

## **Project Title**

Improving Value Driven Outcomes in Total Knee Replacements

## **Project Lead and Members**

Project lead: Dr Philip McGraw

Project members: Fione Gun, Russell Yoong, Leong Kin Seng, Zarina Bte Ahmad, Joyce Ong,

Adj A/Prof Fareed Kagda

## **Organisation(s) Involved**

Ng Teng Fong General Hospital

## **Healthcare Family Group Involved in this Project**

Medical, Nursing

## **Applicable Specialty or Discipline**

Orthopaedics

## **Project Period**

Start date: Jan-2016

Completed date: Jun-2017

## **Aims**

To implement an electronic clinical care pathway for patients undergoing Total Knee Replacement (TKR) surgery with the following objectives: leverage on Epic to standardise and streamline care; improve compliance to evidence-based care protocols; and reduce length of stay and costs

## **Background**

See poster attached/ below

## **Methods**

See poster attached/ below

## **Results**

See poster attached/ below

## **Lessons Learnt**

Standardising care can improve outcomes and lower costs. Epic is a very powerful tool that can be used to facilitate and coordinate care amongst multi-disciplinary teams. Strong leadership and support from clinician lead and multidisciplinary team are essential to the smooth continued functioning of the pathway.

## **Conclusion**

See poster attached/ below

## **Project Category**

Care & Process Redesign, Value Based Care, Length of Stay, Productivity, Quality Improvement, Lean Methodology

## **Keyword**

Total Knee Replacement, Value Driven Outcomes

## **Name and Email of Project Contact Person(s)**

Name: Fione Gun

Email: [fione\\_gun@nuhs.edu.sg](mailto:fione_gun@nuhs.edu.sg)



# IMPROVING VALUE DRIVEN OUTCOMES IN TOTAL KNEE REPLACEMENTS

MEMBERS: DR PHILIP MCGRAW, FIONE GUN, RUSSELL YOONG, LEONG KIN SENG, ZARINA BTE AHMAD, JOYCE ONG, ADJ A/PROF FAREED KAGDA

- SAFETY
- PRODUCTIVITY
- PATIENT EXPERIENCE
- QUALITY
- VALUE

## Define Problem/Set Aim

### Opportunity for Improvement

Variation in care practices may lead to sub-optimal care. Standardisation of care using evidence-based medicine has been shown to improve patient outcomes, reduce length of stay, and minimise costs to both the patient and the hospital.

### Aim

To implement an electronic clinical care pathway for patients undergoing Total Knee Replacement (TKR) surgery with the following objectives:

- leverage on Epic to standardise and streamline care;
- improve compliance to evidence-based care protocols; and
- reduce length of stay and costs

## Establish Measures

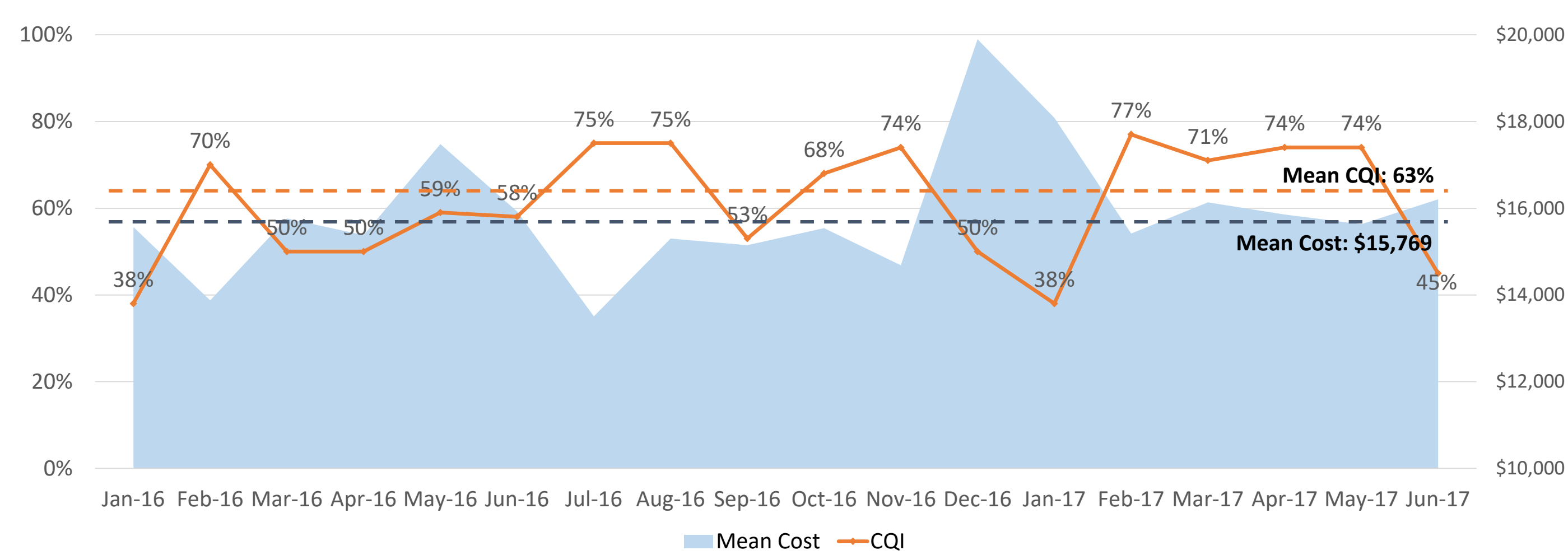
### Baseline Performance

Clinical quality indicators and costs tracked as part of the NUHS Value Driven Outcomes (VDO) project were utilised to determine performance.

The 7 clinical quality indicators are:

1. LOS ≤ 5 days	5. Deep Vein Thrombosis (DVT) Prophylaxis within 24 hours
2. (No) Inpatient Mortality	6. (No) Post-op complication within 30 days of discharge
3. (No) Readmission within 30 days	7. (No) Unscheduled Return to OT within 48 hours
4. (No) Blood transfusion	

An all-or-none composite indicator – Clinical Quality Index (CQI) was computed, along with the mean costs. 18 months' VDO data prior to the implementation of the pathway (Jan 16 to Jun 17) are used as a baseline.



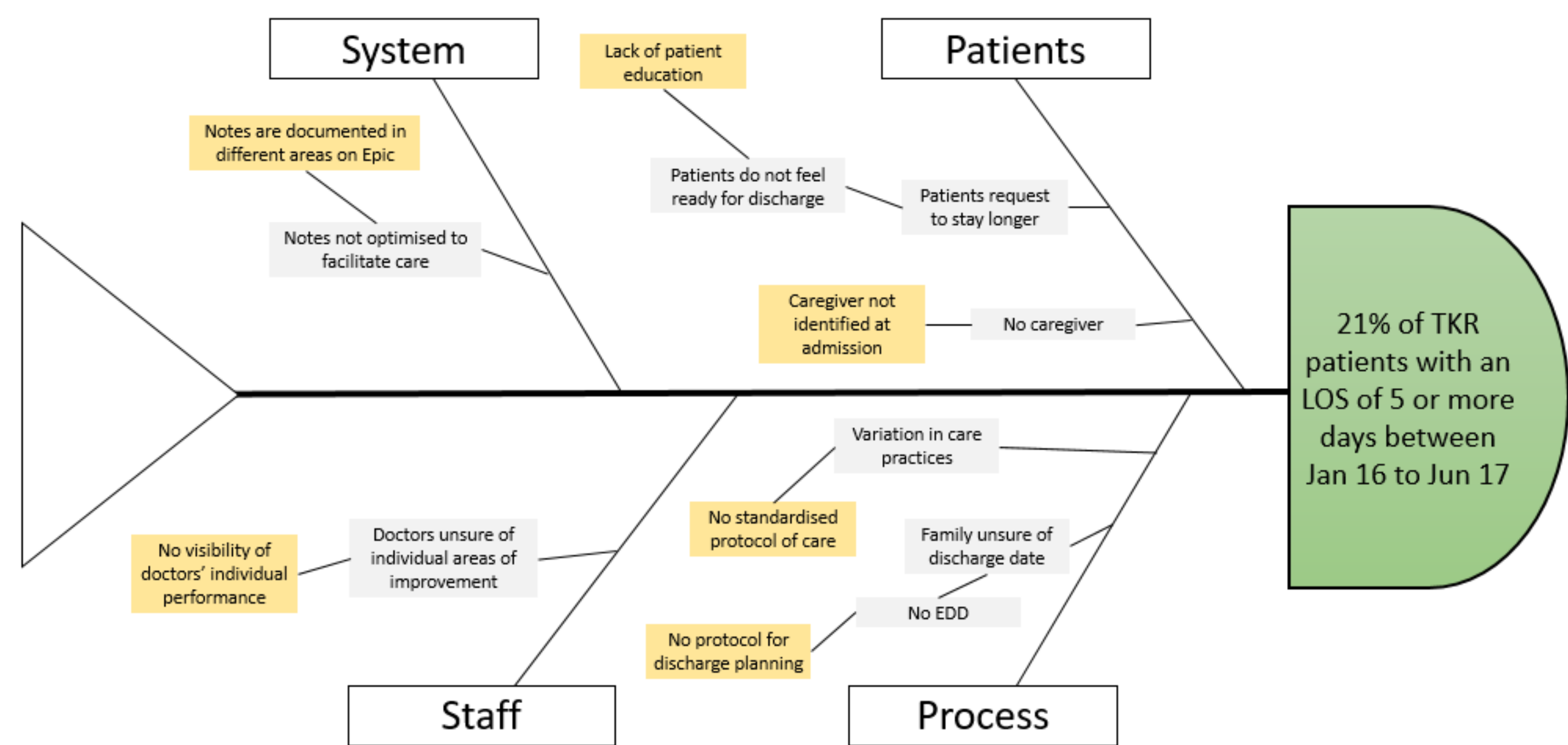
## Analyse Problem

### Root Cause Analysis

Targeted areas of improvement were:

#### 1. Clinical Indicator: LOS ≤ 5 days

(21% did not meet the indicator pre-pathway)



#### 2. DVT Prophylaxis within 24 hours

(10% did not meet the indicator pre-pathway)

- No standardised care protocol, calf pumps may not be given within 24hrs
- Calf pumps were sometimes administered but not charged

#### 3. Surgical Consumable Costs

- Consumable package for TKR surgery unchanged for past few years, and does not reflect current surgical practice

## Select Changes

### Probable solution

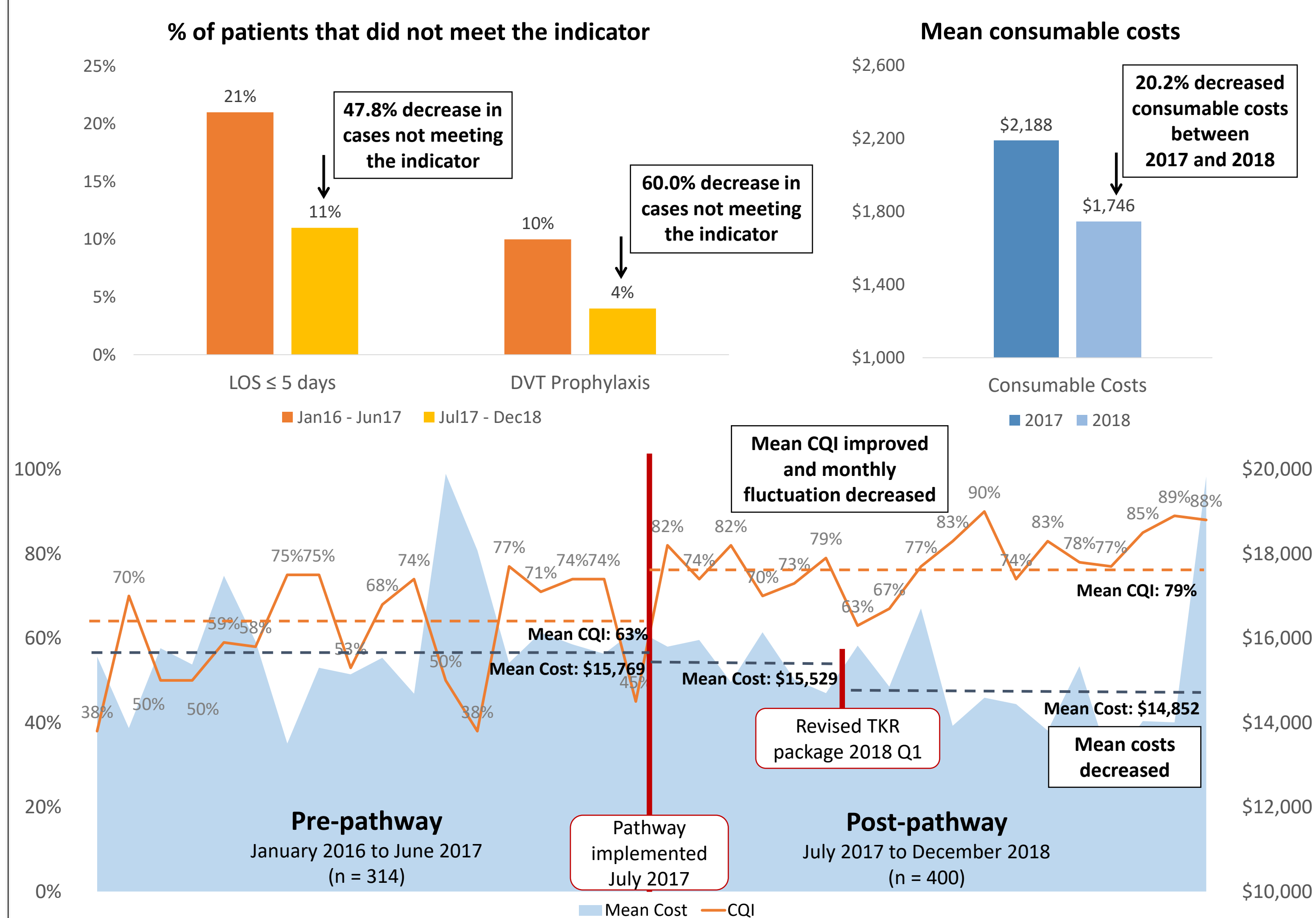
Features of the TKR Pathway was designed to target problems identified. Non-pathway solutions were implemented subsequently.

Problem	Root Cause (in order of impact)	Solution
LOS ≤ 5 days	1. No protocol for discharge planning	Standardised discharge template*
	2. No standardised protocol of care	Day-by-day order sets*
	3. Lack of patient education	Patient education module in Epic*
	5. Lack of individual performance indicators	Individual Clinician Reports (future plan)
	6. Caregiver not identified at point of admission	Day-by-day order sets*
	7. Notes located in different areas in Epic	Consolidation of notes*
	DVT Prophylaxis within 24hrs	1. No standardised protocol of care
	2. Calf pumps given but not charged	Reminders to nurses (ongoing)
Consumable costs	1. Surgical consumable packages not updated	Review TKR consumable package costs

\*Solutions built into TKR pathway

## Test & Implement Changes

Cycle	Plan	Do	Study	Act
1	Compare VDO performance before and after pathway implementation	Pathway was implemented in July 2017	Improvement in performance and decrease in variance	Continue monitoring performance on a monthly basis
2	Compare consumable costs before and after package revision	Package revised in 2018 Q1	Decrease in consumable costs	Review other consumable packages



## Spread Change/Learning Points

### Spread Change

- Best Practice Advisory (BPA) prompts built to facilitate pathway initiation
- Case Managers serve as a crucial single point of contact to ensure and maintain the appropriate use of the pathway
- Introduction to the pathway included into HO/MO orientation

### Learning Points

- Standardizing care can improve outcomes and reduce costs
- Epic is a powerful tool that can be used to facilitate and coordinate care amongst multi-disciplinary teams
- Strong leadership and support from the clinician lead and multidisciplinary team are essential to the smooth and continued functioning of the pathway