Reducing Iatrogenic Opiate Withdrawal in the PICU: An Evidence-based Practice Improvement Project

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BACKGROUND

- Best practice recommendations to reduce pain and agitation associated with mechanical ventilation is the administration of continuous opiate and benzodiazepine infusions for Pediatric ICU (PICU) patients
- This often increases the risk of delirium, prolongs the weaning process, and extends the PICU length of stay (LOS).
- Weaning these infusions too quickly often results in iatrogenic withdrawal syndrome (IWS).
- Symptoms of IWS: tachycardia, hypertension, diaphoresis, fever, irritability, tremors, clonus, hyperactive reflexes, vomiting, diarrhea

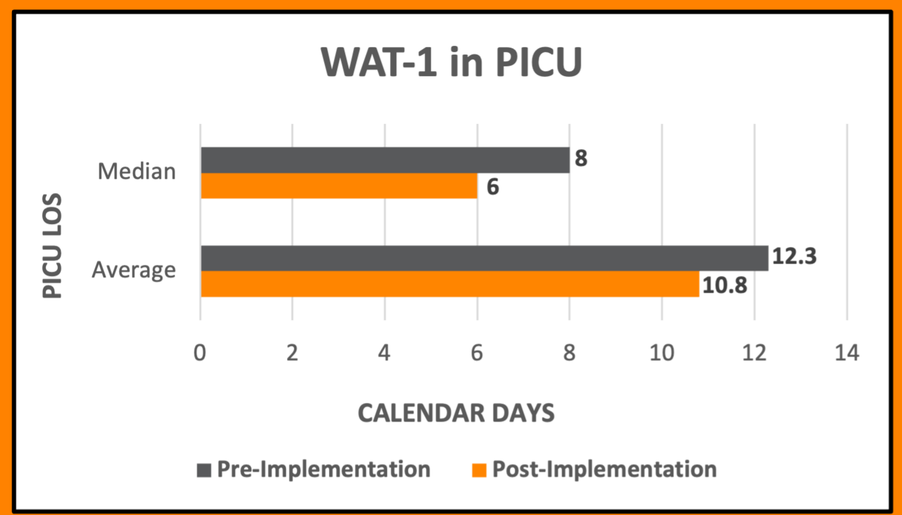
LOCAL PROBLEM

- The project site is a fourteen-bed PICU in Knoxville, Tennessee.
- Prior to implementation, there was no standardized assessment tool with withdrawal at the project site.
- The purpose of this project was to implement the Withdrawal Assessment Tool (WAT-1) in the PICU at the project site.
- The goal of this project was to shorten the length of stay in the PICU and decrease IWS symptoms.

METHODS

- The Evidence-based practice improvement model was used to guide this project.
- A literature search and critical appraisal showed good and consistent evidence supporting the use of the WAT-1 in the PICU.
- The PICU nurses were educated on the use and implementation of the WAT-1 using PDSA (plan-do-study-act) cycles.
- The average length of stay was collected for a three months pre-implementation and three months post-implementation.

Pediatric ICU patients who received continuous sedation were ***more likely to have a shortened ICU length of stay*** after the implementation the Withdrawal Assessment Tool - Version 1.



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INTERVENTIONS

- Staff nurses received education on use of WAT-1
- All patient who received continuous sedation infusions during the post-implementation period were scored every 12 hours from the start of sedation until 72 hours after the last medication was stopped using the WAT-1.

WITHDRAWAL ASSESSMENT TOOL VERSION 1 (WAT – 1)

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Patient Identifier		
	Date:	
	Time:	
Information from patient record, previous 12 hours		
Any loose /watery stools	No = 0 Yes = 1	
Any vomiting/wretching/gagging	No = 0 Yes = 1	
Temperature > 37.8°C	No = 0 Yes = 1	
2 minute pre-stimulus observation		
State	SBS[1] ≤ 0 or asleep/awake/calm = 0 SBS[1] ≥ +1 or awake/distressed = 1	
Tremor	None/mild = 0 Moderate/severe = 1	
Any sweating	No = 0 Yes = 1	
Uncoordinated/repetitive movement	None/mild = 0 Moderate/severe = 1	
Yawning or sneezing	None or 1 = 0 ≥2 = 1	
1 minute stimulus observation		
Startle to touch	None/mild = 0 Moderate/severe = 1	
Muscle tone	Normal = 0 Increased = 1	
Post-stimulus recovery		
Time to gain calm state (SBS[1] ≤ 0)	< 2min = 0 2 - 5min = 1 > 5 min = 2	
Total Score (0-12)		

Note. Reprinted with permission from: Franck LS, Harris S, Soetenga D, Amling J, Curley M. The withdrawal assessment tool (WAT-1): Measuring iatrogenic withdrawal symptoms in pediatric critical care. *Pediatric Crit Care Med* 2008;9(6):573-580.

RESULTS

- No statistically significant decrease in PICU LOS
- When compared to pre-implementation data:
  - Average PICU LOS: ***Decreased*** by 1.5 days
  - Median PICU LOS: ***Decreased*** by 2 days

CONCLUSIONS

- Standardized withdrawal assessment in the PICU
- PICU nurses reported the WAT-1 was helpful in identifying signs of withdrawal in PICU patients
- Next Steps:
  1. Incorporate WAT-1 into electronic health record
  2. Develop methadone weaning protocol

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