

High Risk Pregnancies

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Conflicts of interest

- Grants
- Relationships with private industry



Learning Objectives

- Identify patients at high risk if they become pregnant
- Identify the first trimester patient who warrants referral to a specialist
- Identify common warning signs in the second trimester
- Understand common complications encountered in the third trimester

Pre-test Questions

- Which patient has the highest risk for birth defects?
 - A patient who has a previous child with Down's Syndrome
 - A patient with poorly controlled Type II diabetes
 - A patient who had an abdominal CT in the first trimester
 - A patient who started chemotherapy for breast cancer in the second trimester

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- A patient presents with increased discharge and pelvic pressure at 19 weeks of gestation. The most likely diagnosis is:
 - Chlamydia Trachomatis infection
 - Cervical insufficiency
 - Inevitable Abortion
 - Normal symptoms of pregnancy

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- An 18 year old patient presents at 34 weeks with new-onset high blood pressure and a severe headache. The most likely diagnosis is:
 - Pre-eclampsia
 - Chronic hypertension
 - Methamphetamine use
 - Hemorrhagic stroke



The patient at high risk in pregnancy

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- Reproductive life spans from 12-50
 - Extremes of age increase morbidity and mortality for women
 - In any ovulatory cycle with unprotected intercourse there is a 40% chance of fertilization. About half of these zygotes will implant – 20% chance of pregnancy.
 - 50% of pregnancies in the US are unintended

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- Most high risk consultations occur only when the patient is already pregnant
 - Women frequently don't realize they are pregnant until 6-8 weeks of gestation
 - Referral to high risk physicians can take weeks

Who is at risk in pregnancy?

- Underlying Cardiac Diseases
 - Atrial or ventricular shunts
 - ASD, VSD
 - Stenotic lesions limiting cardiac output
 - Coarctation of the aorta, aortic stenosis
 - Marfan syndrome
 - Pulmonary Hypertension
 - Related to or unrelated to a shunt

- Diabetes

- Type I and Type II diabetics should have tight control before pregnancy
 - HbA1C recommended 5-6 at conception
 - HbA1C above 8.5 strongly associated with congenital defects (22% in one study)
 - Patients with comorbidities have higher fetal and maternal risks during pregnancy

Hypertension

- Risk for growth restriction
- Maternal risk for preeclampsia
 - Recommend optimal control before conception
 - Patients with renal insufficiency often have advancing disease with pregnancy
 - If pregnancy occurs, baseline and continued testing is important
 - 24 hour urine for protein excretion
 - Fetal growth assessment

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- Renal insufficiency
 - GFR is increased in pregnancy
 - Excretion of albumin increases during pregnancy
 - Risk of hypertensive disorders of pregnancy, fetal loss and prematurity are increased

- Thrombophilias

- History of clots

- DVT, PE

- Known hereditary thrombophilia

- Factor V leiden, Protein C/S, prothrombin gene mutations

- Acquired thrombophilia

- Antiphospholipid antibody syndrome

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- Patients undergoing cancer treatment
 - Pregnancy is not advised during chemotherapy or radiotherapy
 - Radiation therapy can be given if needed with abdominal shielding
 - If chemotherapy is required deferring until the 2nd or 3rd trimester is preferable
 - <2% chance of birth defects
 - IUGR with low birth weight and need for premature delivery remain a concern
 - Increased chance of fetal loss or malformation (16%) if given chemotherapy in the 1st trimester

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- Other endocrine disorders
 - Poorly controlled thyroid disease
 - Maternal risk of preeclampsia
 - Fetal risk of growth restriction, cardiac failure, intellectual impairment
 - Congenital Adrenal hyperplasia
 - Concern for virilization of the female fetus

- Neurologic Conditions

- Untreated cerebral aneurysms

- Risk of hemorrhagic stroke

- Multiple sclerosis

- Most women do well during pregnancy
 - Increased risk of flare postpartum

- Other conditions

- HIV/AIDS

- Poorly controlled medical conditions

- Anemia
 - Crohns, Ulcerative colitis
 - Schizophrenia, Bipolar Disorder, Depression and anxiety

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- Most of these patients can embark on a pregnancy
 - Counseling about risk is very important before pregnancy
 - Optimization of health is frequently possible before conception

Contraceptive methods

- Long Acting Reversible Contraceptives (LARCs)
 - Lowest failure rates
 - Favorable side effect profile
 - Easily reversible
 - Mirena, Paragard, Nexplanon
- Many patients can receive estrogen-containing birth control methods
 - SLE patients without antiphospholipid antibody syndrome
 - Patients on anticoagulation



**First trimester patients who
should have additional
assessment and care**



The first trimester

- The first 14 weeks of pregnancy
- Patients with any of the discussed medical conditions should be optimally managed and referred for co-management with a high risk specialist.

Acute illness

- In early pregnancy an obstetrician should be involved in diagnosis and treatment of complicated patients
- If clinical suspicion is high, radiographic studies can be used
- The radiation doses used for an abdominal CT do not reach levels that have a strong association with birth defects
- Repeated CT scans in pregnancy should be avoided if possible because of the mildly increased risk of childhood leukemia in offspring
 - MRI and US are frequently preferred in pregnancy
 - No concern for induced birth defects
 - US frequently the better and faster modality in early pregnancy

Abnormal bleeding

- A patient presenting with bleeding and abdominal pain
 - Ectopic must be excluded
 - Ultrasound is essential
 - If an IUP is not seen, β HCG can be useful
 - Molar pregnancy must be excluded
 - Ultrasound findings of a 'snowstorm' or an abnormal fetus in combination with an abnormally elevated β HCG

Twins and more

- Establishing amnionicity / chorionicity early is important
 - Dichorionic / Diamniotic
 - Growth discordance
 - Monochorionic / Diamniotic
 - Twin-twin transfusion syndrome
 - Stillbirth of one twin risks the other
 - Monochorionic / Monoamniotic
 - Cord entanglement
 - Highest risk of stillbirth
- All twins are at an increased risk for
 - Prematurity
 - Pre-eclampsia

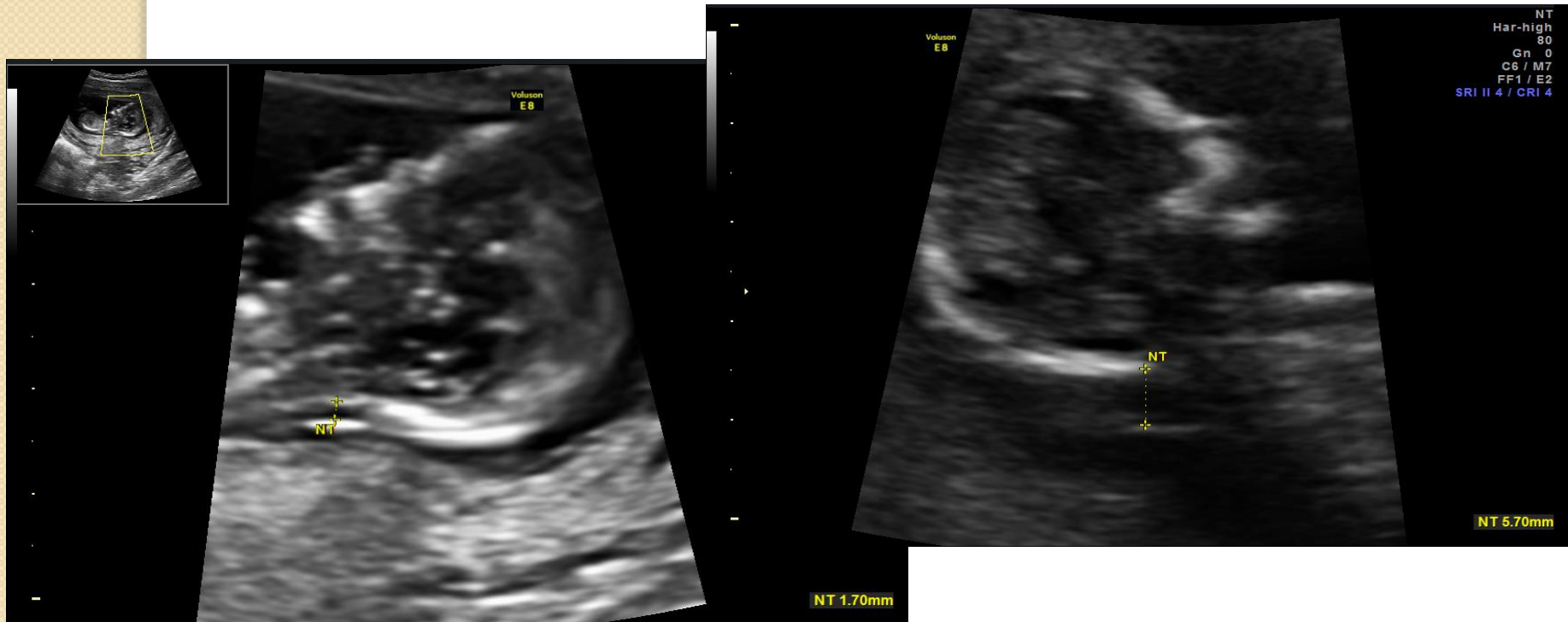


Abnormal screening

- Abnormal nuchal translucency
- Abnormal serum screening
- Abnormal free fetal DNA

Nuchal Translucency

- <3mm in isolation is normal
- <3mm in combination with abnormal serum markers may be screen positive.



Management of Abnormal Screening

- Consultation with a genetic counselor and obstetrician who can offer specialized diagnostic services recommended
- All patients should be offered genetic counseling
 - Those with a child with a chromosomal defect have twice the population risk of a recurrence
 - Some patients with an effected child will have a parent with a balanced translocation, this results in a greatly elevated risk of a recurrence

Obstetric history

- A delivery before 37 completed weeks of gestation
 - Spontaneous
 - I7OHP
 - Cervical lengths
 - Cerclage
 - Indicated
 - Aspirin



Obstetric history

- Previous stillborn infant
- 3 or more prior spontaneous abortions
- History of cesarean section
 - Low transverse
 - Classical, T or J incision



Second trimester warning signs and high risk diagnoses

Second trimester

- 14 – 26 weeks
- Screening window for a short cervix
- The routine anatomy ultrasound is generally performed between 18 and 22 weeks

The anatomy scan

- Placenta

- Placenta Previa

- Planning for preterm cesarean delivery

- Placenta Accreta

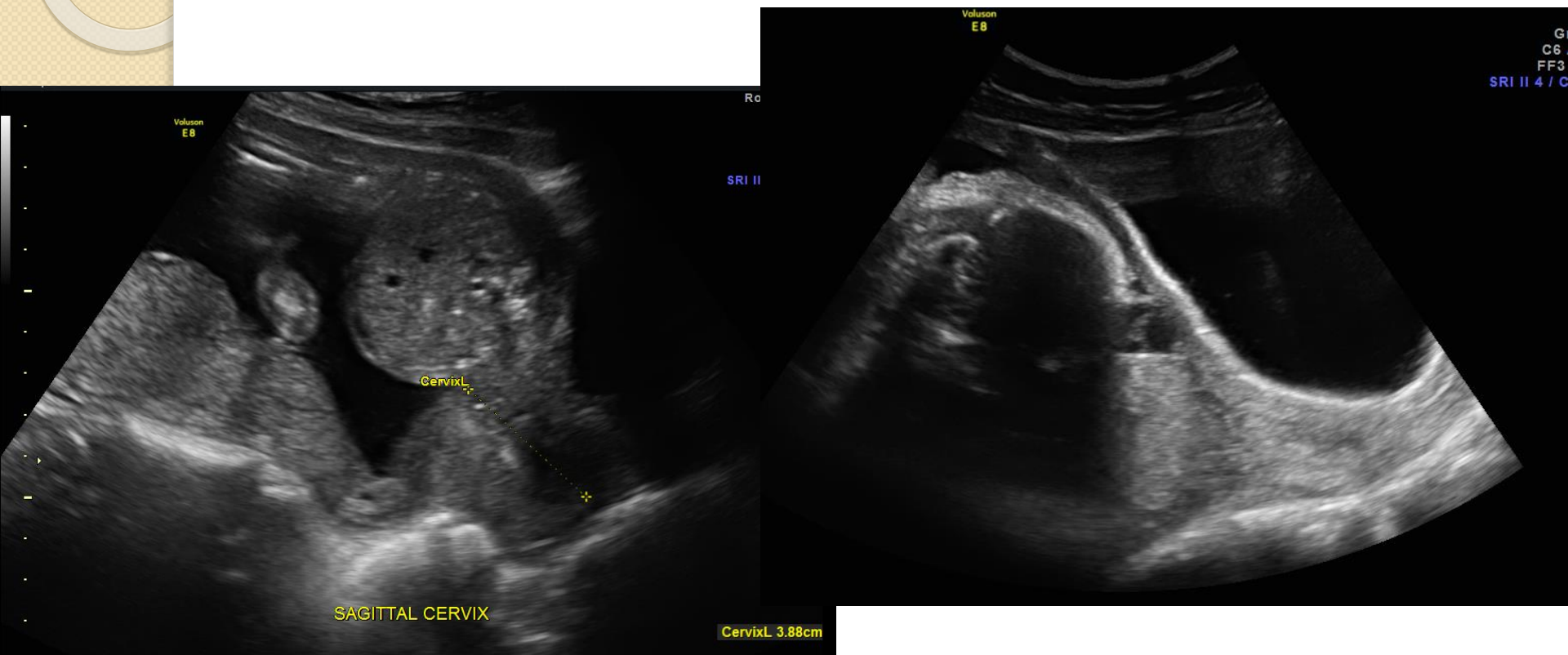
- Planning for preterm cesarean delivery
- Cesarean hysterectomy preferred management

- Vasa Previa

- Ultrasound monitoring with cesarean delivery near term

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- Symptoms of placenta previa are bleeding in the second or third trimester.
 - Many patients will have no symptoms before a significant hemorrhage

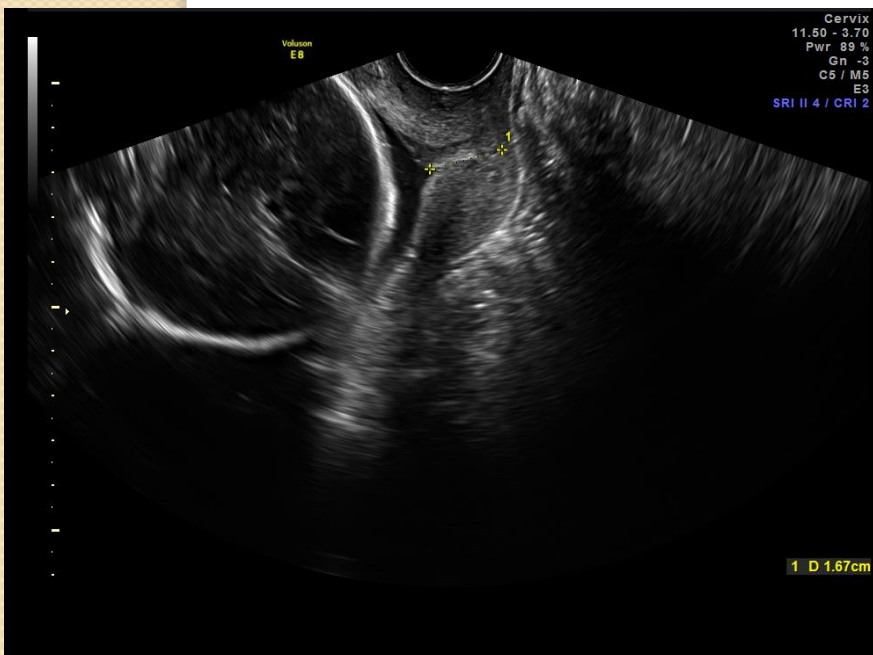
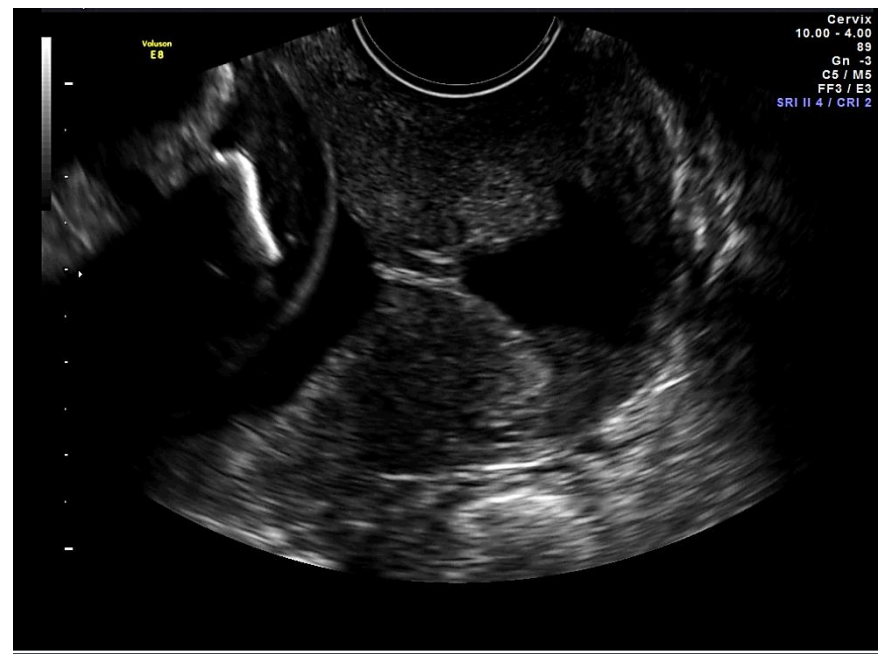
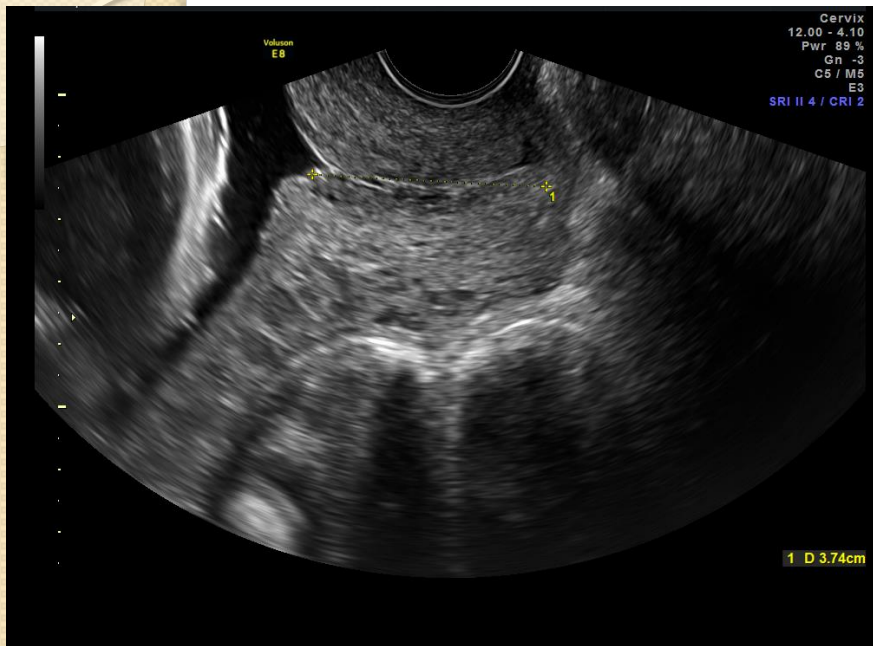
Placental Assessment



- Cervix

- Short cervix

- Consideration of vaginal progesterone
 - Consideration of cerclage



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- Symptoms of shortening / opening cervix
 - Vaginal pressure
 - Increased vaginal discharge
 - Cramping
 - Many patients have no symptoms

- Fetus

- Structural anomalies

- 3% will have a structural difference
 - 1% will have a heart defect
 - The risk of structural defects goes up with certain factors such as family history, diabetes and some medications.

CORD INSERT

Voluson
E8

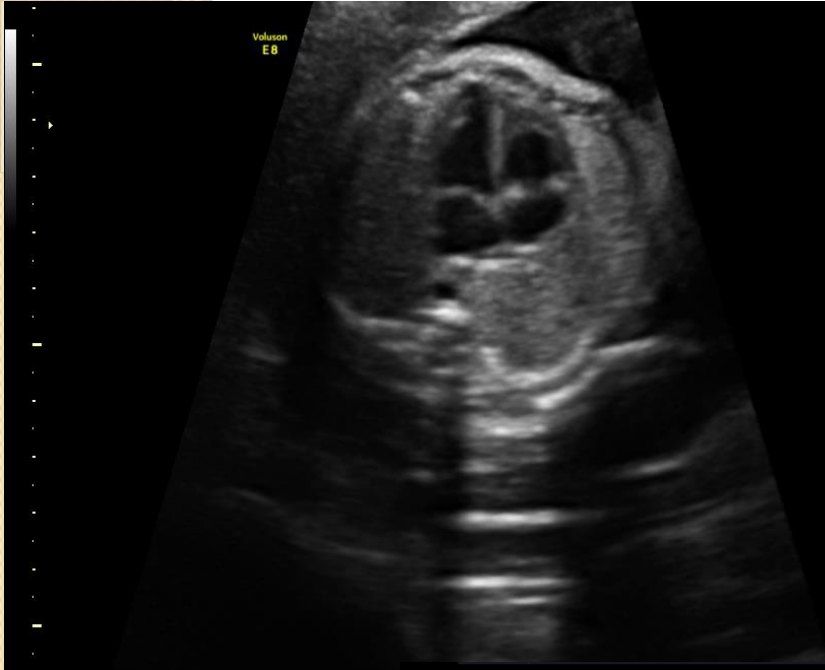
Fet. Card
Har-high
Pwr 85 %
Gn -1
C8 / M7
E1
SRI II 5 / CRI 2

CORD INS

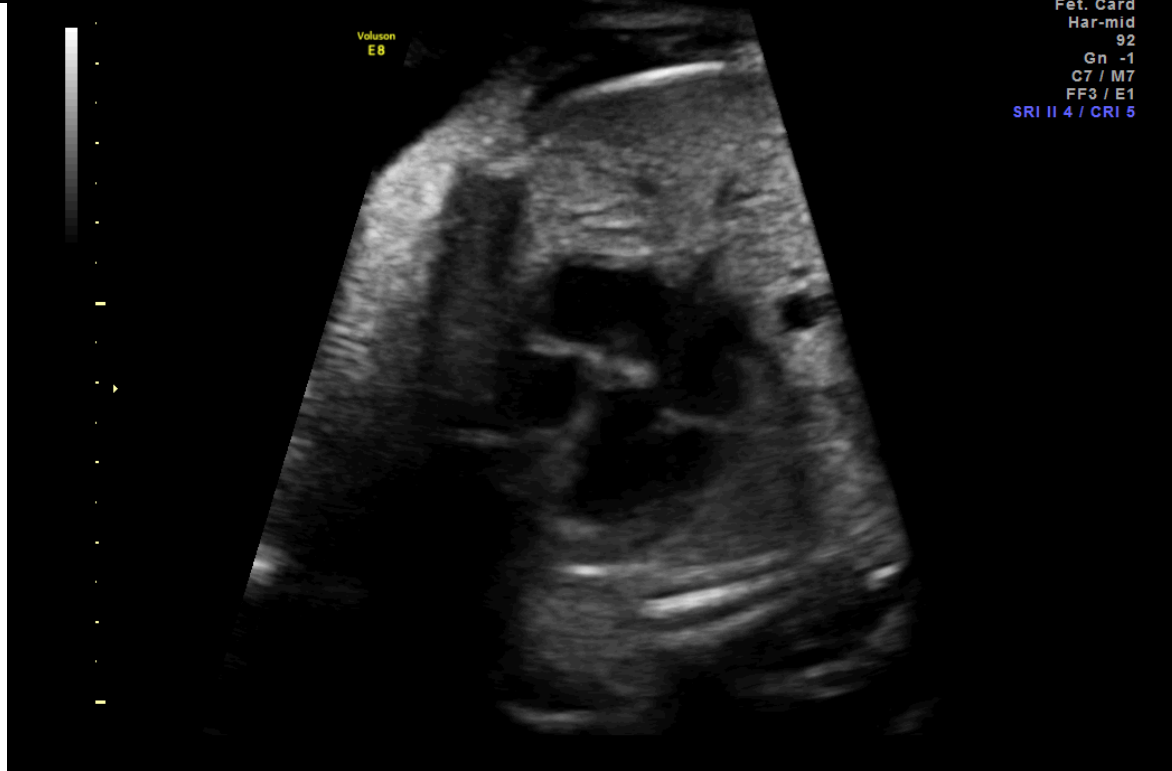
MI =0.53 TIB< 0.4 100%

225/226
41Hz

6.00M R12.0 G40 C77



Fet. Card
Har-mid
Pwr 97 %
Gn 3
C8 / M7
E1
SRI II 5 / CRI 2



Fet. Card
Har-mid
92
Gn -1
C7 / M7
FF3 / E1
SRI II 4 / CRI 5



Third trimester complications

Third Trimester Complications

- Hypertensive disorders of pregnancy
 - Gestational Hypertension
 - Pre-eclampsia
 - Chronic hypertension with superimposed pre-eclampsia
 - Less commonly drug-induced hypertension or other rare causes of hypertension in young people (pheochromocytoma)

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- Gestational hypertension
 - New onset hypertension after 20 weeks
 - 2 readings at least 4 hours apart
 - No associated proteinuria ($>300\text{mg}/24\text{hour}$ collection, protein:creatinine ratio ≥ 0.3 , 1+ protein on urine dipstick)
 - No associated symptoms of pre-eclampsia

- Pre-eclampsia

- New onset hypertension after 20 weeks of gestation
- Proteinuria or
 - Unremitting headache
 - Epigastric or RUQ pain
 - Scotomata
 - Platelet count $<100,000$
 - Liver transaminases $>2\times$ normal values
 - Oliguria

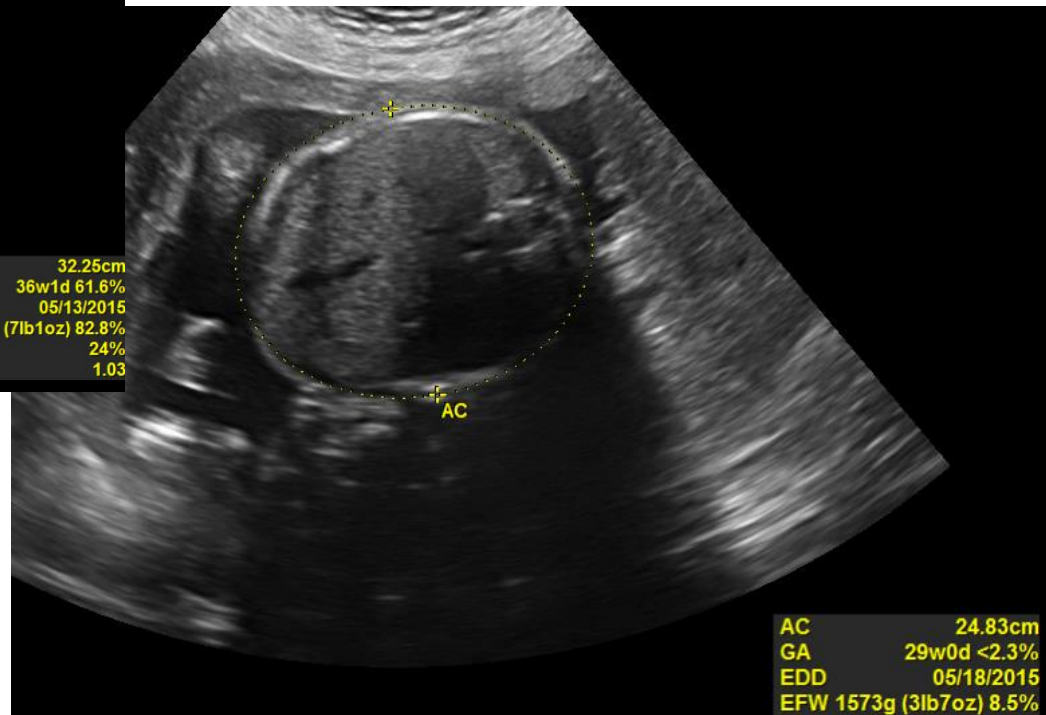
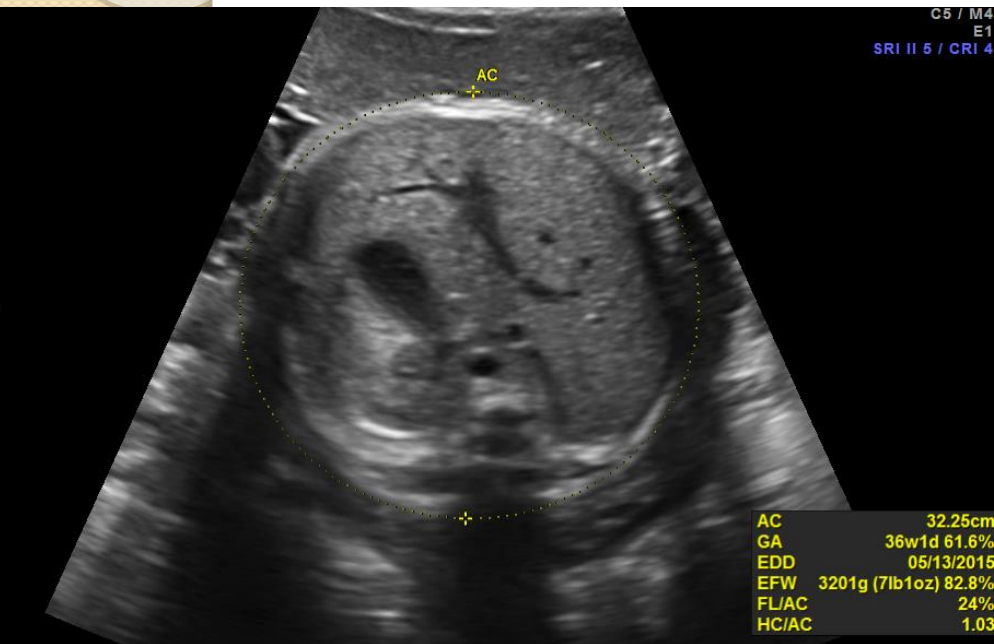
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- Superimposed pre-eclampsia
 - Worsening of hypertension after 20 weeks of gestation
 - Signs or symptoms of pre-eclampsia

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- New onset hypertension at or beyond 37 weeks should generally be treated with induction of labor or cesarean
 - If left untreated patients with gestational hypertension or preeclampsia are at risk for
 - Severe pre-eclampsia
 - Seizures
 - Malignant hypertension
 - Eclampsia
 - Hemorrhagic stroke
 - Patients with pre-existing hypertension should be delivered at 38-39 weeks

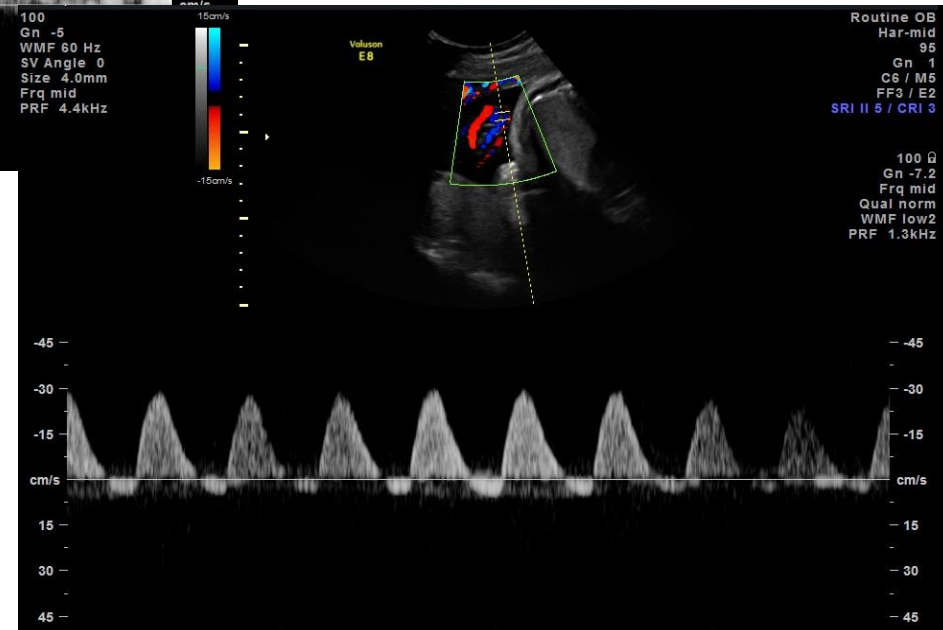
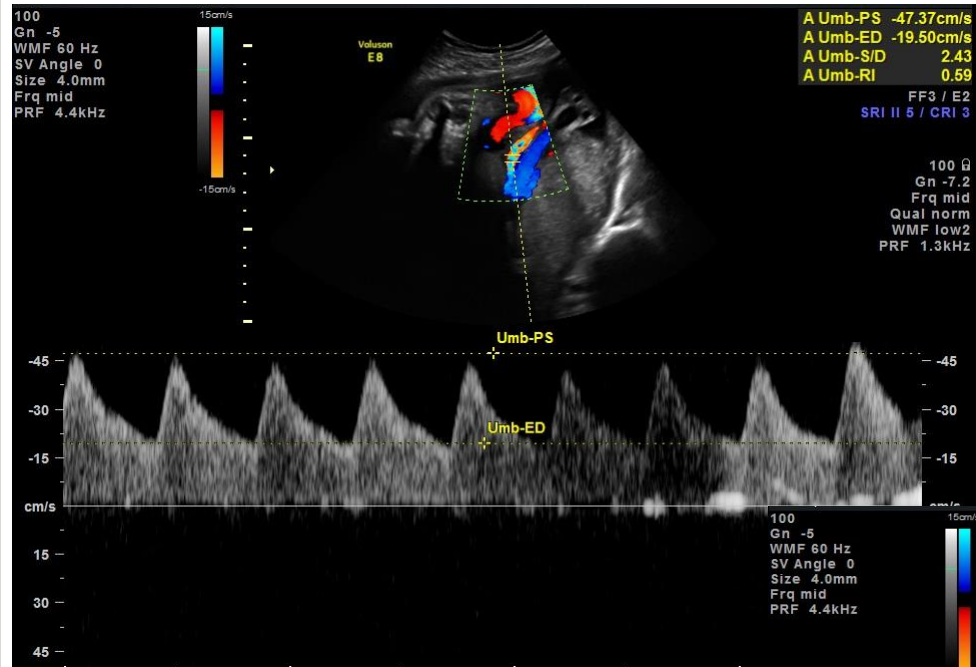
Growth Restriction

- Signs may be lagging fundal height or maternal complaint that the fetus feels 'smaller' than her last baby
- IUGR is growth achieved $<10^{\text{th}}$ percentile
- Doppler assessment of the umbilical arteries should be performed
- With abnormal umbilical artery dopplers, consideration should be given to delivery at a preterm gestational age because of the risk of stillbirth if pregnancy continues

Abdominal circumference



Umbilical Artery Doppler



Decreased Fetal Movement

- Antenatal testing should be instituted
 - Biophysical profile
 - Modified biophysical profile
 - Non-stress Test
 - Contraction stress test

Post-talk questions

- Which patient has the highest risk for birth defects?
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Questions?



- ACOG Practice Bulletin, Pregestational diabetes mellitus, 2005 (Reaffirmed 2014)
- ACOG Practice Bulletin, Gestational diabetes mellitus, 2013
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