

Project Title

Increasing % of Surgeries Done as Day Cases (DS/DS23)

Project Lead and Members

Project lead: A/Prof Cheah Wei Keat

Project members: Clin A/Prof Philip Iau, Adj A/Prof Fareed Kagda, Dr Yap Sau Hsien, Adj A/Prof Harvinder Raj, A/Prof Raymond Ngo, A/Prof Adrian Yap, A/Prof Pipin Kojodjojo, Dr Lennard Thean, Dr Wong Guan Wee, Chee Thong Gan, Joanna Tan Seo Peng, Jolyn Tan, Stephanie Teo, Josephine Wong, Fione Gun, Joyce Loke, Nor'ain Nordin, Goh Yee Hwee, Goh Bee Bee

Organisation(s) Involved

Ng Teng Fong General Hospital

Healthcare Family Group Involved in this Project

Medical

Applicable Specialty or Discipline

General Surgery

Aims

The aim of *“increasing the percentage of surgery done as DS/DS23 to 81% (by 5%, from 76%) in 2 years (by June 2019)”* was set. The monthly surgical load was ~1,000 cases, & a 5% increase would free up ~600 inpatient bed-day a year.

Background

See poster appended/ below

Methods

See poster appended/ below

Results

See poster appended/ below

Lessons Learnt

For each intervention, multiple plan-do-study-act cycles were carried out to perfect its implementation. This was followed by a long period of monitoring to ensure that the intervention sticks & forms part of routine work.

Conclusion

See poster appended/ below

Project Category

Care & Process Redesign

Value Based Care, Operational Management, Resource Allocation, Quality Improvement, Workflow Redesign

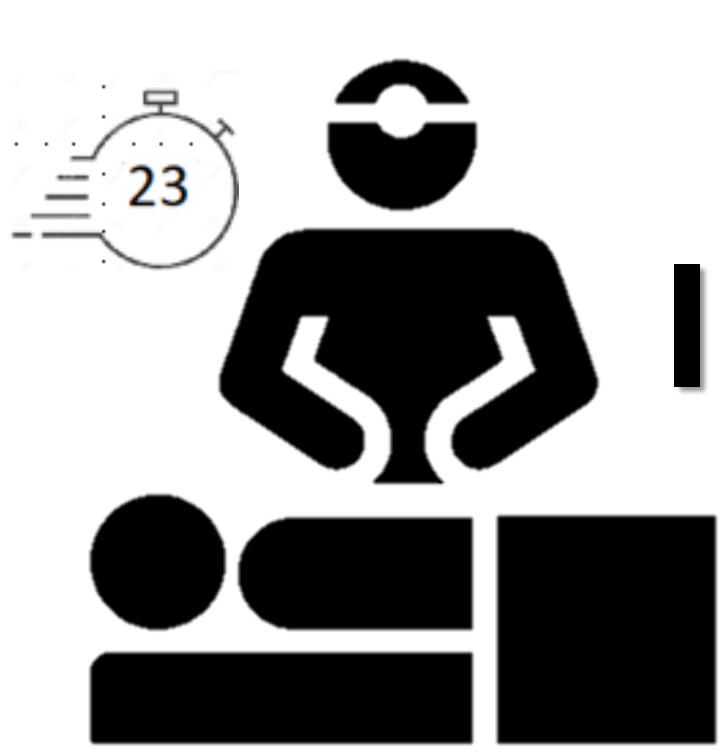
Keywords

Day Surgery, DS23

Name and Email of Project Contact Person(s)

Name: Stephanie Teo

Email: stephanie_teo@nuhs.edu.sg



INCREASING % OF SURGERIES DONE AS DAY CASES (DS/ DS23)

MEMBERS: S TEO; J WONG; DOCTORS, NURSES, ADMINISTRATIVE & ANCILARY STAFF FROM 18 DEPARTMENTS (SEE FIGURE 2 FOR COMPLETE LIST); CHEAH WK

- ☑ PATIENT EXPERIENCE
- ☑ PRODUCTIVITY
- ☑ COST

Define Problem & Opportunity

PROBLEM
Short-staying (0-2 days) surgical patients were occupying inpatient beds which is a higher cost facility compared to Day Surgery (DS) / DS23 facilities, & was contributing to high inpatient bed occupancy rate (BOR) & bed crunch in NTFGH.

OPPORTUNITY
These patients might be suitable for day surgery, either with same day discharge (DS) or discharge within 23 hours (DS23). They would benefit from shorter hospital stays & lower patient bills. For the hospital, this translates to cost-savings. More importantly, every opportunity to right-site to DS/ DS23 facilities frees up at least 1 inpatient bed-day, which allows another patient to access inpatient care.

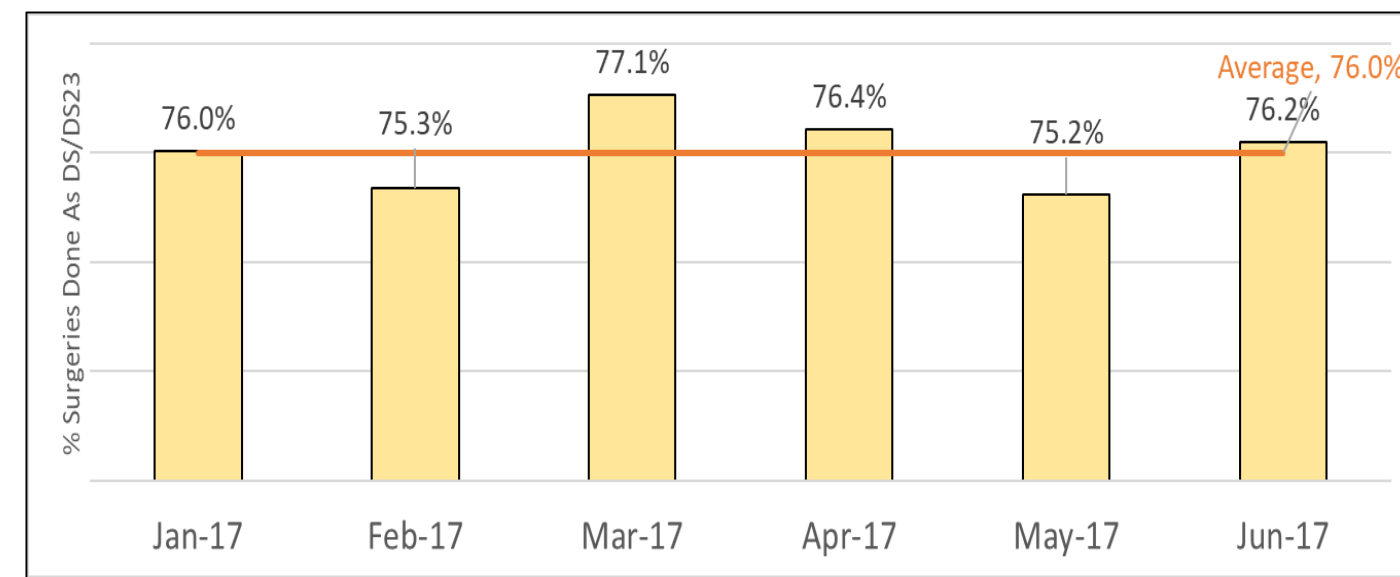
Set Aim, Establish Measure, Form Team

Using the IHI Model for Improvement, the aim was set, baseline measurement established, & team formed.

ESTABLISH BASELINE MEASURE (Ref: Figure 1)
The % of surgeries done as DS/DS23 for 6 months were plotted. It averaged at 76%. This formed the baseline.

SET AIM
Using the baseline measurement as a reference, the aim of **"increasing the percentage of surgery done as DS/DS23 to 81% (by 5%, from 76%) in 2 years (by June 2019)"** was set. The monthly surgical load was ~1,000 cases, & a 5% increase would free up ~600 inpatient bed-day a year.

FORM TEAM (Ref: Figure 2)
A project of this scale involved many departments. Stakeholders from diverse backgrounds were identified & recruited as team members. During the project's active phases, the team members met regularly, with each member contributing his expertise & experience enthusiastically towards the projects aim.

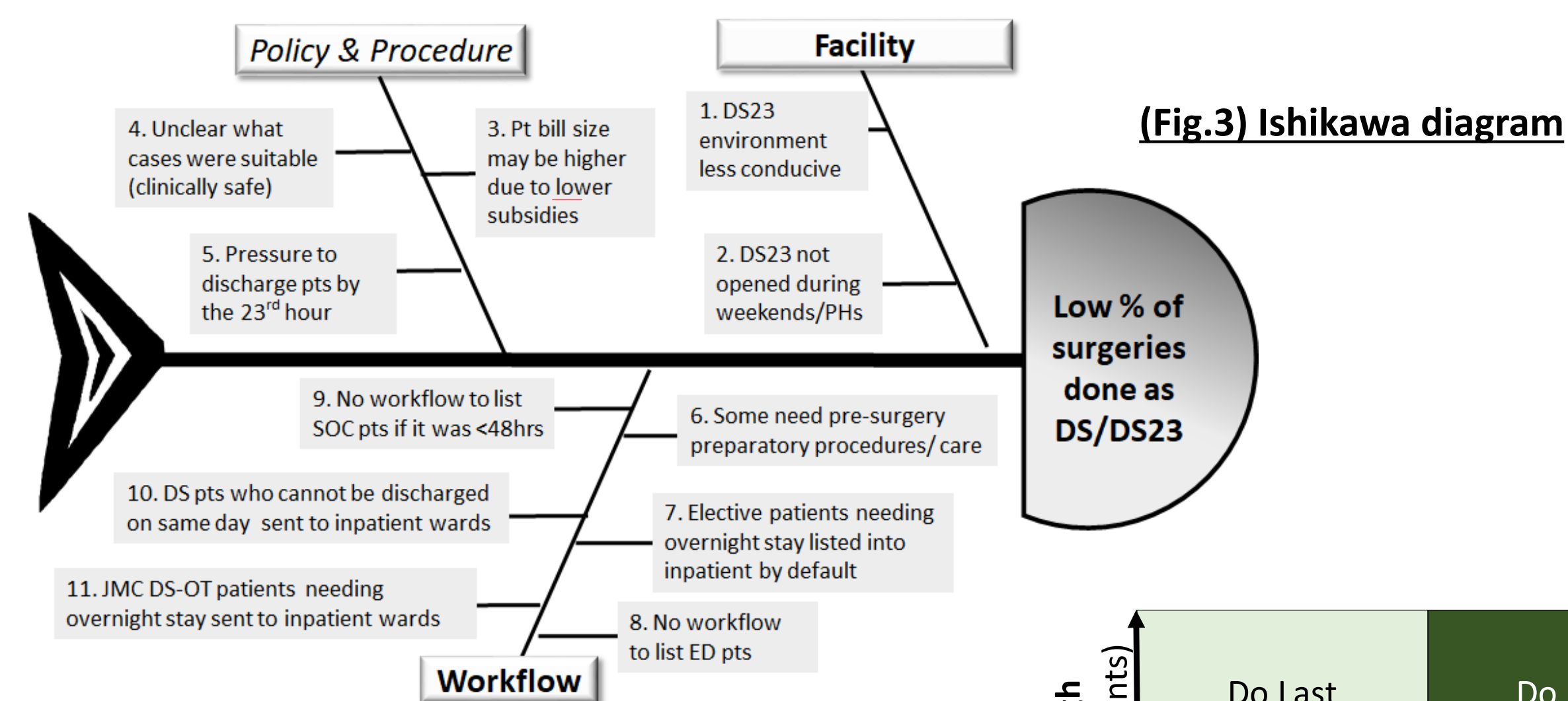


(Fig.1) Baseline measure

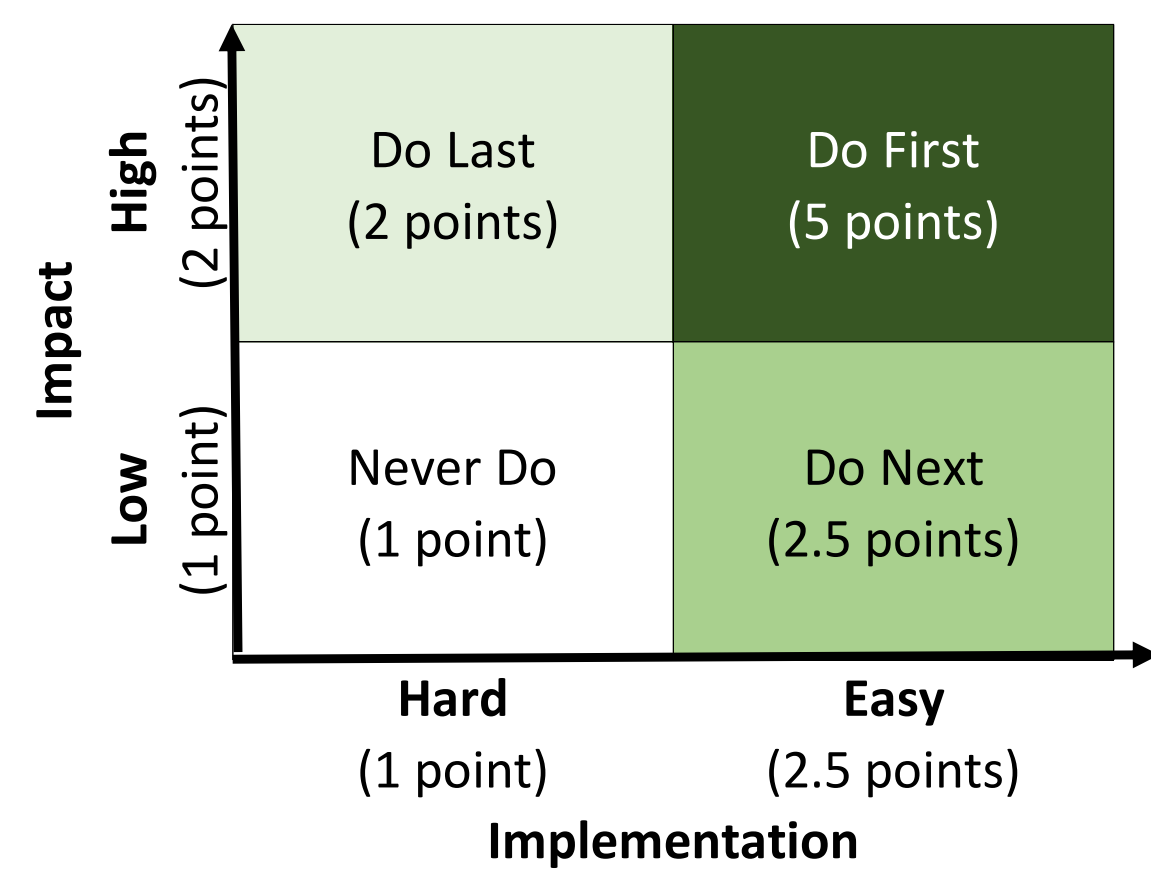
Job Family	Department	Team Members
Clinical (Doctors)	CMB Office	A/Prof Cheah Wei Keat (Former CMB)
	General Surgery	A/Prof Philip Lau, Dr Heng Chin Tiong, Dr Jesse Hu, Dr Cheong Chern Yuen & all Doctors
	Orthopaedic Surgery	Dr Yap Sau Hsien, Dr Chia Chui Ping & all Doctors
	Anaesthesia	A/Prof Fareed Kagda, Dr Audrey Tan, Dr Lim Jin Xi & all Doctors
	ENT Head & Neck Surgery	Dr Lennard Thean & all Doctors
	Ophthalmology Doctors	Dr Lennard Thean & all Doctors
	Dental	A/Prof Adrian Yap & all Doctors
	Gastroenterology	Dr Wong Guan Wee, Dr Qurishi Ahmed & all Doctors
	Cardiology	A/Prof Pipin Kojodajojo & all Doctors
	OT Committee	A/Prof Harvinder Raj & committee members
Nursing	Nursing (Ambulatory)	ADN Jolyn Tan, NC Wang Lili, ANC Meng Zhyan & all Nurses
	Nursing (SOC)	NC Tang Min Yee, ANC Lim Li Lian, NC Manjinder Kaur & all Listing Nurses
	Nursing (Operating Theatre)	ADN Joanna Tan, SNM Kathie Teo & all Nurses
	Specialty Operations	Ms Fione Gun, Ms Evelyn Low, Ms Renee Tan & all who support participating clinical departments
Administrative & Ancillary	Emergency Department	Ms Joyce Loke, Ms Janna Goh & all in ED
	Medical Informatics	Ms Nor'ain Nordin, Mr Felix Lim, Mr Rayner Koh & teams
	Admissions Office	Mr Goh Yee Hwee & team
	Business Office	Ms Goh Bee Bee & team
	Clinical Operations (Former: Specialty Ops + Clin.Projects)	Ms Chee Thong Gan
	Clinical Projects (MA)	Ms Stephanie Teo, Ms Josephine Wong, Ms Michelle Fong

(Fig.2) Team members

Analyse Problem, Select Interventions



(Fig.3) Ishikawa diagram



(Fig.4) above & Fig.5 below

Impact implementation matrix & its usage

ANALYSE PROBLEM – The Ishikawa diagram (Figure 3) was used to drill down to the root causes.

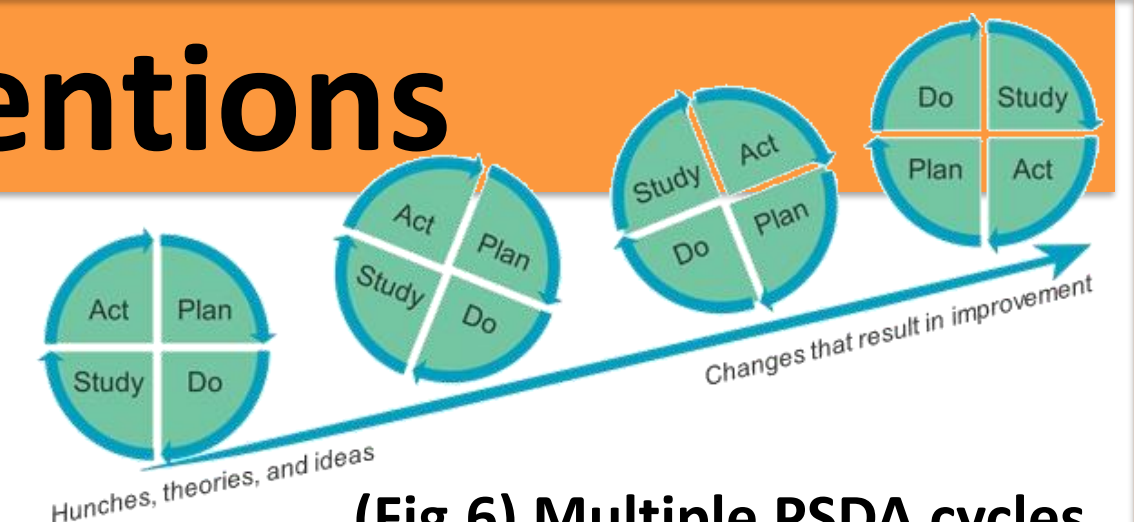
SELECT INTERVENTIONS – Corresponding interventions for each root causes were proposed (Figure 5). The impact- implementation matrix (Figure 4) was used to guide our solution selection & sequence of implementation (Figure 5).

Root Cause	Possible Intervention	Implementation (Hard = 1) (Easy = 2.5)	Impact (Low = 1) (High = 2)	Impact * Implementation
1. DS23 environment was less conducive compared to inpatient wards	A Enhance DS23 facility	2.5	2	5
2. DS23 facility not opened during weekends and public holidays	Extend facility opening to more days	1	1	1
3. Worry that patient bill size may be higher in DS/DS23 due to lower subsidies for DS compared to inpatient	B Ensure DS patient bill size is similar to inpatient stays	2.5	2	5
4. Unclear what cases were suitable (clinically safe) for DS/DS23	C Establish clinical criteria	2.5	2	5
5. For DS23, there's pressure to discharge patient by the 23 rd hour	Establish hourly work to ensure timely discharge.	1	1	1
6. Some patients were admitted earlier for pre-surgery preparatory procedures/ care	D Find ways to do pre-surgery preparatory procedures/ care outside inpatient setting	1	2	2
7. Elective patients needing overnight stay were listed into inpatient wards by default	E Change listing practice for elective patients	1	2	2
8. No workflow to list ED pts	F Establish ED to DS/DS23 workflow	1	2	2
9. No workflow to list SOC pts if it was <48hrs	G Establish Expedited SOC to DS/DS23 workflow	1	2	2
10. DS patients who cannot be discharged the same day were sent to inpatient wards	Establish DS-turn-DS23 workflow*	1	1	1
11. JMC DS-OT patients needing overnight observation were sent to inpatient wards	Establish JMC DSOT-turn-DS23 workflow*	1	1	1

Note on * : Although these weren't selected interventions, they were being initiated & worked on by local teams, even as the main project gains momentum.

Implement Interventions

For each intervention listed in this section, multiple plan-do-study-act cycles (Figure 6) were carried out to perfect its implementation. This was followed by a long period of monitoring to ensure that the intervention sticks & forms part of routine work.



(Fig.6) Multiple PSDA cycles carried out for every intervention

Most interventions were piloted by General Surgery &/or Orthopaedic Surgery departments, then spread to all other surgical departments, & eventually to medicine divisions with procedural work (i.e. Cardiology & Gastroenterology).

A Enhance DS23 facility (2017) – The DS23 facility was made more conducive & similar to inpatient ward - trolley beds replaced with ward beds, patients given proper meals instead of snacks. More beds (including private ones) were added in 2019 as DS23 demand rises.

B Ensure DS23 patient bill size is similar to inpatient stay (2017) – Bill sizes were studied, & it was ascertained that for non-major surgeries (TOSP <5), DS23 cost less than inpatient. DS23 was made the default choice for clinically suitable patients.

C Establish clinical criteria (2017) – Clinical criteria (E.g. by ASA, procedures, medical fitness) for DS/DS23 patients were established & documented in procedural manuals. These criteria(s) were discussed & communicated at clinical departmental meetings.

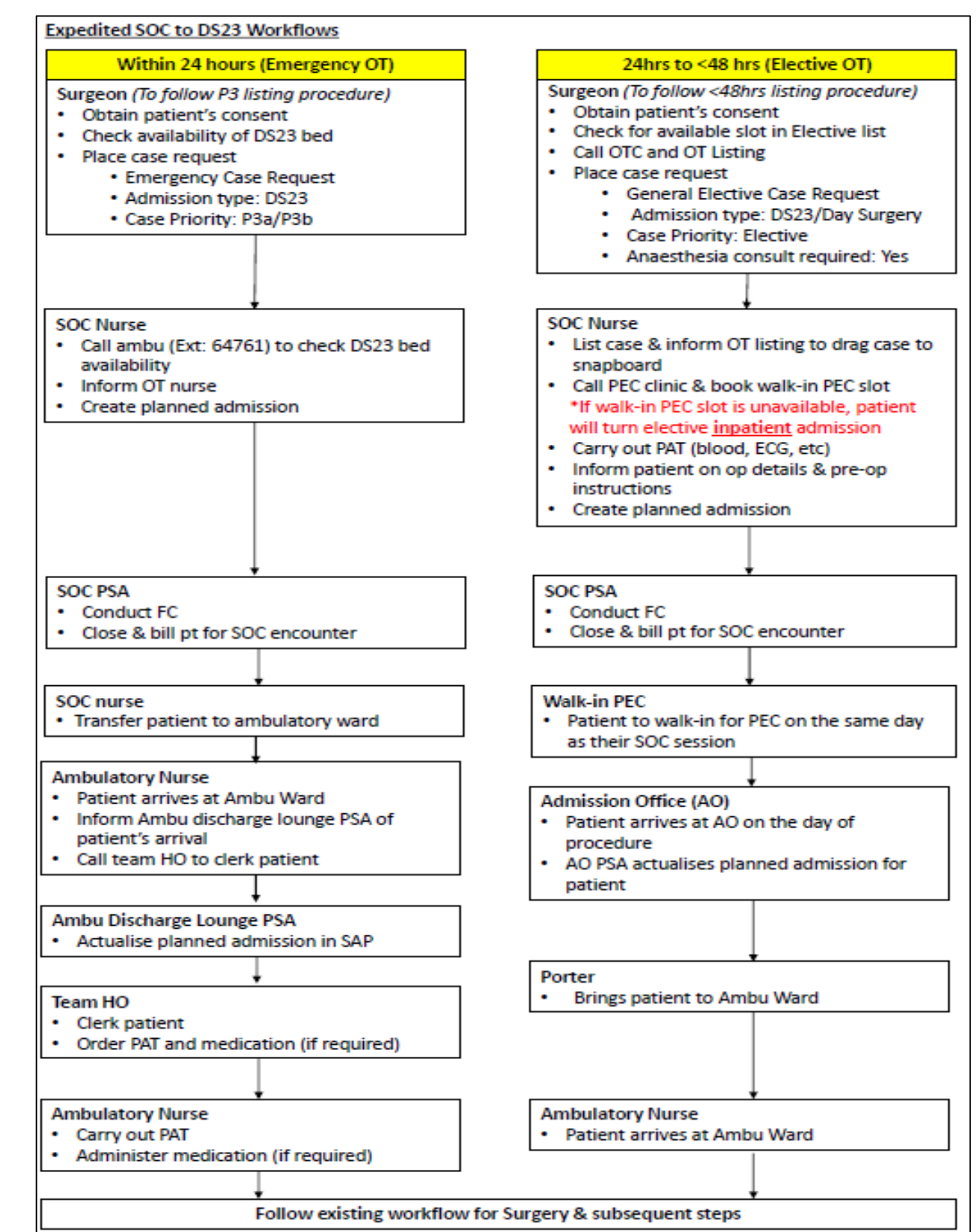
D Find ways to do pre-surgery preparatory procedures/care outside inpatient setting (2018) – Feasibility studies were conducted. Operational & administrative processes were adjusted for some of these to be safely done as outpatients, or even by patients themselves at home.

E Change listing practice for elective patients (2018-20) – To make the changes stick, on a weekly basis, a list of elective inpatients with potential for conversion to DS/DS23 was generated, reviewed by the clinicians, & converted to DS/DS23 if found suitable.

F Establish ED to DS/DS23 workflow (2018-19)** – Initiated by Orthopaedic Surgery & General Surgery departments, a robust referral system was set up. This included the creation of clear workflow, referral criteria, Epic smart texts, Epic "ED to DS/DS" order buttons. It's the 1st time Emergency OTs are used for DS/DS23 patients.

G Establish Expedited SOC to DS/DS23 workflow (2020-21)** – Despite Covid-19 disruptions, extensive workflows were still drawn (Ref: Figure 7), IT dry runs held. A trial was carried out for 2 patients, then extended to all GS abscess cases. It would be rolled out to all departments at Covid-19 endemic stage.

Note on ** : Intervention F was also subsequently extended to JCH, and intervention G to JMC SOC, by the local teams.



(Fig.7) Sample of a workflow at its nth interaction after multiple PSDA cycles

Achieve Outcome

All suitable patients, regardless where they are listed from, can now be listed to DS/DS23, forming a complete matrix for listing patients to DS/DS23.

Facility pts are listed from ->	Time bet listing & surgery ->	Facility pts are listed to - at start state & end states of project		
		≥ 48 hrs	< 48 hrs	≤ 24 hrs
Inpatient Ward	≥ 48 hrs	✓	✓	✓
	< 48 hrs	✓	✓	✓
	≤ 24 hrs	✓	✓	✓
DS23	≥ 48 hrs	X	X	X
	< 48 hrs	✓ A-E	✓ G	✓ F
	≤ 24 hrs	✓ C-E	✓ G	✓ F
DS	≥ 48 hrs	✓	X	X
	< 48 hrs	✓	✓	✓
	≤ 24 hrs	✓	✓	✓

(Fig.8) Where patients can be listed to - at start state & end states of project

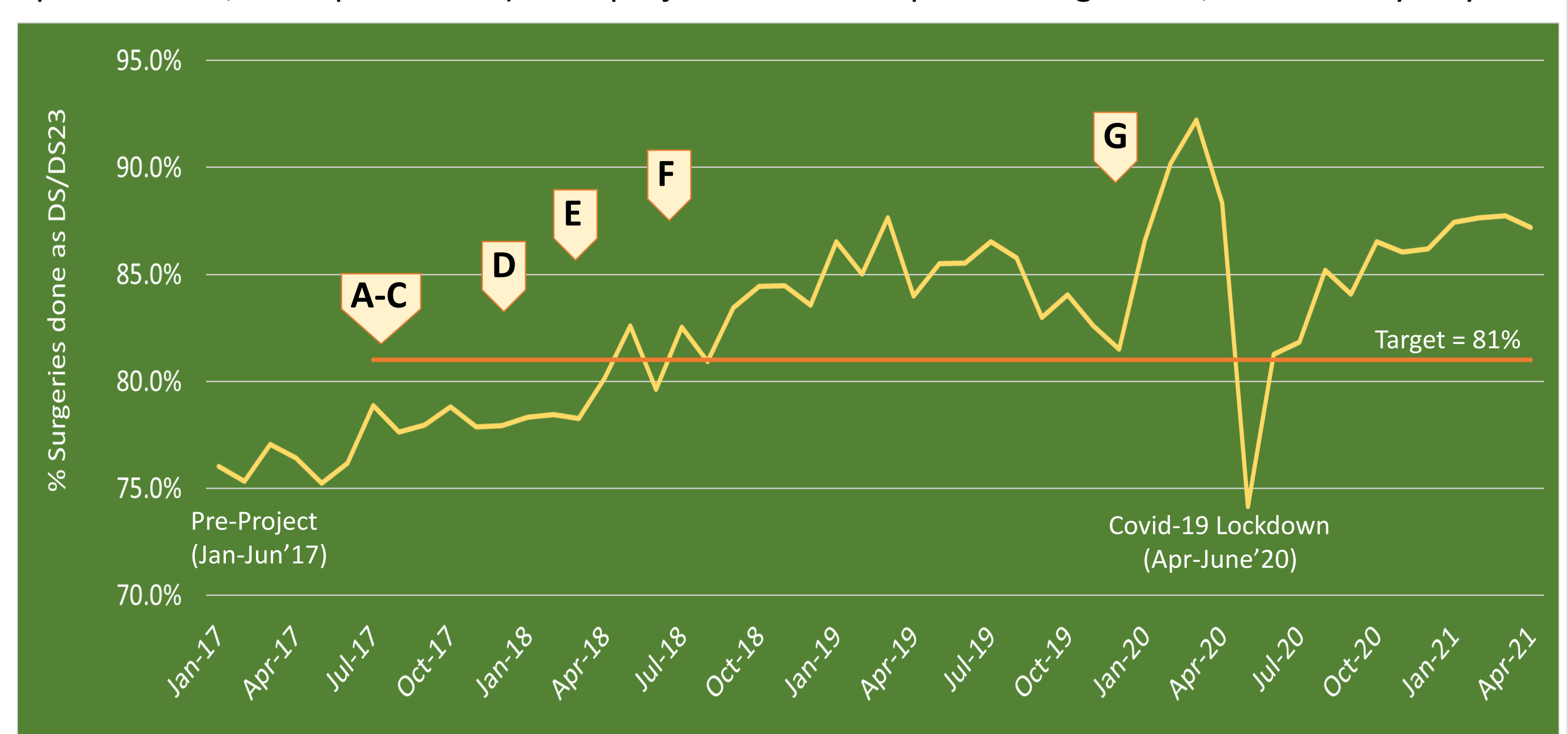
Suitable cases can now be performed as DS/DS23 instead of inpatient cases. Listed below are 8 procedures with the highest conversion rate.

Department	TOSP Code	TOSP Description	% DS/DS23 cases		
			In 2017	In 2020	% change
1 General Surgery (Urology)	SH835P	Prostate gland, various lesions, saturation prostate biopsy***	-	95%	95%
2 Orthopaedic Surgery	SB710S	Shoulder, shoulder soft tissue injury, arthroscopic/open decompression with cuff repair	0%	90%	90%
3 Orthopaedic Surgery	SB700K	Knee, arthroscopy, knee ligament reconstruction	5%	94%	89%
4 Orthopaedic Surgery	SB701K	Knee, Ligaments/ Meniscus/ Cartilage/ Bone Combined, Arthroscopic ACL Or PCL Reconstruction	0%	89%	89%
5 Otolaryngology	SM829E	Ear, various lesions, myringoplasty (post-aural/ endaural approach)	0%	86%	86%
6 General Surgery	SA823B	Breast, tumor (malignant), wide excision/ lumpectomy/ segmental mastectomy/ partial mastectomy	0%	84%	84%
7 Orthopaedic Surgery	SB801S	Shoulder, acromioclavicular joint stabilisation/ reconstruction	0%	83%	83%
8 Otolaryngology	SM724N	Nose, various lesions, septoplasty/ submucous Resection	2%	82%	80%

Note on *** : Prostate biopsy started only in 2018, & listing to DS/DS23 (instead of same-day-admission to inpatient) was immediately made the default because of this project.

(Fig.9) Surgeries with the highest conversion rate

The project overall aim of increasing % of surgeries done as DS/DS23 to 81% was met after one year's effort. The performance has stayed consistently above the target except during Covid-19 lock down period (where only essential surgeries, which are typically more complex & requiring inpatient care, were performed). This project has freed up an average of >1,400 bed-days a year.



(Fig.10) Outcome Measure - Percentage of surgeries done as DS/DS3