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Recognizing Delirium in the PICU: An Evidence-based Practice Improvement Project

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Background

- Delirium is an acute change from a patient's baseline mental status, presenting as inattention, disorganized thinking, or altered level of consciousness that fluctuates
  - » Can by hypoactive, hyperactive, or mixed
- Evidence shows that:
  - » Delirium may increase PICU length of stay and hospital costs
  - » Benzodiazepines are significantly associated with delirium
  - » Younger patients and severity of illness predictors of delirium
- Prevalence of delirium in PICU 56% in children six months to five years and 35% in children 2-5 years old
- In 2011, delirium screening was not being completed in 71% of PICUs

Purpose and Goal of Project

- Purpose: To increase the recognition of delirium in the PICU with the use of a standardized delirium screening tool
- Goal: That the recognition and subsequent management of delirium may lead to reduced patient length of stay and hospital costs

Framework & Synthesis of Evidence

- Evidence-Based Practice Improvement Model guided the project
  - » P-I-C-O question: "In patients admitted to the pediatric intensive care unit, how does using a standardized tool for delirium screening compared to no screening tool affect the recognition of delirium."
  - » Evidence critically appraised using JHNEBP Model tools, level, quality grade, and synthesized

	Ista (2018a)	Ista (2018b)	Smith (2016)	Smith (2011)	Traube (2014)	Silver (2012)	Daoud (2014)
Intervention: Delirium Screens	SOS-PD	SOS-PD	ps-CAM-ICU	p-CAM-ICU	CAP-D	CAP-D	p-CAM-ICU & CAP-D(R)
Sensitivity	96.8%	92.3%	75%	83%	94.1%	89% average	p-CAM-ICU:78% CAP-D(R): 94.1%
Specificity	92%	96.5%	91%	99%	79.2%	100%	p-CAM-ICU: 98% CAP-D(R): 79.2%
Interrater Reliability	0.46-1.0	0.79-1.0	0.76-0.83	0.74-1.0	0.68-0.78	0.91 average	p-CAM-ICU: 0.74-1.0 CAP-D(R): 0.94
Positive Predictive Value	N/A	76.4%	84%	93%	N/A	N/A	p-CAM-ICU: 88% CAP-D(R): 54%
Negative Predictive Value	N/A	99.1%	86%	98%	N/A	N/A	p-CAM-ICU: 97% CAP-D(R): 98%
Sample Size	146	485	271	68	111	50	p-CAM-ICU: 68 CAP-D(R): 111
Level of Evidence	III	III	III	III	III	III	III
Quality of Evidence	B	A	A	A	A	B	A

CAP-D(R)=Cornell Assessment of Pediatric Delirium, Revised; N/A=value was not provided in the article; SOS-PD=Sophia Observation Withdrawal Symptoms-Pediatric Delirium; ps-CAM-ICU=Preschool Confusion Assessment Method for the Intensive Care Unit; p-CAM-ICU=Pediatric Confusion Assessment Method for the Intensive Care Unit; CAP-D=Cornell Assessment of Pediatric Delirium

Practice Recommendations:

1. All PICU patients should be screened for delirium at least once a shift.
2. The Cornell Assessment of Pediatric Delirium (CAPD) should be used to screen PICU patients for delirium.
3. If the CAPD score is greater than or equal to 9, a provider should be notified as further evaluation is needed.
   - » Aim Statement: Registered nurses will complete the CAPD screening once a shift > 85% of the time over 4 months.

Implementation Process

- Educated PICU nurses, float pool nurses, and providers on delirium, delirium screening tool, and interventions they could use to prevent/manage delirium
- Implemented screening tool first on paper and then transitioned to Electronic Medical Record

Outcomes Measured:

- Demographic Data (age, gender, race, ethnicity)
- Individual CAPD Scores
- Length of Mechanical Ventilation
- Admitting diagnosis
- Interventions started (sleep hygiene, medications, changing CXR times to 0800 instead of 0500)
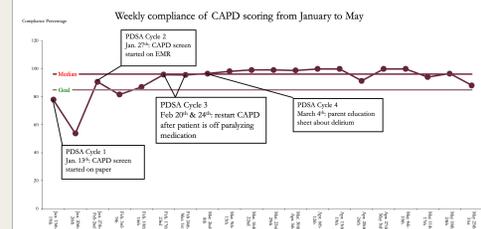- Intubated (yes/no)
- PICU & hospital length of stay
- Compliance of screening tool
- Midazolam Usage (continuous drip/bolus)

Results

Demographics

	n	Percentage
Gender		
Female	84	47%
Male	95	53%
Age		
Under 1 years old	44	24.5%
1-5 years old	35	19.6%
6-10 years old	35	19.6%
11 years and up	65	36.3%
Race, n (%)		
Caucasian	143	79.9%
African American	10	5.6%
Other	26	14.5%
Ethnicity, n (%)		
Hispanic/Latino	14	7.7%
Met Delirium Criteria	39	21.8%
Total (N)	179	

Screen Compliance

Weekly compliance of CAPD scoring from January to May

PDSA Cycle 1 Jan. 13th: CAPD screen started on paper

PDSA Cycle 2 Jan. 27th: CAPD screen started on EMR

PDSA Cycle 3 Feb 20th & 23rd: restart CAPD after patient is off paralyzing medication

PDSA Cycle 4 March 4th: parent education sheet about delirium

Clinical Implications

- This QI project was done in 1 PICU over a 4-month period and cannot be generalizable
- Integrating screening tool into EMR increases compliance
- Delirium increased length of stay
- Being under the age of one and being developmentally delayed increase the likelihood of a positive delirium score
- **Limitations:** Interrater reliability assessed at beginning of project and projected number of independent assessments not completed; screen could include subjectivity

Findings

- *Interrater reliability*- 27 patients were independently scored by bedside & charge RN
  - » Intraclass coefficient- 0.56 (*p*=0.001)
- *Delirium*= score >9 for 48 hours or longer
- *Length of stay* was statistically significant to delirium, *p*<0.001
  - » Median of 3 days for patients without delirium versus 17.5 for those with delirium
- Average CAPD score **during** *intubation*: *M*= 11.36 + 4.86 (SD)
- Average CAPD score **after** *intubation*: *M*= 7.29 + 6.5 (SD), *p*=0.000
- No statistical significance for patient's receiving *Midazolam* versus not receiving on length of stay, *p*= 0.58
- Patients *less than a year old* were 5.8 (95% CI= 1.81, 18.33) times more likely to experience delirium than patients 11 years and older
- Patients categorized as *developmentally delayed* were 49.3 (95% CI= 9.62, 252.6) times more likely to develop delirium than those not categorized as having developmental delay
- Average CAPD score *pre-intervention*: *M*= 13.52 + 5.61 (SD)
- Average CAPD score *post-intervention*: *M*= 11.05 + 5.57 (SD), *p*= 0.009

Acknowledgments

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