

## Mission Statement

To increase post-operative day (POD) 2 mobilisation\* rate from 23% to 75% (stretch goal: 90%) in patients undergoing elective hepatic and pancreatic surgery at TTSH within 6 months

\*Mobilisation: Sit out of Bed ≥ 6 hours & Walk 30 meters

Why 30 meters are chosen?

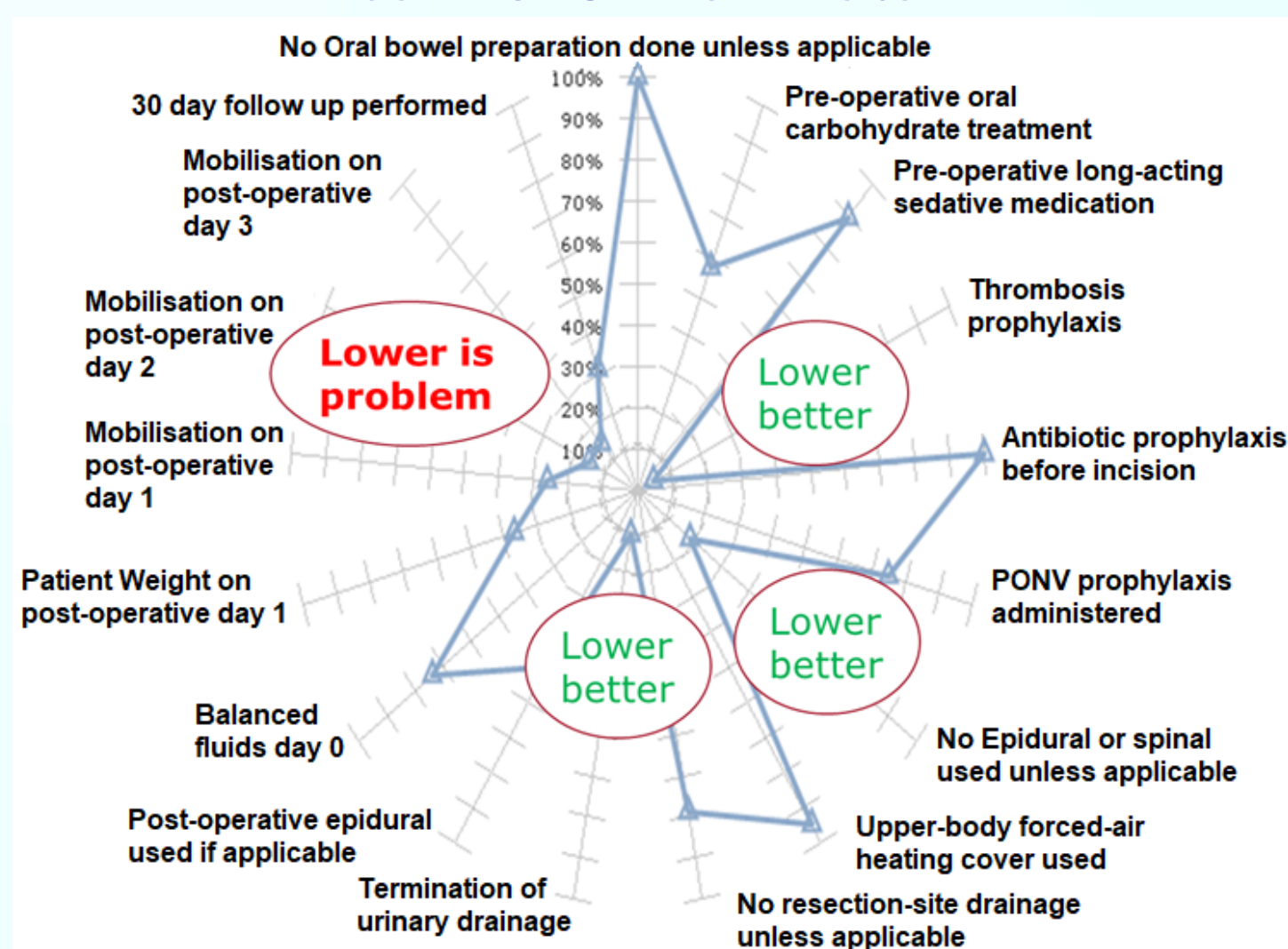
- In the Ward: Distance from the Corner of the Ward Cubicle to Toilet = 15m
- At Home (e.g. 4 Room Flat): Distance from Living Room to Toilet = 15m
- Therefore, in order for Patients to walk independently (walking to & fro): 2 x 15 = 30m.

## Team Members

Name	Designation	Department
<b>Team Leader</b> Adj Asst Prof Vishalkumar G Shelat	Senior Consultant	General Surgery
<b>Team Members</b> Dr Tan Yen Pin	Consultant	General Surgery
Ms Wang Bei	Senior Coordinator	General Surgery
Ms Jaclyn Chow Jie Ling	Senior Physiotherapist	Physiotherapy
Ms Chan Jia Ying	Senior Physiotherapist	Physiotherapy
Ms Priscilla M Joseph	Staff Nurse	High Dependency Unit
Ms Nursharazilla Abdul Rahman	Staff Nurse	Ward 11B
Ms Low Yihui	Staff Nurse	Ward 11C
<b>Sponsor</b> Adj A/Prof Glenn Tan Wei Leong	Head of Department	General Surgery
<b>Mentors</b> Adj A/Prof Tai Hwei Yee & Ms Shirlene Toh		

## Evidence for a Problem Worth Solving

### Year 2018 TTSH Data



Poor post-operative mobilisation causes:

- Increased Muscle Loss
- Pneumonia
- Deep Vein Thrombosis (DVT)
- Prolong Length of Stay (LOS)

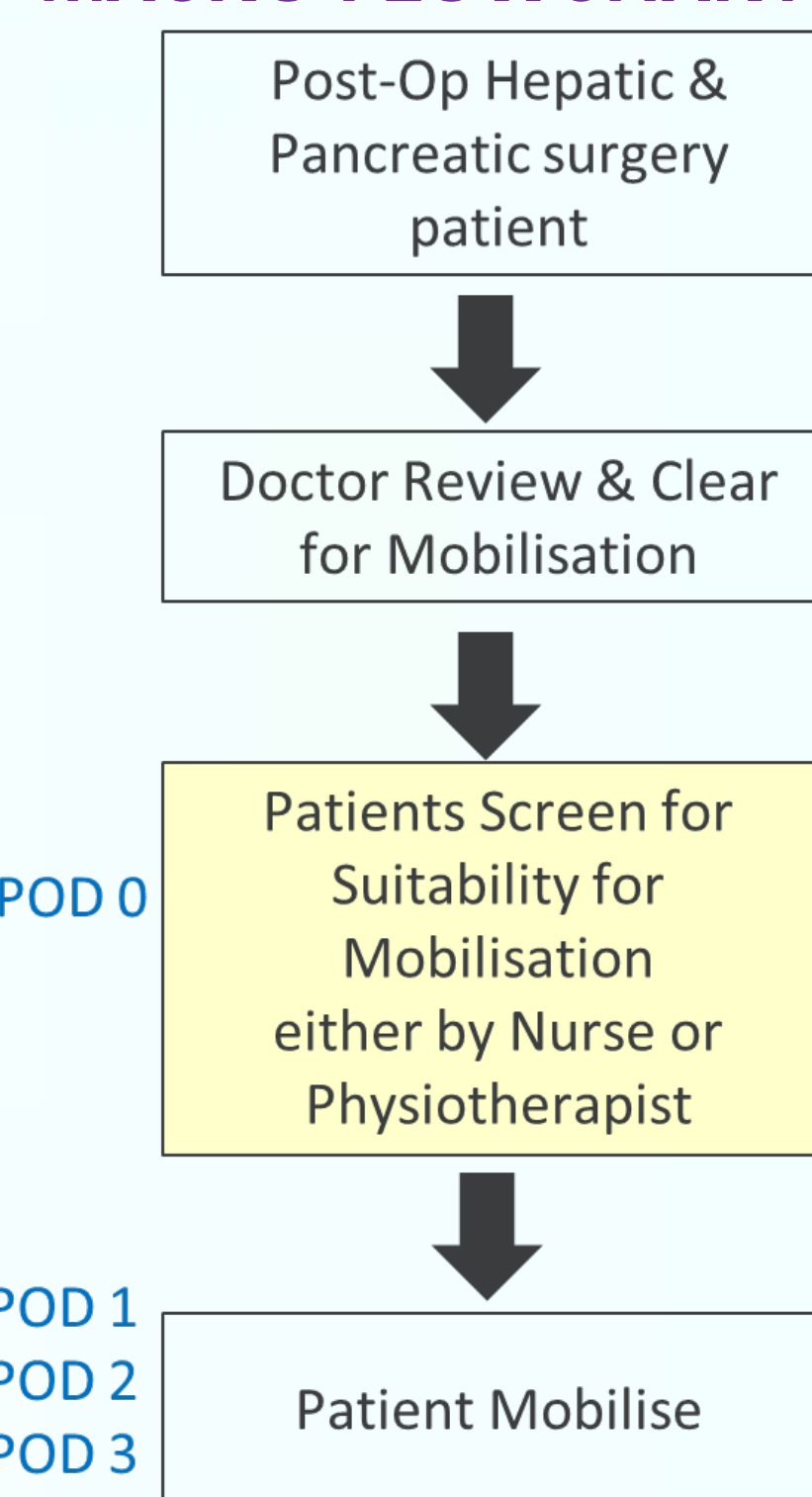
References:

- Ni et al 2018. Early enforced mobilisation after hepatectomy. RCT.
- Kapritsou M 2016. Fast-track recovery program after major liver resection. RCT.
- Hendry PO et al 2010. RCT within an ERAS for liver resection (28%).

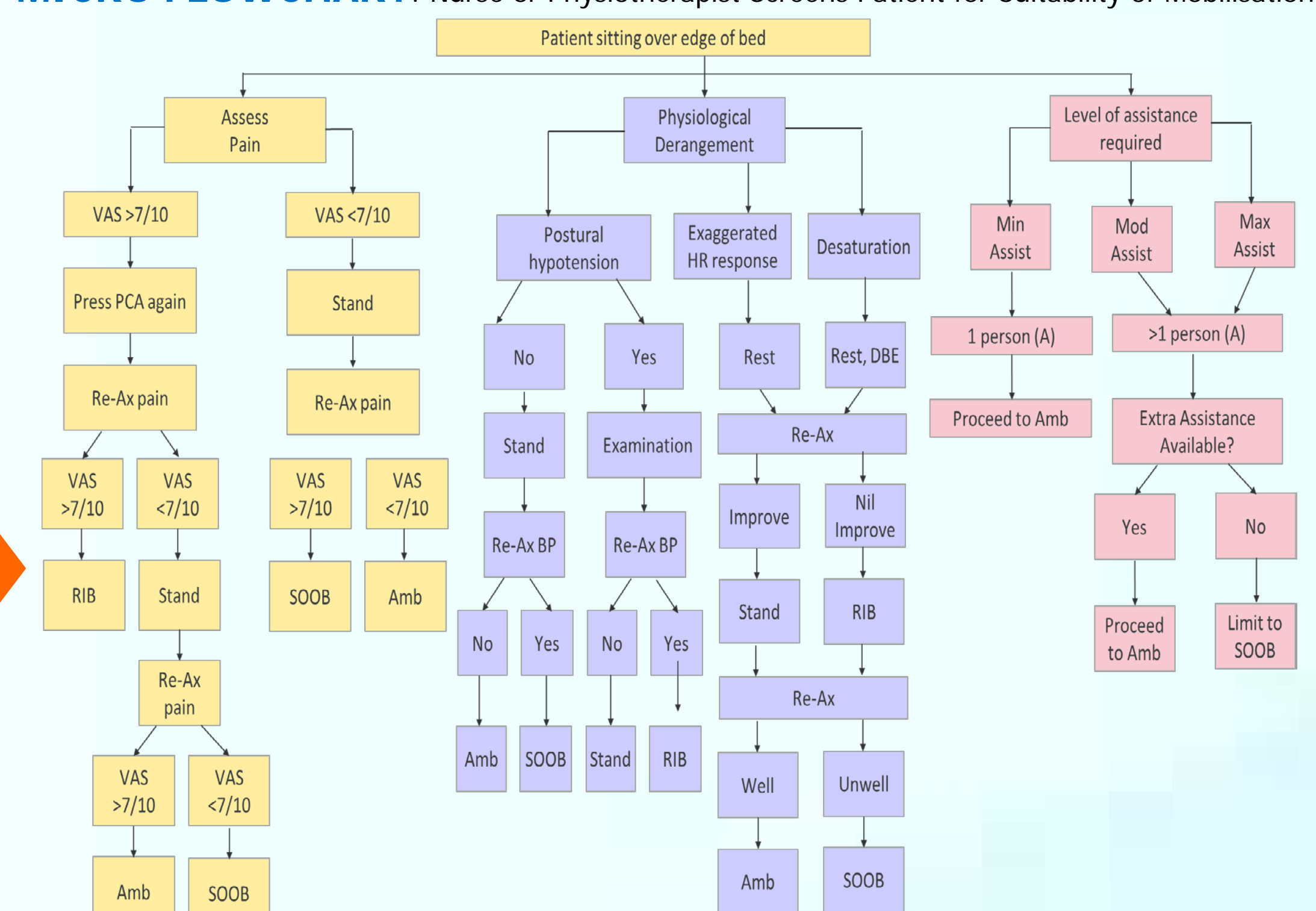
POD 1, 2 & 3 mobilisation rates following major elective hepatic & pancreatic surgery are **BELOW 10% EACH**

## Flow Chart of Process

### MACRO FLOWCHART

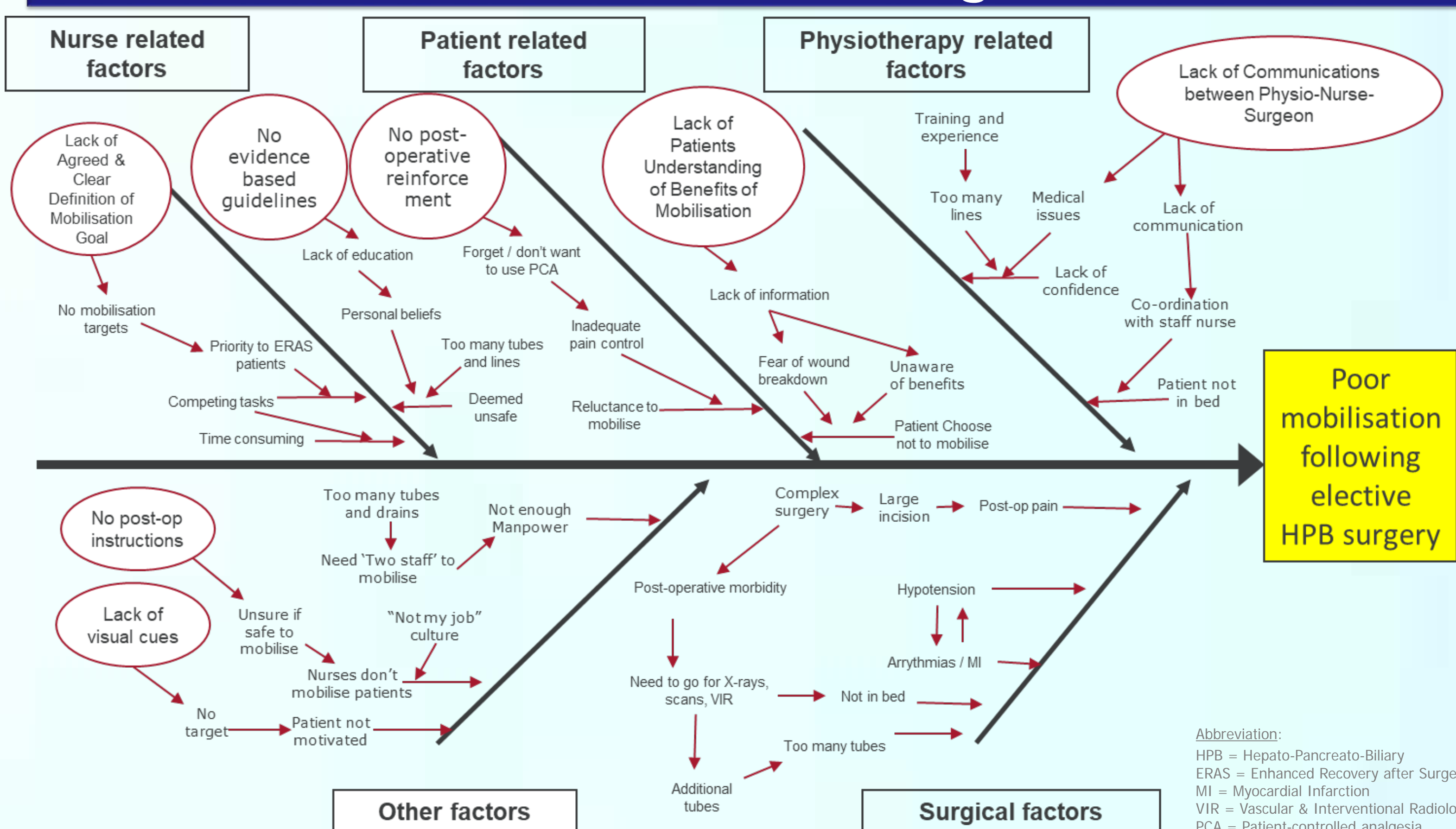


### MICRO FLOWCHART: Nurse or Physiotherapist Screens Patient for Suitability of Mobilisation



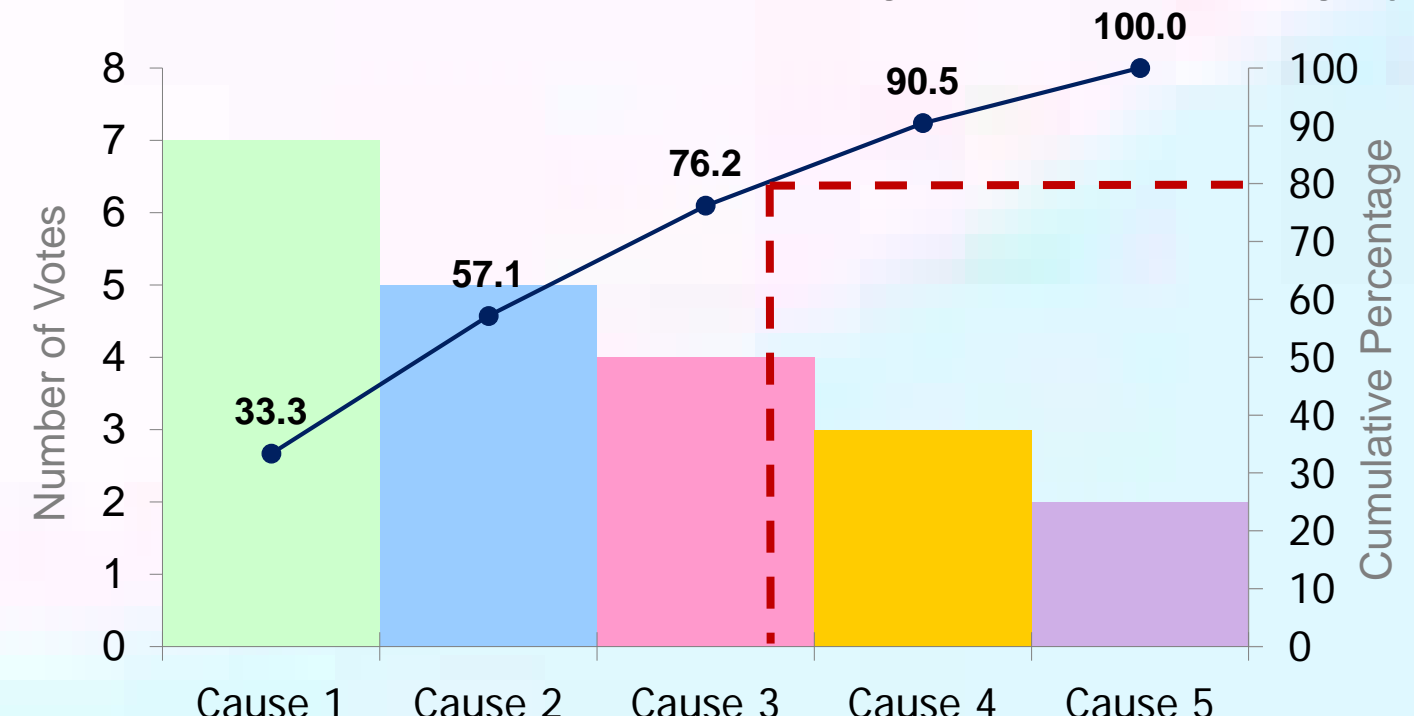
**Abbreviation:**  
POD = Post-Operative Day | VAS = Visual Analogue Scale | Re-Ax = Reassessment | RIB = Rest in Bed | SOOB = Sit out of Bed | Amb = Ambulate | BP = Blood Pressure | DBE = Double-balloon Enteroscopy | HR = Heart Rate

## Cause and Effect Diagram



## Pareto Chart

Causes of Poor Mobilisation following Elective HPB Surgery



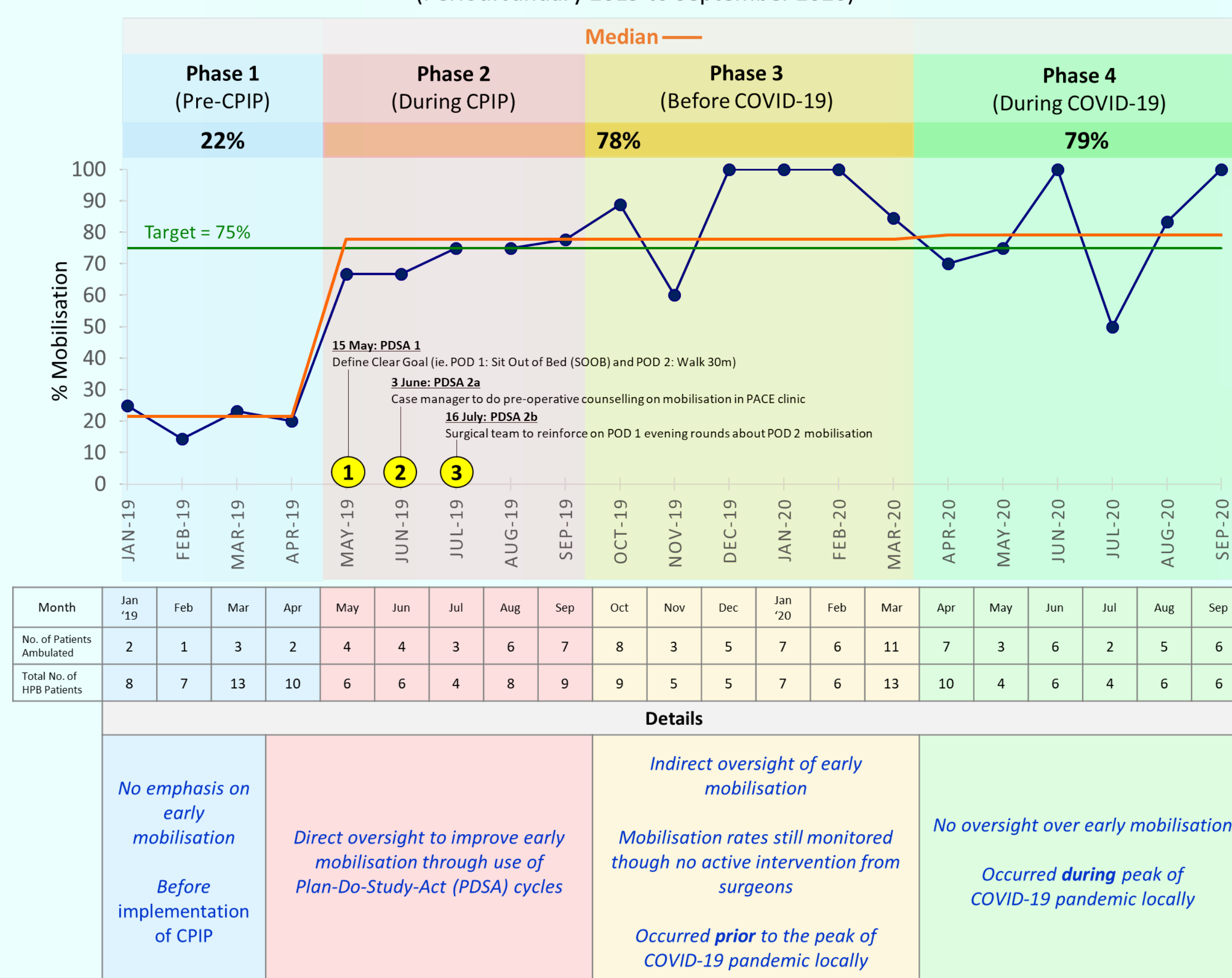
Cause	Description
Cause 1	Lack of Agreed & Clear Definition of Mobilisation Goal
Cause 2	Lack of Patients Understanding of Benefits of Mobilisation
Cause 3	Lack of Communications between Surgeon-Nurse-Physio
Cause 4	No Post-Operative Order
Cause 5	Lack of Visual Cues

## Implementation

Root Cause	Intervention	Implementation Date
<b>Cause 1:</b> Lack of agreed & clear definition of mobilisation goal	<b>PDSA 1:</b> Clearly define mobilisation targets / goals (ie. POD 1: Sit Out of Bed & POD 2: Walk 30m)	15 May 2019 to 2 June 2019
<b>Cause 2:</b> Lack of Patients Understanding of Benefits of Mobilisation	<b>PDSA 2A:</b> Case Manager at Pre-operative Anaesthesia Counselling & Evaluation (PACE) clinic to include post-operative mobilisation into counselling <b>PDSA 2B:</b> Surgical team to reinforce on POD 1 evening rounds about POD 2 mobilisation	3 June 2019 to 15 July 2019 16 July 2019 to 31 July 2019

## Results

Sustainability Run Chart: Mobilisation Rates on POD 2 (Period: January 2019 to September 2020)



Month	Jan-19	Feb-19	Mar-19	Apr-19	May-19	Jun-19	Jul-19	Aug-19	Sep-19	Oct-19	Nov-19	Dec-19	Jan-20	Feb-20	Mar-20	Apr-20	May-20	Jun-20	Jul-20	Aug-20	Sep-20
No. of Patients Mobilised	2	1	3	2	4	4	3	6	7	8	3	5	7	6	11	7	3	6	2	5	6
Total No. of HPB Patients	8	7	13	10	6	6	4	8	9	5	5	7	6	13	10	4	6	4	6	6	

## Cost Savings

	Pre-Intervention	Post-Intervention
Average Length of Stay (Per Patient)	8 days	6.5 days
Average Length of Stay Saved (Per Patient)		8 - 6.5 = <b>1.5 days</b>
Cost of Inpatient Stay (Per Patient)	8 x 1114 = <b>\$8,912</b>	6.5 x 1114 = <b>\$7,241</b>
<b>Cost Savings (Per Patient)</b>		\$8,912 - \$7,241 = <b>\$1,671</b>
Assume No. of Patients under Hepatic & Pancreatic Surgery in 1 Year = 90		
Total Length of Stay Saved (Annualised)		1.5 days x 90 = <b>135 days</b>
<b>Cost Savings (Annualised)</b>		\$1,671 x 90 = <b>\$150,390</b>

**Note:** Unit Cost for Inpatient Stay Per Day Per Patient = \$1,114

## Problems Encountered

- Lack of mobilisation criteria, heterogeneity in defining mobilisation.
- Bed rest recommendation after chest tube removal, blood transfusion, etc.
- Co-ordination between staff nurse, physiotherapy and patient clinical care.

## Strategies to Sustain

- Template in Operating Theatre ordering
- POD 1 evening round reinforcement by surgical team
- Include in HPB handbook for orientation for new staff

## Publication

Tang JH, Wang B, Chow JLJ, Joseph PM, Chan JY, Abdul Rahman N, Low YH, Tan YP, Shelat VG. Improving postoperative mobilisation rates in patients undergoing elective major hepato-pancreato-biliary surgery. Postgrad Med J. 2021 Apr;97(1146):239-247.