Project Title

Optimization of the Ambulatory Surgery Centre (ASC) Utilization for Knee Replacement Surgery

Project Lead and Members

- Zhang Dandan
- Onn Jia Wei Shalene
- Chen Yongqiang Jerry
- Liow Ming Han Lincoln
- Lim Gin Yin

Organisation(s) Involved

Singapore General Hospital

Healthcare Family Group(s) Involved in this Project

Medical

Applicable Specialty or Discipline

Department of Orthopaedic Surgery

Project Period

Start date: Oct 2020

Completed date: N/A

Aim(s)

- Aim of this project is to decrease patients' waiting time for TKR/UKA surgeries by using the ASC operating rooms up to 40% within 6 months without compromising the patients' safety.

Background

See poster appended/ below

Methods

See poster appended/ below

Results

See poster appended/ below

Conclusion

See poster appended/ below

Additional Information

Singapore Healthcare Management Congress 2022 – Merit Award (Operations category)

Project Category

Care & Process Redesign

Access to Care, Waiting Time

Quality Improvement, Workflow Redesign

Keywords

Optimisation of Ambulatory Surgery Centre (ASC)

Name and Email of Project Contact Person(s)

Name: Zhang Dandan

Email: singaporehealthcaremanagement@singhealth.com.sg

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Zhang Dandan, Singapore Genneral Hospital
Onn Jia Wei Shalene,Singapore General Hospital
Chen Yongqiang Jerry, Singapore General Hospital
Liow Ming Han Lincoln, Singapore General Hospital
Lim Gin Yin, Singapore General Hospital

Singapore Healthcare Management 2022

Singapore General Hospital
SingHealth

Background

- The SGH Orthopedic Surgery (OTO) department typically performs over 2000 knee replacement surgeries, including Total Knee Replacement (TKR) and Unicompartmental Knee Arthroplasty (UKA) annually.
- These surgeries are typically **performed in Major Operating Theatres** (OT) in SGH.
- In 2020, due to Covid-19 restrictions on elective surgery, less than 1700 TKR/UKA surgeries were performed, suggesting that there was at least a backlog of 300 patients awaiting surgery.
- In October 2020, when the restrictions are lifted, **Ambulatory Surgery Centre (ASC)** began to explore the possibility of accepting Unicompartmental Knee Arthroscopy (UKA) as well as Total Knee Replacement (TKR) cases.

Aim(s)

The aim of this project is to decrease patients' waiting time for TKR/UKA surgeries by using the ASC operating rooms up to <u>40% within 6 months</u> without compromising the patients' safety

Analysis of Problem

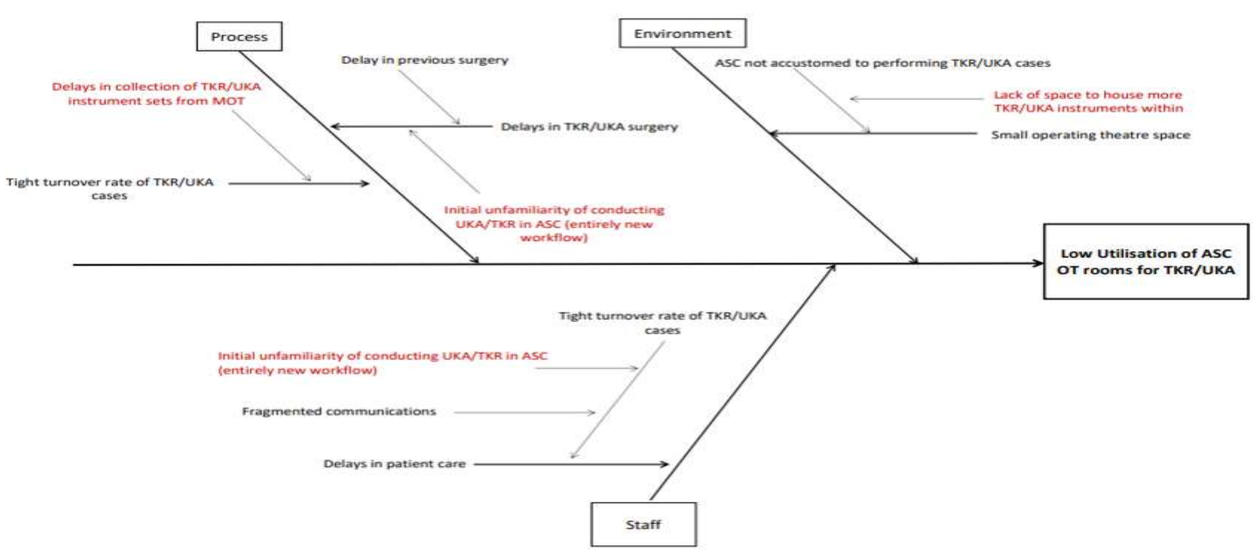


Figure 1: Cause-Effect Diagram of Low Utilisation of ASC for TKR/UKA surgeries

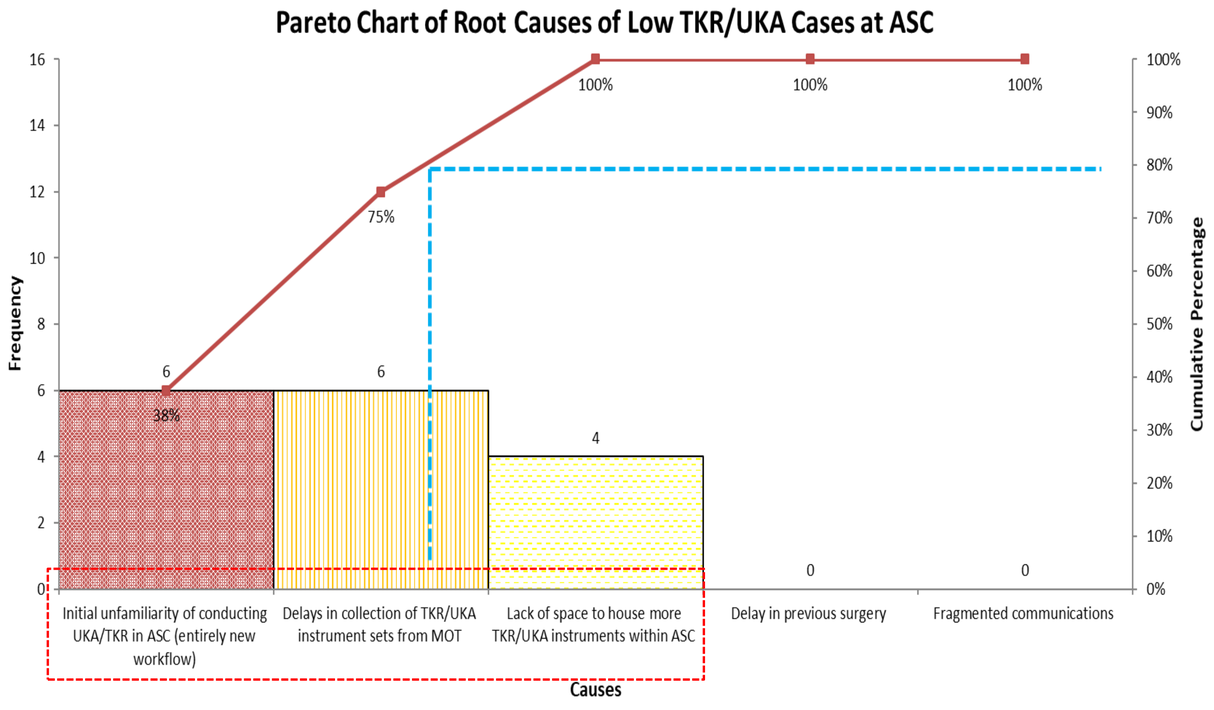


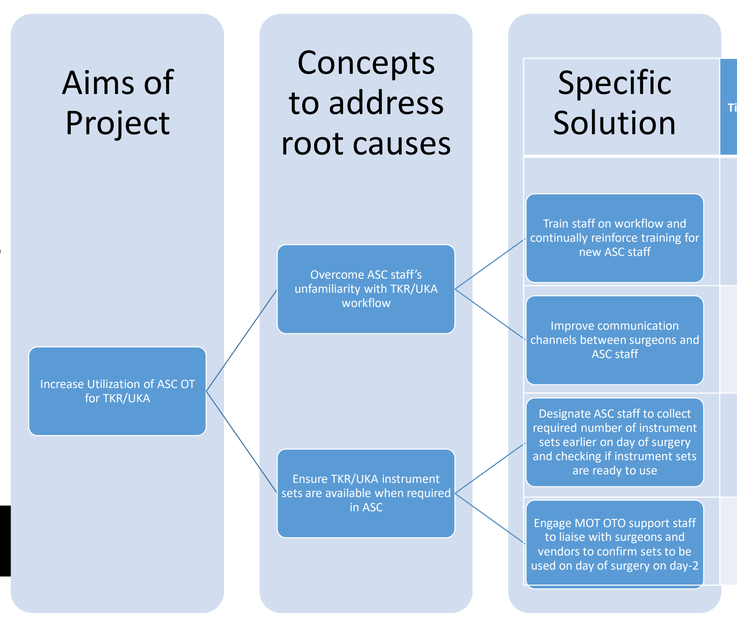
Figure 2: Pareto Chart of Root Causes of Low Proportion of TKR/UKA Cases at ASC. Votes were placed by OTO clinicians and ASC nurses on the most important root causes to address.

<u>The final root causes were</u>:

1. ASC OT staff were unfamiliar with TKR/UKA surgeries, as they were rarely performed in ASC prior to October 2020.
2. Space constraint of smaller ASC OT rooms (as compared to MOT), leading to reduced storage of TKR/UKA instrument sets, and possible delays to commencing surgery.

Interventions/Initiatives

Scoring:
1=meet criteria poorly
5= Meet Criteria Very Well



Specific Solution	Criteria #1 Time Saving	Criteria #2 Cost Saving	Criteria #3 Feasible	Criteria #4 Sustainability	Total score
Train staff on workflow and continually reinforce training for new ASC staff	5	5	5	5	20
Improve communication channels between surgeons and ASC staff	4	4	4	4	16
Designate ASC staff to collect required number of instrument sets earlier on day of surgery and checking if instrument sets are ready to use	5	5	5	5	20
Engage MOT OTO support staff to liaise with surgeons and vendors to confirm sets to be used on day of surgery on day-2	4	4	5	5	18

Figure 3: Prioritization matrix of solutions as brainstormed by team

PDSA	Root Cause of Problem	Intervention
PDSA 1 (Oct 2020)	ASC OT staff were unfamiliar with TKR/UKA Workflow	Staff were trained on new workflow, and training was continually reinforced through routine handling of TKR/UKA cases at ASC OT
		All surgeon put up Implant requirement under Booking Comments " specific Instruction" on SCM for OT nurse to do early preparation
PDSA 2 (Nov 2020)	Space constraint of smaller ASC OT rooms (as compared to MOT), leading to reduced storage of TKR/UKA instrument sets, and possible delays to commencing surgery	New workflow #1: Designate ASC staff to collect required number of instrument sets on day of surgery earlier at 0730hr from MOT and checking if sets are ready for use
		New workflow #2:Engage MOT OTO support staff to liaise with surgeons and vendors to confirm sets to be used two days before operation to avoid delays in receiving instrument sets

Results

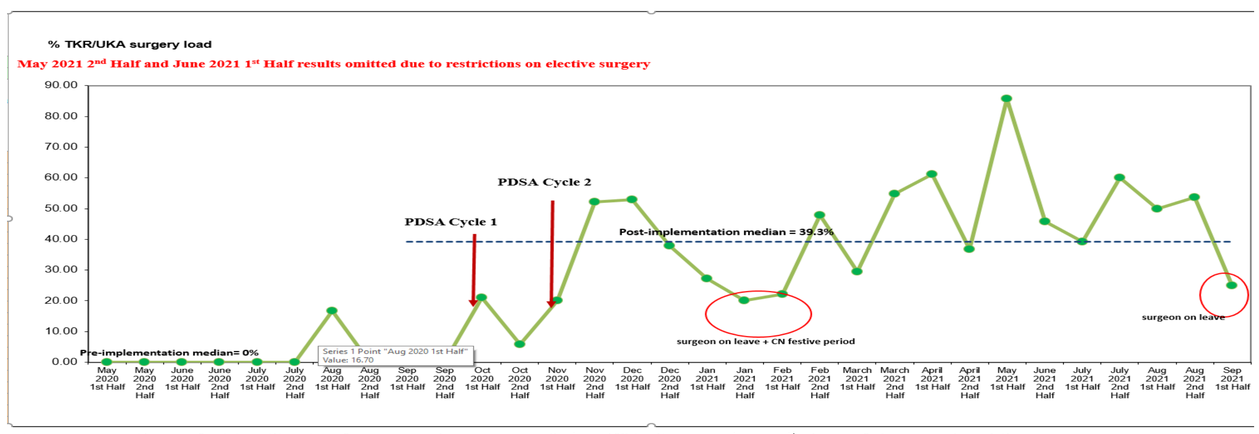


Figure 5: Run Chart of ASC Utilisation for TKR and UKA cases. "1st Half" indicates 1st to 15th days of the month, while "2nd Half" indicates 16th to the last day of the months

- The median monthly % of TKR/UKAs performed at ASC increased to 39.3% in 3 months' time after ASC started accepting routine TKR/UKAs. ($p<0.05$, indicating significant difference).
- This implementation successfully reduced patients' surgery waiting time and has spin-off benefit on the utilization of ASC.
- Currently, up to 11 Orthopaedic surgeons routinely use the ASC operating rooms for TKR/UKA surgeries.

<u>Tangible Results</u>

- A 30-day-post-surgery infection rate was monitored and calculated with result suggesting that clinical safety is not compromised for TKR/UKA surgeries done in ASC in comparison to Major Operating Theatre (MOT).

<u>Intangible Benefits</u>

- Highly Engaged, Motivated & Resilient:
  - ➢ Enhanced multidisciplinary collaboration between OTO surgeons, ASC staff and MOT staff
- Future-Ready & Sustainable
  - ➢ As more patients seek TKR/UKA for their knee condition, the ability to conduct these surgeries outside of MOT has become more important and valuable to meeting patient demand

Sustainability Plans

- It is sustainable to use ASC operating rooms for routine TKR/UKA surgeries without compromising patients' safety.
- With the increase utilization of ASC OT room, more patients are able go for their knee replacement surgeries, thus reducing their waiting time.
- With fine-tuning of workflow and staff training for all involved in the surgeries, ASC has successfully prevented the delays in surgeries and optimized the utilization of ASC operating rooms.