

National Practice Patterns for the Use of Regional Anesthesia for Pediatric Cardiac Surgery and Impact on Postoperative Outcomes:



An Analysis of the Society of Thoracic Surgeons Congenital Cardiac Anesthesia Society (STS-CCAS) Database

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Introduction

- Complications associated with suboptimal pain management after pediatric cardiac surgery have increased the interest in the use of regional anesthesia (RA)¹
- Emerging evidence to support that RA decreases perioperative opioid use and improves pain scores^{2,3}
- Aim 1:** Evaluate national trends in RA use for pediatric cardiac surgery
- Aim 2:** Determine if RA impacts clinical outcomes in ASD/VSD sub-population

Methods

- Retrospective cohort study of all cardiac operations in patients < 18 years in the STS-CCAS Database (2016-2023)
- Exclusion criteria: out of OR operations, centers with > 90% missing for anesthesia approach, records with missing data on RA
- Data collected: Patient characteristics, center level data, surgical data, year, RA type
- Subanalysis in index ASD/VSD cases using univariable analysis and hierarchical multivariable logistic regression models
- Outcomes: Extubation in OR and postoperative length of stay (PLOS)
- PLOS outcome was dichotomized into short (<3 days) and long (>10 days)

Results

	No-RA N= 87,517	RA N= 7,997
Age		
Neonate	17,890 (98%)	364 (2%)
Infant	32,836 (92%)	2,840 (8.0%)
Toddler	13,795 (88%)	1,948 (12%)
School Age	14,106 (88%)	1,886 (12%)
Adolescent	8,890 (90%)	959 (10%)
Weight (kg)	14.8 (19.2)	18.2 (19.1)
Center Volume		
Q1 (<108)	5,485 (80%)	1,375 (20%)
Q2 (108-225)	14,623 (90.0%)	1,623 (10%)
Q3 (226-354)	22,503 (91%)	2,187 (9%)
Q4 (>355)	44,906 (94%)	2,812 (6%)

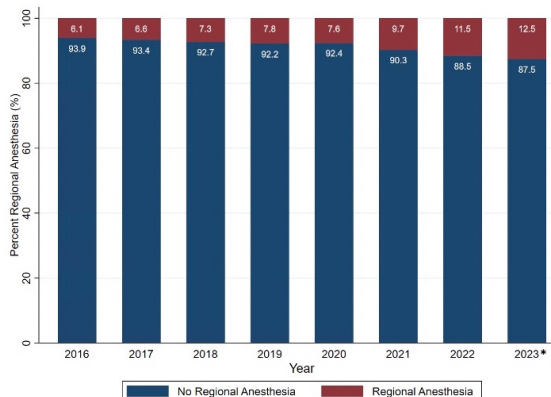


Figure 1: 8-year Trend in Regional Anesthesia use, N = 95,514
Table 1: Clinical Characteristics of cohort stratified by RA from 62 US centers
Table 2: Results of multivariable logistic regression in ASD/VSD cases for perioperative outcomes, N=6,105. ASD without RA is ref group (aOR, p-value).

	OR Extubation		Short (< 3 day) PLOS		Long (< 10 day) PLOS	
ASD repair	1 (ref)	--	1 (ref)	--	1 (ref)	--
VSD repair	0.46 (0.38, 0.57)	< 0.001	0.42 (0.31, 0.58)	< 0.001	4.01 (2.26, 7.11)	< 0.001
ASD with RA	1.74 (1.13, 2.69)	0.01	2.05 (1.32, 3.19)	< 0.001	0.45 (0.10, 2.05)	0.3
VSD with RA	1.58 (1.14, 2.18)	0.01	1.09 (0.67, 1.77)	0.72	2.58 (1.36, 4.93)	< 0.001

Discussion

- Regional anesthesia use in pediatric cardiac surgery is increasing in US**
- Number of neuraxial procedures remained constant over time (500/year)
 - Number of non-neuraxial procedures (ie: fascial plane blocks) increased > 6-fold during study period
- Regional anesthesia use may be associated with improved perioperative outcomes in select populations**
- Subanalysis of ASD/VSD population suggests that patients with RA are more likely to be extubated in the OR and have shorter PLOS
- Our findings support the inclusion of RA in enhanced recovery after surgery protocols for pediatric cardiac surgery**
- When appropriate, regional anesthesia should be considered as part of a postoperative analgesic strategy

References

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