Enhanced Recovery After Surgery (ERAS) programme for Total Knee Replacement patients

Background
In SGH, the length of stay of patients after Total Knee Replacement (TKR) is 4-5 days. Internationally, outpatient arthroplasty services have allowed patients to be discharged home on Post-operative Day (POD) 0 or 1. This has been made possible by advances in preoperative patient education, improved perioperative multimodal pain management strategies and Enhanced Recovery After Surgery (ERAS) programmes. It has been demonstrated that early mobilisation after TKR reduces length of stay. Currently, TKR patients at SGH are assessed by the physiotherapist on POD1 for mobilisation and rehabilitation and discharged after 4-6 days. This project aims to decrease the length of stay post TKR, enhance utilisation of hospital beds, reduce hospitalisation-related costs for patients and the hospital and decrease complications related with prolonged hospital stay, as part of SGH’s goal towards value-driven healthcare.

Mission Statement
To decrease length of stay from for Total Knee Replacement (TKR) patients in SGH from a median of 4 to 3 days within 6 months.

Analysis of Problem
The team first understands the current recovery and ambulation process for TKR patients. The team used the Fishbone diagram to brainstorm root causes and did two rounds of multi-voting to prioritise the final root causes.

The team then brainstormed for solutions based on the 9 root causes that were prioritized via multi-voting using Pareto Chart. Using time, budget and feasibility as our main criteria for evaluation, we implemented solutions that meet all 3 criteria.

Implementation
The finalized solutions were implemented in Aug 2019. Based on staff feedback, the team also subsequently implemented additional measures to further enhance the ERAS programme and improve the cooperation between clinical teams.

Initial Phase
1. Drawing up and implementing an ERAS protocol
2. Briefings for new house officers
3. Orientation given for physiotherapists and nurses
4. Incorporating pre-operative physiotherapy and patient education
5. Standardize intra-operative procedures/protocol by prescribing anti-emetics, withholding opioids, minimizing muscle dissection and providing post-articular injections for ERAS patients

Revamp
1. Confirming patients’ ERAS status using emsul in the business office
2. Use of dedicated Tiger Connect group chats to communicate
3. Implementing same-day discharges at ASC

Results
Based on data collected for 470 patients pre-intervention and 605 patients post-intervention, there was a statistically significant difference in the median LOS after the implementation of the ERAS programme, with a reduction of LOS from 4.03 days to 2.63 days, which has exceeded our goal of reducing the LOS by 25%.

Sustainability Plans
1. Constant feedback between healthcare professionals
2. Continue orientation to house officers, physiotherapists and nurses
3. Expansion of programme to other surgeons
4. Working with community partners to expand the service

Data from February 2020 to June 2020 was limited due to the height of the COVID-19 pandemic during Singapore’s Circuit Breaker period. February 2020’s data has been excluded as it is an anomaly because there was only one patient who was waiting for community hospital and hence was removed from the ERAS programme. Following the gradual easing of measures in July, we saw a sharp increase in number of surgeries but this did not compromise the LOS as the numbers fared relatively similar compared to the rest of the months. There was a statistically significant increase in knee flexion range of motion (66.5 to 86.0 degrees p<0.05) and a statistically significant increase in knee extension range of motion (1.50 to 3.60 degrees p<0.05) as well, showing that patients are able to regain mobility better through the intervention.

Assuming TKR patients are waited on typical SGH B1 Bed, the 1.4 bed days saving per patient amounts to an estimated savings of $126,720 per annum based on an average of 30 patients per month.

We have clearly showed that the implementation of an ERAS programme is not only beneficial for the hospital in terms of cost-savings but also allows patients to recuperate in the comfort of their own home.

Eleanor Chew Shuxian
Senior Principal Physiotherapist
Department of Physiotherapy,
Singapore General Hospital

Samantha Koh
Yes
Patient ambulates in the bed on POD2

Bte Rahmad Zainah
Yes
Patient can walk independently and can be up for home.

Liu Weihua
Yes
Patients may not be discharged depending on the probability of discharged patients.

Anita
Yes
Medication is given on POD 1, with an emphasis on POD 2.

Patients are usually mobilized on POD 1 due to a variety of factors.

Patients are prioritized for therapy sessions.

Sustainability
1. Planning up patients who may not be suitable for the ERAS programme pre-operatively
2. Quarterly meetings and discussions on how to further enhance the ERAS experience for patients
3. Expanding the programme to include community therapists and nurses to reduce the strain on inpatient services
4. Rolling out of ERAS programme to other surgeons now that a protocol has been developed.