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Say No to Drugs: Nonpharmacologic Interventions for Preventing Delirium in Critically Ill Patients Intubated & Sedated in a Pediatric ICU

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Say No to Drugs: Nonpharmacologic Interventions for Preventing Delirium in Critically Ill Patients Intubated & Sedated in a Pediatric ICU

Submitted in Partial Fulfillment of the Requirements for the Degree of Doctor of Nursing Practice at the University of Kentucky

By

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Spring 2024

Abstract

Background. Delirium is an acute clinical syndrome that is characterized by features of disrupted arousal, attention, cognition, sleep, and perception. Delirium is a well-documented phenomenon in critical care settings in both adult and pediatric populations, particularly among patients with length of stay greater than or equal to 48 hours. Delirium has multiple adverse effects, including increased mortality rate, prolonged duration of mechanical ventilation, higher reintubation rates, prolonged intensive care unit (ICU) admission, prolonged hospital admission, short- and long-term cognitive impairment, and posttraumatic stress disorder. There are currently no accepted guidelines or FDA approved medications to treat ICU delirium in the pediatric population, but there is promising research that indicates nonpharmacologic interventions may decrease the incidence and severity.

Purpose. The purpose of this project was to increase the utilization of nonpharmacologic interventions by providing education and creating new documentation requirements for bedside nurses with a goal of decreasing Cornell Assessment of Pediatric Delirium (CAPD) scores in patients intubated and sedated in a Pediatric ICU (PICU).

Methods. This project utilized a quasi-experimental design with a retrospective chart review to evaluate the impact of nurse-driven nonpharmacologic interventions on CAPD scores in patients intubated and sedated in a PICU.

Results. After bedside nurses received education on delirium, a new documentation requirement for nonpharmacologic interventions to prevent and/or decrease the incidence of delirium was implemented for intubated and sedated patients in the PICU. In the pre-intervention chart review, one third of patients (33%) scored positive for delirium (CAPD $\geq$ 8), compared to 13% in the post-intervention chart review (p=.008).

Conclusions. This DNP project reinforces The American College of Critical Care Medicine's recommendation that nonpharmacologic prevention strategies are the strongest recommendation for the prevention and treatment of delirium. These results suggest that nurse-driven nonpharmacologic interventions could significantly decrease the incidence and severity of delirium in intubated and sedated patients who are receiving care in a PICU. This DNP project showed favorable changes in delirium scores, which would hopefully lead to shortened ICU stays and improved morbidity and mortality in this patient population.

Dedication

I would like to dedicate this project first to my husband, Antonio. You were my avid champion when I pulled all-nighters during Pathophysiology; You were my model patient during Advanced Health Assessment; Most importantly, you were always waiting at home with arms wide open after I travelled across the Tri-State Area for more than 400 hours of clinical experience. You encouraged me on the hard days, you celebrated with me on the good days, and you never let me lose sight of the end goal. Thank you for always knowing the right thing to say and for loving me even when I made it difficult. I can only hope to champion your career the way you have mine.

To my parents, Van and Kathy Willis, and my siblings, Sam, Mary Grace, and Zach. Thank you for a lifetime of support. From Kindergarten to my Doctoral Degree, you have always encouraged me to chase after my dreams. Big or small, you have celebrated every milestone by my side. None of this would have been possible without you.

To my friends and co-workers in the Pediatric ICU, I cannot say thank you enough. You have cheered me on from the very beginning, and I can only hope that I have made you proud.

To my first and greatest friend in this doctoral program, Dr. Taylor Bergman. There are no words to say how much I have appreciated your comradery as we tackled this journey together, but I am confident that I could not have survived this without you by my side.

Finally, to our baby due this September: This was all for you.

Table of Contents

List of Tables

List of Appendices

Background & Significance

Problem Statement

Delirium is defined as "a syndrome of acute, fluctuating brain dysfunction, with hallmark features of disrupted arousal, attention, cognition, sleep, and perception" (Dervan et al., 2020, p. 21). Recent data has shown that children in the Pediatric Intensive Care Unit (PICU) have similar risk factors for developing delirium to adult ICU patients. In addition to young age (<5 years) and developmental delay, these include severe illness, mechanical ventilation, use of restraints, inadequate pain control, over-sedation, and lack of day-night routines (Rohlik et al., 2018). There are currently no accepted guidelines or FDA approved medications to treat PICU delirium, but promising research indicates that nonpharmacologic interventions may decrease the incidence and severity.

Context, Scope, & Consequences of the Problem

Delirium is a well-documented phenomenon in critical care settings in both adult and pediatric populations, particularly among patients with length of stay $\geq$ 48 hours. Researchers around the world have published articles on the best ways to identify and treat adult ICU delirium. In the pediatric population, there is limited data to properly quantify the prevalence of delirium, but Rohlik et al. (2018) have predicted that 5-29% of critically ill pediatric patients will experience delirium if admitted to an ICU. Other single-center studies have documented rates of delirium in PICUs as high as 69% (Dervan et al., 2020).

Delirium can have three separate presentations: hypoactive, hyperactive, or mixed delirium. Hypoactive delirium is characterized by "reduced activity, apathy, decreased amount or speed of speech, decreased alertness, unawareness, or hypersomnolence" (Hayhurst et al., 2020, p. e481). Conversely, with hyperactive delirium, patients experience "increased activity levels, increased speed of actions or speech, restlessness, abnormal content of verbal output, hyperalertness, irritability, and combativeness" (Hayhurst et al., 2020, p. e481). A mixed presentation includes aspects from both the hypoactive and hyperactive presentations. Most commonly in pediatrics, patients will display a hypoactive presentation (Green et al., 2019). Hypoactive delirium can be particularly challenging to identify, and many researchers hypothesize that this subtype is underdiagnosed, thereby falsely lowering prevalence rates of delirium.

If left untreated delirium has multiple adverse effects, including increased mortality rate, prolonged duration of mechanical ventilation, higher reintubation rates, prolonged ICU stay, prolonged hospital admission, posttraumatic stress disorder, and short- and long-term cognitive impairment (Green et al., 2019). More commonly associated with hypoactive delirium, these long-term cognitive deficits can affect memory, attention, mental processing speed, and executive function over a period of months or years after the patient is discharged from the ICU. Protecting children from these detrimental effects is a matter of paramount importance.

Current Evidence-Based Interventions

There currently is a lack of evidence supporting the use of pharmacologic agents in the effective management of delirium despite the frequent usage of antipsychotics. The American College of Critical Care Medicine released a Pain, Agitation, and Delirium Guideline, which states that nonpharmacologic prevention strategies are the strongest recommendation for the prevention and treatment of delirium, backed by a moderate level of evidence (Rivosecchi et al., 2015). These evidence-based multicomponent intervention protocols to combat delirium should include early mobilization, promotion of day/night routines, reduction of sensory impairment, and reorientation strategies coupled with nursing education (Mulkey, 2019; Rivosecchi et al., 2015).

To treat delirium, one must first identify it. There is more than one available tool, but this project utilized the Cornell Assessment of Pediatric Delirium (CAPD) screening. CAPD is an observational tool of 8 questions (see Appendix A; Traube et al., 2014) that has been validated for use by nurses and physicians with pediatric experience to detect hypoactive, hyperactive, or mixed-type delirium (Cornell University, 2012). This screening takes less than two minutes and is to be completed twice a day by bedside nurses, once at the end of the 12-hour day shift and once at the end of the 12-hour night shift. CAPD does not require patient participation and may be used for children 0 days to 21 years of age, including those with developmental delays (Cornell University, 2012). For children under the age of 2 years, there are developmental anchor points (see Appendix B) that assist nurses in properly scoring patients (Cornell University, 2012). With this screening tool, a score ≥ 8 is consistent with delirium. Identifying delirium is an important step in its management, as many interventions are targeted towards positive scores.

Purpose & Objectives

The purpose of this DNP project was to increase the use of nonpharmacologic interventions by bedside nurses in patients intubated and sedated in a PICU with a goal of decreasing CAPD scores.

The specific aims were:

1) Develop and implement an order panel within the existing "PICU Pain/Sedation Protocol" order set in the electronic medical record (EMR) Epic that creates a "Brain Task" (see Appendix C) for bedside nurses that links to the nursing flowsheet, providing a place to document nonpharmacologic interventions and allowing for proper tracking of utilization;

2) Educate bedside nurses in the PICU on delirium and the new mandatory documentation requirements for nonpharmacologic interventions; and

3) Reduce CAPD scores of intubated and sedated patients compared to baseline data from March-April 2023 within 6 months after implementation.

Review of Literature

An extensive literature search was conducted to evaluate if the implementation of nonpharmacologic interventions, compared to usual care, would decrease CAPD scores for patients intubated and sedated in the PICU. The literature review utilized the CINAHL and PubMed databases, with key terms including delirium, nonpharmacologic, interventions/treatment, and pediatric/child. Inclusion criteria encompassed articles in the English language, with full-text availability, peer-reviewed, published between 2018-2023, and focused on patients with an age range ≤ 18 years. Articles pertaining to perioperative emergence delirium were eliminated, as well as all studies outside of the pediatric age range. Five articles met the appropriate criteria and were deemed relevant to this research.

The evidence showed that risk factors for delirium are younger age, neurodevelopmental delay, poor nutritional status, cyanotic heart disease, benzodiazepine exposure, coma and deep sedation, requirement for invasive mechanical ventilation, and prolonged cardiopulmonary bypass time (Smith et al., 2022; Silver & Traube, 2019). Additionally, the evidence showed that CAPD or the Pediatric Confusion Assessment Method for the Intensive Care Unit (pCAM-ICU) are the most valid and reliable delirium monitoring tools in critically ill pediatric patients (Smith et al., 2022; Rohlik et al., 2021). Lastly, the evidence showed that the following

nonpharmacologic strategies may help reduce the occurrence rate, duration, and/or severity of delirium: optimization of sleep hygiene, creation of a daily routine, use of interdisciplinary rounds with family engagement, avoiding use of restraints, family involvement with direct patient care, optimization of hearing and vision, and early mobilization (Rohlik et al., 2021; Silver et al., 2019; Silver & Traube, 2019; Smith et al., 2022; Stenkjaer et al., 2022).

All studies in this literature review concluded that there is limited data surrounding nonpharmacologic measures in the pediatric population, but the adult data is promising. Smith et al. (2022) highlight that while data may be insufficient, nonpharmacologic interventions are low risk for the patient and should be encouraged due to possible patient benefit. Two articles were quality improvement projects (Rohlik et al., 2021; Silver & Traube, 2019), one article was an expert opinion Delphi study (Stenkjaer et al., 2022), one article was a practice guideline (Smith et al., 2022), and one article was a clinical pathway (Silver et al., 2019).

The research in pediatric delirium is limited. Many researchers have investigated the use of nonpharmacologic nursing bundles, but many of these studies focus on building the bundle (Silver & Traube, 2019; Stenkjaer et al., 2022). Other studies focus on nursing perception, knowledge, and barriers of nonpharmacologic nursing bundles (Rohlik et al., 2021). However, few studies have documented the impact of the nonpharmacologic interventions on delirium scores, presenting a gap in knowledge. According to the Society of Critical Care Medicine's Clinical Practice Guidelines (Smith et al., 2022), providers should utilize strategies to minimize overall sedation exposure to reduce the incidence and/or severity of delirium, while utilizing nonpharmacologic interventions, which was the aim of this project.

Theoretical/Conceptual Framework

This project utilized a Plan-Do-Study-Act framework, a four-stage problem solving model that is used to improve a process or carry out change. This framework provided clear steps to design and implement my project. The first step was to draft a plan, which was extensively reviewed prior to implementation. After receiving buy-in from the attending physician and nursing care manager, I implemented new documentation requirements regarding interventions for delirium in EPIC and provided nursing education to bedside nurses. After the education had been disseminated and new charting requirements had been implemented, I studied the impact that increased utilization of nonpharmacologic interventions had on CAPD scores of patients intubated and sedated in the PICU. The research collected through this DNP project indicated

that nonpharmacologic interventions may decrease positive delirium scores (CAPD $\geq$ 8) in patients intubated and sedated in a PICU. The results will be disseminated to other providers in the Pediatric Critical Care community with the intent on improving patient outcomes in this population.

Methods

Study Design

This project was designed to evaluate the impact of nurse-driven nonpharmacologic interventions on CAPD scores in patients intubated and sedated in a PICU. A quasi-experimental study design was utilized with a retrospective chart review.

Setting

This DNP project was completed in the combined PICU and Pediatric Cardiac Intensive Care Unit at UK HealthCare's Kentucky Children's Hospital in Lexington, Kentucky, a 16-bed unit that treats and monitors children ages newborn through 18 years. The multidisciplinary team in the PICU provides care to children across central and eastern Kentucky that experience a life-threatening acute illness, injury, or organ failure.

UK HealthCare is committed to creating a healthier Kentucky through their "DIReCT" values. Their five values include diversity, innovation, respect, compassion, and teamwork. This project specifically focused on two of these values, innovation and teamwork. Through innovation, UK HealthCare embraces continual learning and improvement to drive positive change, which is what this project strived to do. With teamwork, UK HealthCare encourages working together to create positive outcomes. This project was a multidisciplinary effort to help improve the care of critically ill patients in the PICU.

Stakeholders involved with this project included the PICU's nursing care manager and assistant care manager, attending physicians, advanced practice providers, clinical nurse expert, and bedside nursing staff. The PICU's Quality & Safety Committee was a stakeholder in this project, as well. The PICU attending physicians and advanced practice providers provided supportive research and clinical expertise that supported the use of nonpharmacologic measures to decrease incidence of delirium. The nursing care manager, assistant care manager, and clinical nurse expert supported evidence-based practice by assisting in the education roll-out and helped promote nursing buy-in. The bedside nursing staff participated in education and were frontline in implementing the nonpharmacologic interventions.

The Quality & Safety Committee at Kentucky Children's Hospital has been instrumental in rolling-out the "PICU Up!" initiative. "PICU Up!" is a national initiative that integrates sleep promotion, delirium prevention, and sedation optimization to increase mobilization in critically ill children. As this initiative is relatively new at Kentucky Children's Hospital, prior to this DNP project, the Quality & Safety committee had heavily focused on the mobilization arm. After implementation of this DNP project, the committee was able to focus on the delirium prevention aspects of the "PICU Up!" initiative and offered its support in providing education to staff members about the importance of delirium prevention.

There were several site-specific facilitators for this project, including buy-in from upper-level management, providers, and nursing staff. Early on, this project was identified by the Quality & Safety Committee as a project that could improve outcomes for patients in Kentucky Children's Hospital's PICU in conjunction with their early mobility protocol. Implementation of the nursing "Brain Task" in EPIC was made easier by the approval to attach the documentation in new flowsheet rows to the existing PICU admission order, "Implement non-pharmacologic measures to promote comfort and decrease risk for delirium."

One site-specific barrier for this project existed, and that was the relatively small size of this regional PICU, thereby producing a smaller sample size.

Sample

The inclusion criteria for participants were: patients $\leq$ 18 years who were admitted to the PICU at Kentucky Children's Hospital between March 1 and April 30, 2023 and October 1 to November 30, 2023, who were intubated and sedated with dexmedetomidine (the most common sedative prescribed in this PICU). Patients without an advanced airway, without an order for dexmedetomidine, and those without documented delirium scores were excluded from the study.

Procedure

Institutional Review Board

Prior to seeking approval from the Institutional Review Board (IRB), on August 14, 2023, the proposal for this DNP project was approved by University of Kentucky's Nursing Research Council. Later, on October 10, 2023, formal approval to proceed with this study was obtained from the University of Kentucky's IRB.

Evidence-Based Intervention

The goal of this DNP project was to increase the use of nonpharmacologic tools for intubated and sedated patients, with the expectation of decreasing CAPD scores. This was accomplished through education to bedside nursing staff and modifications to the EMR, as described below.

The PICU at Kentucky Children's Hospital has a pre-built admission order set in Epic. In this order set is a Nursing Order to "Implement non-pharmacologic measures to promote comfort and decrease risk of delirium." We created a nursing task associated with this order, which links to the "Brain" in Epic, where nurses are reminded of this new required documentation at the time that it is due. Prior to this DNP project, bedside nurses in the PICU had no dedicated place to document their fulfillment of this order. A new flowsheet row was built, and titled "Delirium Interventions." Beneath were two places to document: 1) "Initiate Daytime Delirium Interventions," which was to be completed with the first morning assessment at 8:00 a.m., and 2) "Initiate Nighttime Delirium Interventions," which was to be completed with the first nightshift assessment at 8:00 p.m. These options are associated with "select all that apply" options that allow the nurse to document which nonpharmacologic interventions they completed during their shift, allowing for proper tracking of utilization.

The daytime delirium management strategies included lights on by 9:00 a.m.; natural light during the day; mobilizing per PICU Up! level guidelines; implementation of a daily schedule (if applicable); familiar objects from home provided; familiar social contact provided; reorientation to person, place, time, and situation; optimization of pain management; consultation to Child Life Specialists; and the completion of a sedation holiday (the interruption of continuous infusions of sedatives in an intubated patient).

Nighttime delirium management strategies included turning lights off by 11:00 p.m.; lighting decreased to safest extent; bedtime routine promoted; bath/weight completed by 11:00 p.m. or after 6:00 a.m. (patients that are under the age of 2 years are bathed and weighed on night shift in the PICU at Kentucky Children's Hospital); TV off at night; environmental noise decreased; ear plugs and/or eye masks provided; use of sound machine; cluster care to decrease awakenings; calming techniques provided; optimization of pain management; and education provided to patient and family about optimizing sleep.

Measures & Instruments

This project reviewed documented CAPD scores at two separate time intervals in intubated and sedated patients in the PICU, with two months of data collected both pre- and post-implementation of the nonpharmacologic intervention documentation. The first of the time intervals is the first documented delirium score in the patient's EMR after admission to the ICU, and the second time interval is 24-hours after the initiation of sedation.

Data Collection & Analysis

Data was collected via retrospective chart review with the assistance of UK HealthCare's Data and Analytics team. Descriptive statistics were used to analyze age, gender, and race. Delirium scores were analyzed in a deidentified manner using Chi-Square to compare pre- and post-intervention CAPD scores at the two separate time intervals. With the help of statistician Dr. Amanda Thaxton-Wiggins, this project utilized Statistical Packaging for Social Sciences (SPSS) to translate the results into statistical information for distribution. Statistical significance was considered with a p-value less than or equal to .05.

Results

There were 182 patients admitted to the PICU from March 1, 2023 to April 30, 2023, and 211 patients from October 1, 2023 to November 30, 2023. For this analysis we excluded patients without an order for dexmedetomidine or who had a missing delirium score, yielding a final sample size of 75 in the pre-intervention group and 61 in the post-intervention group.

In the pre-intervention group, the mean age of participants was 5.5 years (SD 6.0) with the majority being male (56.0%) and White (93.3%). In the post-intervention group, the mean age of participants was again 5.5 years (SD 7.6), with the majority being male (62.3%), and White (82.0%) (see Table 1).

For patients in the pre-intervention group (n=75), one third of patients (33.3%) had a positive delirium score (CAPD $\geq$ 8) after admission to the ICU, compared to those after implementation of the nonpharmacologic interventions (n=61) who only saw 13.1% of patients with a positive delirium score (p=.008). Delirium scores were reevaluated 24-hours after the initiation of sedation, with the exclusion of patients who had incomplete documentation of delirium scores. The pre-intervention group (p=56) had a higher rate of positive delirium scores (28.6%), compared to those after the implementation of the nonpharmacologic interventions (n=50; 12.0%; p=.054) (see Table 2).

Discussion

The purpose of this project was to increase the utilization of nonpharmacologic interventions by providing education and creating new documentation requirements for bedside nurses with a goal of decreasing CAPD scores in patients intubated and sedated in a PICU.

The results from this study show preliminary evidence that nurse-driven nonpharmacologic bundles could decrease the prevalence and severity of ICU delirium. The rates of positive delirium scores decreased from 33.3% pre-bundle to 13.1% post-bundle when looking at CAPD scores upon admission to the PICU. When looking at patients after the initiation of sedation, the results were not statistically significant, but rates of positive delirium scores still decreased from 28.6% to 12.1% which is clinically meaningful. This finding was consistent with other studies that showed that nonpharmacologic strategies may help reduce the occurrence rate, duration, and/or severity of delirium (Rohlik et al., 2021; Silver et al., 2019; Silver & Traube, 2019; Smith et al., 2022; Stenkjaer et al., 2022).

This DNP project was beneficial for the PICU at Kentucky Children's Hospital, as the work coincided with one of the Quality & Safety Committee's target goals of addressing delirium. If found to be effective long-term, this decreased prevalence and severity of delirium would decrease mortality rate, shorten duration of mechanical ventilation, decrease reintubation rates, shorten duration of ICU stays and hospital admissions, and decrease the risk of short- and long-term cognitive impairment in this patient population.

To sustain this project, ongoing education would need to be provided to bedside nurses on delirium and the impact of nonpharmacologic interventions on its prevalence and severity. Additionally, new-hire nurses would require more intensive education, similar to what was provided at the initiation of this DNP project.

Implications for Practice, Education, Policy, & Research

Based on the findings of this study, nonpharmacologic interventions show promise toward decreasing the incidence and severity of delirium for patients intubated and sedated in the PICU. Further investigation would be required to identify if these findings could be generalized to all patients admitted to the PICU, regardless of their need for an advanced airway or requirement for sedation.

To be successful, providers, bedside staff, and patients/families admitted to the PICU need to be continually educated on delirium, as these individuals would all play a role in

implementing the nonpharmacologic interventions included in the bundle. Moving forward, delirium education, including its nonpharmacologic management, should be incorporated into all new-hire orientations and refresher courses for all staff should be provided at the annual nursing competency day.

This DNP project came with minimal cost associated. The exception to this would be the need to provide ear plugs and/or eye masks to each patient and batteries for the in-room sound machines in the PICU. When purchased in bulk, these are relatively low-cost items. In the adult population, a systematic review found that multicomponent delirium prevention interventions were found to have an average cost savings of $4697 per person in the ICU. These cost savings were drawn from the sum of inpatient care, reduced length of stay, decreased adverse events such as falls and pressure injuries, and staff allocation (Kinchin et al., 2023).

Given the small sample size, research on a larger scale should be completed to evaluate these findings and provide more information regarding its statistical significance.

Limitations

This was a single-center, retrospective study which limits the ability to generalize the findings of this study to other centers. As the PICU at Kentucky Children's Hospital is a relatively small unit, comprised of just 16 beds, this limited the sample size of this project. The patient population was not diverse, with more than 80% of patients being White.

This study relied on nursing compliance to appropriately document delirium scores, both with accuracy and at properly ordered times of day. Without individually reviewing each chart, it would be difficult to identify if any score would have been deemed inaccurate. But there were several patients found to be without a documented delirium score, eliminating them from being eligibility for this study.

Conclusion

Delirium is defined as "a syndrome of acute, fluctuating brain dysfunction, with hallmark features of disrupted arousal, attention, cognition, sleep, and perception" (Dervan et al., 2020, p. 21). There are currently no accepted guidelines or FDA approved medications to treat ICU delirium in the pediatric population, but there is promising research that indicates nonpharmacologic interventions may decrease the incidence and severity. This DNP project aimed to determine if mandatory charting requirements would increase the utilization of nonpharmacologic interventions in patients intubated and sedated in a PICU. Based on the

results, positive delirium scores were significantly reduced after the implementation of nonpharmacologic interventions. These results support the need for continued education regarding delirium and its nonpharmacologic management for providers and bedside staff in the critical care environment. Additional research is necessary to truly measure the impact that nonpharmacologic interventions may have on all patients that are admitted to PICUs, regardless of their need for intubation or sedation.

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Table 1. Demographic Summary of Pediatric ICU Patients

	Pre-intervention (*n* = 75) mean (SD) or n (%)	Post-intervention (*n* = 61) mean (SD) or n (%)	*p*
Age	5.5 (6.0)	5.5 (7.6)	
Gender			
Female	33 (44.0%)	23 (37.7%)	.971
Male	42 (56.0%)	38 (62.3%)	
Race			
Black or African American	3 (4.0%)	11 (18.0%)	.010
Middle Eastern	1 (1.3%)	0 (0.0%)	
Spanish American	1 (1.3%)	0 (0.0%)	
White	70 (93.3%)	50 (82.0%)	

Table 2. Cornell Assessment of Pediatric Delirium (CAPD) Scores

	Pre-intervention n (%)	Post-intervention n (%)	*p*
Delirium score first charted after admission to ICU	(*n* = 75)	(*n* = 61)	.008
	50 (66.7%)	53 (86.9%)	
0-7	25 (33.3%)	8 (13.1%)	
≥ 8			
Delirium score at 24 hours post initiation of sedation	(*n* = 56)	(*n* = 50)	.054
0-7	40 (71.4%)	44 (88.0%)	
≥ 8	16 (28.6%)	6 (12.0%)	

Cornell Assessment of Pediatric Delirium (CAPD) Screening Tool

RASS Score _____ (if -4 or -5 do not proceed)

Please answer the following questions based on your interactions with the patient over the course of your shift:

	Never 4	Rarely 3	Sometimes 2	Often 1	Always 0	Score
1. Does the child make eye contact with the caregiver?						
2. Are the child's actions purposeful?						
3. Is the child aware of his/her surroundings?						
4. Does the child communicate needs and wants?						
	Never 0	Rarely 1	Sometimes 2	Often 3	Always 4	
5. Is the child restless?						
6. Is the child inconsolable?						
7. Is the child underactive—very little movement while awake?						
8. Does it take the child a long time to respond to interactions?						
					TOTAL	

Appendix B

Developmental Anchor Points for Cornell Assessment of Pediatric Delirium (CAPD) Screening

Developmental Anchor Points For Youngest Patients

	NB	4 weeks	6 weeks	8 weeks	28 weeks	1 year	2 years
1. Does the child make eye contact with the caregiver?	Fixates on face	Holds gaze briefly Follows 90 degrees	Holds gaze	Follows moving object/caregiver past midline, regards examiner's hand holding object, focused attention	Holds gaze. Prefers primary parent. Looks at speaker	Holds gaze. Prefers primary parent. Looks at speaker	Holds gaze. Prefers primary parent. Looks at speaker
2. Are the child's actions purposeful?	Moves head to side, dominated by primitive reflexes	Reaches (with some discoordination)	Reaches	Symmetric movements, will passively grasp handed object	Reaches with coordinated smooth movement	Reaches and manipulates objects, tries to change position, if mobile may try to get up	Reaches and manipulates objects, tries to change position, if mobile may try to get up and walk
3. Is the child aware of his/her surroundings?	Calm awake time	Awake alert time Turns to primary caretaker's voice May turn to smell of primary care taker	Increasing awake alert time Turns to primary caretaker's voice May turn to smell of primary care taker	Facial brightening or smile in response to nodding head, frown to bell, coos	Strongly prefers mother, then other familiars. Differentiates between novel and familiar objects	Prefers primary parent, then other familiars, upset when separated from preferred care takers. Comforted by familiar objects especially favorite blanket or stuffed animal	Prefers primary parent, then other familiars, upset when separated from preferred care takers. Comforted by familiar objects especially favorite blanket or stuffed animal
4. Does the child communicate needs and wants?	Cries when hungry or uncomfortable	Cries when hungry or uncomfortable	Cries when hungry or uncomfortable	Cries when hungry or uncomfortable	Vocalizes /indicates about needs, eg. hunger, discomfort, curiosity in objects, or surroundings	Uses single words, or signs	3-4 word sentences, or signs. May indicate toilet needs, calls self or me
5. Is the child restless?	No sustained awake alert state	No sustained calm state	No sustained calm state	No sustained calm state	No sustained calm state	No sustained calm state	No sustained calm state
6. Is the child inconsolable?	Not soothed by parental rocking, singing, feeding, comforting actions	Not soothed by parental rocking, singing, feeding, comforting actions	Not soothed by parental rocking, singing, feeding, comforting actions	Not soothed by parental rocking, singing, comforting actions	Not soothed by usual methods eg. singing, holding, talking	Not soothed by usual methods eg. singing, holding, talking, reading	Not soothed by usual methods eg. singing, holding, talking, reading (May tantrum, but can organize)
7. Is the child underactive—very little movement while awake?	Little if any flexed and then relaxed state with primitive reflexes (Child should be sleeping comfortably most of the time)	Little if any reaching, kicking, grasping (still may be somewhat discoordinated)	Little if any reaching, kicking, grasping (may begin to be more coordinated)	Little if any purposive grasping, control of head and arm movements, such as pushing things that are noxious away	Little if any reaching, grasping, moving around in bed, pushing things away	Little if any play, efforts to sit up, pull up, and if mobile crawl or walk around	Little if any more elaborate play, efforts to sit up and move around, and if able to stand, walk, or jump
8. Does it take the child a long time to respond to interactions?	Not making sounds or reflexes active as expected (grasp, suck, moro)	Not making sounds or reflexes active as expected (grasp, suck, moro)	Not kicking or crying with noxious stimuli	Not cooing, smiling, or focusing gaze in response to interactions	Not babbling or smiling/laughing in social interactions (or even actively rejecting an interaction)	Not following simple directions. If verbal, not engaging in simple dialogue with words or jargon	Not following 1-2 step simple commands. If verbal, not engaging in more complex dialogue

22

Appendix C

Description of "Brain Task"

The nursing "brain" (see Figure C1) in Epic is where a nurse may see their assigned patients for the day, and the assigned tasks associated with that patient. A "Brain Task" (see Figure C2) is a timed reminder notifying nurses of medications that are due, labs to be collected, or tasks that must be completed at designated times throughout their shift.
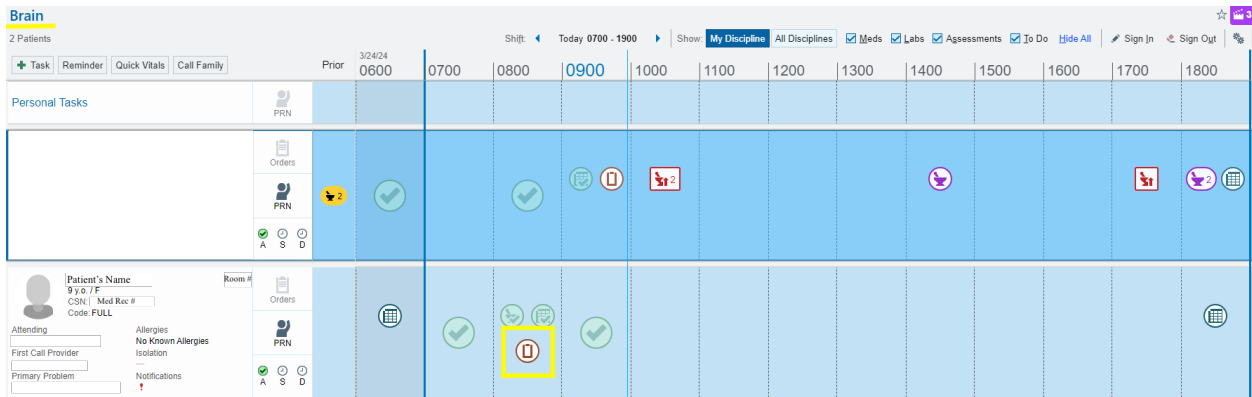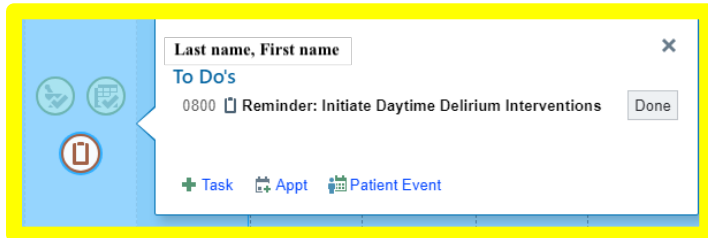

Figure C1. "Brain" in Epic

Figure C2. "Brain Task" in Epic