# Essentials of Prenatal Care

Hannah Myrick Anderson, MD

Hospital Yojoa

# SOURCES OF INFORMATION

- WHO Recommendations on Antenatal Care for a Positive Pregnancy Experience (2016) http://www.who.int/reproductivehealth/publications/maternal_perinatal_health/anc-positive-pregnancy-experience/en/
- Guidelines for Perinatal Care: Eighth Edition (AAP, ACOG, 2017) http://sales.acog.org/Guidelines-for-Perinatal-Care-Eighth-Edition-P262.aspxt
- ACOG practice bulletin 233: Anemia in Pregnancy, 2024
- WHO recommendations on antiplatelet agents for the prevention of pre-eclampsia, 2021
- ACOG practice advisory Low-Dose Aspirin Use for the Prevention of Preeclampsia and Related Morbidity and Mortality, 2021
- WHO guideline on syphilis screening and treatment for pregnant women
- Urinary Tract Infections in Pregnant Individuals Clnical Consensus, ACOG
- ACOG practice bulletin 190, Gesetational Diabetes Mellitus

# Maria

- 17 yo Honduran G2P1, stay at home mom, partner is a farm worker. Presents for first prenatal visit. Unsure LMP.
- G1, term, female SVD, diagnosed with pre eclampsia at 40 weeks and induced in the public hospital, no records available
- Exam: VSS.. Fetal heart tones: 140s.
- Ultrasound: Singleton. EGA of 12 weeks 3 days

# Complications

- Teen pregnancy
- History of pre eclampsia
- Unsure LMP

# What lab work should she receive?

- Complete Blood Count - if not available, Hgb
- Blood type
- Syphilis, HIV screening
- Urinalysis

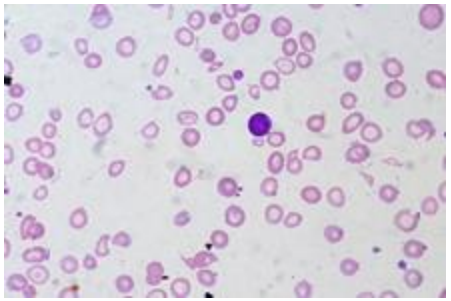
# Who should receive HIV and syphilis screening?

- Per USPSTF and WHO recommendations, all pregnant women should receive HIV testing at least once in pregnancy
- Women who  live in high prevalence  (>1/1000 + HIV in pregnant women) areas should receive repeat HIV testing third trimester
- WHO and USPSTF recommend universal screening for syphilis in all pregnant women at first visit

# Lab results

- Hgb: 10.1
- Blood type: A+
- Syphilis: neg
- HIV: neg
- Urine dipstick: +nitrites, +leukocytes

# Anemia in Pregnancy



ACOG and CDC: first trimester <11 g/dL, second trimester <10.5 g/dL, third trimester <11 g/dL.

WHO: less than 11 g/dL

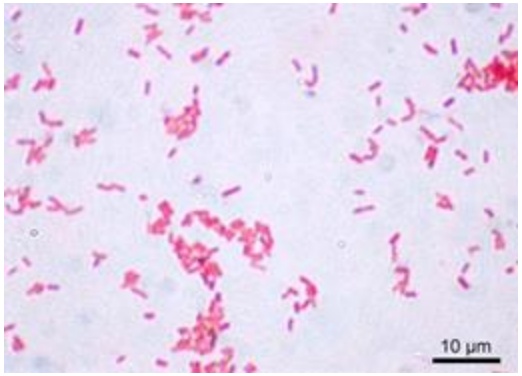
Prevention:

- 30-60 mg elemental iron, 0.4 mg folic acid
- In settings where anemia in pregnant women exceed 40% prevalence - 60 mg daily
- low prevalance settings (<20%) weekly supplementation with 120 mg elemental iron, 2.8 mg folic acid.

Treatment:

- 120 mg elemental iron daily until resolution of anemia

# Asymptomatic bacteriuria




Diagnosis:

- Recommended - mid stream urine culture
- gram stain when urine culture not available
- dipstick is least sensitive/specific option

Treatment

- A 7 day regimen of antibiotics to prevent persistent bacteriuria, preterm birth, low birthweight

| Table 1. Antibiotic Regimens for Treatment of Asymptomatic Bacteriuria and Acute Cystitis | | |
|---|---|---|
| **Antimicrobial** | **Regimen** | **Considerations** |
| Nitrofurantoin | 100 mg orally every 12 h for 5–7 d | Reasonable to offer in the 1st trimester if no appropriate alternatives are available<br>Avoid as treatment for pyelonephritis due to inability to reach therapeutic levels in the kidney |
| Cephalexin* | 250–500 mg orally every 6 h for 5–7 d | |
| Sulfamethoxazole-trimethoprim | 800/160 mg every 12 h for 5–7 d | Reasonable to offer in the 1st trimester if no appropriate alternatives are available<br>In areas with more than 20% resistance to trimethoprim-sulfamethoxazole, avoid if initiating treatment before culture results are available |
| Fosfomycin | 3 g orally once | Avoid as treatment for pyelonephritis due to inability to reach therapeutic levels in the kidney |
| Amoxicillin* | 500 mg orally every 8 h for 5–7 d<br>875 mg orally every 12 h for 5–7 d | High degree of resistance; avoid if initiating treatment before culture results are available |
| Amoxicillin—clavulanate* | 500 mg orally every 8 h for 5–7 d<br>875 mg orally every 12 h for 5–7 d | High degree of resistance; avoid if initiating treatment before culture results are available |

# Pre-eclampsia prevention

Low dose Aspirin (WHO recommends 75 mg prior to 20 weeks gest, USPSTF and ACOG 81 mg between 12-16 weeks ideally)

Moderate Risk: primiparity, family history of pre-eclampsia, age greater than 40 years, or multiple pregnancy

High Risk: diabetes, chronic or gestational hypertension, renal disease, autoimmune disease, positive uterine artery Doppler, previous history of pre-eclampsia, or previous fetal or neonatal death associated with pre-eclampsia

**WHO and ACOG risk recommendations differ regarding risk and timing of initiation**

**Table 1.** Clinical Risk Assessment for Preeclampsia*

| Risk Level | Risk Factors | Recommendation |
|---|---|---|
| High† | • History of preeclampsia, especially when accompanied by an adverse outcome<br>• Multifetal gestation<br>• Chronic hypertension<br>• Type 1 or 2 diabetes<br>• Renal disease<br>• Autoimmune disease (systemic lupus erythematosus, antiphospholipid syndrome) | Recommend low-dose aspirin if the patient has one or more of these high-risk factors |
| Moderate‡ | • Nulliparity<br>• Obesity (body mass index greater than 30)<br>• Family history of preeclampsia (mother or sister)<br>• Sociodemographic characteristics (African American race, low socioeconomic status)<br>• Age 35 years or older<br>• Personal history factors (eg, low birthweight or small for gestational age, previous adverse pregnancy outcome, more than 10-year pregnancy interval) | Consider low-dose aspirin if the patient has more than one of these moderate-risk factors§ |
| Low | • Previous uncomplicated full-term delivery | Do not recommend low-dose aspirin |

*Includes only risk factors that can be obtained from the patient's medical history. Clinical measures, such as uterine artery Doppler ultrasonography, are not included.

†Single risk factors that are consistently associated with the greatest risk of preeclampsia. The preeclampsia incidence rate would be approximately 8% or more in a pregnant woman with one or more of these risk factors.

‡A combination of multiple moderate-risk factors may be used by clinicians to identify women at high risk of preeclampsia. These risk factors are independently associated with moderate risk of preeclampsia, some more consistently than others.

§Moderate-risk factors vary in their association with increased risk of preeclampsia.

Modified from LeFevre, ML. U.S. Preventive Services Task Force. Low-dose aspirin use for the prevention of morbidity and mortality from preeclampsia: U.S. Preventive Services Task Force Recommendation Statement. Ann Intern Med 2014;161:819–26.

# Calcium supplementation for prevention of pre-eclampsia

Recommended dosing: **1.5 g - 2 g Calcium supplementation daily** in areas with low dietary calcium intake

# Preventive Helminthic Treatment

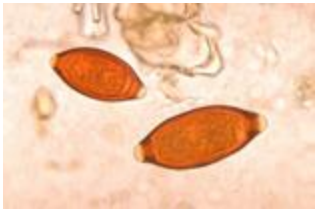
- Single dose of 400 mg of Albendazole after the 1st trimester

  Appropriate in countries which meet both requirements:

- Endemic areas: those with greater than 20% prevalence of hookworm infection and/or trichiuria
- A 40% or greater prevalence of anemia among women

Honduras: endemic area but anemia among women is at about an 18 % prevalence

Deworming done on a case by case basis



trichuria

hookworm

# Social Screening

- Interpersonal violence screening
- Tobacco use
- Substance use

# NAOMI

- 39yo G4P2A1 Nigerian lawyer from Lagos presents at for first antenatal care at 25 w by LMP c/o burning vaginal pain.
- G1- Term female SVD
- G2- 13w miscarriage
- G3- 34w male SVD
- Exam: VSS, BMI 25, Chest clear,  Abd nontender FH 30cm, FHT 130s,  1cm tender red group of vesicles posterior R labia minora. US EGA 27.3w

# ISSUES

- AMA
- late entry to care
- Unclear EDD
- Herpes genital lesion
- History of preterm delivery

# LATE ANTENATAL CARE

- Introduces uncertainty about EGA
- Reduces number of prenatal visits
- Delays recognition or treatment of medical problems, social problems, substance use issues, mental health issues

# Antenatal Care Contact Schedule

- Models with a **minimum of 8 contacts** are recommended to reduce perinatal mortality and improve women's experience of care
- Optimal pregnancy dating requires an **ultrasound prior to 24 weeks gestation.**

**Box 5: Comparing ANC schedules**

| WHO FANC model | 2016 WHO ANC model |
|---|---|
| *First trimester* | |
| Visit 1: 8–12 weeks | Contact 1: up to 12 weeks |
| *Second trimester* | |
| Visit 2: 24–26 weeks | Contact 2: 20 weeks<br>Contact 3: 26 weeks |
| *Third trimester* | |
| Visit 3: 32 weeks<br>Visit 4: 36–38 weeks | Contact 4: 30 weeks<br>Contact 5: 34 weeks<br>Contact 6: 36 weeks<br>Contact 7: 38 weeks<br>Contact 8: 40 weeks |
| Return for delivery at 41 weeks if not given birth. | |

# Advanced Maternal Age

- ACOG practice bulletin on stillbirth from 2009. IOL at 39w
- AMA patients increased risk of stillbirth, HTN, DM
- 1996-2006 births to women >34yo increased 12% to 20%
- The 35/39 study NEJM 3/3/16
  - 619 ladies, IOL at 39w, or at 41-42w
  - No difference in c/s or complications
  - IOL at 39w safe, but may not reduce risk of stillbirth
- Larger studies needed

# REDATING BASED ON ULTRASOUND

**Table 1.** Guidelines for Redating Based on Ultrasonography ⇦

| Gestational Age Range* | Method of Measurement | Discrepancy Between Ultrasound Dating and LMP Dating That Supports Redating |
|---|---|---|
| ≤13 6/7 wk | CRL | |
| • ≤ 8 6/7 wk | | More than 5 d |
| • 9 0/7 wk to 13 6/7 wk | | More than 7 d |
| 14 0/7 wk to 15 6/7 wk | BPD, HC, AC, FL | More than 7 d |
| 16 0/7 wk to 21 6/7 wk | BPD, HC, AC, FL | More than 10 d |
| 22 0/7 wk to 27 6/7 wk | BPD, HC, AC, FL | More than 14 d |
| 28 0/7 wk and beyond† | BPD, HC, AC, FL | More than 21 d |

# WHAT IS HER EGA?

- 25w EGA by LMP falls between 22 and 28w
- Discrepancy is 17d, which is >14dy
- US dating is considered “best”
- Best clinical estimate of EGA is 27.3w

# HERPES SIMPLEX IN PREGNANCY

- Primary or recurrent  HSV may be treated in pregnancy with acyclovir or valacyclovir
- Women with recurrent genital herpes should be offered suppressive viral therapy at or beyond 36w.
- Acyclovir 400mg BID, or valacyclovir 500mg QD
- Women in labor with no visible lesions on perineum may deliver vaginally

# Malaria Prophylaxis

- Malaria- Sulfadoxine pyramethamine 3 doses from 2nd trimester 1mo apart, with promotion of insecticide treated nets, in endemic areas

Malaria prevalence in pregnancy in Nigeria 19-72%

# HIGH RISK FOR TB

- HIV infected
- Close contact of person with active TB
- Work or live in Prison, Hospital, Nursing Home
- DM, Lupus, Cancer, or Addiction
- Lives in high prevalence area (100/100,000 per WHO)
- Homeless

Nigeria is one of WHO's 30 "high burden" countries, with TB prevalence around 300/100,000

# TB SCREENING

Patient at risk for TB (previous slide) needs screening

- Symptom screening
  - Cough >2w
  - Cough or fever or hemoptysis or weight loss or night sweats
- CXR
- Immunological screening (in US)
  - PPD
  - IGRA

# PREVENTING PRETERM BIRTH

- Risk factors
  - Previous preterm birth increases risk 1.5-2 fold
  - Cervical length <2.5cm
- Ultrasound Screening
  - Vaginal progesterone reduces risk of PTB in women with CL 10-20mm at EGA 19-23.6w
- Intervention
  - Progesterone (injectable hydroxyprogesterone) supplement starting at 16-24w through 36.6w - NO LONGER RECOMMENDED
  - Cerclage in some singleton pregnancies

# NAOMI

- Acyclovir starting at 36w
- Malaria preventative therapy with 3 monthly doses of Sulfadoxine Pyramethamine
- TB screening

# SELMA

25yo G2P0 Tunisian secretary presents for a follow up visit at 29 weeks gestation. Pregnancy complicated by depression and RH neg status. She complains of low back pain.

She looks well and her vital signs are stable -FHT-140, FH-32 cm.

# ROUTINE CARE in 3rd Trimester

- FH
- FHT
- TT or TDAP
- GDM screening

# Gestational Diabetes Screening

WHO currently does not have a recommendation on whether or how to screen for GDM, and screening - strategies for GDM are considered a priority area for research, particularly in LMICs.

U.S. Preventive Services Task Force: Screen all pregnant women for GDM at or beyond 24 weeks of gestation

# Which Screening Test Should We Use?

- In the US, we commonly use a two step approach
  - Universal screening with 1 hour GTT (50 g)
  - If positive (>130-140 g/dL), 3 hour GTT (100g)
  - diagnosed with GDM if exceeding >2 thresholds, the thresholds are not agreed upon

**Table 1.** Proposed Diagnostic Criteria for Gestational Diabetes Mellitus*

| | Plasma or Serum Glucose Level Carpenter and Coustan Conversion | | Plasma Level National Diabetes Data Group Conversion | |
|---|---|---|---|---|
| Status | mg/dL | mmol/L | mg/dL | mmol/L |
| Fasting | 95 | 5.3 | 105 | 5.8 |
| 1 hour | 180 | 10.0 | 190 | 10.6 |
| 2 hours | 155 | 8.6 | 165 | 9.2 |
| 3 hours | 140 | 7.8 | 145 | 8.0 |

# Which Screening Test Should We Use?

- Another option is a one step approach
  - 2 hour GTT (75 g)
  - fasting value, 92 mg/dL; 1-hour value, 180 mg/dL; or 2-hour value, 153 mg/dL
  - diagnosed with GDM if exceeding 1 or more threshold
  - This will increase the number of women diagnosed with GDM

# Tetanus vaccination

- Status unknown or never vaccinated: two doses of a tetanus toxoid-containing vaccine (TT-CV) one month apart with the second dose given at least two weeks before delivery.

- If a woman has had 1–4 doses of a TT-CV in the past, she should receive one dose of a TT-CV during each subsequent pregnancy to a total of five doses (five doses protects throughout the childbearing years).

# Anti-D immunoglobulin prophylaxis

- No need for ANTENATAL anti-D immunoglobulin
- POSTNATAL anti-D immunoglobulin should be given if newborn is RH positive

# Fetal Kick Counts

- NOT RECOMMENDED except in the setting of rigorous research

# DEPRESSION IN PREGNANCY

- Depression affects about 12% of pregnant American women
- Risks of untreated maternal depression include
  - Poor fetal growth, preterm birth, developmental problems
  - Postpartum and chronic maternal depression
- Brown, Ray, and Wilton JAMA 4/18/17
  - 35,906 pregnancies
  - 6% of pregnancies with SSRI exposure
  - SSRI exposure not associated with autism spectrum disorder in child
- Probably no difference between SSRIs. Sertraline most common

# What about her back pain?

| D. Interventions for common physiological symptoms | |
|---|---|
| | **Recommendation** |
| Nausea and vomiting | **D.1:** Ginger, chamomile, vitamin B6 and/or acupuncture are recommended for the relief of nausea in early pregnancy, based on a woman's preferences and available options. |
| Heartburn | **D.2:** Advice on diet and lifestyle is recommended to prevent and relieve heartburn in pregnancy. Antacid preparations can be offered to women with troublesome symptoms that are not relieved by lifestyle modification. |
| Leg cramps | **D.3:** Magnesium, calcium or non-pharmacological treatment options can be used for the relief of leg cramps in pregnancy, based on a woman's preferences and available options. |
| Low back and pelvic pain | **D.4:** Regular exercise throughout pregnancy is recommended to prevent low back and pelvic pain. There are a number of different treatment options that can be used, such as physiotherapy, support belts and acupuncture, based on a woman's preferences and available options. |
| Constipation | **D.5:** Wheat bran or other fibre supplements can be used to relieve constipation in pregnancy if the condition fails to respond to dietary modification, based on a woman's preferences and available options. |
| Varicose veins and oedema | **D.6:** Non-pharmacological options, such as compression stockings, leg elevation and water immersion, can be used for the management of varicose veins and oedema in pregnancy, based on a woman's preferences and available options. |

# Questions?

Hannah Myrick Anderson, MD
+1(816)726 9635
WhatsApp
hannahmyrick@gmail.com