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~ Foundational Prenatal Concepts ~

Menstrual Cycle

- **The goal:** procreation
- **Hypothalamic-pituitary cycle:** negative feedback loop; controls hormone release, activity, and events; low estrogen and progesterone → FSH/LH release → follicular development
- **Ovarian cycle:** follicular development → ovulation → loss of corpus luteum
- **Endometrial cycle:** 4 phases; usually lasts 21-35 days
  - ***Menstruation:*** endometrial shedding/bleeding occurs during days 1-5 of cycle
  - ***Proliferation****:* rapid endometrial growth occurs during days 5-14 of cycle (ovulation)
  - ***Ovulation****:* egg is released from the ovary, rupturing the graafian follicle
    - Ovum: viable for 24 hours
    - Sperm: viable for 72 hours
    - Fertile period: increased basal body temp (BBT) with increased progesterone levels; cervical mucous becomes clear, thin, and slippery
  - ***Secretory phase****:* thick endometrial lining and increased secretions during days 15-24
  - ***Ischemic phase****:* loss of blood supply to the endometrium → necrosis and menstruation; days 25-28

Aspects of the Menstrual Cycle

- **Graafian follicle (GF):** fluid-filled cavity that surrounds and protects the egg
- **Corpus luteum (CL):** empty graafian follicle; produces estrogen and progesterone until the placenta forms
- **Estrogen:** helps uterus grow, builds endometrium, lactation duct development, increased mucus and discharge, preps myometrium for labor
- **Progesterone:** placenta function, endometrial maintenance, quiescent uterus, laciferous cell development
- **Follicle-stimulating hormone (FSH):** GF development and estrogen production
- **Luteinizing hormone (LH):** surges before ovulation and triggers release of the egg

Functions of the Placenta

- **Placenta:** organ attached to the uterus during pregnancy; forms at 12 weeks
- **Hormone production:** hCG, hPL, progesterone, estrogen
- **Storage:** carbs, proteins, calcium, and iron are readily accessible
- **Nutrition:** nutrients cross from the maternal system to the fetus
- **Excretion:** fetal waste crosses into the maternal blood to be excreted by the maternal kidneys
- **Respiration:** O_2 diffuses in and CO_2 diffuses out
- **Yolk sac:** provides oxygen and nutrients to the embryo until the placenta develops

Fetal Circulation

- **Two arteries:** carry waste and deoxygenated blood through the placenta and to the mother
- **One vein:** carries oxygenated blood from the mother to the fetus
- **Ductus arteriosus:** bypasses the lungs; connects the pulmonary artery to the aorta

- **Complications:** 7-fold increased risk for ectopic pregnancy, infertility, chronic pelvic pain, painful intercourse
- **S/S:** flu-like symptoms, UTIs, irregular vaginal bleeding, abdominal pain

TORCH Syndrome

- **TORCH:** organisms that can cross the placenta; **T**oxoplasmosis, **O**thers, **R**ubella, **C**ytomegalovirus, **H**erpes
- **Toxoplasmosis:** asymptomatic/mild maternal effects; greatest risk for fetal effects during T1
  - Education: good hand hygiene, avoid raw meat, avoid cat litter
- **Others:** hepatitis A and B; 10% of mothers become chronic carriers; perinatal transmission uncommon
  - Education: hepatitis A is fecal/oral spread and hepatitis B is parenterally spread; vaccines
- **Rubella:** rash, fever, mild maternal effects; 50-80% chance of congenital CRS deafness in fetus
  - Education: tested during pregnancy but cannot receive live vaccine until after birth
- **Cytomegalovirus:** asymptomatic/mild maternal effects; splenomegaly, IUGR, jaundice in fetus
  - Education: avoid contact with immunosuppressed people
- **Herpes:** painful blisters for mom; risk from late pregnancy until birth for fetus
  - Education: if active lesions are present, vaginal delivery cannot occur

Spontaneous Abortion (Miscarriage)

- **Threatened miscarriage:** slight bleeding/spotting, mild cramping, no passage of tissue, no dilation
  - Management: can be carried through to term; bed rest, transvaginal US, beta-hCG/progesterone assessment
- **Inevitable miscarriage:** moderate bleeding, mild to severe cramping, no passage of tissue, cervical dilation
  - Management: expectant management if there is no pain, bleeding, or infection; prompt termination via surgery or curettage if pain/bleeding/inflammation is present
- **Incomplete miscarriage:** heavy/profuse bleeding, severe cramping, passage of tissue, cervical dilation with tissue in the cervix
  - Management: possible additional dilation, curettage, misoprostol
- **Complete miscarriage:** slight bleeding, mild cramping, passage of tissue, no dilation *(cervix closes itself)*
  - Management: none needed if contractions are adequate to prevent hemorrhage and infection; transvaginal US needed if gestational sac is not identified
- **Missed miscarriage:** no bleeding, possible spotting, no cramping, no passage of tissue, no dilation
  - Management: pregnancy termination via misoprostol, dilation/curettage, expectant management

Causes of Early Pregnancy Bleeding

- **Cervical insufficiency:** preterm cervical dilation; may be d/t collagen disorders, uterine abnormalities, or previous cervical trama
  - ***Cerclage:*** stitches cervix closed; removed at 36 weeks or if advanced PTL, vaginal bleeding, or PPROM
- **Ectopic pregnancy:** fertilized ovum implants outside the uterine cavity; 90% occur in the fallopian tube; lowers chance of successful future pregnancies

~ Postpartum Care ~

Emotional Support

- **Reva Rubin:** nurse researcher who studied the development of the maternal role
  - ***Taking in:*** first few days PP; egocentrism makes teaching difficult
  - ***Taking hold:*** improved self-perceptions as a parent and improved ability to receive information
  - ***Letting go:*** listening to their decision-making and affirming as much as reasonable
- **Trauma-informed care (TIC):** realizing the impact of trauma, recognizing it's presentation, and preventing Retraumatization
- **Education:** make every moment a teaching moment and individualize care

Principles of the PP Assessment

- **Principle #1:** BUBBLESH assessment
- **Principle #2:** cluster care; be prepared, organized, and efficient; do everything in one visit to maximize rest and bonding time
- **Principle #3:** get permission to touch
- **Principle #4:** retake abnormal measurements and chart the best, most normal measurement; assume the client is healthy unless proven otherwise

BUBBLESH Assessment

- **Breasts:** dysmorphia, soft/filling/engorged, lactogenesis phase, nipples, LATCH score
- **Uterus:** firm vs. boggy, position r/t midline, relation to umbilicus
  - ***Involution:*** should move down 1 cm/fingerbreadth per day
- **Bowel:** bowel movements; constipation is common
- **Bladder:** output, voiding, bladder volume; should be voiding ~60-90 mL/hr
- **Lochia:** amount, color, odor, etc.
  - ***Rubra:*** 1-3 days PP; bright red
  - ***Serosa:*** 4-10 days PP; pinkish-brown
  - ***Alba:*** 10-14 days PP, up to 6 weeks; whitish-yellow
  - ***Scant/light:*** few (or no) clots; monitor, teach self-massage and self-assessment
  - ***Medium:*** clots smaller than plum size, <1 pad saturated per hour; monitor closely, check urinary pattern, uterine massage
  - ***Heavy:*** plum size clots, 1 pad saturated per hour; monitor very closely, identify cause, uterine massage, voiding; notify HCP
  - ***Hemorrhage:*** OB emergency; 1 pad saturated q 15-30 mins, large clots; palpate uterus, uterine massage, administer meds as ordered, ensure IV access, notify HCP
- **Emotional, Episiotomy, Extremities:** emotional adjustment, healing of episiotomy, sensation and strength of extremities
  - ***REEDA:*** **R**edness, **E**dema, **E**cchymosis, **D**ischarge, **A**pproximation of wound

Hyperbilirubinemia (Jaundice)

- **Hyperbilirubinemia:** jaundice in the first 24 hours of life or that persists after 1 week
- **Conjugated/direct bilirubin:** processed by the liver and does not cross the BBB
- **Unconjugated/indirect bilirubin:** is not processed by the liver; crosses the BBB and causes brain damage
- **Etiology:** normal physiologic processes; immature liver/intestinal processes for metabolism, conjugation, or excretion
- **Risk factors:** increased bili production, maternal/fetal blood incompatibility, sepsis, delayed stooling, congenital factors, SGA, LGA
- **Management:** breastfeed within the first 3 hours of life, 8-12 feeds/day, ongoing assessment, bili level, breastfeeding, phototherapy
- **Kernicterus:** brain damage d/t acute bilirubin toxicity
  - S/S: hyper- or hypotonia, lethargy, difficult to arouse, high-pitched cry, arching back, fever

Problems in Late-Preterm Infants

- **Jaundice:** presents more severely than in term infants d/t immature liver; longer-lasting, more common
- **Altered thermoregulation:** less brown fat, postural immaturity, more susceptible to cold stress
- **Breastfeeding problems:** less stamina, ineffective suck, poor latch, sleepy
- **Feeding intolerance:** gut functionally mature at 34 weeks; regurgitation, reflux
- **Poor feeding:** decreased oral motor maturity, hypotonia, poor latch, decreased endurance, decreased ability to pace flow, easily overstimulated, longer sleep periods, higher risk of hypoglycemia
- **Respiratory instability:** decreased ability to clear lung fluid, decreased surfactant levels
- **Complications:** RDS, TTNB, persistent pulmonary HTN (PPHN), pneumonia, periodic breathing
- **Discharge criteria:** stable temp, voiding/stooling, consistently good feedings, normal bili levels, car seat test passed, follow-up plan in place

Respiratory Distress

- **Respiratory distress syndrome (RDS):** alveoli collapsed, decreased lung compliance, increased lung resistance, lungs solid and congested, unstable air space
  - Complications: hypoxia, acid-base imbalances
- **Transient tachypnea of the newborn (TTNB):** hyperinflated lungs, delayed fluid resorption, flat diaphragm
- **S/S:** variable based on the condition and gestational age
  - Cardinal signs: color changes, nasal flaring, retractions, grunting, poor feeding, hypotonia
  - Mild: pallor, nasal flaring
  - Moderate: poor feeding, subcostal retractions, restlessness, weak cry, pallor, pale mucous membranes
  - Severe: intercostal/sternal/nuchal retractions, expiratory grunting, stridor, hypotonia, lethargy, cyanosis
- **Management:** surfactant, ventilation, fluids, meds

Infection/Sepsis

- **Sepsis:** systemic infection; lethargy, unstable temp, feeding problems, RDS, apnea, behavior changes
- **Septic work-up:** CBC w/ diff., cultures, spinal tap, urinalysis, chest x-ray
- **Management:** treat symptoms (thermoregulation, oxygen, IVFs, enteral nutrition), antibiotics