

Introduction

Sedation is sometimes required to facilitate dental care in children. At UPD we provide Oral / IV moderate sedation and deep IV sedation based upon the requirements of the case. The advantages of a deep inhalational sedation include rapid induction and recovery of deep sedation, early discharge, with **no** IV access required. The aim of this prospective study is to evaluate the outcomes of a chair based office deep inhalational sedation at the UPD sedation suite for pediatric patients ages 4-12 with smaller dental treatment plans. Our secondary outcome is an assessment of the efficacy of this sedation technique for patients with reported ADHD and ASD (Special Needs, SN) with a focus on the incidence of post sedation delirium.

TABLE 1. PAED SCALE	0	1	2	3	4
CHILD MAKES EYE CONTACT WITH CARE GIVER	ALL THE TIME	MOST OF THE TIME	SOMETIMES	OCCASIONALLY	NOT AT ALL
CHILD'S ACTIONS ARE PURPOSEFUL	ALL THE TIME	MOST OF THE TIME	SOMETIMES	OCCASIONALLY	NOT AT ALL
CHILD IS AWARE OF SURROUNDINGS	ALL THE TIME	MOST OF THE TIME	SOMETIMES	OCCASIONALLY	NOT AT ALL
CHILD IS RESTLESS	NOT AT ALL	OCCASIONALLY	SOMETIMES	MOST OF THE TIME	ALL THE TIME
CHILD IS INCONSOLABLE	NOT AT ALL	OCCASIONALLY	SOMETIMES	MOST OF THE TIME	ALL THE TIME

TABLE 2	AGE (years)	WEIGHT (kg)	BMI
OVERALL average	6.7	27.1	16.7
OVERALL SD	1.8	8.9	2.7
SPECIAL NEED average (n=13)	7.8	33.5	18.3
NO SN average (n=55)	6.4	25.5	16.3
<i>ttest (SN and No SN), p value:</i>	0.010	0.003	0.016

Methods

Following the Sevoflurane deep inhalational sedation, patients' behavior was observed during recovery and agitation/delirium was assessed using the Pediatric Anesthesia Emergence Delirium Scale (PAEDS, Table 1, Ref.1). The treatment outcomes were assessed based on the treatment planned

and the treatment completed. During the sedation, the Anesthesiologist manages the airway initially with chin lift, jaw thrust, with assisted BMV as needed. Sedation quality and airway interventions were assessed using our routinely used Airway and Behavior scores recorded on the sedation record. Parents were contacted 48-72 hours after surgery by phone to answer questions about the sedation experience. This included; drowsiness, N/V, pain, procedure recall, post sedation behavior, an overall rating of the sedation with any comments and would they repeat the process.

Results

Overall, we have completed over 300 cases since we started this sedation technique in March 2022. In this prospective study, we have recruited 68 patients. The Overall and SN patient demographics are shown in table 2. The procedure and sedation timing as well as sedation outcomes are shown in table 3. Of the 68 treatment plans, all were completed with 17 patients receiving additional treatment. There was no difference in monitored parameters during the sedation between the two groups (Figure 1).

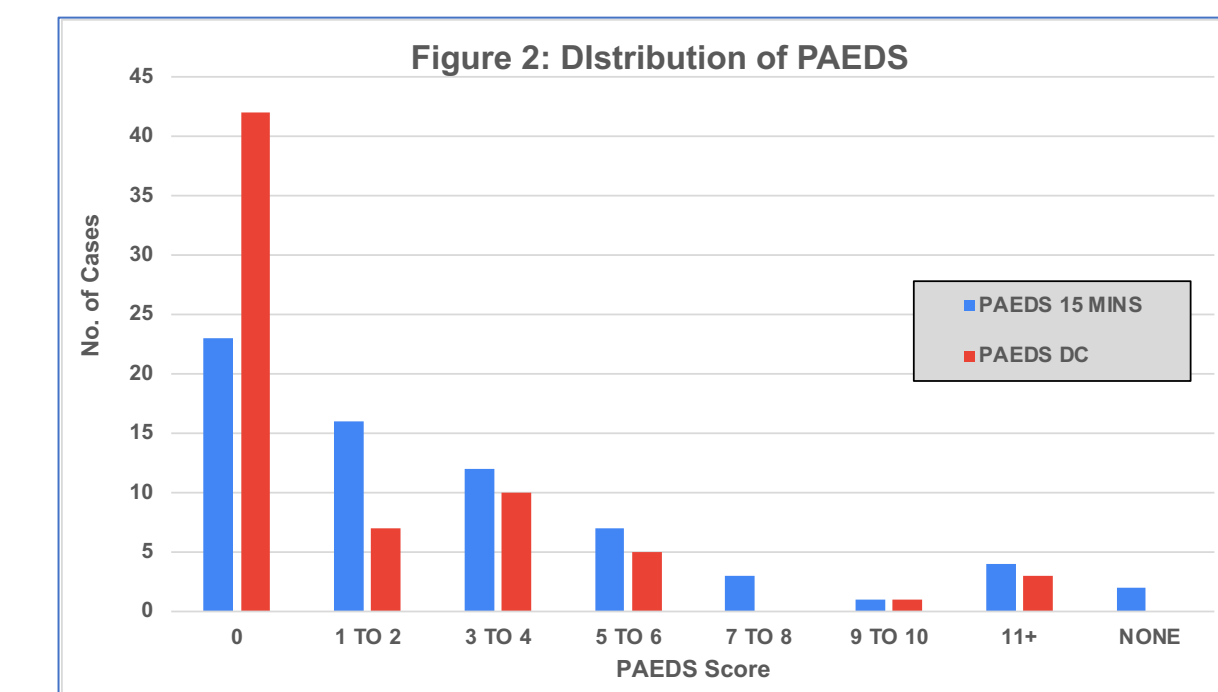
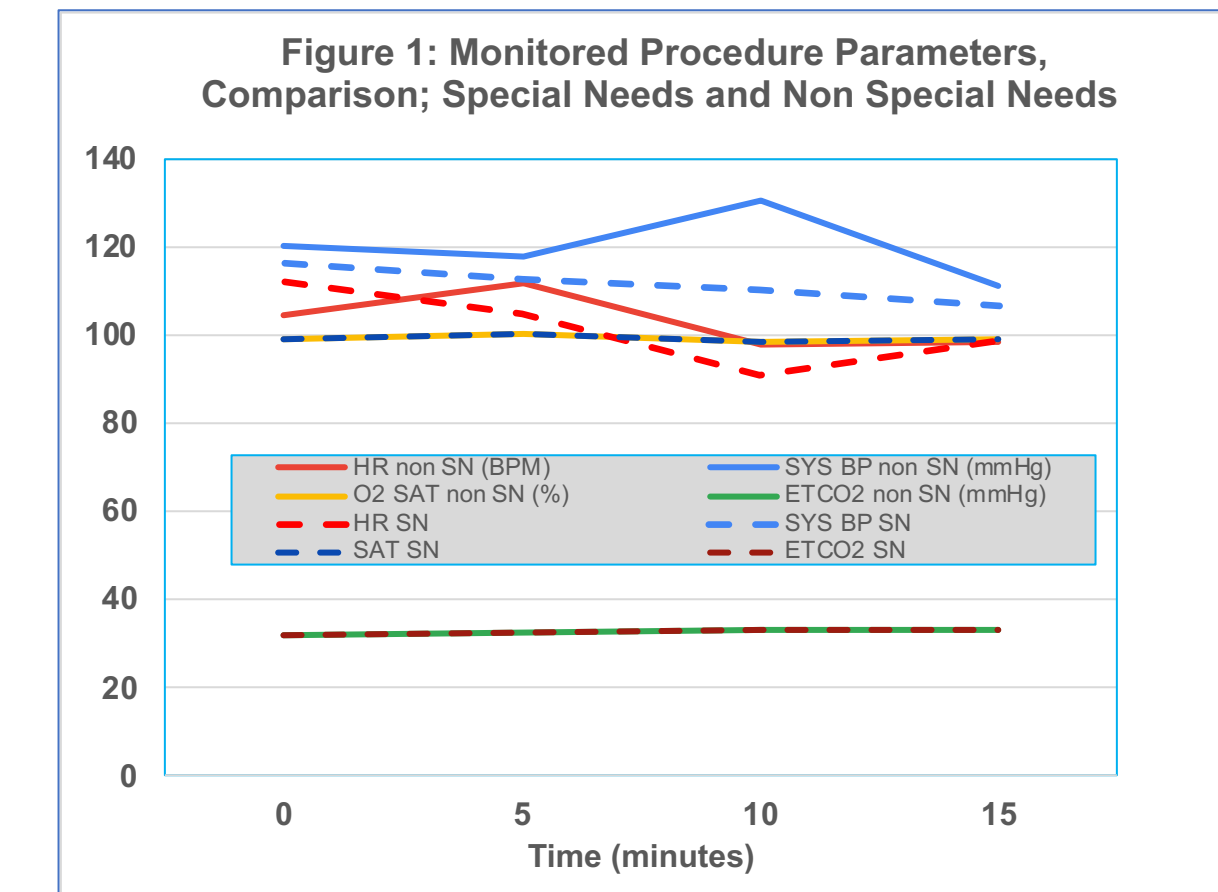
The average PAEDS for all patients 15 minutes post procedure was 2.8 and at discharge 1.7 (Figure 2). The PAEDS was higher in the SN group at 15 minutes (4.8 c/w 2.3, $p=0.013$), however at discharge they were no different (2.9 c/w 1.4, $p=0.111$). Delirium (a PAEDS > 9) occurred in 5 children at T=15 mins (SN=2, $p=NS$) and in 4 children on DC (SN=1, $p=NS$). All 44 parents (~65%) who answered our follow-up phone calls said they would repeat the sedation experience. The questionnaire results such as post sedation behavior and overall parent outcome assessments are shown in table 4.

TABLE 3	NITROUS TIME	SEVOFLURANE TIME	SEDATION TIME	PROCEDURE TIME	PHASE 1 TIME	DC TIME	PRE RASS	AIRWAY SCORE	BEHAVIOR SCORE
SN average	3.8	11.1	3.4	8.5	6.1	21.7	1.1	4.5	9.8
NO SN average	3.2	9.1	2.9	6.9	6.3	21.2	0.8	4.4	9.9
<i>ttest</i>	0.071	0.058	0.089	0.145	0.718	0.805	0.474	0.772	0.435

TABLE 4	FOLLOW-UP PHONE CALL		
% Post OP Required Pain meds	% Repeat Process	Post Sedation Behavior	Overall Assessment
46.3	100	NORMAL	FAIL (1)
% Post OP Drowsiness	% Post OP N / V	30	0
45.5	18.2	QUIET	POOR (2)
		6	0
		CONFUSED	OKAY (3)
		3	2
OVERALL average	4.8	HYPERACTIVE	GOOD (4)
SPECIAL NEED average	4.5	1	6
NO SN average	4.8	AGITATED	EXCELLENT (5)
<i>ttest</i>	0.103	4	36
		AGGRESSIVE	
		0	

Discussion

As we develop this service, the patient selection and procedures appear to be appropriate. We have expanded the size and duration of procedures over the initial 6 months and the study results reflect our present practice. The treatment proved to be safe and effective for every patient in this population and parent satisfaction was very high. Post sevoflurane agitation has been reported after pediatric surgery ~ 50% (Ref. 2), however we did not see many patients whose PAEDS exceeded 9 (Ref. 3). The short duration of administration may be why. The PAEDS was slightly higher in the SN group at 15 minutes but similar on discharge. This suggests no increased risk of delirium for these children and the quality of sedation appeared to be equally good as was parent satisfaction.



1. Sikich N, Lerman J. Development and Psychometric Evaluation of the Pediatric Anesthesia Emergence Delirium Scale. Anesthesiology 2004; 100:1138 – 45.
 2. Denberu E, Habtamu G, et al. Incidence and associated factors of emergence agitation after general anesthesia and surgery among pediatric patients: A prospective follow-up study. International Journal of Surgery Open, 27, 2020, 25-31.
 3. Russell PS, Mammen PM, et al. Pediatric Anesthesia Emergence Delirium Scale: A diagnostic meta- analysis. World J Clin Pediatr 2022 March 9; 11(2): 196-205.