Congenital Heart Disease

PEDIATRIC CARDIAC CRITICAL CARE OUTCOMES IMPROVE FOLLOWING IMPLEMENTATION OF A COMMERCIAL DATA AGGREGATION AND VISUALIZATION SOFTWARE PLATFORM

Oral Contributions
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Background: Software that aggregates and displays real-time physiologic data in the pediatric cardiac intensive care unit (CICU) holds promise to advance clinical care. We assessed multiple CICU outcomes at our institution before and after implementation of a commercial software platform and compared these changes with control hospitals in the Pediatric Cardiac Critical Care Consortium (PC4).

Methods: We evaluated outcomes in our CICU pre- (8/2014 - 9/2016) and post- (9/2016 - 1/2018) implementation of T3 software (Etiometry, Inc., Boston, MA). We analyzed the following case-mix adjusted CICU outcomes between eras: postoperative mortality, cardiac arrest, unplanned CICU readmission, and postoperative CICU length of stay. There were no quality improvement initiatives focused on any of these outcomes in either era, nor were there any major CICU organizational or resource changes. We used a difference-in-differences (DID) analysis to compare outcomes at our CICU to control hospitals (N=21) that had at least 6 months of data in the PC4 registry in the pre-T3 era. We performed multivariable regression for each outcome where the primary independent variable is an interaction term between site (our CICU vs. control) and era (pre vs. post).

Results: We compared 1,436 patients in the pre- and 779 in the post-implementation eras at our CICU to 19,854 (pre) and 14,160 (post) at control hospitals. Patient characteristics did not differ significantly between eras. Relative reductions were observed in our CICU in the post-implementation era for cardiac arrest rates among medical patients, readmission rates, and postoperative CICU length of stay by -14%, -41%, and -18%, respectively. These improvements were significantly greater than changes at control hospitals (p<0.05 for all DID interaction terms).

Conclusion: Clinical outcomes improved after implementation of the T3 software platform in our CICU, and these improvements were significantly greater than secular changes across control hospitals. Future investigation should focus on whether other hospitals can improve with implementation of similar software, and on elucidating which specific engagement strategies optimize their clinical value.