**Supplemental Material**

Survey Questions

**Center Characteristics**

1. What is the setting of your practice?

*Question type:* Choose one

* 1. Private
  2. Academic
  3. Mixed model
  4. Other (comment)

1. How many cardiologists are in your practice?

*Question type:* Choose one

* 1. 1-10
  2. 11-20
  3. 21-40
  4. 41-60
  5. Greater than 60

1. How many cardiologists in your group or institution are considered core echocardiography faculty? For purposes of this question a core echocardiography faculty member may be defined as one who spends a substantial amount of their clinical time (approximately 50% or more) interpreting echocardiograms.

*Question type:* Choose one

* 1. 1-5
  2. 6-10
  3. 11-15
  4. 16-20
  5. Greater than 20

1. How many cardiovascular surgery cases (with and without cardiopulmonary bypass) were performed at your institution in the calendar year 2021?

*Question type:* Choose one

* 1. Less than 150
  2. 150-249
  3. 250-349
  4. Greater than 349

1. What is the name of your group or institution? This question is optional.

*Question type:* Comment

* 1. (comment)

1. Does your group or institution perform transesophageal echocardiography (TEE)?

*Question type:* Choose one

* 1. Yes
  2. No

**TEE Performance and Reporting**

1. Who inserts TEE transducers at your institution?

*Question type:* Choose one

* 1. Cardiologist only
  2. Anesthesiologist only
  3. Cardiologist or anesthesiologist
  4. Other (comment)

1. How many cardiologists interpret TEEs at your institution? In this question interpretation indicates signing a formal report which is incorporated into the medical record.

*Question type:* Comment

* 1. (comment)

1. How many TEEs were performed at your institution in calendar year 2021? If the specific number is not known, please give your best estimate.

*Question type:* Comment

* 1. (comment)

1. Does your institution provide regularly scheduled physician coverage to perform and interpret TEEs for 24 hours per day on all days of the year?

*Question type:* Choose one

* 1. Yes
  2. No

1. Does your institution perform TEEs to assist cardiac catheterization-based interventions (for example, during device closure of an atrial septal defect)?

*Question type:* Choose one

* 1. Yes
  2. No

1. Does your institution perform diagnostic TEEs NOT associated with a surgical or catheterization-based procedure (for example, for suspected endocarditis or to evaluate for thrombus in the setting of atrial fibrillation)?

*Question type:* Choose one

* 1. Yes
  2. No

1. **If YES to question 12:** How frequently is general anesthesia with intubation (as opposed to moderate sedation) used at your institution during performance of a diagnostic TEE in cases where the patient is not already intubated?

*Question type:* Choose one

* 1. Never
  2. 1-33% of the time
  3. 34-66% of the time
  4. 67-99% of the time
  5. Always

1. How frequently do sonographers participate in TEE image acquisition or button manipulation during performance of a TEE?

*Question type:* Choose one

* 1. Never
  2. 1-33% of the time
  3. 34-66% of the time
  4. 67-99% of the time
  5. Always

1. Does your institution use 3D TEE for clinical purposes?

*Question type:* Choose one

* 1. Yes
  2. No

1. How frequently is post-operative TEE performed for the following surgeries at your institution?

*Question type:* Choose one

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | Procedure not performed at our institution | Never | 1-33% of the time | 34-66% of the time | 67-99% of the time | Always |
| Norwood procedure |  |  |  |  |  |  |
| Glenn procedure |  |  |  |  |  |  |
| Fontan procedure |  |  |  |  |  |  |
| Coarctation repair |  |  |  |  |  |  |
| Systemic-to-pulmonary artery shunt |  |  |  |  |  |  |
| Heart transplant |  |  |  |  |  |  |
| Epicardial pacemaker implantation |  |  |  |  |  |  |
| Atrial septal defect repair |  |  |  |  |  |  |

1. Does your institution offer epicardial echocardiography? For this question epicardial echocardiography is defined as imaging of the heart with the patient’s chest open with the ultrasound transducer placed directly on the epicardial surface of the heart.

*Question type:* Choose one

* 1. Yes
  2. No

1. **If YES to question 17:** Who manipulates the transducer to acquire epicardial echocardiography images? Check all that apply.

*Question type:* Check boxes

* 1. Surgeon
  2. Surgical assistant
  3. Cardiologist
  4. Sonographer
  5. Other (comment)

1. For surgical cases where post-operative TEE is requested, how frequently are pre-operative TEE images acquired at your institution?

*Question type:* Choose one

* 1. Never
  2. 1-33% of the time
  3. 34-66% of the time
  4. 67-99% of the time
  5. Always

1. **If question 19 options “b-e” are selected:** When pre-operative TEE images are acquired in patients in whom post-operative TEE is requested, how frequently does your institution bill and report pre-operative and post-operative TEEs separately?

*Question type:* Choose one

* 1. Never
  2. 1-33% of the time
  3. 34-66% of the time
  4. 67-99% of the time
  5. Always

**Equipment Use**

1. What **neonatal** TEE transducer(s) are used at your institution?  Please check all that apply from the below options.  If the transducer used at your institution is not listed, please select “other” and write in the vendor(s) and transducer name(s).

*Question type:* Check boxes

* 1. Phillips: S8-3t
  2. General Electric: 10T-D
  3. Other (comment)

1. What **pediatric** TEE transducer(s) are used at your institution?  Please check all that apply from the below options.  If the transducer used at your institution is not listed, please select “other” and write in the vendor(s) and transducer name(s).

*Question type:* Check boxes

* 1. Phillips: S7-3t
  2. General Electric: 9T
  3. General Electric: 9T-RS
  4. General Electric: 9VT-D
  5. Fujifilm/Hitachi: S3ESCLS
  6. Siemens: V7M
  7. Other (comment)

1. What **adult** TEE transducer(s) are used at your institution?  Please check all that apply from the below options.  If the transducer used at your institution is not listed, please select “other” and write in the vendor(s) and transducer name(s).

*Question type:* Check boxes

* 1. Phillips: X8-2t
  2. Phillips: X7-2t
  3. Phillips: S7-2
  4. General Electric: 6T
  5. General Electric: 6T-RS
  6. General Electric: 6T-OR
  7. General Electric: 6Tc
  8. General Electric: 6Tc-RS
  9. General Electric: 6VT-D
  10. Fujifilm/Hitachi: MXS2ESLL1
  11. Fujifilm/Hitachi: S3ESEL
  12. Fujifilm/Hitachi: S3ESL1
  13. Siemens: V5M
  14. Other (comment)

1. Does your institution have a written policy describing lower patient weight limits permissible for use of TEE transducers of different sizes?

*Question type:* Choose one

* 1. Yes
  2. No

1. **If YES to question 24:** What is the lowest patient weight (in Kg) deemed acceptable for use of the **neonatal** transducer in your written policy, below which use of the neonatal transducer is not attempted?  If your center uses multiple neonatal transducers and there are different weight limits established for different transducers, please indicate as a comment which weight limit is used for each transducer specifically.

*Question type:* Comment

* 1. (comment)

1. **If YES to question 24:** What is the lowest patient weight (in Kg) deemed acceptable for use of the **pediatric** transducer in your written policy, below which use of the pediatric transducer is not attempted?  If your center uses multiple pediatric transducers and there are different weight limits established for different transducers, please indicate as a comment which weight limit is used for each transducer specifically.

*Question type:* Comment

* 1. (comment)

1. **If YES to question 24:** What is the lowest patient weight (in Kg) deemed acceptable for use of the **adult** transducer in your written policy, below which use of the adult transducer is not attempted?  If your center uses multiple adult transducers and there are different weight limits established for different transducers, please indicate as a comment which weight limit is used for each transducer specifically.

*Question type:* Comment, optional

* 1. (comment)

**Trainee Participation in TEE**

1. Does your institution have a categorical pediatric cardiology fellowship?

*Question type:* Choose one

* 1. Yes
  2. No

1. **If YES to question 28:** Do categorical cardiology fellows have astructured rotation or rotations which include participation in TEE?

*Question type:* Choose one

* 1. Yes
  2. No

1. **If YES to question 28:** How frequently do categorical pediatric cardiology fellows assist with TEE cases?

*Question type:* Choose one

* 1. Never
  2. 1-33% of the time
  3. 34-66% of the time
  4. 67-99% of the time
  5. Always

1. **If YES to question 28:** Is there a minimum number of TEEs that your institution requires categorical pediatric cardiology fellows to complete before graduation?

*Question type:* Choose one

* 1. Yes
  2. No

1. **If YES to question 31:** What is the minimum number of TEEs that categorical pediatric cardiology fellows are required to complete at your institution before graduation?

*Question type:* Comment

* 1. (comment)

1. Does your program have a 4th year advanced imaging fellowship program for pediatric cardiologists who have completed a 3-year categorical fellowship?

*Question type:* Choose one

* 1. Yes
  2. No

1. **If YES to question 33:** Is there a minimum number of TEEs that your institution requires 4th year advanced imaging fellows to complete before graduation?

*Question type:* Choose one

* 1. Yes
  2. No

1. **If YES to question 34:** What is the minimum number of TEEs that 4th year advanced imaging fellows are required to complete at your institution before graduation?

*Question type:* Comment

* 1. (comment)

**Quality Assurance**

1. Are complications associated with TEE such as esophageal perforation or endotracheal tube dislodgement formally captured? For this question, captured indicates recording of the complication either within or outside of the formal medical record.

*Question type:* Choose one

* 1. Yes
  2. No

1. Are complications associated with TEE such as esophageal perforation or endotracheal tube dislodgement formally reviewed? For this question, reviewed indicates review and discussion of the complication in a venue such as a periodic quality improvement meeting or morbidity and mortality conference.

*Question type:* Choose one

* 1. Yes
  2. No

1. Are pre-operative TEE discrepancies compared to operative findings formally captured? For this question, captured indicates recording of the discrepancy either within or outside of the formal medical record.

*Question type:* Choose one

* 1. Yes
  2. No
  3. Not applicable – our center does not perform pre-operative TEE

1. Are pre-operative TEE discrepancies compared to operative findings formally **reviewed**? For this question, **reviewed** indicates review and discussion of the complication in a venue such as a periodic quality improvement meeting or morbidity and mortality conference.

*Question type:* Choose one

* 1. Yes
  2. No
  3. Not applicable – our center does not perform pre-operative TEE

1. Are pre-operative TEE discrepancies compared to pre-operative transthoracic echocardiogram findings formerly **captured**? For this question, **captured** indicates recording of the discrepancy either within or outside of the formal medical record.

*Question type:* Choose one

* 1. Yes
  2. No
  3. Not applicable – our center does not perform pre-operative TEE

1. Are pre-operative TEE discrepancies compared to pre-operative transthoracic echocardiogram findings formally **reviewed**? For this question, **reviewed** indicates review and discussion of the discrepancy in a venue such as a periodic quality improvement meeting or morbidity and mortality conference.

*Question type:* Choose one

* 1. Yes
  2. No
  3. Not applicable – our center does not perform pre-operative TEE

1. How are TEE discrepancies shared with the physicians?

*Question type:* Choose one

* 1. Individual feedback at the time discrepancy is noted
  2. Periodic feedback in a group setting
  3. No standardized process exists
  4. Other (comment)