

## TEAM

The fetal cardiology program, in partnership with Minnesota Perinatal Physicians and the Midwest Fetal Care Center, provides state-of-the-art, comprehensive care for unborn babies with congenital defects and other abnormalities affecting the cardiovascular system. Our fetal cardiology program, part of the Children's Minnesota pediatric cardiovascular program, is able to provide a seamless transition to pediatric care after delivery.



**Lisa Howley, MD**  
Director, Fetal Cardiology



**Bradford Chu, MD**  
Pediatric Cardiologist



**David Gremmels, MD**  
Pediatric Cardiologist



**Christine Hills, MD**  
Pediatric Cardiologist



**Joanna Lowisz, DO**  
Pediatric Cardiologist



**Rodrigo Rios, MD**  
Pediatric Cardiologist



**Amy Lund, NP**  
Fetal Nurse Coordinator

## SERVICES

The fetal cardiology team is proud to offer the following services:

### Diagnostic imaging

- Fetal cardiology consultation is available 5 days a week for patients with suspected congenital heart disease, fetal arrhythmia or cardiomyopathy concerns. Emergent fetal echo consultations are available within 24 hours of referral.
- Fetal cardiac screening is also provided as part of the comprehensive evaluation of fetal patients with other non-primary cardiac abnormalities including myelomeningocele, twin-to-twin transfusion syndrome, pulmonary lesions, congenital diaphragmatic hernia, high output fetal state (fetal tumors, anemia, twin reversed arterial perfusion sequence) and other abnormalities.

### Early Fetal Echocardiography

- For those families at high risk for congenital heart disease, early fetal cardiac screening is available as early as 14 weeks gestation. Earlier detection can greatly reduce parental stress and offer more time for prenatal counseling and education.

### Operative Fetal Cardiology Monitoring

- The fetal cardiology team collaborates with the fetal surgery team at the Midwest Fetal Care Center to provide real-time fetal hemodynamic monitoring during open fetal surgical cases. Continuous echocardiographic imaging during the fetal procedure provides minute-to-minute information on fetal heart rate and heart function which may guide the conduct of the operation.

## LOCATIONS

Midwest Fetal Care Center – Minneapolis, MN\* | St. Paul, MN\* | Saint Louis Park, MN | Virtual consultation of images

Children's Physician Access



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RESOURCE

612.343.2121  
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\*Early fetal echocardiogram performed at this location

## FACTORS ASSOCIATED WITH INCREASED RISK OF CHD IN THE FETUS

Early detection of congenital heart problems saves lives and allows families to prepare for what's ahead. The American Heart Association publication on the Diagnosis and Treatment of Fetal Cardiac Disease has outlined the following factors associated with increased risk of congenital heart disease in the fetus:

### Maternal factors

- Pregestational DM (preconception metabolic control may affect risk) or DM identified in the first trimester
- Gestational diabetes mellitus with HbA1c > 6%
- Phenylketonuria (preconception metabolic control may affect risk)
- Lupus or Sjögrens only if SSA/SSB autoantibody positive:
  - Increased risk with maternal hypothyroidism or maternal vitamin D deficiency;
  - With prior affected child with CHB or neonatal lupus, risk increased
- Medication exposures: Teratogens – anticonvulsants, lithium, ACE inhibitors, retinoic acids, vitamin A (>10,000 IU retinol/d), SSRIs, Vitamin K antagonists, NSAIDs
- Maternal infection
- Use of assisted reproduction technology

### Family history

- First- or second-degree relative with structural cardiac disease
- First- or second-degree relative with disease disorder, or syndrome with mendelian inheritance associated with structural cardiac disease (ie. *hypertrophic cardiomyopathy, Marfan or Ehler-Danlos syndromes*)

### Fetal factors

- Suspected cardiac abnormality on obstetric ultrasound
- Rhythm abnormalities: tachycardia, bradycardia, irregular rhythm
- Noncardiac abnormality
- Known or suspected chromosomal abnormality
- Increased NT  $\geq$  3.5mm
- Abnormality of umbilical cord, placenta, or intra-abdominal venous anatomy
- Monochorionic twinning
- Hydrops fetalis

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