

Adult Congenital & Pediatric Cardiology QUALITY NETWORK™

Metric # 036 : Initial Fetal Echocardiogram Image Quality
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036 : Initial Fetal Echocardiogram Image Quality

- Definition : This metric will assess the average image quality score for initial fetal echocardiograms designated as complete studies for fetuses with structurally normal hearts
- Numerator : The sum of the *Fetal Echo Image Quality Assessment* worksheet scores for all fetal echocardiograms assessed for the measurement time period
- Denominator: The number of complete transabdominal fetal echocardiograms >18 week gestational age assessed during the measurement time period



Inclusion and Exclusion Criteria

Included

- Initial study > 18 week EGA
- Structurally normal heart

Excluded Populations

- Fetuses with structurally abnormal cardiac anatomy, rhythm or function
- First trimester fetal echocardiograms
- Multiple gestation
- Fetuses that have had a prior echocardiogram at same institution
- Studies with poor acoustic windows due to maternal body habitus, fetal position/movement, advanced gestational age or otherwise technically limited



Data Collection

- Quarterly review
- Minimum of 10 fetal echocardiograms/center will be reviewed
- If the center performs < 10 fetal echocardiograms /quarter, all studies performed for that quarter will be reviewed
- Goal: Centers to review performance with staff and assess opportunities for improvement



Fetal Echo Image Quality Assessment Tool

Metric #: 036
Effective: 07.01.2021

Appendix 1

Fetal Echo Image Quality Assessment Tool

Each worksheet is for ONE fetal echo evaluation

Patient Name:

EDD:

Sonographer:

Interpreter:

Echo Machine:

Reviewer:

Date of Birth:

Gestational Age:

Date of Study:

Location of Study:

Date of Review:

Time Spent for Review:



Fetal Echo Image Quality Assessment Tool

4 categories

- 2D imaging – 6 points
- Rhythm – 1 point
- Color Doppler – 4 points
- Spectral Doppler – 3 points

Maximum possible points for each echo scored = 14 points



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Fetal Echo Image Quality Assessment Tool

How to score ?

Question is answered “Yes” if images meet the stated criteria for quality under each category. It is recognized that fetal position and movement can affect the quality of the study. If optimal images are obtained for each view during the course of the study, question is answered “Yes”.



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2D Imaging (6 points)

- Ultrasound output settings appropriate and consistent with ALARA (As Low as Reasonably Achievable)
- Brightness and contrast level appropriate such that individual structures are clearly defined
- Balanced Penetration: Resolution- Transducer and imaging modality selection results in maximal image resolution possible for given depth of imaging



2D Imaging (6 points)

- Zoom / Region of interest : The fetal heart should fill at least one third of the imaging sector display. The focal zone should be appropriately positioned to region of interest
- Cine loops: The fetal heart is examined as a moving structure and images are be saved as video clips in the form of cine loops and sweeps
- Sweeps: Sweep(s) of the fetal abdomen and chest are performed with appropriate transducer alignment for demonstration of visceral situs and segmental anatomy



Rhythm assessment (1 point)

Rhythm assessment

- Ideal image should be obtained by aligning the M-mode across the atrium and ventricle so as to obtain clearly identifiable waves from atrial and ventricular contractions. If rhythm assessment is performed by Doppler, the sample is appropriately placed and Doppler tracings are optimized



Color Doppler (4 points)

- Frame rate appropriate: Transducer selection and CFI settings such as box size and imaging depth is adjusted to obtain highest frame rates possible (> 20fps is desirable)
- Nyquist limits are set appropriate to the structure being investigated so as to allow for diagnostic imaging (inflows /outflows > 50cm/s, venous flows <35cm/s)
- Color settings: Ideal color settings result in appropriate color fill of the structure being interrogated
- Color persistence is set to low /none such that color fill of structures is appropriate for the cardiac cycle



Spectral Doppler (3 points)

- Alignment and placement of Doppler sample: as parallel to direction of blood flow as possible but angle <20 degrees at all times and appropriate sample volume size and position (not applicable where pattern rather than velocity is being assessed)
- Appropriate Doppler scale and baseline: Doppler envelopes are complete with maximal signal size and minimal artefact
- Sweep speed : adjusted appropriately for visualization of Doppler contours and measurement of time intervals, if performed.



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