Pediatric Dental Post-Sedation Discharge Events and Proper Discharge Timing

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PURPOSE

The aim of this study was to validate discharge scales, the Modified Aldrete Score (MAS) and the Vancouver Recovery Score (VRS) in pediatric sedation and to compare the post-discharge effects of commonly used moderate sedation medicaments in pediatric dentistry.

BACKGROUND

- Sedation dentistry is a common practice in which medications are used to help combat patient's dental fear and anxiety during a procedure to aid in successful treatment.
- The goal of pediatric dental treatment is enhanced patient outcomes, while prioritizing safety not only during the treatment, but ensuring the safe and timely discharge after sedation.
- Sedation drugs can be administered through various routes such as oral, nasal, intramuscular, intravenous (IV), subcutaneous, and inhalational routes¹ and include but are not limited to, midazolam, hydroxyzine, dexmedetomidine, ketamine, and chloral hydrate.2
- Post-sedation discharge events may include prolonged sleepiness, motor imbalance, delayed time to return to normal activity³ and agitation, which may include whines, cries, hallucinations, restlessness, or physical combativeness.4,5,6
- Current AAPD recommended discharge criteria focus on patient consciousness and O2 saturation⁷, and may lead to variability amongst providers due to objective interpretation.
- MAS, which is commonly used in pediatric dental sedation, compares postoperative vitals and how awake a child is to their pre-procedure score, but fails to measure alertness.8
- VRS, commonly used in medicine, identifies 12 distinct items that encompass three categories of alertness indicators. It has shown excellent internal consistency and reliability.9

Criteria	Characteristics	Points
Activity	Able to move 4 extremities	2
	Able to move 2 extremities	1
	Unable to move extremities	0
Respiration	Able to breathe deeply and cough freely	2
	Dyspnea or limited breathing	1
	Apneic	0
Circulation	BP ± 20% of pre-anesthetic level	2
	BP ± 20-49% of pre-anesthetic level	1
	BP ± 50% of pre-anesthetic level	0
Consciousness	Fully awake	2
	Arousable on calling	1
	Not responding	0
Oxygen saturation	Able to maintain O ₂ saturation >92% on room air	2
	Needs oxygen to maintain O ₂ saturation >90%	1
	O ₂ saturation <90% even with supplemental oxygen	0

Figure 1: Modified Aldrete Score

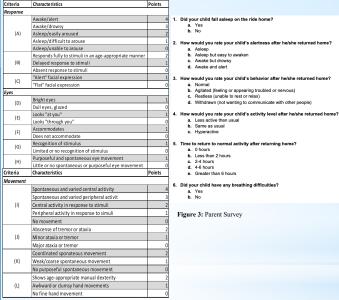


Figure 2: Vancouver Recovery Score

METHODS

- A prospective cohort study of 70 children, 1/5/2022-12/13/2023
- Inclusion criteria: 3-6 years old, ASA I or II, and English speaking
- Children scheduled for dental treatment with in-office moderate sedation were given one of the following medicaments
 - · PO Midazolam
 - IN Midazolam

 - PO Midazolam/PO Vistaril
 - · IN Dexmedetomidine (Dex)
 - · PO Versed/IN Dex
 - PO Triazolam
- Recovery scales were used 5-, 10-, 15-, and 20-minutes post operatively (Figure 1 and 2)
- · Parental survey was given to assess how patient recovered at home after treatment (Figure 3)

DATA ANALYSIS

- Descriptive statistics were completed
- Categorical data are presented as frequency count (%) and scores are presented as median [interquartile range with 25th percentile, 75th percentile].
- Data were analyzed with SAS v9.4.

RESULTS

- The resident's and nurse's VRS scores post-operatively agreed for 73% of cases and MAS scores agreed 97%
- Pre-operatively, the median VRS was 22 and median MAS was 10. Post-operatively at 20 minutes, the medians remained the same for both.
- By parent report, 42% of patients were awake but drowsy when home, 42% were agitated, 58% were less active than usual, 67% returned to normal activity between 2-6 hours after returning home

CONCLUSIONS

Based on this study's current data, the VRS and MAS scores are global scales that show potential to quantify discharge criteria after pediatric dental sedation

LIMITATIONS

- · Inability to fill out scales during and after treatment due to patient's behavior
- · Parent compliance with survey
- Uneven distribution of drug regimen used

collaboration. Pediatr Crit Care Med. 2013;14:112-3.

Keira PM. Pediatric sedation outside of the operating room: A multispecialty international

- Sharan R, Makkar V, Gupta KK, Khetarpal R, Kataria AP. Conscious Sedation: Emerging Trends in Pediatric Dentistry. Anesth Essays Res. 2017 Apr-Jun;11(2):277-281. doi: 10.4103/0259-
- 1162.171458. PMID: 28663606; PMCID: PMC5490120. Dosani FZ, Flaitz CM, Whitmire HC, Vance BJ, Hill JR. Postdischarge events occurring after
- pediatric sedation for dentistry. Pediatric Dentistry 2006; 28(3): 260-265 Huang A, Tanbonliong T. Oral sedation postdischarge adverse events in pediatric dental patients
- Lightdale JR, Valim C, Mahoney LB, et al. Agitation during procedural sedation and analgesia in
- children. Clin Pediatr (Phila) 2010;49(1):35-42 Muthukrishnan A, McGregor J, Thompson S. Safety and predictability of conscious sedation in
- dentistry: A multicentre regional audit South and West Wales experience. Br Dent J
- Guidelines for Monitoring and Management of Pediatric Patients Before, During, and After Sedation for Diagnostic and Therapeutic Procedures. Pediatr Dent 2019;41(4):E26-E52. Aldrete, I.A. "The post-anesthesia recovery score revisited." Journal of clinical anesthesia vol. 7.1
- (1995): 89-91. doi:10.1016/0952-8180(94)00001-k Macnab AJ. Levine M. Glick N, Susak L, Baker-Brown G. A research tool for measurement of recovery from sedation: the Vancouver sedative recovery scale. J Pediatric Surgery. 1991; 23(11): 1263-1267