Learning Objectives

- List the benefits of prenatal care
- Describe routine and specialized prenatal diagnostic tests
- Discuss the treatment of gestational diabetes
- List topics commonly discussed during prenatal visits
- Describe the signs/symptoms of preterm labor
- Discuss maternal postpartum physical and emotional changes
Consider:

- Unplanned pregnancy: almost 50% of pregnancies are unintended
- 50% of women with planned pregnancies and 66% with unplanned pregnancies have 1 or more risk factors
- About 30% of women do not enter into care until the second trimester
Risks for Mother & Baby

- Undiagnosed or uncontrolled Diabetes Mellitus
- Asthma
- Anemia
- HTN
- Nutritional deficiencies: folate deficiency, obesity, underweight
  - Eating disorders or history of bariatric surgery
- Exposure to toxins or teratogens (smoking, alcohol, drugs)
- STDs
- Family history of genetic/chromosomal abnormalities/AMA
- Previous Caesarean or other uterine surgery
Pregnancy Risks in Women with Diabetes

- Women in poor glycemic control during the first 7 weeks of gestation have a high incidence of
  - Spontaneous abortion
  - Fetal congenital anomalies – heart defects

- Poor glycemic control later in pregnancy increases risk of
  - Macrosomia with birth weight 4 Kg or 9 lbs
  - Labor arrest
  - Preterm birth
  - Birth injury; shoulder dystocia
  - Hypoglycemia, hyperbilirubinemia
Risks related to weight

- **Weight**
  - **Obesity** – BMI ≥ 30 kg/m²
    - Linked to:
      - subfertility
      - child with congenital anomaly
      - Gestational Diabetes Mellitus (GDM)
      - stillbirths
      - increased prevalence of pregnancy associated hypertension

- **Bariatric Surgery:**
  - Gastric bypass
  - Gastric sleeve
  - Gastric (lap) band
Tobacco, ETOH, Drugs

- **Substance Use**
  - Exposure to tobacco, alcohol, illicit drugs
    - Tobacco – associated with adverse outcomes: miscarriage, prematurity, low birth weight
    - Alcohol – birth defects to include growth retardation, behavioral problems, fetal alcohol syndrome (heavy use during pregnancy)
    - Illicit Drugs – may result in social disturbances in mother, developmental delays for child

If the woman is not coping well with her situation, how will she cope with a child who has special needs?
Benefits of Prenatal Care

▪ Detect actual problems or recognize potential problems
  ▪ Treatment plan
    ▪ Medications
    ▪ Lifestyle alterations
    ▪ Plan for delivery

Optimally Healthy Mother, Optimally Healthy Baby

Studies have shown repeatedly that $$$$ put into PNC save many more $$$$$$$$ in PP intensive treatment for mother or baby.

PNC is a good investment for families and for the country!
Benefits of Prenatal Care

- Major goal of prenatal care is to ensure the birth of a healthy baby with minimal risk for the mother

- Achieved by:
  - Early, accurate estimation of gestational age
  - Identification of the patient at risk for complications
  - Ongoing evaluation of the health status of both mother and fetus
  - Anticipation of problems and intervention to prevent or minimize illness or injury
  - Patient education and communication
Reduce Barriers to Care

▪ Become a helpful, patient centered organization
  ▪ Accept women at the place from which they start
  ▪ Cultural competence
  ▪ Initiate health education programs
  ▪ Have hours of operation that work for most people
  ▪ Welcome SOPs

▪ Community resources
  ▪ Cal-Safe
  ▪ PHNs – Nurse, Family Partnership
  ▪ Food banks
  ▪ Rehab options
  ▪ Law enforcement, safe houses
Components of the Prenatal Lab Panel

- Routine exam includes:
  - PT (hCG in blood or urine)
  - Blood group (A, B, AB, O)
  - Rh & antibody screen
  - CBC
  - Varicella/ Rubella titer
  - Hepatitis B surface antigen
  - HIV counseling and testing
  - RPR
  - Urine culture
  - Fasting glucose or Hgb A1c (<13 weeks)
Obese women have a higher risk of undiagnosed, preexisting diabetes

- Diagnosis can be made in women at the initial prenatal visit (less than 13 weeks gestation)
  - Fasting glucose ≥ 126 mg/dL or
  - A1C ≥ 6.5%

Gestational Diabetes is diagnosed by
- Fasting glucose between 92mg/dl and 125mg/dl
- A1c between 5.7% and 6.4%

- EARLY DIAGNOSIS AND TREATMENT OF DIABETES IS THE KEY TO REDUCING RISK FOR MOTHER AND FETUS
Additional Tests

- Further testing in patients with specific clinical indications:
  - Pap
    - Maternal age 21 or more
  - TB testing
    - Positive testing – CXR to exclude active TB
  - Hepatitis C antibody in high risk populations
  - Screen for STD – gonorrhea, chlamydia
  - Wet Mount/Affirm for candida, BV and trichomonas
  - Cystic Fibrosis Screen – if desired
  - Thyroid Function Tests
Iron Deficiency Anemia vs. Thalassemia

- Most common cause of anemia = iron deficiency
  - CBC shows low hemoglobin/hematocrit
    Hemoglobin carries O2 to all of our cells

Thalassemia results from defective hemoglobin and cannot be treated with iron.
  - Common among Asians, Africans and Mediterranean peoples
  - CBC shows low Mean Corpuscular Volume, suspect thalassemia:
    Iron Studies & Hgb Electrophoresis are ordered.

Electrophoresis will also uncover Sickle Cell Trait
Interventions

- RhoGam for Rh neg
- PNV & supplemental iron for IDA
- Antibiotics for STDs, vag infections, UTI
- Begin GDM Protocol early
- Refer HIV + patients for specialized treatment programs
- Perinatology referal for Diabetes, Thal, Hepatitis, Toxo/CMV, CF
- Immunizations
  - Postpartum: Rubella, Varicella, HPV vaccines
  - During pregnancy: Hep B, T-dap, flu
Clinical Manifestations and Diagnosis of Early Pregnancy Signs & Symptoms

- 60% of women have symptoms by 5-6 weeks; 90% by 8 weeks
- Most common
  - Amenorrhea – cardinal sign!
  - Nausea with or without vomiting
  - Breast enlargement and tenderness
  - Increased urinary output
  - Fatigue
  - Headache bleeding gums
  - Food cravings (Pica) or aversions
Initial Prenatal Assessment and Patient Education

- History and physical examination
  - Obtain social & family, medical and obstetrical history
  - Obtain or review the lab panel
  - Generate an individualized “problem list”
  - Calculate estimated date of delivery (EDD)
    - By menstrual history if regular 28-day cycles and with sure, NI LMP
    - By FH & bimanual pelvic exam
    - By ultrasound
  - Baseline BP, weight and BMI
  - Complete head to toe physical exam
  - Listen for FHT (fetal heart tones)
Genetic Testing

- **CA Prenatal Screening Program**
  - Diagnoses T18, T21, NTDs, AWDs, SLOS
    - First trimester blood test between 10w – 13w+6d
    - hCG & pregnancy associated plasma protein A
    - Can be combined with nuchal translucency sono between 11w+2d - 14w+2d,
    - hCG & PAPP-A combined with NT gives preliminary risk assessment

- **15 – 20 weeks of gestation**
  - Neural tube defects: maternal serum alpha-fetoprotein (MSAFP),
  - Down Syndrome: Quadruple test: second trimester testing of maternal serum

Serum Integrated Screening = 1<sup>st</sup> & 2<sup>nd</sup> trimester blood samples
Full Integrated Screening = both blood samples + NT sono
Genetic Testing

- IF THE PATIENT SCREENS POSITIVE
  - Referral is made to a qualified Perinatal Diagnosis Center
  - Risks reviewed with genetic counselor
  - Level II sono is offered
  - Chorionic Villus Sampling
  - Amniocentesis is offered
    - Amnio gives the definitive diagnosis
    - To know or not to know; that is the question.
    - Caution: if the patient is referred to perinatology prior to appt with PDC, her referral may be cancelled.
Alternative Genetic Test

- “Microarray” analyzes fetal DNA in maternal blood
- Detects T13, T18, T21
  - Blood is drawn from the mother after 10 completed weeks
  - Not valid in multiple gestations
  - Not valid in egg donor pregnancies
Initial Prenatal Assessment and Patient Education

- Seat belts – lap belt placed across hips, below uterus; shoulder belt between breasts, lateral to uterus
- Vitamins, nutrition, and weight gain
  - Standard prenatal multivitamin with iron
  - Folate supplements prior to conception and through first trimester
  - Appropriate weight gain
- Alcohol, cigarettes, illicit drugs – GET TREATMENT
  - Should completely stop
  - Mixed messages about marijuana
- Infection precautions – immunizations up to date
- Work – may continue, if no potential for hazards, until labor
More Patient Education

- Hot tubs and saunas – avoid during first trimester due to heat exposure
- Sexual activity – enjoy unless pain, vaginal bleeding occur

Medications
- Pain and fever – acetaminophen
- Cold and allergies – Sudaphed
- Constipation and diarrhea –
  - Constipation: increase fiber, fluids, bulk forming laxatives, ambulation
  - Diarrhea: hydration, alter diet
- Nausea and vomiting
  - Bland or salty foods, Ginger, B6, small portions, don’t mix food & H2O
  - Hyperemesis may require IV rehydration and medication
Healthy Diet Improves Pregnancy Outcome

- Eat well balanced meals and stay hydrated
  - The intrauterine environment appears to affect subsequent infant and childhood development
    - Permanent effects on adult health

2200 cal/day for TWG 25-35 lbs;
11-15 lb TWG for obese women

If the patient wants > 1 cup of coffee per day, better drink decaffeinated
Healthy Diet

▪ Foods to avoid:
  ▪ Raw or undercooked eggs or meat including pate or meat spreads
  ▪ Unpasteurized milk or cheese
  ▪ Albacore tuna, shark, swordfish, mackerel or tilefish

Fast food is poison; lots of fat, carbs and salt and little nutrition
Prenatal Care After Initial Assessment

- Frequency of prenatal visits
  - Every 4 weeks until 24-26 weeks gestation; every 2-3 weeks from 28-36 weeks gestation; then weekly until delivery

- Signs and symptoms to report to provider
  - Signs of SAB: backache, pelvic cramps or pressure, vaginal spotting or bleeding, uterine contractions
  - Dysuria
  - Fever, shaking chills
Prenatal Care After Initial Assessment

- Always, always, always
  - Measurement of maternal BP and weight
  - Urine dipstick for glucose, protein or suspected UTI
  - Measurement of the uterine size or fundal height to assess fetal growth
  - Documentation of fetal cardiac activity
  - Assessment of maternal perception of fetal activity
    - Beginning at 20 weeks
Second Trimester Prenatal Care

- **14 – 28 weeks of gestation**
  - Ultrasound screening for growth and anatomy, optimal between 18 – 20 weeks
  - Gender is considered an incidental finding
  - Cervical length: transvaginal ultrasound measurement of cervical length
    - Short cervical length associated with spontaneous preterm birth < 35 weeks

- **24 – 28 weeks of gestation**
  - Rescreen for Gestational Diabetes
  - H&H: assess for anemia
  - For Rh Negative patients, repeat Antibody Screen
    - Administer RhoGam within 10 days of negative ABS
Diabetes in pregnancy may predispose a woman to the development of Type II Diabetes in less than a decade.

Gestational DM is persistent hyperglycemia (high blood sugar) that first occurs during pregnancy.

Diabetes runs in families so the children of diabetics are at risk for developing diabetes.
Risk Factors for Gestational Diabetes

- Family hx of DM, especially in first degree relatives
- Prepregnancy weight ≥ 110% of ideal body weight or BMI > 30
- Age greater than 25 years
- Birth weight 9 lbs or 4 kg of previous baby
- Personal hx of abnormal glucose tolerance test
- Ethnic group with higher rate of type 2 (non-caucasion)
- Previous unexplained perinatal loss or birth of a malformed child
- Maternal birthweight > 9 pounds or < 6 pounds
- Glycosuria at first prenatal visit
- Polycystic ovary syndrome
Gestational diabetes

Diagnosis can be made in women who meet either of these criteria

- At 24 – 28 weeks of gestation:
  - 75 gram 2-hour oral GTT with at least 1 abnormal result
    - Fasting plasma glucose $\geq 92$ mg
    - 1 hour $\geq 180$ mg/dL
    - 2 hour $\geq 153$ mg/dL

An abnormal result 50 gm 1 hour GTT followed by
100 gm 3 hour GTT with 2 abnormal results
Fasting glucose 95mg/dl
1 hour 180mg/dl
1 hour 180mg/dl
2 hour 155mg/dl
3 hour 140mg/dl
Management of Diabetes in Pregnancy

- Provider visits every 2 weeks or more often
- Achieving and maintaining excellent glycemic control
  - Provider and RD work together to teach/reinforce healthy diet choices
  - Home glucose monitoring: fasting and 1 hour after meals
- Regular exercise
- Screening and intervention for maternal medical complications
  - Persistent hyperglycemia usually necessitates the addition of oral antidiabetic agents (Glyburide or Metformin) or insulin
  - Perinatology consult
    - May include serial sonos for biometry/EFW
  - Antepartum testing: NST/AFI or BPP
- Plan for delivery
Second Trimester Issues

- SOB/Dyspnea
  - Good posture (like your Mama said)

- Supine hypotension – that old whifty feeling
  - Avoid lying flat on your back

- Heartburn
  - Diet modification and antacids

- Gallstones or Sludge
  - Diagnosed with abd sono
  - Treated with low fat diet

- Hemorrhoids
  - Avoid constipation
  - OTC medications
Skin

- Striae gravidarum
- Diastasis recti
- Linea nigra
- Cholasma
- Vascular spiders
- PUPPs
Third Trimester Prenatal Care

- Repeat CBC for women with IDA
- STD: recheck if diagnosed with STD earlier in pregnancy, continue to be high-risk for acquiring STD, (new sex partner(s) or have a partner who is not compliant with treatment)
- Beta-hemolytic streptococcus or GBS
  - Swab of both lower vagina and rectum done at 36 weeks
  - No need to screen if found to have GBS bacteriuria earlier in current pregnancy or if gave birth to a previous infant with invasive GBS disease – these women will receive intrapartum antibiotic prophylaxis

- Fetal assessment:
  - Daily fetal movement counts beginning at 28 weeks
  - Antenatal testing NST+ AFI (amniotic fluid index)
  - Indications include AMA, GDM, cholestasis, preeclampsia
Third Trimester Prenatal Care

- Patient education in preparation for labor and delivery
  - Support during labor including labor analgesia
  - Course of normal labor
  - Induction of labor
  - Postterm pregnancy
  - TOLAC/VBAC

- Patient education regarding postpartum issues
  - Postpartum care and complications
  - Breastfeeding
  - Neonatal circumcision
  - Newborn safety and care
  - Contraception
Preeclampsia is the presence of HTN (140/90 or >) and proteinuria after 20 weeks gestation
- Most frequently diagnosed in the late 3rd trimester
- Cause is unknown but abnormalities in placental vasculature lead to poor blood flow, release of factors that attack maternal organs
- Physical signs: severe HA, blurry vision, edema of hands & face, gastric pain
- Lab tests = liver function tests (LFT) and 24 hour urine collection for protein and creatinine
- Can result in seizures (eclampsia) with fetal compromise
- Mg SO4 IV is given to prevent seizures until delivery is accomplished
- Delivery is the cure
PRETERM LABOR

- PTL = the presence of Ucs that cause Cx change before 37 weeks

- Patients at increased risk for PTL
  - Age <17 or >35
  - African descent
  - Multiple gestation
  - Multiple abortions
  - Cx or uterine defects
  - Late PNC
  - Use of tobacco, ETOH or drugs
  - Stress
  - Domestic violence
  - Prior PTL/D
Additional Risks for PTL

- Preterm, premature rupture of membranes (PPROM)
- UTI, pyelonephritis
- STDs
- HTN, preeclampsia
- Good old Diabetes
- Over or under weight
- Short pregnancy interval
- Vaginal bleeding
Treatments for PTL

▪ For patients with prior history of PTD
  ▪ 17 P between 16 and 36 weeks
  ▪ Cerclage in early 2nd trimester for patients with incompetent Cx

Fetal Fibronectin (FFN) between 24-35 weeks
  Strength is in Negative predictive value

Steroid injections (Betamethasone) to improve fetal lung maturity

Mg SO4 therapy reduces the risk of CP in preterm infants
Post Partum
Assessment

- Uterine involution
  - Progressive descent occurs at 1-2cm/day
  - 2nd week uterus is within pelvis
  - 6th week uterus return to non pregnant size

- Lochia usually resolves by 4 to 6 weeks
  - return to menses if non-lactating 6 to 8 weeks

Breast feeding support
Colostrum is produced immediately; milk is produced by PP day 3
Breast milk contains everything a newborn needs
Breast milk changes over time as the infant’s needs change
Breast feeding improves attachment and strengthens facial muscles
Assessment

- Vaginal canal decreases in edema and rugea return by week 4
  - Avoid unprotected intercourse even if breast feeding

- Episiotomy/lacerations initial healing by 2-3 weeks, completed by 4-6 months
  - Sutures dissolve in 5-6 weeks

- Cardiovascular system
  - Diuresis after 12 hr, lasting for next 3-7 days
  - Hemoglobin values return to normal by 6-8 wks
Assessment

- GDMs
  - Insulin resistance resolves when the placenta is removed
    - Recheck 2 hour GGT 6 weeks post partum
      - If the PP 2 hour GTT is abnormal, refer patient for ongoing diabetes care
    - Remind patient that she is at risk for Type 2 DM
      - Continue GDM diet and exercise plan
      - Children learn their eating habits from their parents

- Skin and Hair
  - Darkened pigments resolve
  - Hair follicles change out with old and in with new
Common Complaints

- Sore nipples
- Mastitis hurts!!!
  - Hot, erythematous, exquisitely tender, usually unilateral
  - Dicloxacillin QID X 10-14 days
  - Patient may continue breast feeding
- Carpal tunnel syndrome
- Constipation
- Baby Blues vs. Depression
Blues vs. Depression

- Blues - transient, usually lasting from 2-4th post partum day for up to 2 weeks
- Depression - lowered mood, irritability, fatigue, worthlessness, subtle changes in personality, interferes with ADLs
- Psychosis - severely impaired with delusions
- Common diagnostic tools are Edinburgh Scale and PHQ–9
- Need system for Behavioral Health referral
CONTRACEPTIVE OPTIONS

- Natural Family Planning
- Condoms
- Oral Contraceptives
- DMPA
- Nuva ring
- IUD
- (Im) Nexplanon
- Ortho-Evra