cancellations/Postponements - Session Planning - Pre-Procedure Anaesthetic Care time - Admission time analysis, etc.	√

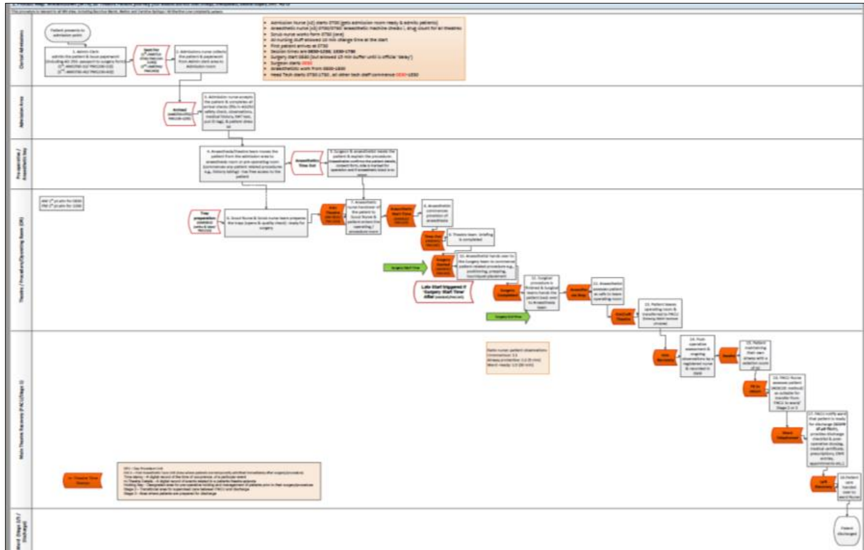
Some problems we cannot tackle :

- Company policy matters
- Industrial Relations issues
- Award/wages/conditions
- Personality clashes

Step 4: Background & Problem Breakdown

Scope: WTN Theatre Patient Journey

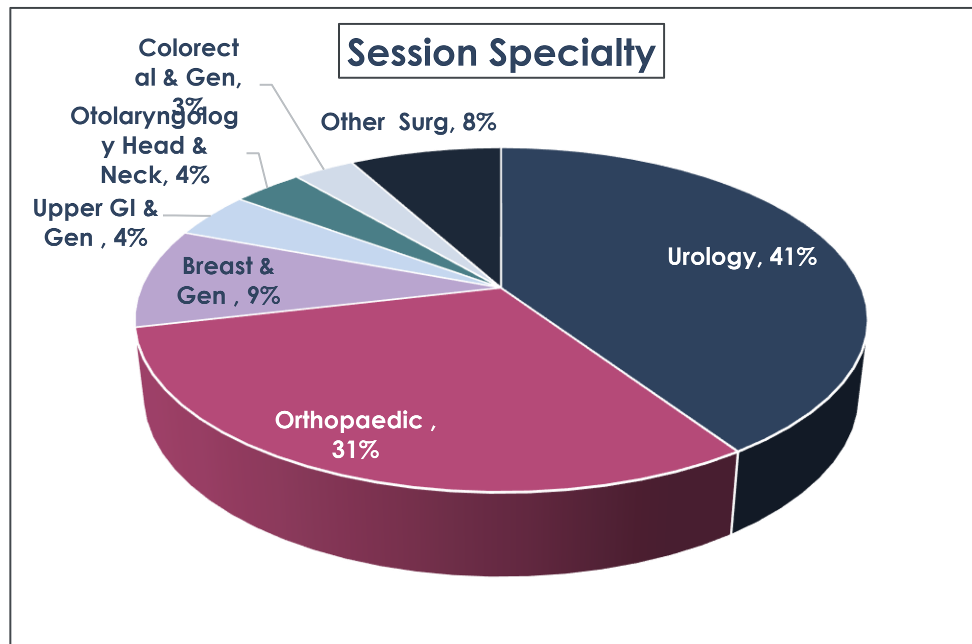




- Admission Nurse (x2) starts 0700 (gets admission room ready & admits patients)
- Anaesthetic nurse (x2) 0700/0730: anaesthetic machine checks, drug count for all theatres
- Scrub nurse (x1) works from 0730 & others (0800): bring in the loan trays to theatre and start scanning the trays to scan care for all 4 theatres (start checking trays at 0820)
- All nursing stuff allowed 10 min change time at the start
- First patient arrives in admission room at 0730
- Nurse morning huddle (0800-0815)
- **Session times are 0830-1230; 1330-1730**
- Surgery start 0830 (but allowed 15 min buffer until is official 'delay')
- Surgeon starts 0830
- Anaesthetists work from 0800-1800
- Head Tech starts 0730:1730 , all other tech staff commence 0830-1830
- 4 x theatres available, 4 Pre anaesthetics room, from which just one can be used for anaesthetics procedures

Step 4: Background and Problem Breakdown

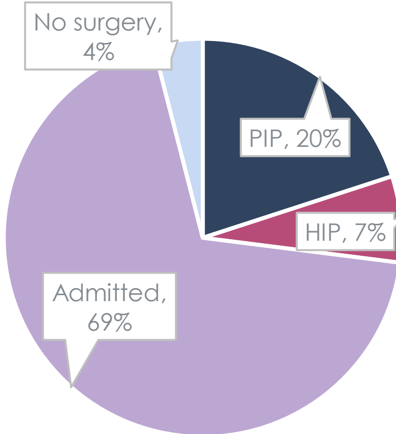
* Data source timeline: 1.05.2022-30.04.2023

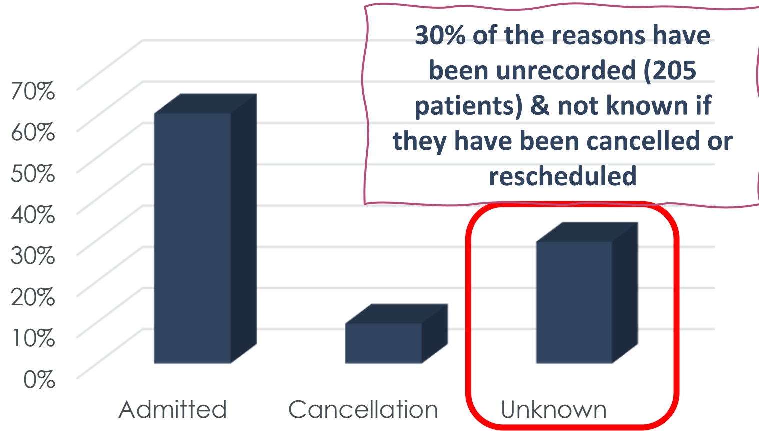


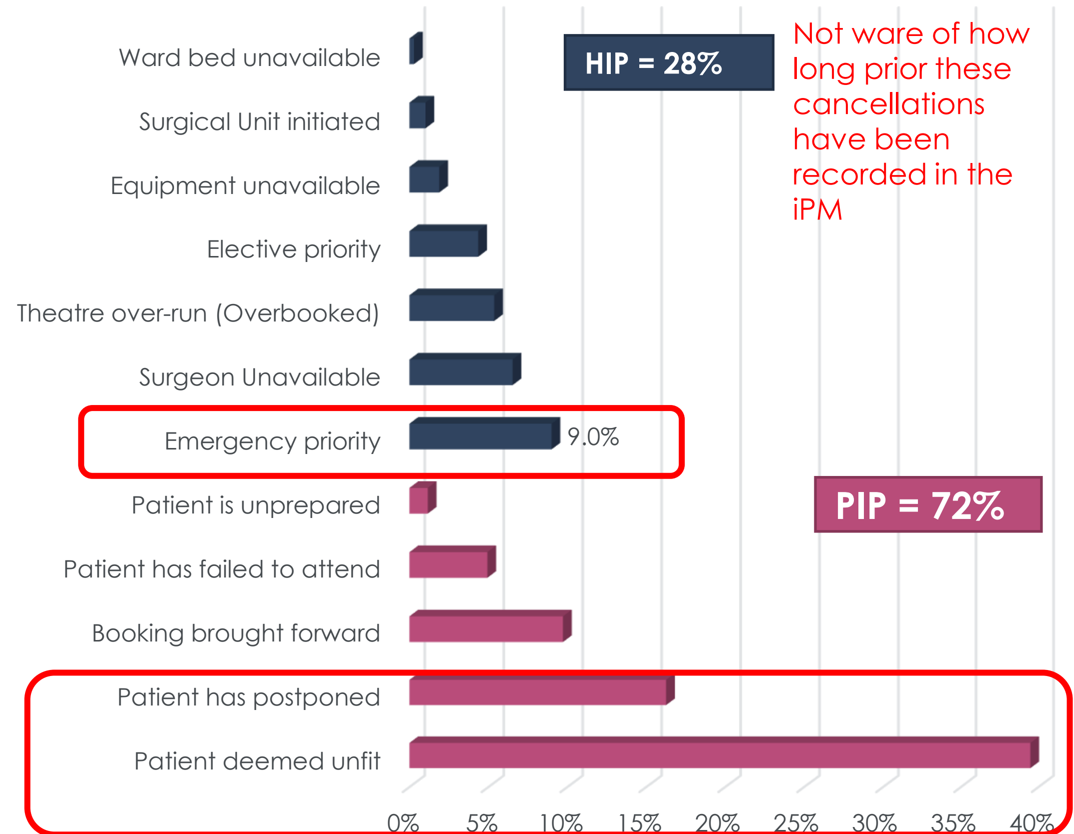
- Avg time per procedure is 85 min & per session 189 min (Anaes. start to Anaest. stop)
- 72% surgeries are within Urology (41%) & Orthopaedics (31%) specialty.
- Most of the procedures have been scheduled in Theatre 3 (33% & others 20% in average)
- 91% of the sessions have been scheduled for 240min (4hrs) per session, 3% under 240 min, 4% over 240 min & 3% on Saturdays.

Step 4: Data Analysis: Postponements

% of Surgeries Postponed



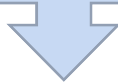


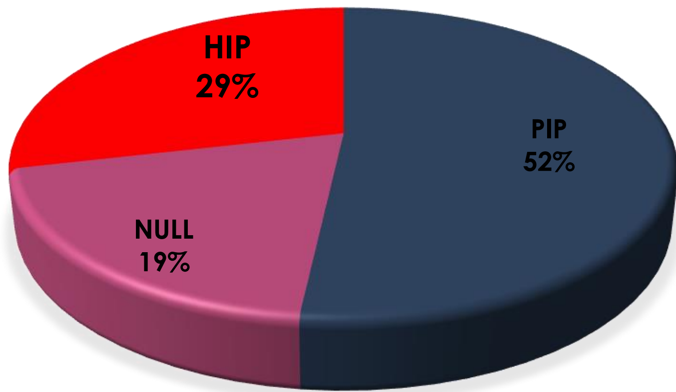


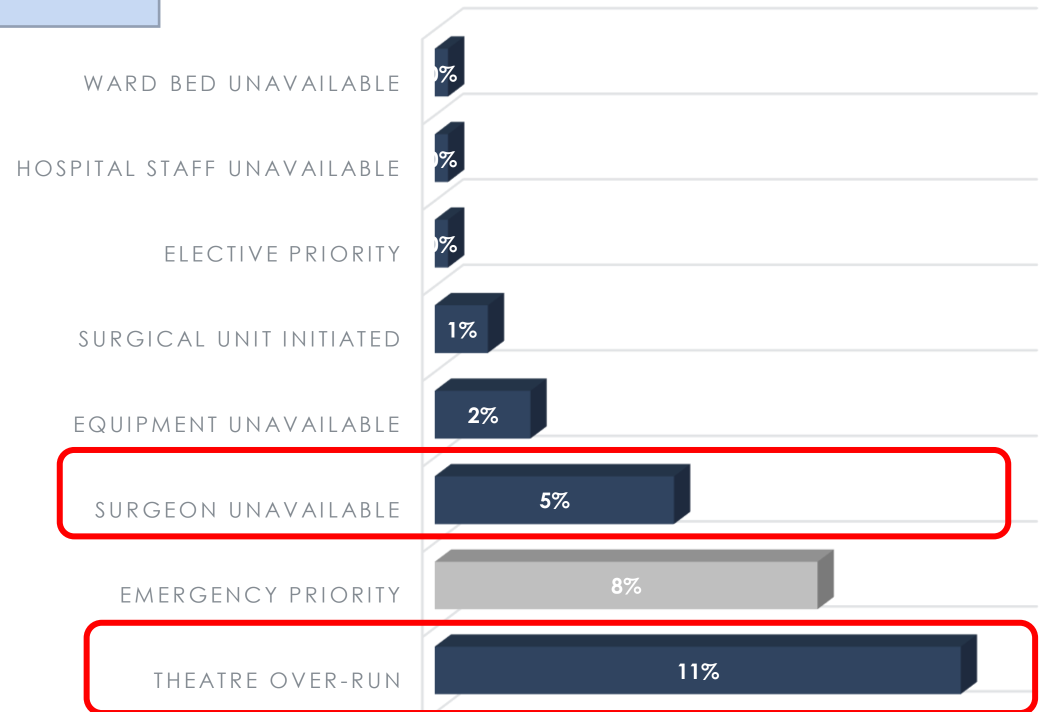
Step 4: Data Analysis: Postponements

Surgery Cancelled on the day of Admission

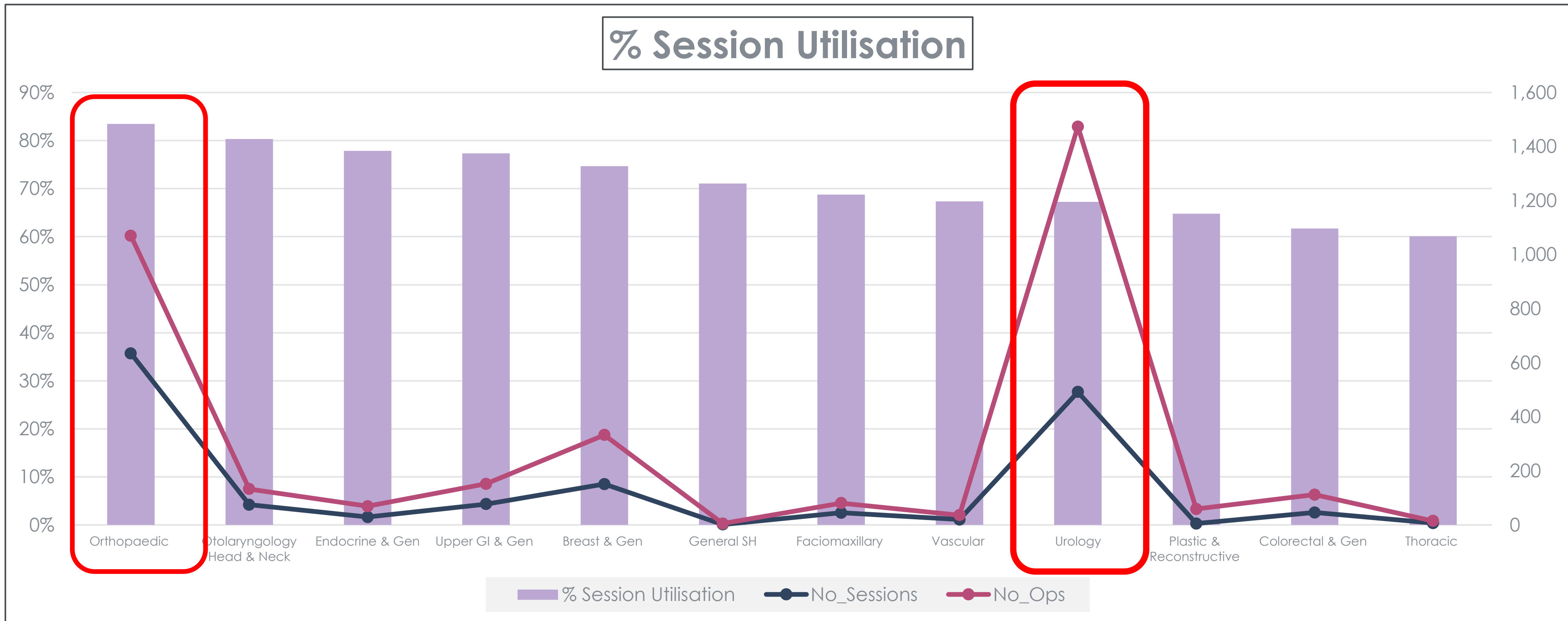
7% of Overall cancellations of day of Admission







Step 4: Data Analysis: Utilisation per Session specialty



- Lowest utilisation of high volume procedures have been noted for Urology (67%) . Compared with Orthopaedics Utilisation of 84%

Step 4: Data Analysis: Pre-Procedure Anaesthetic Care time

Anaest start to Surg start vs Session Specilaty Analysis (minutes)

30,000
25,000
20,000
15,000
10,000
5,000
0

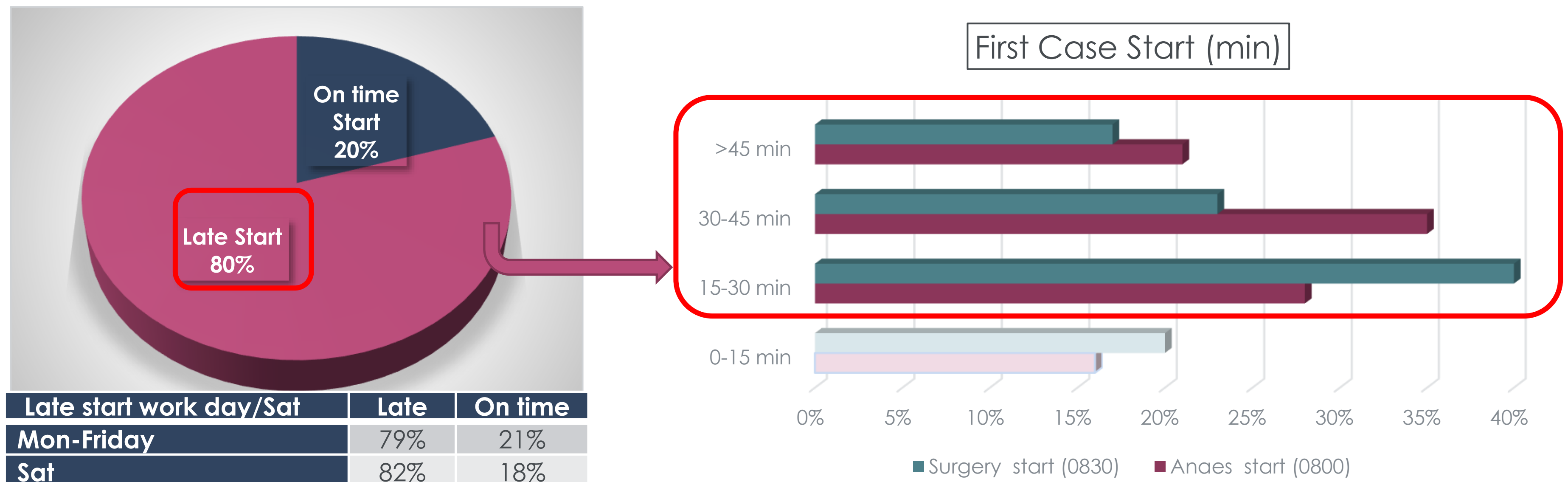
100
90
80
70
60
50
40
30
20
10
0

Urology
Orthopaedic
Breast & Gen
Upper GI & Gen
Otolaryngology Head & Neck
Colorectal & Gen
Faciomaxillary
Endocrine & Gen
Plastic & Reconstructive
Vascular
Thoracic
General SH

Sum of Anaes start to Surg start Mins
Anaes start to Surg start Per session min
Anaes start to Surg start Per Operations min

- Avg time wait from Anaesthesia start to surgery start per operation is 20 min
- Orthopaedics and Urology Surgeries have highest number of sessions with over 43min of Pre-procedure Anaesthetics care time.

Step 4: Data Analysis: First Case Morning Start on time

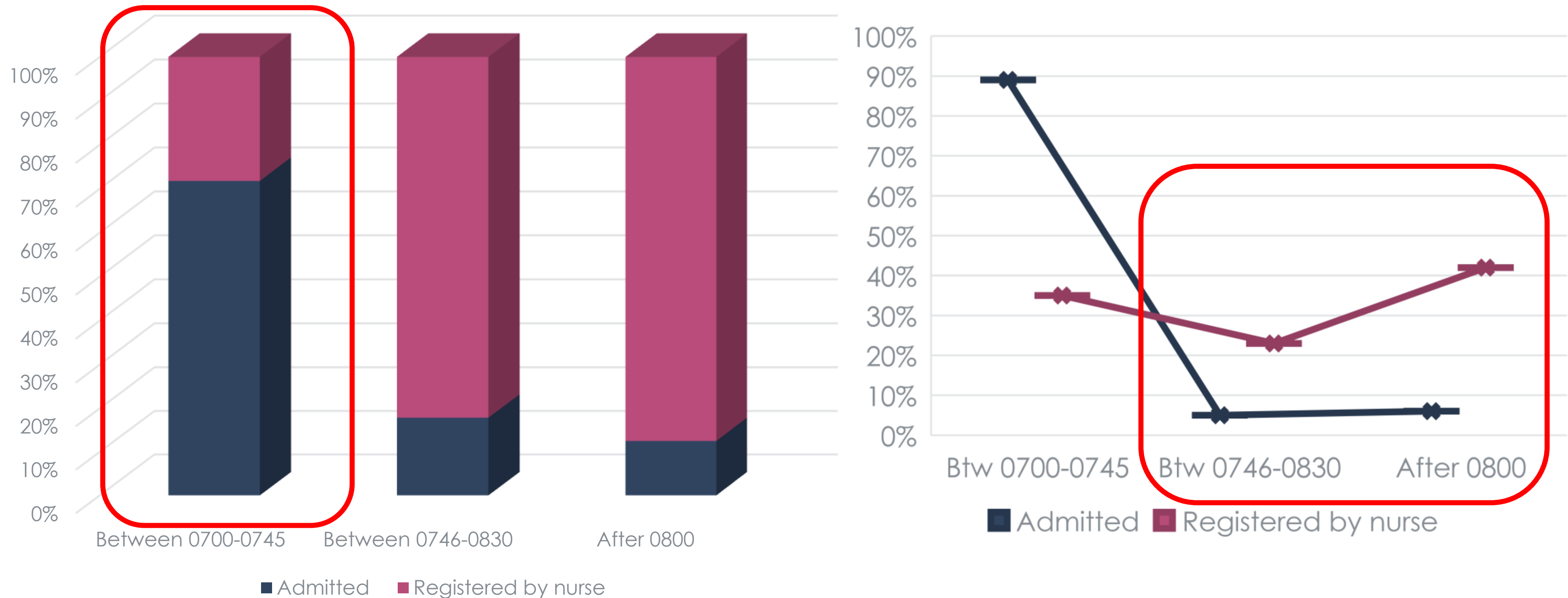


Late start work day/Sat	Late	On time
Mon-Friday	79%	21%
Sat	82%	18%

- >80% of the first Morning cases are delayed for more than15min (Anaesthetic & Surgery start), from which >40% with over 30min delay (starting after 9am)
- Out of 126 Principal surgeons, performing 3,416 operations across 4 theatres, 76% were started late, performed by 96% of the regular surgeons operating at WTN hospital.
- Out of 12 session specialties, 11 have been started over 80% -100% of their time late, with Urology & Orthopaedics being the top highest number of performed late surgeries.
- 96% of the 3416 procedures were Elective (3293) and 123 were Emergency (4%)
- NSW target: 95 % of sessions to start on or before the scheduled start time (0-14min no grace given).

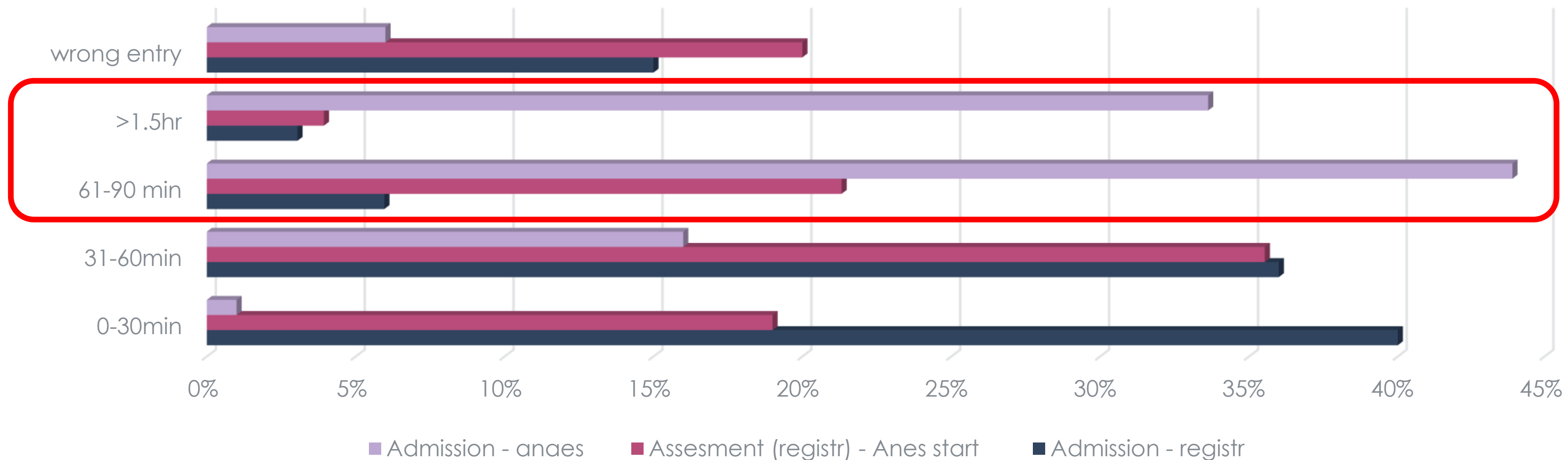
* Data source timeline: 1.05.2022-30.04.2023

Step 4: Data Analysis: Admission time: Clerical to Registration of Frist case



- 35% of the First case patients wait more than 45 min & 45% more that 30min between clerical admitting and admission (registration) by the nurse
- Big discrepancy between Clerical admission time and nurse registration for most of the patients

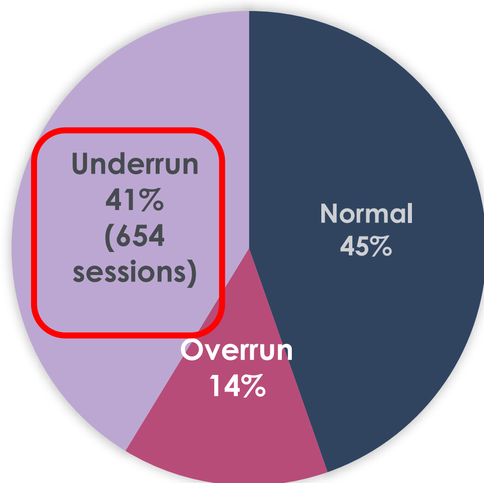
Step 4: Data Analysis: Admission to Anaesthesia start time of First case



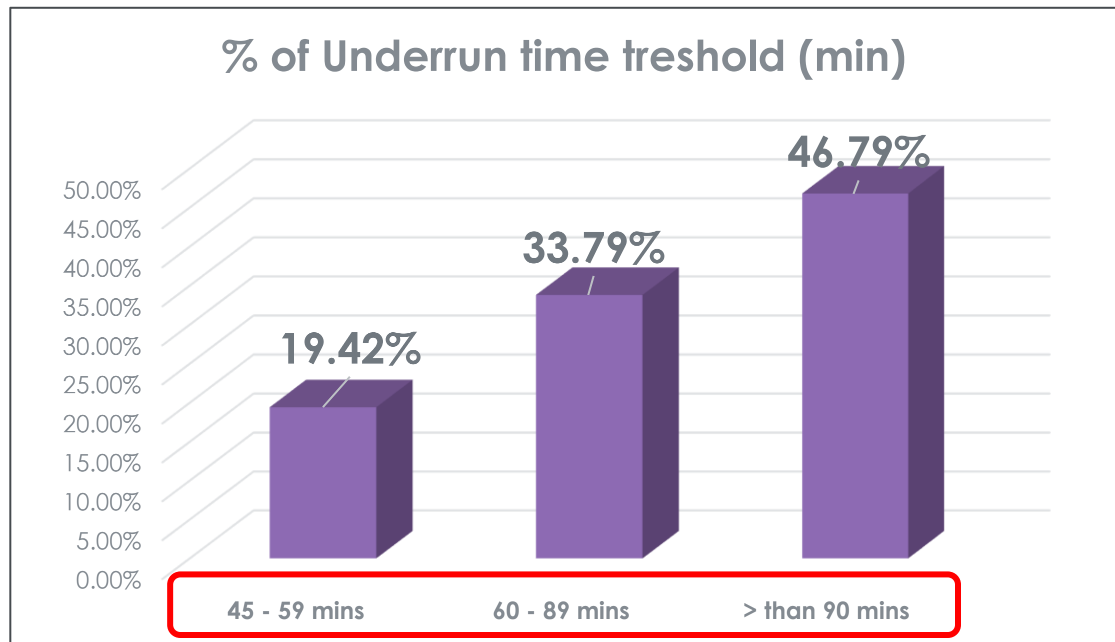
- 34% of the first morning cases wait more than 1.5hr from the admission to anaesthesia start time
- 45% of the first morning cases wait more than 30min from admission to nurse registration
- 61% of the first morning cases wait more than 30min from nurse registration anaesthesia start time (25% of the patients wait >60 min).
- Significant wrong data entry (>20%)

Step 4: Data Analysis: Underrun, Overrun, Turnaround Time & Surgical efficiency

- 71% Surgical Efficiency (NSW target 65%)
- Average Turnaround time is 19 min (QLD target 15 min)



Start on Time	Normal	Overrun	Underrun
AM	46%	19%	35%
PM	44%	9%	47%

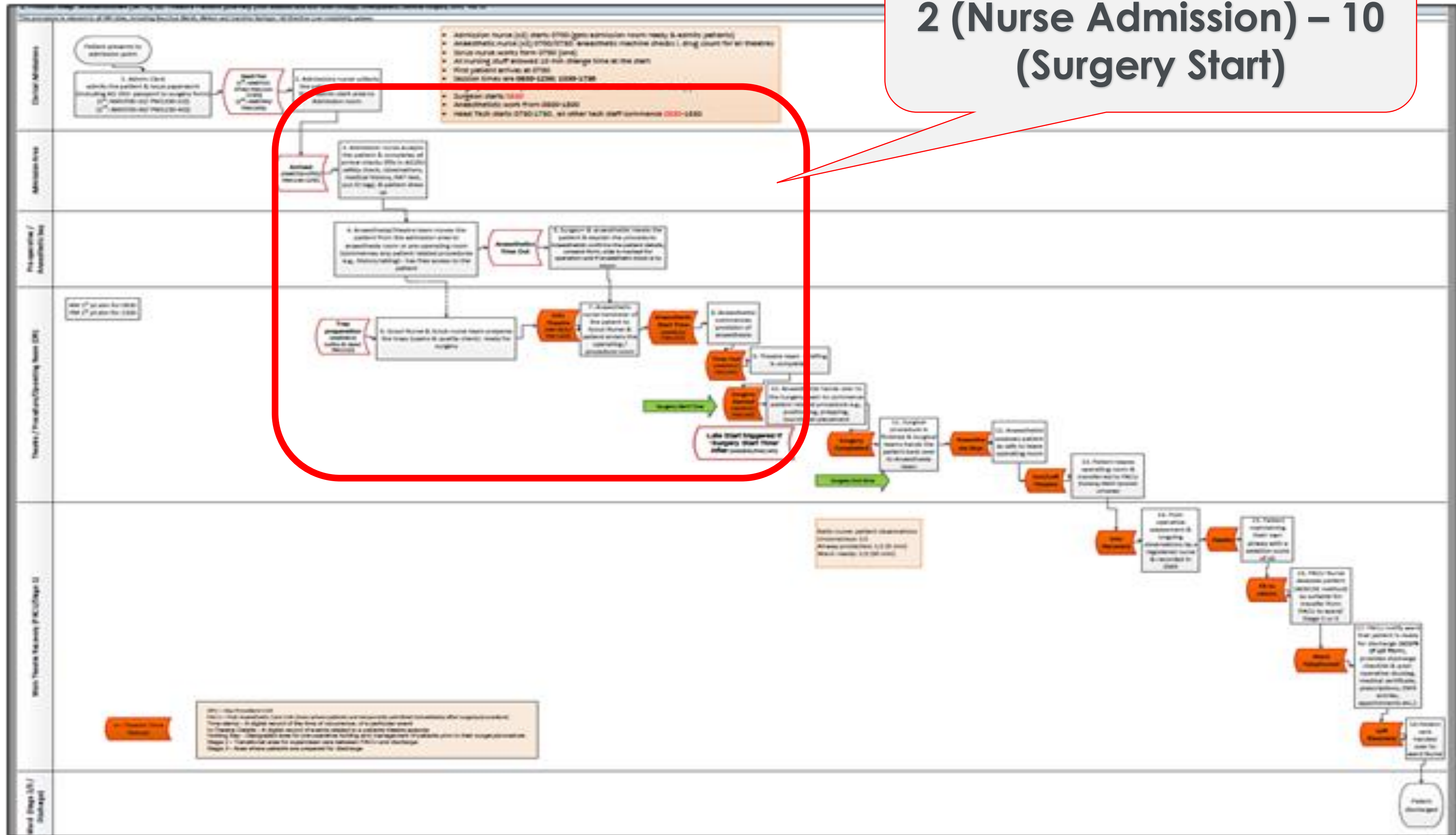


- Surgical Efficiency **-** The proportion of the preparation for surgery & surgery time is performed during a planned surgical session
- Turnaround time - period between anaesthetic stop time of previous operation and into theatre time of current operation.
-Underrun minutes - anaesthetic stop time that is more than 45 minutes BEFORE session end date time.
-Overrun minutes - anaesthetic stop time that is more than 30 minutes AFTER session end date time.

Step 4: Process Mapping

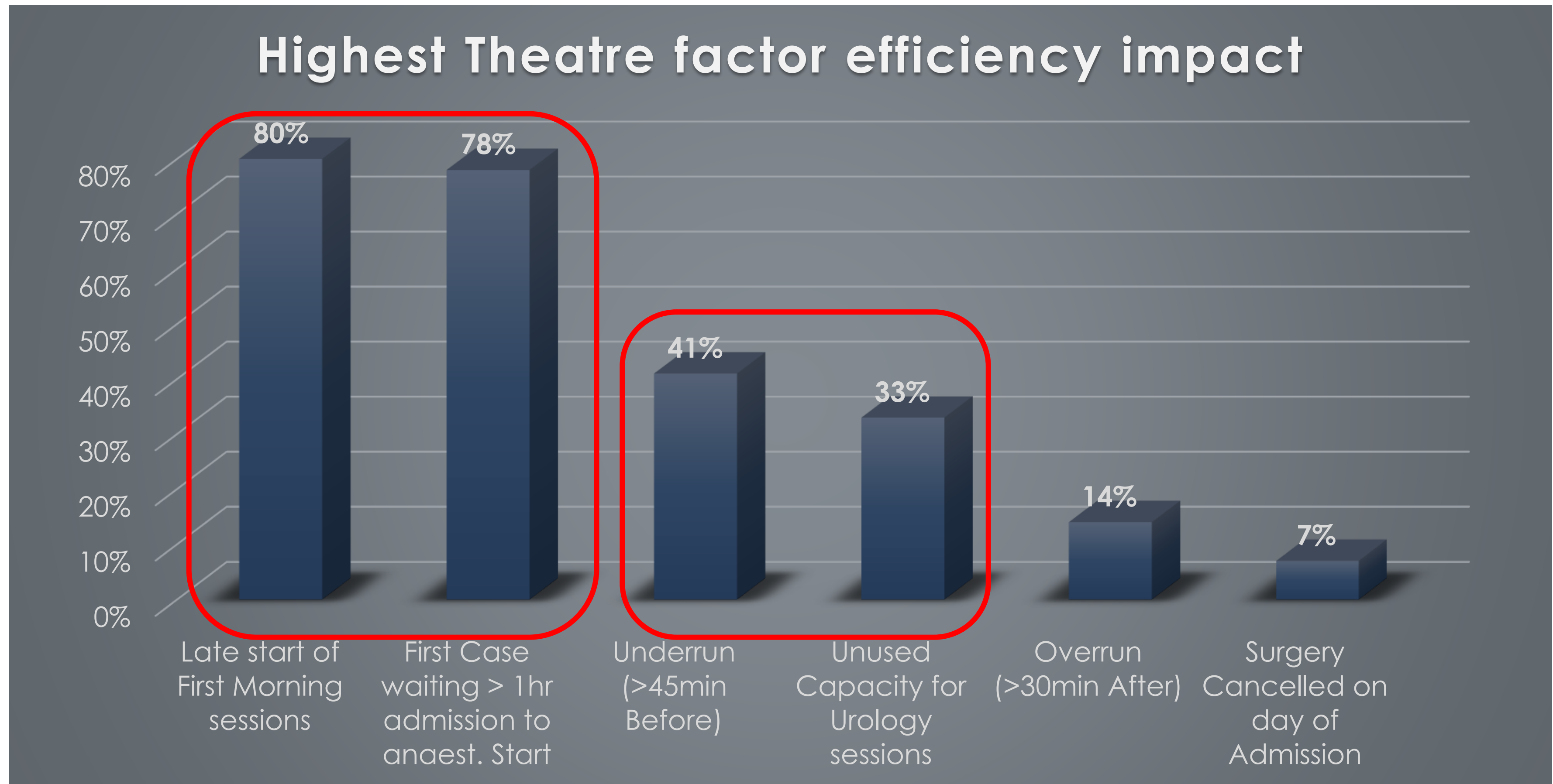
Scope: WTN Theatre Patient Journey

Process Steps:
2 (Nurse Admission) – 10 (Surgery Start)

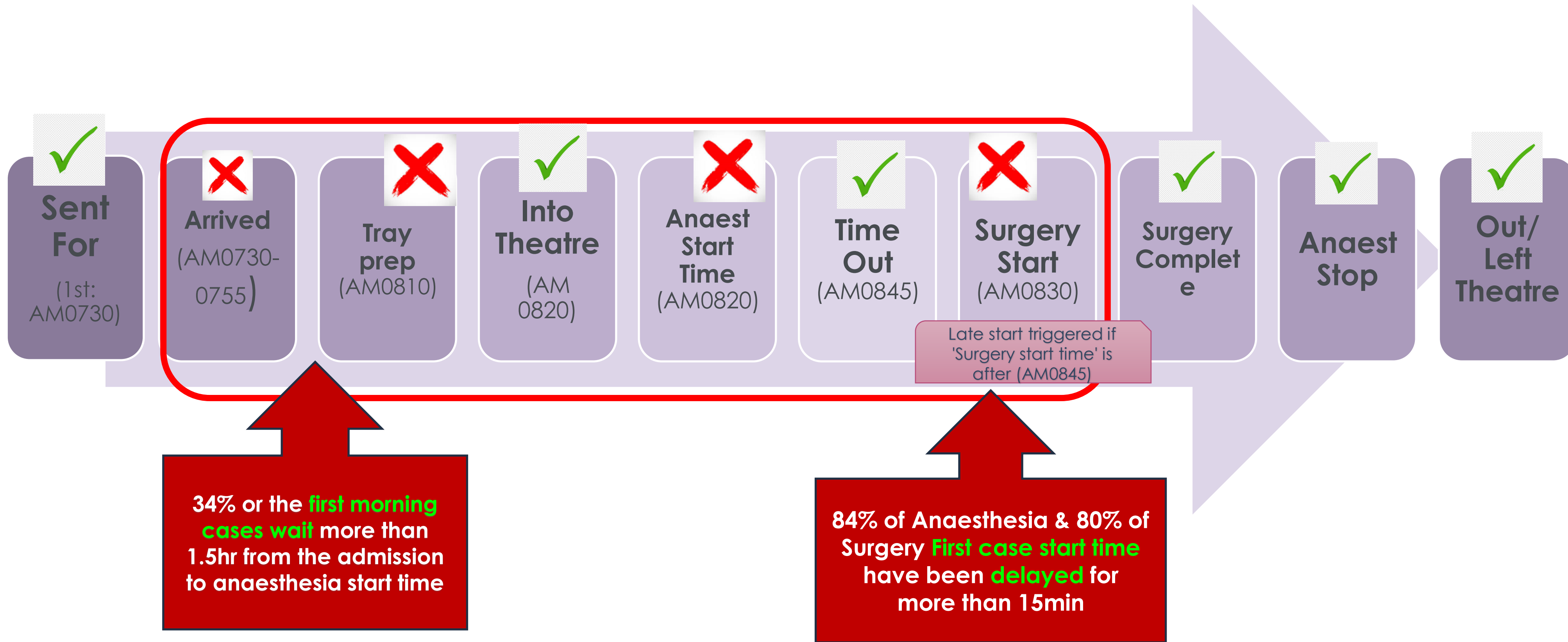


Step 4: Data Analysis: Overview of the Findings

Problem: 30%-45% of WTN Theatre Unused Capacity



Step 5: Prioritised Problem at Point of Occurrence



Prioritised Problem:

WTN Theatre Unused Capacity due to the First Case 'admission to surgery start' delay times

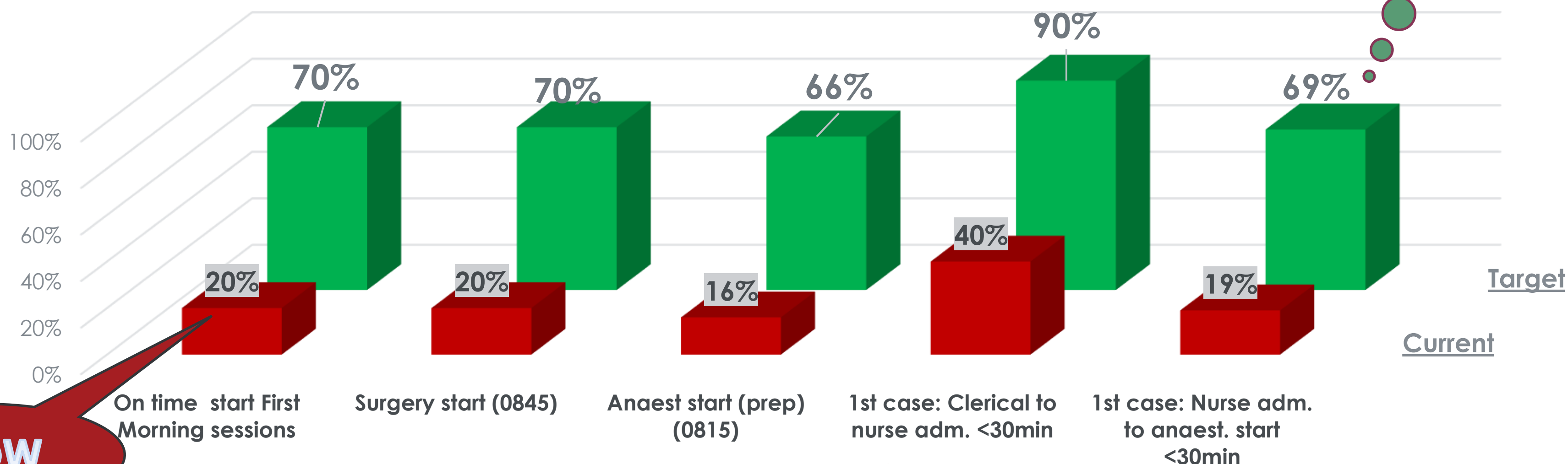
Step 6: Set The Target

Prioritised Problem:
WTN Theatre Unused Capacity due to the First Case 'admission to surgery start' delay times

TARGET

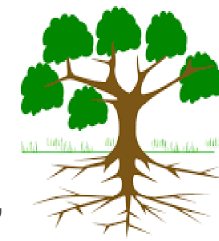
To improve Morning **'admission to surgery start'** time sessions at Williamstown Hospital by **50%**, at all 4 theatres by December 2022.

Future



- Target: 95 % of sessions to start on or before the scheduled start time (0-14min no grace given).

Step 7: Root Cause Analysis



Above the surface you see the **Symptoms** of the problem

Dig deeper to find the **Root Cause** of the problem

- Prioritised Problem: 'WTN Theatre Unused Capacity due to the First Case 'admission to surgery start'
- Identified / brainstormed 30 symptoms/causes & Recognised 22 Root causes for further countermeasure /solution Identification
- Visited & consulted with RMH (21/7), PeterMac (20/7), Sunshine Hospital (1/8), Epworth (22/8) & St. V... ...vate

Root Cause

Problem

Cause/ Symptom

Environment / Equipment

Behaviour / People

Measurement

Method

WTN Theatre Unused Capacity caused by 'First Case admission to surgery start' delay times

Step 8: Develop Countermeasures

Addressed the following Root Causes:

RC #	Root Cause	Proposed Solutions (Countermeasure) – What	How	By Whom	By When
1	No time stamps in place for measuring the time form "Arrived" to "Arrived into nurse Admission area" in iPM	To ensure data point registration for patient 'Arrived' and 'Nurse admission' times	- EMR data point registration at patient clerk admission time - EMR data point at 'nurse admission' time	JB	29.07.23
2	IPM allows empty entry of timestamps 'Into theatre', 'anesthesia start' & 'Theatre Timeout' start times by scout nurse	No empty entries in Theatre start time fields to be allowed (arrived, admission, Into theatre, anaesthesia start, surgery start, knife to skin & Theatre Timeout timestamps)	- Ensuring that all the timestamps in EMR are compulsory entries - Ensuring that 'surgery start time' is mandatory field in EMR - Submission to change request for amendment of 'knife to skin' timestamp field to mandatory in EMR. - Mandatory 'knife to skin' timestamp update in EMR & Policy update accordingly - All the EMR updates to be communicated to unit manager by Ops manger - All the EMR updates to be communicated to all WTN staff members (anaes. staff) by WTN NUM	JB, JH, RG, AW, Ops manager (AW), NUM	29.07.23 15.08. 23 30.09.23 30.09.23
3	Admission time not able to be entered in iPM by admission nurse	Admission nurse to be able to enter the time in EMR	Admission time to be entered by Admin nurse in EMR	JB	29.07.23
4	No staggered approach morning admissions available	To be introduced staggered approach for morning admission cases	- Introducing of staggered approach for first 2 pts (1st/2nd patient by 0700AM arrival)& then stagger the rest (3rd/4th.. 8am arrival) patients using EMR - Using the established prioritisation booking criteria Booking office to book & advise the patients of the exact day/time of the surgery (SMS)	Booking Mgr (Kristen Robinson)	06.10.23
		Standardisation of the Booking process for Williamstown theatre day surgeries	- Rescheduling of the list criteria & process by NUMs, day prior the surgery to be reviewed & agreed by all stakeholders - Create PPG(Policy, Procedure and Guideline) including all the required Booking process steps - Day Surgery Booking list criteria & process to be communicated to all staff members	Booking Mgr (KR) / Alison Chircop	23.10.23

Step 8: Develop Countermeasures

Addressed the following Root Causes:

RC #	Root Cause	Proposed Solutions (Countermeasure) – What	How	By Whom	By When
5	There is no official standard process in place for undertaking Prewarming process	To be established official standard process for undertaking Prewarming process (1st patients ready for theatre by 07:45 which will give sufficient time for warming)	- Initial education with NUM for Prewarming process by ERAS - NUM education to her team. - Formal face to face education with Anaesthetist and ERAS coordinator - Discussion of warming processes a with admissions, theatre and recovery staff (28/07/23) - Put in place official PPG for undertaking Prewarming process (ERAS) & uploaded onto PROMPT - Advise the staff of updated PPG	RG & ERAS ANUM/ NUM Bec (ERAS Co-ordinator) & Claire (Anaesthetist) Ops manager	28.07.23 6.10.23 13.11.23
6	Misconception by the staff of the current process of waiting of non-ortho & ortho patients 'into theatre' prior all the trays/equipment (ortho & non-ortho) are opened	All the patients to be allowed presence 'into theatre' prior all trays/equipment have been opened & checked by nursing staff	- Agree on a consistent approach to being able to bring the patients (ortho & non-ortho) into theatre. - Changing the staff language: it is not the anaes. nurse asking if they can come in but advocating and asking why not? - For ortho trays to be followed the prioritisation tray opening process - ut in place official PPG for bringing the patient into theatre - Communicate the standard process to all WTN staff members - Audit & ensure the new process have been followed by all staff members.	Ops manager /NUM	5.10.23 23.10.23
7	No appropriate packaging solution for spare ortho loan trays & consequently storage placement at WTN hospital	To be introduced spare ortho trays & storage for ortho loan spare trays	- To be identified & supplied MOQ (minimum order quantity) for required ortho spare loan trays at WTN hospital - To be undertaken storeroom review, understand the WTN storage system & usage item frequency - To be introduced appropriate storage for the MOQ ortho trays - Set up an appropriate storage place for storing of the MOQ ortho spare trays - To be set up an appropriate OH&S process instructions for handling of the stored equipment.	Jhunel B, (Allison S & Madison)	23.11.2023

Step 8: Develop Countermeasures

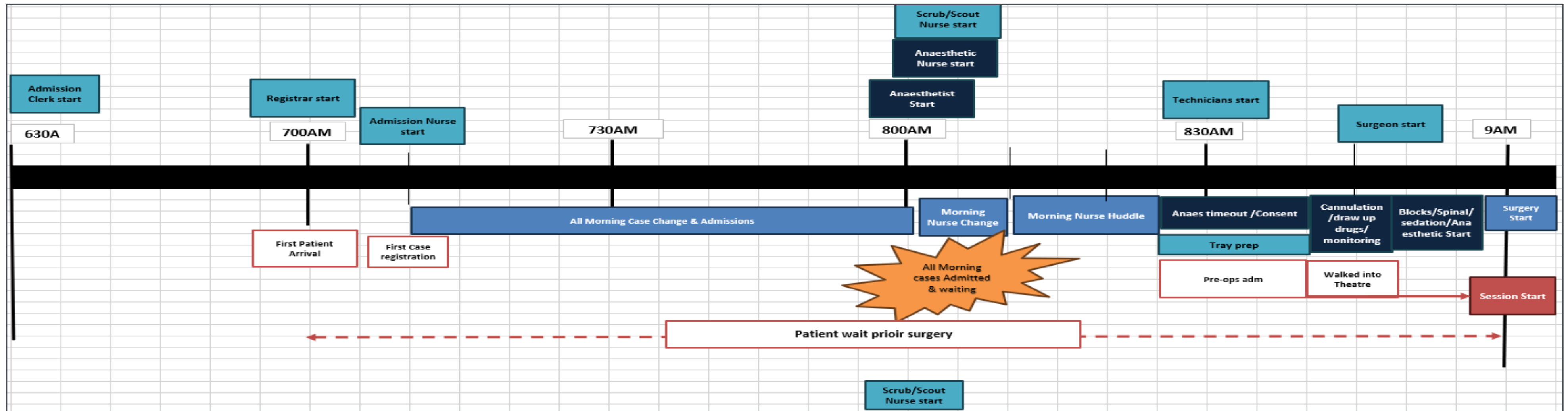
Addressed the following Root Causes:

RC #	Root Cause	Proposed Solutions (Countermeasure) - What	How	By Who	By When
8	Orthopaedics team do not have sufficient time to attend the morning huddles	Improve the efficiency of pre-ops processes to allow Orthopaedics team Morning huddle attendance	- Improve the efficiency & effectiveness of Morning huddles meetings (see RC#9) - Improve the efficiency of the theatre prep process [see RC#6 (tray prep) & RC#7 (ortho loan tray equip availability)]	JB & RG	18.09.23 15.09.23
9	Long & No standardised time for morning huddle meeting	Moring huddle meeting structure & timing to be improved & standardised	- The morning huddle to be undertaken (moved) to Fishbowl area - The new structure for Moring huddles to be introduced & agreed by NUM - EMR monitors to be set up & utilised for comms of daily lists, staffing & other planned items - Meeting huddles to be max of 5 min, limited just to last minute exclusions or exceptions of the planned list on the day from the daily EMR planned list - The new improved structure to be communicated formally to all staff members	JH/NUM Alison C/ Kim A Alison C/ Kim A	14.08.23 25.08.23 18.09.23
10-18	Lack of process/staff efficiency & alignment	To be improved the WTN Theatre pre-ops Process/staff efficiency & alignment (See slide 28&29)	- Alignment of 'into theatre' times for anesthetists start(0800), Surgeon start (0815), scrub/scout nurses start tray preparation/ opening (0815) & moved into theatre & Anesthetic start (0815/20) - PACU nurses start roster change to (1x830/1x900/2x930) to increase nurse afternoon availably (13/11/23). - Surgent & Surgery start to be officially set at WTN by 'Surgeon start time' to be set for 0815AM & Surgery start time (patient hand over to surgeon) to be set to 0830 - All of the Tech start to be present at the time of the surgery start time by 1 x tech staff to commencing at 0730AM & 3 x tech staff to commence at 0815AM - New proposed aligned process/staff timings to be presented & approved by WG - Develop SOP for WTN Roles and Responsibilities process changes - Staff to be clearly communicated of their expected change & start time - Load into PROMPT Policy and Procedure System (TBC)	PT/WG / Imp Team WG / Imp Team / AC/Tech Team Mgt RG/JMcK/RH/KM	13/10/23 23/10/23 23/10/23

Step 8: Develop Countermeasures (RC #10-#18)– Staff time alignment

General Info	WTN	Others (RMH /PeterMac/StVP)	Suggested
Session times	0830-1230; 1330-1730	0830-1230; 1300-1700/0830-1230; 1330-1730	0830-1230; 1330-1730
Anaesthetic bays attached	No	Yes	No
Nurse allowance of 10 min	Yes, at start time	No /Yes (prior start time)	Yes, at start time
Admission Clerk start	0630AM	2x0600 2x0630	0630AM (staggered)
First patient Arrival	0700AM	0610AM	0705AM
Staggered approach	**No**	Yes, works very well. The confirmation is taken by surgeons' office prior the surgery (StVP) / head nurse get the list day prior (RMH) .	Yes, first 2 cases 7AM & rest at 810AM
Admission Nurse start /No	1 x 0700AM /**1 x 0730 AM**	2x 0630 & rest x 0700 / 2 x 0600 rest x 0630AM	2 x 0700/ 0715
Fist Case Nurse admission	0710AM	All first cases by 0700	All1st/2nd cases by 0800AM
Anaesthetic Nurse start	1 x 0700AM / 1 x 0730AM / 2 x 0800AM	2 x 0700; rest x 0730	1 x 0700 / 1 x 0730 / 2 x 0800
Scrub / Scout nurse	**0730 (x1)** & 0800 (x7)	0720 X all	**0730 (x1)** & 0800 (x7)
Morning nurse huddle	Yes, (15 min) 0810-0825	730AM Yes - exceptions (2-3 min)	**0810AM exceptions only (max 5 min)**
Tray prep /opening/scrub	0825-0845		**0815**
In Anaesthetic bay/room	N/A (1 x avail but not used)	**730 & cannula/spinal start**	1st Anaest room / into theatre
Consent/ATO	0815/30	**0730AM**	**0800**
Moved into theatre	0830/45 (walked by anaest. nurse)	0810/15 by trolley	**0820**
Registrars start (mark & consult.)	0700AM (start)		0750-0815
Anaesthetist	0800AM	700AM	**0800AM**
Anaesthetic start (Cannula/draw up drugs/ monitor/spinal/blocks)	0830/45 (walked by anaest. nurse)	0810/15 by trolley	**0815**
One tech early start	0730AM	**N/A**	1 x 0730AM
Technicians start	0830AM (x3)	0730 all per room	**3x 0815**
Surgeon start	0830/45AM	715/30	**0815**
Surgery Start	0830/0845 (15min grace)	**0830 knife to skin**	**0830 (15min grace:0815-0830) (handover)**
PACU Nurse start /No	2 x 800/830AM(1830)/2 x 900/930AM(1930)	1x0730AM (staggered start times)	**1x830AM/1 x 900/2 x 930AM**

Step 8: Develop Countermeasures – Staff time alignment



Scrub/Scout
Anaesthetic Nurse start
Technicians start
Admission Clerk start
Registrar start
Anaesthetist
Surgeon start
Admission Nurse start
630AM
700AM
730AM
800AM
815AM
830AM
9AM
Morning Nurse Change
First 2 morning cases changed & Admitted
Morning Nurse Change
Nurse Huddle
Anaes prep/ patient mark out/ Anaes timeout /Consent
Cannula/ draw up drugs/ monitor /Spinal/blocks/ sedate
First Patient Arrival
First Case registration
Tray prep
Surgery Start
Pre-ops adm
Moved into Theatre
Session Start
1st & 2nd Morning Case Change & Admissions
3rd & 4th Morning Case Change & Admissions
Patient wait prioir surgery

Step 8: Develop Countermeasures

Root Cause 19: No (sufficient) appropriate anaesthetic rooms/bays for commencement of anaesthetic preparation processes

Solution: Increasing the Utilisation of current Pre-operational rooms

Epworth Hospital Visit: 22/8/23

- ❑ **Option 1:** Current process of the cannul[illegible] proce[illegible] the theatres as the preparation of the trays can be undertaken at the same time w[illegible] the theatres.

Challenges:

- The patient is still walked into the theatre & anae[illegible] is not completed
- The patient admission in the theatre (other th[illegible] ill [illegible]ed due to the wait for theatre room preparation / clean prior bringing the next patient. Therefore [illegible] separa[illegible]nnulation room (anaesthetic room will be desirable).

- ❑ **Option 2:** PACU rooms to be used just for 1st morning cases

Challenges:

- Cannot be used for the cases other than the 1st cases
- Staffing challenges and movement (JB)
- Sunshine hospital does not undertake any c[illegible]eanesthetic preparation processes in this area but just uses it as a holding bay.
- Logistics of moving the patients into the thea[illegible]CU WTN would be convoluted.
- There will need to be established different [illegible]es [illegible]st patients and the rest of the patients which will add complexity of the stuff to be able to follow [illegible] process [illegible]n day to day basis.
- The utilisation of Anaesthetic room 1 will be further compromised.

Step 8: Develop Countermeasures

Root Cause 19: No (sufficient) appropriate anaesthetic rooms/bays for commencement of cannulation/ blocks/spinal process

Proposed Solution: Increasing the Utilisation of WTN 4 Pre-operational rooms

Anaesthetic Room #1

Anaesthetic Room #4

Anaesthetic Room #2 & #3

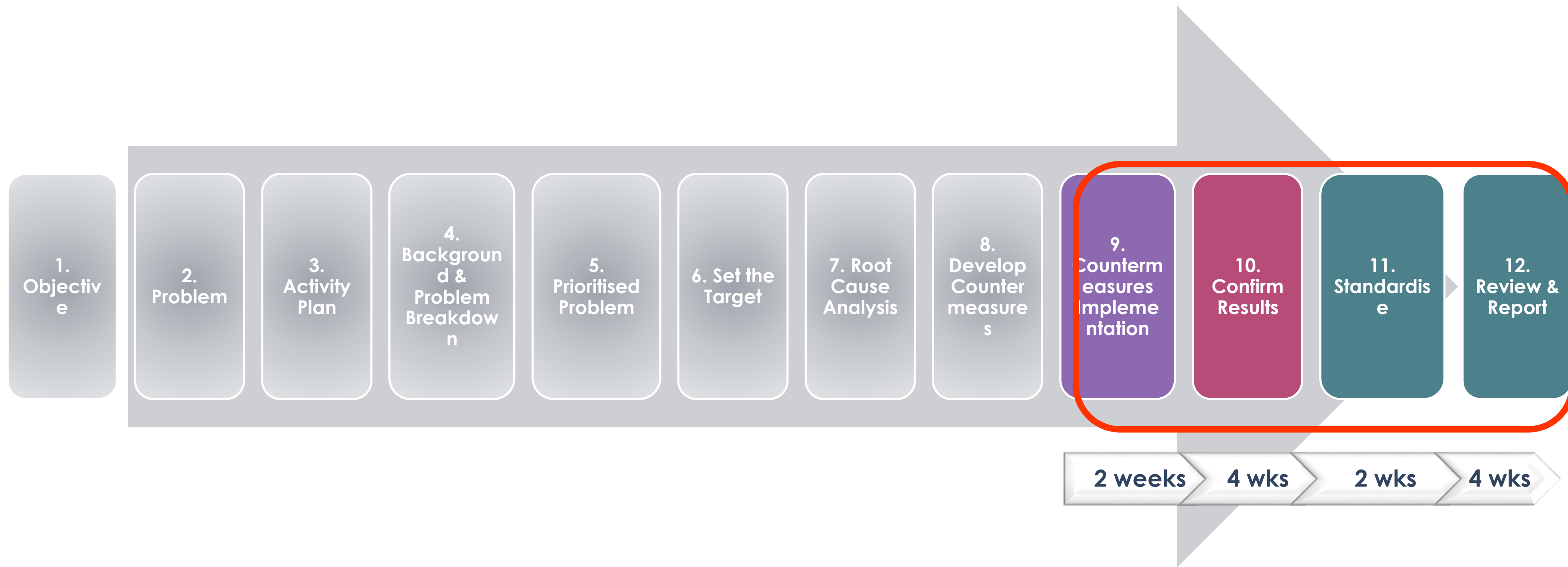
Step 8: Develop Countermeasures

Addressed the following Root Causes:

RC #	Root Cause	Proposed Solutions (Countermeasure) - What	How	By Whom	By When
19	No (sufficient) appropriate anaesthetic rooms/bays for commencement of anaesthetic preparation processes	**Option 3: Increasing the Utilisation of WTN 4 Rooms (decision for use rest solely within the discretion of Anaesthetist) by:** **- Use of the Room 1 as an Anaesthetic room at all times (undertaking cannulation, blocks, sedation, lines, etc…)** **- Use of the rooms 1-4 as Consultation room at all times, including undertaking cannulation process.**	- To advise Anaesthetic unit of the proposed process change in the rooms 1- 4 & ask for their support - Provide the quotation & timeline / ability to source all the necessary equipment for rooms 1-4 - Supply of the equipment & set up of the rooms, including removal of the computers tables / seating & replacement with WOWs - Set up process for ongoing housekeeping maintenance for Rooms 1-4 - Set Implementation date & communication to all the relevant parties	ALL WTN Theatre Staff	14.9.23 13.11.23 23.11.23
20	Complexity of scheduling of the patients for 1 anaes. room as the other rooms are not capable to accommodate any of cannulation/spinal process				
21	Not ability for standard scheduling approach for all 4 rooms				
22	There are not anaesthetic bay/ward available at WTN & all cannulation/spinal process is undertaken 'Into theatre'				

WTN Theatre Improvement Project – Next Steps

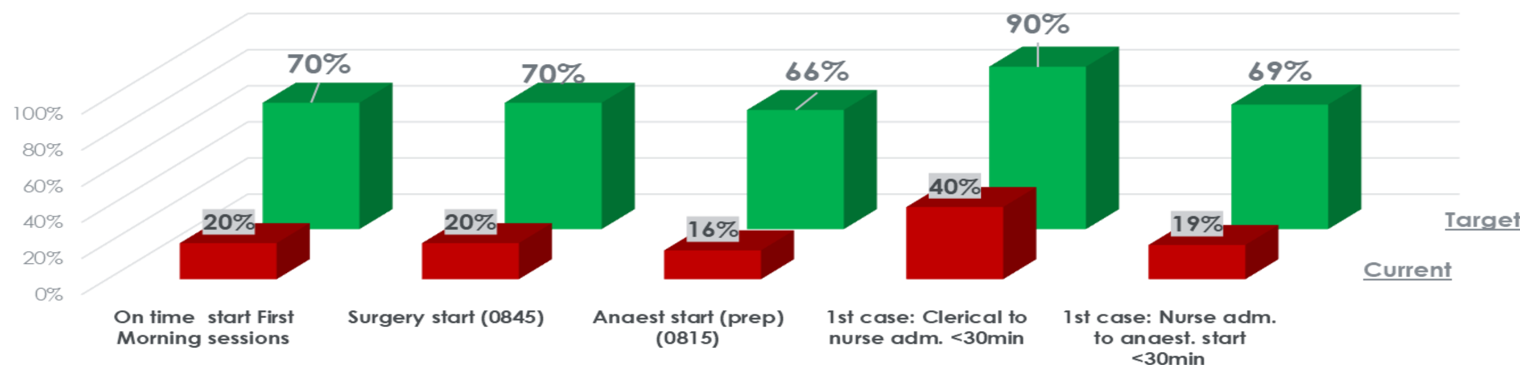
We are Going Live Monday, 23rd of October 2023!



Step 10: Confirm Results

KPI's to be used to measure the success across 4 weeks from implementation date (23/10/23-23/11/23)

- On time start First Morning sessions (planned session time vs actual session start time)
- Surgery start (8:30am and 8:45)
- Anaesthesia start (8:15)
- 1st case: Clerical to nurse admission (<30min)
- 1st case: Nurse admission to anaesthesia start (<30min)



Additional measures to be considered:

- Underruns: (No. of sessions finishing >30mins before 12:30 and 1730)
- Overruns: (No. of sessions finishing >30mins after 1230 and 1730)

- **The initial data collection and reporting will be undertaken by WH Site Lead on the weekly basis,**
- **Set up an ongoing consistent Efficiency reporting process and Allocate responsible person/team for the same.**

Discussion & Questions