BISPECTRAL INDEX (BIS) MONITORING

Will the use of the bispectral index (BIS) monitoring system versus the current scoring system, RASS, lead to better patient outcomes related to sedation and paralytic use in ICU patients?

Background

Current practice at UM BWMC for sedating and paralyzing ICU patients utilizes the RASS scoring system and train of four electrode stimulator. Current studies have shown the effectiveness of using the bispectral index (BIS) monitoring system in addition to using RASS and Train of Four.

Our goal is to determine the effectiveness of using the BIS monitoring system and to gain insight on how it could positively affect our patient population.

The evidence appraisal we performed aimed to discover if the utilization of the BIS monitoring system could decrease hospital length of stay, decrease mortality in the ICU patient population, and decrease hospital and patient cost while staying in the ICU.

Appraisal of Evidence & Research Methods

Using the Johns Hopkins Nursing Evidence Based Practice Appraisal Tool, we conducted our evidence appraisal based on the following parameters:

- **Search terms**: BIS monitoring, RASS scoring, ICU sedation, Paralytic use, Anesthesia monitoring, BIS vs RASS
- **Criteria**: peer-reviewed, evidence-based experimental studies or reviews published within the last 10 years
- **Our evidence appraisal comprised of 1 experimental study/randomized trial, 3 quasi-experimental studies, 2 opinions of respected authorities, and 1 article based on evidence obtained from literature reviews and quality improvement reports.

Summary of Evidence

- "The Bispectral Index monitor may be a useful addition to observational scales in assessing sedation, comfort, and the patient’s own experience" (Wright, MD Fracp, and Joseph Chung, MBChB, 2017)
- "BIS monitoring is an easy to use adjunct to monitoring sedation in the critically ill patient, that may reduce costs, morbidity, and mortality related to sedation in the ICU" (Ellie Z. Franges, 2009)
- "Numerous studies have documented the ability of BIS to reduce intermediate outcomes such as hypoxic drug administration, extubation time, postoperative nausea, and shorten recovery room discharge." (Jay W. Johansen, 2006)
- "In a study conducted with patients older than age 60, delirium incidence was lower in patients with BIS monitoring." (Diana Lopez, 2016)
- "Bispectral index monitoring of ICU patient on continuous infusions of paralytics and sedatives reduces sedative drug cost as well as the recall phenomenon. Significant under-sedation may occur using subjective analysis of sedation in the ICU." (LI Kaplan and H Bailey, 2000)

RECOMMENDATIONS

Based on evidence appraisal, it is best practice to use a combination of vital signs, BIS, and RASS for patients who are sedated and on paralytic agents in order to provide the best care with the least amount of negative outcomes.

- **Nursing Implications**
  - Standard practice for all patients on both a paralytic and a sedative
  - By using the BIS monitoring system on every patient, staff will be decreasing the occurrence of delayed extubation, delirium, and decrease ICU length of stay
  - Education about BIS monitoring in conjunction with RASS and the use of the Train of Four electrode would allow for better understanding of the use and importance of proper sedation. This will inspire a change in practice in Critical Care West (CCW) on all of our patients and enhance patient satisfaction, decrease cost of hospitalization, and increase positive outcomes.

Next Steps for Education

- Update the CCW unit policy and procedure guidelines
- Develop education at a unit-level first
- Engage unit education committees and unit practice councils to give nurses the added knowledge and resources needed in order to apply practices to patient care.
- Incorporate in-services for staff to learn on the job training. Provide one super-user per shift to assist staff in the use of the BIS monitoring system.

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*References available upon request*