

# ANTENATAL TESTING

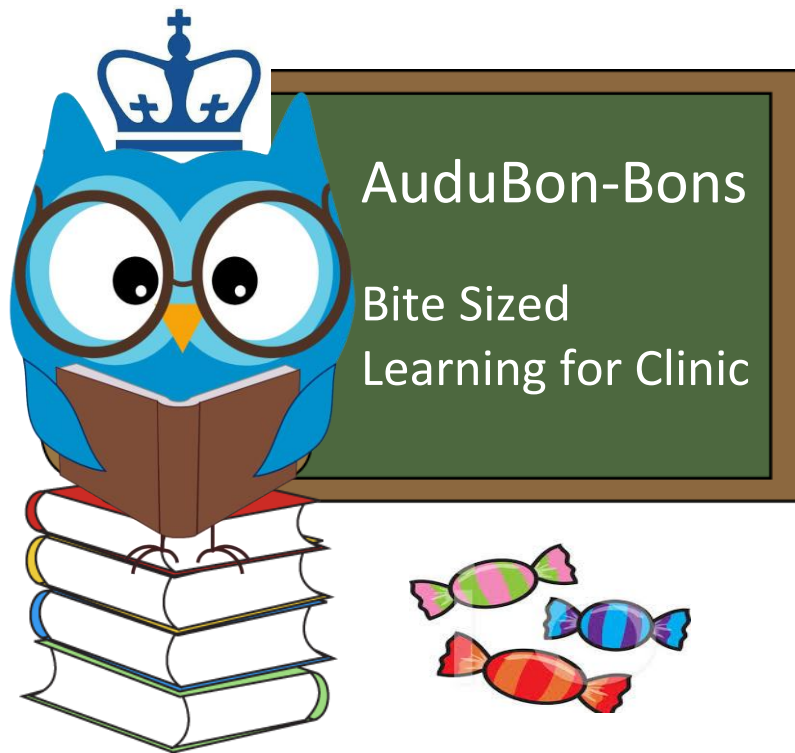
Week 35

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Reading Assignment:

ACOG Practice Bulletin #145

Antepartum Fetal Surveillance



# LEARNING OBJECTIVES



- To recognize the indications for antenatal testing
- To understand the techniques for antenatal testing
- To counsel on the guidelines for antenatal testing consistent with the best scientific evidence



# CASE VIGNETTE

- Ms. Alta Presion, a 39 yo G1 P0 woman at 37wga, presents to clinic for an antepartum visit requesting an explanation for why she needs to have such frequent ultrasounds.



# FOCUSED HISTORY

What elements of the patient's history are most relevant?

- PMH: **Chronic hypertension not on medication**  
**Normotensive with rare mild range hypertension during pregnancy**  
**Advanced maternal age**
- PSH: Liposuction 5 years ago
- OBH: **Current pregnancy uncomplicated other than PMH noted above**  
**Reports normal fetal movement**  
**Denies ctx, lof, vb**  
**Denies symptoms of preeclampsia**
- PGYNH: Regular menses prior to pregnancy. Denies history of STIs or abnormal paps.  
Denies history of fibroids or cysts.
- MEDS: PNV
- All: NKDA
- FH: HTN
- SH: Denies tob, drug, etoh use. Denies IPV. Accepts blood products.



# PERTINENT PHYSICAL EXAM FINDINGS

What elements of the patient's physical exam are most relevant?

- General: Well appearing woman, VSS (normotensive)
- CV: RRR
- Resp: CTAB
- Abd: Soft, ND, NT, appropriately gravid, no RUQ tenderness
- **FH: 36cm**
- **FHR 140s bpm**
- Ext: WWP, no edema



# INDICATIONS FOR ANTENATAL TESTING

- **What is the purpose of antenatal testing?**
  - To prevent fetal death
- **What are this patient's indications for antenatal testing?**
  - Chronic hypertension
  - Advanced maternal age
- **Has antenatal testing been demonstrated to definitively improve fetal outcome?**
  - No. However, there is observational evidence that it decreases risk of fetal death. Risk/Benefit ratio in favor of testing in appropriate pregnancies.



# INDICATIONS FOR ANTENATAL TESTING

## What are the indications for antenatal testing?

- Pregnancies where the risk of fetal death is increased

### Box 1. Indications for Antepartum Fetal Surveillance Testing ↩

#### Maternal conditions

- Pregestational diabetes mellitus
- Hypertension
- Systemic lupus erythematosus
- Chronic renal disease
- Antiphospholipid syndrome
- Hyperthyroidism (poorly controlled)
- Hemoglobinopathies (sickle cell, sickle cell-hemoglobin C, or sickle cell-thalassemia disease)
- Cyanotic heart disease

#### Pregnancy-related conditions

- Gestational hypertension
- Preeclampsia
- Decreased fetal movement
- Gestational diabetes mellitus (poorly controlled or medically treated)
- Oligohydramnios
- Fetal growth restriction
- Late term or postterm pregnancy
- Isoimmunization
- Previous fetal demise (unexplained or recurrent risk)
- Monochorionic multiple gestation (with significant growth discrepancy)

Data from Liston R, Sawchuck D, Young D. Fetal health surveillance: antepartum and intrapartum consensus guideline. Society of Obstetrics and Gynaecologists of Canada, British Columbia Perinatal Health Program [published erratum appears in J Obstet Gynaecol Can 2007;29:909]. *J Obstet Gynaecol Can* 2007;29:S3-S56. (Level III)

Condition
Abruption
Advanced maternal age > 35 years *
Amniocentesis ≥ 24 weeks
Antiphospholipid syndrome
Chronic hypertension
Chronic renal disease
Cholestasis
Maternal cyanotic heart disease
Decreased fetal movement
Diabetes mellitus (type 1 or 2)
Gestational diabetes (on medication or poor control)
Gestational diabetes (on diet and good control)
Gestational hypertension
Hyperthyroidism (poor control)
Hemoglobinopathies (SS, SC, S-thal)
Fetal growth restriction (EFW < 10 <sup>th</sup> or AC < 5 <sup>th</sup> )
Isoimmunization
Known or suspected fetal anomaly
Multiple gestations
Dichorionic twins
Trichorionic triplets
Uncomplicated monochorionic multiples
Complicated monochorionic multiples
Monoamniotic multiples
Obesity with BMI > 30 <sup>†</sup>
Oligohydramnios
Polyhydramnios
Post EDC pregnancy
Preeclampsia
Prior intrauterine fetal demise (unexplained)
Systemic lupus erythematosus (active disease)
Thrombophilia with poor OB history



# TIMING AND FREQUENCY OF ANTENATAL TESTING

Per ACOG, based  
on clinical judgement

## INDICATIONS FOR ANTENATAL SURVEILLANCE (BPP +/- NST):

Condition	Initiate Testing (GA in weeks)	Frequency of Testing
Abruption	At diagnosis	Twice weekly
Advanced maternal age > 35 years *	36 +	Weekly
Amniocentesis ≥ 24 weeks	Post-procedure	NST once
Antiphospholipid syndrome	32	Weekly
Chronic hypertension	32-34	Weekly
Chronic renal disease	32	Weekly
Cholestasis	At diagnosis	Weekly; 2 x weekly if bile acids > 40
Maternal cyanotic heart disease	28	Weekly
Decreased fetal movement	At diagnosis	Once
Diabetes mellitus (type 1 or 2)	32 (earlier if poor control or end-organ damage)	Twice weekly
Gestational diabetes (on medication or poor control)	32	Twice weekly
Gestational diabetes (on diet and good control)	40	Weekly
Gestational hypertension	At diagnosis	Weekly
Hyperthyroidism (poor control)	32	Weekly
Hemoglobinopathies (SS, SC, S-thal)	32	Weekly
Fetal growth restriction (EFW < 10 <sup>th</sup> or AC < 5 <sup>th</sup> )	At diagnosis	Weekly; 2 x weekly if abnormal Dopplers
Ischemization	At diagnosis	Weekly MCA Dopplers
Known or suspected fetal anomaly	32 weeks	Weekly
Multiple gestations		
Dichorionic twins	36	Weekly
Trichorionic triplets	32	Weekly
Uncomplicated monochorionic multiples	> 16 weeks	q 2 wks 16-32 wks; weekly > 32 weeks
Complicated monochorionic multiples	> 16 weeks	Per MFM
Monoamniotic multiples	When intervention desired	Per MFM
Obesity with BMI > 30 <sup>†</sup>	34-36 <sup>†</sup>	Weekly
Oligohydramnios	At diagnosis	Twice weekly
Polyhydramnios	At diagnosis	Weekly
Post EDC pregnancy	41	Twice weekly
Preeclampsia	At diagnosis	Twice weekly
Prior intrauterine fetal demise (unexplained)	34 weeks (earlier if prior loss < 34 weeks)	Weekly
Systemic lupus erythematosus (active disease)	28	Weekly
Thrombophilia with poor OB history	32	Weekly

\* Consider earlier testing (~ 32-34 weeks) in AMA > 40 yo

† Consider earlier testing (~ 34 wk) in BMI > 35





# TECHNIQUES FOR ANTENATAL TESTING

What are the techniques for antenatal testing currently in use?

- **Maternal-fetal movement assessment**
  - To be reviewed in Fetal Movement Counseling Bon-Bon
- **Contraction stress test**
- **Nonstress test**
- **Biophysical profile**
  - Modified biophysical profile
- **Umbilical artery doppler velocimetry**
  - Only in growth-restricted fetuses



# CONTRACTION STRESS TEST

- **What is the physiology of a CST?**
  - Fetal oxygenation is worsened by uterine contractions
- **How is a CST performed?**
  - Patient in lateral recumbent position
  - FHR and uterine contractions recorded
  - 3 contractions for at least 40 seconds in 10 minute period
    - Spontaneous or induced contractions
- **How is a CST interpreted?**
  - **NEGATIVE:** no late or significant variable decelerations
    - Even if the contraction frequency is fewer than three in 10 minutes
  - **POSITIVE:** late decelerations after 50% or more of contractions
  - **EQUIVOCAL-SUSPICIOUS:** intermittent late decelerations or significant variable decelerations
  - **EQUIVOCAL:** FHR decelerations that occur in the presence of contractions more frequent than every 2 minutes or lasting longer than 90 seconds
  - **UNSATISFACTORY:** fewer than three contractions in 10 minutes or an uninterpretable tracing



# NONSTRESS TEST

- **What is the physiology of an NST?**

- In a fetus that is not acidotic or neurologically depressed, fetal movements cause accelerations

- **How is an NST performed?**

- Semi-fowler or lateral recumbent position
- FHR and uterine contractions recorded
- 20 minutes duration
  - May be necessary to monitor longer to account for sleep cycle

- **How is an NST interpreted?**

- **REACTIVE:** 2 or more accelerations in 20 minute period
- **NON-REACTIVE:** Lacks sufficient accelerations in 40 minute period



# BIOPHYSICAL PROFILE

- **What are the components of a BPP?**

1. Nonstress test—may be omitted without compromising test validity if the results of all four ultrasound components of the BPP are normal (35)
2. Fetal breathing movements—one or more episodes of rhythmic fetal breathing movements of 30 seconds or more within 30 minutes
3. Fetal movement—three or more discrete body or limb movements within 30 minutes
4. Fetal tone—one or more episodes of extension of a fetal extremity with return to flexion, or opening or closing of a hand
5. Determination of the amniotic fluid volume—a single deepest vertical pocket greater than 2 cm is considered evidence of adequate amniotic fluid (36-38)

- **How is a BPP interpreted?**

- Each component receives 2 points:
  - **8-10: NORMAL**
  - **6: EQUIVOCAL**
  - **4 or less: ABNORMAL**
  - **OLIGOHYDRAMNIOS:** Always evaluate further



# MODIFIED BIOPHYSICAL PROFILE

- **What are the components of a modified BPP?**
  - NST and amniotic fluid volume assessment
- **What is the physiology of a modified BPP?**
  - NST represents a short-term assessment of acid-base status
  - Amniotic fluid volume represents a long-term assessment of placental function
- **How is a modified BPP interpreted?**
  - Abnormal if either component is abnormal



# FALSE-NEGATIVE RATE OF ANTENATAL TESTING

How reassuring is normal antenatal testing?

- High negative predictive value for incidence of stillbirth within 1 week
  - **CST:** 0.3 per 1000
  - **NST:** 1.9 per 1000
  - **BPP:** 0.8 per 1000
  - **Modified BPP:** 0.8 per 1000



# SOCIAL DETERMINANTS OF HEALTH

**How many appointments do I need go to!?**

The medical risks of antenatal testing may be minimal, but the time required can have a huge impact on our patients. Many patients do not have sick/medical time from work and struggle with finding childcare options. It is our responsibility to keep the patient at the center of their care, including looking at the psychosocial impact of our recommendations.



# EPIC .PHRASE

## **.BBANTESTING**

Description: Antenatal Testing Counseling

Given the patient's \*\*\*, I recommended they initiate antenatal testing at \*\*\*wga with \*\*\*. This will occur at \*\*\* frequency. I reviewed the indication for antenatal testing, the method, and the implications of the results. Their questions were answered to their satisfaction.





# CODING AND BILLING

## Antenatal Testing Counseling

- **ICD-10 Codes**

- 036.8190
  - Decreased fetal movement, unspecified trimester
- 036.8390
  - Maternal care for abnormalities of the fetal heart rate or rhythm, unspecified trimester

- **CPT Codes**

- 99214
  - Office or other outpatient visit for the evaluation and management of an established patient, which requires at least two of these three key components:
    - A detailed history; a detailed examination; medical decision making of moderate complexity.
    - Counseling and/or coordination of care with other physicians, other qualified health care professionals, or agencies are provided consistent with the nature of the problem(s) and the patient's and/or family's needs.
    - Usually, the presenting problem(s) are of moderate to high severity.
    - Typically, 25 minutes are spent face-to-face with the patient and/or family.



# EVIDENCE

- Antepartum fetal surveillance. Practice Bulletin No. 145. American College of Obstetricians and Gynecologists. Obstet Gynecol 2014;124:182–92.
- Coletta, Jaclyn. Columbia University Medical Center Department of Obstetrics and Gynecology OB/GYN Ultrasound Practice Guidelines. Revision October 2016.

