TO IMPROVE THE ON-TIME START RATES FOR FIRST CASE ON WEEKDAYS IN TTSH RADIOLOGY ANGIO SUITE

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Mission Statement

To improve the first case on-time start rates on weekdays in TTSH Radiology Angio Suite from 10% to 80% in 6 months

- The first case will usually be an inpatient case (<10% outpatient first case in last 6 months)
- Avoids manpower time wastage and help avoid unsafe practice such as the staff rushing to prepare the case

Team Members

	Name	Designation	Department
Team Leader	Dr. Ivan Huang	Associate Consultant	Diagnostic Radiology
Team Members	Dr. Gavin Lim	Consultant	Diagnostic Radiology
	Dr. Adeline Teh	Consultant	Respiratory & Critical Care Medicine
	Dr. Puah Ser Hon	Consultant	Respiratory & Critical Care Medicine
	Poh See Yin	SN	Diagnostic Radiology
	Christina Ting	SN	Diagnostic Radiology
	Joy Ponce	Radiographer	Diagnostic Radiology
	Fiona Tan	SN	Ward
	Francis	Porter	Porter
	SAN Suchitra	StarTeam SN	StarTeam

Advisor: Dr. Pua Uei, Dr. Lawrence Quek, Kelly Wang Zhifan, Sister Chow, Chrsitina Tan, Abdul Rahman
Sponsor: Adj A/Prof Gregory Kaw Jon Leng, Diagnostic Radiology HOD & Mentor: A/Prof Thomas Chee

Evidence for a Problem Worth Solving

- Delay in start time of procedures done at VIR
- Wastage of working hour as nurses, radiographers and doctors end up starting the procedures late
- Additional stress throughout the day for staff and patients
- This can potentially result in an unsafe working environment for staff and also patients
- Staff work overtime → overtime co$t

More than a third of elective surgery sessions started late

Starting elective surgery sessions late was a problem at all five hospitals. In 2014, 37 per cent of elective sessions started late, resulting in a significant lost time. For example, four per cent of sessions started more than one hour late resulting in 571 hours of unused operating theatre time.

Starting the first case of a session on time makes it more likely that the session will finish on time. It also reduces the likelihood of day of surgery cancellations.

	SCGH	OPH	SDH	BH	AH	TOTAL
>10 minutes late	28%	67%	27%	42%	40%	37%
>30 minutes late	10%	17%	6%	12%	7%	11%
>60 minutes late	4%	3%	2%	5%	2%	4%

Table 1: Proportion of elective sessions that started late in 2014, based on when the first patient of the session arrived in theatre

1st case start time in TTSH Angio Suite in the months of May – August 2018

Day	Mon	Tue	Wed	Thu	Fri
Date	30/4	1/5	2/5	3/5	4/5
Time	8:18	PH	8:30	8:20	8:20
Date	7	8	9	10	11
Time	8:14	8:18	8:10	8:20	8:16
Date	14	15	16	17	18
Time	8:47	8:30	8:20	8:25	8:51
Date	21	22	23		
Time	8:50	8:20	8:23		

Day	Mon	Tue	Wed	Thu	Fri
Date	18/6	19	20	21	22
Time	8:10	8:29	8:47	9:12	8:21
Date	25	26	27	28	29
Time	8:32	8:49	8:35	8:32	8:21
Date	2/7	3	4	5	6
Time	8:31	8:44	8:40	8:22	8:24
Date	9	10	11	12	13
Time	8:26	8:40	8:15	8:21	8:24

8/76x100%=10.5%

Day	Mon	Tue	Wed	Thu	Fri
Date	2	3	4	5	6
Time	8:31	8:44	8:40	8:22	8:24
Date	9	10	11	12	13
Time	8:26	8:36	8:15	8:21	8:24
Date	16	17	18	19	20
Time	8:34	8:22	9:14	8:37	8:33
Date	23	24	25	26	27
Time	8:16	8:24	8:26	8:31	8:29
Date	30	31			
Time	8:35	8:52			

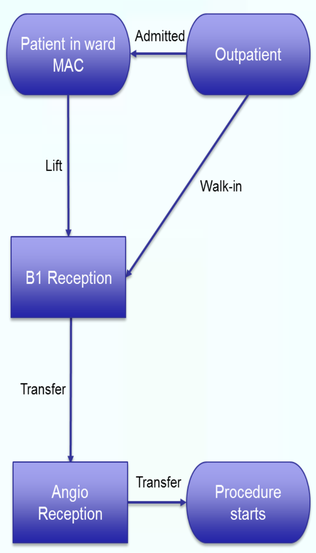
Day	Mon	Tue	Wed	Thu	Fri
Date			1	2	3
Time			8:41	8:25	8:22
Date	6	7	8	9	10
Time	8:58	8:48	8:18	PH	8:16
Date	13	14	15	16	17
Time	8:38	8:28	8:14	8:26	8:12
Date	20	21	22	23	24
Time	8:21	8:12	PH	8:25	8:17
Date	27				
Time	8:19				

3.5.5 Starting on Time

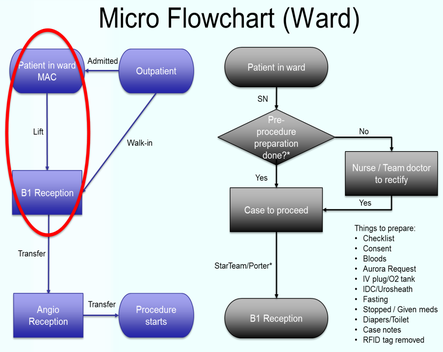
One of the key contributors to improving theatre efficiency is starting on time. Starting a list on time and as planned will ensure the greatest opportunity to finish on time (and thus minimise overtime costs), avoid unnecessary cancellations and maximise the use of available theatre time to increase productivity.

Flow Chart of Process

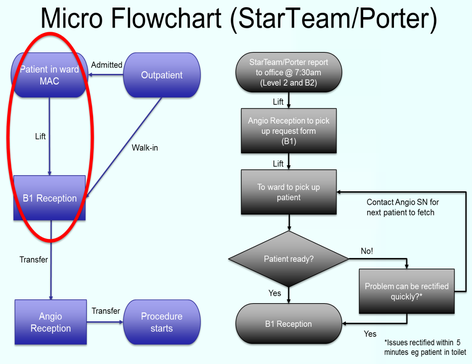
Macro Flowchart



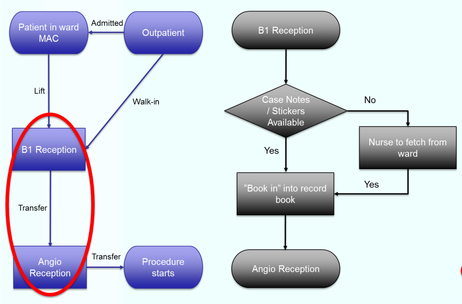
Micro Flowchart (Ward)



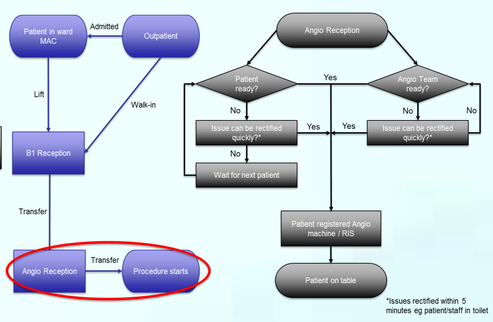
Micro Flowchart (StarTeam/Porter)



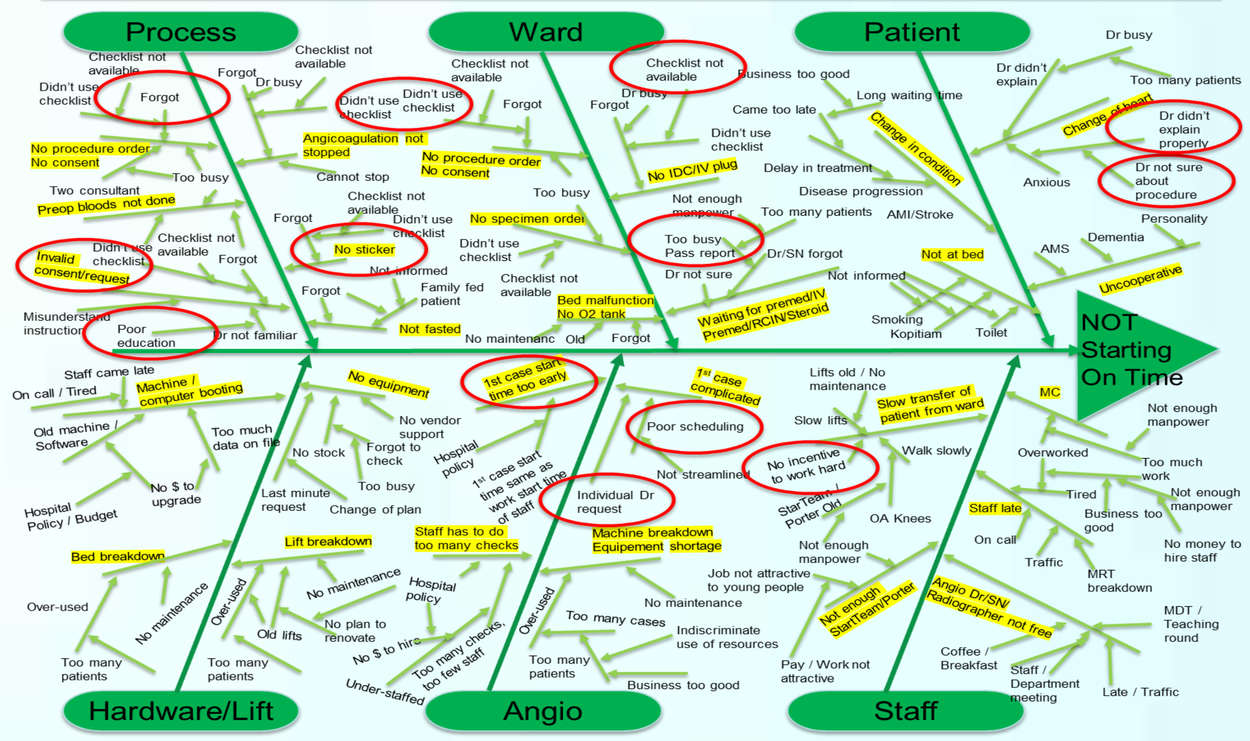
Micro Flowchart (B1 Reception)



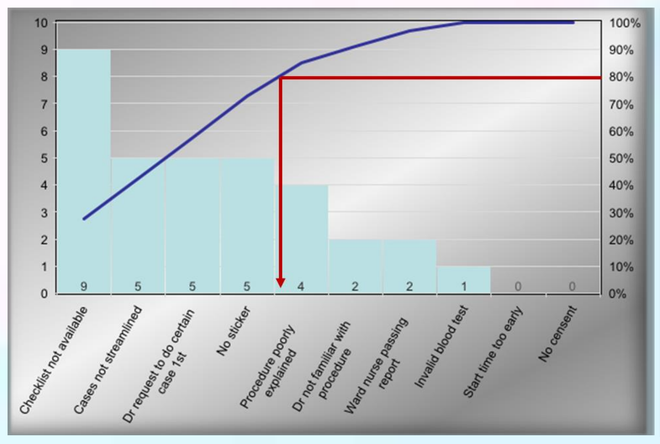
Micro Flowchart - Angio



Cause and Effect Diagram



Pareto Chart

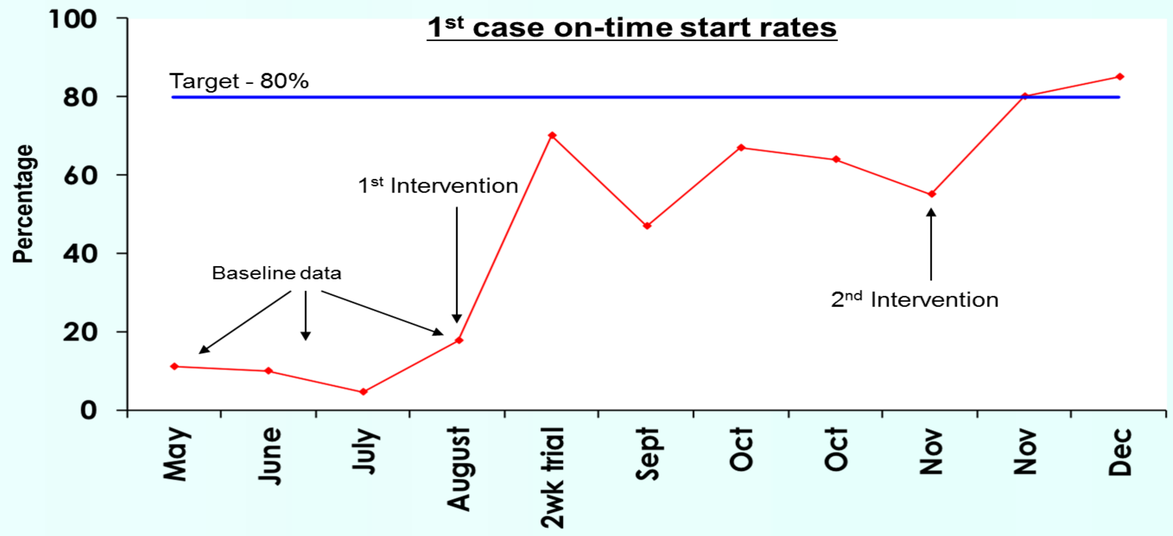


No	Root causes
1	Checklist not available
2	Cases not streamlined
3	Doctor request to do certain case 1st
4	No sticker
5	Procedure poorly explained
6	Doctor not familiar with procedure
7	Ward nurse passing report
8	Invalid blood test
9	Start time too early
10	No consent

Implementation

CAUSE / PROBLEM (refer to Pareto Chart)	INTERVENTION	DATE OF IMPLEMENTATION
Check list not available in the ward	Check list made available to ward staff (delivered on D-1)	28 Aug 2018
Cases not streamlined	List "simple" cases first	19 Nov 2018
Doctor asked complicated case to be done first	Straightforward case to be fetched first, followed by 2nd case complicated case	19 Nov 2018

Results



Cost Savings

Hourly manpower cost:
Radiographer - $ 72/hour, Nurse - $ 60/hour, Doctor - $ 300/hour
One room = one radiographer + two nurses + one doctor = $ 432/hour
Three rooms = $ 1296/hour
Assuming delay of 30 minutes per day
Idle manpower cost incurred = $ 648/day
That's $3,240/week; That's $168,480/year

Estimated about 1 more case being done per day

- Simple case : $300
- Complex case : $2000
- Shortens waiting list
- Allows for existing infrastructure to be optimized

Intangible gains

- Overtime cost from staff staying back to clear cases
- Cost of delay to other patients, who end up staying in hospital for longer
- Also, it improves patient satisfaction and staff morale

Lessons Learnt

- Problems faced by a department may be the manifestation of issues along the entire "supply chain… It all adds up
- Engagement and buy-in from various stakeholders is important
- Inter-department collaborative work brings about positive outcome and experience for the patient
- Knowing the ground and its micro-processes is essential for planning the intervention
- Everyone in the team is important... No voice is too small to be heard
- Sometimes, modification of existing processes is what's needed
- Interventions may not always work at first

Strategies to Sustain

- Positive outcome is the result of input from all stakeholders
- Continuous staff feedback and optimization of workflow will ensure sustainability
- Inter-department collaborative work should be encouraged
- Continual auditing is important
- Times and circumstances may change again · we must change and adapt with time
- Never be afraid to go back to square 1, especially when circumstances are different