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| **Quality Metric TEE 1: Accuracy of Pediatric Pre-Cardiac Surgery Transesophageal Echocardiogram** |
| **Measure Description:** Diagnostic discrepancies of pre-cardiac surgery transesophageal echocardiogram (TEE) assessment in congenital heart disease patients. |
| Numerator Numerator Exclusions | Total number of pre-cardiac surgery TEEs with 1 or more major discrepancies\* (see definitions) identified within 24 hours of surgery.Structures that are attempted and cannot be reasonably or always imaged by the TEE examination (aortic arches, distal branch pulmonary arteries, vertical veins, anterior structures, inferior vena cava, inferior atrial septum, coronary arteries, BT shunts, Glenn shunts, or Fontan shunts). |
| **Denominator**  | Total pre-cardiac surgery TEE reports. |
| **Period of Assessment** | Quarterly |
| **Sources of Data** | Post-cardiac surgery TEE, retrospective medical record review, and operative reports. |
| **Definitions**\*Diagnostic major discrepancy is defined as a discrepancy between the findings on the pre-operative TEE and surgical findings that changes the surgical plan (focused or comprehensive TEE). Discrepancies include the following:1. Failure of reporting anatomic structures visualized on pre-cardiac surgery TEE
2. Failure of interrogating anatomic or hemodynamic elements
3. Failure of correct interpretation
4. False positive (structure that was seen or reported when it is not present)
5. False negative (structure that was not seen or reported when it is present)
6. Incorrect diagnosis
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| **Rationale**Inaccurate or incomplete imaging findings may adversely impact patient safety and/or alter patient management. Identification of discrepancies will guide tests of change to improve TEE accuracy.Quality review is required of echocardiography laboratories for accreditation. Evaluate and track granular details based on institutional preference (example worksheet attached). |
| **Clinical Recommendation(s)** |
| ACC/AHA guidelines [Spertus JA](file:///C%3A%5Cpubmed%3Fterm%3DSpertus%20JA%5BAuthor%5D%26cauthor%3Dtrue%26cauthor_uid%3D21070935), et al; [ACCF/AHA Task Force on Performance Measures](file:///C%3A%5Cpubmed%3Fterm%3DACCF%5CAHA%20Task%20Force%20on%20Performance%20Measures%5BCorporate%20Author%5D). ACCF/AHA new insights into the methodology of performance measurement: a report of the American College of Cardiology Foundation/American Heart Association Task Force on performance measures. J Am Coll Cardiol. 2010 Nov 16;56(21):1767-82ASE/Other guidelines:Ayres NA, Miller-Hance W, Fyfe DA, Stevenson JG, Sahn DJ, Young LT, Minich LL, Kimball TR, Geva T, Smith FC, Rychik J. Indications and guidelines for performance of transesophageal echocardiography in the patient with pediatric acquired or congenital heart disease: report from the task force of the Pediatric Council of the American Society of Echocardiography. [J Am Soc Echocardiogr.](http://www.ncbi.nlm.nih.gov/pubmed/15637497) 2005 Jan;18(1):91-8.[Benavidez OJ](file:///C%3A%5Cpubmed%3Fterm%3DBenavidez%20OJ%5BAuthor%5D%26cauthor%3Dtrue%26cauthor_uid%3D18519849), [Gauvreau K](file:///C%3A%5Cpubmed%3Fterm%3DGauvreau%20K%5BAuthor%5D%26cauthor%3Dtrue%26cauthor_uid%3D18519849), [Jenkins KJ](file:///C%3A%5Cpubmed%3Fterm%3DJenkins%20KJ%5BAuthor%5D%26cauthor%3Dtrue%26cauthor_uid%3D18519849), [Geva T](file:///C%3A%5Cpubmed%3Fterm%3DGeva%20T%5BAuthor%5D%26cauthor%3Dtrue%26cauthor_uid%3D18519849). Diagnostic errors in pediatric echocardiography: development of taxonomy and identification of risk factors. Circulation. 2008 Jun 10;117(23):2995-3001.Benavidez OJ, Gauvreau K, Geva T. Diagnostic errors in congenital echocardiography: importance of study conditions. J Am Soc Echocardiogr. 2014 Jun; 27(6):616-23. |
| **Attribution** |
| This measure should be reported by pediatric cardiologists at tertiary care children’s hospital.  |
| **Method of Reporting** |
| Pre-cardiac surgery TEE reports from tertiary care children’s hospitals compared to the operative findings.**Implementation strategies:*** **Full Review** – 100% of pediatric cardiac surgical cases that require TEE

 **or*** **Sample Review** – 80 cases per year (20 consecutive surgical cases per quarter) or minimum criteria of 20 cases per year (minimum criteria of 5 cases per quarter)
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| **Challenges to Implementation**  |
| No quality electronic medical recordsNot all cardiac centers have cardiac surgeryCommitment and time of personnel |
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Worksheet for institution to track granular details of major discrepancies.

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| Patient | Physician | Date of TEE study | Wt (kg) | Age | Type of TEE probe:1. Micro
2. Pediatric
3. Adult
 | Type of TEEs: 1. Focused
2. Comprehensive\*
 | What is the discrepancy? | Discrepancies:1. Failure of reporting
2. Failure of interrogation
3. Failure of correct interpretation
4. False positive
5. False negative
6. Incorrect diagnosis
 | How was discrepancy found?1. Surgical inspection
2. Retrospective image review
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| EB | 3 | 2/22/2018 | 20kg | 6 yrs | 2 | 1 | VSD was missed on the TEE | 2 | 1 |
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\*Comprehensive TEE is a full TEE evaluation of all cardiac structures within the limitation of TEE