Prenatal Diagnosis: Should We Do More Than What We Are Paid For?

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What Should The Patient Be Concerned About?

- Genetic Syndromes
- Abnormal Fetal Growth
- Abnormal Fetal Anatomy
- Placental Anatomy
- Placental Function

Ultrasound Technologies

- 3D/4D
- Pulsed Doppler
- Color Doppler
- B-Mode

First Trimester

Routine

- B-Mode Screening Examination

First Trimester Screening Examination only Uses B-Mode Ultrasound

- CRL
- Heart Rate
- Nuchal Translucency

Most Common Approach

- Soft Tissue
- Skeletal
- Placental
- Vascular

Normal Measurement

Abnormal Measurement
Abdominal: B-Mode vs Power Doppler

12 Weeks

Four-Chamber LVOT Main PA 3-Vessel

12 Weeks

First Trimester

PLUS

Routine Use of Pulsed Doppler Ultrasound

The addition of each ultrasound modality increases the general detection rate of serious birth defects.

Doppler evaluation of the uterine arteries

Normal Abnormal

First Trimester

PLUS

Doppler evaluation of the uterine arteries

Only Significant When ASA Started < 16 Weeks

% Decrease in Disease


Severe Preeclampsia Gest Hypertension IUGR

3D/4D Ultrasound

Routine Use of 3D/4D Ultrasound

The addition of each ultrasound modality increases the overall detection rate of serious birth defects.
First Trimester

**PLUS**

3D Ultrasound

Endovaginal evaluation of fetal anatomy

Not Routinely Done in US

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Second Trimester

**Routine**

B-Mode Screening Examination

Second Trimester Screening Examination only Uses B-Mode Ultrasound

4-Chamber View

The addition of each ultrasound modality increases the overall detection rate of serious birth defects

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**PLUS**

B-Mode Screening Examination

Outflow Tracts

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**PLUS**

Routine Use of Color Doppler Ultrasound

Color Doppler

The addition of each ultrasound modality increases the overall detection rate of serious birth defects
Routine Second Trimester Color Doppler

PLUS

Pulmonary Stenosis

Color Doppler

PLUS

Vasa Previa

Color Doppler

Routine Second Trimester Color Doppler PLUS Pulmonary Stenosis

Routine Second Trimester Color Doppler PLUS Vasa Previa

Routine Second Trimester Color Doppler PLUS Routine Use of Pulsed Doppler Ultrasound

Doppler evaluation of the uterine arteries

CMAJ 2008, 701-711

0 5 10 15 20 25
High Risk Low Risk Overall Severe Likelihood Ratio

Preeclampsia IUGR

Routine Second Trimester Color Doppler PLUS Routine Use of 3D/4D Ultrasound

Routine Use of 3D/4D Ultrasound

PLUS

3D/4D Ultrasound

PLUS

Uterine Artery Predicting Disease

Preeclampsia IUGR

Uterine Artery Predicting Disease

PLUS

Doppler evaluation of the uterine arteries

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3D/4D Ultrasound

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Uterine Artery Predicting Disease

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Routine Second Trimester Color Doppler PLUS Routine Use of Pulsed Doppler Ultrasound

Doppler evaluation of the uterine arteries

CMAJ 2008, 701-711

0 5 10 15 20 25
High Risk Low Risk Overall Severe Likelihood Ratio

Preeclampsia IUGR
Routine Second Trimester

PLUS
3D/4D Ultrasound

NORMAL Second Trimester

PLUS
3D/4D Ultrasound

NORMAL

PLUS
Endovaginal cervical length measurement

Truncus Arteriosus
Third Trimester

Routine

B-Mode Screening Examination

Third Trimester Screening Examination only Uses B-Mode Ultrasound

The addition of each ultrasound modality increases the overall detection rate of serious birth defects.

Routine

4-Chamber View

Third Trimester

PLUS

B-Mode Screening Examination

Tetralogy of Fallot

Normal

Tetralogy of Fallot

RV

LV
Tetralogy of Fallot

Normal 4-Chamber View

VSD Overrides the Aorta

Small Pulmonary Artery

Coarctation of the Aorta

Z-Scores

Aortic Arch
D-Transposition of the Arteries

Normal

D-Transposition of the Arteries

Normal

D-Transposition

Third Trimester

Routine Use of Color Doppler Ultrasound

PLUS

Color Doppler

B-Mode

The addition of each ultrasound modality increases the overall detection rate of serious birth defects

Severe Aortic Stenosis

Normal

Severe Aortic Stenosis and Endocardial Fibroelastosis

Severe Aortic Stenosis

Four-Chamber View
Severe Aortic Stenosis

Shunting VSD

Normal Shunting VSD

Shunting VSD

Third Trimester

Vasa Previa

PLUS
Color Doppler Ultrasound

Uterine Artery at 28 and 32 Weeks

PLUS
Doppler evaluation of the Uterine Artery

Normal

Abnormal

Umbilical Artery

PLUS
Doppler evaluation of the Umbilical Artery
Pulsed Doppler PLUS Third Trimester

Middle Cerebral Artery Doppler evaluation of the Middle Cerebral Artery

Redistribution

Anemia

Routine 3D/4D Ultrasound PLUS

The addition of each ultrasound modality increases the overall detection rate of serious birth defects.

Routine Use of 3D/4D Ultrasound

Routine 3D/4D Ultrasound PLUS

3D/4D Ultrasound