



Use of Silicone Foam Dressing in the Prevention of Sacral And Coccygeal Pressure Injuries in Critical Care Settings

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Pressure Injury Prevention Strategies



Photos: courtesy of Connie Lee



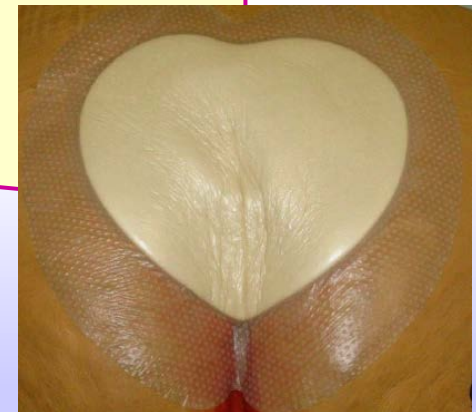
Role of dressing materials in pressure injury prevention



Reference	Setting	Anatomical location(s) reported	Intervention group	Control group	Main results
Johnstone and McGowan ²⁸ (2013)	CCU	Sacrum	Mepilex Border Sacrum plus standard PU prevention measures	Standard PU prevention measures	<ul style="list-style-type: none"> Lower PU incidence in intervention group: <ul style="list-style-type: none"> Intervention: 0/75 (0%) Historical comparison: 3/20 (15%) - 9/20 (45%) over a 3-month period (no. of PUs not reported)
Lientz ²⁷ (2013)	CCU/ICU/OR	Sacrum	Mepilex Border Sacrum plus standard PU prevention measures	Standard PU prevention measures	<ul style="list-style-type: none"> PU incidence in intervention group: 0/56 (0%) PU rate in historical control group: 5/year (no. of PUs not reported)
Castellino et al. ⁴⁵ (2012)*	ICU	Sacrum	Mepilex Border Sacrum plus standard PU prevention measures	Standard PU prevention measures	<ul style="list-style-type: none"> Lower PU incidence in intervention group: <ul style="list-style-type: none"> Intervention: 0/71 (0%) Historical comparison: 16.7% (no. of patients and PUs not reported)
Chalker ²⁵ (2012)	ICU	Sacrum	Mepilex Border Sacrum plus standard PU prevention measures	Standard PU prevention measures	<ul style="list-style-type: none"> PU incidence in intervention group: 5/275 (1.8%) PU prevalence in historical control group: 13.6% (no. of patients and PUs not reported) Classification of PUs: <ul style="list-style-type: none"> Intervention category/stage II (n=2), SDTI (n=3)

Effectiveness of multi-layer silicone foam dressing in the prevention of pressure injury

- *Displace friction to the outer layer of dressing*
 - *Enhance tissue tolerance to pressure*
 - *Absorb moisture*
- *Relieve local shear forces*



Kiely⁴⁶ (2011)
Walsh et al.²⁹ (2011)
Cano et al.⁴⁷ (2011)
Koerner et al.⁴⁸ (2011)
Gentry and Wright⁴⁹ (2010)
Muldoon et al.³⁰ (2010)

AIM

The purpose of this study is to investigate the clinical efficacy of multi-layer silicone foam dressings in reducing *sacral and coccygeal pressure injury incidence rate* as compared to standard preventive interventions in *critical care settings (ICU and HDU)*.

IRB Approval

Approval from Institutional Review Board of the University of Hong Kong/ Hospital Authority Hong Kong West Cluster was granted.

Methodology

Observation period

Baseline of PI incidence rate was obtained (Norton score ≤ 14)

Intervention period

All patients with Norton score ≤ 14

Application of Silicone Foam Dressing over sacral and coccygeal area

Examined by nurses daily

Changed every 3 days or soaked by urine or feces

Continue all routine pressure injury prevention measures

Terminated when

Develop stage 1 or above pressure injury

48 hours after patient discharged from critical care setting

Norton score > 14 during revision

Patient characteristics and study variables

Variable ^a	Overall (N=471)	Control group (N=278)	Intervention group (N=193)	P-value
Initial Norton score – mean ± SD				
(10-14)	12.28 ± 1.33	12.23 ± 1.34	12.33 ± 1.32	0.485
(<10)	8.03 ± 0.96	8.00 ± 0.95	8.14 ± 1.00	0.444
Lowest Norton score –mean ± SD				
(10-14)	12.10 ± 1.33	12.01 ± 1.28	12.19 ± 1.37	0.223
(<10)	7.86 ± 0.99	7.88 ± 0.99	7.82 ± 1.01	0.700
Gender				
Male	292 (62.0)	175 (62.9)	117 (60.6)	0.630
Female	179 (38.0)	103 (37.1)	76 (39.4)	
Body mass index (BMI)	23.05 ± 4.60	23.14 ± 4.65	22.91 ± 4.54	0.607
Risk factors				
Diabetic Mellitus	82 (17.4)	49 (17.6)	33 (17.1)	0.902
Stroke	42 (8.9)	27 (9.7)	15 (7.8)	0.514
Cognitive impairment	17 (3.6)	7 (2.5)	10 (5.2)	0.139
Cardiopulmonary disease	271 (57.5)	166 (59.7)	105 (54.4)	0.257
Malignant disease	132 (28.0)	74 (26.6)	58 (30.1)	0.465
Hemodynamic unstable	166 (35.2)	100 (35.9)	66 (34.2)	0.769
Turning permissible	454 (96.4)	267 (96.0)	187 (96.9)	0.803
Current operation	209 (44.4)	119 (42.8)	90 (46.6)	0.451
Mattress				
Standard foam mattress	402 (85.4)	242 (87.1)	160 (82.9)	0.234
Special mattress	69 (14.6)	36 (12.9)	33 (17.1)	

^aCategorical data are expressed as number (%) and continuous data as mean ± standard deviation.

Patient characteristics and study variables

Variable ^a	Overall (N=471)	Control group (N=278)	Intervention group (N=193)	P-value
Age – years				
Mean ± SD	62.23 ± 17.15	60.25 ± 17.23	65.09 ± 16.67	0.002
Median (range)	64 (19-97)	62 (19-92)	67 (19-97)	
Nutrition support	250 (53.1)	163 (58.6)	87 (45.1)	0.005
Average length of stay (days) in ICU/HDU				
Mean ± SD	6.55 ± 10.11	5.67 ± 10.81	7.81 ± 8.88	0.024
Median (range)	4 (1-106)	3 (1-106)	5 (1-71)	

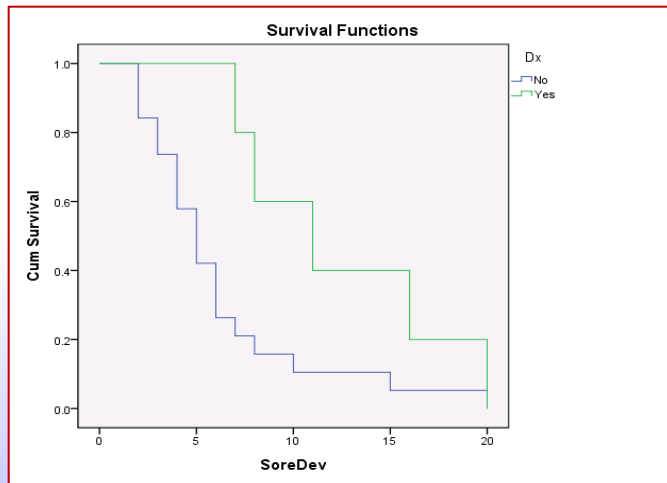
^aCategorical data are expressed as number (%) and continuous data as mean ± standard deviation.

Outcome variable

Outcome variable ^a	Overall (N=471)	Control group (N=278)	Intervention group (N=193)	P-value
Pressure injury staging				
Stage 1	11 (45.8)	8 (42.1)	3 (60.0)	
Stage 2	13 (54.2)	11 (57.9)	2 (40.0)	
Stage 3	0	0	0	
Stage 4	0	0	0	
Unstageable	0	0	0	
Deep tissue pressure injury	0	0	0	
No. of patients who developed pressure injuries (incidence rate) ^b	24 (7.78)	19 (12.05)	5 (3.31)	0.04

^aCategorical data are expressed as number (%).

^b Incidence rate is calculated as "Number of new ulcers x 1000 / Number of patient bed days".



Equality of survival distributions by using Kaplan-Meier analysis

*Intervention group had resulted in **72.5%** reduced risk of pressure injury development (p=0.04).*

Conclusion and Recommendation

- In this study, the average application of multi-layer silicone foam dressing was around *1.96 pcs per patient* with Norton score ≤ 14 *within 5 days* and the incidence of pressure injury decreased by 72.5% ($p=0.04$).
- Clinicians should therefore consider the use of prophylactic foam dressings in the prevention of *pressure injuries* so as to further reduce the pressure injury incidence in critical areas.