

Title: Retrospective Study on OR Extubation following Congenital Cardiac Surgery on CPB at Columbus Children’s Hospital

Author(s): Aymen N Naguib, MD, Stephen Spanos, MD, Janet Isaacs, CRNA, Peter Winch, MD,MBA Vincent F. Olshove Jr., CCP

Affiliation(s): Columbus Children’s Hospital

ABSTRACT BODY:

Introduction: Extubating pediatric patients in the OR following congenital cardiac surgery after CPB is challenging to the anesthesiologist. Although Early Extubation has been discussed in the literature, but we were interested in reviewing the experience within our institution to identify the success rate, along with the associated risks and benefits. Furthermore, we analyzed the data to determine if the probability of Early Extubation could be predicted based on quantifiable intraoperative criteria.

Methods: After IRB approval, retrospective data was obtained from our Heart Center database for 874 patients who underwent congenital cardiac surgery on CPB. We also reviewed the ICU records of these patients for the first 24 hours after surgery.

Results: Extubation in the OR was achieved in 614 patients (70.25%), Seven patients were extubated upon arrival to the CICU. There were 4 deaths in the extubated group; no death was due to early extubation. 37 patients required some respiratory support in the CICU ranging from CPAP (17 patients), oral airway (10 patients), nasal trumpet (3 patients) or face mask (7 patients). Nine patients required reintubation in the CICU. The average length of stay in the CICU for the extubated group was 3.6 days where the average length of stay for the patients who were left intubated was 13.21 days. Age was another predictor for OR extubation; 56.4% of patients under 1 year of age were successfully extubated in the OR while 85% older than 1 year of age. Patients under 1 year of age were generally extubated if they weighed more than 5kg.

Discussion: The practice of Early Extubation for pediatric patients following congenital cardiac surgery requiring CPB is achievable and safe. Collaboration between Anesthetic, Surgical and Perfusion teams is an important component of Early Extubation success along with clear communication between the OR and ICU. The benefits of Early Extubation include reduced ICU costs, improved physiology for better post-operative management by avoiding positive pressure ventilation, and increased parental satisfaction. Additional advantages of this practice may also include a decrease in respiratory infections, shortened ICU stays, and decreased utilization of inotropic agents. Further analysis is necessary to determine if any of these presumed advantages are statistically supported.

			Extubated in the OR					
			No			Yes		
			n	Mean	Standard Deviation	n	Mean	Standard Deviation
Age 1 or older	Patient Age(years)		59	17.14	13.45	367	10.87	11.19
	Perfusion Time		59	208	93	367	133	65
	Lab Base Excess		59	0	4	367	-1	4
	Lab Lac		59	3.1	2.4	367	2.4	1.4
	Aortic Cross Clamp	No	Clamp Time	15	-	-	82	-
Yes		Clamp Time	44	125	70	285	76	47
Age < 1	Patient Age(months)		163	.22	.23	235	.47	.23
	Perfusion Time		163	191	84	235	146	62
	Lab Base Excess		163	1	6	235	-1	4
	Lab Lac		163	3.2	2.4	235	1.9	1.2
	Aortic Cross Clamp	No	Clamp Time	12	-	-	10	-
Yes		Clamp Time	151	103	58	225	80	39

Refs: 1.Barash P.et al., Early Extubation following pediatric cardiothoracic operation: a variable alternative. Ann. Thorac. Sur. 1980; 29: 228-233.
 2. Carol L. Lake, Fast tracking the pediatric cardiac surgical patient.
 3. Rodolfo A. Neirotti, et al., Early extubation in congenital Heart Surgery.

