Advocating for Evidence-Based Practice at the Critical Care Bedside: The Pressure Ulcer Prevention Study

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Purpose & Research Questions

1. Is there a difference in nurses' use of evidence-based pressure ulcer nursing practices in the PICU following the implementation of only Part I of the intervention (Educational Component of the PPUP) versus implementation of Part I and Part II (Innovative Components of PPUP)?
2. Is the change in nurses' use of evidence-based pressure ulcer prevention practices in the PICU sustained 6 months following completion of the PPUP?

Conceptual Framework

- The Ottawa Model of Research Use (Logan & Graham, 1998): foundation
- Social Learning Theory (Wenger, 1998): self-questionnaire & educational component
- The Socioecological Model (Stokols, 1992) & Multiple Intervention Framework (Edwards, Mills, & Kothari, 2004): interventional strategies at personal, unit & organizational levels

Methodology

- **Method:** Exploratory study; repeated measures design measured pre and post implementation of the PPUP
- **Sample:** Convenience, non-random sample (N= 48) of nurses in one Canadian PICU
- **Data Collection:** (1) Nurses' self reported use using the pressure ulcer prevention questionnaire (PUP) and (2) audited use of BPG nursing interventions collected by research nurse
- **Data Analysis:** Descriptive statistics; McNemar test.

Methodology

Time	Intervention and Data-Collection Activity
T1 (baseline)	• Collection of demographic data and baseline measures (self-reported/audited use of EBP) • Distribution to all eligible RNs
Part I (educational component) x 1 month √ independent learning activities (weekly article dissemination x 4, poster displays, FAQ sheet) √ group learning (standardized 1-hour didactic teaching session to all PICU staff)	
T2 (immediately after part I)	• Repeated measures (self-reported and audited use of BPG) • Distribution to all RNs who completed T1 questionnaire
Part II (innovative component) x 1 month √ unit-based champion (PICU Advanced Practice Nurse) √ hospital-based champion (Wound and Skin Care Specialist) √ introduction of practice tools and resources √ introduction of PICU standards of nursing care related to pressure-ulcer prevention	
T3 (immediately after part II)	• Repeated measures (self-reported and audited use of BPG) • Distribution to all RNs who completed T2 questionnaire
T4 (6 months after T3)	• Repeated measures (self-reported and audited use of BPG) • Distribution to all RNs who completed T3 questionnaire

RNAO BPG Interventions

1. Risk assessment using assessment tool
2. Risk assessment using risk assessment tool completed
3. Risk, including risk-assessment score discussed during rounds
4. Nutritional assessment considering risk for pressure ulcers completed
5. Consultation with dietitian initiated
6. Pressure-reducing or pressure-relieving support surface used
7. Lifting device used for patients too heavy to lift off mattress
8. HOB elevated to < 30 degrees
9. Q2 hourly turning schedule implemented
10. Head repositioned side to back to side Q2 hourly
11. Protective skin barrier applied over bony prominences if voluntary or involuntary movements lead to friction injury

PUP Questionnaire Example

Nursing Intervention	**IF IMPLEMENTED** fill in the circle for the following statements that indicates your reason(s) for implementing this intervention. If none of these reasons apply, feel free to write in your explanation.	**IF NOT IMPLEMENTED** fill in the circle for the following statements that indicates your reason(s) for not implementing this intervention. If none of these reasons apply, feel free to write in your explanation
Assessment of risk of pressure ulcers completed using assessment tool **O YES** **O NO**	O BPG O Suggestion in an article I have read O Suggestion by nursing colleague O Requested by family member O Requested by other member of heath care team O Usual practice (tradition) O Kardex/Care Plan notation/directive O Physician order O Unit expectation **Other:**	O Lack of knowledge regarding indications O Lack of technical skill or training O Requested by member of heath care team O Requested by family member O Usual practice (tradition) O Physician order O Unit expectation O Patient too unstable O Inadequate resources (e.g., people, equipment O Inadequate time **Other:**

NB: At 4 times, participants indicated which BPG interventions they had implemented during their most recent clinical experience.

Results

- Forty-eight percent (n = 23) of the RNs participated in the study, with one nurse lost at T4
- 78 days of data collection; 464 patients observed across T1-T4
- Audited practice demonstrated a pattern similar to that for participants' self-reports at all four time points.
- Between T1 & T3 - significant change in 2 of 11 BPG practices: assessment of risk of pressure ulcers using an age-appropriate tool (p = ≤0.001), and the documentation of same (p = ≤0.001)

Audited Use of BPG Interventions

	T1	T2	T3	T4
Number of patients at risk for pressure ulcer as assessed by Advanced Practice Nurse, *mean (sd)*	5.6 (1.5)	4.8 (1.6)	4.1 (1.7)	4.7 (1.8)
Number of assessments of risk evident in nursing documentation	0 (0, 0)	0 (0, 1)	1 (0, 5)	0 (0, 2)
Number of evidence-based nursing practices documented	0 (0, 1)	2 (0, 5)	3.5 (1, 6)	3 (1, 6)
Number of dietitian consultations completed	0 (0, 1)	0 (0, 0)	0 (0, 0)	0 (0, 1)
Number of nutritional assessments completed	0 (0, 0)	0 (0, 0)	2 (1, 6)	4 (2, 7)
Number of pressure-relieving surfaces in use	4 (1, 5)	2 (0, 4)	1.5 (0, 4)	2 (0, 3)
Number of lifting devices in use > 20kg	0 (0, 1)	0 (0, 0)	0 (0, 0)	0.0 (0.0)
Number of patient turning/repositioning schedules documented per chart or Kardex	0 (0, 0)	0 (0, 0)	3 (1, 6)	3 (1, 6)
Number of transparent dressings, liquid films, and elbow/heel protectors used to prevent friction injury	0 (0, 1)	1 (0, 3)	1 (0, 3)	1 (0, 3)
Number of patients with head and bed elevated to < 30°	5 (2, 7)	4 (1, 7)	4 (1, 8)	4 (2, 6)
Number of consultations with skin-care expert	0 (0, 1)	1 (0, 1)	1 (0, 1)	0 (0, 2)

*** Unless otherwise indicated, data are presented with median and range.**

Self-Reported Use of BPG Interventions

Intervention	T1–T2	T1–T3	T1–T4	T2–T3	T2–T4	T3–T4
1. Risk assessment using assessment tool	0.003	< 0.001*	0.003	0.070	0.687	0.625
2. Risk assessment documented based on risk-assessment tool	0.031	< 0.001*	0.002	0.003	0.180	0.125
3. Risk, including risk-assessment score, discussed during rounds	0.500	0.250	0.250	0.625	0.625	1.000
4. Nutritional assessment considering risk for pressure ulcers	0.008	0.125	0.219	0.625	1.000	1.000
5. Consultation with dietitian related to nutritional needs	1.000	1.000	0.453	1.000	0.453	0.375
6. Pressure-reducing or pressure-relieving support surface	0.625	1.000	0.625	0.625	1.000	1.000
7. Lifting device for patients too heavy to lift off mattress	1.000	0.625	0.289	0.375	1.000	0.125
8. Head of bed elevated to less than 30 degrees	0.039	0.388	0.344	0.453	0.250	1.000
9. Q2 hourly turning schedule	0.508	0.125	0.289	0.687	1.000	1.000
10. Head repositioned side to back to side Q2 hourly	0.727	1.000	1.000	1.000	1.000	1.000
11. Protective skin barrier placed over bony prominences if voluntary or involuntary movements lead to friction injury	0.031	0.065	0.375	0.687	1.000	1.000

Responses are based on participants' most recent clinical experience of a child at risk for pressure ulcer.
*** Significant after Bonferonni adjustment for multiple testing.**

Reasons for Implementing Selected BPG Interventions, T1–T4

Interventions	Usual Practice				Unit Expectation				EBP Guideline				Suggestion by Nursing Colleague			
	T1 % (n/N)	T2 % (n/N)	T3 % (n/N)	T4 % (n/N)	T1 % (n/N)	T2 % (n/N)	T3 % (n/N)	T4 % (n/N)	T1 % (n/N)	T2 % (n/N)	T3 % (n/N)	T4 % (n/N)	T1 % (n/N)	T2 % (n/N)	T3 % (n/N)	T4 % (n/N)
A	100 (3/3)	7.1 (1/14)	5.3 (1/19)	14.3 (2/14)	66.7 (2/3)	0.0 (0/14)	0.0 (0/19)	42.9 (6/14)	0.0 (0/3)	85.7 (12/14)	89.5 (17/19)	78.6 (11/14)	33 (1/8)	21.45 (3/14)	31.6 (6/19)	21.4 (3/14)
B	100 (2/2)	12.5 (1/8)	17.6 3/18	41.7 (5/12)	50 (1/2)	25 (2/8)	35.3 (6/18)	33.3 (4/12)	0.0 (0/2)	87.5 (7/8)	88.2 (15/18)	83.3 (10/12)	0 (0/2)	50 (4/8)	17.6 (3/18)	16.7 (2/12)
C	71.4 (10/14)	70.6 (12/17)	83.3 (15/18)	40 (6/15)	57.1 (8/14)	47.1 (8/17)	44.4 (8/18)	66.7 (10/15)	14.3 (2/14)	58.8 (10/17)	61.1 (11/18	73.3 (11/15)	0 (0/14)	11.8 (2/27)	11.1 (2/18)	13.3 (2/15)
D	66.7 (2/3)	22.2 (4/18)	44.4 (8/18)	35.7 (5/14)	33.3 (1/3)	50 (9/18)	55.6 (10/18)	35.7 (5/14)	0.0 (0/3)	72.2 (13/18)	61.1 (11/18)	85.7 (12/14)	0 (0/3)	33 (6/18)	16.7 (3/18)	21.4 (3/14)

NB: n = number of nurses who chose the item as a reason for implementing the practice. N = number of nurses who implemented the BPG intervention. A = risk assessment using assessment tool. B = assessment documented based on risk-assessment tool. C = Q2 hourly turning scheduling implemented. D = use of a pressure-reducing or pressure-relieving support surface.

Nurses' Rationale To Not Implement BPG Intervention(s)

1. Patient characteristics (e.g., c-spine not cleared, hemodynamic instability with position change)
2. Team characteristics (e.g., unable to initiate independent consultation, lack of attention to risk- assessment information by other health care disciplines)
3. Resource availability (e.g., lack of appropriate lifting devices and protective barriers, lack of readily available assessment tools and guidelines at the bedside)

Limitations

- Lack of comparison group
- Small sample size
- Incomplete responses to PUP Questionnaire
- Lack of a priori power calculation
- Audit tool reported unit responses, not a specific nurse's use

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Recommendations

- Establish baseline performance of BPG interventions prior to the KTA intervention study
- Target a few BPG interventions as focus for change and power the study to detect clinically important changes
- Administer questionnaire in interview format to reduce number of non-responses
- Incorporate an interdisciplinary study design approach and link with CQI initiative, especially patient-outcome audit feedback

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Questions

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