

Project Title

PeriopeRativE ProgrAm foR Elderly (PREPARE) – Preoperative Optimization of Frail Patients
Undergoing Major Abdominal Surgery

Project Lead and Members

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Organisation(s) Involved

Singapore General Hospital

Project Period

Start date: Jan-2019

Completed date: Dec-2019

Aims

To implement frailty assessment tool to identify frail elderlies during preoperative assessments; and to employ a centralised approach of providing in-house prehabilitation to frail patients thereby improving postoperative outcomes and reducing cost.

Background

Frailty is a state of reduced physiological reserve predisposing one to adverse outcomes when exposed to stressors such as surgery. It is one of the strongest predictors of postoperative complications in a recent meta-analysis (Watt et al, 2018). Complications range from mortality to morbidities resulting in prolonged hospital stay, hospital readmissions and increased healthcare-related cost (Chan et al, 2019). This is a great concern in our healthcare system as the currently ageing population means more frail elderlies will be needing surgery. In 2017, approximately 1800 elderlies aged

70 years and above underwent elective surgery at SGH. Among these patients, 13% were identified as being 'vulnerable to frail'. Fortunately, there is growing evidence that frail patients who are optimised before surgery via prehabilitation may achieve improved postoperative outcomes (Howard et al, 2018).

Methods

Refer to attachment

Results

Refer to attachment

Lessons Learnt

We learnt that the implementation of new programs has to be approached systematically. Firstly, we need to be able to identify the correct patient group. Before we started this project, there was no screening tool that was validated, feasible and acceptable for the preoperative setting in Singapore. Thus, we embarked on a study to validate the EFS for this purpose. Subsequently, we obtained approval from relevant hospital authorities to establish a highly motivated multi-disciplinary team whose members are like-minded in the purpose of improving patients prior to surgery. Thirdly, we employed interventions that are evidence-based. We had good data collection to track the implementation outcomes. We held regular meetings to review data and to strategise further actions to assess the impacts on patient care (e.g. patient-centred health outcomes), as well as to improve the implementation of the program (e.g. take-up rate). Finally, the results of this program were regularly communicated to various stakeholders such as the hospital's medical board, surgeons and patients, to increase the mindshare of the program. We discovered first-hand that the frailest patients that may benefit the most from this program are often the hardest to recruit into the program, as they have accessibility barriers to return back for supervised exercise programs, such as limited transport options and financial constraints. Nevertheless, with the positive results from our first year of PREPARE implementation, we hope to draw media attention to the benefits of prehabilitation. This would educate the public, and in turn, encourage more eligible patients and their family members to be open to the benefits of prehabilitation.

Conclusion

We have instituted a centralized and standardized approach for frail patients going for elective surgery. These patients were provided with a personalized prehabilitation strategy, and this was translated into lowered median length of stay, complication rate and bill size for said patients. With greater awareness of the benefits of prehabilitation, we believe PREPAPRE has the potential to be scaled to a nation-wide program, to maximize postoperative outcomes for frail patients.

Additional Information

Surgery is like a marathon, do not jump into surgery without preparation! Take control of your journey.

Project Category

Care Redesign, Clinical Improvement

Keywords

Care Redesign, Clinical Improvement, Workflow Improvement, Medical Services, Anaesthesiology, Internal Medicine, Medical Services, Nursing, Allied Health, Physiotherapy, Multi-Disciplinary team, Frailty, Elderly Patients, Preoperative Care, Edmonton Frailty Scale, Postoperative Outcome, Postoperative Complications, Health Optimisation, Length of Hospital Stay, Referral Rate, Continuity of Care, Singapore General Hospital, Pre-Admission Centre, Pre-Surgery Anaesthetics Counselling, Risk Assessment, Elective Surgery, Abdominal Surgery

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PeriopeRativE ProgrAm for Elderly (PREPARE) – Preoperative Optimisation of Frail Patients Undergoing Major Abdominal Surgery



Singapore
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SGH PREPARE Team

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Introduction

Singapore General Hospital's Pre-Admission Centre (SGH PAC) is a one-stop preoperative care centre providing pre-surgery counselling, risk assessment and health optimization before surgery. Patients undergo a series of preoperative tests at PAC to assess their 'fitness' for surgery.

Frailty is a state of reduced physiological reserve predisposing one to adverse outcomes when exposed to stressors such as surgery. It is one of the strongest predictors of postoperative complications in a recent meta-analysis (Watt et al, 2018). Despite the important association between frailty and postoperative complications, there is no internationally standardised frailty assessment tool for the preoperative setting at present. This is a barrier for identifying frail elderly requiring preoperative optimisation. In addition, the current decentralised and unstandardized approach to identify and serve frail elderly for preoperative optimisation is expensive due to the unnecessary duplication of services, and poor in equitability as many patients are not aware of these beneficial services.

These factors present a great concern in our healthcare system as the ageing population would mean more frail elderly needing surgery. In 2017, among 1800 elderly aged 70 years who underwent elective surgery at SGH, 13% were identified as being 'vulnerable to frail'. Thus, SGH has embarked on a transformation project comprising a multi-disciplinary team of anaesthetists, Internal Medicine (IM) physicians, nurses, physiotherapists, dieticians and administrators to design frailty assessment and preoperative services tailored to suit each patient's health needs. The project was implemented in January 2019, and improvements of care outcomes from January – December 2019 were compared with a similar patient cohort in 2018.

Objective

SGH has implemented a frailty assessment tool to identify frail elderly during preoperative assessments; and employed a centralised approach of providing in-house prehabilitation to frail patients thereby improving postoperative outcomes and reducing cost.

Results

Median hospital length of stay in vulnerable-frail patients

Specialty	Median Length of Stay		
	Pre-Cohort	Post-Cohort	% LOS Reduction / Increase
CLR	12	7	↓ 42%
HPB	15	11	↓ 27%
Surg Onco	15	10	↓ 33%
URO	6	4	↓ 33%
UGI	9.5	13	↑ 37%

2-3 DAYS



Average proportion of vulnerable-frail patients with no complications



24%



Average bill size post-intervention

Nature of Operation	Average Final Bill Size at 'A' Rates		
	Pre-Cohort	Post-Cohort	% Bill Reduction / Increase
Anterior Resection	\$ 30,277 (n=1)	\$ 24,002 (n=7)	↓ 21%
Colectomy	\$ 25,985 (n=3)	\$ 24,198 (n=5)	↓ 7%
Whipples	\$ 48,194 (n=2)	\$ 52,308 (n=2)	↑ 9%

21%

Anterior Resection

7%

Colectomy



Methodology

Measurable outcomes were defined to achieve our objective namely reduction in (1) hospital length of stay and (2) severity of postoperative complications experienced.

(A) Prospective observational study to validate the use of Edmonton Frailty Scale (EFS) for frailty assessment

A prospective observational study of 134 elderly aged 70 years and above who attended PAC at SGH prior to major abdominal surgery from Dec 2017 – Sep 2018 was conducted, and its feasibility to be administered in a fast-moving outpatient clinic was assessed. The EFS score was a significant predictor of postoperative complications and longer lengths of stay after adjusting for confounders including age, gender, race, surgical disciplines and surgical technique (open or laparoscopic surgery). The average time taken to complete EFS was 3.75 minutes, and there was high inter-rater correlation of scores between 2 nurses assessing the same patient.

(B) Formed a PREPARE team comprising anaesthetists, nurses, physiotherapists and healthcare administrators to facilitate seamless screening, referral and preoperative optimization

Screening is performed by nurses using the EFS, together with the measurement of patients' anthropomorphic dimensions and vital signs. Patients scheduled for major abdominal surgery and identified as frail on the EFS would have a preoperative optimisation strategy drawn up by their reviewing anaesthetist. This strategy is often made after consultation with IM physicians and allied health members of the PREPARE team. Interventions include preoperative physiotherapy education, inspiratory muscle training and/or preoperative exercise programs conducted by physiotherapists; nutritional supplementation/education by dieticians and optimization of chronic medical problems by the IM physicians, often within the same visit at the PAC. Where appropriate, the PREPARE team would also follow-up on these patients after their surgery, while they are admitted, to ensure continuity of care. To maximise patient convenience and avoid burdening patients with multiple hospital visits, the PREPARE team was embedded in the PAC, so that every elderly patient aged ≥ 65 years would receive mandatory screening in their elective surgical journey at SGH.



(C) Engaged primary surgeons to improve PREPARE take-up rate

Word-of-mouth was used to spread awareness of this project to primary surgeons, to gain their support of PREPARE. Increasingly, more and more surgeons started referring patients whom they suspected to be frail for earlier review by the PREPARE team, so that the team would have a longer period to optimize patients prior to their surgery.

(D) Improving take-up rate for PREPARE by Plan-Do-Study-Act

The team had regular process meetings to monitor patients recruited for PREPARE. Through the PDSA cycle, we recognised that the take-up rate for PREPARE could be improved. This was done by (1) Repeat reminders to junior doctors on the availability of this programme (2) Pasting laminated copies of referral criteria in prominent areas of the consult room and (3) Expanding the referral criteria to include all patients with poor baseline functional scores so that they could also benefit from preoperative optimisation. This resulted in an improvement in take-up rate from 9% between Jan to Jun 2019, to 18% between Jul 2019 to Dec 2019 (Fig 1)

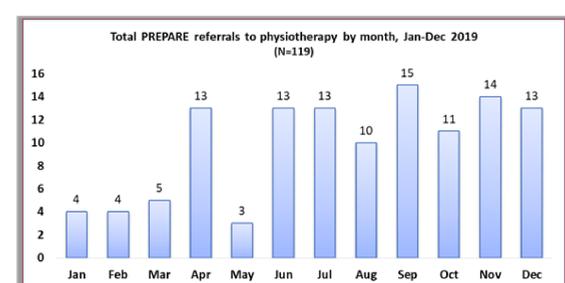


Fig 4: Number of PREPARE patients referred for physiotherapy

Conclusion

We have instituted a centralised and standardised approach for frail patients going for elective surgery. These patients were provided with a personalised prehabilitation strategy, and this was translated into lowered median length of stay, complication rate and bill size for said patients. With greater awareness of the benefits of prehabilitation, we believe PREPARE has the potential to be scaled to a nation-wide program, to maximize postoperative outcomes for frail patients.