Development, Implementation, and Evaluation of the Pain Management Protocol in the Critical Care Unit

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References: scan the QR Code

Introduction

Pain

- Subjective and multidimensional experience
- Mechanically ventilated patients limited from expressing their pain
- Incidence of pain reported:
  - 47% at rest
  - 49-76% during routine nursing care

(Arroyo-Novoa et al., 2019; Chanques et al., 2017).

The **Society of Critical Care Medicine (SCCM)** guidelines recommended using evidence-based, reliable, and valid behavioral tools to assess pain for the non-verbal ICU population: **Critical Care Pain Observation Tool (CPOT)** (Delvin et al., 2018).

Aim: Improve pain assessment and management effectiveness with the CPOT pain management protocol for mechanically ventilated adult ICU patients, admitted to 332-bed urban hospital at the northeastern, New Jersey.

Background and Significance

- Annual ICU admissions include 4 million patients in the US with 20-40 % of the ICU patients ventilated (SCCM, n.d)
- Prolonged mechanical ventilation leads to ventilator-associated events and higher length of stay (LOS)
- LOS increases financial health care burden
- The median ICU cost in American hospitals was $9,619, and day two of mechanical ventilation (MV) cost is 35% higher than non ventilated patients' stay (Kramer et al., 2017).

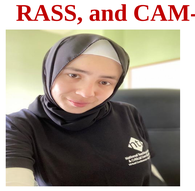
Adverse outcomes of pain

- Cardiac instability
- Immunosuppression
- Prolong ventilation
- Delays wound healing
- LOS
- Anxiety
- Delirium
- Depression
- Post-ICU PTSD
- Decreased quality of life

Current Practice

- The practice site uses the Face, Leg, Activity, Crying, Consolability (FLACC) scale, and physiological parameters
- The FLACC process improved pediatric patients pain management, however, it fell short in meeting pain management of the mechanically ventilated adult patients.

Scan the QR code for the CPOT, RASS, and CAM-ICU flowchart.



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Methodology

Design

- Quality improvement project with post interventional retrospective chart review
- Protocolized pain management change in the ICU with post interventional survey from all nursing staff.

Setting	Project Population	Nursing Staff Voluntary Survey
• 34-bed mixed ICU, Level II trauma, teaching, and comprehensive stroke center at the northeastern, New Jersey	• Purposeful sample of MV ICU patients age >18 • 50 charts reviewed. • All bedside ICU nurses surveyed voluntary for the evaluation portion of the project.	▪ Email notification for all ICU nurses ▪ Huddle posters on the communication board ▪ Web based, implied consent. ▪ No harm for the staff.

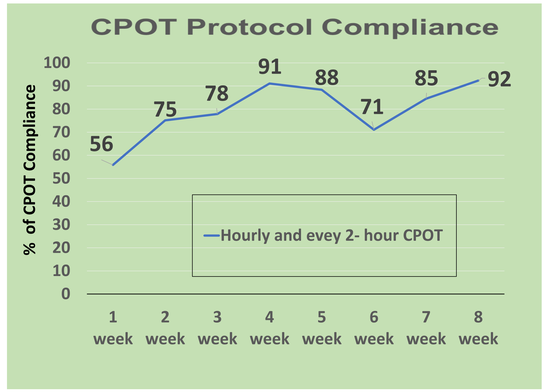
Intervention

- CPOT pain management protocol endorsement through ICU leadership and interdisciplinary team.
- Nurses educated through MC Strategies.
- IT department built the pain management order sets in the Cerner platform.
- CPOT pain management initiated after education session.
- DNP student investigator and two CPOT change agents review the project 3x week via huddle.
- Nurses used CPOT at least every 2 hours (Q2) or frequently as needed and provided analgesics based on the orders sets until patients were extubated, able to self report, transferred, or deceased.
- ***Evaluation:*** After eight weeks of implementation, a 5-point Likert type scale survey completed by nursing staff to evaluate the CPOT pain assessment **appropriateness, applicability and feasibility** for their patient population via **Qualtrics.**
- Chart review performed weekly to evaluate the adherence of the staff to the new protocol for eight weeks.
- ***Analysis*** of survey data based on the scores: higher score is positive feedback; and data summary analyzed through Excel.

Indicator	Score		Description
Facial expression	Relaxed, neutral	0	No muscle tension observed
 0 1 2	Tense	1	Presence of frowning, brow lowering, orbit tightening, and levator contraction or any other change (eg, opening eyes or tearing during nociceptive procedures)
	Grimacing	2	All previous facial movements plus eyelid tightly closed (the patient may have mouth open or may be biting the endo-tracheal tube)
Body movements	Absence of movements or normal position	0	Does not move at all (does not necessarily mean absence of pain) or normal position (movements not aimed toward the pain site or not made for the purpose of protection)
	Protection	1	Slow, cautious movements, touching or rubbing the pain site, seeking attention through movements
	Restlessness	2	Pulling tube, attempting to sit up, moving limbs/thrashing, not following commands, striking at staff, trying to climb out of bed
Compliance with the ventilator (intubated patients)	Tolerating ventilator or movement	0	Alarms not activated, easy ventilation
	Coughing but tolerating	1	Coughing, alarms may be activated but stop spontaneously
	Fighting ventilator	2	Asynchrony: blocking ventilation, alarms frequently activated
or **Vocalization (nonintubated patients)**	Talking in normal tone or no sound	0	Talking in normal tone or no sound
	Sighing, moaning	1	Sighing, moaning
	Crying out, sobbing	2	Crying out, sobbing
Muscle tension Evaluation by passive flexion and extension of upper limbs when patient is at rest or evaluation when patient is being turned	Relaxed	0	No resistance to passive movements
	Tense, rigid	1	Resistance to passive movements
	Very tense or rigid	2	Strong resistance to passive movements, inability to complete them
Total		__/8	

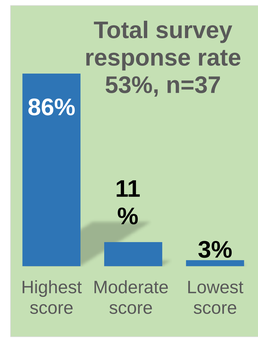
[a] Adapted with permission from Gélinas et al.[1]

Results



- 66% of nurses completed CPOT Educational Module
- Every 4-hour pain assessment practice reduced from 44% to 8%
- Every 2-hour and hourly pain assessments with CPOT represented compliance
- 92% compliance rate at the end of the intervention
- Increased pain incidents with frequent CPOT assessment.

- 37 surveys completed with 53% response rate
- 86% of the nurses completely agreed that CPOT pain management protocol was an applicable, appropriate, and feasible intervention for their patient population
- 5 Nurses provided additional positive feedbacks:
  - "CPOT titration orders have been implemented seamlessly into our order sets, and this makes it possible for us to address our patients' pain in an effective manner appropriately. This was very well implemented by Barno, and it has been a great tool to utilize in our vented Critical Care patients!".



Discussion

Conclusion

- Consistency and frequency of pain assessment and documentation reflected the protocol adherence
- Participants found the CPOT pain assessment protocol effective and appropriate when managing pain for mechanically ventilated patients.

Implication

Clinical Practice	Education	Healthcare Policy	Quality and Safety	Economic/cost benefits
▪ Fulfills the gap in the PADIS Guideline ▪ Provides accurate pain assessment with effect to the practice of analgo-sedation approach to care.	▪ Rises awareness about pain assessment and management gap in clinical practice ▪ Improves knowledge about significance of pain management ▪ Provides nurses autonomy to manage pain for ICU population	▪ Facilitates the transition to the new EHR with policy change based on ABCDEF bundle	▪ Decreases ventilator associated adverse events ▪ Decreases oversedation ▪ Minimizes the negative consequences of pain ▪ Provides safe pain management practice ▪ Increases patients' satisfaction.	▪ Shortens length of hospital stay ▪ Decreases mechanical ventilation days ▪ Reduces psychological effects of pain ▪ Minimizes post ICU long term care.