Objectives

• Learn how to organize prenatal visits
• Learn what is evidence based and what is standard of care/convention
• Learn what resources are available to help you with prenatal care
• Learn what guidance/counseling may be beneficial to patients throughout their visits
Levels of Evidence

• A = randomized controlled trial
• B = cohort study
• C = non-randomized trial with concurrent or historical controls, case control study, study of sensitivity/specificity of a diagnostic test, population – based descriptive study
• D = Cross-sectional study, case series, case report
Levels of Evidence

Reports that synthesize or reflect upon collections of primary reports

• Class M = Meta-analysis, systematic review, decision analysis, cost-effectiveness analysis
• Class R = Consensus statement, consensus report, narrative review
• Class X = Medical opinion
Frequency of Prenatal Visits

- Monthly visits until 28 weeks
- Every 2 weeks until 35-36 weeks
- Then weekly until delivery
- Recent study showed that decreasing the number of prenatal visits to 4 did not change pregnancy outcomes (maternal or neonatal) however decrease patient satisfaction
First Prenatal Visit

- Initial Height, Weight, and BMI (B)
- Screen for tobacco and alcohol use – cessation if appropriate (A)
- Labs - blood type, Rh, antibody screen (A)
  - rubella screen (B)
  - syphilis screen (A)
  - Hep B screen (HBsAg) to screen for active Hep B infection (A)
  - HIV (A)
  - GC/CT screen (B)
  - cbc (anemia screening) (B) – *Give Fe if Hb <11*
Why BMI???

- Pre-pregnancy BMI in the underweight category had an increased risk of preterm birth (C)
- High pre-pregnancy BMI have increased risk for gestational diabetes, hypertension, preeclampsia, dystocia in labor, primary Caesarean section, labor induction, increased wound infection, antepartum venous thromboembolism, and anesthesia complications (B)
- Pre-pregnancy BMI in the obese category had an increased risk of gestational hypertension and significantly higher postpartum BMI at the six week postpartum visit if weight gain during the pregnancy was greater than 15 pounds. Equally important, that same study showed no adverse effects on perinatal morbidity or mortality among obese women whose weight gain during pregnancy was less than 15 pounds (A)
## BMI and Mode of Delivery

<table>
<thead>
<tr>
<th>BMI</th>
<th>Nulliparous Cesarean Rate, %</th>
<th>Mutlitparas and Prior Cesarean Cesarean Rate, %</th>
<th>Mutliparas without prior Cesarean Cesarean Rate, %</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;25.0</td>
<td>11.1</td>
<td>24.9</td>
<td>2.2</td>
</tr>
<tr>
<td>25-29.9</td>
<td>17.7</td>
<td>32.6</td>
<td>3.3</td>
</tr>
<tr>
<td>30.0-34.9</td>
<td>25.1</td>
<td>38.8</td>
<td>5.3</td>
</tr>
<tr>
<td>35.0-39.9</td>
<td>33.0</td>
<td>43.7</td>
<td>7.7</td>
</tr>
<tr>
<td>&gt;40</td>
<td>42.8</td>
<td>52.8</td>
<td>11.0</td>
</tr>
</tbody>
</table>
What is the recommended Weight Gain??

<table>
<thead>
<tr>
<th>Pre-pregnant or Initial Pregnant BMI</th>
<th>BMI</th>
<th>Total Weight Gain Range (pounds)</th>
<th>Rate of Weight Gain in Second and Third Trimesters (pounds/week)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Underweight</td>
<td>&lt;18.5</td>
<td>28-40</td>
<td>1 (range 1.0-1.3)</td>
</tr>
<tr>
<td>Normal Weight</td>
<td>18.5-24.9</td>
<td>25-35</td>
<td>1 (range 0.8-1.0)</td>
</tr>
<tr>
<td>Overweight</td>
<td>25.0-29.9</td>
<td>15-25</td>
<td>0.6(range 0.5-0.7)</td>
</tr>
<tr>
<td>Obese</td>
<td>&gt;30</td>
<td>11-20</td>
<td>0.5(range 0.4-0.6)</td>
</tr>
</tbody>
</table>
Why iron??

- Iron deficiency may be related to pre-term birth and low birth weight however other studies fail to demonstrate this correlation (R).
- An RCT concluded that IV iron replaced iron stores faster and more effectively than po iron with no serious adverse reactions (A).
- Excess supplementation may not be benign. Mineral imbalances, including Zinc and Copper, may result. Placental infarctions are non-existent with Hb levels < 8.0. No benefit from supplementation can be demonstrated for non-anemic women in the prevention of IUGR, PIH, primary pulmonary hypertension, or fatigue. (C)
First Prenatal Visit

- Dating – offer U/S (if unsure LMP) (A)
- Calcium - 1000-1300 mg daily (A)
  *Calcium intake should be 1000-1300 mg per day. May benefit women at high risk for gestational hypertension but does not prevent pre-E (A)
- Folic Acid supplementation: 400-800 mcg/day for primary prevention (up to 4 mg/day if increased risk) ideally from 4 weeks pre-conception through first trimester. (A)
  * supplementation is in addition to RDA of 600 mcg daily from food
- Flu Shot (for women who will be in 2\textsuperscript{nd} and 3\textsuperscript{rd} trimester during flu season) (B)
- Early Genetic Counseling/Testing for women at increased risk (age, hx, ethnicity) (B)
- Screening for Domestic Violence (C)
The "Dating" Ultrasound

• Several randomized control trials (RCT) have failed to show any consistent benefit in maternal or fetal outcome of routine U/S (R)

• However, more recent literature suggests that routine ultrasound leads to a decrease in post-term pregnancy and a better ability to assess gestational age and multiple pregnancy (A)
14-20 weeks

- Urine Culture – to screen for asymptomatic bactiuria (A)
- Offer Quad screen – screening for Down’s syndrome, spina bifida and trisomy 18 (B)
Let’s Discuss Genetic Screening - An appointment of it’s own

<table>
<thead>
<tr>
<th>Test</th>
<th>When</th>
<th>How</th>
<th>What For?</th>
<th>Sensitivity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Triple Screen</td>
<td>15-22 weeks</td>
<td>Serum</td>
<td>Trisomy 18, trisomy 21, spina bifida</td>
<td>73% sensitive 9% false positive rate</td>
</tr>
<tr>
<td>Quad Screen</td>
<td>15-22 weeks</td>
<td>Serum</td>
<td>Trisomy 18, Trisomy 21, Spina Bifida</td>
<td>81% sensitive 5% false positive rate</td>
</tr>
<tr>
<td>First Trimester Screen</td>
<td>10 4/7-13 6/7</td>
<td>Ultrasound + Serum</td>
<td>Trisomy 21, trisomy 18, trisomy 13</td>
<td>82-87% sensitive 5% false positive rate</td>
</tr>
<tr>
<td>Sequential Screen</td>
<td>10 4/7-13 6/7</td>
<td>Ultrasound + serum</td>
<td>Trisomy 21, Trisomy 18, Spina Bifida</td>
<td>95% sensitive 5% false positive rate</td>
</tr>
</tbody>
</table>
18-20 weeks

• Offer U/S for fetal anatomic survey
• In the Routine Antenatal Diagnostic Imaging with Ultrasound Study (RADIUS), 85% of the patients had a recognized indication for ultrasound examination (*Crane, 1994 [A]*). The near-universal access to prenatal ultrasound examinations continues to spur an ongoing controversy regarding the use of routine ultrasound examination in screening low-risk pregnancies.
the American College of Obstetricians and Gynecologists recommends if one screening ultrasound examination is performed, the optimal timing is at 18-20 weeks of gestation (American College of Obstetricians and Gynecologists, 2009b [R]). This timing provides satisfactory information for dating the pregnancy, allows good visualization of the fetal anatomy with concomitant detection of anomalies, and is performed at a time in the pregnancy when legal termination of the pregnancy is possible, if desired. There is no evidence to support the use of routine ultrasound examination in low-risk pregnancies after 24 weeks gestation (Bricker, 2008 [M]).
26-28 weeks

• Rhogam at 28 weeks if Rh negative (B)
• cbc (screening for anemia) (B) – Fe if < 10.5
• Screen for GDM with 1 hour GTT (C)
• Offer information about antenatal classes, info re: hospital registration (A)
Who needs a GTT

- Patients who are considered at increased risk for gestational diabetes should be screened with a one-hour glucose test as soon as the patient is confirmed to be pregnant.
- High risk (one or more of the following):
  - BMI greater than 30
  - Diabetes in first-degree relative
  - History of glucose intolerance
  - Previous infant with macrosomia (greater than 4,500 grams)
  - Current glycosuria (previous impaired fasting glucose (IFG) with fasting BG 110-125 mg/dL)
  - Previous gestational diabetes mellitus
  - Hispanic or Native American
Why Screen??

- In a recent randomized clinical trial, treatment of women with gestational diabetes reduced the rate of serious perinatal outcomes (defined as death, shoulder dystocia, bone fracture and nerve palsy) from 4% to 1%. (A)
New Screening Guidelines and Why??

• International Association of Diabetes and Pregnancy Study Groups (IADPSG) recently published a study recommending new diagnostic criteria for GDM using a one step GTT.

• Recommendations were based on the HAPO study. A 75 gm oral GTT was performed of a multi-national, multi-cultural, ethnically diverse cohort of 25,000 women in the third trimester.
Threshold Values for Diagnosis of GDM or Overt Diabetes in Pregnancy

**GDM**

FPG – 92
1 hour – 180
2 hour – 153

*One or more of these must be equaled or exceeded for diagnosis of GDM*

**Overt Diabetes in Pregnancy**

FPG >126
HBA1C>6.5
Random BS>200
Why Change??

• There was a continuous graded relationship between higher maternal glucose and increasing frequency of BW>90%, primary cesarean delivery, neonatal hypoglycemia, cord C-peptide>90%, pre-eclampsia, preterm delivery, shoulder dystocia/birth injury, hyperbilirubinemia, and intensive neonatal care.
35-37 weeks

• Rectovaginal GBS swab (B)
  - Proper culture techniques include sampling the introitus (lower vagina) and the perianal area.
• Leopold maneuvers for fetal position (B)
• Offer ECV for women with breech presentation (A)
37-42 weeks

- Weekly visits at 37 weeks and every week thereafter
- Offer membrane sweeping to reduce the need for IOL at term (A)
  - Stripping membranes at cervical examinations greater than or equal to 38 weeks reduces the rate of post-term (greater than 42 weeks) deliveries by up to 75%, significantly reduces the risk of induction of labor (8.1% versus 18.8%), and increases the likelihood of a gravida presenting to labor and delivery in the active phase of labor.
41 + weeks

- Consider IOL after 41 weeks gestation (A) (reduces rates of perinatal death without increasing rates of C-section)

- If IOL declined, serial fetal surveillance with NST/AFI measurements twice a week.
EVERY Routine Visit

- Fundal Height (B)
- Auscultation of fetal heart tones (C)
- Maternal weight and blood pressure (C)
- Urine dip for glucose and protein (C)
Prenatal Vitamins

• There is no clinical evidence that universal supplementation with a multivitamin in pregnancy is beneficial. Multivitamins are designed with the daily recommended doses of vitamins and occasionally minerals for a healthy adult.

• Prenatal vitamin supplementation is recommended for multiple gestations, tobacco or chemical use, complete vegetarians and for women with inadequate diets despite counseling.
Supplements (cont)

• Randomized placebo-controlled trials and non-randomized controlled trials in pregnant women with a prior pregnancy affected by an NTD have demonstrated that folic acid supplements substantially reduce the risk of recurrent NTD (A)

• RDA of folate is 600 mcg of dietary folate equivalents (legumes, green leafy veggies, citrus, whole wheat bread). Folate deficiency is associated with LBW, congenital cardiac and orofacial cleft abnl, abuption, and SAB (B)
Supplements (cont)

• Vitamin D supplementation in pregnancy is recommended for women who are complete vegetarians and others who have a lack of vitamin D-fortified milk in their diet.

• In vulnerable communities (e.g., Southeast Asian women in northern climates), vitamin D supplementation during pregnancy reduces the risk of symptomatic neonatal hypocalcemia (A)
What to avoid??

• Limit Vit A to < 5,000 IU/day. More is associated with neural crest defects (B)

• Avoid shark, swordfish, king mackerel, and tuna steaks. Can lead to neurological abnl in infants (B)

• Moderate amounts (1-2 cups per day) of caffeine is considered safe. (B)
What is NOT evidence based!!

• Kick Counts - There is no evidence that a formal program of fetal kick counts reduces the incidence of intrauterine fetal deaths. (A)

• The evaluation of clinical pelvimetry during the prenatal period is of little value in predicting the occurrence of cephalopelvic disproportion (CPD) during delivery. In cases in which a previous Caesarean section had been performed for CPD, or for women who are at high risk for CPD, there may be some usefulness in performing clinical pelvimetry prior to the subsequent delivery (C)
NOT evidence based.....

- A systematic review concluded a 1+ dipstick reading had no clinical value, since a negative dipstick did not necessarily exclude significant proteinuria, while many women with positive tests did not have it (M)

- The USPSTF does not recommend universal screening for bacterial vaginosis. However, women with a history of preterm labor may be advised that such a screening is necessary (USPSTF – R)
Counseling questions??

• Hot Tubs and Saunas: should be avoided in the first trimester. Has been associated with neural tube defects and SAB. (B)

• Work: certain working conditions have been associated with increased adverse outcomes of pregnancy, including preterm birth, low birth weight, and pregnancy-induced hypertension. (C) These factors include:
  - Working more than 36 hours per week or 10 hours per day
  - Heavy lifting
  - Excessive noise
  - 4 hours standing per shift
  - Mental stress
  - Cold work environment
Counseling cont…..

• SEX – yes!!! (B)

• Air travel – generally considered safe until about 4 weeks prior to delivery. Lengthy trips (airplane or car) can increase risk of DVT

• Hair Color – no evidence that hair dyes are clearly associated with fetal malformation however most physicians feel that they should be avoided in the first trimester.
Counseling, cont....

• Women who did not receive complete prenatal health behavior advice were 1.5 times more likely to deliver very-low-birth-weight (VLBW) infants (C)

• Studies show that if providers counsel women re: breast feeding, more patients initiate breastfeeding and continue for a longer duration. (B and C)
And if you do it right...
you get a GREAT outcome!!!
My Boys...