

## 2016 Midwest Pediatric Cardiology Society Abstract Submission

**Project Title:** Cardiopulmonary exercise testing for surgical risk stratification in adults with congenital heart disease

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**Background:** Over the past decades, advancements in the care of children with congenital heart disease (CHD) have led to a significant increase in the number of patients who reach adulthood. Even after their heart defects have been “repaired,” patients often require repeated cardiothoracic surgeries. These surgeries are a common source of morbidity and mortality in adult congenital heart disease (ACHD) patients, for whom there are few preoperative risk assessment tools available. In the general adult population without CHD, cardiopulmonary exercise testing (CPET) has been shown to hold predictive value for postoperative morbidity and mortality after major non-cardiac surgery. Our aim was to develop a method to accurately assess perioperative risk using specific variables gathered during CPET for ACHD patients undergoing cardiothoracic surgery.

**Methods:** Retrospective chart review was conducted on 78 ACHD patients who participated in CPET at the Children’s Hospital of Wisconsin less than 12 months prior to cardiothoracic surgery requiring cardiopulmonary bypass between January, 2005 and December, 2015. Minimally invasive procedures, Fontan palliation, and heart transplant patients were excluded. Demographic information, CPET results, and perioperative surgical data were collected for each patient.

**Results:** Significant postoperative complications were documented in 46 patients (59.0%). Univariate analysis of preoperative CPET results identified several variables that suggested an association with postoperative complications, though they did not meet statistical significance. These included respiratory quotient (RQ) [1.08 (0.78 – 1.20) vs. 1.13 (0.87 – 1.36),  $p = 0.0624$ ], metabolic equivalents (METs) [10.4 (3.1 – 17.6) vs. 12.1 (5.8 – 18) mL/kg/min,  $p = 0.0796$ ], and heart rate response [94.5 (38 – 172) vs. 104 (34 – 171) bpm,  $p = 0.0935$ ].

**Conclusions:** Although preoperative CPET results did not significantly predict postoperative complications after major cardiothoracic surgery in this cohort of ACHD patients, trends toward possible associations are noted. Results may have been affected by small sample size and selection bias based on which patients were considered well enough to perform CPET. Future studies with a larger and more diverse population are worth consideration.