Project Title

Safety Without Restraints in Surgical Intensive Care Unit (SICU) (Sustainability Phase)

Project Lead and Members

Project lead: Yang Xuelian

Project members: Li Qin, Wang Lin, Rasidah, Lee Pei Khim, Jaclyn Chow, Xu Min Ling

Organisation(s) Involved

Tan Tock Seng Hospital

Healthcare Family Group(s) Involved in this Project

Nursing, Allied Health

Applicable Specialty or Discipline

Surgical Intensive Care Unit, Physiotherapy

Project Period

Start date: Aug 2018

Completed date: Mar 2021

Aims

To reduce the inappropriate use of wrist-restrainers for intubated surgical patients in TTSH SICU from 41% to 15% over a sustained period

Background

See poster attached/ below

Methods

See poster attached/ below

Results

See poster attached/ below

Lessons Learnt

See poster attached/ below

Conclusion

See poster attached/ below

Additional Information

Accorded the NHG Quality Day 2022 (Category A: Improving and Sustaining Quality & Safety) Merit Award

Project Category

Care & Process Redesign

Quality Improvement, Lean Methodology, Value Based Care, Safe Care

Keywords

Decision Wheel, Restraint Use

Name and Email of Project Contact Person(s)

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Safety Without Restraints in Surgical Intensive Care Unit (Sustainability Phase)

Tan Tock Seng HOSPITAL
National Healthcare Group

Ms Yang Xuelian, Ms Li Qin & Mr Wang Lin
Ward 3B

National Healthcare Group
Adding years of healthy life

Mission Statement

To reduce the inappropriate* use of wrist-restrainers for intubated surgical patients in TTSH SICU from 41% to 15% over a sustained period

Inclusion Criteria: Patient who is alert, able obey comments, not confused.

Exclusion Criteria:

- CAM ICU +ve
- RASS > +2 (Patients in Confused & Agitated State)
- Nasal intubation; Intubation grade >3

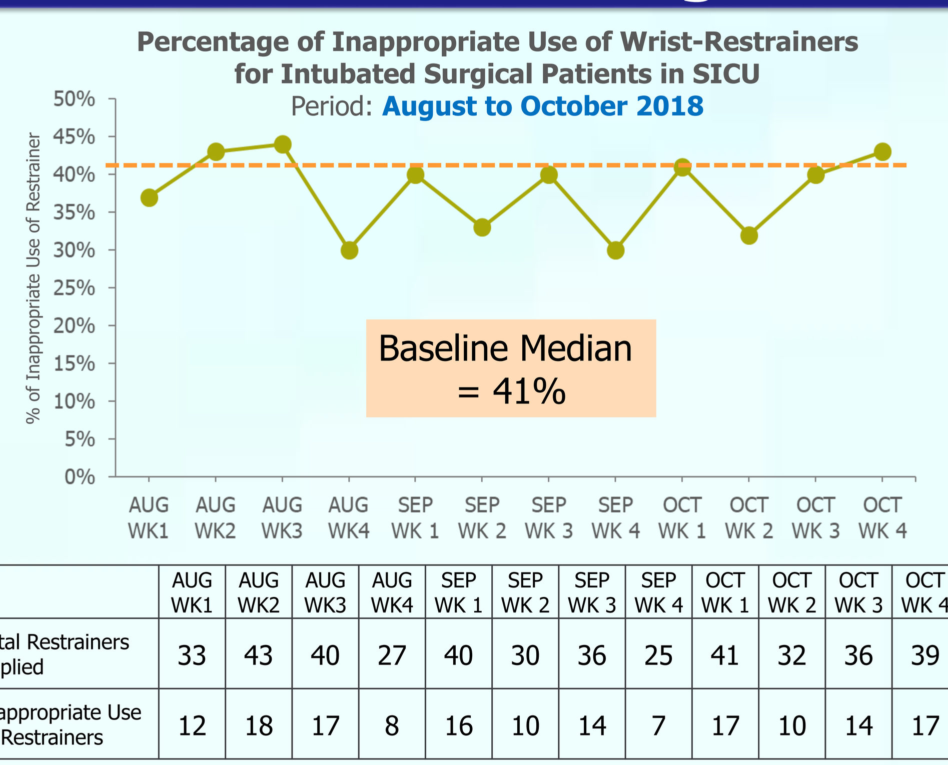
Team Members

	Name	Designation	Department
Team Leader	Yang Xuelian	Nurse Clinician	Previous: SICU Current: Ward 6D
Team Members	Li Qin	Senior Nurse Clinician	SICU
	Wang Lin	Assistant Nurse Clinician	Previous: SICU Current: Ward 6A
	Rasidah	Senior Staff Nurse	SICU
	Lee Pei Khim	Senior Staff Nurse	SICU
	Jaclyn Chow	Physiotherapist	Physiotherapy
	Xu Min Ling	Assistant Nurse Clinician	SICU

Sponsors: Dr Nelson Chua & Ms Tay Meow Hoon

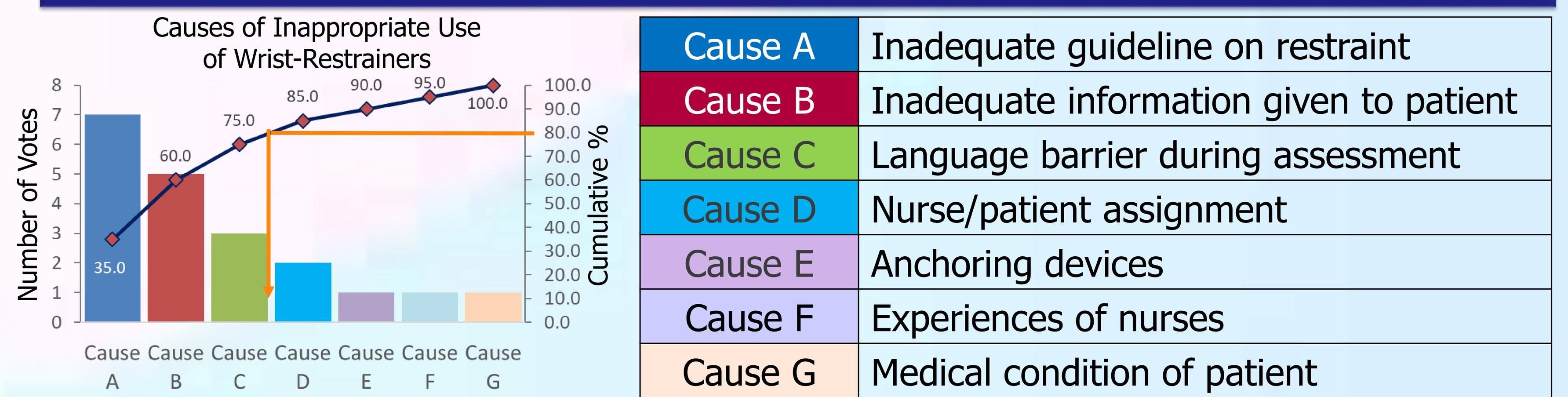
Evidence for a Problem Worth Solving

- In Africa, Langley, Schmollgruber & Egan (2011) reported in their qualitative study that 48.9% of the ICU patients were restrained.
- Kooi et al. (2015) in their study conducted in Netherlands also found out that 23% of the patients are restrained.
- Martin & Mathisen (2005) in their bilcultural study discovered that restraints used in the United States is 39 out of 109 patients (36%), however **0 restrainer use in Norway.**



	AUG WK1	AUG WK2	AUG WK3	AUG WK4	SEP WK 1	SEP WK 2	SEP WK 3	SEP WK 4	OCT WK 1	OCT WK 2	OCT WK 3	OCT WK 4
Total Restrainers Applied	33	43	40	27	40	30	36	25	41	32	36	39
Inappropriate Use of Restrainers	12	18	17	8	16	10	14	7	17	10	14	17

Pareto Chart

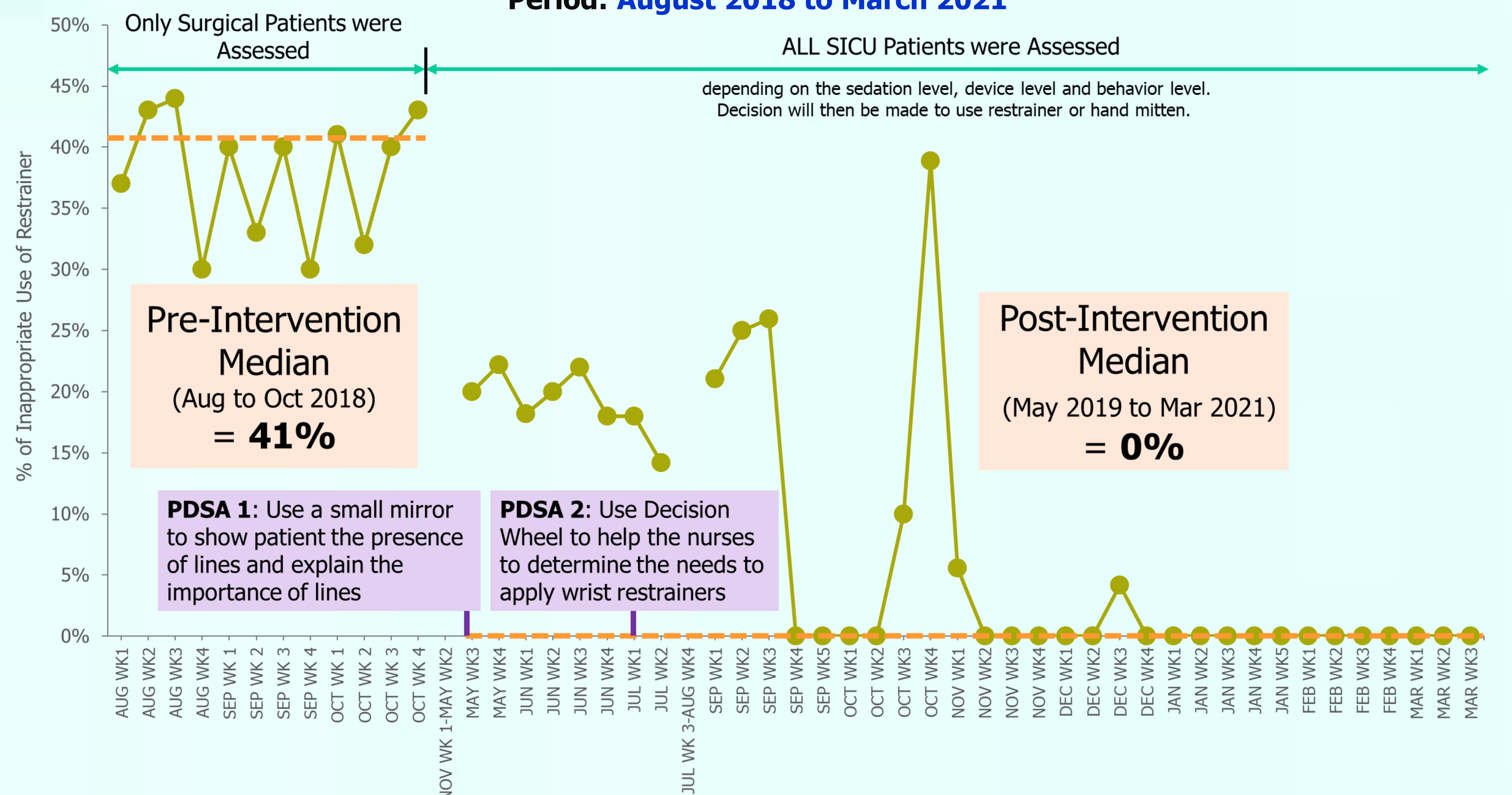


Cause A	Inadequate guideline on restraint
Cause B	Inadequate information given to patient
Cause C	Language barrier during assessment
Cause D	Nurse/patient assignment
Cause E	Anchoring devices
Cause F	Experiences of nurses
Cause G	Medical condition of patient

Implementation

Root Cause	Intervention	Implementation Date
Cause B: Inadequate information given to patient	**PDSA 1**: Use a small mirror to show patient the presence of lines and explain the importance of lines	20 May 2019
Cause A: Inadequate guideline on restraint	**PDSA 2**: Use Decision Wheel to help the nurses to determine the needs to apply wrist-restrainers	1 July 2019

Results



	Year 2018 AUG WK 1	AUG WK 2	AUG WK 3	AUG WK 4	SEP WK 1	SEP WK 2	SEP WK 3	SEP WK 4	OCT WK 1	OCT WK 2	OCT WK 3	OCT WK 4
Total Restrainers Applied	33	43	40	27	40	30	36	25	41	32	36	39
Inappropriate Use of Restrainers	12	18	17	8	16	10	14	7	17	10	14	17

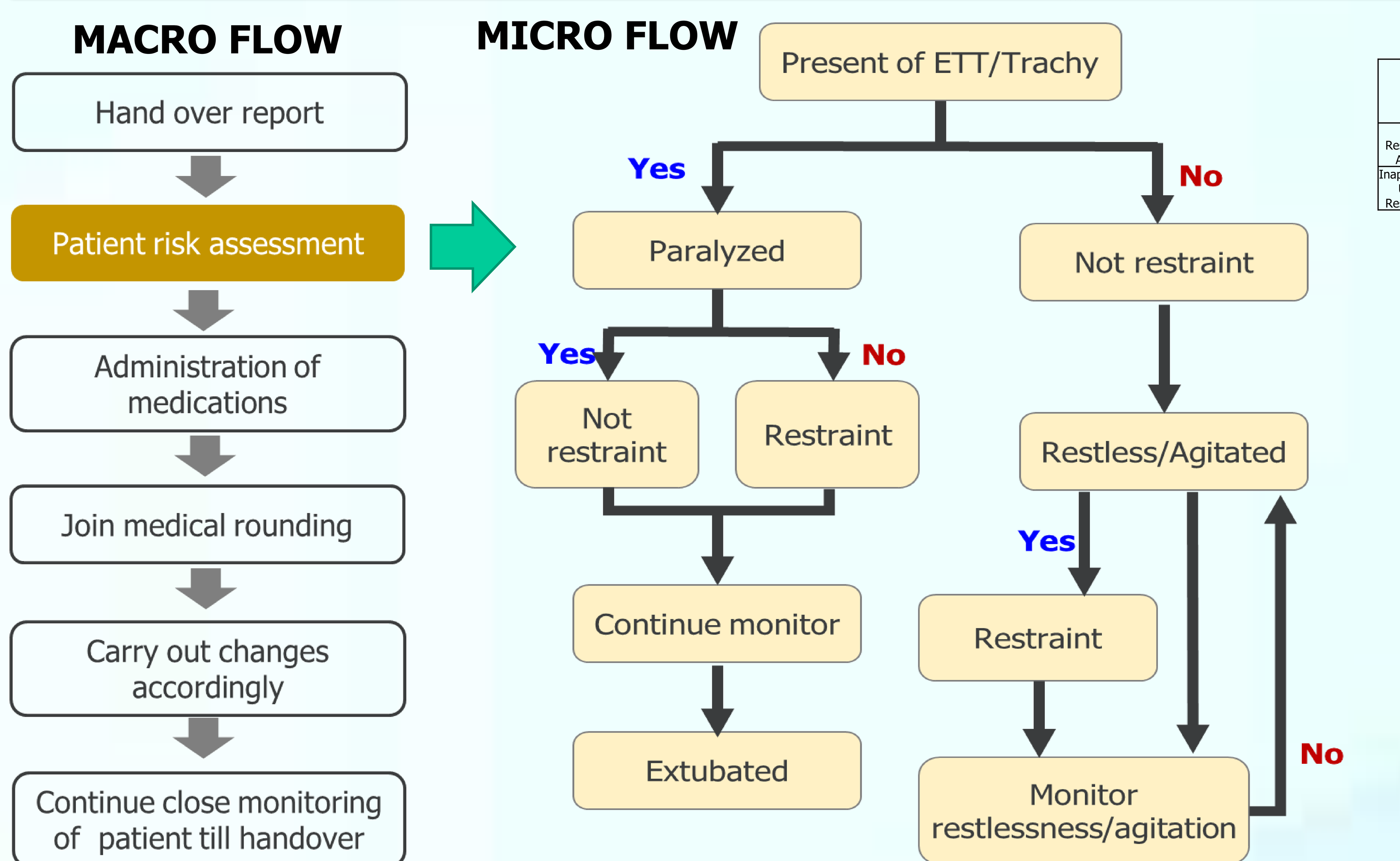
	Year 2019 MAY WK 3	MAY WK 4	JUN WK 1	JUN WK 2	JUN WK 3	JUN WK 4	JULY WK 1	JULY WK 2
Total Restrainers Applied	17	19	17	18	19	14	16	13
Inappropriate Use of Restrainers	3	4	3	4	4	3	3	2

	Year 2020 SEP WK 1	SEP WK 2	SEP WK 3	SEP WK 4	SEP WK 5	OCT WK 1	OCT WK 2	OCT WK 3	OCT WK 4	NOV WK 1	NOV WK 2	NOV WK 3	NOV WK 4	DEC WK 1	DEC WK 2	DEC WK 3	DEC WK 4
Total Restrainers Applied	19	24	27	15	9	3	6	10	18	18	16	18	19	15	21	24	18
Inappropriate Use of Restrainers	4	6	7	0	0	0	0	1	7	1	0	0	0	0	0	1	0

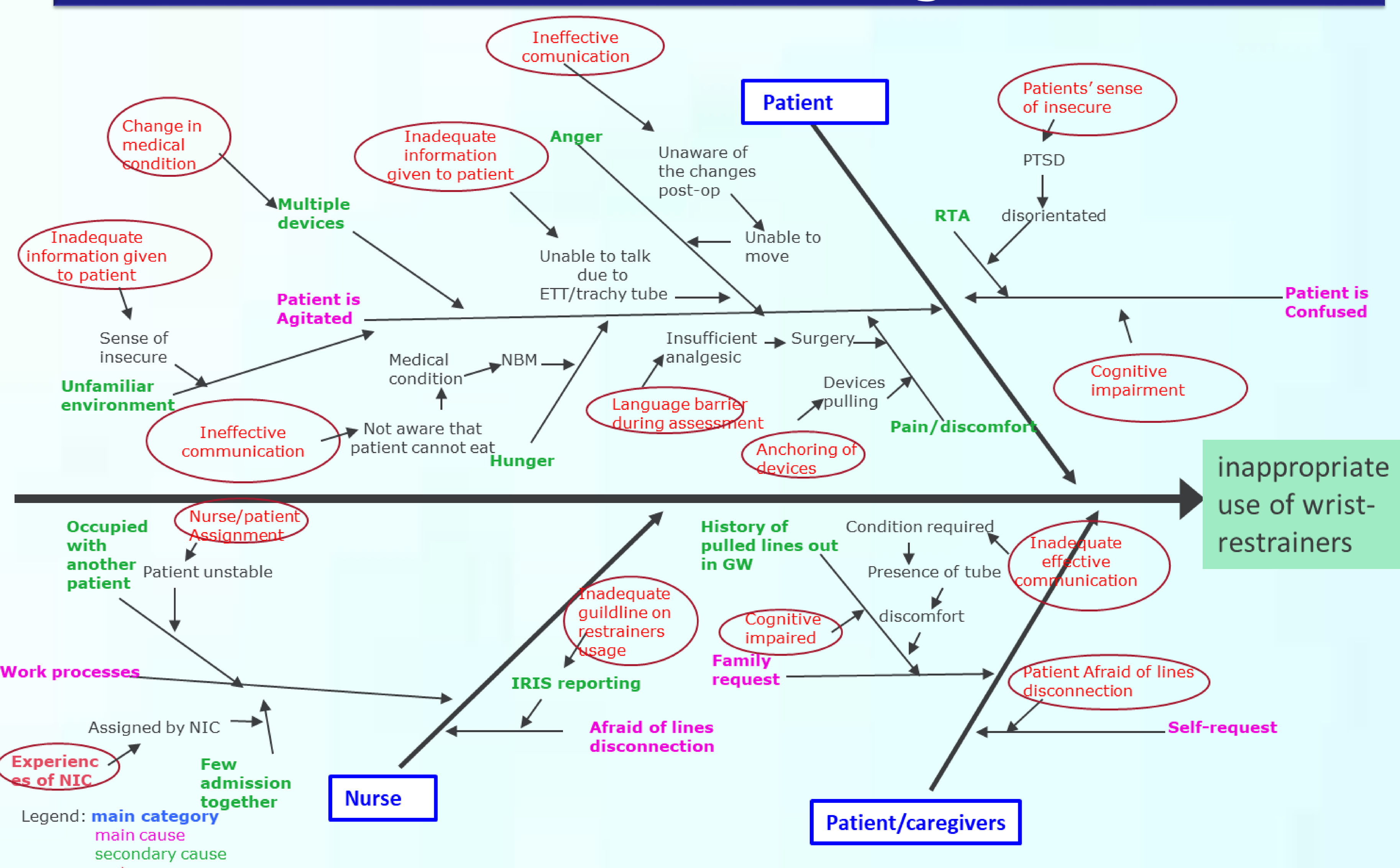
	Year 2021 JAN WK 1	JAN WK 2	JAN WK 3	JAN WK 4	JAN WK 5	FEB WK 1	FEB WK 2	FEB WK 3	FEB WK 4	MAR WK 1	MAR WK 2	MAR WK 3
Total Restrainers Applied	19	7	21	8	10	18	18	16	17	23	16	27
Inappropriate Use of Restrainers	0	0	0	0	0	0	0	0	0	0	0	0

Since April 2021 onwards, the interventions have been incorporated as part of Ward 3B daily workflow. Compliance to all interventions was ensured with regular briefing and roll calls. Sampling audits will be carried out to see if interventions are ongoing and results sustained. PDSA cycles will kick in to make refinement to the existing intervention when necessary.

Flow Chart of Process



Cause and Effect Diagram



Cost Savings

	Pre-Intervention (Aug to Oct 2018)	Post-Intervention (Jan to Mar 2021)
Average No. of Restrainers Applied (Per Week)	35	17
Median % of Inappropriate Use of Restrainers	41%	0%
No. of Inappropriate Restrainers Used	14	0
Restrainer Cost + Nursing Manhour Cost	(14 x $35) + (14 x $0.97 x 6) =$571.48	$0
Potential Cost Avoidance of inappropriate use of Retrainers (Per Week)	571.48 – 0 = $571.48	
Potential Cost Avoidance of inappropriate use of Retrainers (Per Month)	571.48 x 4 = **$2,041.48**	
Potential Cost Avoidance of inappropriate use of Retrainers (in 1 Year)	441.48 x 12 = **$23,601.48**	

Note: Each pair of restrainer cost = $35; Number of minutes required to apply restrainers to patient by nurse = 6 mins; Weighted Ave Cost per min for Senior Staff Nurse = $0.97

Lessons Learnt

1. Assessing the need for restraints, multiple approach will enhance nurses' decision making process.
2. Appropriate interventions are required to improve patient outcomes
3. ICU nurses must keep vital therapies intact while maintaining human dignity

Strategies to Sustain

1. To educate patients at pre-operation phase (to tell in advance - show video that patients will have tube in their mouth etc.)
2. Involve relatives during their visitation period, to encourage them to interact with patient, like holding hands, off restrainers if they are around.
3. Explore more alternatives instead of physical restraint, like simple activities to occupy patients' mind.
4. Nurses to change mindset