

Prenatal Care

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Prenatal Care - Introduction

- **Prenatal care focuses on prevention**
- **Majority of pregnant gravidas will deliver without major complications**
- **Goal of prenatal care is to select gravidas at risk for development of major complications and early prevention/intervention in order to affect improved outcome**

Gestational Age

- **Outcome in pregnancy is gestational age dependant**
- **Calculation of gestational age is made using a variety of methods:**
 - Patient history
 - Initial pelvic exam/biochemical test of pregnancy
 - Fetal heart auscultation (10-11 or 18-19 weeks)
 - Quickening (16-20 weeks)
 - Serial fundal height measurement (at umbilicus - 20 weeks)
 - Ultrasound estimation of gestational age
- **Dating (U.S.) best based upon MENSTRUAL DATING (Last normal menstrual period to estimated date of confinement 40 7-day weeks)**

Ultrasound Dating

- **Ultrasound dating less accurate as gestational age advances**
- **Early pregnancy - Crown Rump Length (CRL): $CRL + 6.5$ approximates gestational age (± 7 days)**
- **Mid pregnancy (12-28 weeks) - correlation between ultrasound and menstrual dating is $\pm 10-14$ days**
- **In late pregnancy, ultrasound accuracy as single estimate of gestational age is not great (± 21 days)**

Physical Exam - Fundal Height

- **Fundal Height evaluation is reasonable estimate of gestational age**
- **After 20 weeks gestation:**
 - **Gestational age in menstrual weeks roughly equivalent to centimeters from superior aspect of symphysis pubis to fundal portion of uterus**
 - **Inter-observer differences exist**
 - **Circumstances may alter measurement:**
 - **Multiple gestation**
 - **Oligohydramnios/Polyhydramnios**
 - **Uterine pathology**

Antenatal Testing

- **High-risk pregnancies at risk for fetal loss receive antenatal testing at least once per week:**
 - **Nonstress testing**
 - **Contraction stress testing**
 - **Biophysical profile testing**

Fetal Movement Testing

- **Fetal movement positively associated with fetal well-being and negatively associated with intrauterine fetal demise**
- **Average fetal movement varies with gestational age**
- **Maternal perception of fetal movement varies**
 - **In late pregnancy force of fetal movement is less than earlier in gestation**
 - **Quickening first felt at 16-20 weeks**

Laboratory Tests - Prenatal Care

- Hemoglobin/Hematocrit
- Urinalysis/Urine Culture/Urine Dipstick
- Glucose testing
- Blood Type/Rh
- Serologic test for Syphilis
- N. Gonorrhea/Chlamydia
- Other tests

Hemoglobin/Hematocrit (H/H)

- Normally red-cell mass increases in pregnancy and plasma volume increases (even more)
- Result of expansion is a measured decrease in hemoglobin/hematocrit - nadir of H/H at approx 28 weeks
- In U.S., H/H tested early in pregnancy, at 28 weeks and at or near term
- Anemia can be a screen for:
 - Maternal disease
 - Hemoglobinopathy
 - Anemia (Iron deficiency; Folate; B12)

Urinalysis/Culture/Dipstick

- **In U.S., urinalysis and dipstick generally done at intake (culture optional)**
- **Dipstick for Proteinuria**
 - Done each visit
 - If +, may indicate renal disease, preeclampsia, or infection
- **Dipstick for glucose - not reliable association with serum glucose**
- **Cystitis and Pyelonephritis much more common in pregnancy - use low threshold for diagnosis**

Blood Type/RH

- **In U.S., Rh-negative blood is approximately 10%-20%**
- **Typing done in case blood later needed**
- **Indirect antibody testing for antibodies to red cell antigens performed**
- **If fetus is at risk for disease, level of monitoring is increased**

Infectious Disease Testing

- In U.S., Gonorrhea, Syphilis, and Chlamydial cervical cultures obtained
- In U.S., most areas screen for HIV
 - Immunoprophylaxis in labor and treatment antepartum lowers perinatal transmission
- Lancefield Group B Streptococcus may be cultured or empirically treated in labor if in a high-risk group (preterm, prior infant with disease, prolonged ruptured membrane, etc.)

Glucose Testing

- **Gestational diabetes (U.S.) incidence is approximately 5% of pregnant population**
- **Diabetes screen (28 weeks gestation)**
 - 1-hr post 50 gram glucose load by mouth
 - Diabetes suspected if >140 mg%
- **Glucose tolerance test diagnostic**
 - 100 gram glucose load with fasting, 1 hr, 2 hr, and 3 hr serum glucose
 - Any two values abnormal diagnostic (<105 ; >190 ; >165 ; >145 mg%, respectively)
- **Fasting and 2 hr postprandial may be alternative**
- **Macrosomia is risk factor**

Visit Interval - Pregnancy (Uncomplicated Patient)

- **Conception until 26-28 weeks gestational age - Every 4 weeks (Pelvic exam on first visit)**
- **28-36 weeks gestational age - Every 2 weeks**
- **36-40 weeks gestation - Every week (Pelvic exam at least by term)**
- **High risk pregnancy may alter visit intervals**
- **Preterm labor risk may alter pelvic exam interval**
- **Post dates pregnancy - Consider evaluation for antenatal testing (Nonstress testing)**

Other Testing

- **Serum marker screening (Maternal serum alphafetoprotein, human chorionic gonadotropin, and estriol) usually offered in U.S. to patients 15-21 weeks**
- **Patients at risk for fetal aneuploidy may receive invasive prenatal diagnosis (such as amniocentesis)**
- **In U.S., prenatal Rubella immunity testing performed**

Symptoms to Evaluate During Pregnancy

- **Bleeding**
- **Decreased fetal movement**
- **Swelling**
- **Headache**
- **Visual disturbance**
- **Contractions**
- **Leakage of fluid**

Bleeding in Pregnancy

- Etiology of bleeding is influenced by gestational age
- Early pregnancy bleeding is more important if associated with pelvic pain (Threatened abortion?)
- Late pregnancy bleeding differential diagnosis:
 - Abruptio placenta
 - Placenta previa
 - Cervicitis
 - Labor
 - Vasa previa

Swelling (Edema)

- **Edema is relatively common in pregnancy (80%+ in warm climates or high salt consumption)**
- **Pathologic edema may be associated with preeclampsia:**
 - **>4 lb weight gain in one week**
 - **Sudden swelling of hands or face**
 - **Presence of other symptoms associated with preeclampsia**

Decreased Fetal Movement

- **Decreased fetal movement may be lack of maternal perception of fetal movement**
- **Intrauterine fetal compromise may be preceded by decreased fetal movement**
- **Probably a wise idea to address maternal perception of decreased fetal movement**

Headache/Visual Disturbance

- **Headache and visual disturbance (double vision, photophobia, etc.) may be:**
 - **Preeclampsia**
 - **Migraine/Cluster headache**
 - **Other neurological conditions**
 - **Isolated event**
- **Careful history may elucidate “normal” causes from “abnormal causes”**
- **Headache/visual disturbance with hypertension should be considered preeclampsia until proven otherwise**

Leakage of Fluid (“ROM”)

- **Pregnancy normally associated with increased amount of vaginal discharge**
- **Warning signs for discharges:**
 - **Watery discharge = possible ROM**
 - **Green discharge = possible meconium**
 - **Itching discharge = possible vaginitis**
 - **Bloody discharge = cervicitis or serious causes of vaginal bleeding**

Leakage of Fluid (“ROM”)

(2)

- **If ruptured membranes suspected, sterile speculum exam can evaluate:**
 - **pH: Amniotic fluid typically with alkaline pH (>7.0)**
 - **Pooling or direct leakage: Fluid will directly leak out of cervix during Valsalva**
 - **Fetal ferning: Classic ferning pattern under microscopic visualization**

Leakage of Fluid (“ROM”)

(3)

- **Prolonged rupture of amniotic membranes (>24 hours) associated with increase in intrauterine infection**
- **Preterm rupture of amniotic membranes associated with preterm labor and infection**
- **Term ROM associated with spontaneous labor in over 90% of patients**

Contractions

- **Uterine contractions occur throughout pregnancy (4/hour in early third trimester)**
- **Frequency of contractions increases just prior to the onset of perceived labor**
- **Persistent contractions of closer than 15 minutes apart that do not resolve with simple bedrest or fluids need some sort of evaluation**
- **Cystitis often associated with uterine irritability**
- **Multiple pregnancy and polyhydramnios also associated with irritability**

Weight Gain in Pregnancy

- **At term, approximate weight of blood volume expansion, fetus, uterus, and edema generally equals approximately 7 kg**
- **Weight gain of 200-500 gm per week is advocated**
- **Many suggest an additional weight at term to account for breast feeding fat reserve - total of approximately 10 kg recommended**
- **Excessive weight gain over 20-25 kg may increase risk of gestational diabetes and other complications**

Blood Pressure

- **Blood pressure normally decreases to a nadir at mid-pregnancy**
- **Blood pressure then rises to early pregnancy levels by term**
- **Blood pressure should be taken in the right or left arm while the subject is sitting**
- **A large degree of blood pressure variation exists between sitting, in the lateral recumbent position, or supine position during late pregnancy**

Nutrition in Pregnancy

- **On average, an additional 300 Kcal intake is recommended during pregnancy**
- **An additional 5-6 gm/day of protein needed**
- **Calcium:**
 - **Although optimal for women in general, only about 30 gm of calcium (2.5% of total stores) is scavenged by the fetus**
- **Folate:**
 - **A minimum of 0.4 mg folate will reduce the rate of open neural tube defects**

Nutrition - Iron (Fe)

- **300 mg of Fe transferred to fetus during pregnancy**
- **500 mg of Fe used to expand maternal blood volume**
- **Women usually are at an Fe deficit:**
 - **Minimal recommendation is 15 mg Fe/day**
 - **If depleted, 30-60 mg more reasonable**
 - **Multiple gestation or anemia may require up to 200 mg/day**

Alcohol/Tobacco

- **Smoking effects:**
 - Lower birthweight/growth restriction
 - Placental abruption
 - Placenta previa
- **Alcohol effects:**
 - Birth defects
 - Behavior disorder
 - Placental abruption
- **Summary - Do not drink or smoke while pregnant**

Common Complaints/Issues in Pregnancy

- **Constipation**
- **Morning sickness (Nausea and vomiting during pregnancy)**
- **Heartburn**
- **Hemorrhoids**
- **Backache**

Constipation

- **Caused by motility effects of progesterone and direct mass-effect of gravid uterus**
- **Treatment generally should be via dietary modification:**
 - **Increased fluids**
 - **Increased bulk**
- **Mild laxatives or stool softeners may be reasonable**

Morning Sickness

- **Nausea typically occurs between 6-12 menstrual weeks - some patients have symptoms longer**
- **Dietary modifications:**
 - **Frequent small meals**
- **Anti-emetics may be needed:**
 - **Antihistamines**
 - **Phenothiazine**
- **Acupressure may help**
- **Rare refractory cases may require hospitalization, nutrition, etc.**

Heartburn

- **Reflux esophagitis is more frequent during pregnancy**
- **Dietary treatment:**
 - Limit spicy foods
 - Limit eating prior to reclining
- **Medications:**
 - Antacids
 - H2 antagonists
- **Lifestyle treatment:**
 - Bed elevation

Hemorrhoids

- **Constipation worsens preexisting hemorrhoids**
- **Stool softeners and/or treatment of constipation probably helpful**
- **Local measures may help**

Backache

- **Posture in pregnancy is lordotic**
- **Back strain is common**
- **Treatment of back strain is problematic:**
 - **Aspirin and NSAID's not recommended**
- **Best advice is prevention (good lifting mechanics)**
- **Bedrest, massage, heat, and non-aspirin analgesia as treatment for pain**

Conclusion

- **Prenatal care is preventive and supportive in nature**
- **Through cooperation between the pregnant patient and her care provider, complications can be monitored**