

Discharging Spontaneous Pneumothorax Patients on Postoperative Day 2 (POD2)

Dr Tan Ann Kheng
Department of General Surgery (GS)

MISSION STATEMENT

To reduce the average number of hours of stay on day of discharge* at inpatient ward for TTSH's post op primary spontaneous pneumothorax patient from 15.32 hours to ≤ 14 hours in 6 months

* Day of Discharge = POD2 ≤ 2 pm

Why POD2? Surgeon removes chest tube on POD2 and perform check Chest X-ray (CXR) 4 hours post removal of chest tube

Also, Business Officer will levy another day of ward charges if patient is discharged after 2pm.

TEAM MEMBERS

	Name	Designation	Department
Team Leaders	Dr Tan Ann Kheng	Consultant	Thoracic Surgery Service
	Ms Ho Pei Ying	Coordinator	Thoracic Surgery Service
Team Members	Ms Alwiyah Bte Rahmat	Nurse Clinician	Ward 11D
	Ms Lim Hui Shin	Nurse Clinician	Ward 11D
	Ms Xie Sihui	Principle Pharmacist	Pharmacy Practice
	Mr Yip Jun Siang	Senior Radiographer	Radiography Service
	Dr Leow Ee-J	Medical Officer	General Surgery

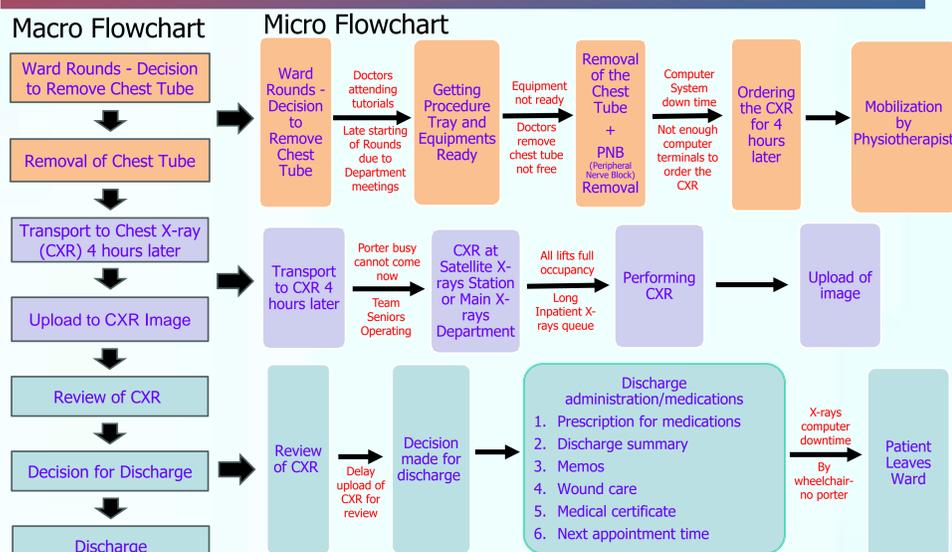
Mentor: Dr Liu Huimin

EVIDENCE OF A PROBLEM WORTH SOLVING

- *In India (Sir Ganga Ram Hospital, New Delhi), for a study of 110 consecutive cases, the mean hospital stay is 3.83 days, ranging from 2 to 9 days.
- In Europe / Japan, uncomplicated, no air-leak cases have their chest tube removed on POD1 or even on Op Day with strict criteria of patient selection.
- All published studies agree that the source of pain is at the site of chest drain and early removal also help lower the suffering of patient and enable early ambulation with increase satisfaction from Nursing Staff and Patients.

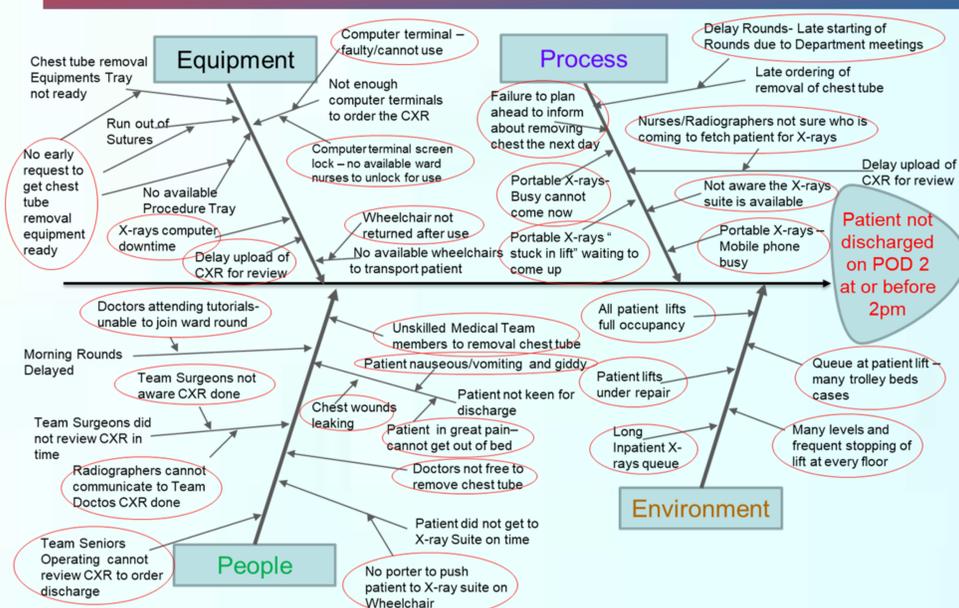
*Reference: Puri HV, Asaf BB, Palle MV, Bishnoi S, Kumar A. Video-assisted thoracoscopic surgery management of primary spontaneous pneumothorax: Results in 110 consecutive cases. *Lung India* 2021;38:36-40

FLOWCHART

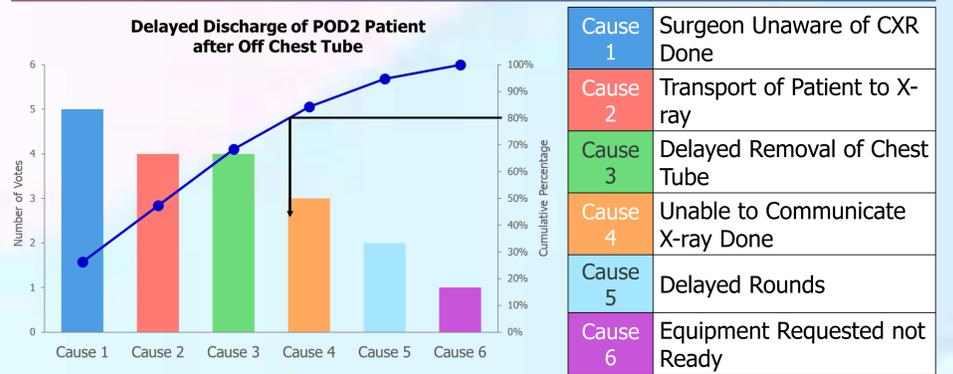


Note: Gap in practices are highlighted in red texts

CAUSE AND EFFECT DIAGRAM



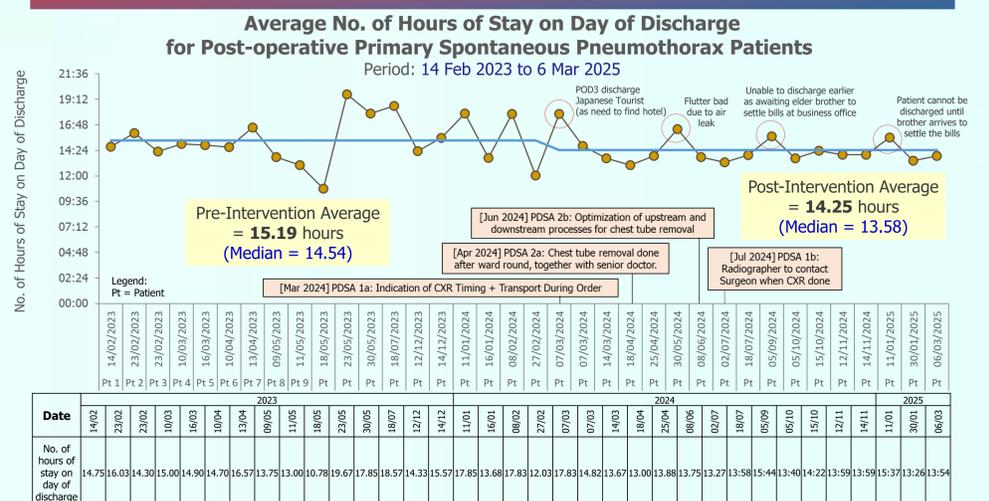
PARETO CHART



INTERVENTION

ROOT CAUSE	INTERVENTION	DATE OF IMPLEMENTATION
Cause 1: Surgeon Unaware of CXR Done	Indication of CXR Timing + Mode of Transport During Order	1 March 2024
Cause 2: Transport of Patient to X-ray		
Cause 3: Delayed Removal of Chest Tube	Chest tube removal done after ward round, together with senior doctor.	1 April 2024

RESULTS



COST SAVINGS

	Pre-Intervention	Post-Intervention
Percentage of Patients Discharged on POD2 (ie. ≤ 2 pm)	26%	65%
Assume average no. of patients per month = 2 (in a year is 24 patients)		
No. of Patients Discharged on POD2 (ie. ≤ 2 pm) in 1 year	6 patients	16 patients
No. of Bed Days (Annualized)	6 x 2 = 12 days	16 x 2 = 32 days
Total No. of Bed Days Saved (Annualized)		32 - 12 = 20 days
Annual Total Savings (In Monetary Terms)		20 x 1046 = \$20,920

Note: Estimated cost of inpatient ward charge per day is \$1046

PROBLEMS ENCOUNTERED

- Training of new junior colleagues to the team and getting them to understand how to apply the various work improvement processes.
- Tying down discharge matters (ordering of discharge medications over the weekend). New house officer ordered only 3 days of analgesia for a recent patient discharged on Sunday and a new order of 2 weeks supply of analgesia need to be made which led to further delay of discharge.

STRATEGIES TO SUSTAIN

For Junior/Mid-Level Doctors

- Proper Orientation for new members of the surgical team.
- Physical Coaching-Bedside teaching/Demonstration.

LESSONS LEARNT

- It is so tempting or so "correct" about wanting to correct a problem with solution(s) without first properly studying the problem(s) with stakeholders and colleagues, especially as surgeons who just want to act.
- Only with proper study of a problem, with all-round perspectives and proven methodology, can we even begin to approach solutions and perform cycles of improvement with carefully collected results to show us what works or not.
- Work improvement can produce benefits to more stakeholders then we realized down-stream.