

"Time to Take the Pressure Off" : Reducing Facial Pressure Injuries From Non-Invasive Ventilation (NIV) (Sustainability Phase)



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Mission Statement

To reduce the prevalence for facial pressure injuries related to Non-Invasive Ventilation (NIV) in ICU/HDU patients from 5% to 2.5% (50%) reduction) over a sustained period

Team Members						
	Name	Designation	Department			
Team Leader	Lim Voon Ping	Senior Nurse Clinician	NCID ICU			
ream Leader	Joel Quek Wee Teck	Assistant Nurse Clinician	NCID ICU			
Team	Tneh Yu Xuan	Senior Staff Nurse	NCID ICU			
Members	Vincy Mathew	Senior Staff Nurse	NCID ICU			
	Lucius Tan Ren Jie	Senior Staff Nurse	NCID ICU			
	Chan Cui Peng	Senior Staff Nurse	NCID ICU			
	Rommel Jude Tambot De Guzman	Senior Respiratory Therapist	Respiratory Therapy			
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	Muhamed Maliki Bin Mohamed Nasir	Assistant Nurse Clinician	Nurse Clinician Specialty			
	Helen Hii Shiu Sing	Senior Patient Service Associate	NCID ICU			

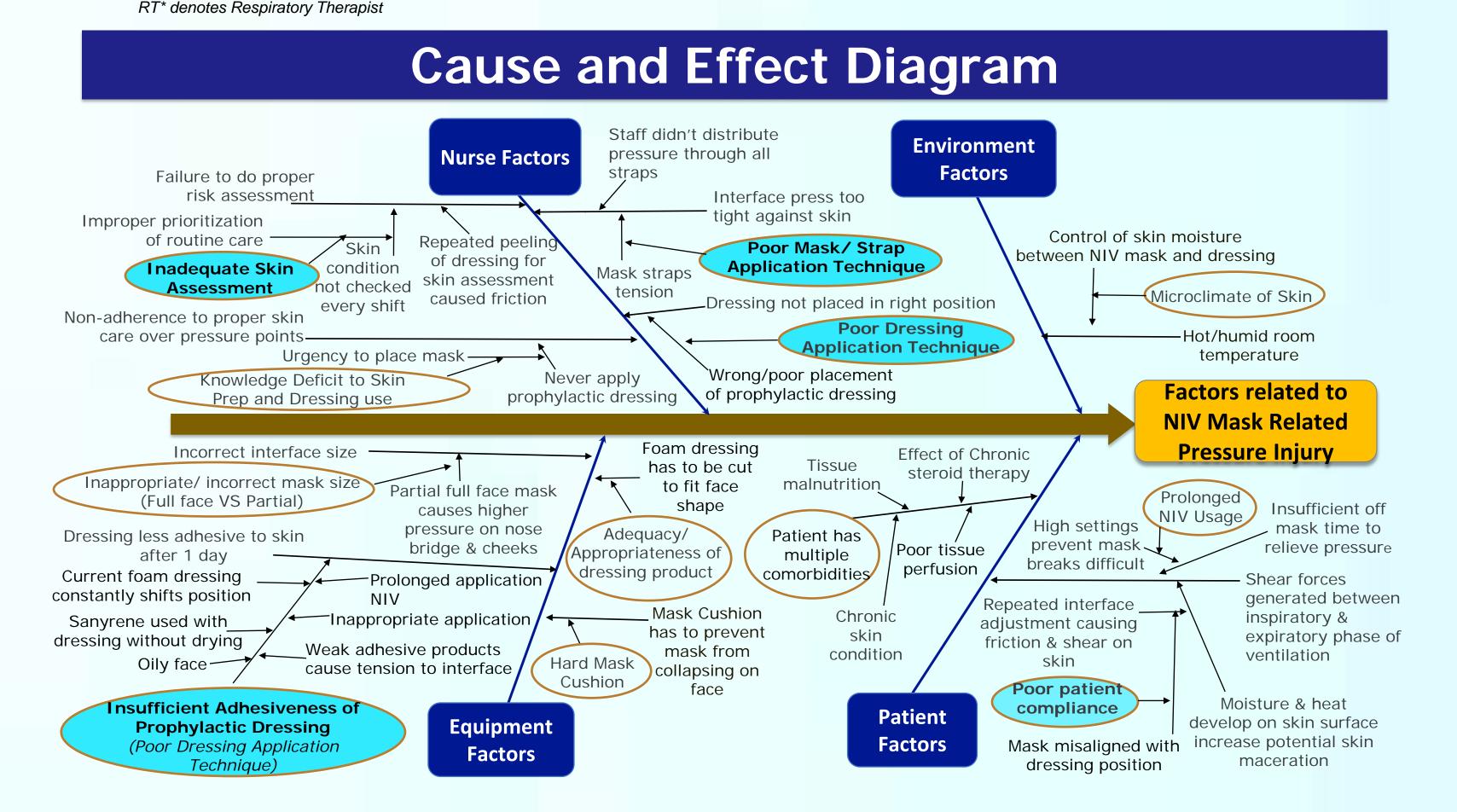
Sponsors: Dr Benjamin Ho & Ms. Lorraine Tan

Evidence for a Problem Worth Solving

- The current foam dressing (Mepilex foam) is the standard prophylaxis dressing for NIV interfaces
- With new innovations, other protective dressings have been made available in the market incorporating less-pain contact layer with silicone adhesion technology and at a cost-effective price
- Feedback from staff on current prophylaxis dressing used with NIV interface:
 - Ineffective in preventing PIs due to the dressing less adhesiveness to skin
- With repeated NIV mask adjustments, it causes a lot of friction and shear
- The need to consider using other prophylactic measures to reduce pressure injuries from face mask interfaces

Baseline Data Of Facial	Year	Pts on NIV	Staging	Total	%		
Pressure Injuries	Jun 2020		Stage 1	2	27, 407	Right Ear (N=1) Nose Bridge (N=1)	
	(1st COVID	11	Stage 2	1	36.4%	Cheeks with forehead (N=1)	
	Surge)		Deep Tissue Injury	1		Nose Bridge (N=1)	
Pre-Intervention		27	Stage 1	2	11.1%	Nose Bridge (N=1)	
Median = 5%	Sep 2020					Cheeks (N=1)	
			Stage 2	1		Nose Bridge (N=1)	
	Jan – Mar 2021	28	Stage 1	5	17.9%	Nose bridge (N=4)	
	Jan – Iviai 2021	Nose bridge & Ear (N=		Nose bridge & Ear (N=1)			

Flow Chart of Process **MACRO FLOW** MICRO FLOW Doctor order to start NIV Total full face mask Monitor skin condition RN informs RT* (for NIV initiated from every shift Use Mepilex Border Flex RT prepares machine & selects appropriate Full face mask mask interfaces Lite dressing Skin assessment: Check for facial Assess patient physical & functional Performs skin RN performs risk review and skin preparation risk factors & any influences to trauma, abrasion/laceration, skinpreparation wound healings related disease, known pressure injury Skin care (Perform Daily) relieve pressure off as tolerate by Ensure skin is dry & relatively oil free RN applies prophylaxis dressing on pressure point area Do not apply Linovera before applying correctly continue to monitor till end of the Monitor tolerance to File PRISM if redness not resolved RT initiates NIV Reinforce Dos & Don'ts during Patient/ Inform NO on duty Family education Staff re-education as Document in Nurse to nurse RN monitors skin condition every shift monitoring form Handover required

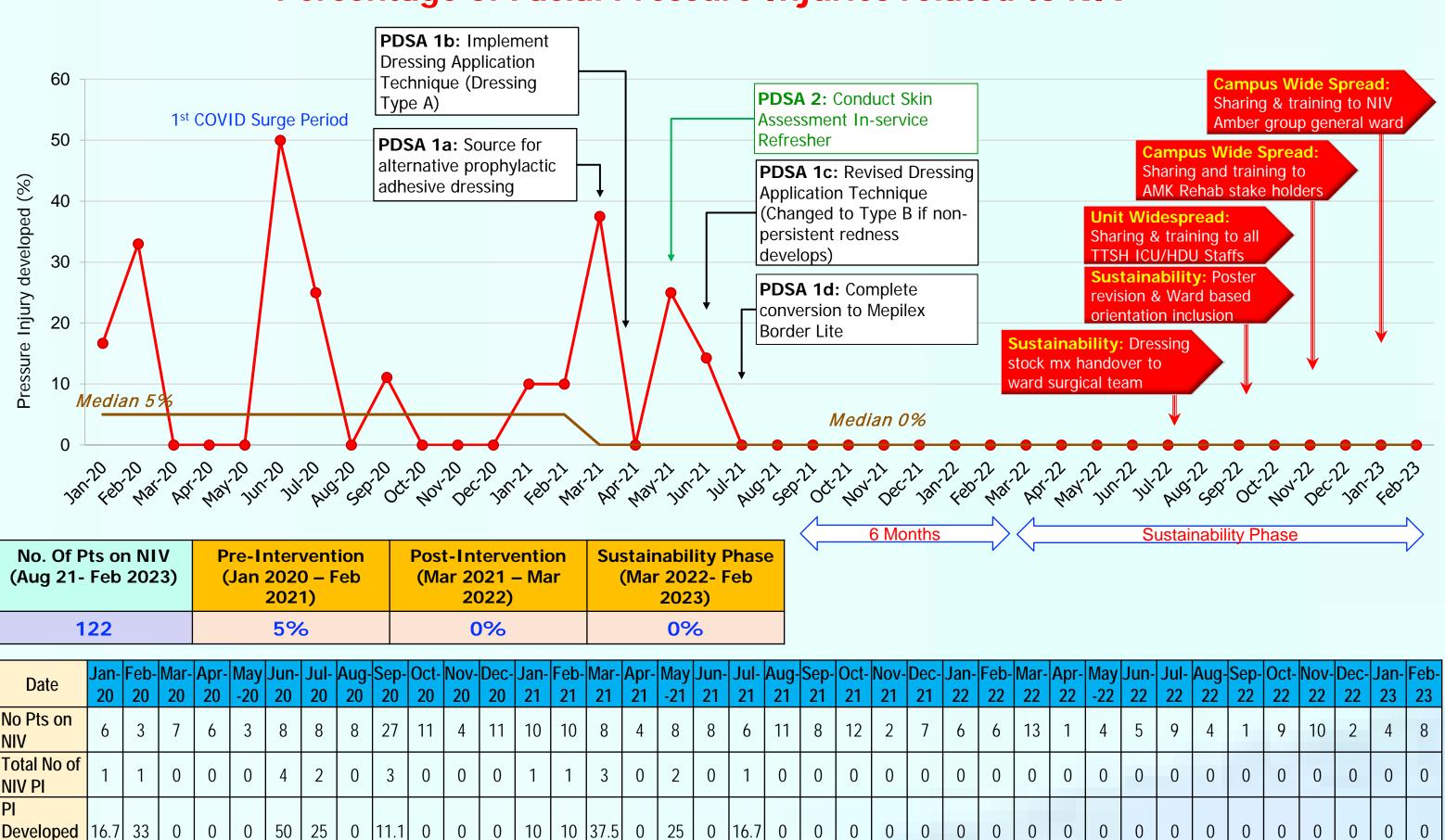


Pareto Chart Poor Dressing Adhesiveness and Cause 1 **Application Technique** Inadequate Skin Assessment Cause 2 Poor Mask/Strap Application Cause 3 Technique Cause 4 Poor Patient Compliance

High Rate of NIV Related Pressure Injury Sustainability & Spread IMPLEMENTATION DATE **STRATEGY INTERVENTION TYPE Sustainability** Poster revision and inclusion of project in ward based Mepilex-Border Flex Lite Dressing (ME-BOLD) (OICU Ward orientation for new staff **Application for NIV Mask** Poster revised for clarity and teaching video created Specific) 12 September 2022 Requisites: 3 pieces of (12.5cm X 5cm) in preparation for unit wide spread Inclusion in ward based orientation syllabus for new Ensure skin is dry and relatively oil free ward nurses O Not apply Linovera before applying dressing Dressing stock management handover to ward surgical stores team Step 2 Step 3 Step 1 26 July 2022 Monitoring usage and ordering of dressing stock to be done by ward surgical stores team instead of project team Unit Wide (All ICUs/HDUs): Spread Project sharing with Nursing Officers & Conduct of Unit Wide staff training 16 September 2022 Adoption of project across all TTSH ICUs/HDUs with nursing as the primary driver •Training for nurses done via Zoom Trim ME-BOLD adhesive Place dressing over the Snip the edge if required Campus Wide (TTSH Ang Mo Kio Rehabilitation to avoid sticking on the area as required prior nose-bridge and cheek Ward): placing it on forehead Project sharing & adaptation planning with unit stakeholders & conduct of 'Train the Trainers' **ATTENTION: ATTENTION:** Step 4 30 November 2022 Adoption of project with tweaks after discussion with unit stakeholders to cater to unique considerations •Train the Trainers' session done face-to-face Campus Wide (NIV Amber Group General Wards): Project sharing & adaptation planning with unit stakeholders. Conduct of 'Train the Trainers' 31 January 2023 Pilot trial of project in NIV ember group general Repeat Step 2 & 3 on the **Ensure sufficient** DO NOT cut the wards with respiratory therapy as the primary driver cushioning part other side of the cheek by overlapping of dressing supported by nursing overlapping it on the nose-To trim the sides before across nose-bridge •Train the Trainers' session done face-to-face with peeling the plastic cover. bridge respiratory therapy & nursing

Results

Percentage of Facial Pressure Injuries related to NIV



	Actual Cos	st Savi	ngs				
	BEFORE		AFTER				
Product Description	Mepilex Foam (10 x 10	0 cm)	Mepilex Border Flex Lite (12.5 X 5 cm)				
Cost (per piece)	\$4.80		\$3.78				
Total Cost Per Patient (Average 3 days application)	\$4.80 x 3 (Average daily change based on previous practice)	\$14.40	\$3.78 x 3 (3pcs upon initiation, dressing kept till 7 days)	\$11.34			
Man-hour Cost^	\$0.97 x 10 x 3	\$29.10	\$0.97 x 10	\$9.70			
Man-hour Required	10 mins x 3 = 30 minutes		10 minutes				
Time Savings (Per patient)	30 - 10 = - 20 minutes (20 X \$0.97 = - \$19.40)						
Total Cost (Per Patient)	\$43.50		\$21.04				
Difference in Cost	\$21.04 - \$43.50 = - \$22.46						
Average Patient on NIV (Per Month)	70 patients on NIV over last 12 months : 70 ÷ 12 = 5.83 (6 patients) (March 22 – February 23)						
	Based on average 6	patients per m	nonth				
Cost Savings (Monthly)	- (\$19.40 + \$22.46) x 6 = - \$251.16						
Cost Savings (Annualized)	- \$251.16 x 12 = - \$3013.92						
Potential Time Savings	20 minutes x 6 x 12 = 1440 minutes (24 hours)						
^ Number of minutes required to ap	oply dressing by nurse = 10mins; W	eighted Ave Cost	per min = \$0.97				

of fillilates required to apply dressing by flarse – forfills, weighted Ave Cost per filling

- Interventions for successful sustainability
- Indoctrination of project into ward standard of practice Training a larger pool of trainers to incorporate project training into ward-based orientation for new nurses

Lessons Learnt

- Savour the journey, and it's not just about KPIs Trusting others to carry on good work and handling over crucial processes to ward staff responsible for assignment
- 2. Frequent auditing and immediate correction are a project main stay; from implementation through to sustainability
- 3. Spread the project goes beyond simple "copy & paste"
 - Adaptations required
 - Multiple units have the same problem, but each has unique considerations
 - Discussion with unit stake holders required to understand considerations and tweak project implementation accordingly
- 4. Our lessons learnt is crucial to successful project adoption in other units