Complications of Pregnancy & Labor and Delivery

- **Preterm Labor & Birth:**
    - Preterm labor: cervical changes and uterine contractions occurring between 20 and 37 weeks of pregnancy
    - Preterm birth: any birth that occurs before completion of 37 weeks of pregnancy
- Spontaneous preterm birth
    - An early initiation of the labor process
    - Comprises 75% of preterm births
    - Common Causes: infection, uterine anomaly, multifetal gestation, smoking
    - Predicting spontaneous preterm labor:
        - Cervical length: shortening (occurs over length of time so not always sensitive for predicting imminent labor)
        - Fetal Fibronectin Test (fFN):
            - glycoprotein found in plasma and produced during fetal life
                - appears in vaginal secretions in early and late pregnancy
                - Presence during late second/early third trimester may indicate placental inflammation
- Indicated preterm birth
    - A means to resolve maternal or fetal risk
    - Common Causes: preeclampsia, fetal disorders, placental disorder
- Prevention:
    - Lifestyle modifications (i.e. smoking)
    - Prophylactic Progesterone Supplementation
        - Vaginal suppositories, creams, IM
        - Given 16-36 weeks
        - Often if found to have shortened cervix
- Early Recognition and Diagnosis:
    - Often not preventable but need to intervene immediately
        - Transfer to appropriate level of care
        - Antibiotics to prevent Group B Strep infection in infant
        - Administer antenatal glucocorticoids (i.e. betamethasone, dexamethasone) to promote lung maturity
        - Administer Mag Sulfate for birth prior to 32 weeks gestation to reduce incidence of Cerebral Palsy (neuroprotectant)
    - Criteria:
        - Gestational Age between 20-36 weeks
        - Regular uterine activity, accompanied with change in cervical effacement, dilation, or both
        - Initial presentation with regular contraction and cervical dilation of at least 2 cm
- Care Management
    - Lifestyle modifications
        - Activity restriction
            - Limited work hours
        - Restriction of sexual activity
            - Has not been shown to be effective
        - Home care
            - Modified bed rest

        - Strict bed rest shown to have adverse outcomes
- Suppression of uterine activity
    - Tocolytics
        - Afford opportunity to begin administering antenatal glucocorticoids
        - “off-label use” to suppress labor
        - All relax smooth muscle
            - Magnesium sulfate
            - Terbutaline
            - Nifedipine
            - Indomethacin
- Promotion of fetal lung maturity
    - Antenatal glucocorticoids (Betamethasone or Dexamethasone IM)
        - Administered between 24 and 34 weeks gestation
        - Accelerate fetal lung maturity by stimulating fetal surfactant production
        - Optimal benefits occur within the first 24 hours of administration
- Management of inevitable preterm birth
    - Labor progressed to cervical dilation of 4 cm likely to lead to inevitable preterm birth
    - Magnesium sulfate is given to reduce or prevent neonatal neurologic sequelae
    - Malpresentation is common
    - Neonatal resuscitation
    - Fetal and early neonatal loss

- **Premature Rupture of Membranes (PROM)**
- Rupture of amniotic sac and leakage of amniotic fluid beginning at least 1 hour before onset of labor at any gestational age
- Preterm Premature Rupture of Membranes (PPROM)
    - ROM before 37 weeks gestation
    - Infection major risk
- Care Management:
- PROM
    - Determine for each woman based on an estimate of risk
    - Infection is the greatest risk
    - Labor will likely be induced
- PPROM
    - Managed conservatively
    - Usually hospitalized
    - Abx use to prevent uterine infection

- **Chorioamnionitis**
- Bacterial infection of the amniotic cavity
    - AKA: amnionitis, intrapartum infection
    - Major cause of complications
        - 1% to 5% of term births
        - 25% of preterm births
    - Clinical findings
        - Maternal fever
        - Fetal tachycardia
        - Uterine tenderness

        - Foul odor of amniotic fluid
- Causes:
    - Prolonged labor with ROM, multiple vaginal exams
- Can develop bacteremia
- Treatment:
    - Prompt broad-spectrum antibiotic use

- **Postterm Pregnancy, Labor, and Birth**
- A pregnancy that extends beyond the end of 42 weeks gestation
- Maternal risks
    - Dysfunctional labor
    - Perineal injury due to macrosomia
    - Hemorrhage and infection
    - Interventions more likely to be necessary
    - Fatigue and psychologic reactions
- Fetal risks
    - Abnormal fetal growth
    - Macrosomia
    - Increased risk for birth injuries
    - Aging placenta
    - Oligohydramnios
- Care management
    - Still controversial
    - Most physicians induce at 41 weeks gestation
    - Others allow pregnancy to continue
        - With assessment tests of fetal well-being normal
        - Biophysical profile
        - Nonstress test

- **Dysfunctional Labor (Dystocia)**
- Defined as long, difficult, or abnormal labor
    - Ineffective uterine contractions (powers)
    - Alterations and pelvic structure (passage)
    - Fetal causes (passenger)
    - Maternal position during labor and birth
    - Psychologic response of the woman
- Normal uterine contraction pattern:
    - Contraction frequency Q 2-3 minutes; duration 60 seconds

- **Dysfunctional Labor: Uterine**
- Hypertonic Uterine Dysfunction:
    - Uncoordinated, frequent painful, but ineffective contractions
    - Responds to rest and sedation
    - Hypotonic Uterine Dysfunction:
    - Strength or frequency of contractions ineffective
    - Responds to oxytocin

- **Dysfunctional Labor: Abnormal Labor Patterns**
- Precipitous labor
    - Labor that lasts less than 3 hours
    - Hypertonic uterine contractions
    - Complications
        - Placental abruption
        - Uterine tachysystole
        - Recent cocaine use
    - Can be a traumatic event for the laboring mother/ family
    - Always stay with the mother

- **Dysfunctional Labor: Alterations in Pelvic Structure**
    - Pelvic dystocia
        - Contractures of pelvic diameters that reduce capacity of bony pelvis, inlet, midpelvis, or outlet
            - Previous pelvis fx, congenital abnormalities, neoplasms
    - Soft tissue dystocia
        - Results from obstruction of birth passage by an anatomic abnormality other than bony pelvis
            - Placenta previa, fibroids, full bladder/ rectum, bicornuate uterus ("two horns")

- **Dysfunctional Labor: Fetal Origin**
    - Anomalies
        - Open neural tube defects, hydrocephalus
    - CPD
        - Cannot fit through maternal pelvis
    - Malposition
        - Common is occiput posterior (OP) → mother often complains of back pain
    - Malpresentation
        - Common is breech
    - Multifetal pregnancy

- **Obstetrical Emergency: Shoulder Dystocia**
    - Head is born, but anterior shoulder cannot pass under pubic arch
    - Newborn is more likely to experience birth injuries
        - Brachial plexus
        - Clavicle fracture
        - Asphyxia
    - Maternal complications
        - Hemorrhage
        - Rectal injuries
- Shoulder becomes wedged under symphysis pubis
    - 1. Suprapubic pressure- pushes shoulder under symphysis pubis
    - 2. McRobert's position- opens pelvic outlet to widest angle
    - 3. Gaskin's Maneuver- woman moves to hands and knees position
    - 4. Wood Screw maneuver- turn infant to rotate under symphysis pubis
    - 5. Intentional fracture of clavicle

- **Obstetric Emergencies: Meconium- Stained Amniotic Fluid**
    - Indicates that the fetus has passed the first stool before birth
    - Three possible reasons
        - Normal physiological function that occurs with maturity
        - Hypoxia-induced peristalsis and sphincter relaxation
        - Umbilical cord compression- induced vagal stimulation
    - Place of the infant at risk for meconium aspiration syndrome
    - Requires the team skilled in neonatal resuscitation

- **Obstetric Emergencies: Prolapsed Umbilical Cord**
    - When cord lies below presenting part of fetus
    - Contributing factors include
        - Long cord (longer than 100 cm)
            - High risk for nuchal cord at delivery
        - Malpresentation (footling breech)
        - Transverse lie
        - Unengaged presenting part
    - Most commonly noticed with membranes ruptured
- Care Management:
    - Prompt recognition!! Do not leave alone
        - Fetal hypoxia from prolonged cord compression can result
    - Relieve pressure of cord
        - Sterile glove → hand into vagina and hold presenting part off of cord (DO NOT REMOVE YOUR HAND)
        - Reposition woman in which gravity keeps pressure off cord
        - If fully dilated, forcep/ vacuum assist delivery
        - STAT C-section
- If cord protruding: loosely wrap with saturated sterile towel in warm NS
- 100% Oxygen, Increase IVF, continue fetal monitoring

- **Obstetric Emergencies: Uterine Rupture**
- Rupture of the uterus
    - Very serious obstetric injury
    - Most frequent cause
        - Scarred uterus as a result of previous cesarean births
        - VBAC
    - Signs and symptoms
        - Abnormal FHR tracing
        - Loss of fetal station
        - Abdominal pain
        - Shock
- Management:
    - Depends on severity
    - Laparotomy → hysterectomy
    - Blood products prn
    - High rate of fetal mortality (50-75%)
    - Hight Risk Maternal mortality
    - Increased risk

        - Multiple cesarean births
        - No previous vaginal births
        - Augmented or induced labor
        - Multifetal gestation
        - Macrosomia
        - Infection
        - Short interpregnancy interval
- Uterine Dehiscence:
    - Incomplete uterine rupture with separation of previous scar

- **Obstetric Emergencies: Amniotic Fluid Embolus**
- Amniotic fluid embolism (anaphylactoid syndrome of pregnancy)
    - Rare
    - Amniotic fluid containing particles of debris in circulation
    - Occurs during labor, during birth, or within 30 minutes after birth
    - Acute onset of hypotension, hypoxia, cardiovascular collapse, and coagulopathy
    - Maternal mortality to 61% or higher
    - Neonatal outcome is poor
- Care Management:
    - CPR often
    - Perimortem c-section decided with 4 minutes of CPR
    - Grief Counseling/ Perinatal Loss Support

- **Cord Insertion & Placental Variations**
    - Velamentous insertion of cord is rare anomaly
        - Associated with placenta previa and multiple gestation
        - Cord vessels branch at membranes and course onto placenta
        - Rupture of membranes or traction on cord may tear one or more fetal vessels
        - Fetus may rapidly bleed to death as a result
    - Succenturiate placenta
        - Placenta has divided into 2 or more lobes
        - Fetal vessels run between the lobes
        - One or more lobes may remain attached after delivery
            - Ensure no retained placenta
        - Increased risk of hemorrhage
    - Battledore (marginal) insertion of cord
        - Inserted on the marginal aspect of the placenta (not center)
        - Increases risk of fetal hemorrhage, especially after marginal separation of placenta

- **Hemorrhagic Complications: Vasa Previa**
- Fetal vessels lie over the cervical os
    - Vessels are implanted into the fetal membranes rather than into the placenta
    - Usually protected by membranes; thus not at risk for rupture
    - Dx by US
    - Associated with velamentous/ succenturiate insertion
    - ROM may rupture fetal vessels
        - Fetus may rapidly bleed to death

- Requires admission with bedrest once fetus viable, scheduled c-section to prevent ROM

- **Hemorrhagic Complications: Placenta Previa**
  - Placenta implanted in lower uterine segment near or over internal cervical os
  - Classification based on degree internal cervical os is covered by placenta
    - Complete placenta previa
    - Marginal placenta previa
    - Low-lying placenta previa
  - Clinical Manifestations
    - Painless bright red vaginal bleeding during 2^{nd}/ 3^{rd} trimester
    - Typically diagnosed with transvaginal US
    - Maternal and fetal outcomes
      - Abnormal placental attachment
      - Excessive bleeding
      - Fetal risks include malpresentation, preterm birth, fetal anemia, and congenital anomalies
  - Diagnosis and medical management
    - Standard diagnosis is transabdominal ultrasound examination
    - Management includes:
      - Expectant management: observation and bed rest
      - Cesarean birth
      - Prepare for hemorrhage (blood transfusion, surgical, etc)

- **Hemorrhagic Complications: Abruptio Placenta**
- Premature separation of placenta (Abruptio placentae)
  - Serious complication
  - Risk Factors:
    - Maternal HTN
    - Cocaine
    - Blunt trauma
    - Smoking
  - Classification systems
    - Grades: 1 (mild), 2 (moderate), 3 (severe)
  - Clinical manifestations:
    - Vaginal bleed, abdominal pain, uterine tenderness, contractions
    - BLEEDING IS NOT ALWAYS APPARENT!!!
- Maternal, fetal, and neonatal outcomes
  - Dependent on:
    - Extent of placental detachment
    - Overall blood loss
    - Degree of coagulopathy present
    - Time that passes between detachment and birth
- Management:
  - Depends on severity
    - Close monitoring, continuous EFM
    - Strict maternal urine output to assess maternal perfusion
    - Birth if term
    - Prepare for possibility of grief for infant loss (mother is also critical)

- **Hemorrhagic Complications: Postpartum Hemorrhage**
- Definition and incidence
    - Traditionally defined as loss of more than:
        - 500 ml of blood after vaginal birth
        - 1000 ml after cesarean birth
    - Leading cause of maternal morbidity and mortality
- Uterine atony – PRIMARY CAUSE
    - Marked hypotonia of uterus
    - Risks:
        - Multiparity
        - Hydramnios
        - Macrosomic fetus
        - Multifetal gestation
        - Long labor
- Immediate tx: First line- fundal massage → Bimanual compression of the uterus
- Hemorrhagic Complications: Postpartum Hemorrhage- Pharmacological Tx

<u>Pitocin</u>

- Action
    - Intermittent, rhythmic contractions
- Side Effects
    - Rebound!
    - HTN
- Administration
    - IV, IM

<u>Methergine</u>

- Action
    - Rapid, sustained, titanic contractions
- Side Effects
    - HTN, N/V, HA
- Contraindication
    - HTN, Heart Disease
- Administration
    - IM, PO, IV

<u>Hemabate (Prostin/</u>PGF2a)

- Last resort option r/t action and SE
- Classification - Prostaglandin
- Action – induces intense ctx
- Side Effects
    - HA, N/V/D, HTN
    - Respiratory effects
- Contraindication
    - Asthma, CV, Renal
- Administration
    - IM, Intramyometrially
- Other causes:
    - Retained placenta
    - Ruptured uterus → repair/ hysterectomy

- **Hemorrhagic Complications: DIC**
- Disseminated Intravascular Coagulation: overstimulation of the coagulation process
    - Never a diagnosis, but results from a problem that triggers the clotting cascade
        - Common Causes in Pregnancy:
            - Placental Abruption
            - Retained fetus
            - Amniotic Fluid Embolism
            - Preeclampsia
            - HELLP
            - Sepsis
    - Lab Presentation:
        - Decreased platelets, decreased fibrinogen, increased fibrin split products
- Clinical picture of- clotting, bleeding, ischemia
- Management:
    - Correction of underlying cause
    - Volume expansion/ blood products
    - Anticoagulation therapy
    - Supportive care
- Renal Failure is consequence of DIC → Strict I & O's

- **Emergency Delivery**
- Never leave the mother alone
- Reassure the pt that you will stay with her
- Provide privacy
- Prepare the delivery area (towels, paper)
- Wash hands or sterile gloves

When the mom says "the baby is coming"
she is <u>always</u> right!!!

- Pressure on head and perineum to prevent tears
- Guide head
- Hold NB with towel or dry clothing
- Note time of delivery
- After delivery, NB head down for drainage of mucus
- Clamp or tie off umbilical cord (do not have to cut)
- Keep NB warm – use blankets or placenta