Postpartum Physiology

- Puerperium (postpartal period)
  - Time between birth of newborn & return of reproductive organs to nonpregnant state
  - Referred to as 4thtrimester
  - Lasts up to 6 weeks-can vary between women
- Reproductive Changes
  - Involution of the Uterus: the involution process involves the rapid reduction in size of the uterus as it returns to its non-pregnant state. It occurs from a decrease in myometrial cell size. The weight of the uterus decreases and there are contractions of the uterus (after pains) that are important for postpartum homeostasis. The contraction of the uterus compresses the intramyometrial blood vessels. This is a result of the pituitary releasing oxytocin which strengthens and coordinates uterine contractions.
  - The most important aspect of involution is *exfoliation*
  - Factors retarding uterine involution are...
    - Prolonged labor, anesthesia, difficult birth, grandmulti, full bladder, incomplete expulsion of placenta or membranes, infection, over distention of uterus
  - We will feel the fundus after delivery, it will already be below umbilicus (at least a couple of finger-breadths below). should be located at midline...if it's not then this could be b/c bladder is full. One reason the bladder could be full is d/t swelling of the urethra which blocks urine flow...this usually resolves after 24 hours.

Uterine Involution

Time	Location of Fundus
Immediately	Midline 1/2 to 2/3 between symphisis process and umbilicus
6-12 hours	At umbilicus
24 hours	1 cm below umbilicus
3 days	3 cm below umbilicus
7 days	Just palpable at symphysis

- For every 24 hours, the fundus goes down 1 cm (on average)
- Subinvolution is the failure of uterus to return to non-pregnant state
- When assessing the fundus, you also want to know if soft, boggy, firm. You want it to be firm!

Placental Site

- Placenta separation occurs
  - 15 minutes 90% of the time
  - By 30 minutes the placenta has separated in 95% of the patients
- Placental separation: Includes spongy layer of endometrium
- Superficial layer: Becomes necrotic and sloughs off

- **Postpartum Bleeding - Types of Lochia**
- Note: At no time should lochia smell bad...will smell fleshy and like menstrual fluid. If it smells bad, then you're likely looking at an endometrial infection.

Types of Lochia, cont'd

	Rubra	Serosa	Alba
Normal Color	Red	Pink, brown tinged	Yellowish-white
Normal Duration	1-3 days	3-10 days	10-14 days, but not abnormal to last longer
Normal Discharge	Bloody with clots; fleshing odor; increased	Serosanguineous (blood and mucus) consistency; fleshy odor	Mosty mucus, no strong odor; flow on standing or breastfeeding or during physical activity
Abnormal Discharge	Foul smell; numerous large clots; quickly saturates	Foul smell; quickly saturates perineal pad	Foul smell; saturates perineal pad; reappearance of pink or red lochia; discharge lasts far too long (past 4 weeks)

Cervical Changes
• Edematous, bruised, spongy, flabby, & formless postdelivery
• Cervical edema may remain for several months. 2-3 days post delivery the cervix resumes prior appearance but remains 2-3 cm dilated. By the end of the first week the cervical os narrows to 1 cm (can only get one finger in). The external os is wider than in the pregnant state and has a "fish mouth" or "smiley face" look.

Vaginal Changes
• Post delivery the vagina is edematous, gaping & bruised
• Rugae (on walls of vagina) reappear in 3 to 4 weeks...but if breastfeeding the rugae may not return for months and may be more prone to dry-vagina syndrome d/t being low on estrogen while breastfeeding.
• Vagina returns to size 6 to 8 weeks postdelivery

Perineum
• May have ecchymosis, edema, or both
• Laceration or episiotomy may be present...both need stitches
    • Laceration = let introitus tear naturally
    • Episiotomy = surgical incision; can come in four different levels; stitches dissolve...around 7 days they'll see little brown flecks on toilet paper (chromic material from stitches).
        • first degree is just the tissue
        • second degree is a little more tissue, a little longer, does not include msucle
        • third degree goes into muscle
        • fourth degree lays open rectum
• Nursing interventions: ice on perineum, "wet" wiping, Tucks and Spray, warm water over perineum
• Healing occurs in first 2 weeks

Abdominal Changes
• Uterine ligaments
    • Round & Broad Ligaments stretched and the recovery period is the length of puerperium (postpartal period)
• Abdominal wall
    • Loose & flabby
    • Responds to exercise in 2 to 3 months (walking, side leg raises)
    • Over distended abdomen may fail to regain tone (with multiples)
• Diastasis Recti Abdominis

In Clinical!
VS q 15 minutes for first hour after delivery. Includes fundal massage!

After that, fundal checks and VS q 30 for 2nd hour.

Soft, mushy fundus is not good. Off to the side is no bueno. Clots are also bad.

    - Recovery depends on total # of pregnancies, pregnancy spacing, operative delivery, & type and amount of physical exercise
- Striae
    - Fade over time, remain visible

prolactin can be released after placenta is delivered.

prolactin is necessary for production
oxytocin is necessary for release

Breast Adaptations
- Pituitary Gland (this is how the breast gets turned "on" initially) see handout with feedback loop.
    - posterior pituitary -Oxytocinproduced
    - Infant suckling promotes let down effect
- anterior pituitary -Prolactinreleased from
- initiates milk production
- Breast distention caused by
    - congestion of veins and lymphatics (aka "engorgement")
    - engorgement 3 to 4 days...can return anytime you skip a lot of feedings)
- Returning to non pregnant state depends on
    - Breast feeding; oxytocin causes the uterus to contract; can ask patient if they feel it in their uterus...this is a sign that things are working.
- Non breast feeding: breasts will still fill up
    - Have pt wear a well-fitting bra and don't take it off except to shower. Don't run a lot of hot water on the breast while showering.
    - Resolves in 24 to 36 hours as long as breasts are not stimulated.
    - However...can lactate if she changes her mind in a few days.

Gastrointestinal & Urinary Tract System
- GI Tract
    - Bowels are sluggish after birth d/t...
        - Effects of progesterone, decreased abdominal muscle tone & bowel evacuation associated with labor and birth
        - Episiotomy/Laceration, hemorrhoids may delay elimination
    - Nursing Intervention: will be giving Colace, increasing fiber and fluids
    - won't tear out stitches of episiotomy...but may hurt hemorrhoids.
- Urinary Tract
    - Overdistention & incomplete emptying may occur
    - Urinary output increases during early postpartum period (mom needs to get rid of that excess fluid)
        - Peurperal diuresis
        - Increased risk of urinary tract infection
    - Watch for complete bladder emptying

Cardiovascular System Changes
- Heart returns to normal position d/t shift in diaphragm and abdominal contents
- Immediate postdelivery Cardiac Output
    - peak approximately 80%
    - 10 to 15 minutes post delivery prelabor values
    - Returns to normal 6 to 12 weeks
- Blood Volume
    - Plasma volume decreased by 1000ml
    - Hypervolemia occurs

Hematologic Changes
    - Hematocrit increases-3 to 7 days post delivery (d/t decrease in plasma volume so there is now no more hemodilution). It is related to decrease in plasma volume & dehydration.
        - Stabilized in 2 to 3 days and returns to pre-pregnant value (37-47%) in 4-5 weeks
- Degree of blood loss reflected in postpartum hemoglobin

    - 2%-3% point drop in hematocrit = blood loss of 500 ml (1g hgb drop = decrease of 500 ml)
- Platelets typically fall as a result of placental separation
    - Decreases 3rdto 4th postpartum day one

Endocrine Changes
- Significant hormone changes in postpartum period
    - Placental
        - HCG nonexistent at end of 1st postpartum week
        - Decrease in HCS/HPL, estrogen, cortisol, & placental enzyme insulinase
        - Estrogen decreases
    - Pituitary
        - Serum prolactin rises during first 2 weeks
        - FSH & LH absent first few weeks postpartum

Respiratory System Changes
- Respiratory system returns quickly to pre-pregnant state
- Change occurs due to decrease in progesterone, decrease in intra-abdominal pressure, and increase excursion of the diaphragm
- Chest wall compliance returns to normal

Vital Sign Changes (see handout for more info)
- Blood pressure following delivery
    - Transient rise in both systolic & diastolic BP
    - Increased blood pressure
    - Low or decreasing BP
    - Orthostatic hypotension
- Temperature
    - Slight elevation postpartally, but not up to infection rate.
    - Due to exertion or dehydration - generally 36.2 to 38°C
- Pulse
    - Puerperal bradycardia common
    - Occurs 6 to 10 days postpartum, but should be ok by 2-week period

Incidental Changes
- Weight loss
    - 10 to 12 lb initially
    - Puerperal diuresis causes a loss of an additional 5%
    - 6th to 8th week many returned to pre-pregnant weight (25 to 30lbs weight gain)
    - for many people breastfeeding is a powerful weight loss source
- Postpartum Chill
    - Intense tremors (“the shakes”)...this is normal. Tell them not to tense up muscles and fight it...just go with it. Put some blankets on them and this will keep muscles warm and help them relax.
    - Theories sudden release of pressure on pelvic nerves,
    - Reactive to maternal adrenaline production during labor, reaction to epidural anesthesia
- Postpartum Diaphoresis
    - Diaphrotic episodes frequently during night
    - Mom will be HOT and will want fan on...make sure baby is covered though!
- Afterpains
    - Intermittent uterine contractions
    - More common in multiparas
    - Loss of uterine tone from distention
    - May be severe for 2 to 3 days

Common Medications Used in the Postpartum Period

- Postpartum Hemorrhage
  - Oxytocin-10 to 40 units in 500 to 1000 LR
  - Methergine- 0.2mg IM q 2 to 4 hours; 0.2mg PO q 4 to 6 hours (varies)
  - Hemabate 0.25mg IM q 15 to 90 min
  - Cytotex

Normal Post delivery medication
- Epidural Morphine
- Norco, Vicoden, Ibuprofen, RhoGAM, Rubella Virus Vaccine,

Fluids and Nutritional Needs
- No dietary restriction unless preclampsia
- Oral fluids and IV fluids restore fluid balance: encouraged oral intake
- 500 calories each day for breast feeding mothers

Maternal Psychologic Changes
- Mother needs to accomplish physical and psychologic changes
  - Time of readjustment & transition
  - Mother and Father adapt to roles: critical stage for mother & baby; variety of responses occurs
- Family relationship increase
  - stress may increase
  - Alters family system
- Social support important
  - Greatest concern lack of social support

Maternal Attainment
- Process : woman learns mothering behaviors and becomes comfortable with her identity as a mother
- Occurs within 3 to 10 months and is influenced by social support, woman's age, personality traits, marital relationship, presence of underlying anxiety or depression, previous child care skills, temperament of infant, & family socioeconomic status
- This process occurs with each child
  - Gradually and systematically evolves
  - Mother grows to know child, forms relationship, maternal identity evolves
- Occurs in four stages (Mercer, 1995)
  - Anticipatory stage, formal stage, informal stage & personal stage
  - Anticipatory stage occurs during pregnancy; woman looks to role models and how her mother mothered
  - Formal Stage begins when baby is born and is influenced by guidance of others. Mom tries to act as expected
  - Informal Stage. Mom begins making own choices about mothering...she develops her own style based on what works for her
  - Personal Stage is the final stage. In this stage the woman is comfortable with herself as a mother

Rubin "Aquiring Role of Mother" is observed in stages
- Stage 1: Dependent (Taking In)
  - Last 2 to 3 days -depends
  - Mother becomes dependent on nurses and diverts psychologic needs. She concentrates on the infant and tends to be passive and just follow directions.
  - Parent's tend to verbalize experiences r/t pregnancy & child birth
  - Teaching needs to be repeated due to anxiety, and preoccupation with new role
- Stage 2: Dependent-Independent (Taking Hold)
  - Alternates between independent need for nurturing and

Taking in: Taking in what's just happened and making it real. Focus is on mom and the changes in her body...not so much on baby.

Taking hold: "I've got this episiotomy and I've got to know how to take care of it." Taking care of things...learning how to take care of baby and self. Lots of teaching in this time period.

Letting go: Happens after discharge...around Day 7-10. A hormonal shift occurs (little less Prolactin and little less Progesterone), and women have a time when they are very weepy...and are very introspective and realize baby is no longer a part of them...there is a sadness about this, but it's not depression (that's something else entirely).

acceptance by others
    - Taking charge
    - Responds to opportunities to learn and practice baby care
- Stage 3: Interdependent (Letting Go)
    - Mother & family move forward as unit
    - Needs to establish lifestyle that both includes & excludes baby
    - Individual roles resolved
    - Resumption of sexual intimacy

Initial Attachment
- Attachment is the emotional bond between parent and infant that is demonstrated on regular pattern. It is influenced by several factors and is essential for infant's growth and survival.
    - Family origin, stability of environment, communication pattern, degree of nurturing, level of trust, self esteem, capacity for enjoyment, adequacy of knowledge, prevailing mood, & reaction to pregnancy
- Mother-infant bond is the basis on which subsequent attachment is formed. It plays a major role in the infant developing sense of self. The infants also attach to the father, sibling, and significant caregivers.
    - The idea of reciprocity occurs when mother and infant enjoy each other. The mother develops relationship with infant and involves mutual cuing behaviors.
- Attachment is accomplished in phases
    - Acquaintance phase
        - Mother gets to know baby
        - Infant gives clear behavioral cues
        - Infant becoming acquainted and may show signs of recognition
    - Phase of mutual regulation
        - Mother/infant balance between mothers needs and infants needs
        - Negative maternal feeling may surface or intensify-may build up if unable to verbalize
        - Some negative feelings are considered normal the first few days after birth
    - Attachment proceeds in progression
        - Touching
            - Fingertips-newborn extremities-palmar contact (see in Taking In)
            - With large body areas & enfolding infant (see in Taking Hold)
            - May take minutes to days
        - En Face Position
            - Increase portion of time face to face and eye to eye contact
            - Intense interest in infant opening eyes
            - Eye's open –mother greets newborn and talks in high pitched voice
    - Mother relies on sense of sight, touch, & hearing to get to know baby
        - Responds to newborn noises-cries, cough, sneezes, & grunts
    - Mother may experience shock, disbelief, and denial
        - "I can't believe she is finally here" or "I felt he was a stranger"
        - May express feelings of connectedness or say things like, "She's got your cute nose, Daddy"

Nursing Care of the Postpartum Patient
- Essential component of nursing care post delivery
- Changes in systems should be evaluated and interventions based on change

Factors Inhibiting Involution
- Prolonged labor: muscles relax
- Anesthesia: medication induced relaxation
- Grandmulti: repeated distention of uterus
- Full Bladder: bladder fills and pushes on uterus. A full bladder interferes with uterine contractions
- Incomplete expulsion of placenta: tissue prevents ability of uterus to contract
- Over distention: overstretching

Initial Post Delivery Recovery and

- Postpartum Assessment
  - Initial assessment based on ACOG, AWHONN guidelines
    - Uterus-recovery period
      - First hour q 15 min, second hour q 30min
      - First 24 hours every 4 hours- depends on institution
      - After 24 hours every 8 hours
  - Recovery & postpartum assessment
    - Bleeding - scant, moderate, heavy
    - Position of uterus - midline or deviated
    - Tone - firm or boggy
    - Height - 2 F above U
    - Odor - may mean infection

Evaluating lochia

- Scant = Blood only on tissue when wiped; less than 1 in on peri-pad within 1 hr
- Light = Less than 4 inches on peri-pad within 1 hr
- Moderate = Less than 6 inches on peri-pad within 1 hr
- Heavy = Saturated peri-pad within 1 hour

Self Care Education

- Physiologic changes
  - Involution of uterus: Let mom know this is a normal process and let her know how long she will bleed.
  - How to assess fundus for firmness
  - After pains: Uterine contractions will occur first few days after delivery; breastfeeding stimulates contractions
  - Perineal Care: Demonstration of how to cleanse perineum going front to back after urination and defecation
  - Perineum: Assessment based on REEDA
    - R-Redness,E-Edema & swelling, E-Ecchymosis or bruising, D-Drainage, A-Approximated

Postpartum Assessment

- Heart & Lung Sounds: listen at lungs for fluid accumulation
  - preterm labor and preeclampsia patients ??
- Vital Signs & blood pressure
  - Initially recovery period as outlined
  - Temperature: Initially, unless febrile, then every 8 hours
  - BP and pulse every shift unless condition merits
- Bladder: Distention/ Palpable/ Pain; Assess voiding via Foley or measured voids
- Elimination: Normal bowel function and presence of hemorrhoids
- Extremities: Pt has increased risk for thrombophelebitis
  - Predisposing factors hypercoagulability, severe anemia, obesity, traumatic delivery
  - Check for redness, tenderness, warmth
- Rest and Sleep Status
  - Physical fatigue affect adjustment and function of new mothers
  - Energy required for physiological adjustment and assume new roles
  - Daily rest periods should be encouraged; hospital time scheduled to allow for napping

Self Care Education

- Hemorrhoids
  - Treat if symptomatic
  - Side lying position –tighten buttock, sitz bath, witch hazel applied to anal area
- Nutrition
  - Increase in Protein & Vitamin C
  - Breast feeding nutritional requirements (extra 500 cals a day of high-quality nutrients)

self care education, cont'd
- Diaphroesis
  - Educate patient regarding postpartal diaphoresis
  - Increased perspiration due to elimination of excess fluids from pregnancy
  - Provide dry gown and linen change
- Measures to provide comfort: medications
- Postpartum Blues
  - 40 to 85% experience highs & lows
  - Feel anxious, cry for no reason
  - Last for several weeks –usually goes away

Assessments after a Cesarean Delivery
- Lung sound
- Bowel Sounds
- Surgical Site
  - dressing dry & intact
  - no drainage
  - incision clean & dry

Cesarean Birth
- Nursing interventions –prevention or alleviate pain
  - Pt may have epidural morphine
  - Take vital signs every 4 hours, make sure you get respiratory rate & level of consciousness d/t opioids every 1 to 2 hours for 24 hours
  - A temp greater than 100.4 two consecutive times is not OK....indicates infection
  - May have itching at site
- Promote comfort through proper positioning. Can't have any other analgesia for 24 hours.
- Encourage presence of significant other
- Encourage breathing techniques, relaxation, & distraction techniques
- Adequate rest periods
- Encourage ambulation...get up second day (most will really want to get up, so usually not a problem)
- Promote parent-infant interaction
  - Infant to recovery room as soon as possible
  - Allow patient to do as much as possible

Cultural Influences
- View of birth and birth process depends on culture
- Expectations influenced by beliefs and values
- Nurses need to understand some of the differences in beliefs and practices
- Some cultures extended family plays essential role

Promotion of Effective Learning
- Meeting needs of mother
- Needs vary
  - Age, background, culture, experience and expectations
  - Teens = fewer life experiences to draw from
- Effective education provides
  - Knowledge to meet mothers needs & ability to seek assistance if needed
- Nurse assesses learning needs by
  - Observation, sensitivity to nonverbal cues, and phrased questions
  - Ex. What plans have you made for handling things when you get home?

Timing of Teaching
- Educational methods depend on institution
- New mother more receptive to teaching 24 to 48 hours post delivery
- Timing for fathers –tend to attend when planned

Evaluation
- Information should be provided:
  - How to care for herself
  - Signs of possible complications
- Opportunities for evaluation of material should be used
- Self Assessment Tools

Identifying Abnormal Bonding
- Turns away from infant
- Avoids infant
- Identifies infant with someone parent dislikes
- Fails to place infant in family context
- Expresses disappointment

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