

#### **Project Title**

Day Surgery Unicompartmental Knee Arthroplasty (UKA) – The Paradigm in Enhanced Recovery

#### **Project Lead and Members**

#### Project lead:

- Adj Asst Prof Wee Liang Hao James, Consultant
- Ms Wong Xiu Qing Clara, Principal Physiotherapist

#### Project members:

- Ms Yap Yan Mei, Senior Physiotherapist
- Dr Tan Tong Leng, Consultant
- Dr Terence Quek Jinlin, Consultant
- Ms Adeline Tang Lai San, Nursing Officer
- Mr David Zhang Jiancai, Principal Occupational Therapist
- Ms Tok Xue Hui, Senior Occupational Therapist
- Ms Justina Wong, Care Coordinator

#### **Organisation(s) Involved**

Tan Tock Seng Hospital

#### **Project Period**

Start date: May 2019

Completed date: Dec 2020

#### Aims

To safely reduce the average length of stay (ALOS) post Unicompartmental Knee Arthroplasty (UKA), improve inpatient bed availability, reduce costs, and improve patient outcomes.



# CHI Learning & Development System (CHILD)

#### Background

See poster attached/ below

#### Methods

See poster attached/ below

#### Results

See poster attached/ below

#### **Lessons Learnt**

We learnt the importance of harnessing the expertise of a multidisciplinary team to exhaustively identify the root causes of delayed discharge post-UKA, select the main root causes for intervention, and then brainstorm practical solutions. We found the CPIP methodology, particularly the PDSA cycles, to be crucial. We consistently gathered patient and staff feedback to continually improve the work processes. Communication amongst team members was also vital in identifying and closing gaps on the ground and allow swift corrective interventions to be made. The use of simple technology such as the Tigerconnect chat group allows for secure and effective communication.

If starting over again, we would include a patient who had undergone UKA surgery in our team early on in the brainstorming process, which would have aided in identifying root causes and providing another important perspective for planning interventions.

#### Conclusion

See poster attached/ below

#### **Project Category**

Care & Process Redesign



# CHI Learning & Development System (CHILD)

#### **Keywords**

Care & Process Redesign, Workflow Redesign, Effective Care, Length of Stay, Efficient Care, Discharge Planning, Quality Improvement, Root Cause Analysis, Plan Do Check Act, Clinical Practice Improvement, Pareto Chart, Cost Savings, Multi-Disciplinary, Orthopaedics, Allied Health, Physiotherapy, Occupational Health, Anaesthesiology, Surgery, Nursing, Tan Tock Seng Hospital, Unicompartmental Knee Arthroplasty Surgery, Pre-Operative Care, Post-Operative Care, Elective Surgery

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# Day surgery unicompartmental knee arthroplasty – The paradigm in enhanced recovery.

National Healthcare Group

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Adding years of healthy life

#### **BACKGROUND**

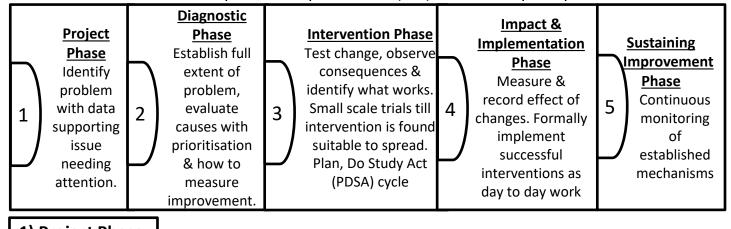
Data from 2018-2019 revealed that patients undergoing Unilateral Knee Arthroplasty (UKA) in TTSH had an average length of stay (ALOS) of 3.9 days. In contrast, Oxford University Hospital in the UK reported ALOS of 1.5 days with an accelerated recovery protocol post-UKA, with no negative effects<sup>1</sup>. The authors reported improved bed occupancy rates and cost savings. Therefore, our team decided to review our practices and redesign the model of care to bring about systemic change in managing patients undergoing UKA. We aim to safely reduce the ALOS post UKA, improve inpatient bed availability, reduce costs, and improve patient outcomes.

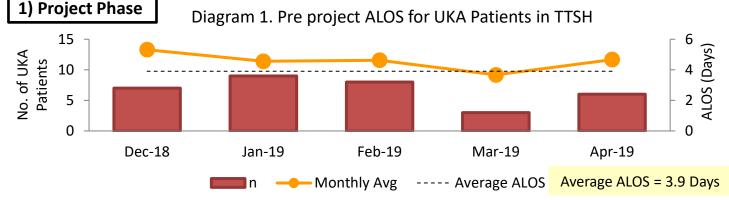
#### **IMPETUS FOR CHANGE**

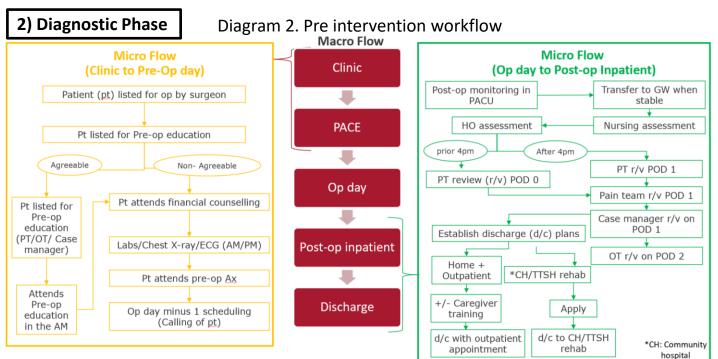
TTSH is one of Singapore's largest multi-disciplinary hospitals with high bed occupancy rates. To improve bed availability for emergency admissions, it is crucial to facilitate safe and timely discharge of patients following elective surgery. With evidence from overseas practice illustrating good outcomes from an accelerated program, the team decided to embark on this project.

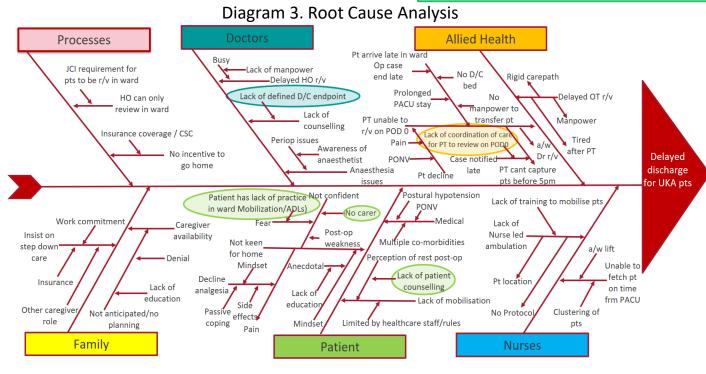
#### Strategy

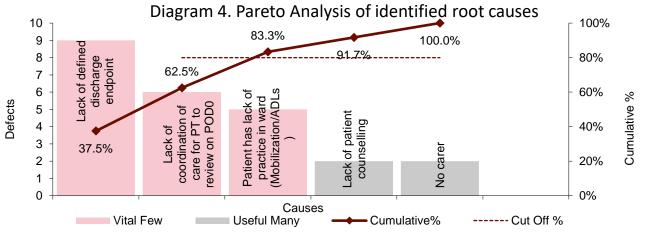
Our team utilize the clinical practice improvement (CPI) model and principles:











#### **REDESIGING THE SYSTEM & IMPEMENTING** 3) Intervention Phase + Timeline Aug Sept Oct **Harmonize discharge endpoint:** 1. Consistent messaging conveyed to patients. Modified education materials during pre-op education session **PDSA** Not all patients referred to pre-op counselling: Surgeons informed to list patients for pre-op counselling **Coordination to implement same day PT protocol:** 1. Form Tigertext chat group, Surgeons inform team of UKA patient prior to op 2. Patients admitted to DS ward before 5pm, Nurses call PT to review Patients had incontinence during PT on POD 0 as anesthesia not completely worn off: Diaper used till anesthesia effects worn off Increase practice of mobilization in DS ward COVID PDSA **Continue all interventions** Post circuit 1. ↑ number of admissions to DS ward Aim towards POD 0/1 discharge instead of POD 2 3. †patient support: Patients can call/whatsapp a to seek advice 24/7 (existing practice in another ward) 4) Impact & Implementation Phase Diagram 5. Post intervention workflow **Macro Flow Micro Flow** Micro Flow Clinic (Clinic to Pre-Op day) (Op day to Post-op Inpatient) Patient (pt) counselled by Surgeon on expected Post-op monitoring in Transferred to DS ward length of stay and admission to DS ward **PACE** Early post-op review (r/v) by Dr Pt listed for Pre-op education -Non- Agreeable PT r/v POD 1

## **EVALUATION AND MEASUREMENT OF IMPROVEMENT**

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ost-op inpatient

Discharge

Increased no. of pts seen by PT on POD 0 + Nurse

start mobilising pts post

PT review

Home +

+/- caregiver training

Reinforced discharge (d/c) plans

\*CH/TTSH rehab

Apply

d/c to CH/TTSH

rehab

Pain team r/v POD 1

Case manager r/v on

Earlier OT review if pt for home on POD 1

hospital

# 5) Sustaining Improvement Phase

Pt attends financial counselling

Labs/Chest X-ray/ECG (AM/PM)

Pt attends pre-op Ax

Op day minus 1 scheduling

(Calling of pt)

Pt listed for

education

Nursing)

by PT/OT/Case

manager on

expected LOS

Diagram 5. Run chart on ALOS for UKA Patients in TTSH from Pre to Post Intervention

ALOS (Days) ---- Mean ALOS

Pre-Intervention Mean

Period: Jan to Dec 2019

= 2.7 Days

= 2.1 Days

Period: Jan to Oct 2020

= 2.1 Days

- Systemic change across the multi-disciplinary healthcare team has become the standard procedure for patients undergoing UKA surgery in TTSH
- Patients now routinely discharge on POD 1/2 with improved ALOS from 3.9 to 2.1 days
- Use of DS wards and reduction in ALOS has freed up valuable inpatient beds for emergency admissions
- On average, patients undergoing DS UKA saved \$4276.73) compared to those admitted to inpatient wards
- Patients undergoing DS UKA had the shortest ALOS of 1.87 days compared to those who went to an Orthopedic ward (ALOS of 2.58days) or general ward (ALOS 3.48 days)

## **CONCLUSION**

Achieving primary and stretch goal is possible with a well-coordinated multi-disciplinary team effort. Working on one intervention at a time allows accurate evaluation of effectiveness of each intervention. Applying the PDSA cycle identifies and addresses practical issues faced by staff on the ground during implementation of change, and this improves work processes and efficacy of interventions. UKA patients admitted to the DS ward benefitted from this as there were notable cost savings. Early mobilization helps to improve patient confidence in self-care post-UKA. Well-coordinated pre and post-operative care ensure that patients were discharged earlier. DS UKA allows the hospital to reap benefits from freeing up bed space in the inpatient wards for acutely ill patients.

Reference: 1. Reilly KA, Beard DJ, Barker KL, Dodd CA, Price AJ, Murray DW. Efficacy of an accelerated recovery protocol for Oxford unicompartmental knee arthroplasty--a randomised controlled trial. Knee. 2005 Oct;12(5):351-7.