



Hemostasis Special Interest Group

Routine preoperative laboratory testing in elective pediatric cardiothoracic surgery patients: a survey of current practices



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Introduction

- Recent studies examining the utility of preoperative lab testing found that routine testing is expensive for patients and hospitals and procedures are rarely cancelled due to laboratory abnormalities.¹
- We conducted a survey of pediatric cardiac anesthesiologists to define current practices in preoperative laboratory testing and the perceived necessity for these studies prior to elective pediatric cardiothoracic surgery.

Methods

- Survey of pediatric cardiac anesthesiologist members of the Hemostasis Interest Group (HIG) of the Congenital Cardiac Anesthesia Society (CCAS)
- Participating programs (n = 12) monitored their respective preoperative laboratory practice for 6 months, from 1 April 2017 to 30 September 2017
 - Included outpatients < 18 years old presenting for cardiac surgery requiring cardiopulmonary bypass (CPB)
 - Assumed that all programs required type and screen (T&S), pregnancy testing, and arterial blood gas (ABG) with hemoglobin prior to CPB initiation
- Each institution assessed:
 - Current routine laboratory practices
 - Laboratory tests deemed necessary for all outpatients
 - Laboratory tests necessary for specific outpatient populations
 - Whether the availability of a particular laboratory test would have changed management if known prior to CPB initiation

Table 1. Preoperative laboratory practices for pediatric cardiac surgery patients by institution

Program	Outpatient Cases During Study Period	Average Number of CPB Cases per Year	Current Routine Preoperative Labs	Outpatient Labs Deemed Necessary by Pediatric Cardiac Anesthesiologists
Children's Healthcare of Atlanta	183	600	CBC, T&S, coagulation panel including fibrinogen, CMP	CBC
Lucile Packard Children's Hospital/Stanford	159	450-500	CBC, T&S, coagulation panel including fibrinogen, CMP, UA	CBC, coagulation panel, CMP
Seattle Children's Hospital	134	340	CBC, T&S, BMP, prealbumin	none
Vanderbilt	132	400	CBC, T&S, BMP, UA	CBC
Hospital for Sick Children	130	400-500	CBC, PT/INR, PTT, ATIII	CBC, PT/INR, PTT, ATIII
Children's Medical Center Dallas	126	320	CBC, T&S, BMP	none
Texas Children's Hospital	112	650	CBC, T&S, PT/INR, PTT, BMP, UA	none
UT Houston	58	250	CBC, T&S, BMP, serum osmolality, triglycerides	CBC with Differential
Duke	53	230	none	none
Nemours/Alfred I. duPont	51	200	CBC, T&S, BMP	CBC
Johns Hopkins Children's Center	46	200	CBC, T&S, PT/INR, PTT, CMP	hemoglobin
University of North Carolina	24	105	CBC, T&S	none

References

1. Nieto RM et al. *J Thorac Cardiovasc Surg.* 2017;153:678-85.

Results

- 11/12 institutions obtain routine preoperative laboratory studies (Table 1)
- 5/12 recommend fewer studies than is their current practice
- No one reported an incidence where a particular data point would have changed management if known prior to CPB
- Additional testing performed at certain institutions for specific populations:
 - Trisomy 21: thyroid panel
 - Infectious concerns: respiratory viral panel, CRP, hepatitis C testing
 - Single ventricle physiology: coagulation studies
 - Neonates/infants: Antithrombin III activity
 - 22q11 deletion: calcium level
 - History of abnormal bleeding: testing per hematology consult

Discussion

- Significant variability exists in current preoperative laboratory testing practice for outpatients presenting for pediatric cardiac surgery
- Further discussion regarding which tests, if any, are necessary for safe management is warranted
- Future studies might examine effects of minimizing preoperative testing to decrease hospital and patient costs while maintaining safe care