A Drug Use Evaluation Comparing Dexmedetomidine Use at 3 Fraser Health Sites relative to the Manufacturer's Recommended Directions for Use (DECODE study)

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Background

- Dexmedetomidine is an α_2-receptor agonist approved for use as a sedative in the US and Canada in 2009
  - Acts at the locus ceruleus and spinal cord to produce sedation and analgesia
  - Loading dose (optional) 1 mcg/kg over 10-20 mins
  - Maintenance infusion 0.2-0.7 mcg/kg/hr, titrate to goal sedation
  - Maximum duration of 24 hours

Objectives

- **Primary:**
  - Use/Amount of bolus doses
  - Infusion parameters (initial, min/max, average weighted rate)
  - Duration of therapy
- **Secondary:**
  - Time until extubation (hours)
  - % time RASS goal within target (-1 to +1),
  - Incidence: bradycardia, hypotension, other serious AEs
  - Use of prior sedatives
  - Total cost of drug per patient

Methods

- **Design:** Retrospective chart review, multi-centred (BUH, RCH, SMH)
- **Inclusion:** Adults >18 y.o. receiving dexmedetomidine in ICU Jan 1, 2011 – Nov 30, 2012
- **Statistics:** Descriptive statistics

Table 1: Study population demographics at 3 Fraser Health sites.

	FHA (n=57)	BUH (n=7)	RCH (n=32)	SMH (n=18)
Male, No (%)	39 (68)	4 (57)	23 (72)	12 (67)
Age (years), mean ± SD	45 ± 19	50 ± 21	44 ± 19	60 ± 14
Weight (kg), mean ± SD	80 ± 27	93 ± 40	85 ± 23	86 ± 20
Reason for Admission, No (%)				
Medical	42 (74)	7 (100)	18 (56)	18 (100)
Trauma	15 (26)	0	14 (44)	0
Previous sedative administered, No (%)				
Benzodiazepine	53 (93)	6 (86)	32 (100)	15 (83)
Propofol	34 (60)	1 (14)	24 (75)	9 (50)
Antipsychotics	51 (89)	3 (43)	26 (81)	6 (33)

Results

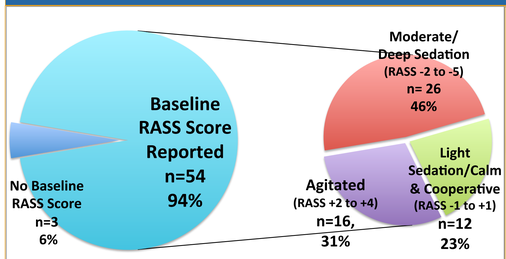


Fig. 1: Baseline RASS Scores prior to Dex (n=57)

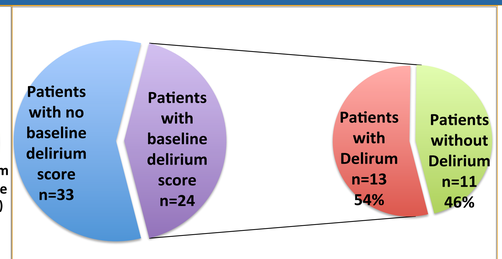


Fig. 2: Baseline Delirium Scores prior to Dex (n=57)

Table 2: Details of dexmedetomidine use at 3 FHA sites.

	FHA (n=57)	BUH (n=7)	RCH (n=32)	SMH (n=18)
Bolus dose				
Patients, No (%)	24 (42)	0	17 (53)	6 (33)
Bolus dose given (mcg/kg), mean ± SD	1 ± 0	0	0.93 ± 0.23	1 ± 0
Infusion Rates (mcg/kg/h), mean ± SD				
Initial	0.37 ± 0.17	0.4 ± 0	0.4 ± 0.19	0.29 ± 0.14
Minimum used	0.25 ± 0.11	0.3 ± 0.12	0.27 ± 0.13	0.21 ± 0.02
Maximum used	0.64 ± 0.21	0.79 ± 0.20	0.66 ± 0.20	0.61 ± 0.21
Average weighted	0.51 ± 0.16	0.51 ± 0.13	0.54 ± 0.16	0.45 ± 0.15
Durations (hours), mean ± SD				
Therapy	28 ± 18	20 ± 13	30 ± 18	43 ± 20
Intubated while on Dex	19 ± 18	11 ± 12	21 ± 19	29 ± 29
Total Amount of drug received (mcg), mean ± SD	1490 ± 212	897 ± 770	1494 ± 1136	1603 ± 838
Total Cost of drug received ($), mean ± SD	303.22 ± 212.26	186.85 ± 160.40	311.36 ± 236.68	334.02 ± 174.57

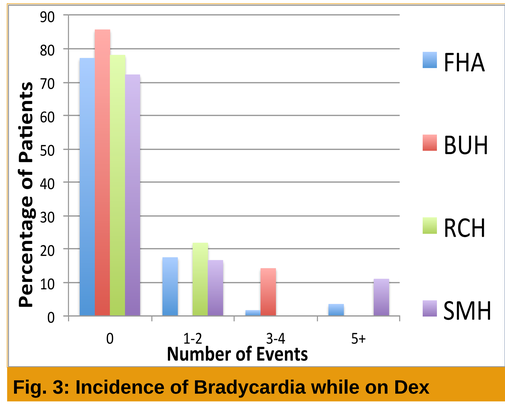


Fig. 3: Incidence of Bradycardia while on Dex

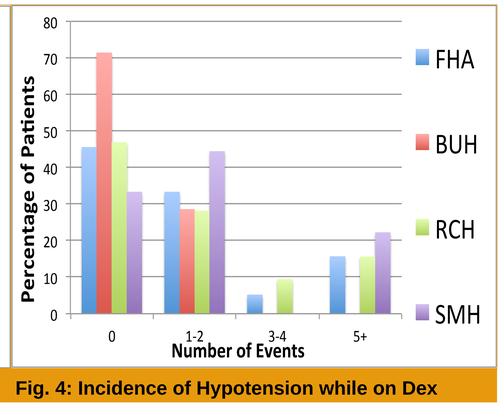
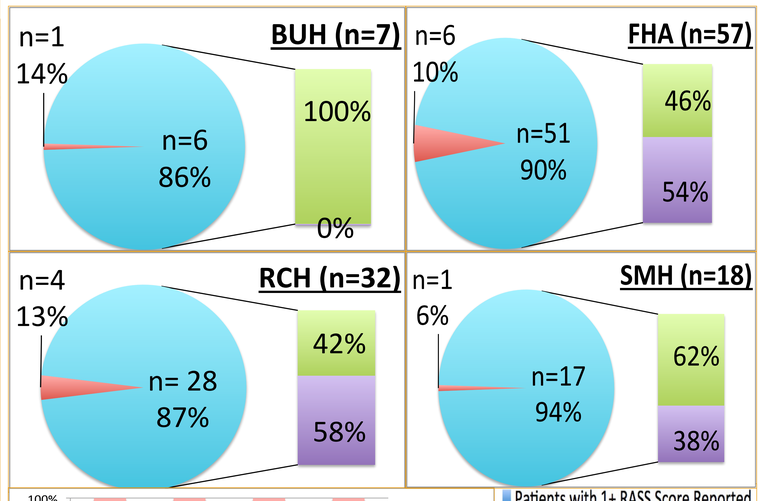


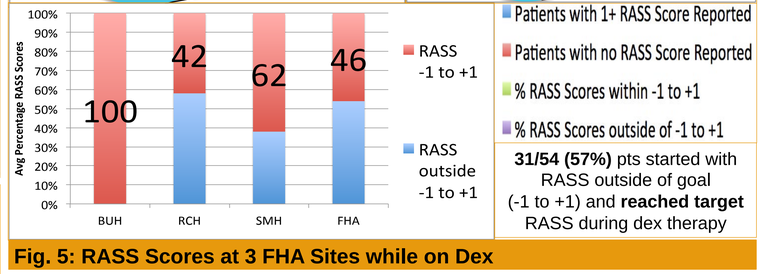
Fig. 4: Incidence of Hypotension while on Dex

Table 3: Cost of dexmedetomidine use at 3 FHA sites.

	FHA (n=57)	BUH (n=7)	RCH (n=32)	SMH (n=18)
Total Expected Cost ($)*	71,746.08	10,928.40	45,785.04	25,961.04
Actual Cost ($)	17,375.67	1,333.44	10,000.08	6,042.15
Percentage of Budget Used	24.22	12.20	21.84	23.27

*based on patient weight, dosed at 0.7 mcg/kg/hr for 24 hrs





31/54 (57%) pts started with RASS outside of goal (-1 to +1) and **reached target** RASS during dex therapy

Fig. 5: RASS Scores at 3 FHA Sites while on Dex

Conclusions

- Variation in use of loading dose but compliant with recommended dosing
- Infusion parameters similar among sites and follow recommended directions for use
- Differing durations of therapy
- Main adverse events: bradycardia and hypotension
- No other serious adverse events documented
- Delirium results inconclusive
- Actual cost was ~25% of expected cost