

Project Title

Improving Prone Positioning Process for Acute Respiratory Distress Syndrome (ARDS)

Project Lead and Members

- Dr Tan Hui Li
- Xu Xu Hong
- Chiu Hung Ling
- Patricia Yong
- Dr Tan Qiao Li
- Dr Sewa DuuWen
- Dr Ng Shin Yi
- Dr Phua Ghee Chee

Organisation(s) Involved

Singapore General Hospital

Aims

The aim of this project is to reduce the time taken to implement Prone Positioning by 50 and to reduce the incidence of pressure injuries by 90 within 12 months.

Background

See poster appended / below

Methods

See poster appended / below

Results

See poster appended / below

Conclusion

See poster appended / below

Additional Information

Singapore Healthcare Management (SHM) Conference 2021 – Merit Award
(Operations Category)

Project Category

Care & Process Redesign

Keywords

Care & Process Redesign, Healthcare Training & Education, Safe Care, Intensive Care,
Root Cause Analysis, Plan Do Check Act, Cost Effectiveness, Simulated Training,
Healthcare Administration, Nursing, Singapore General Hospital, Acute Respiratory
Distress Syndrome, Lung Recruitment, Prone Position, Pressure Injuries, Specialty
Nursing

Name and Email of Project Contact Person(s)

Name: Dr Tan Hui Li

Email: singaporehealthcaremanagement@singhealth.com.sg

Improving Prone Positioning Process for Acute Respiratory Distress Syndrome (ARDS)



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Dr Tan Hui Li¹, Singapore General Hospital
 Xu Xu Hong¹, Singapore General Hospital
 Chiu Hung Ling¹, Singapore General Hospital
 Patricia Yong¹, Singapore General Hospital
 Dr Tan Qiao Li², Singapore General Hospital
 Dr Sewa DuuWen², Singapore General Hospital
 Dr Ng Shin Yi³, Singapore General Hospital
 Dr Phua Ghee Chee², Singapore General Hospital

¹Nursing Division / Speciality Nursing, ²Dept of Respiratory Critical Care Medicine, ³Dept Surgical Intensive Care

Introduction

Widespread inflammation in the lungs may result in a life-threatening condition called acute respiratory distress syndrome (ARDS). Large randomized studies and meta-analysis have shown that prone positioning (PP) improved oxygenation and survival rates in mechanically ventilated patients with ARDS. Despite the evidences, the use of prone positioning in the intensive care units (ICUs) has often been limited or delayed by the physical challenges and associated risks such as inadvertent endotracheal extubation, hemodynamic instability, pressure injuries, and arterial and catheter dislodgements.



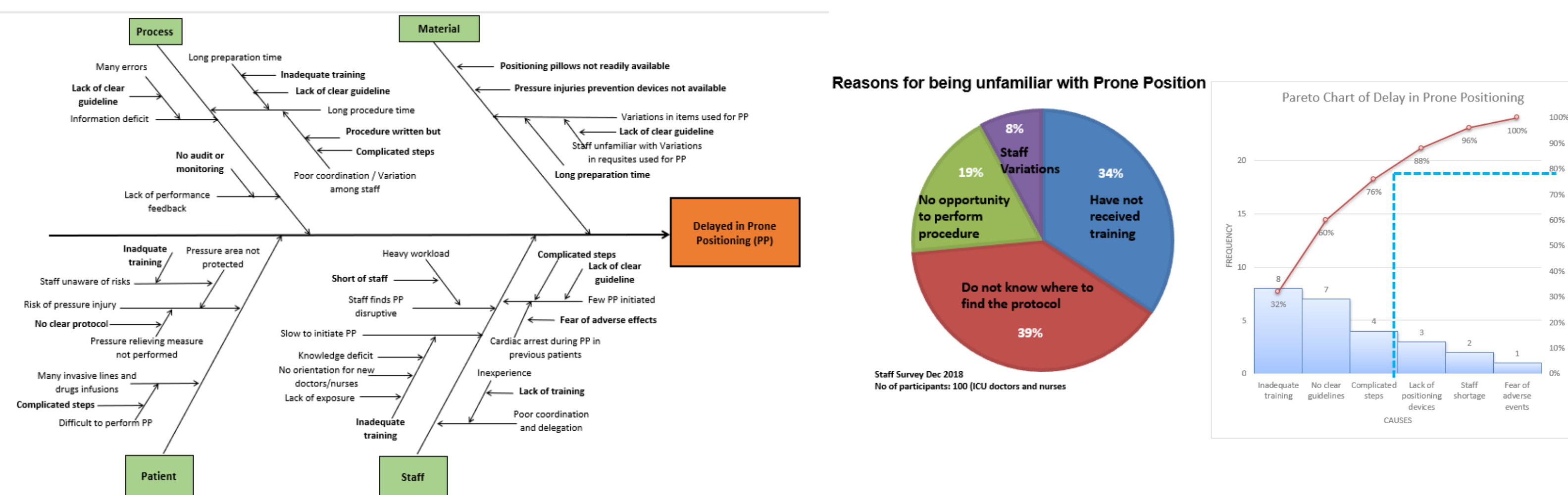
Aim

To reduce the time taken to implement PP by 50% within 12 months
 To reduce the incidence of pressure injuries by 90% within 12 months

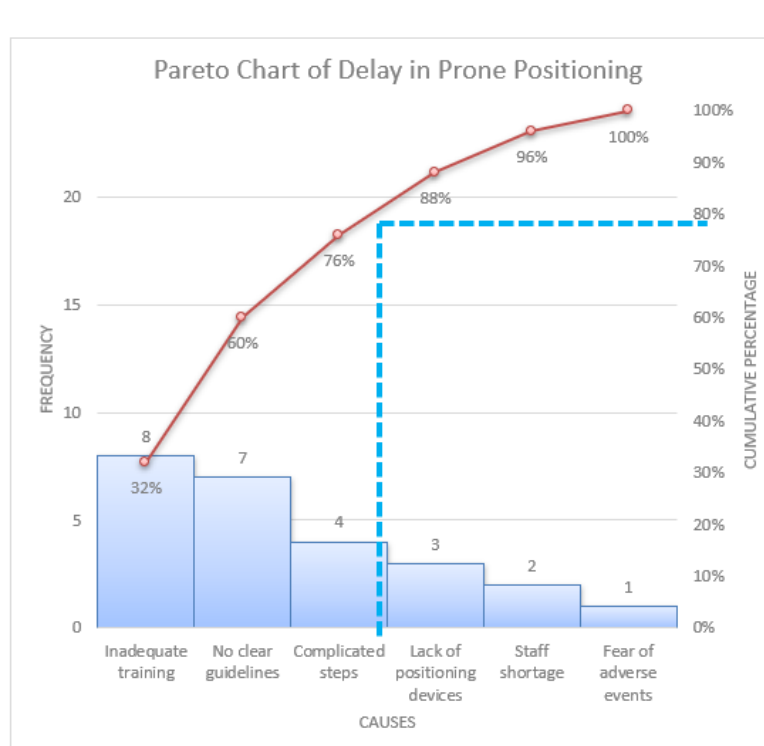
Methodology

A multi-disciplinary workgroup was formed. Support was obtained from senior administrators. The project was registered under SGH QIP and scoped to cover all ICUs.

Root cause analysis: Utilising cause-effect analysis, observing PP process, and obtaining feedback and survey from ICUs staff, potential root causes of delay in initiation, safety gaps, procedure time, complications and pressure injuries were identified.



Reasons for being unfamiliar with Prone Positioning



Final solutions: Tree diagram and Prioritization matrix to develop the final solutions

Aim of project	Root causes	Specific Solutions	Column #1	Column #2	Column #3	Column #4	Total Score
Staff training	Lack of clear guideline information deficit	Online didactic lecture	4	2	5	5	17
		Training videos	4	2	5	5	17
		Simulation drills	3	3	4	4	14
Standardize	Lack of clear guideline information deficit	Clear protocols	5	5	5	5	20
		Prepare algorithm to guide initiation and termination of PP	5	5	5	5	20
		Videoconference manual make available to staff	5	5	5	5	20
Positioning steps	Lack of clear guideline information deficit	Collate available positioning products to staff	3	1	3	3	10
		Standardize the steps for PP	5	3	5	5	18

3 Plan-Do-Check-Act (PDCA) cycles implemented

PDCA 1 : Guidelines, protocol, checklist and algorithm to guide and standardize practice

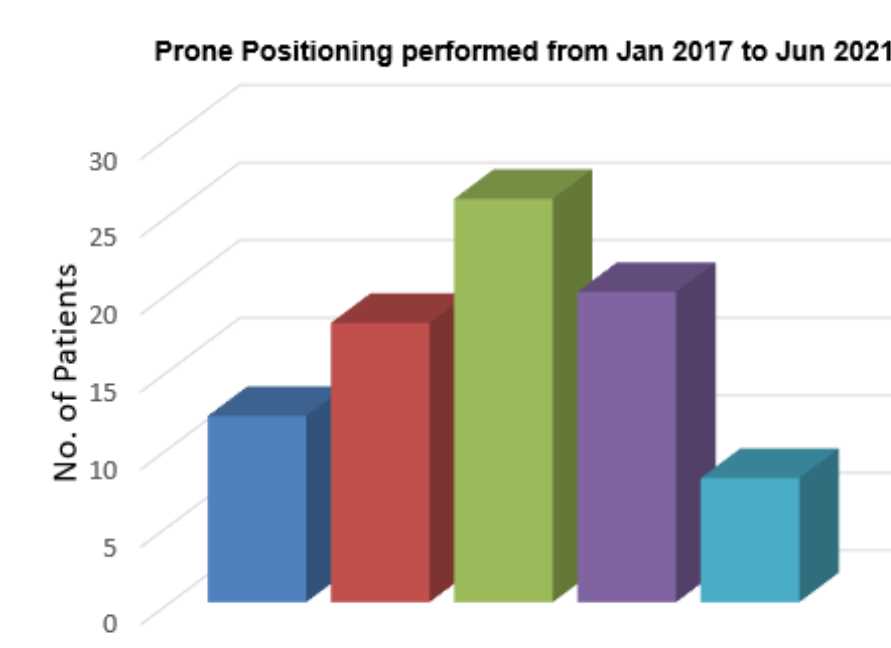
PDCA 2 : Simplifying the PP steps, online learning, videos and simulation training

PDCA 2 : Trial of commercial prone devices, multidisciplinary procedure and crisis simulation training



PDCA 3 : Communications, roadshows, audits and yearly competency to sustain improved PP care

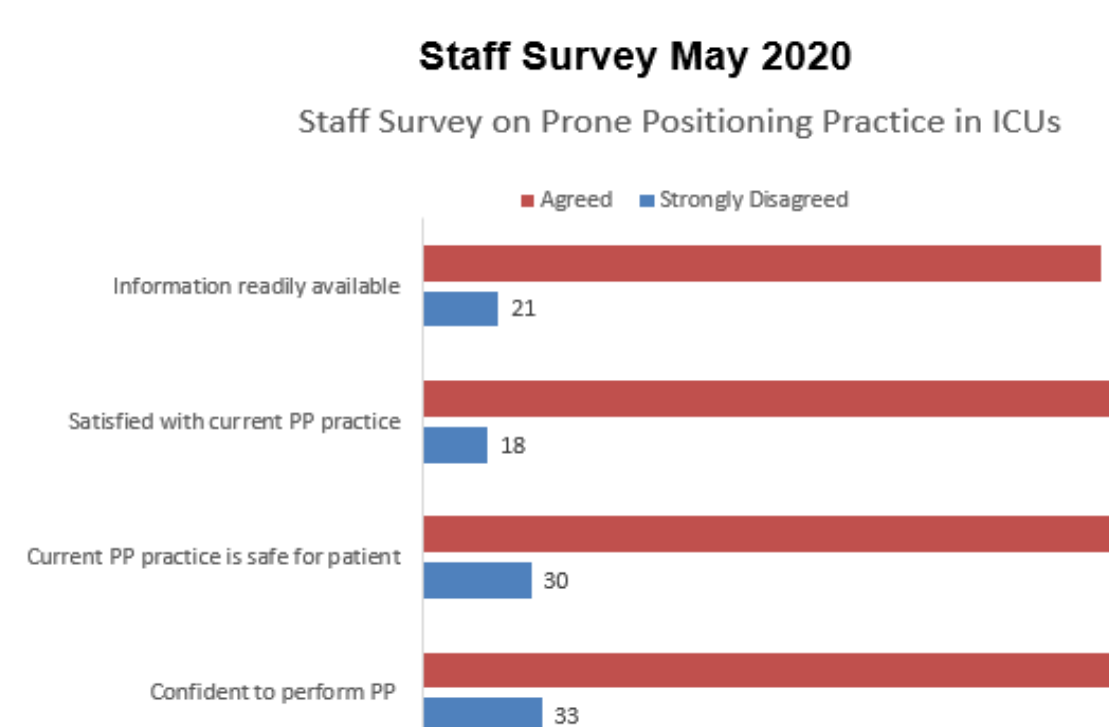
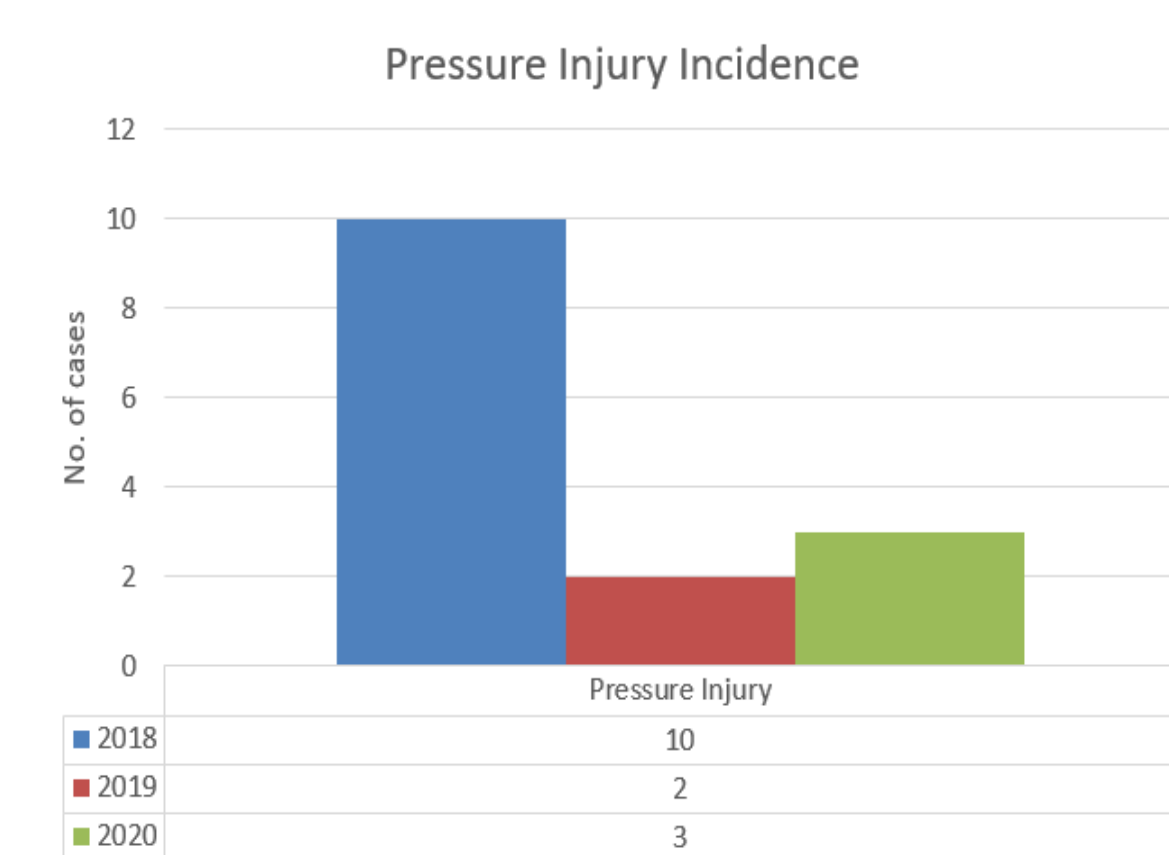
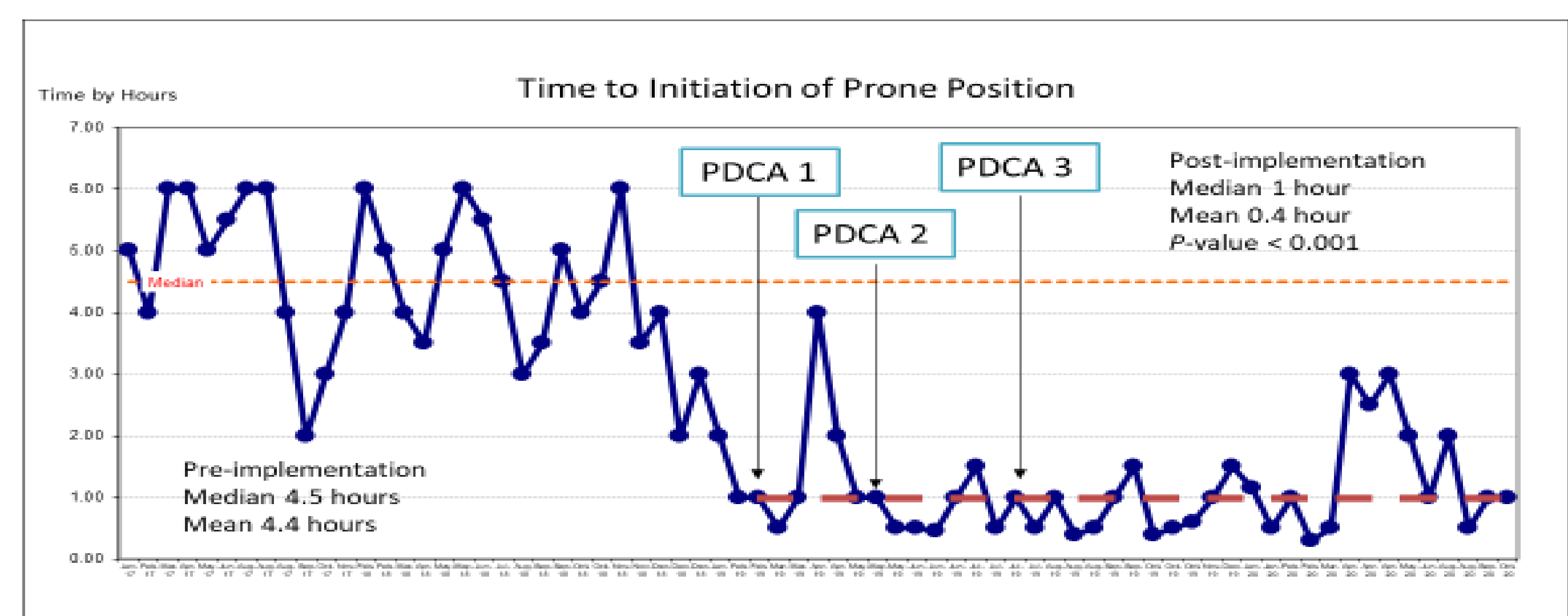
Results



- Yearly increment in numbers of patients on prone position
- 46 patients from Jan 19 to Dec 20 vs 30 patients from Jan 17 to Dec 18

Preparation and Procedure Time for PP

	Pre-implementation (Hour)	Post-implementation (Hour)	P-value
Preparation Time (Mean)	0.91	0.28	p-value <0.05
Procedure Time (Mean)	0.5	0.2	p-value >0.05



- Median initiation time reduced from 4.5 hrs to 1 hr
- Mean preparation time reduced from 0.91 hrs to 0.28 hrs
- Incidence of pressure injuries reduced by 50%
- Potential cost-saving of \$27,280 or \$5,456 for each pressure injury prevented
- Overall, staff were satisfied with current PP practice and felt confident and safe to PP

Conclusion

Prone positioning helps improve oxygenation and lung recruitment in patients with ARDS. During COVID-19 pandemic, prone positioning was widely used as a low-cost effective way of saving patients' lives. Our project came in time to prepare the ICU teams and train the deployed staff assigned to ramp up ICU capabilities. Combining forces with all intensive care units at SGH, our team developed a systematic approach to perform prone positioning in a safe manner. Together as a big team, we were able to overcome the challenges and associated risks with it. ICU teams' knowledge, skills and confidences to perform prone positioning were greatly enhanced. Early initiation of therapy was achieved.

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