

September, 2018

Dear Referring Providers:

Minnesota Perinatal Physicians would like to provide information regarding our enhanced early cardiac screening program for high risk conditions. In addition, we are providing background for our practice change to include a pediatric cardiology fetal echocardiogram (FE) at both 16 weeks and 20-22 weeks for monochorionic twin pregnancies.

In regards to monochorionic twins, we have reviewed the literature in conjunction with our pediatric cardiology colleagues and have determined that fetal echocardiogram may be predictive of which pregnancies are more likely to progress to Twin-Twin Transfusion Syndrome (TTTS) and may ultimately require fetoscopic intervention.

**Our current recommendations are in alignment with the most recent literature for monochorionic twins:**

- All monochorionic twin pregnancies should undergo fetal echocardiogram (FE) at 16 weeks and 20 - 22 weeks gestational age to assess for early diastolic abnormalities, even in the absence of concerns for TTTS.
- If there are concerns for TTTS or selective IUGR (sIUGR), the first baseline examination in a tertiary center should include complete FE.
- In the case of a surgical procedure, a baseline FE should be performed. Postop FE may be performed at one week and one month post laser therapy for TTTS if abnormalities are noted preoperatively.
- If there is a single fetal demise in a twin pregnancy, FE is strongly recommended for the survivor twin.

The literature shows that diastolic filling abnormalities in the recipient twin may be predictive of the development and progression of TTTS. Diastolic filling pathology was seen at presentation in 10/10 of the twin pairs in whom the initial evaluation did not meet criteria for TTTS but who subsequently developed ultrasound criteria for the diagnosis of TTTS. (*Fetal Echocardiography in Twin-Twin Transfusion Syndrome. Anita Moon-Grady. Am J Perinatol 2014.*) In addition, several other studies have identified FE abnormalities that are also

predictive of the development/progression of TTTS and are specific to the donor and recipient twins. Interestingly, these findings can be seen early in pregnancy which is the driving force for our clinical change to include early FE for monochorionic twin gestations. Early diagnosis is imperative for patient counseling, appropriate ultrasound surveillance, and timely management of these very complex multiple gestations.

**Our updated early FE recommendations are in line with current recommendations:**

In addition to the early cardiac screening recommendation for all monochorionic twins, we now offer early fetal cardiac screening for many other high risk conditions listed below and in the attached reference.

Current literature supports early fetal screening/echocardiography by experienced cardiology examiners, stating it is sufficiently reliable to predict cardiac disease and thus alter obstetrical management. Earlier detection (<18 weeks) of CHD allows for valuable parental counseling, potential fetal treatment for evolving ductal dependent disease, and the ability for parents to make informed pregnancy decision. Prenatal diagnosis of CHD has generally been shown to have significant positive impacts on delivery planning, postnatal management, and neonatal outcomes (reduction in mortality and morbidity including neurologic development).

Minnesota Perinatal Physicians and Children's Heart Clinic have together increased our expertise and knowledge with early fetal cardiac screening, which currently consists of an ultrasound exam at approximately 14w0d-16w6d gestational age. A formal follow-up fetal echocardiogram with pediatric cardiology will be performed at 18-22 weeks.

Early fetal cardiac screening (14w0d-16w6d) is currently offered for the following conditions:

- Fetal NT  $\geq$  3.5 mm
- Fetal hydrops or effusions
- Parent or first degree sibling with chromosomal abnormality associated with CHD (ie. 22q11 deletion)
- Fetal karyotype abnormality confirmed by diagnostic testing or suspected based on NIPT and ultrasound
- Fetal cardiac abnormality suspected on MPP ultrasound
- Maternal autoantibodies (SSA/SSB) – scheduled at 16w
- Monochorionic twins as above – scheduled at 16w

Additional reasons where early fetal cardiac screening (14w0d-16w6d) may be considered:

- CHD in prior sibling and parents request early screening
- Parent AND prior sibling with CHD

- Fetal cardiac abnormality suspected on obstetrical ultrasound
- Fetal major extracardiac abnormality on obstetrical ultrasound
- Parent with highest risk cardiac disease (ie. heterotaxy, AVSD, or aortic stenosis)

Thank you for allowing us to review this discussion topic and please look for more education on this topic soon. As always, we appreciate the opportunity to participate in the care of your patients. For additional questions call the contact number noted below to speak with an available MPP physician.

Sincerely,

Minnesota Perinatal Physicians  
612-863-4502

## **REFERENCES**

Fetal Echocardiography in Twin-Twin Transfusion Syndrome. Anita Moon-Grady. Am J Perinatol 2014.

Recommendations for Fetal Echocardiography in Twin Pregnancy in 2016. International Prenatal Cardiology Collaboration Group. Prenat Cardio 2016 Jan.

Diastolic Cardiac Pathology and Clinical Twin-Twin Transfusion Syndrome in Monozygotic/Diamniotic Twins. Anita Moon-Grady. Am J Obstet Gynecol 2011 September.

Fetal Heart in Twin-to-Twin Transfusion Syndrome. Tim Van Mieghem et al. Int J Peds 2010

Diagnosis and treatment of fetal cardiac disease: a scientific statement from the American Heart Association. Circulation. 2014.