Comparing Emergence Delirium Scales in the Pediatric PACU: Is PAED Really the Most Effective Scale?

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Background

- Emergence delirium (ED) is an acute state of dissociation (hyperactive state, lack of recognition, and disorientation) while emerging from anesthesia
- Multiple factors can contribute to ED:
  - Type of surgery (more prevalent in ENT, Ophthalmic)
  - Methods of anesthesia
  - Anxiety and Pain
  - Age ≥2
- Currently Phoenix Children's does not have a protocols or assessment tool to detect ED
- PACU RNs have difficulty distinguishing between pain and/or ED
- Our unit primarily performs outpatient pediatric ENT procedures (typically < 1 hr),
- Due to the subjective definitions and multiple screening tools for ED, there are inconsistent incidence rates reported (10-80%)
- Although PAED is currently the only validated ED scale, literature shows other ED scales such as, RASS and WATCHA.
- After performing a literature review, we determined that ED is detected at:
  - PAED (0-20): ≥ 10
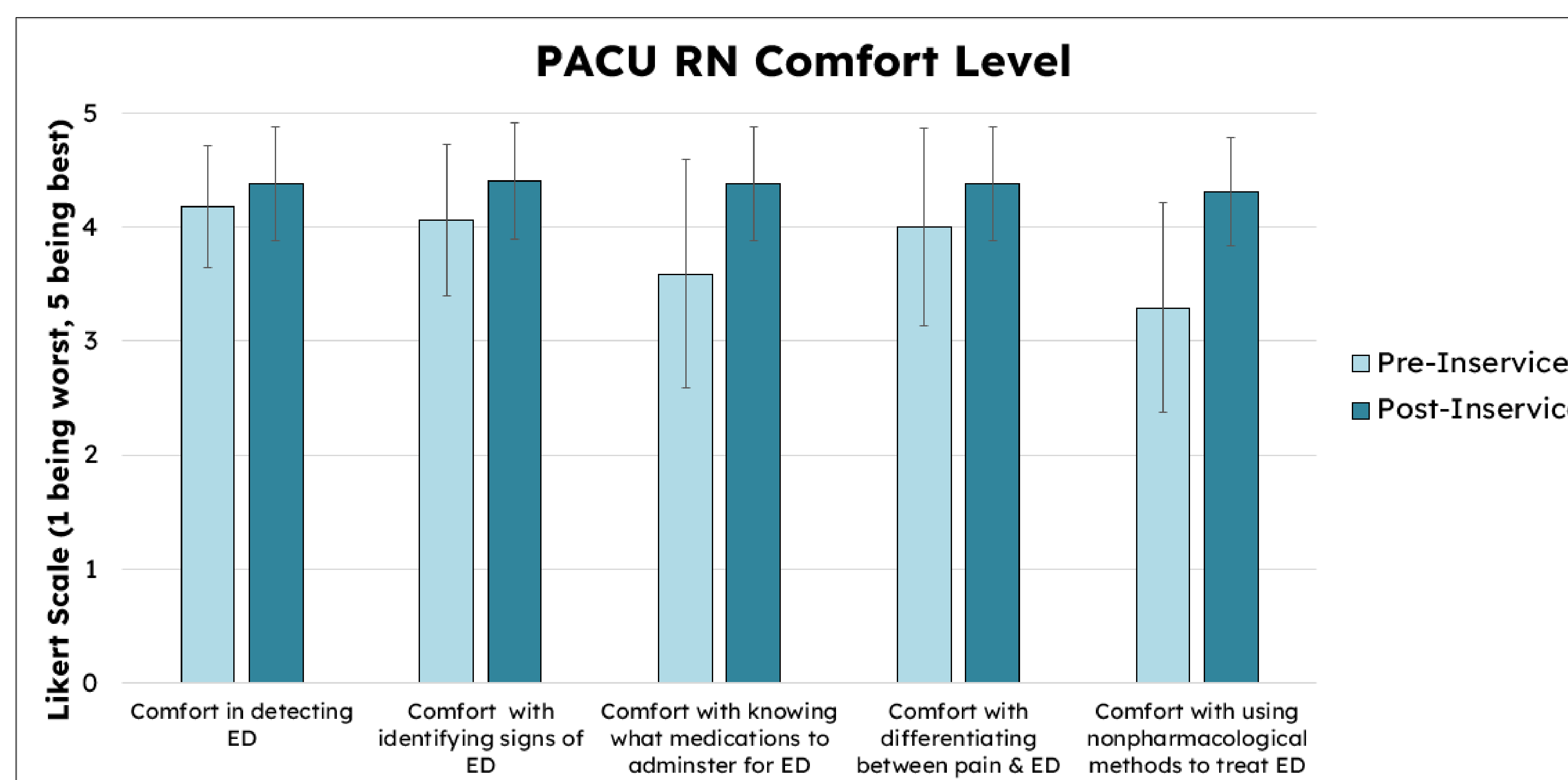 - RASS (-5 - +4): ≥ 2
  - WATCHA (0-4): ≥ 3

Objectives

- Provide education on ED to PACU RNs
- Evaluate multiple ED scales
- Determine an efficient and practicable ED scale for our unit

Implementation

- Staff education on ED and utilization of scales were performed prior to the study
- Staff evaluated their knowledge and comfort level using the Likert scale pre- and post-inservice
- 100 pediatric patients were randomized into one of the following: PAED, RASS, WATCHA
- Inclusion Criteria: ≥2 years old, adenotonsillectomy (T&A) or T&A with or without myringotomy
- FLACC and assigned ED scale were surveyed at the frequency of vitals from Phase 1 to discharge per institution policy
- All PACU interventions were recorded on the data collection sheets according to patient status.

Successful Practice

Average ED Scale Score by PACU Phase

	Phase 1 (N=553)	Phase 2 (N=631)	Total (N=1184)
WATCHA			
N	203	219	422
Mean (SD)	0.1 (0.5)	1.2 (1.1)	0.6 (1.0)
Median	0.0	1.0	0.0
Q1, Q3	0.0, 0.0	0.0, 2.0	0.0, 1.0
Range	(0.0-3.0)	(0.0-4.0)	(0.0-4.0)
RASS			
N	177	207	384
Mean (SD)	-3.6 (2.3)	-0.3 (1.4)	-1.8 (2.5)
Median	-5.0	-1.0	-1.0
Q1, Q3	-5.0, -4.0	-1.0, 0.0	-5.0, 0.0
Range	(-5.0-5.0)	(-4.0-4.0)	(-5.0-5.0)
PAED			
N	169	187	356
Mean (SD)	11.7 (1.9)	6.5 (6.0)	9.0 (5.2)
Median	12.0	5.0	12.0
Q1, Q3	12.0, 12.0	1.0, 12.0	4.0, 12.0
Range	(1.0-16.0)	(0.0-20.0)	(0.0-20.0)

Prevalence of ED and/or Pain Interventions by Scale

	PAED (N=31)	RASS (N=34)	WATCHA (N=35)	Total (N=100)	p value
Age (years)					0.8386[1]
N	31	34	32	97	
Mean (SD)	6.5 (3.5)	6.8 (3.5)	6.4 (3.6)	6.6 (3.5)	
Median	6.4	6.3	5.3	5.9	
Q1, Q3	3.5, 8.3	3.8, 9.6	3.8, 8.3	3.8, 8.7	
Range	(2.0-18.0)	(2.8-15.0)	(2.1-16.0)	(2.0-18.0)	
Any interventions					0.5631[2]
No	10 (32.3%)	15 (44.1%)	12 (34.3%)	37 (37.0%)	
Yes	21 (67.7%)	19 (55.9%)	23 (65.7%)	63 (63.0%)	
Any delirium interventions					0.8707[2]
No	29 (93.5%)	31 (91.2%)	33 (94.3%)	93 (93.0%)	
Yes	2 (6.5%)	3 (8.8%)	2 (5.7%)	7 (7.0%)	
Any pain interventions					0.8039[2]
No	14 (45.2%)	18 (52.9%)	18 (51.4%)	50 (50.0%)	
Yes	17 (54.8%)	16 (47.1%)	17 (48.6%)	50 (50.0%)	

[1]Kruskal Wallis test   [2]Chi-square test

PACU RN Comfort Level — Likert Scale (1 being worst, 5 being best). Pre-Inservice, Post-Inservice. Comfort in detecting ED; Comfort with identifying signs of ED; Comfort with knowing what medications to administer for ED; Comfort with differentiating between pain & ED; Comfort with using nonpharmacological methods to treat ED.

Max PAED score by delirium intervention

	No (N=29)	Yes (N=2)	Total (N=31)	p value
PAED				0.0391[1]
N	29	2	31	
Mean (SD)	13.2 (2.8)	18.0 (2.8)	13.5 (3.0)	
Median	12.0	18.0	12.0	
Q1, Q3	12.0, 14.0	16.0, 20.0	12.0, 16.0	
Range	(5.0-19.0)	(16.0-20.0)	(5.0-20.0)	

[1]Kruskal Wallis test

Max WATCHA score by delirium intervention

	No (N=33)	Yes (N=2)	Total (N=35)	p value
WATCHA				0.0331[1]
N	33	2	35	
Mean (SD)	2.1 (1.1)	4.0 (0.0)	2.2 (1.2)	
Median	2.0	4.0	2.0	
Q1, Q3	1.0, 3.0	4.0, 4.0	1.0, 3.0	
Range	(0.0-4.0)	(4.0-4.0)	(0.0-4.0)	

[1]Kruskal Wallis test

Max RASS score by delirium intervention

	No (N=31)	Yes (N=3)	Total (N=34)	p value
RASS				0.0055[1]
N	31	3	34	
Mean (SD)	0.8 (1.6)	4.0 (0.0)	1.1 (1.8)	
Median	0.0	4.0	0.5	
Q1, Q3	0.0, 2.0	4.0, 4.0	0.0, 2.0	
Range	(-4.0-5.0)	(4.0-4.0)	(-4.0-5.0)	

[1]Kruskal Wallis test

Future Implications

- Implementation of protocol = early interventions
- Regardless of the ED scale used, higher scores correlate with increased medication interventions
- Low reporting of ED interventions may confirm the difficultly in deciphering between ED & pain
- Continuation of data collection to help determine what ED scale is most appropriate for our institution.

WATCHA Scale

Asleep	0
Calm	1
Crying but can be consoled	2
Crying and Inconsolable	3
Agitated and thrashing around	4

Pediatric Anesthesia Emergence Delirium (PAED) Scale

The child makes eye contact with the caregiver	The child's actions are purposeful	The child is aware of his/her surroundings	The child is restless	The child is inconsolable
4 = not at all	4 = not at all	4 = not at all	0 = not at all	0 = not at all
3 = just a little	3 = just a little	3 = just a little	1 = just a little	1 = just a little
2 = quite a bit	2 = quite a bit	2 = quite a bit	2 = quite a bit	2 = quite a bit
1 = very much	1 = very much	1 = very much	3 = very much	3 = very much
0 = extremely	0 = extremely	0 = extremely	4 = extremely	4 = extremely

RASS Scale

Score	Term	Description
+4	Combative	Overtly combative or violent, immediate danger to staff
+3	Very agitated	Pulls on or removes tube(s) or catheter(s)
+2	Agitated	Frequent non-purposeful movement, fights ventilator
+1	Restless	Anxious but movements not aggressively vigorous
0	Alert and Calm	
-1	Drowsy	Not fully alert but has sustain awakening (eye opening/ eye contact) to voice (>10 secs)
-2	Light Sedation	Briefly awakens to voice with eye contact (<10 secs)
-3	Moderate Sedation	Movement or eye opening to voice (but no eye contact)
-4	Deep Sedation	No response to voice but movement or eye opening to physical stimulation
-5	Unarousable	No response to voice or physical stimulation

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