

Project Title

Improving ROTEM Timings in Major Trauma

Project Lead and Members

Project lead: Dr Chen Xinying

Project members: Sister Malar, Yang Hua, Dr Soo Kian Shing, Dr Naville Chia, Lim

Woan Wui, Dr Jerry Goo, Ritchelle Sagun

Organisation(s) Involved

Khoo Teck Puat Hospital

Healthcare Family Group(s) Involved in this Project

Medical

Applicable Specialty or Discipline

Haematology

Project Period

Start date: May 2022

Completed date: Oct 2022

Aims

To increase the proportion of major trauma patients requiring Massive Transfusion Protocol (MTP) activation who had ROTEM done within 60 minutes of OT arrival from 20% to 100% within 6 months.

Background

Coagulopathy is major cause of morbidity & mortality in trauma patients.

Methods

See poster appended/below

Results

- 100% of actual major trauma patients had ROTEM done within 60 min of OT arrival by Oct 2022
- Average Timing of ROTEM was 42 min in 2022 vs 84 min in 2021
- Results are sustained to Aug 2023 (last audit)

Conclusion

See poster appended/below

Project Category

Training & Education

Learning Theories & Framework, Simulated Training

Keywords

Coagulopathy, Mortality, Trauma Patients, Clot Kinetics, Guidelines, Massive Transfusion Protocol, ICU Stay

Name and Email of Project Contact Person(s)

Name: Dr Chen Xinying

Email: chen.xin.ying@ktph.com.sg

Mission Statement

- **Background: Coagulopathy** is major cause of morbidity & mortality in trauma patients.
- **ROTEM** is a Point-of-Care Viscoelastic Assay that gives rapid, real-time information on **clot kinetics**.
- It allows for **goal directed** blood product transfusion instead of fixed ratio transfusion of 1:1:1
- **KTPH** has **ROTEM guided MTP guidelines** since 2021
- **Aim:** To increase the proportion of major trauma patients requiring Massive Transfusion Protocol (MTP) activation who had ROTEM done within **60 min** of OT arrival from **20% to 100%** within **6 months**.

Team Members

	Name	Designation	Department	Role
1.	Dr Chen Xinying	Consultant	Anaesthesia	Team Leader
2.	Sister Malar	Peri-op Nurse Clinician	MOT	Member
3.	Yang Hua	Anaesthesia Nurse	MOT	Member
4.	Dr Soo Kian Shing	Senior Resident Physician	Anaesthesia	Member
5.	Dr Naville Chia	Senior Consultant	Anaesthesia, Blood Transfusion Service	Member
6.	Lim Woan Wui	Trauma Nurse Coordinator	General Surgery	Member
7.	Dr Jerry Goo	Senior Consultant/ Trauma Surgeon	General Surgery	Member
8.	Ritchelle Sagun	Senior Medical Technologist	Lab Medicine	Member

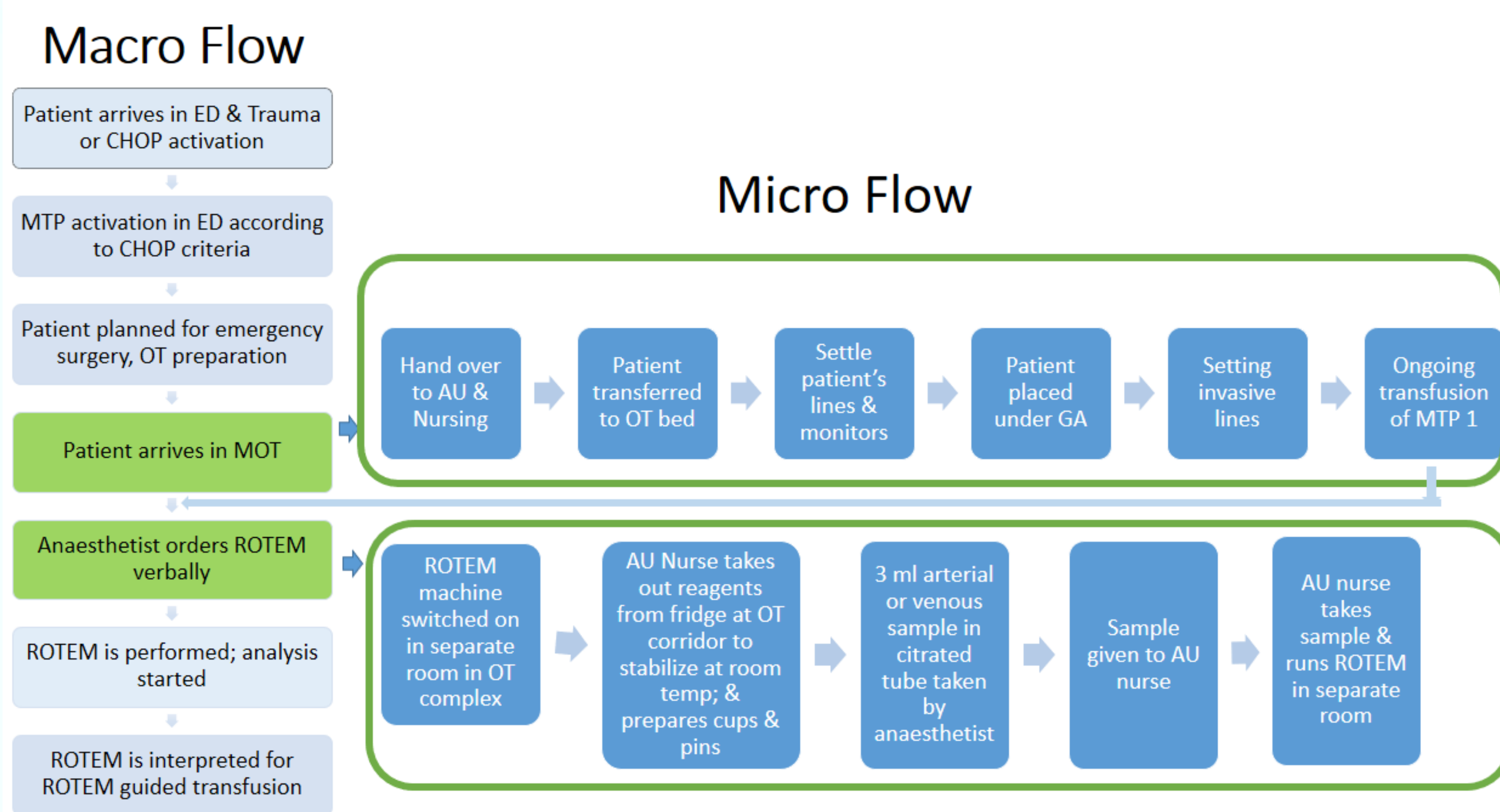
Evidence for a Problem Worth Solving

- Literature has shown that **goal directed** ROTEM guided MTP **improves survival** after injury, **promotes appropriate use of blood products** while **shortening ICU stay**
- Use of VHAs has been recommended during massive transfusion in **local & international trauma guidelines**

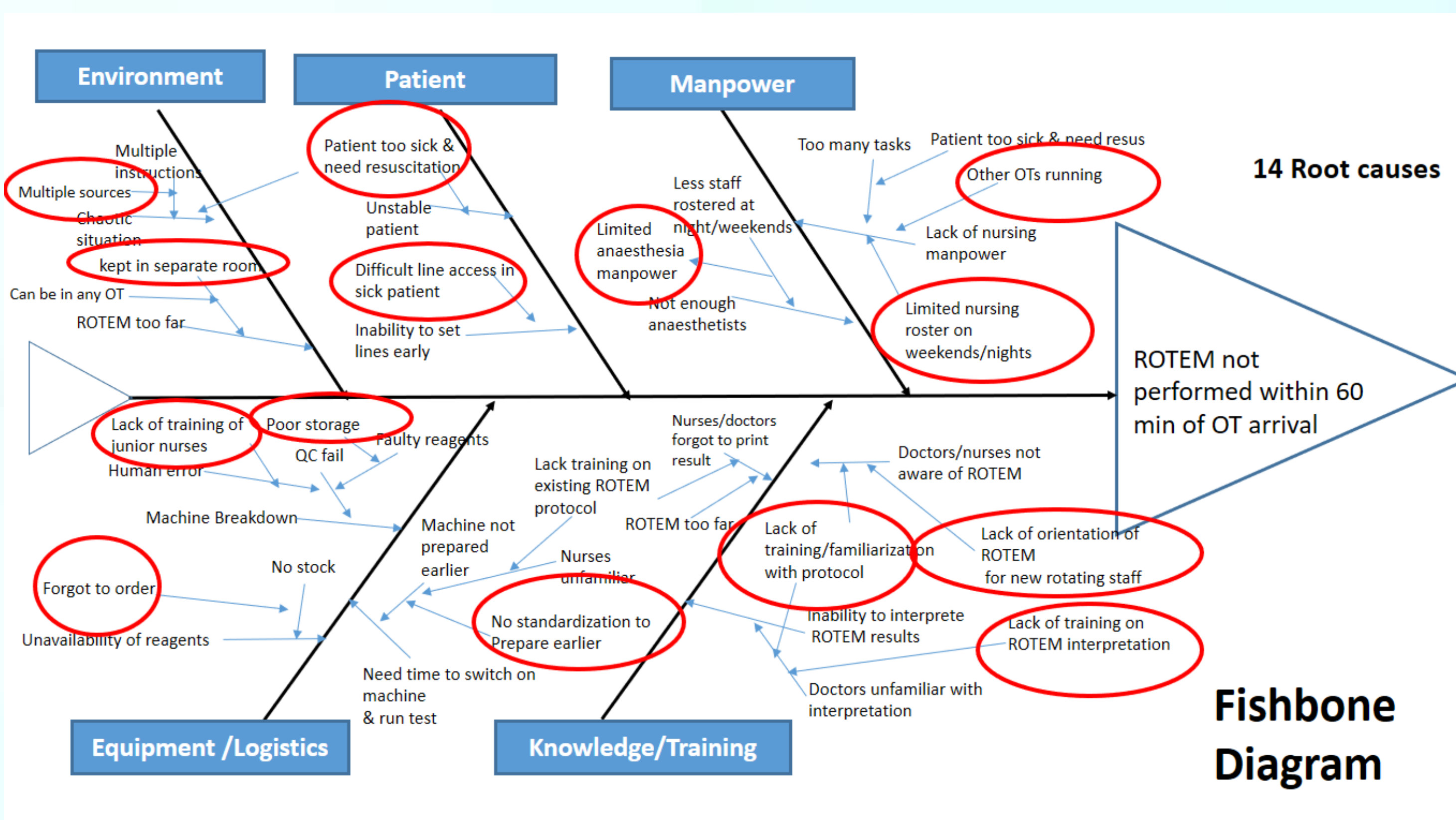
Current Performance of a Process

- Only **20%** of patients had ROTEM done within 60 min in 2019-2021

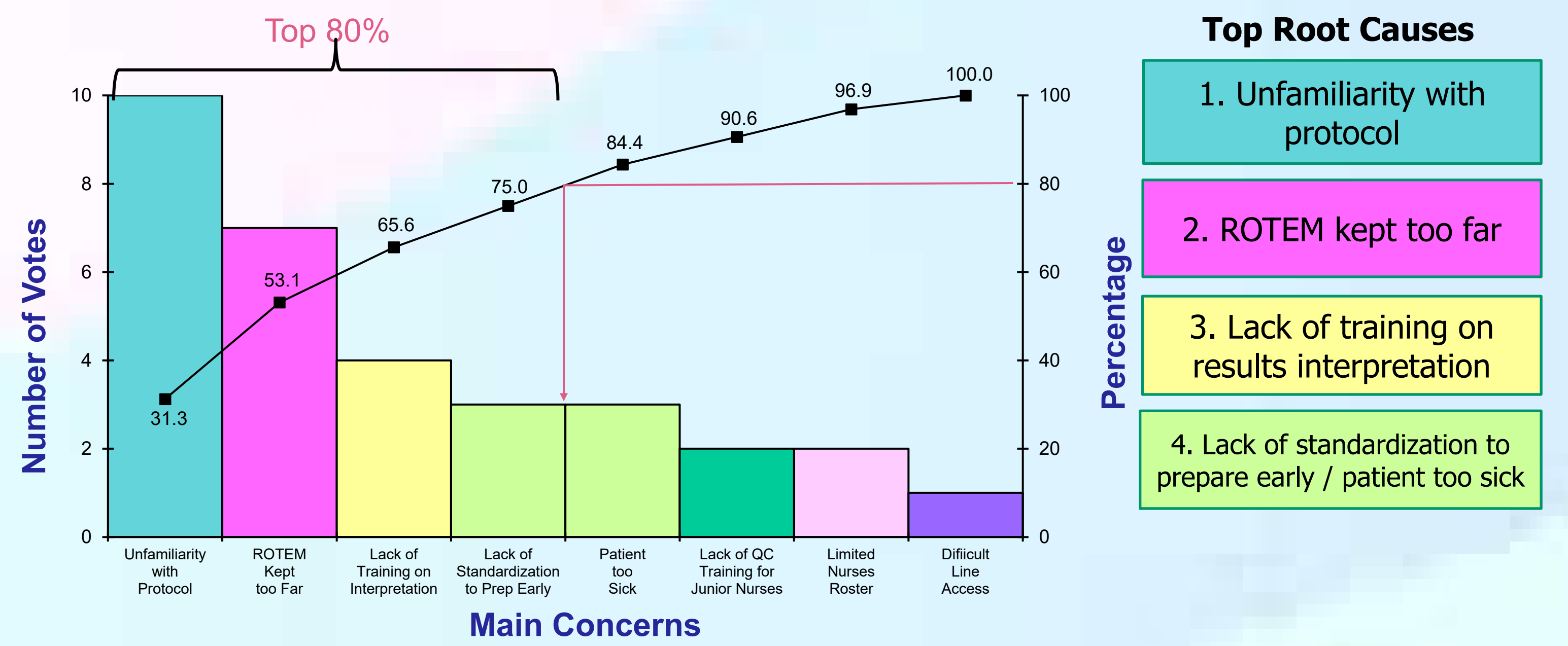
Flow Chart of Process



Cause and Effect Diagram



Pareto Chart

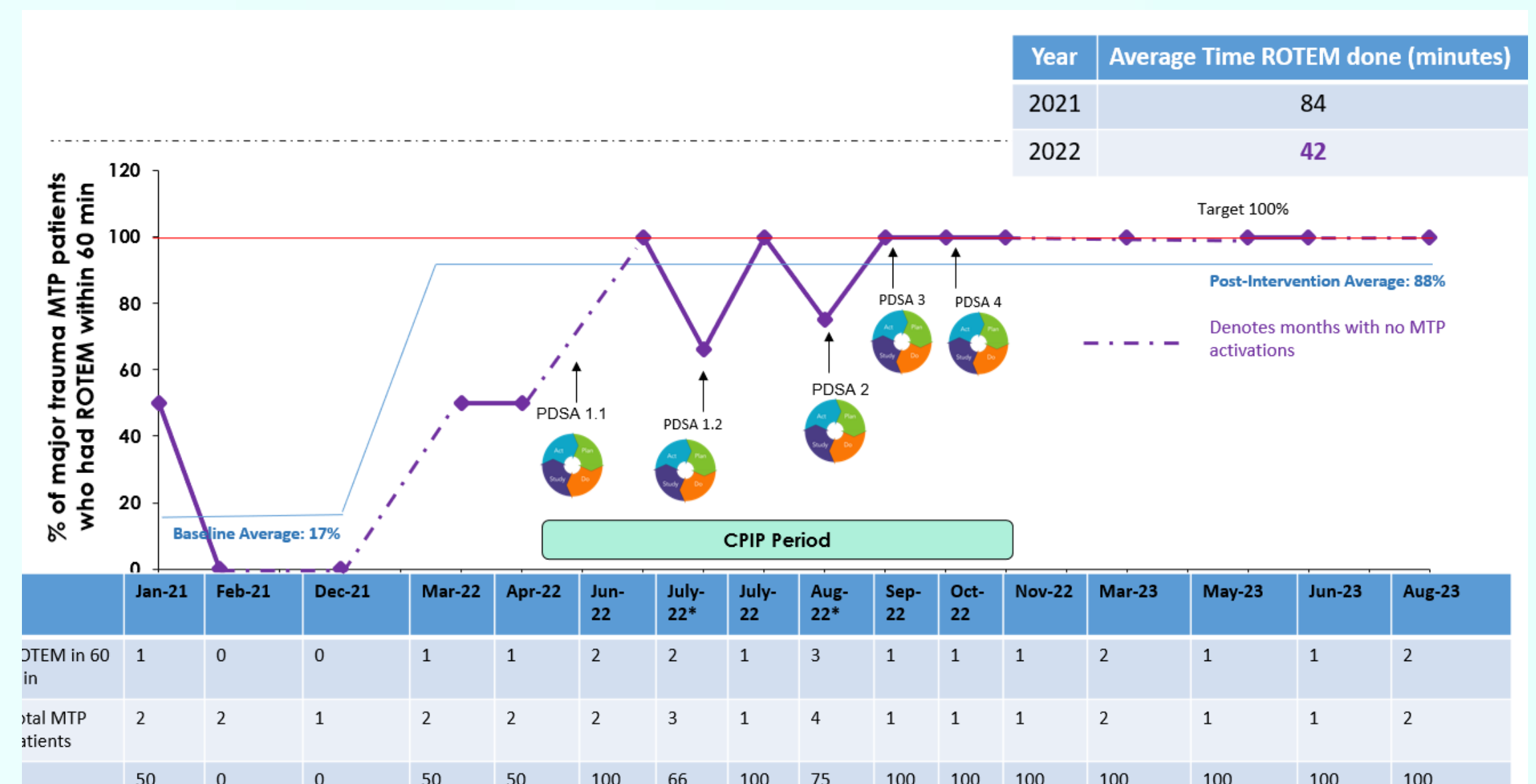


Implementation

	Problem	Plan	Do	Study	Act
PDSA 1.1 May '22	Unfamiliarity with Existing ROTEM-Guided Protocol	Increase awareness of ROTEM within Anaesthesia Dept	Re-education at M & M presentation	Compliance 100% (2/2 cases) over a month	Continue regular reminders
PDSA 1.2 Jul '22		Increase awareness for new staff through simulation practice	Team-based simulation done	Compliance 66% (2/3) cases; positive feedback from participants	Continue regular simulation training
PDSA 2 Aug '22	Lack of Training on Results Interpretation	Training on interpretation on results	Formal department teaching & quiz	75% compliance rate (3/4 cases)	Regular teaching & algorithm placed at ROTEM machine
PDSA 3 Sep '22	ROTEM too Far	Train nurses to bring ROTEM analyzer into EOT & switch on	Trial of moving ROTEM during simulation	100% (1/1 case) compliance Good feedback	Incorporate into our guidelines/workflow
PDSA 4 Oct '22	Patient too Sick	Get Lab medicine to help give reminder during MTP activation	Verbal prompt created during MTP activation	100% (1/1 case) compliance	Updated into SOP

Results

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Run Chart of ROTEM done within 60 min of OT arrival

Cost Savings

Clinical Outcome	Cost savings to Patient (A class)	Cost Savings to Hospital per patient
Reduction in blood products by 1 MTP cycle	\$1550.12	\$1713.16
Reduction by 2 FFP	\$206.10	\$191.30
Reduction by 1 pooled platelets	\$274.87	\$542.34
Reduce ICU LOS by 2 days	\$2362.62	\$4177.66

- **Cost savings to Hospital for 10 patients per year ~ Up to \$58908.20**

Problems Encountered

- Difficult to change general mindset of doing things the usual way
- Trauma patients are small in number, challenging to perform PDSA cycles; this was overcome by performing simulations
- Staying focused on the mission & keeping the momentum within 6 months is only possible with like-minded team members

Strategies to Sustain

- **Regular** teaching sessions / simulation practice / reminders
- **Standardization:** Interventions incorporated into the actual workflow & SOP
- **Review/Monitoring:** Continue to monitor the progress 6 monthly or yearly
- **Update** department regularly on targets and the good work done to get better clinical outcomes, more cost savings to hospital/patient
- **Spread:** Sharing at Hospital Trauma Committee & local/international courses/conferences