

# FAMILY MEDICINE BOARD REVIEW: MATERNITY CARE

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# Conflicts of Interest/Disclosures

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- I have no disclosures or conflicts of interest.

# Objectives

- Review basic prenatal care including routine laboratory work up, diagnostic tests, and screening recommendations
- Define the various levels of hypertension in pregnancy and their management
- Describe the diagnosis of diabetes in pregnancy and its management
- Recognize the various complications that can occur during delivery and how to manage them

# Importance

## □ Maternity care

- This module covers prenatal care, antepartum care, and postpartum care. It does not include the management of high-risk pregnancy, but may include the management of acute and chronic disease in pregnant women. Topics covered include such things as screening, nutrition, management of labor and delivery, complications of pregnancy, and key concepts of advanced life support in obstetrics. Selected neonatal problems such as ABO incompatibility and neonatal resuscitation may also be covered.

<b>Cardiovascular</b>	<b>10%</b>
<b>Endocrine</b>	<b>7%</b>
<b>Gastrointestinal</b>	<b>6%</b>
<b>Hematologic/Immune</b>	<b>3%</b>
<b>Integumentary</b>	<b>5%</b>
<b>Musculoskeletal</b>	<b>10%</b>
<b>Nephrologic</b>	<b>3%</b>
<b>Neurologic</b>	<b>3%</b>
<b>Nonspecific</b>	<b>8%</b>
<b>Psychogenic</b>	<b>6%</b>
<b>Reproductive—Female</b>	<b>3%</b>
<b>Reproductive—Male</b>	<b>1%</b>
<b>Respiratory</b>	<b>11%</b>
<b>Special Sensory</b>	<b>2%</b>
<b>Population-based Care</b>	<b>4%</b>
This includes topics such as biostatistics and epidemiology, evidence-based medicine, prevention, health policy and legal issues, bioterror, quality improvement, and geographic/urban/rural issues.	
<b>Patient-based Systems</b>	<b>4%</b>
This includes topics such as clinical decision-making, communication and doctor-patient interaction, family and cultural issues, ethics, palliative care, and end-of-life care.	
<b>Module</b>	<b>13%</b>
Selected from eight possible choices at the time of the examination. (See descriptions below.)	

*Total does not equal 100% because of rounding*

# Routine prenatal care

- Initial visit
  - ▣ 6 to 8 weeks
- Visit frequency
  - ▣ Initial visit to 28 weeks: q4 weeks
  - ▣ 28 to 36 weeks: q2 weeks
  - ▣ > 36 weeks: q1 week
- Postpartum visit
  - ▣ 4 to 6 weeks after delivery

# Initial prenatal labs

- Blood type/Rh/Antibody
- Hemoglobin and hematocrit
- Rubella antibody titer
- Chlamydia and gonorrhea
  - ▣ If less than 24yo
- Hepatitis B surface antigen
- Syphilis screen
- HIV screening
- Urine culture
- Cervical cytology
  - ▣ If indicated
- Cystic fibrosis screen
- Pap smear (if appropriate)

# Asymptomatic bacteriuria

- > 100,000 of a single species
  - ▣ E coli most common
- Higher rate of preterm labor
- Treatment
  - ▣ Cephalexin 250mg PO QID x7 days

# Additional screening

- Maternal serum alpha-fetoprotein (MSAFP)
  - 16 to 18 weeks
  - High: neural tube defect
  - Low: Trisomy 21 or 18

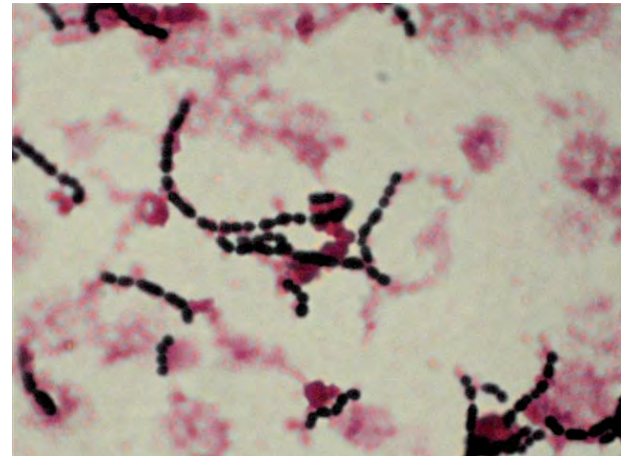


# Additional screening

- Ultrasonography
  - ▣ 18 to 20 weeks
  - ▣ Not recommended for routine use
    - High evidence for determining placental location, fetal location, fetal viability, and fetal number
    - Not good at detecting minor fetal abnormalities
      - Able to detect major abnormalities

# GBS screening

- 35 to 37 weeks
- Everyone gets screened
  - ▣ Except
    - Any GBS bacteriuria during the pregnancy
    - Previous infant with GBS sepsis
- Treatment
  - ▣ Penicillin
  - ▣ Cefazolin
  - ▣ Clindamycin
  - ▣ Vancomycin



# Gestational diabetes

- Routine screening at 24 to 28 weeks
  - ▣ Earlier screening (<24 weeks)
    - Guidelines vary
    - BMI  $\geq$  25 and one or more of
      - Gestational diabetes in previous pregnancy
      - HgbA1C  $\geq$  5.7
      - Impaired fasting glucose
      - First degree relative with diabetes mellitus
      - High risk ethnicity (African American, Latino, Native American, Asian American, Pacific Islander)
      - PMH of hypertension, CV disease, hyperlipidemia, PCOS
      - Physical inactivity

# Gestational diabetes

- Initial test: 50g oral glucose tolerance test
  - ▣  $> 135$  or  $140$ : 3 hours glucose tolerance test
  - ▣ 3 hour glucose tolerance test
    - 2 or more elevated values: gestational diabetes
- Other tests
  - ▣ HgbA1C  $> 6.5\%$ 
    - More accurate in earlier pregnancy
  - ▣ Random plasma glucose  $> 200$
  - ▣ Fasting plasma glucose  $> 126$

# Gestational diabetes

- Management
  - Nutritional counseling
    - No clear consensus on when to start medication
  - Medications
    - Metformin
    - Glyburide
    - Insulin
  - Biweekly NSTs after 32 weeks
- Goal blood sugars
  - Fasting <95
  - 2 hour postprandial <120
- Delivery
  - Manage expectantly if well controlled
  - Induction at 39 weeks if not well controlled
    - Cesarean section if estimated fetal weight >4,500 grams



# Gestational diabetes

- Complications
  - Maternal
    - Gestational hypertension
    - Preeclampsia
    - Cesarean delivery
    - Diabetes later in life
  - Fetal
    - Macrosomia
    - Shoulder dystocia
    - Birth trauma
    - Hypoglycemia
    - Hyperbilirubinemia

# Gestational hypertension

- > 140/90 on two separate occasions
  - ▣ >160 systolic or >110 diastolic once
- Can be only during pregnancy
  - ▣ Transient hypertension of pregnancy
- Can persist after pregnancy
  - ▣ Chronic hypertension
- Management
  - ▣ Labetalol
  - ▣ Nifedipine
  - ▣ Methyldopa
- Complications
  - ▣ IUGR
  - ▣ Preeclampsia

# Preeclampsia

## □ Definition

- Elevated blood pressure after 20 weeks

- Proteinuria

  - $> 0.3\text{g}$  protein in 24-hour urine specimen

  - Urine protein:creatinine ratio of  $\geq 0.3$

    - Not required if hypertension and severe features present

## □ Eclampsia

- Preeclampsia with seizures



# Preeclampsia

- Severe features
  - SBP >160 or DBP >110 twice
  - Platelets <100,000
  - Elevated LFTs
    - Two times normal range
  - RUQ pain not relieved by medication
  - New visual disturbances
  - Worsening renal disease
    - Doubling of creatinine

# Preeclampsia

- Risk factors
  - UTIs during pregnancy
  - Multiple gestation
  - Preeclampsia in previous pregnancy
  - Age extremes in pregnancy
  - Gestational diabetes
  - Hypertension

# Preeclampsia

- Diagnosis
  - ▣ Blood pressure parameters
  - ▣ History and physical
  - ▣ Labs
    - Urine protein:creatinine ratio
    - UA
    - 24-hour urine specimen
    - CBC
    - Uric acid
    - CMP

# Preeclampsia

- Management
  - Magnesium sulfate
    - In severe preeclampsia only
    - Reduces risk of seizures
  - Antihypertensive therapy
    - If blood pressure consistently over  $>160/110$
  - Delivery
    - Okay to delivery vaginally
- Postpartum care
  - Continue magnesium sulfate for at least 24 hours
  - May need antihypertensives upon discharge

# Preeclampsia

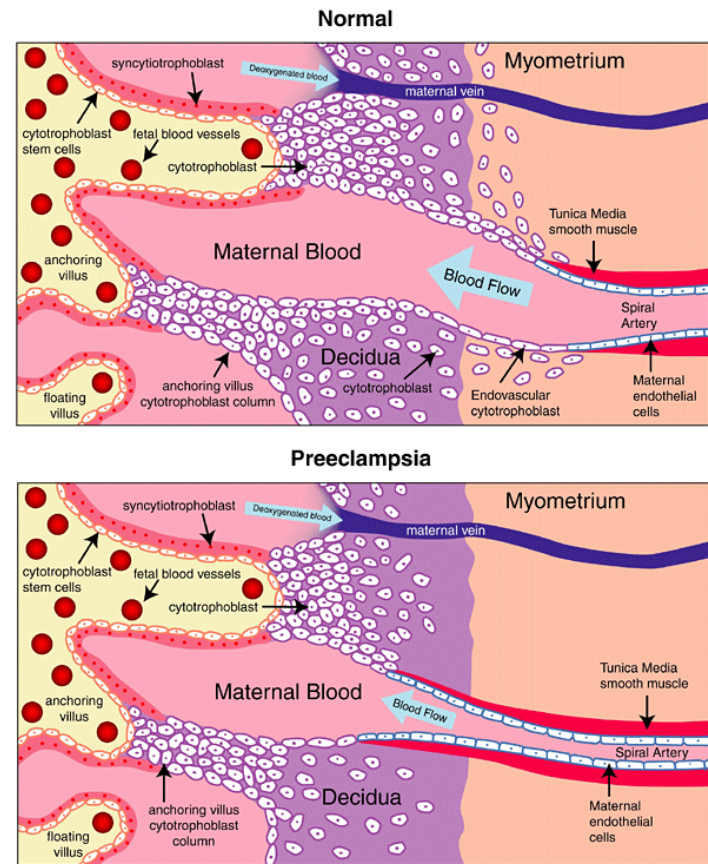
## □ Prevention

- ▣ Aspirin 81 mg after first trimester

- If history of preeclampsia before 34 weeks

- If high risk for preeclampsia

- Recurrent preeclampsia



# Preeclampsia

## □ Complications

### ▣ Maternal

- Increased risk of permanent hypertension
- Increased risk of CVA
- Increased risk of ischemic heart disease
- Increased risk of thrombotic events

### ▣ Neonatal

- IUGR
- Hyperbilirubinemia

# Postpartum hemorrhage

- Definition
  - Any bleeding that is more than expected or that results in signs/symptoms of hypovolemia
  - >500ml in vaginal delivery
  - >1,000ml in cesarean section
  - Early: within 24 hours of delivery
  - Late: 24 hours to six weeks after delivery
- Management
  - ABCs
  - Bimanual massage
  - Evaluate the cause
    - Four Ts
      - Tone
      - Tissue
      - Trauma
      - Thrombin

# Postpartum hemorrhage

## □ Medications

- Oxytocin

- Misoprostol (Cytotec) 800-1000mcg per rectum

- Methylergonovine (Methergine) 0.2mg IM

  - Contraindicated in hypertension

- Carboprost (Hemabate) 0.25mg IM

  - Contraindicated in asthma



# Additional reading

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- Nutrition in pregnancy
- Ectopic pregnancy
- Intrahepatic cholestasis of pregnancy
- Preterm labor
- Late pregnancy bleeding
- Labor induction

# Questions?



# Resources

- American Academy of Family Physicians. [www.aafp.org](http://www.aafp.org)
- American Board of Family Medicine. [www.abfm.org](http://www.abfm.org)
- American Congress of Obstetricians and Gynecologists. [www.acog.org](http://www.acog.org)
- Google Image. [www.google.com/image](http://www.google.com/image)
- United States Preventive Services Task Force. [www.uspreventiveservicestaskforce.org](http://www.uspreventiveservicestaskforce.org)
- Weismiller, D.G. (2016). Maternity Care I. *AAFP Board Review Course*.
- Weismiller, D.G. (2016). Maternity Care II. *AAFP Board Review Course*.

## Maternity Care Questions

A 21yo G1P0 at 35.5 weeks presents to her obstetrical appointment. She has no complaints today and denies any vaginal bleeding or discharge, contractions, or pain. She has good fetal movement. Her pregnancy has been uncomplicated thus far except for a UTI treated when she was 31 weeks. While reviewing her chart, you note her urine culture at that time showed >100,000 colonies *E coli*, and she was treated with an appropriate antibiotic. However, you notice that the day before the *E coli* urine culture, another urine culture was done that showed <5,000 colonies Group B streptococcus.

How do you proceed with her GBS testing at her appointment today?

- A. Perform the GBS swab today because she is between the indicated range of 35 and 37 weeks
- B. Perform the GBS swab today because there were not enough colonies in her previous GBS-positive urine culture to merit GBS prophylaxis at time of delivery
- C. Perform the GBS swab because the previous GBS-positive urine culture was likely incorrectly cultured and was probably *E coli*
- D. Do not perform the GBS swab because treatment of her previous UTI four weeks ago will interfere with the results
- E. Do not perform the GBS swab because her previous GBS-positive urine culture indicates need for GBS prophylaxis at the time of delivery

A 34yo G1P0 at 8 weeks presents for her initial obstetrical appointment. She is new to your practice. She is accurate with her dates, as she has been closely tracking her last menstrual period. She has no complaints today and denies any vaginal bleeding, discharge, or pain. Her past medical history includes hypertension, hyperlipidemia, and obesity (BMI 32). She has never had diabetic screening in the past, and you have no record of any previous lab work. She asks when she should be screened for diabetes.

What is your recommendation for this particular patient?

- A. Screen for diabetes now with a HgbA1C and treat if > 6
- B. Screen for diabetes now with a fasting blood sugar and treat if >110
- C. Screen for diabetes now with a 50g oral one-hour glucose tolerance test and if >140, order a 100g oral three-hour glucose tolerance test
- D. Screen for diabetes at 24 to 28 weeks with a HgbA1C and treat if >6
- E. Screen for diabetes at 24 to 28 with a 50g oral one-hour glucose tolerance test and order a 100g oral three-hour glucose tolerance test if >140

A 38yo G4P3 at 15 weeks presents for an obstetrical appointment. Her pregnancy has been uncomplicated, and she was last seen four weeks ago. She has no pertinent past medical, surgical, social, or family history. She is only on a prenatal vitamin. Her blood pressure is normal today. Her last delivery was complicated by preeclampsia diagnosed at 32 weeks with induction and an unremarkable vaginal delivery at 38 weeks. Her two previous deliveries before that were unremarkable vaginal deliveries; she did not have preeclampsia with either of them.

What is your recommendation to her at this visit concerning prevention of preeclampsia?

- A. Start aspirin 81mg PO qday due to her advanced maternal age
- B. Start aspirin 81mg PO qday due to her developing preeclampsia before 34 weeks during her last pregnancy
- C. Start aspirin 81mg PO qday due to her developing preeclampsia after two pregnancies without preeclampsia
- D. Do not start aspirin due to her previously having two pregnancies without preeclampsia
- E. Do not start aspirin due to her normal blood pressure at today's visit

## Maternity Care Questions and Answers

A 21yo G1P0 at 35.5 weeks presents to her obstetrical appointment. She has no complaints today and denies any vaginal bleeding or discharge, contractions, or pain. She has good fetal movement. Her pregnancy has been uncomplicated thus far except for a UTI treated when she was 31 weeks. While reviewing her chart, you note her urine culture at that time showed >100,000 colonies *E coli*, and she was treated with an appropriate antibiotic. However, you notice that the day before the *E coli* urine culture, another urine culture was done that showed <5,000 colonies Group B streptococcus.

How do you proceed with her GBS testing at her appointment today?

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- C. Perform the GBS swab because the previous GBS-positive urine culture was likely incorrectly cultured and was probably *E coli*
- D. Do not perform the GBS swab because treatment of her previous UTI four weeks ago will interfere with the results
- E. Do not perform the GBS swab because her previous GBS-positive urine culture indicates need for GBS prophylaxis at the time of delivery

Correct answer: E. Any previous GBS bacteriuria, regardless of colony count or timing during pregnancy, indicates need for GBS prophylaxis at the time of delivery. The other indication to withhold GBS testing is when the mother has had a previous infant with GBS sepsis.

Choice A is incorrect. While the indicated range for performing a GBS swab is 35 to 37 weeks, it is not necessary in this case given her history of GBS bacteriuria.

Choice B is incorrect, as the colony count in a urine culture does not factor into whether to offer GBS prophylaxis at the time of delivery.

Choice C is incorrect, as it is unlikely the urine culture was incorrectly cultured. Any GBS bacteriuria indicates a need for GBS prophylaxis at the time of delivery, regardless of its timing to other urine cultures.

Choice D is incorrect, as four weeks would be sufficient time between antibiotic treatment and the performance of the GBS swab. There is some debate as to whether recent antibiotic usage (within one week) should delay GBS swab performance; however, no consensus exists.

A 34yo G1P0 at 8 weeks presents for her initial obstetrical appointment. She is new to your practice. She is accurate with her dates, as she has been closely tracking her last menstrual period. She has no complaints today and denies any vaginal bleeding, discharge, or pain. Her past medical history includes hypertension, hyperlipidemia, and obesity (BMI 32). She has never had diabetic screening in the past, and you have no record of any previous lab work. She asks when she should be screened for diabetes.

What is your recommendation for this particular patient?

- A. Screen for diabetes now with a HgbA1C and treat if  $> 6$
- B. Screen for diabetes now with a fasting blood sugar and treat if  $>110$
- C. Screen for diabetes now with a 50g oral one-hour glucose tolerance test and if  $>140$ , order a 100g oral three-hour glucose tolerance test
- D. Screen for diabetes at 24 to 28 weeks with a HgbA1C and treat if  $>6$
- E. Screen for diabetes at 24 to 28 with a 50g oral one-hour glucose tolerance test and order a 100g oral three-hour glucose tolerance test if  $>140$

Correct answer: C. Patients with known risk factors for glucose intolerance such as this patient (hypertension, hyperlipidemia, obesity) should be screened for diabetes at their initial obstetrical appointment. The standard two-step method of a 50g oral one-hour glucose tolerance test followed by a 100g oral three-hour glucose tolerance test if  $>140$  is an appropriate way to screen.

Choices A and D are incorrect. A HgbA1C can be a useful screening test for diabetes for those that cannot tolerate the oral glucose tolerance tests. However, a first trimester cut-off of 6.5 is recommended. The HgbA1C loses accuracy as pregnancy progresses and is generally not recommended between 24 and 28 weeks.

Choice B is incorrect. A fasting blood sugar can be used for those that cannot tolerate the oral glucose tolerance test, though the oral glucose tolerance test is recommended. If a fasting blood sugar is used, a value of  $>126$  is the threshold for treatment.

Choice E is incorrect. While the regimen listed is correct, this patient needs screening prior to 24 to 28 weeks given her risk factors.

A 38yo G4P3 at 15 weeks presents for an obstetrical appointment. Her pregnancy has been uncomplicated, and she was last seen four weeks ago. She has no pertinent past medical, surgical, social, or family history. She is only on a prenatal vitamin. Her blood pressure is normal today. Her last delivery was complicated by preeclampsia diagnosed at 32 weeks with induction and an unremarkable vaginal delivery at 38 weeks. Her two previous deliveries before that were unremarkable vaginal deliveries; she did not have preeclampsia with either of them.

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- D. Do not start aspirin due to her previously having two pregnancies without preeclampsia
- E. Do not start aspirin due to her normal blood pressure at today's visit

Correct answer: B. Preeclampsia prevention with aspirin 81mg PO qday is indicated if a patient has developed preeclampsia before 34 weeks in any previous pregnancy. Other indications for prevention include being high risk to develop preeclampsia, such as patients with hypertension, and multiple pregnancies with preeclampsia.

Choice A is incorrect. Advanced maternal age is a risk factor for preeclampsia, but by itself, it is not an indication to start preeclampsia prevention with aspirin, and it is not the most important reason to start aspirin in this patient.

Choices C and D are incorrect. Previous pregnancies without preeclampsia do not affect the decision to offer prevention. Regardless of what number pregnancy a patient develops preeclampsia before 34 weeks, it is still appropriate to offer prevention. For example, if a patient develops preeclampsia before 34 weeks with her first pregnancy and then has three straight pregnancies without preeclampsia, she should still be offered preeclampsia prevention.

Choice E is incorrect. A normal blood pressure does not preclude the need for preeclampsia prevention in this patient. Blood pressure does not play a role in the decision to offer prevention or not.