Postpartum Physiology, what’s normal?

Let’s go over a head to toe maternal postpartum assessment together.

Neurologic Changes/Conditions

- **Headache**
  - Most common neurologic symptom
  - Can occur from
    - Fluid shifts
    - Stress
    - Spinal headache
    - Fluid and Electrolyte imbalance
    - Preeclampsia

Postdural puncture headache (spinal headache)

- Leaking of cerebrospinal fluid from the site of a puncture of the dura mater
- Most common when dura is accidently punctured during epidural placement
- Assuming an upright position triggers a change in volume of CSF and leaking
  - Intensifies headache
  - Auditory problems
  - Visual problems
- Signs and symptoms begin within 2 days and may persist for days or weeks

Postdural puncture headache

- **Nursing Care**
  - Administration of oral analgesics and methylxanthines (caffeine or theophylline)
  - Remain laying as position change precipitates the fluid shift
  - Epidural blood patch
    - 20 ml of the patient’s blood is injected slowly into the lumbar area of the epidural space.
    - This creates a blood clot that patches the dura mater
  - Most rapid and beneficial relief method

Temperature

If in the first 10 days postpartum (excluding the first 24 hours post delivery) if mom has:

- Oral temperature of ≥100.4 degrees Fahrenheit on two occasions that are 6 hours apart think possible puerperal infection

  - Cardinal symptoms of postpartum infection include an elevated temperature, tachycardia, and pain.
What is a puerperal infection?

- An infection of the reproductive tract associated with childbirth, which may occur anytime up to six weeks post delivery
- Most common puerperal infection is endometritis
- A mom may be discharged prior to symptoms of a puerperal infection becoming apparent, proper discharge teaching is necessary. About 84% of postpartum infections manifest after discharge from the hospital.

### Vital signs

<table>
<thead>
<tr>
<th>Normal Findings</th>
<th>Deviations From Normal Findings with probable causes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Temperature: Slight increase in the first 24 hours to 38 degrees C (100.4 degrees F) due to dehydration.</td>
<td>Temperature: greater than 38 degrees C (100.4 degrees F) after 24 hours can be indicative of infection (endometritis, urinary tract infection, other systemic infections)</td>
</tr>
<tr>
<td>Pulse: Slight elevation in first hour after birth that gradually declines over 48 hours. Puerperal bradycardia of 40-50 bpm is common</td>
<td>Pulse: Rapid or increasing pulse rate can indicate hypovolemia</td>
</tr>
<tr>
<td>Respirations: Return to pre-pregnancy rate soon after birth</td>
<td>Respirations: Hypoventilation can be a result of an unusually high spinal block or epidural medication after a cesarean section</td>
</tr>
<tr>
<td>Blood Pressure: Slight transient return of approx. 5% increase over the first few days to weeks after delivery. Orthostatic hypotension may be a result of splenic engorgement after birth</td>
<td>Blood Pressure: Hypotension can indicate hypovolemia (late sign), Hypertension can be caused by excessive use of vasopressor or oxytocin. Gestational hypertension may continue for weeks after delivery, assess for corresponding signs of preeclampsia</td>
</tr>
</tbody>
</table>

### Integumentary Changes

- Cholasma (mask of pregnancy)
  - Usually disappears in the postpartum woman. May persist in about 30% of women
- Hyperpigmentation of areola and linea negra may not completely regress
- Striae gravidarum (stretch marks) on breast, abdomen, and thighs may fade but usually do not disappear completely
- Spider angiomas and palmer erythema usually regresses rapidly due to decreased estrogen
  - Spider angiomas may persist indefinitely in some women
- Hair loss may occur as the rapid growth associated with pregnancy ends
- Hair and nail strength return to pre-pregnancy states

### How often to complete a comprehensive maternal assessment?

- Follow your facility’s protocols
- This is a guide, may need to be done more frequently
- To promote maternal safety and optimal outcomes there have not been clinical trials to state exactly how often to assess during the postpartum period: guidelines state what to assess but don’t states exactly how often
- Except temperature, 2008 ACOG and AAP state at least every 4 hours during the immediate postpartum period

AWHONN Perinatal Nursing 2014

### Maternal Blood Pressure

- Many women have a rise in blood pressure right after delivery
- This is a transient increase in both the systolic and diastolic
- This will spontaneously return to the pre-pregnancy baseline over the next few days

**If there is a rise in blood pressure**

- Continue to closely observe blood pressure readings. If the reading is 140/90 mm Hg on two or more occasion at least 6 hours apart. (AWHONN 2014)
- Or this patient is having headaches/visual changes the health care provider needs to be aware (AWHONN 2014)

Be aware that preeclampsia can persist into or occur for the first time in postpartum
Nursing Care

• Orthostatic hypotension may happen in the first 48 hours post delivery
  – May be due to the decrease in intrapelvic pressure
  – She may feel dizziness right after moving to a standing position

Maternal Blood Pressure

• How should BP be taken?
  – See resources section under Hypertension for full hand out on how to properly measure a blood pressure

Let’s Discuss Cardiovascular Changes

Decreased Heart Rate

• Bradycardia is common during the first 6-10 days after delivery

• The heart rate is 50-70 beats per minute possibly related to:
  – Decreased cardiac strain
  – Decreased blood volume following placental separation
  – Increased stroke volume

Elevated Heart Rate

• Tachycardia needs to be evaluated, may be due to:
  – Blood loss
  – Temperature elevation
  – Infection
  – Prolonged labor
  – Fear
  – Pain
Cardiovascular Changes

• Immediately following birth, autotransfusion occurs

• Which is what?

• It means that the blood that was going through the placenta stops, creating more blood circulating in just the maternal system

Cardiovascular

• Changes in blood volume is dependent on
  – Blood loss during birth
  – Amount of extravascular fluid that is excreted

• Average blood loss
  – Vaginal deliveries 300-500mL
  – Cesarean section deliveries 500-000 mL

Cardiovascular Changes

• This will create an increased stroke volume (the amount of blood pumped with one contraction) which will increase the cardiac output

• So the 500-700 mL per minute of blood flow that was going to the uteroplacental unit is now in just the maternal systemic venous circulation right after delivery

Cardiac output

10-15 minutes post delivery cardiac output is at the highest

One hour post delivery cardiac output reaches pre labor value

Declines by 30% in the first 2 weeks

By 6-12 weeks postpartum the cardiac output reaches prepregnant levels

Peripartum Cardiomyopathy

Defined as:
“a weakness of the heart muscle that by definition begins sometime during the final month of pregnancy through about five months after delivery, without any other known cause.”

• Dr. Lili Barouch, Assistant Professor of Medicine, Division of Cardiology, Johns Hopkins School of Medicine

Cardiovascular

• Maternal Physiological changes that allow the new mother to accommodate for changes in blood volume include:
  – Elimination of utero-placental circulation
    • Reduces vascular bed by 10-15%
  – Loss of placental endocrine function
    • Removes the stimulus for vasodilation
  – Mobilization of extravascular fluid
    • Movement of fluid from extravascular spacing to vasculature happens by 3rd day postpartum
Peripartum Cardiomyopathy

- Actual cause is unknown
- May be associated with nutritional and immunologic mechanisms
- Higher Incidence in:
  - Older gravidas
  - Multiparas
  - African-Americans
  - Multiple gestations
  - Patients with preeclampsia

Evaluation of Respiratory Changes

Signs and Symptoms

Present with signs and symptoms of pulmonary edema
- Dyspnea - difficult or labored breathing
- Cough
- Orthopnea - sensation of breathlessness in the recumbent position, relieved by sitting or standing.
- Tachycardia
- Occasional hemoptysis - coughing up blood or blood tinged mucous

Respirations

- Should remain within the normal range of 12-20 breaths per minute
- Variations to this may be:
  - pain, fear, excitement, exertion
- **Immediate** attention is needed if she also has shortness of breath, chest pain, anxiety, restlessness... could be a pulmonary emboli

Pulmonary Embolism

Most common signs:
- Tachpnea (>20 breaths/min)
- Tachycardia (>100 beats/min)
- Dyspnea-labored breathing, shortness of breath
- Chest pain
- Hemoptysis - coughing up of blood or bloody sputum
- Abdominal pain

Most serious signs:
- Sudden collapse/Syncope
- Cyanosis
- Hypotention
- Presyncope

Normal Respiratory Changes

After delivery the reduction in the intra abdominal pressure allows for increased expansion of the diaphragm. Mom feels like she can take that deep breath again!
Respiratory

• When you let your breath out there is remaining air in your lungs, this is called residual volume.

• This too will normalize for mom soon after the baby is delivered.

Everyone take a deep breath in..... Let that breath out

The volume of air you just inhaled and exhaled is called tidal volume.

Tidal volume normalizes for mom soon after birth.

To help prevent a mom from getting into a shallow breathing pattern we should teach patients how to perform pulmonary exercises

– Place her in a high fowler’s position, use a pillow to support her incision and instruct her to take a deep breath and cough.
– If available utilized respiratory therapists to assist in the patient education
– Administering pain medication prior to pulmonary exercise may be beneficial
– Explained that these exercises will help reduce the chance of atelectasis and pneumonia by promoting adequate lung function.

Postpartum Neuraxial Morphine

Who is a candidate?

• Cesarean deliveries
• Extensive episiotomies, 3rd or 4th degree lacerations

Effective pain relief?

• Yes, when compared to IV administration of medication:
  • Provides better pain control in the first 24 hours following delivery
  • Earlier ambulation
  • Earlier bowel function in postoperative cesarean patient

Neuraxial Morphine

Nursing Care

– Monitor Level of Consciousness
– Respiratory Rate every hours if epidural morphine administered for 12-24 hours
  • Notify anesthesia if respiratory rate is <10 or other specified criteria
– If the patient received EREM (Depodur) a sustained release formulation
  • Assess respiratory status for 48 hours
– Pulse oximetry 12-24 hours post epidural morphine administration
  • Notify anesthesia if 02 saturation <90%
  • Pulse oximetry is not sensitive to hypercarbia or hypoventilation
– Narcan (Naloxone 0.1 mg IV push at the bedside in case of respiratory depression

Early-onset respiratory depression
30-90 minutes after administration

Late-onset respiratory depression
6-18 hours after administration

Women at an increased risk for respiratory depression

• Morbidly Obese
• Concurrently receiving magnesium sulfate
• History of obstructive sleep apnea
Breasts

Nursing Care: Breasts

If breastfeeding, assess for:

- Size and shape of the breasts
- Any abnormalities, reddened areas, or engorgement
- Palpate for softness, slight firmness associated with filling, or firmness associated with engorgement
- Warmth
- Tenderness

Nursing Care: Breasts

If breastfeeding, assess nipples for:

- Fissures
- Cracks
- Soreness
- Inversion

Explain the difference to patients

**Breast Fullness**
- transitional fullness will usually last about 24 hours
- the breast will still be soft enough for the baby to nurse
- Typically no pain, but a sense of fullness to the breast
- will occur about the 3-5th day post delivery
- breast fullness is normal and will resolve

**Engorgement**
- overfilling and swelling of the breast and/or areola
- typically be painful, warm to the touch, skin will appear shiny and taut
- engorgement can occur at any time
- initiation of breastfeeding soon after delivery, and offering frequent feedings will reduce the chances of engorgement

Nursing Care: Breasts

If bottlefeeding, assess breasts for:

- Size
- Shape
- Tenderness
- Color

Nursing Care: Breasts

Bottlefeeding mother

- No evidence currently exists to show that nonpharmacologic approaches to suppress lactation are more effective than no treatment
  Oladapo & Fawole, 2009

- In the United States medication to suppress lactation is no longer given
Nursing Care: Breasts

Bottlefeeding mother

- Bathe breasts during daily shower, but inform her to allow the warm water to run over her shoulder instead of directly at her breasts
- Avoiding breast and nipple stimulation is recommended
- Breast Binding is no longer recommended

The goals of breast care are prevention of infection, adequate breast support, and maternal comfort

Uterus

Involution: the return of the uterus to a nonpregnant state after birth

- Reduction in size occurs over 6 weeks
- Fundus will go through involution at a rate of 1 finger breadth (1 cm) per day
- Decreased estrogen and progesterone contribute to uterine cell atrophy and autolysis (self destruction of excess hypertrophied tissue). Cell number remains the same.

As the nurse

We need to understand
- the expected involution process of the uterus to know if there is a need for intervention
- palpate the fundus, where is it located and how does it feel?
- a boggy uterus, a uterine height higher than normal, or a uterus that is displaced from midline needs to be investigated

Uterus

B) 6-12 Hours Postpartum

A) Immediately Postpartum
Uterine Involution

• Factors that enhance involution
  • Uncomplicated labor & birth
  • Complete expulsion of amniotic membranes and placenta
  • Breastfeeding
  • Manual removal of the placenta during cesarean section
  • Early ambulation

Assessing the Uterus

• Have the woman void prior to assessment, a distended bladder may cause the uterus to deviate, typically to the right
• Make sure the woman is in a supine position
• The clinician should have one hand at the level of the umbilicus and the other hand right about the symphysis pubis to stabilize the uterus. The support is need to help prevent uterine inversion and prolapse
• The hand at the umbilicus will push down and in to feel the fundus
• The fundus is the part of the uterus above the insertion of the fallopian tubes

Uterine Subinvolution

• Subinvolution: failure of the uterus to complete the process of involution

Factors That Slow Uterine Involution

<table>
<thead>
<tr>
<th>Factor</th>
<th>Rationale</th>
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<tbody>
<tr>
<td>Prolonged Labor</td>
<td>Muscles relax because of prolonged time of contraction during labor</td>
</tr>
<tr>
<td>Anesthesia</td>
<td>Muscles relax</td>
</tr>
<tr>
<td>Difficult Birth</td>
<td>Excessive manipulation of the uterus</td>
</tr>
<tr>
<td>Grandmultiparity</td>
<td>Diminished uterine tone and muscles relaxation from repeated pregnancies</td>
</tr>
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Factors That Slow Uterine Involution

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<tr>
<td>Full Bladder</td>
<td>Interferes with effective uterine contractions</td>
</tr>
<tr>
<td>Incomplete Expulsion of Placenta or Membranes</td>
<td>Interferes with ability of uterus to remain firmly contracted</td>
</tr>
<tr>
<td>Infection</td>
<td>Inflammation interferes with uterus’ ability to contract effectively</td>
</tr>
<tr>
<td>Over distention of Uterus</td>
<td>Overstretching from multiple gestation, hydramnios, or large baby</td>
</tr>
</tbody>
</table>
What is Uterine Atony?

• Lack of muscle tone
  • Is the leading cause of early postpartum postpartum hemorrhage (50% off PPH cases)

• If the uterus is not contracting and putting pressure on these vessels:
  – the uterus will fill with blood and clots
  – Not Good!
  – this will lead to hemorrhage
  – frequent uterine assessment is necessary

In the case of subinvolution

• The lochia doesn’t typically progress like it is suppose to
• Subinvolution is most commonly diagnosed during her follow up exam in the clinic
• Treatment depends on the reason the uterus is not going through the involution process

Placental Site

• After delivery the placenta should separate spontaneously
• The placental site heals by exfoliation
• Tell patients they may have an increase in bleeding around postpartum day 7-14
• This is due to the placental site sloughing off, but this bleeding should only last a few hours

Vaginal Changes

• Vagina may appear edematous, gaping, and/or bruised
• Vaginal mucosa might appear pale and without rugae
• The post-delivery hymen has characteristic small skin tags at its edges
• The labia majora and the labia minora are looser

Uterine Contractions

• Compression of the intramyometrial blood vessels by contraction of the uterine muscle is the primary source of postpartum homeostasis.

• Afterbirth pains
  – Strong uterine contraction of the involuing uterus
  – Caused by oxytocin release from the posterior pituitary
    • May be more severe with breastfeeding
    • May be accompanied by an increase of lochia
  – More common in multipara women, women with an overdistended uterus, or if clots or retained placental fragments remain in uterus.
  – Usually lasts 2-3 days

Afterbirth pains comfort measures

• Pain Medications
  – Ibuprofen (24 hour maximum dosage 3200mg) or Acetaminophen (24 hour maximum dosage 4000mg)
  – Narcotic analgesics as prescribed (with attention to medications containing Acetaminophen)
• Take pain medications approximately 1 hour prior to nursing
• Prone position with small pillow under abdomen
  – The position applies pressure to uterus and stimulates contraction. The constant contraction eases the after birth pain.
• Warm compress or water bottle to lower abdomen
Bladder

Urinary System Changes

• Transient loss of bladder tone or decreased bladder tone is expected during pregnancy due to the effect that progesterone has on smooth muscle
• The fetal head pressing on the bladder during labor may have caused some trauma/edema
• This may cause a decreased sensation making voiding difficult

• Diuresis occurs due to:
  – Decrease in estrogen which stimulated fluid retention during pregnancy
  – Decrease in residual hypervolemia, or fluid overload
  – Reduction in venous pressure in the lower half of the body
  – Profound diuresis can begin immediately after delivery and spontaneous voiding usually returns within 6-8 hours post delivery
  – Bladder fills rapidly after delivery due to the marked increase in urine production
  – Urine volume should return to pre-pregnant levels by 2-3 days after delivery

Nursing Care: Urinary System

• Assess for bladder distention and encourage the woman to empty her bladder regularly
• Stimulate voiding by running tap water or pouring warm water over the perineum
• Uterine atony that can be caused by bladder distention
• C-Section patients should have I/O documented until spontaneous voiding after catheter removal
• Patient should void spontaneously by 6-8 hours after birth
• Expected volume is 150 ml for each void
  • (Simpson and Creehan, 2014)

Nursing Care: Urinary System

• Catheterize if bladder is distended and patient is unable to void
  – Avoid Rapid Emptying
  – Do not remove more than 800 ml at one time
  – This prevents a precipitous drop in intraabdominal pressure and splenic engorgement and hypotension

Perfect environment for a UTI...

A bladder that experienced trauma from delivery, bacteria that may have been introduced during catheterization, and retention of residual urine give way to an environment to develop cystitis
Typically symptoms of cystitis happen around 2-3 days post delivery
Make Sure Patient’s Know the Signs of a UTI

- Urinary frequency
- Dysuria
- Urgency
- Hesitancy
- Dribbling
- Nocturia
- Suprapubic pain
- May have gross hematuria
- Odor

If cystitis is suspected...

- The nurse may need to assist the postpartum women with obtaining a urine sample. In order to not contaminate the sample it needs to be obtained during midstream to avoid getting lochia in the sample
- Then the sample is sent for microscopic examination, culture, and sensitivity tests.

Discuss Hygiene

- Explaining that proper perineum care is essential during this healing process.
- A reminder to use the peri bottle, wash hands before and after peri care, wipe from front to back, change the peri pad often.
- Once the lochia has stopped the cervix is closed and the chance of infection ascending from the vagina to the uterus reduces.

Transient Stress Incontinence

Causes?

- Conflicting evidence to support if pregnancy predisposes women for urinary incontinence and pelvic organ prolapse or if it is after a certain number of vaginal births increases the risk of developing urinary incontinence and pelvic organ prolapse
- Factors that influence it
  - Length of second stage of labor
  - Infant’s head size
  - Infant’s birth weight
  - Episiotomy

Urine components

- Renal glycosuria (simple sugar glucose is excreted in the urine despite normal or low blood glucose levels)
  - Induced by pregnancy, usually disappears by 1 week postpartum
- Lactosuria (abnormal amount of lactose in the urine)
  - Occurs in lactating women
- Blood Urea Nitrogen (medical test that measures the amount of urea nitrogen found in blood. The liver produces urea in the urea cycle as a waste product of the digestion of protein.)
  - Increases during postpartum as autolysis as uterine involution occurs

- Plasma Creatinine (Creatinine is a waste product produced by muscles from the breakdown of a compound called creatine. Almost all creatinine is filtered from the blood by the kidneys and released into the urine, so blood levels are usually a good indicator of how well the kidneys are working.)
  - Return to normal by 6 weeks
- Proteinuria (presence of excess proteins in the urine)
  - Resolves by 6 weeks
- Ketonuria (ketone bodies are present in the urine, the body produces excess ketones as an indication that it is using an alternative source of energy. It is seen during starvation or more commonly in type I diabetes mellitus.)
  - Occurs with dehydration in women with uncomplicated births or prolonged labor
Bowels
Gastrointestinal System

To Facilitate Normal Bowel Function

• Drink water
• Eat a high fiber diet
• Don’t ignore it
• Avoid Straining
• Ambulate
• Stool Softeners
• Medication

Gastrointestinal System Changes

• Bowels sluggish after birth due to
• Bowel movement may not happen for 2-3 days
  – lingering effects of progesterone
  – decreased abdominal and intestinal muscle tone
  – the peptide hormone relaxin depresses bowel motility

Cesarean Deliveries

• After a cesarean delivery moms may start with clear liquids
• Typically once bowel sounds are present the diet can advance to solids
• Ambulate early!
• Gas build up can occur following a cesarean birth because of the anesthesia and intestinal manipulation, moving will help expel some of the gas
• Stool softeners and other medications are available

Nursing Care: Nutrition

• Assess the woman’s appetite
• Most women are hungry and thirsty post vaginal delivery
• Provide the woman with a menu to select meals that appeal to her appetite
• Make snacks readily available
• Encourage foods high in protein, roughage, vitamins and minerals

Gastrointestinal

Assess for nausea

• Antiemetic medications include
  – Ondasetron (Zofran)
  – Promethazine (Phenergan)
  – Metoclopramide (Reglan)
Nursing Care: Gastrointestinal

- Gas pains
  - Ambulation
  - Rocking in a rocking chair
  - Avoiding gas-forming food
  - Avoiding carbonated beverages

Abdominal Incision

- The nurse needs to include assessing the incision, looking for:
  - Approximation of the edges
  - Is there any: Redness, Discoloration, Warmth, Edema, Unusual Tenderness, or Drainage

Abdominal Incision

Teach the signs of infection and proper care for the area.

- If she notices foul odor, fever, redness around the incision, discharge from the incision, or the incision appears open she needs to call right away.
- She can shower as usual and just pat the area around the incision dry.
- Remind her if there are steri-strips that they will fall off and not to pull them.

Wound infections from cesarean section or dehiscence

- Elevated temperature on 3rd or 4th post delivery day, can be masked by early postoperative fever
- Presence of cellulitis
- Redness, indurated (hardened), and inflamed appearance around the repaired edges
- Discharge from the incision, such as pus or blood
- Incision appears open and abdominal contents are exposed to air
- Often associated with endometritis

Postpartum Endometritis (metritis)

- An infection of the uterine lining
- Postpartum endometritis happens in 1-3% of vaginal births and about 10 times more common for cesarean deliveries
- Administration of antibiotics prior to cesarean delivery can decrease the incidence of endometritis
- Findings in the first 24-36 hours post delivery tend to be related to group B Streptococcus (GBS). Late-onset is more commonly associated with genital mycoplasmas and Chlamydia trachomatis
Symptoms for Endometritis (metritis)

- Foul smelling lochia
- Fever (typically between 101-104 degrees Fahrenheit)
- Uterine tenderness on palpation
- Lower abdominal pain
- Tachycardia
- Chills

Treatment

- Typically treated with IV antibiotics, cephalosporins or penicillin
- Mom typically will improve within a few days of initiated antibiotic treatment
- Treatment is typically continued until mom is afebrile and asymptomatic for 24 hours
- If a fever continues at the 48 hour mark after antibiotics then additional investigating is needed to check for refractory pelvic infection

Be aware of the risk factors for Postpartum Uterine Infection

- Cesarean Delivery (single most significant risk)
- Prolonged premature rupture of the amniotic membranes
- Prolonged labor preceding cesarean birth
- Obstetric trauma (episiotomy, laceration of perineum, vagina, or cervix
- Multiple vaginal examination during labor
- Compromised health status (low socioeconomic status, anemia, obesity, smoking, use of illicit drugs or alcohol, poor nutritional state)
- Use of fetal scalp electrode or intrauterine pressure catheter

Be aware of the risk factors for Postpartum Uterine Infection

- Chorioamnionitis (infection of the placenta, chorion, and amnion)
- Pre-existing bacterial vaginosis or Chlamydia trachomatis infection
- Instrument assisted childbirth (vacuum or forceps)
- Manual removal of the placenta or uterine exploration after delivery
- Retained placental fragments
- Lapses in aseptic technique by surgical staff
- Diabetes mellitus
- Immunocompromised status

What about Postoperative Prevention for DVT’s?

Even if a mom is at a low risk for thrombogenic thrombophilias she needs postoperative prophylaxis. Treatment is aimed at preventing VTE (Venous Thromboembolism)

- Nonpharmacologic Interventions
  - Graduated elastic compression stockings
  - Pneumatic compression devices

May have questions about Integumentary System Changes

Stretch marks

- Common on breasts, abdomen, hips, and thighs fade, but usually do not disappear
- It is caused by the stretching of the skin and softening and relaxing of the dermal collagenous and elastic tissues
We are going to talk about ways to care for your perineum, including hygiene and also pain management.

**Monitoring for infection** is important let’s talk about the signs and symptoms you need to know about for when you go home.

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**Episiotomy**

- Surgical enlargement of the vagina
- Incision to the perineum, completed in the last part of the second stage of labor
- Based on 2012 hospital discharge date about 12% of vaginal births had an episiotomy
- Compared to 1992’s data which stated about 54%

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**Perineal Lacerations**

- With a vaginal delivery around 53-79% of women will have some type of laceration
- Most common are 1st and 2nd degree lacerations
- Occur as the fetal head is being born
- Repairs should be attended to quickly to promote healing, and limit the damage
- If mom has an operative assisted delivery or precipitous labor she is at an increased risk

---

**Severe Perineal Lacerations**

- Mother may get a single dose of antibiotic during the repair
- Monitor to evaluate wound healing
- Some Expert Opinion Suggestions for OASIS:
  - Stool softeners and oral laxative
  - Instruct patient on how to avoid constipation
  - Early and consistent follow up care

---

**Perineal Lacerations**

- First Degree
  - Laceration that extends through the skin and structures superficial to the muscle
  - Perineal skin and mucous membranes
- Second Degree
  - Laceration that extends through muscles of the perineal body
  - Skin and mucous membranes plus fascia and muscles of perineum
- Third Degree
  - Laceration that continues through the anal sphincter muscle
  - Skin, mucous membranes, muscle of the perineum, extends into rectal sphincter
- Forth Degree
  - Laceration that also involves the anterior rectal wall
  - Extends into rectal mucosa to expose rectum

---

**Perineal Lacerations**

- Bleeding from the laceration is one of the most common complications
- Observe for hematoma formation
- If the laceration extends into or through the anal sphincter complex it may be referred to as Obstetric Anal Sphincter Injuries (OASIS)
- These mothers need additional teaching and education geared toward healing
Let Your Patients Know...

- After delivery the soft tissue in and around the perineum may be swollen and bruised
- Initial healing of the episiotomy occurs within 2 to 3 weeks
- Supportive tissue of the pelvic floor is stretched and during birth and complete healing may take 4 to 6 months

Nursing Care: Pelvic Muscular Support

- Instruct the mother that Kegel exercises can improve the tone and contractibility of the vaginal opening
- Can be started soon after delivery
- Kegel exercises can help to maintain perineal muscle tone and help prevent urinary leakage

Kegel Exercises

- Contracting the muscles of the perineum with enough force to stop a stream of urine
- The contraction is held for about 5 seconds and then released
- This exercise is repeated 4 to 5 times in a row
- Then work up to keeping the muscles tightened for 10 seconds at a time, then relaxing for 10 seconds. Goal is to complete 3 sets of 10 repetitions a day

Nursing Care: Perineum

- Assess perineum with the mother laying in a Sims’ position and the buttock is lifted to show the perineum and anus.
- Use the acronym REEDA as a guide
  - Redness
  - Ecchymosis/bruising (purplish color)
  - Edema (swelling) of the perineum
  - Discharge from the episiotomy
  - Approximation of the skin edges

Nursing Care: General Perineum

- Provide comfort measures for perineal/rectal pain:
  - Ice packs
  - Sitz baths
  - Peri bottle
  - Anesthetic sprays
  - Topical creams
  - Witch hazel pads (to reduce edema)

Sitz Bath

- A portable basin that will fit in the toilet, the water will sooth the tissue and reduce inflammation by promoting vasodilation
- Offer either cool or warm water and allow woman to chose which temperature she wants
- She should utilize the sitz bath for 20 minutes at a time, three to four times daily
- This can be initiated 24 hours or more post delivery
Nursing Care: Perineum

- Be sure to consider cultural norms before application.
- Some cultural groups considered blood “hot” and when she looses blood she is now in a “cold” state. To avoid illness the mother needs to return back to a hot state.

Peri bottle

- Intended use of peri bottle is to squirt warm water toward the front of the perineum and let it run from the front to the back. This can relieve discomfort and keep the area clean.

Signs of infection of the episiotomy or repaired laceration of the perineum may include:

- Redness
- Warmth
- Edema
- Purulent drainage
- Gaping of the previously approximated wound
- Local pain

General Prevention of Postpartum Infection

- Proper hand washing, by everyone
- Adequate nutrition, fluids, and rest
- Encourage complete emptying of her bladder
- Proper breast and perineal hygiene
- Breastfeeding support, to help minimize nipple trauma and ensure breast emptying
- Education to non-breastfeeding moms to minimize breast stimulation

May fear first bowel movement

- The woman with an episiotomy or hemorrhoids may fear her first bowel movement due to anticipated pain, thus she tries to delay it
Nursing Care: Hemorrhoids

• Hemorrhoids, distended rectal veins, may become larger in the second stage of labor due to the pressure on the lower bowel
• However, after delivery the hemorrhoids reduce in size and can be manually inserted into the rectum if needed
• Educate her on the suggestions to facilitate normal bowel function to help ease her mind about the potential pain with the first bowel movement

Nursing Care: Hemorrhoids

• Teaching to mother:
  – Sit on flat, hard surfaces
  – Avoid soft surfaces
• Why?
  – Soft surfaces separate the buttocks and decrease the venous flow, and intensifies the pain
  – Tighten buttocks before sitting
  – Lay on her side instead
• Provide comfort measures:
  – Ice Packs
  – Anesthetic sprays or ointments
  – Cool witch hazel pads

Cervix

• Immediately following birth, the cervix and lower uterine segment are thin and flaccid
• The external cervical os never regains its pre-pregnant appearance
• The cervix may appear: spongy, flabby, formless, and/or bruised
• Over next 12-18 hours the Cervix shortens and becomes firmer
• Within 2-3 days postpartum
  – Cervix has shortened, firmed and regained its form
  – Os will close to 1 cm by one week after birth
  – Appearance will no longer have circular shape but rather a jagged slit “fish mouth”

Lochia

When to call your provider

What the expected progression of vaginal bleeding should be

Lochia

• Lochia occurs in 3 stages and is classified according to its appearance and contents
  – Lochia Rubra
  – Lochia Serosa
  – Lochia Alba

The total amount of lochia varies by person, the average volume is 150 -400 mL

Lochia

<table>
<thead>
<tr>
<th>Lochia</th>
<th>Color</th>
<th>Time Frame</th>
<th>Constituents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rubra</td>
<td>Dark red</td>
<td>First 1-3 days</td>
<td>Epithelial cells, blood, blood clots, fragments of decidua, and mucus</td>
</tr>
<tr>
<td>Serosa</td>
<td>Pink or brown</td>
<td>Days 3-10</td>
<td>Blood, mucus, and invading leukocytes</td>
</tr>
<tr>
<td>Alba</td>
<td>White (creamy or yellowish)</td>
<td>Days 10-14 up to 6 weeks</td>
<td>Largely mucus, leukocyte count high</td>
</tr>
</tbody>
</table>
Things to tell your patient...

- This discharge normally has a musty, stale odor that is not offensive
- Any foul odor is suggestive of infection and they should call their health care provider
- Lochia is heavier in the morning than at night, there is pooling in the vagina and uterus when the she is in a lying position
- The amount of lochia may also be increased by exertion or breastfeeding

<table>
<thead>
<tr>
<th>Amount</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scant amount</td>
<td>Blood only on tissue when wiped or less than 1 inch stain on peripad within 1 hour</td>
</tr>
<tr>
<td>Light amount</td>
<td>Less than 4-inch stain on peripad within 1 hour</td>
</tr>
<tr>
<td>Moderate amount</td>
<td>Less than 6-inch stain on peripad within 1 hour</td>
</tr>
<tr>
<td>Heavy amount</td>
<td>Saturated peripad within 1 hour</td>
</tr>
</tbody>
</table>


Visual verses Measuring

- A visual account of blood loss can vary person to person
- Weighing the pads is more accurate
- You must know the dry weight of the pad
- Peripads can be weighed if needed: 1 gram = 1 ml of blood

- To help mothers endure the blood loss at delivery the body will have a 30-45% increase in the blood volume at term.
- The human body typically holds about 5 Liters of blood, depending on the size of the person.
- Blood loss for an uncomplicated vaginal delivery – 500 ml
- Blood loss after cesarean – 1000 ml or more

Things to tell your patient

- What the expected progression of lochia should be
- Notify her health care provider if:
  - Bright-red lochia returns after lochia has stopped
  - Persistent discharge of lochia rubra or a return to lochia rubra can indicate subinvolution or postpartum hemorrhage
  - An offensive odor, may suggest infection
Homans Sign (Legs)

How Many Assess for Homans sign?
Some hospitals don’t conduct a Homans sign during the assessment
• Stating it is not diagnostic and may lead to an embolus if the clot becomes loose while the nurse is assessing
• The other hand is that there are no published reports of an embolus occurring due to conducting a Homans sign
• How it is performed: The nurse will abruptly and with force dorsiflex the ankle while observing for pain in the calf and popliteal area

Break this down...you need to remember
Mom has a high-volume, high-flow, and low-resistance uteroplacental circulation that is meant to support fetal development so she has measures in place to prevent maternal hemorrhage... such as increase in concentration of coagulation factors and fibrinogen. The down side... now mom is at an increased risk venous thrombosis and pulmonary embolus.

Postpartum mothers are at more of a risk for

–Thrombophelbitis
–Thrombus formation
–Inflammation involving a vein

Deep vein thrombosis (DVT)

Physical Findings:
• Pain/tenderness
• Tenderness with palpation
• Change in surface temperature
• Edema (usually one is larger)
• Erythema (red/patchy skin color)
• Mottled appearance (discolored/patchy skin color)
• Difference in leg circumference of each leg

Assessment & Education about DVT’s is important
• More common in the postpartum period between days 10-20
• About 90% of Pulmonary Embolisms (PE) come from lower extremity DVT’s!
Thromboembolic Disease

Postpartum measures to decrease the risk:
- Early ambulation
- Leg exercises in bed and turning frequently, every two hours
- Use of antiembolism stockings for those woman at risk
- Avoid pressure behind knees & crossing the legs
- Avoid sitting for extended periods of time
- Promote elevation of the legs while sitting
- Avoid dehydration, promote fluids
- Encourage the woman not to smoke

Evaluation of Neuromuscular System Changes

Nursing Care: Neuromuscular

- Observe for return of full sensory
- Assist with ambulation mother may not have all her sensation yet or could be dizzy due to orthostatic hypotension
- Have mom sit on the side of the bed, wait, and gradually go to a standing position

Postpartum Chill

- Right after delivery some may have intense tremors/shivering
- As long as there is no fever present this is not a threat to mother
- Comfort measures to help can include a warm blanket, warm drink, reassuring her that it is common and will dissipate

Integumentary

- During first postpartum week profuse afebrile diaphoresis is common, especially at night, as a mechanism to secrete excess accumulation of fluid
- Nursing Care
  - Instruct woman that excessive sweating is normal
  - Change the bed linens and provide a clean gown as needed
  - Observe for itching from epidural morphine
    - Medications to ease itching include
      - Diphenhydramine (Benadryl) 25 mg IV or oral every 6 hours PRN, itching
      - Narcan drip
      - Nubain
    - Offer cool washcloth and provide cool environment

Immune System
Postpartum Physiologic Changes

The white blood cell count is increased post delivery. By the end of the first week postpartum it will return to a normal level.

Lukocytes return to nonpregnant level by six weeks post delivery.

Rhogam

Rhogam causes lysis of any fetal red blood cells that might have entered the maternal circulation (fetomaternal transfusion) before the mother has time to build up antibodies against foreign protein.

In the United States most of the population is Rh positive.

Rubella Vaccine

- Rubella Vaccine
  - If rubella titer is 1:18 or less or equivocal the mother should get the rubella vaccine, and advised against pregnancy for the next 28 days.
  - If Rhogam and a live virus vaccine (such as measles or rubella) is administered during postpartum, the mother needs to get a post-vaccination serology test in three months to check immunity.

Vaccines

Breastfeeding mothers can be vaccinated, inactivated and live viruses can be given to a breastfeeding mother, with the exception of the smallpox vaccine.

Lab values will be off..
### Platelets
- **After Delivery**: Decrease right after delivery due to the placental separation
- **Return to Normal Value**: Begin to increase by day 3-4 post delivery, return to normal levels by 6 weeks post delivery

### Coagulation Factors
- **Plasma fibrinogen**: Typically remain elevated for a few weeks after delivery. This offers protection to the mother from hemorrhage. But it may also increase her risk of thrombus formation.
- **Return to Normal Value**: Return to nonpregnant level around 3-4 weeks post delivery

### Blood volume
- **After Delivery**: Blood volume decreases 16% from peak pregnancy levels on the third day postpartum
- **Return to Normal Value**: Total blood volume decreases to nearly prepregnant levels 1 to 2 weeks postpartum

### Coagulation Factors
- **After Delivery**: Average increase of 14-16,000/mm³
- **Return to Normal Value**: May increase to 30,000/mm³ during labor and right after delivery

### Hematocrit
- **After Delivery**: Lower post delivery, drops in the third trimester of pregnancy. Increase in hematocrit is seen between day 3 and 7 due to the plasma volume decrease being greater than the loss of red blood cells after delivery
- **Return to Normal Value**: Return to normal range within 4-8 weeks postpartum. Exception if there was excessive blood loss

### WBC’s
- **After Delivery**: Increase of 14-16,000/mm³
- **Return to Normal Value**: May increase to 30,000/mm³ during labor and right after delivery

### Hematocrit
- **After Delivery**: Lower post delivery, drops in the third trimester of pregnancy. Increase in hematocrit is seen between day 3 and 7 due to the plasma volume decrease being greater than the loss of red blood cells after delivery
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### Glucose Levels
- **After Delivery**: Lower glucose levels for moms during postpartum. May need less insulin requirements for insulin-dependent diabetic women
- **Return to Normal Value**: Gestational Diabetic moms typically have normal glucose levels right after delivery

### Endocrine system
- **Placental Hormones**
  - Estrogen and Progesterone decrease markedly with expulsion of the placenta
  - Reach lowest levels by 1 week postpartum
  - Estrogen
    - Decreases also associated with diuresis of excess extracellular fluid accumulated in pregnancy
  - Progesterone
  - Human chorionic gonadotropin (hCG)
    - Disappears fairly quickly from circulation

### Pituitary Hormones
- **Prolactin**
  - Prolactin levels increase after birth
  - Highest in the first month for breastfeeding mothers and remain elevated while lactation occurs
  - Return to pre-pregnant levels by 3 weeks in non-lactating women
- **Oxytocin**
  - Released from posterior pituitary in response to suckling infant
Emotions

We will cover this more in the section about Perinatal Mood Disorders.

Energy Level

- Ranges from high energy to extreme fatigue and sleepiness, this is individual
- Moms will often feel physical fatigue, and fatigue is common
- This should resolve over the first few weeks postpartum

How is Mom feeling??

Nursing Care: Energy Level

We can help by:
- Organize nursing activities to avoid frequent interruptions
- Schedule nap time to encourage and promote rest
- Someone there to watch the infant so mom can rest peacefully knowing her baby is cared for

Resumption of Sexual Activity

Nursing Care: Resumption of Sexual Activity

When can couples safely resume intercourse?

- Current recommendations are that couples may resume intercourse once the perineum is healed and the lochia has stopped
- Average time for this is 3-6 weeks
- The risk of infection and hemorrhage are minimal after about two weeks post delivery
Nursing Care: Resumption of Sexual Activity

- Reasons couples may wait due to:
  - Mom is tired
  - Decreased libido
  - Hormonal alterations may impact mom’s physiologic response to sexual stimulation for months
  - Baby’s needs
  - Vaginal dryness

Nursing Care: Ovulation and Menstruation

- Instruct women about when ovulation and menstruation can be expected to return based upon whether the woman is breastfeeding or bottle feeding
- The first menstrual cycle is typically anovulatory, but some (about 25%) may ovulate before menstruation.

Menstruation Return

- Nonlactating Women:
  - Between 7-12 weeks
- Lactating Women:
  - If breastfeeds for one month or shorter: return will be similar to a non lactating women.
  - If exclusively breastfeeding: return will be delayed, it varies greatly between women.

Ovulation

- Ovulation suppression is due to high prolactin levels
- Nonlactating women
  - Mean time is about 70-75 days
- Lactating women
  - Delayed ovulation for lactating women, mean time is around 4-6 months.

References:

- The American College of Obstetricians and Gynecologists, Practice bulletin: July 2016. Prevention and management of obstetric lacerations at vaginal delivery

(Mattson & Smith, 2016)