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## Mission Statement

To reduce average length of stay (ALOS) after elective total hip replacement (THR) in Ward 85 in TTSH from 4.65 days to 2.9 days (stretch goal of 2.0 days) in 6 months

- Cohort of Patients: Primary elective total hip replacement (THR) patients
- Data Collection: TTSH Hip registry
- Balance Measures: 30 days readmission rate

## Team Members

	Name	Designation	Department
<b>Team Leaders</b>	Dr Remesh Kunnasegaran	Consultant	Orthopaedic Surgery
	Ms Yap Yan Mei	Principal Physiotherapist	Physiotherapy
<b>Team Members</b>	Dr Daniel Hap Xing Fu	Associate Consultant	Orthopaedic Surgery
	Dr Sherlyn Tham	Medical Officer	Orthopaedic Surgery
	Dr Ang Xian'en Hope	Consultant	Anaesthesiology, Intensive Care & Pain Medicine
	Dr Leon Lim Tak Keet	Registrar	Anaesthesiology, Intensive Care & Pain Medicine
	Ms Tok Xue Hui	Senior Occupational Therapist	Occupational Therapy
	Ms Nur Hasanah	Physiotherapist	Physiotherapy
<b>Sponsors</b>	Ms Chung Sze Yun Caroline	Nurse Clinician	Ward 12C
	Ms Lina Sim Si Bei	Assistant Nurse Clinician	Ward 85
	Adj A/Prof Lee Keng Thiam (HOD of Orthopaedic Surgery) & Mr Christopher Ng Thong Lian (HOD of Physiotherapy)		
<b>Mentors</b>	Dr Abdul Kareem Saleem Ahmed & Dr William Chan		

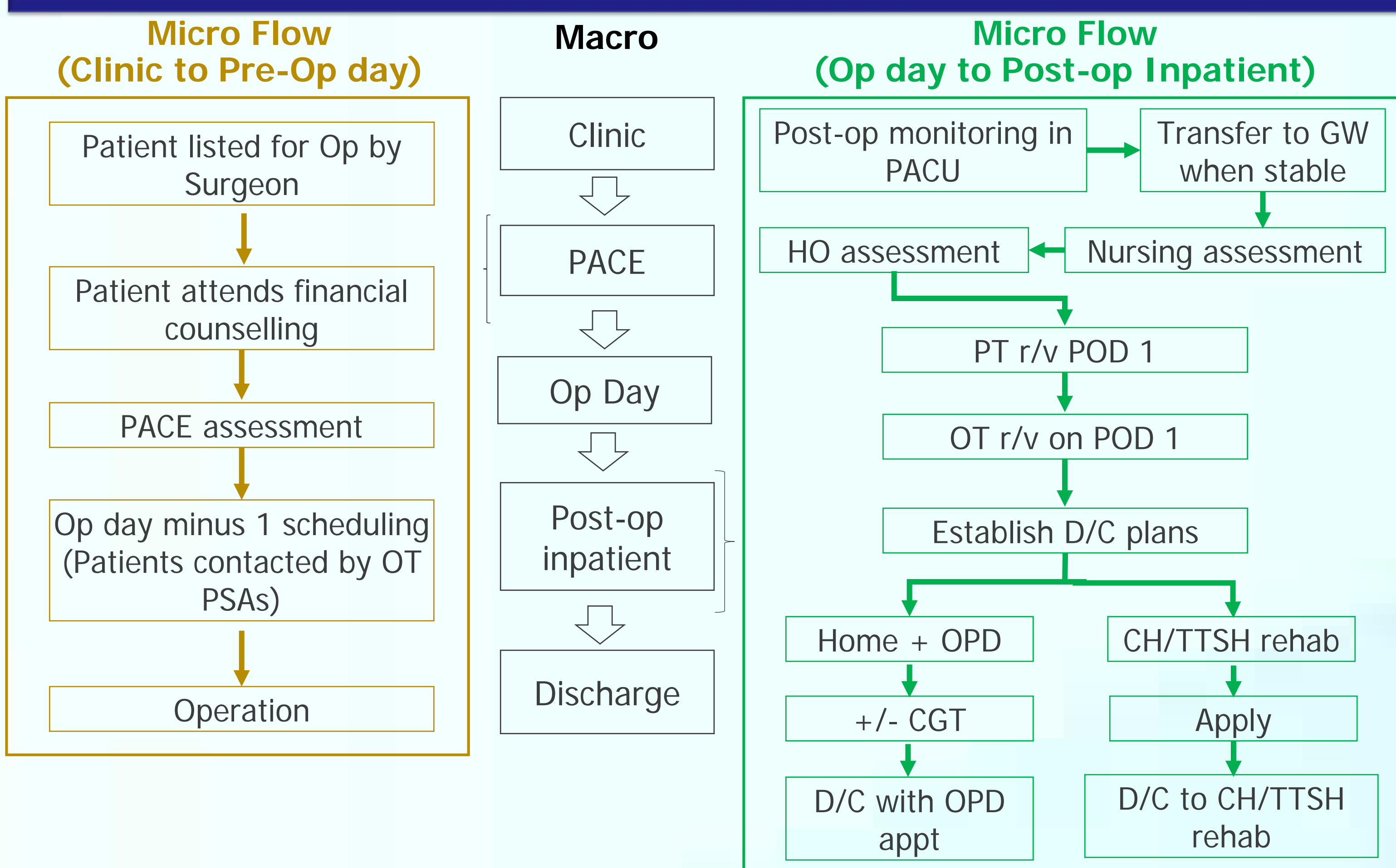
## Evidence for a Problem Worth Solving

1. Washington University of Medicine, 2015<sup>1</sup>:
  - Rapid recovery protocol reduced ALOS of THR patient by 50%, from 4 days to 2 days.
  - Had no impact on 30 days readmission rate
  - Reduced in-hospital cost
2. Netherland, 2013<sup>2</sup>:
  - THR Rapid protocol was applied to 1180 patients.
  - ALOS of THR patients' hospital stay from 4.04 days to 2.9 days
3. Singapore General Hospital<sup>3</sup>
  - Jan 2020: An enhanced recovery programme piloted at SGH enabled a group of patients to go home on POD 0

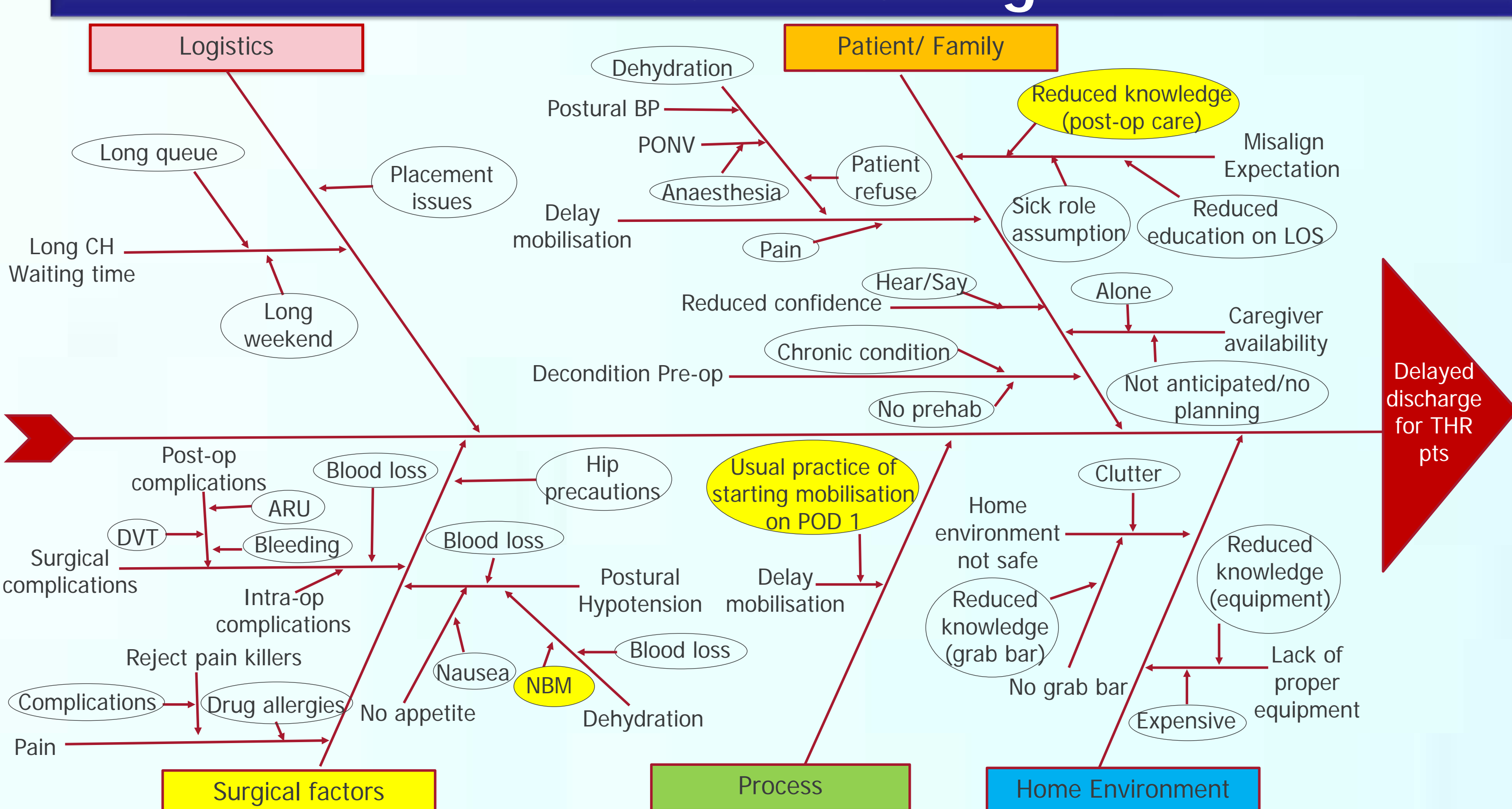
References:  
1. Stambough JB, Nunley RM, Curry MC, Steger-May K, Cichosy C. Rapid recovery protocols for primary total hip arthroplasty can safely reduce length of stay without increasing readmissions. J Arthroplasty. 2015 Apr;30(4):521-6.2.  
2. den Hartog VM, Mathijssen NM, Vehmeijer SB. Reduced length of hospital stay after the introduction of a rapid recovery protocol for primary THA procedures. Acta Orthop. 2013 Oct;84(5):444-7. 3.  
3. <https://www.sgh.com.sg/news/patient-care/sgh-cuts-hospital-stay-for-total-hip-replacement-patients-from-days-to-hours-with-enhanced-recovery-programme>

Elective total hip replacement (THR) cases in TTSH have a prolonged length of stay as compared to international standards

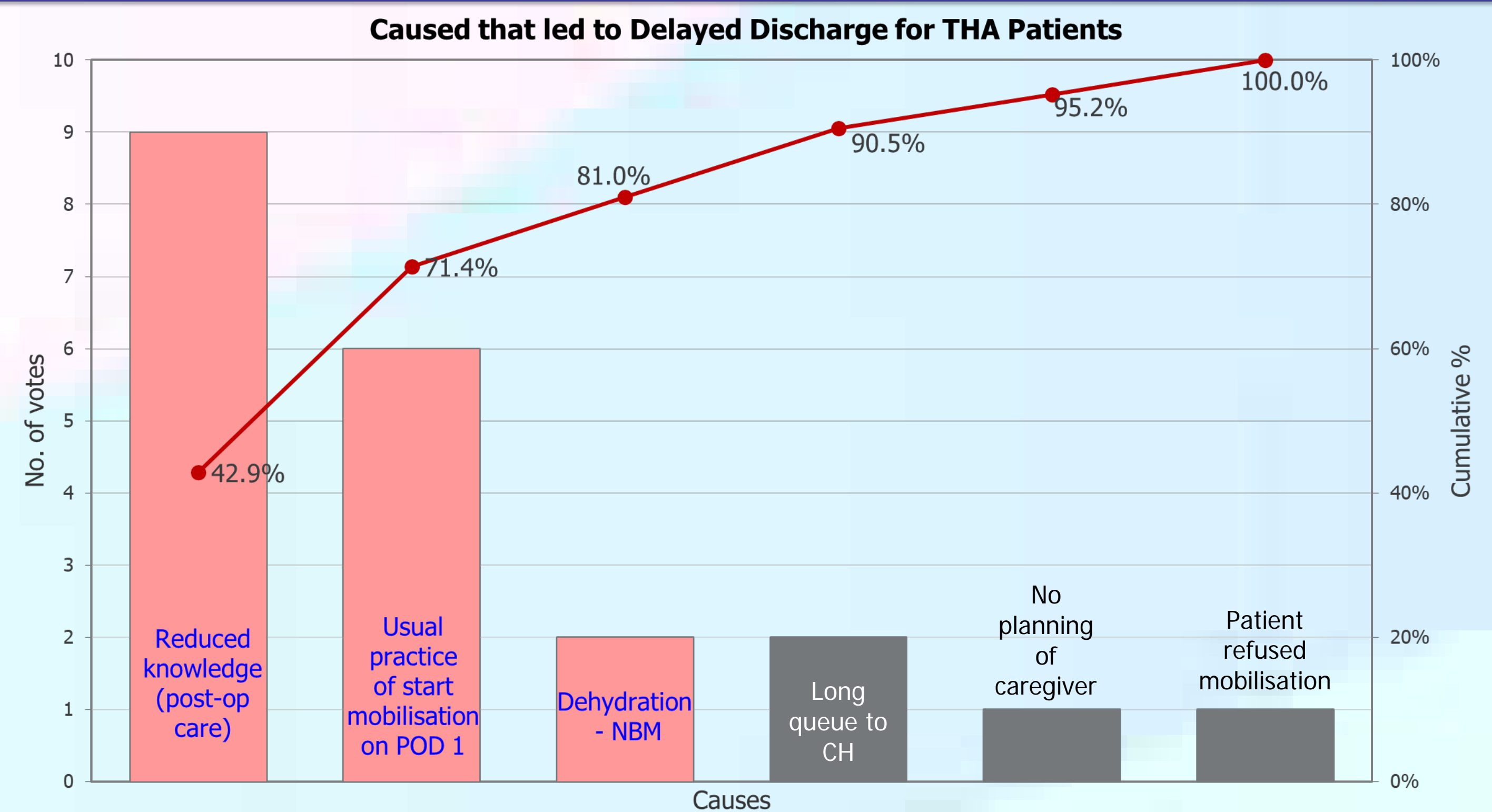
## Flow Chart of Process



## Cause and Effect Diagram



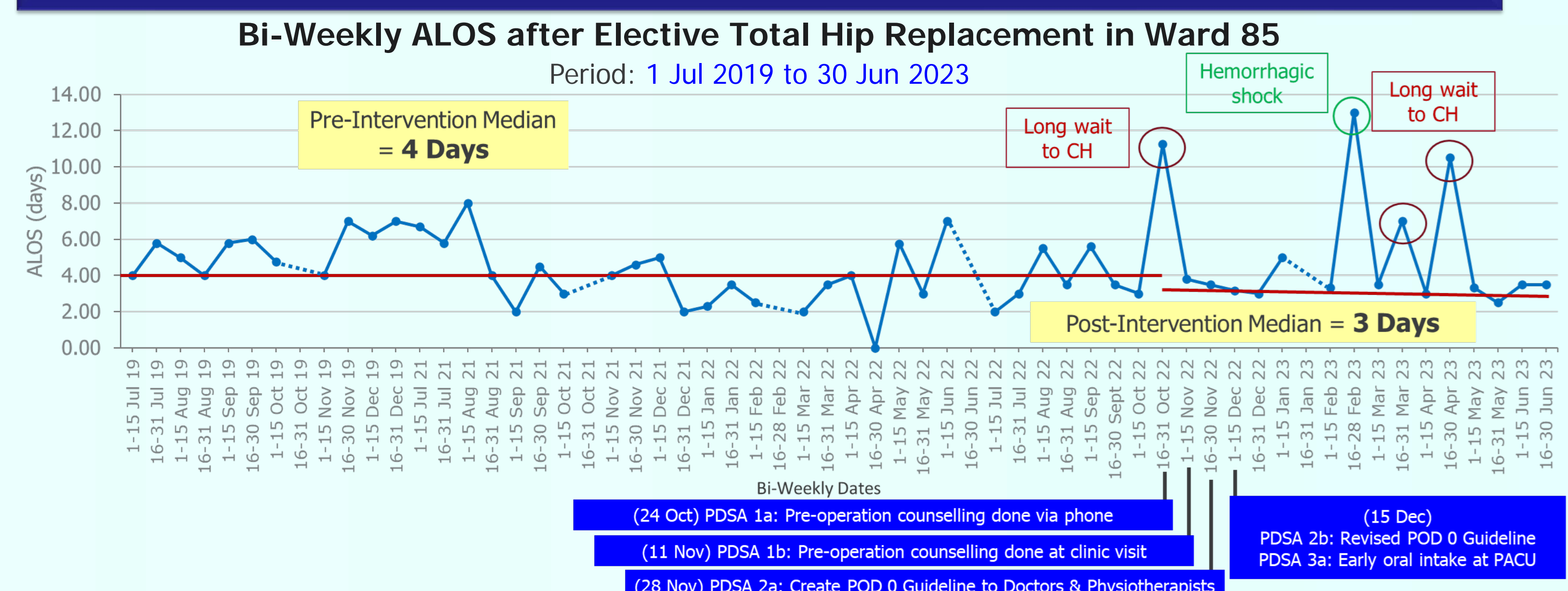
## Pareto Chart



## Implementation

CAUSE	INTERVENTION	DATE OF IMPLEMENTATION
<b>Cause 1:</b> Reduced Knowledge (Post Op Care)	PDSA 1a: Pre-operation counselling done via phone	24 October 2022
	PDSA 1b: Pre-operation counselling done at clinic visit	11 November 2022
<b>Cause 2:</b> Usual Practice of Starting Mobilisation on POD 1	PDSA 2a: Create POD 0 Guideline to Doctors & Physiotherapists	28 November 2022
	PDSA 2b: Revised POD 0 Guideline	
<b>Cause 3:</b> Dehydration - NBM	PDSA 3a: Early Oral Intake at PACU	15 December 2022

## Results



Date	1-15 Jul 19	16-31 Jul 19	1-15 Aug 19	16-31 Aug 19	1-15 Sep 19	16-30 Sep 19	1-15 Oct 19	16-31 Oct 19	1-15 Nov 19	16-30 Nov 19	1-15 Dec 19	16-31 Dec 19	1-15 Jan 20	16-31 Jan 20	1-15 Feb 20	16-31 Feb 20	1-15 Mar 20	16-31 Mar 20	1-15 Apr 20	16-30 Apr 20	1-15 May 20	16-31 May 20	1-15 Jun 20	16-30 Jun 20																			
Number	3	5	1	4	5	6	4	0	1	1	5	1	3	5	2	4	3	4	1	0	1	5	1	1	3	2	2	0	2	2	1	0	4	5	1	0	1	4	4	2	5	6	3
ALOS	4.00	5.80	5.00	4.00	5.80	6.00	4.75	0.00	4.00	7.00	6.20	7.00	6.70	5.80	8.00	4.00	2.00	4.50	3.00	0.00	4.00	4.80	5.00	2.00	2.30	3.50	0.00	2.00	3.50	4.00	0.00	5.75	3.00	7.00	0.00	2.00	3.00	5.50	5.80	3.50	3.00		
Mean ALOS	4.65																																										

## Cost Savings

	Pre-Implementation	Post-Implementation
<b>Average Length of Stay (Per Patient)</b>	4.65	4.47
<b>Total No. of Bed Days (Annualized)</b> With reference to 76 patients (ie. Total Patients in Year 2019)	4.65 x 76 = 353.4	4.47 x 76 = 339.72
<b>Difference in Bed Days (Annualized):</b>		353.4 - 339.72
		<b>14 Bed Days Saved</b>
<b>Difference in Bed Days in Monetary Terms (Annualized):</b>		14 x \$427
		<b>\$5,978</b> (Savings in Monetary Terms)

Note:  
 ▪ Estimated cost of inpatient ward charge per day is \$427 (A1 Class)  
 ▪ Bed Days calculation based on Value Office Model

## Problems Encountered

1. Challenges in the provision of preoperative education
  - Time constraints in clinic
  - Lack of manpower to help with preoperative education
2. Challenges in the early mobilisation of patients
  - Late arrival of patients in the ward after office hours
  - Post-operative nausea, vomiting and giddiness.
3. Long waiting times for community hospital

## Strategies to Sustain

1. Empowering the coordinator to assist with preoperative education.
2. Monitoring the percentage of patients receiving the preop education and the quality of the education.
3. Education materials and information sheets to assist with patient and carer driven learning.
4. Upskilling nurses to assist with post op reviews and POD 0 mobilisation.