Project Title

Increasing Proportion of Angioplasty Procedures Done as Day Surgery for SGH Patients with Dialysis Access Dysfunction to 65.0% within 12 Months

Project Lead and Members

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Organisation(s) Involved

Singapore General Hospital

Healthcare Family Group(s) Involved in this Project

Medical

Applicable Specialty or Discipline

Renal, Vascular, Interventional Radiology

Aim(s)

To decrease day surgery angioplasty by optimising management of patients

Background

See poster appended/ below

Methods

See poster appended/ below

Results

See poster appended/ below

Lessons Learnt

Implementation initially was not as smooth as workflow was new and our stakeholders (e.g. dialysis centres) needed time to adapt to the streamlined workflow. The project also took place in the midst of the COVID pandemic and the team had to work to implement the initiatives taking into account of pandemic-related infection control protocols.

From the results of the post-intervention analysis, there is an increase in proportion of DS cases turning inpatient. To better manage the day surgery turned inpatient rate, the team will review these cases to identify reasons for inpatient admission. Suitable adjustments to the protocols implemented will be made based on the findings.

Conclusion

See poster appended/ below

Additional Information

We hope to share on how patients with dialysis access dysfunction requiring angioplasty can be managed in the outpatient setting and how this shift in patient management will benefit both patients and the healthcare system

Project Category

Care & Process Redesign

Value Based Care, Quality Improvement

Keywords

Value Driven Care

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Background

The Singapore Ministry of Health introduced Value Driven Care (VDC) programme in 2019 to optimize the healthcare outcomes of various conditions. Since then, Singapore General Hospital (SGH) has embarked on a number of institution initiated VDCs, including Blocked Vascular Access for patients with end-stage renal disease (ESRD). This VDC actively tracks and monitor patients who underwent arteriovenous fistula/graft (AVF/G) angioplasty and/or thrombolysis for dialysis access dysfunction. The procedures are performed by operators from three departments in SGH, namely, Renal Medicine (REN), Vascular Surgery (S0V), and Vascular and Interventional Radiology (VIR). The length of stay (LOS) and cost to hospital are analyzed by an interdisciplinary committee.

Aim

To increase the percentage of elective angioplasty performed as day surgery for patients with dialysis access dysfunction from 36% to 65% within 12 months

Analysis of problem

Data on LOS and cost for patients who underwent AVF/AVG angioplasty in 2019 and 2020 were extracted and deep-dive analysis via case reviews was conducted by the interdisciplinary team consisting of clinicians from REN, SOV and VIR, executives and data analysts from CGQ, SMA. The following areas for improvement were identified:

1. Length of stay

- The average (LOS) for patients who underwent AVF/AVG angioplasty inpatient was 2 days in 2019 and 2020.
- 77.8% of patients were hospitalized for optimization before procedure.
- Patients with hyperkalemia were admitted for inpatient management.
- Approximately half of these patients can be potentially managed in outpatient setting.

2. Cost of day surgery vs inpatient angioplasty

- Median total cost for day surgery was 64.0% and 24.1% lower than inpatient angioplasty in 2019 and 2020, respectively.
- This is mainly due to savings from room charges and daily treatment fees for day surgery procedure, which is also affected by length of stay.

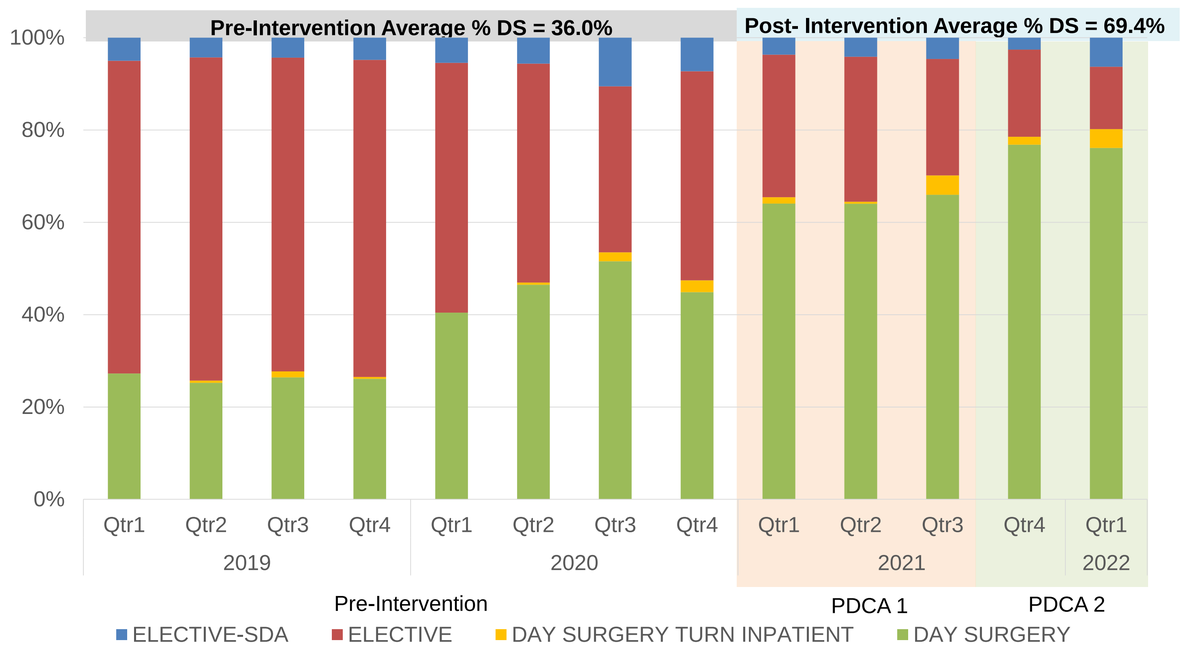
Interventions

Using the Plan-Do-Check-Act (PDCA) cycle, the following interventions were implemented in 2021:

Problems Identified	Intervention	Addressed in
Lack of protocol and awareness of dialysis centres on the types of patients suitable for day surgery	Established criteria of day surgery angioplasty for ESRD with vascular access dysfunction Streamlined process of referral from dialysis centre to the Vascular Hotline to identify patients suitable for day surgery	PDCA 1 (Jan 2021)
Patients electively admitted for angioplasty could have been treated as outpatient. The main reasons for admission was to optimize patients: 1) Who have diabetes mellitus and on insulin therapy 2) Who have hyperkalaemia	10 to 15 dedicated slots per week for day surgery were created by REN, S0V and VIR	
	Work procedure on pre-procedure fasting in diabetic patients was streamlined with the help of Endocrinologist	PDCA 2 (Sep 2021)
	Hyperkalemia protocol instituted for management of patients with hyperkalemia in day surgery setting	

Results

The proportion of day surgery angioplasty increased from 36.0% in 2019-2020 to 69.4% in 2021- Mar 2022.



With increased proportion of day surgery cases, average LOS has also reduced. Consequently, median and average total cost have decreased (table 2).

Table 2: % Change in average LOS and cost

	2019	2020	2021	2022 (Jan to Mar)
Average LOS (Days)^	1.5	1.0	**0.6**	**0.5**
% Change in Median Total Cost*	NA	+5.5%	**-6.6%**	**-4.2%**
% Change in Average Total Cost*	NA	+9.1%	**-7.0%**	**-0.8%**

^ Day surgery cases are discharged on the same day and are considered to have a LOS of 0 day
*Change vs previous year

However, a corresponding increase in proportion of cases turning inpatient was observed. To better manage the day surgery turned inpatient rate, the team will review these cases to identify reasons for inpatient admission. Suitable adjustments to protocols initiated will be made based on the findings.

Sustainability Plans

- Adoption of day surgery as routine pathway for ESRD patients who require elective angioplasty
- Continuous monitoring of the proportion of elective angioplasty performed as day surgery and its impact on LOS and cost via automated dashboard, with day surgery turned inpatient as balancing measure
- Regular results reporting to different stake holders to promote continuous engagement and build intrinsic motivation
- Maintaining the champions from 3 department to sustain improvement strategy, spread improvement impact and encourage cultural change