



Dexmedetomidine in Pediatric Cleft Lip and Palate Surgery: Impact on Recovery & Perioperative Narcotic Use

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Introduction

- Dexmedetomidine (DEX), a highly selective alpha-2 adrenergic receptor agonist, known for its sedative, anxiolytic, and analgesic effects. It has hemodynamic stability, respiratory-sparing and opioid-sparing effects¹.
- Potential advantages include decreases opioid requirements and provides anti-nociceptive effects for somatic and visceral pain².
- Potential disadvantages include delayed emergence increased intraoperative hypotension,³ and prolonged PACU stay⁴.
- Resource limited countries face challenges when it comes to providing safe anesthesia including decreased availability of medications, equipment and lack of adequate training^{5,6,7}.
- Rotaplast International is an organization that brings together a multidisciplinary team including surgeons and anesthesiologists to provide free reconstructive surgery to children (Rotaplast.org).

Design/Sample

- With IRB approval, de-identified data was obtained from the records of pediatric patients from multiple countries.
- Cases were reviewed retrospectively to identify patients who had undergone cleft lip and palate repairs and revisions.
- Data extracted and analyzed included patient demographics, procedure type, intraoperative drug amounts, perioperative complications and analgesia.

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Results

Table 1: Intra-operative Analgesia & Complications				
Procedure	Acetaminophen (mg/kg)	Total OR Narcotics (ms eq/kg)	Tachycardia/Hypertension (n)	Bradycardia/Hypotension (n)
DEX				
All Patients	22 [15, 29]	0.16 [0.10, 0.27]	170 (46%)	141 (38%)
Lip & Lip Revision	23 [16, 30]	0.14 [0.10, 0.23]	60 (35%)	73 (42%)
Palate & Palate Revision	20 [15, 27]	0.18 [0.12, 0.31]	110 (55%)	68 (34%)
Primary Lip	23 [16, 30]	0.17 [0.11, 0.25]	40 (38%)	54 (51%)
No-DEX				
All Patients	21 [16, 27]	0.13 [0.09, 0.22]	138 (40%)	132 (38%)
p	0.415	0.0001*	0.151	0.878
Lip & Lip Revision	21 [16, 27]	0.11 [0.08, 0.18]	74 (33%)	88 (39%)
p	0.158	0.007*	0.748	0.537
Palate & Palate Revision	20 [15, 27]	0.19 [0.10, 0.30]	64 (54%)	44 (38%)
p	0.757	.0550	0.908	0.627
Primary Lip	21 [15, 32]	0.11 [0.08, 0.19]	45 (35%)	55 (43%)
p	0.441	0.001*	0.685	0.238

*statistically significant

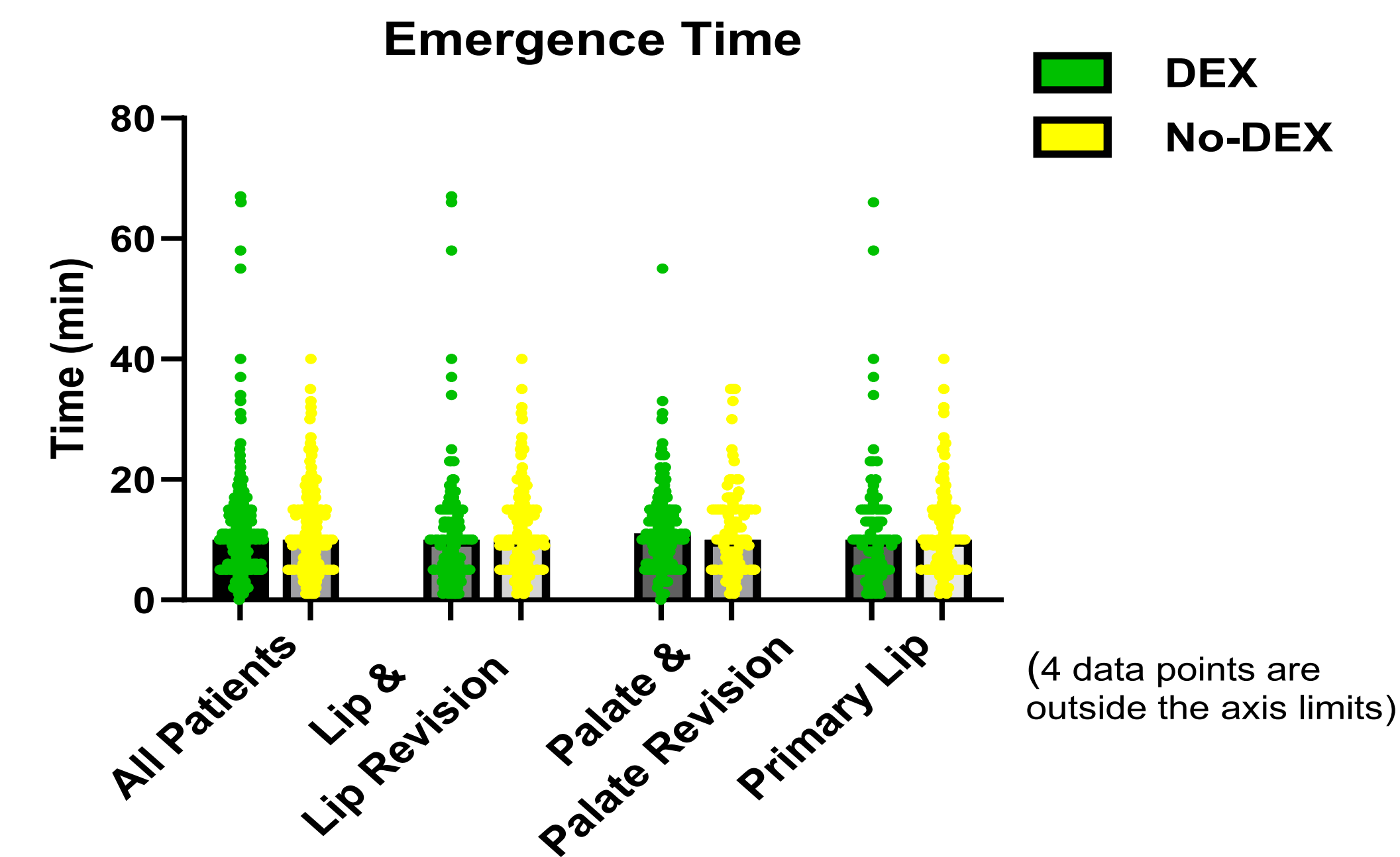
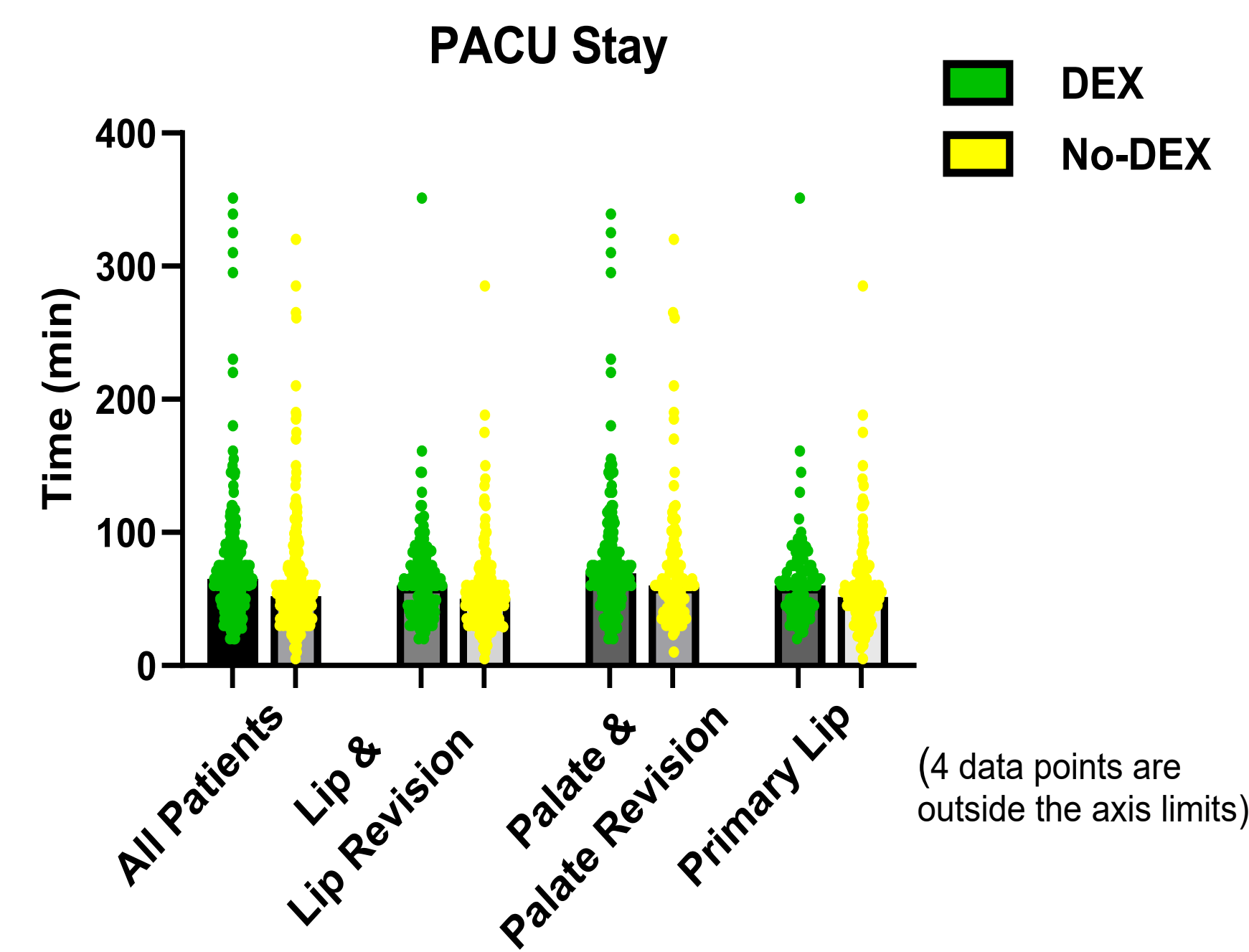


Table 2: PACU Analgesia and Recovery						
Procedure	Emergence Time (min)	PACU Analgesia Required (n)	PACU Narcotics (ms eq/kg)	PACU Duration (minutes)	Peri-operative Complications (n)	Total Narcotics (ms eq/kg)
DEX						
All Patients	10 [5, 15]	128 (34%)	0.06 [0.03, 0.08]	65 [45, 85]	19 (5%)	0.18 [0.11, 0.28]
Lip & Lip Revision	10 [5, 14]	39 (23%)	0.04 [0.03, 0.07]	60 [41, 80]	5 (3%)	0.15 [0.10, 0.23]
Palate & Palate Revision	11 [7, 15]	89 (45%)	0.06 [0.04, 0.08]	69 [55, 86]	14 (7%)	0.21 [0.13, 0.32]
Primary Lip	10 [5, 15]	14 (13%)	0.07 [0.05, 0.09]	60 [44, 75]	4 (4%)	0.19 [0.11, 0.25]
No-DEX						
All Patients	10 [5, 15]	107 (31%)	0.05 [0.04, 0.10]	52 [40, 65]	17 (5%)	0.15 [0.09, 0.24]
p	0.980	0.381	0.162	<0.0001*	>0.999	0.0004*
Lip & Lip Revision	10 [5, 15]	50 (22%)	0.05 [0.04, 0.10]	50 [35, 60]	5 (2%)	0.12 [0.08, 0.20]
p	0.511	>0.999	0.067	<0.0001*	0.752	0.008*
Palate & Palate Revision	10 [5, 15]	57 (48%)	0.06 [0.04, 0.10]	60 [42, 81]	12 (10%)	0.20 [0.14, 0.33]
p	0.949	0.561	0.492	0.015*	0.397	0.995
Primary Lip	10 [5, 15]	32 (25%)	0.06 [0.05, 0.10]	52 [40, 65]	0	0.13 [0.09, 0.22]
p	0.945	0.032*	0.794	0.016*	0.041*	0.005*

Summary

In patients who received intraoperative DEX:

- There was a **clinically and statistically significant decrease in postoperative analgesia** requirement in patients who underwent primary lip surgery.
- There was **no** clinically significant increase in emergence time or PACU duration.
- There was **no** clinically significant overall decrease in intraoperative narcotic use.
- There was **no** clinically significant increase in intraoperative hypotension or other complications.

Conclusion

The unstructured use of dexmedetomidine did not significantly impact overall perioperative narcotic use in this sample of cleft lip and palate repair and revision patients. However, patients undergoing primary lip repair required significantly less postoperative analgesia, suggesting a potential clinical benefit in this subset. These findings highlight the need for further research to evaluate structured clinical protocols for dexmedetomidine use, particularly in low-resource settings and international surgical contexts, to better assess its potential opioid-sparing effects and overall safety in pediatric populations.

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