Safety and Use of Dexmedetomidine in the Pediatric Intensive Care Unit (**SAD-PICU**)

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Background

- Critically ill infants and children require sedation for comfort and to prevent self-extubation and/or self-removal of intravenous catheters
- Dexmedetomidine: alpha-2 agonist
  - Sedative
  - Opioid-sparing
- Advantages:
  - Short acting
  - Inactive metabolites
  - Minimal respiratory depression
  - Reduced time to extubation in ventilated children
- Limited safety data for use >24 hours
- June 2010: dexmedetomidine available in Canada and Children's & Women's (C&W) formulary
- Sedation practice in the Pediatric Intensive Care Unit (PICU) has evolved since introduction of dexmedetomidine

Objectives

- **Primary:** Determine the rate of adverse events associated with dexmedetomidine in critically ill children
- **Secondary:**
  - Characterize the use of dexmedetomidine in the PICU at C&W
  - Determine the effectiveness of dexmedetomidine in this setting

Methods

- **Design:** Retrospective review
- **Population:** Patients who received dexmedetomidine between June 2010 and September 2011
- **Inclusion:** < 18 years of age and received dexmedetomidine in the PICU
- **Exclusion:** Procedural sedation
- **Statistics:** Descriptive statistics with SPSS 17.0

Results

Table 1. Patient Demographics (N=145)

Median Patient Age (range) [months]	33 (0-212)
Female [%]	32.7
Median Weight (range) [kg]	15 (2.4-79)
Median PRISM Score (range)	3 (0-31)
Median PICU length of stay (range) [days]	5 (1-111)

Figure 1. Admission Diagnosis

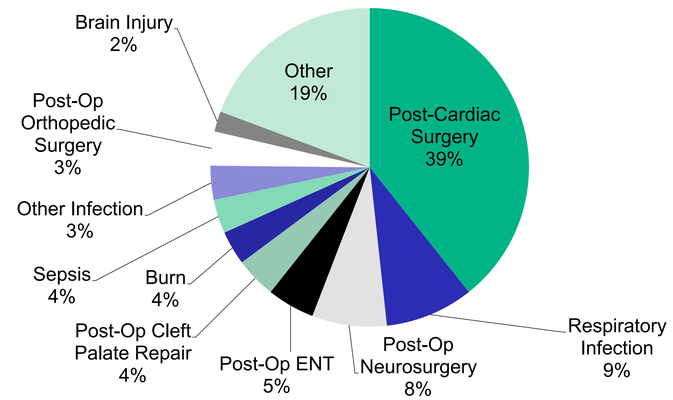


Figure 2. Comorbidities

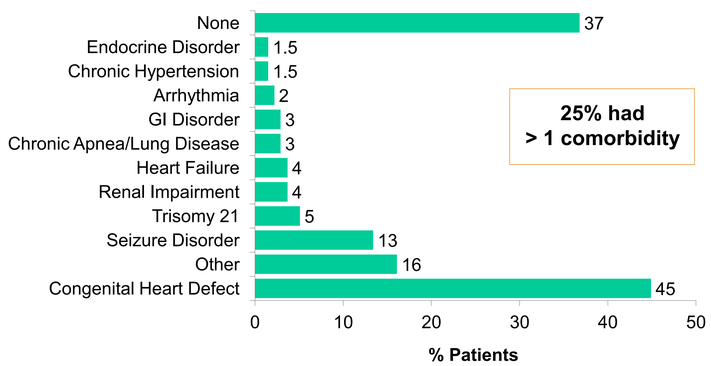


Table 2. Dexmedetomidine Usage

	Mean Dosage [mcg/kg/h] (SD)	Dosage Range [mcg/kg/h]	Median Duration* [h] (range)
All N= 145	0.43 (0.17)	0.05-2	21 (1-855)
0-1 month N= 18	0.35 (0.13)	0.1-0.7	**40** (9-307)
>1 month-1 y N= 37	0.43 (0.10)	0.1-1	**37** (1-263)
1-5 y N= 24	0.52 (0.25)	0.1-2	24 (7-855)
5-12 y N= 34	0.45 (0.14)	0.05-1	18 (1-654)
>12 y N= 32	0.36 (0.15)	0.05-0.8	20 (1-216)

***47% of infusions were >24 hours in duration**

Figure 3. Effectiveness: Sedation (SBS) & Pain Score

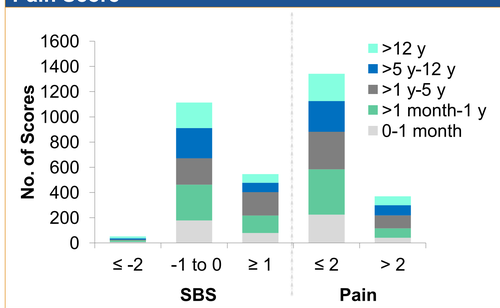


Figure 4. Concomitant Sedatives

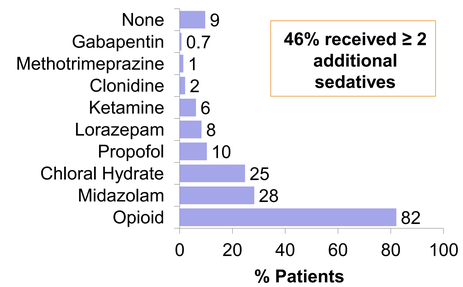


Figure 5. Safety: Adverse Events by Age

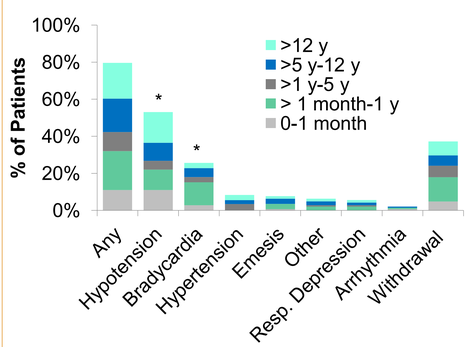
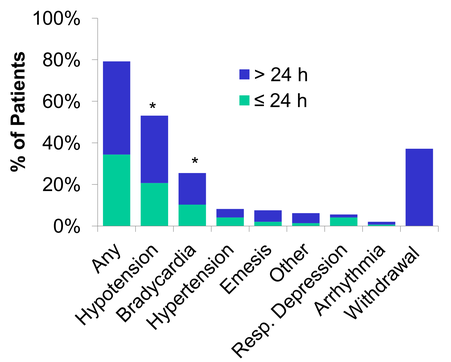


Figure 6. Safety: Adverse Events by Duration



* 22% of patients with bradycardia and hypotension had a Naranjo Score >4 ("probable" association)

Conclusions

- Our study is the largest in this population
- Adverse events were common, the majority were hemodynamic effects and appeared to be associated with duration of therapy
- Patients achieved adequate sedation the majority of time
- Prospective, comparative studies assessing adverse events when treatment duration exceeds 24 hours are required