Congenital Heart Surgeons' Society (CHSS) Technical Assessment Project

Project Team:
William G. Williams, MD, Executive Director, CHSS Data Center
William M. DeCampli, MD, PhD, Managing Director, CHSS Data Center

Background:
Children undergoing heart surgery are routinely assessed for residual lesions through echocardiograms (echos) prior to hospital discharge. While this information is known to the child's surgeon, there is currently no standard mechanism for the surgeon to assess whether these residual lesions are within the range of that achieved by the surgeon's peers.

Bacha and colleagues first described the use of a technical performance score. (1) The technical performance score measures specific elements of the surgical repair. The premise is that, by scoring different elements of the repair, an individual surgeon will gain insight into those parts of an operation that went very well, but might be able to improve on others. Research has shown that one's technical performance score does impact patient outcomes. (1, 2, 3)

The CHSS Technical Assessment Project (TAP) provides a mechanism for individual surgeons to anonymously compare their technical performance to those of their peers and thereby provides a mechanism for individual improvement.

Design:
The Technical Assessment Project will record residual lesions by routine pre-discharge echos following four common surgical procedures:

- Ventricular Septal Defect (VSD) Repair
- Complete Atrioventricular Canal Repair
- Tetralogy of Fallot Repair
- Arterial Switch Operation (transposition +/- VSD)

Surgeons or their delegates (e.g., Research Coordinator, echocardiologist, etc) will enter data, extracted from the patient's surgical note and pre-discharge echo, into the Research Electronic Data Capture (REDCap) Database. Data collected will be specific to each surgery and will allow for reliable measurement of the patient's residual lesions. Comparisons of residual lesions of an individual surgeon's patients can be obtained by that surgeon only, via a pre-formatted online report at any time.

This multi-institutional quality improvement (QI) project, involving approximately 70 CHSS centers, will be administered and monitored by the CHSS Data Center at The Hospital for Sick Children (SickKids) in Toronto, Ontario, Canada. Participating surgeons from these centers will obtain any appropriate local/institutional approvals prior to project participation. Execution of

the data sharing agreements for the project will be facilitated through the SickKids legal services department, as appropriate.

Confidentiality:
Data will be extracted from surgical records and pre-discharge echos at the participating site and will be entered in a coded manner into a secure, password protected REDCap database. Data collected are specific to the surgical procedure and will not contain information that would directly identify the patients. Each institution and surgeon will be assigned a code by the CHSS Data Center to maintain anonymity. Results displayed in graphical form which compare the surgeon's/institution's rate and severity of residual lesions to that of all CHSS surgeons (i.e., aggregate experience of all users) will not identify any surgeons/institutions. Data collected will be securely retained on an ongoing basis for as long as required and then securely destroyed according to the institutional policy effective at that time.

It is important to note that appropriate approvals must be obtained for any proposed uses of the data that go beyond the scope of this QI project, including uses in any other QI or research projects.

Outcomes:
It is expected that some surgeons' technical assessment will be affected in one or more of the four lesions to be assessed. The CHSS Data Center may seek future feedback from users to evaluate and better understand the impact of the Technical Assessment Project. Results arising out of the analysis of the QI project data will be presented or published in aggregate, de-identified format only. Evaluation of any change in surgical technical assessment will be at the discretion of the individual CHSS institutions.

References:
(1) Bacha EA, Larrazabal LA, Pigula FA, Gauvreau K, Jenkins KJ, Colan SD, Fynn-Thompson F, Mayer JE and del Nido PJ. Measurement of technical performance in surgery for congenital heart disease: The stage I Norwood procedure. J Thorac Cardiovasc Surg 2008; 136: 993-7

(2) Karamichalis JM, Thiagarajan RR, Liu H, Mamic P, Gauvreau K and Bacha EA. Stage I Norwood: Optimal technical performance improves outcomes irrespective of preoperative physiologic status or case complexity. J Thorac Cardiovasc Surg 2010; 139: 962-8

(3) Nathan M, Karamichalis JM, Liu H, del Nido P, Pigula F, Thiagarajan R and Bacha EA. Intraoperative adverse events can be compensated by technical performance in neonates and infants after cardiac surgery: A prospective study. J Thorac Cardiovasc Surg 2011; 142: 1098-107