POSTPARTUM PHYSIOLOGY AND ASSESSMENT

Maternal Core Curriculum Fellowship

2026

OBJECTIVES

- Discuss the normal physiological changes of pregnancy and postpartum
- Identify essential components of a comprehensive postpartum maternal assessment
- Recall critical postpartum discharge education points

THE POSTPARTUM PERIOD - PUERPERIUM

- Begins immediately after birth
- Traditionally 6 weeks
- “Fourth trimester”

(DAVIDSON ET AL., 2024 & DAVIDSON ET AL., 2024)

EARLY POSTPARTUM NURSING FOCUS

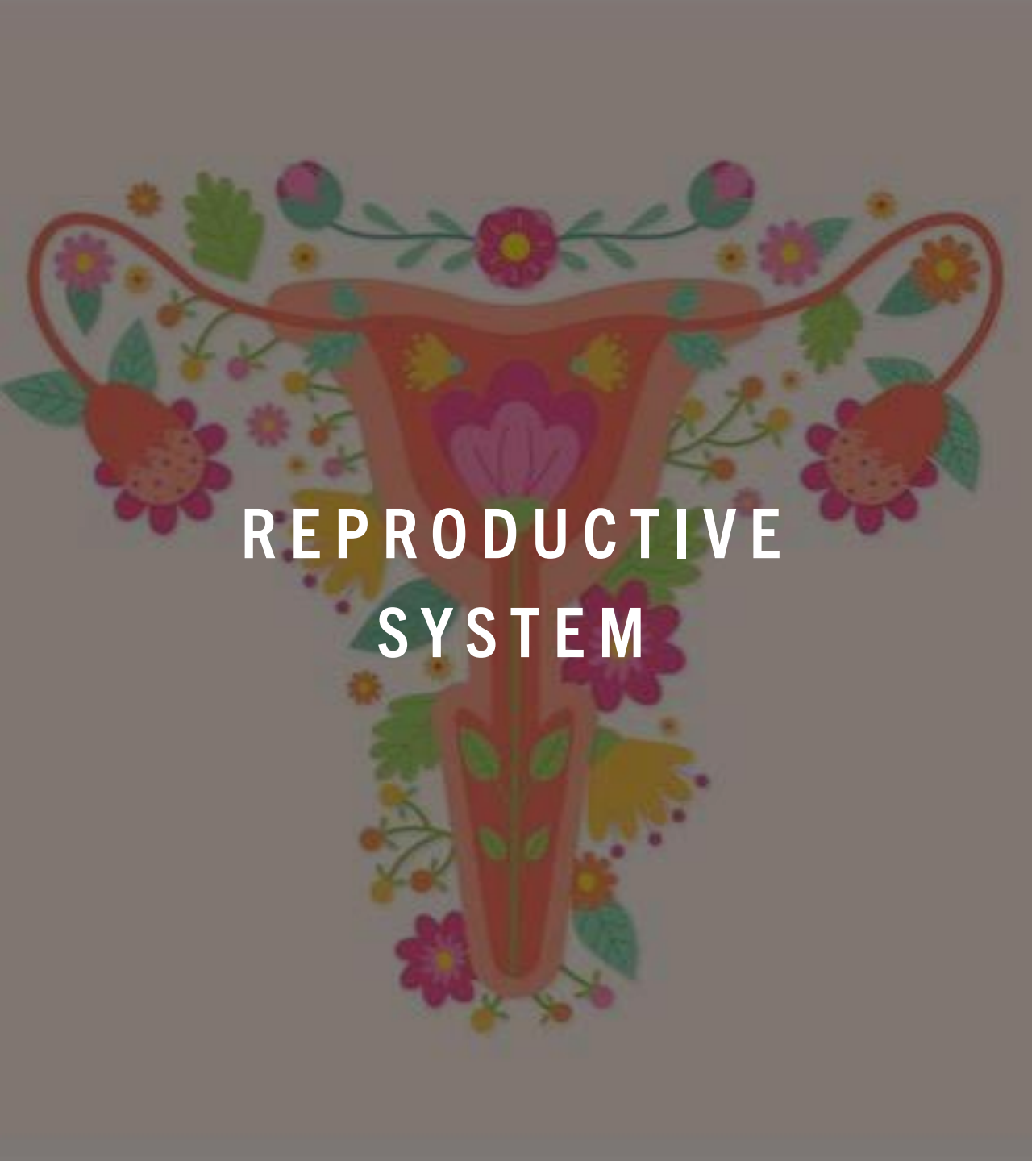
- Assisting with rest and recovery from labor/birth
- Assessing physiologic and psychologic adaptation postpartum
- Preventing complications
- Education on self and infant care
- Supporting initial transition to parenthood

(LOWDERMILK ET AL., 2024)

ESSENTIAL PATIENT INFORMATION

- Patient's name and age
- Healthcare provider information
- Gravidity and parity
- Anesthesia used
- Medications administered
- Duration of labor and time of ROM
- Labor induction or augmentation
- Mode of birth
- Perinatal repair or type of cesarean incision
- Lab values including blood type and Rh status; GBS status; rubella immunity; HIV, Hep B, syphilis serology results; other infections and if treated
- Type and volume of IV fluids
- Physiologic status since birth
- Description of fundus, lochia, bladder, and perineum
- Neonatal data

(LOWDERMILK ET AL., 2024)



REPRODUCTIVE SYSTEM

- Uterus
- Cervix
- Ovaries
- Vagina & Perineum
- Pelvic Muscular Support
- Breasts

UTERUS IN PREGNANCY

- Growth initially simulated by increase in estrogen and progesterone, increased vascularity & dilation of blood vessels
- Oxygen consumption increases
- Blood flow increases 10x over pregnancy course

	Non Pregnant	Term Gestation
Weight	4-70 g	1200 g
Capacity	10 ml	5 L

(DAVIDSON ET AL., 2024 & LOWDERMILK ET AL., 2024)

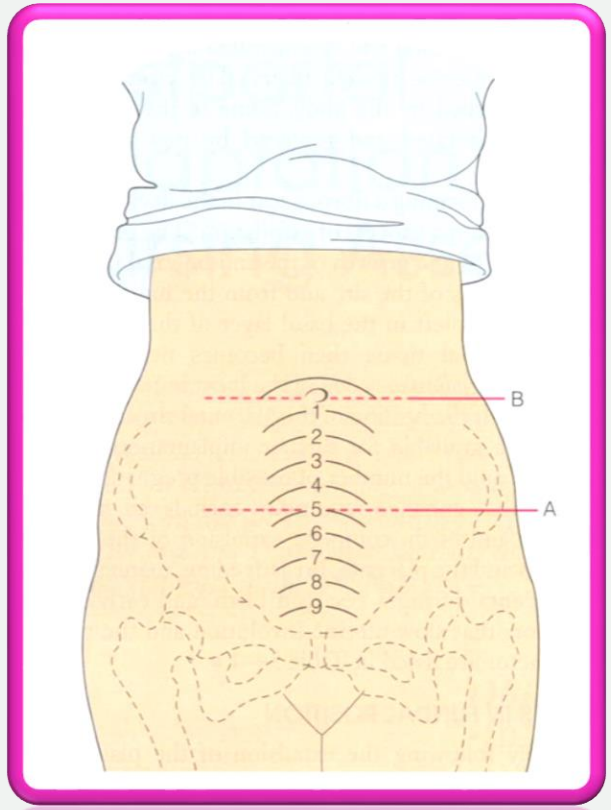
UTERUS POSTPARTUM

- Autolysis from decreased estrogen and progesterone
- Contractions
  - Compress intramyometrial blood vessels to promote hemostasis
  - Coordinated by oxytocin – endogenous vs. exogenous
  - Afterpains – Primipara vs. Multipara

(LOWDERMILK ET AL., 2024)

UTERUS – INVOLUTION

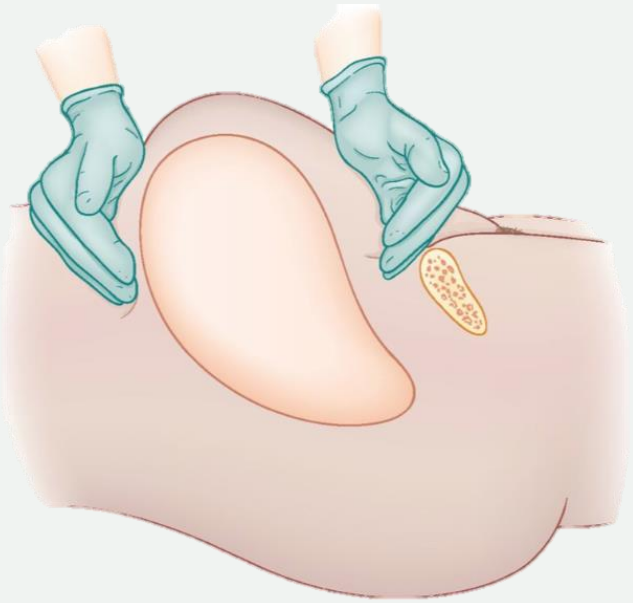
- Rapid reduction in size and return to non-pregnant state
- U/2 below umbilicus after delivery of placenta
- Rises to approximately 1/U within 12 hours
- Descends 1-2cm every 24 hours
- Subinvolution



(LOWDERMILK ET AL., 2024, 2020)

UTERINE ASSESSMENT

- Assess for consistency and tone, position, height, and tenderness
- Abnormal findings include soft, boggy, higher than expected, lateral deviation
- Patient should be supine
- Use both hands to palpate, assess, and massage



(BAKER & JANKE, 2024; LOWDERMILK ET AL., 2024)

UTERINE NURSING INTERVENTIONS

- Know your patient's baseline
- Pre-medicate PRN
- Ensure your patient has voided before assessment
- Fundal massage PRN
- Assess lochia with each fundal check
- Afterpains interventions
- Chart appropriately (example: U/1, midline, boggy, firms with massage)
- Bedside report

(DAVIDSON ET AL., 2024)

PLACENTAL SITE

- After delivery of the placenta and membranes, vascular constriction and thromboses decrease the placental diameter
- Heals by sloughing of necrotic tissue which prevents scar tissue
- Endometrial regeneration

(LOWDERMILK ET AL., 2024)

LOCHIA

- Postpartum discharge associates with uterine involution and endometrium changes
- Can last 4-6 weeks or longer postpartum
- 3 Stages

Type	Appearance	Timing Postpartum	Contents
Rubra	Bright red	1-3 days	Blood from placental site, trophoblastic tissue debris, vernix, lanugo, meconium
Serosa	Pinkish-brown	4-10 days	Blood, wound exudate, RBCs, WBCs, trophoblastic tissue debris, cervical mucous, microorganisms
Alba	Whitish-yellow	10-14 days, can last 3-6 weeks	WBCs, trophoblastic tissue debris

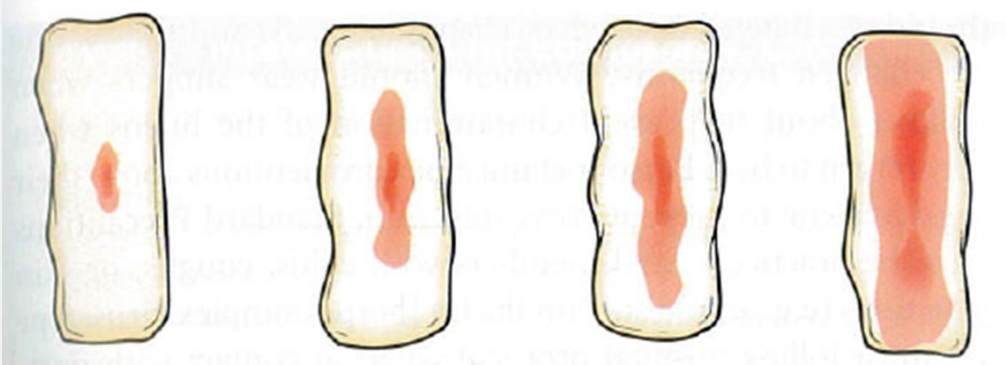
(LOWDERMILK ET AL., 2024)

LOCHIA CHARACTERISTICS

- Volume
- Trend toward lighter flow and color
- Warning signs

Lochial Bleeding	Nonlochial bleeding
• Usually trickles from vaginal opening & steady flow is increased with uterine contraction • Gush of lochia may appear when the uterus is massaged. • Gush of lochia that is dark in color indicates it had pooled in the relaxed vagina & soon lessens to a trickle of bright red lochia (1-3 days postpartum)	• Bloody discharge that spurts from the vagina when the uterus if firmly contracted may indicate a cervical or vaginal tear in addition to lochia • If the amount of bleeding continues to be excessive and bright red, a tear may be the source

LOCHIA

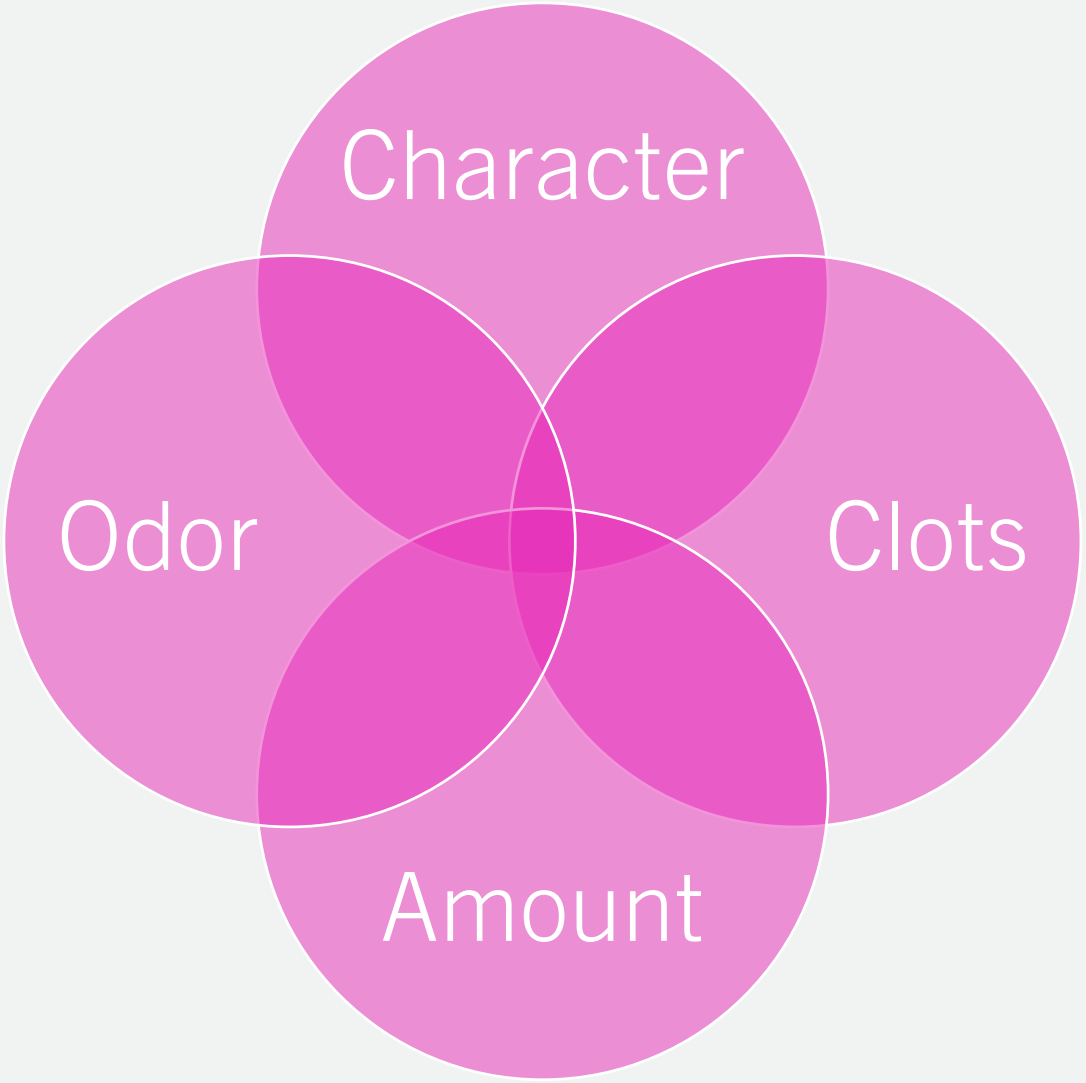


Scant Small Moderate Heavy

Scant	Small	Moderate	Heavy	Excessive
• <1 inch in 1 hour or • Only on TP w/wiping	• <4 inches in 1 hour • 10-25ml	• <6 inches in 1 hour • 25-50ml	• Pad saturated in 1 hour • 30-80ml	• Pad saturated in 15 minutes

(DAVIDSON ET AL., 2024; LOWDERMILK ET AL., 2024)

LOCHIA ASSESSMENT



- Normal Findings:
  - Scant to moderate
  - Small clots < nickel size
  - Fleshy odor
- Abnormal Findings:
  - Heavy
  - Large clots
  - Uterine atony
  - Foul odor

Common Concerns:

- Gush of blood
- Clots

(DAVIDSON ET AL., 2024; DAVIDSON ET AL., 2024)

LOCHIA

Educate your patients on:

- Normal lochia progression
- Sloughing of placenta site

Educate your patient to call a healthcare provider if:

- Saturating pad in 1 hour or less
- Passing clots egg/plum size or larger
- Return of bright red lochia after previously stopped
- Persistent bright red lochia occurs
- Foul smelling odor

(BAKER & JANKE, 2024; DAVIDSON ET AL., 2024; SUPLEE ET AL., 2017)

REPRODUCTIVE SYSTEM IN PREGNANCY

Ovaries	Vagina	Breasts
• Estrogen & progesterone increase	•Mucosa thickens •Connective tissue loosens •Smooth muscle hypertrophies •Vaginal vault lengthens •Chadwick sign •Edema & varicosities •Altered vaginal microbiome	•Changes occur in early pregnancy due to increased estrogen & progesterone •Nipples & areola have increased pigmentation •Areolas enlarge •Hypertrophy of Montgomery glands •Increased blood supply •Breasts are prepared for lactation •Lactogenesis 1 occurs

(LOWDERMILK ET AL., 2024)

CERVIX & OVARIES

Cervix	Ovaries & Menstruation

• Soft and spongy after birth
• Protrudes into the vagina
• Appears bruised and edematous
• Cervical os gradually closes
  • Dilated 2-3cm by 2-3 days postpartum
  • 1cm by 1 wk postpartum
• External os never regains its prepregancy appearance
	• Varies considerably based on lactation
	• Mean ovulation time is approximately 6 months for breastfeeding patients and 7-9 weeks for nonbreastfeeding patients
	• Menstruation return varies by breastfeeding pattern and length
	• First cycle is may be heavier than usual & gradually returns to baseline after 3-4 cycles
	• Ovulation precedes menstruation

(LOWDERMILK ET AL., 2024)

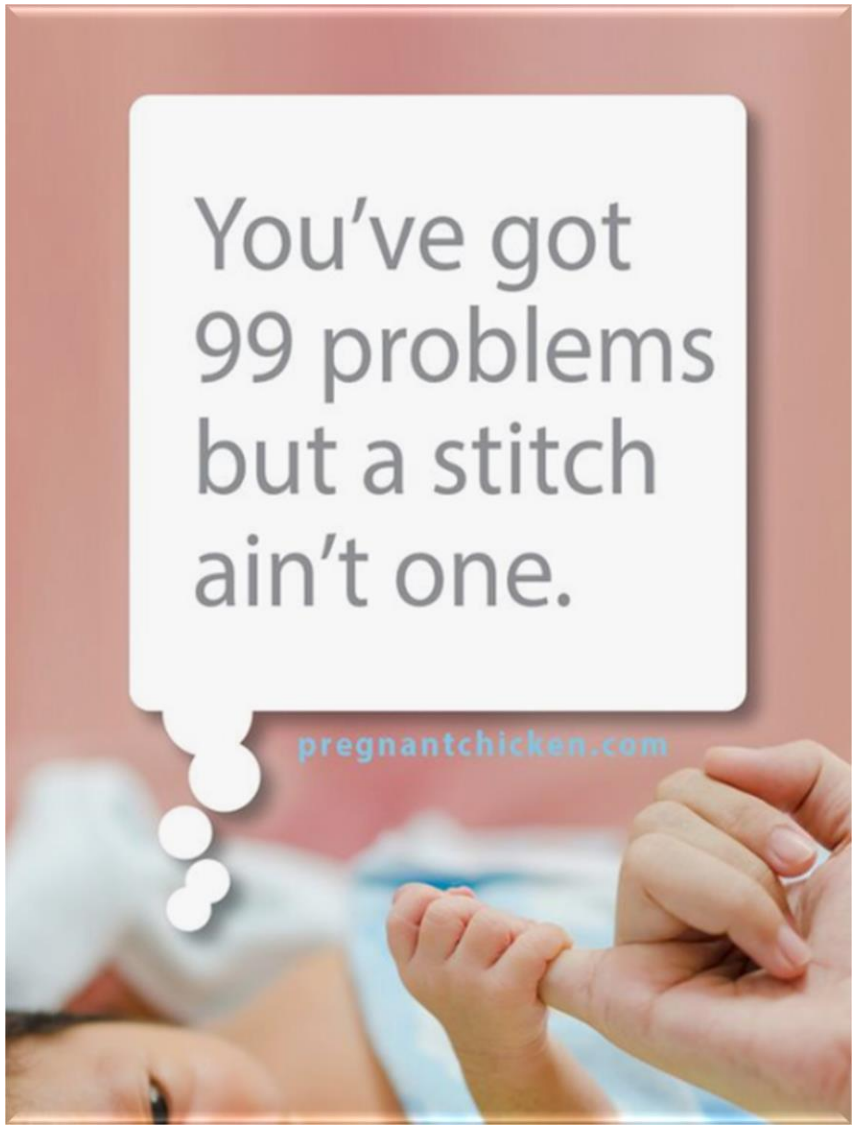
VAGINA, PERINEUM, AND PELVIC MUSCULAR SUPPORT

- Postpartum estrogen deficiency results in thin vaginal mucosa and absence of rugae
- Vagina decreases in size and regains tone but does not fully return to prepregnancy state
- Rugae reappears by 3 weeks but is never as prominent
- Introitus is reddened and edematous after delivery
- Initial healing of a laceration or episiotomy occurs within 2-3 weeks but may take 4-6 months to heal completely
- Trauma and hemorrhoids
- Supportive tissues of the pelvic floor may be torn or stretched during birth

(LOWDERMILK ET AL., 2024)

PERINEUM/RECTUM

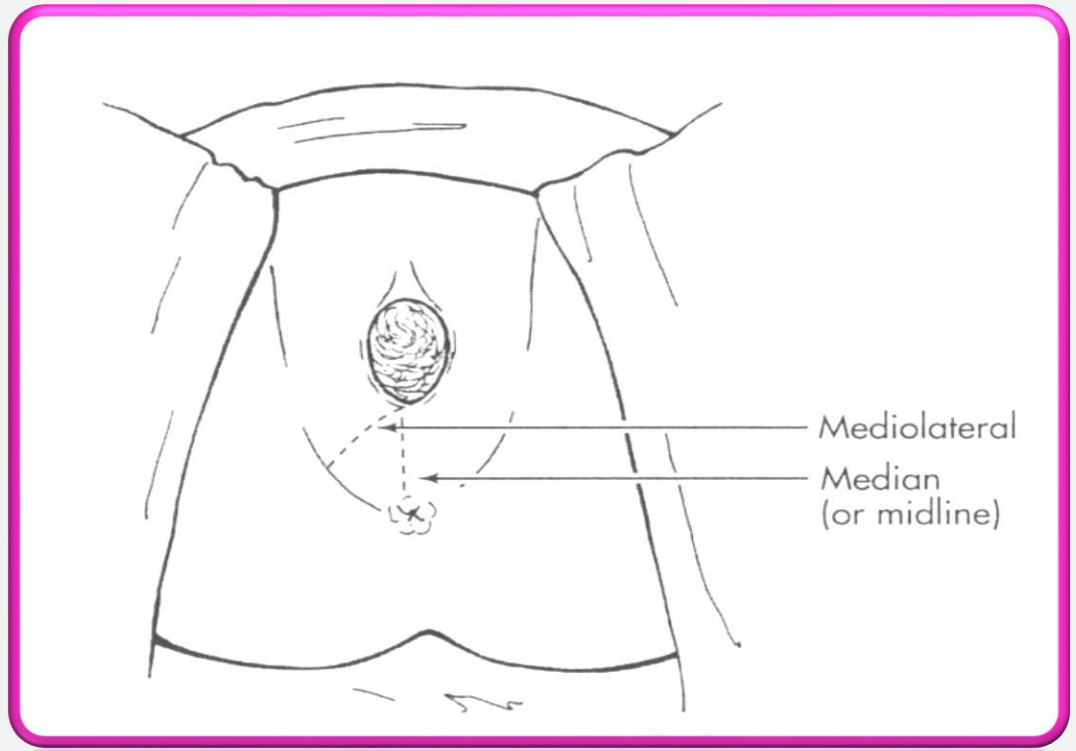
- Inspect for the presence of:
  - Laceration
  - Episiotomy
  - Hemorrhoids
- Patient placed in lateral SIMS position, lift buttocks to expose perineum and anus



(DAVIDSON ET AL., 2024)

EPISIOTOMY

- Approximately 10% of U.S. births
- EBP guidelines advise against
- No maternal benefits
- Complications

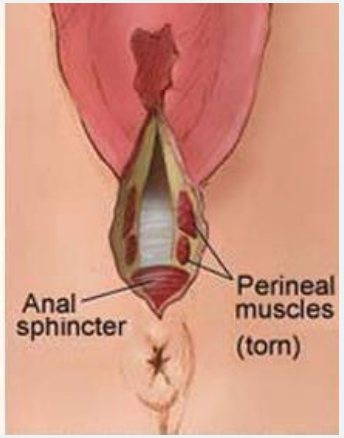


(DAVIDSON ET AL., 2024)

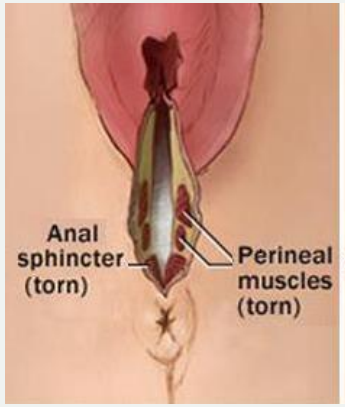
LACERATIONS

- First Degree - superficial to the muscle
- Second Degree - extends through the muscle
- Third Degree - continues through the anal sphincter muscle
- Forth Degree – involves anterior rectal wall
- Cervical

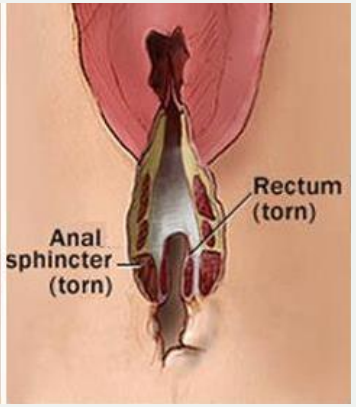
1st degree



2nd degree



3rd degree

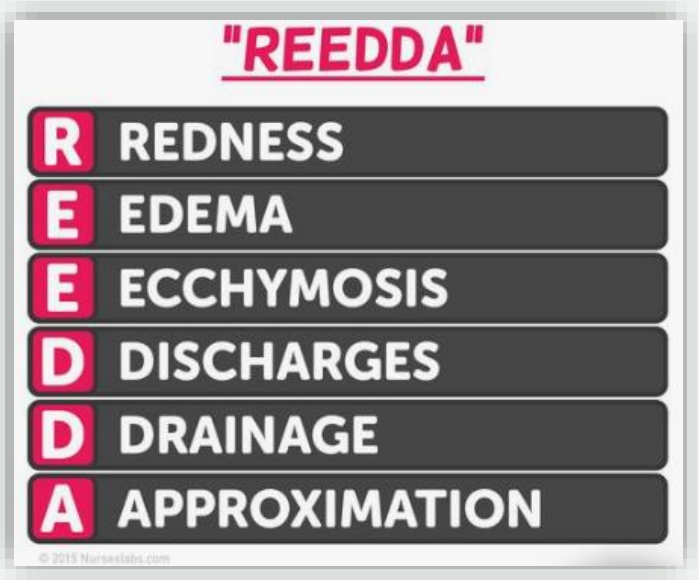


4th degree

(BAKER & JANKE, 2024; HTTP://GYNAEONLINE.COM/PERINEAL_TEAR.HTM)

PERINEUM/RECTUM NURSING CARE

- Assess for:
  - Healing – REEDA
  - Pain
  - Hemorrhoids – number, size, pain/tenderness
- Nursing Interventions:
  - Promote comfort
  - Prevent infection



(DAVIDSON ET AL., 2024; LOWDERMILK ET AL., 2024)

BREASTS (BREASTFEEDING)

- Little change noted for first 24 hours postpartum
- Colostrum may be expressed from the breast
- Lactogenesis II occurs around 72-96 hours PP
  - Transition of colostrum to mature milk
  - Breasts are fuller and heavier
  - May be warm, firm, and tender
  - May feel nodular or lumpy upon palpation
- Patients may experience engorgement which lasts 24-48 hours
  - Frequent breastfeeding decreases risk and/or duration

(LOWDERMILK ET AL., 2024)

BREASTS (NONBREASTFEEDING)

- Often feel nodular bilaterally
- Prolactin levels drop rapidly
- Colostrum is present the first few days postpartum
- Breast tissue tenderness may occur 2-3 days postpartum
- Engorgement may occur 3-4 days postpartum and resolves spontanesously, usually by 24-26 hours
- Milk is present but should not be expressed
- Lactation ceases in a few days to one week

(LOWDERMILK ET AL., 2024)

BREASTS

- Assess breasts for:
  - Size and shape
  - Any abnormalities, reddened areas, or engorgement
  - Engorgement: firmness + warmth, tenderness
- Assess nipples for trauma: redness, bruising, cracks, fissures, abrasions, blisters, inversion

1-2 Days PP	2-3 Days PP	3-5 Days PP
Soft	Filling - Slight firmness	Full – Firmness that softens with breastfeeding

(DAVIDSON ET AL., 2024; DAVIDSON ET AL., 2024)

BREAST FULLNESS OR ENGORGEMENT?

Fullness	Engorgement
• Transitional fullness will usually last about 24 hours • Occurs about the 3-5th day postpartum • Normal and self resolves • Breast will still be soft enough for the baby to nurse • Typically no pain – mild tenderness	• Occurs around 72-96 hours PP • Caused by: congestion and vascularity, accumulation of milk, and edema caused by the swelling and obstruction of drainage of the lymphatic system • Overfilling and swelling of the breast and/or areola • Breasts are hard, painful, warm, and appear taut and shiny • Exacerbated by scheduled feedings, limited time at breast, decreased skin to skin

(DAVIDSON ET AL., 2024)

BREAST COMFORT MEASURES

Breastfeeding mothers:

- Feeding on demand
- Cold compresses applied to breasts after feeding
- Gentle breast massage and hand expression to relieve pressure
- Colostrum & glycerin gel pads for sore nipples
- NSAIDS

Non-breastfeeding mothers:

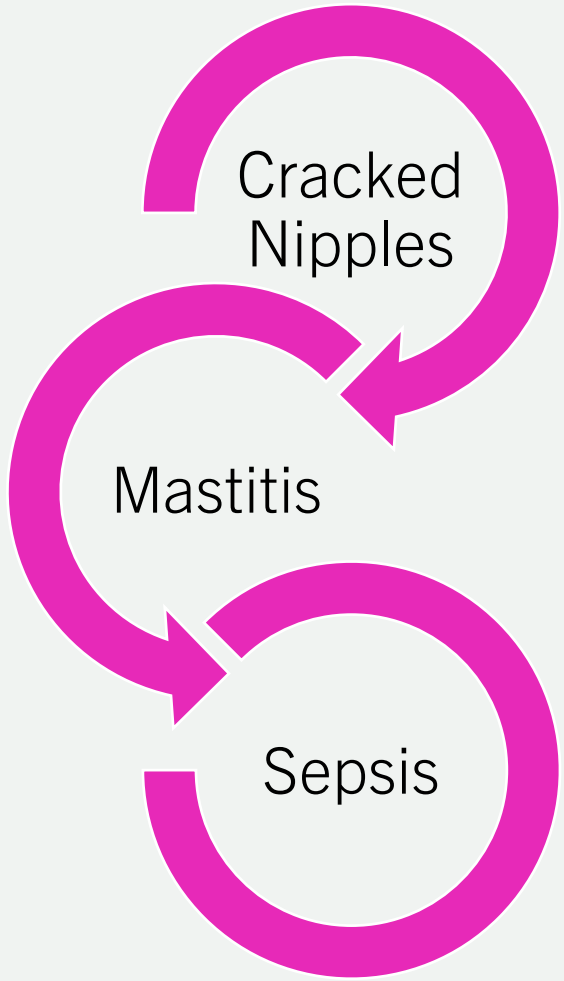
- Assess for evidence of discomfort
- Cold compresses
- NSAIDS
- Teach patients to:
  - Avoid stimulation to breasts/nipples, newborn suckling, expressing breastmilk
  - Use a supportive bra

(DAVIDSON ET AL., 2024; LOWDERMILK ET AL., 2024)

BREASTS

Educate your patient to call a healthcare provider if:

- Cracked, bleeding nipples
- Engorgement and/or hard, lumpy, reddened area on breast
- Fever
- Flu like symptoms (aches and chills)



(DAVIDSON ET AL., 2024)

- Blood Volume
- Cardiac Output
- Blood Pressure
- Structural Adaptations
- Blood components

BLOOD VOLUME IN PREGNANCY

- Total blood volume increases by 40-50% during pregnancy, approx. 1200-1600 ml above nonpregnant levels
- Increase is even greater with multiple gestations
- Purpose:
  - Meeting blood volume needs of the hypertrophied vascular system of the enlarged uterus
  - Hydrating maternal and fetal tissues
  - Compensating for blood loss during birth and postpartum

(LOWDERMILK ET AL., 2024)

BLOOD VOLUME

- Variable based on EQBL and amount of extravascular water mobilized and excreted postpartum
- Average blood loss:
  - Vaginal 300-500ml (10% of blood volume)
  - Cesarean 500-1000ml (15-30% of blood volume)
- Diuresis initially decreases plasma volume
- Plasma volume is replenished by the third day postpartum

(LOWDERMILK ET AL., 2024)

POSTPARTUM PHYSIOLOGIC CHANGES TO COPE WITH BLOOD LOSS DURING BIRTH:

- Elimination of uteroplacental circulation
- Loss of placental endocrine function
- Mobilization of extravascular water stored during pregnancy

CARDIAC OUTPUT IN PREGNANCY

- Increases 30-50% during pregnancy, declining to 20% increase by 40 weeks gestation
- Heart rate increases, peaks at 15-20 beats/min over pregnancy baseline, and persists until term
- Increase is a result of increased stroke volume and increased heart rate
- Increases further with exertion

(LOWDERMILK ET AL., 2024)

CARDIAC OUTPUT

- Immediate blood loss decreases plasma volume without reducing cardiac output
  - Approximately 500ml blood is diverted from uteroplacental to maternal circulation
  - Rapid decrease in uterine blood flow
  - Mobilization of extracellular fluid
- Peaks immediately after birth by 60-80% above prelabor values
- Returns to pre-labor levels within 1 hour postpartum
- Declines by 30% by 2 weeks postpartum
- Return to prepregnant levels by 6-12 weeks postpartum

(LOWDERMILK ET AL., 2024)

BLOOD PRESSURE IN PREGNANCY

- BP remains the same or slightly decreased from reduced systemic vascular resistance
- Systolic blood pressure remains at prepregnancy levels or slightly decreases
- Diastolic blood pressure decreases until 24-32 weeks gestation & returns to prepregnancy levels by term
- Influencing factors on blood pressure
- Increased venous pressure & reduced blood flow in legs

(LOWDERMILK ET AL., 2024)

STRUCTURAL CHANGES IN PREGNANCY

- Slight cardiac hypertrophy
- Heart pushed upward and forward to the left
- Transient auscultatory changes
- Cardiac rhythm is affected

(LOWDERMILK ET AL., 2024)

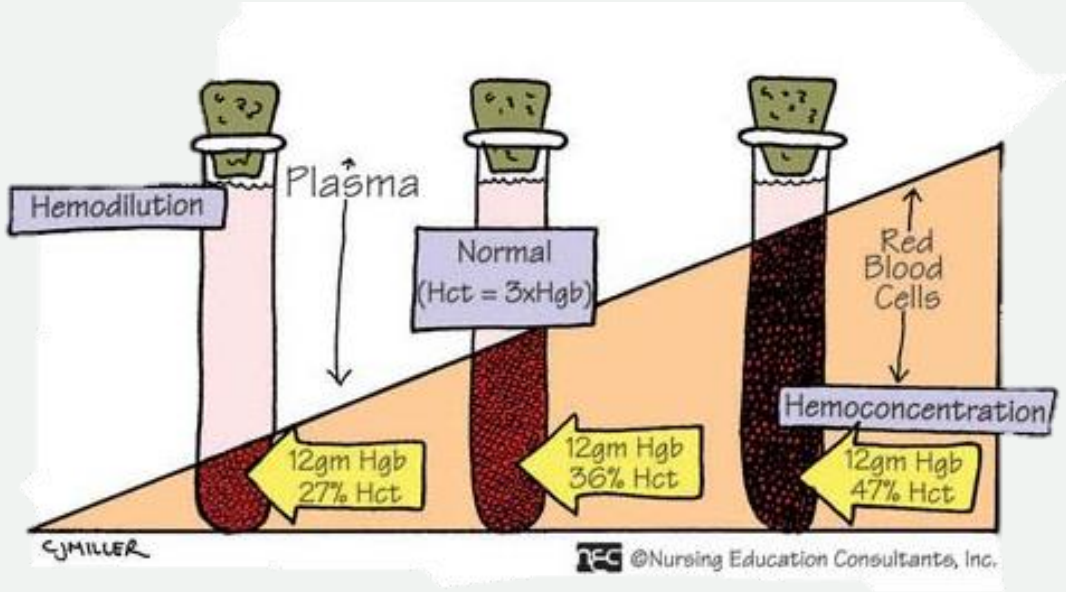
BLOOD COMPONENTS IN PREGNANCY

- Physiologic anemia of pregnancy results in a decrease in hgb & hct
- White blood cell count increases
- Pregnancy is a hypercoagulable state
- Increased risk for thromboembolic complications

(LOWDERMILK ET AL., 2024)

HEMOGLOBIN AND HEMATOCRIT

- Decrease slightly during the first 24 hours postpartum
- Plateau by 3 to 4 days postpartum
- Increase and reach nonpregnant levels by 4 to 8 weeks postpartum



WHITE BLOOD CELLS

Can rise to 30,000mm^3 during labor and after birth

Returns to nonpregnant levels 1 to 2 weeks postpartum

May obscure diagnosis of acute infection

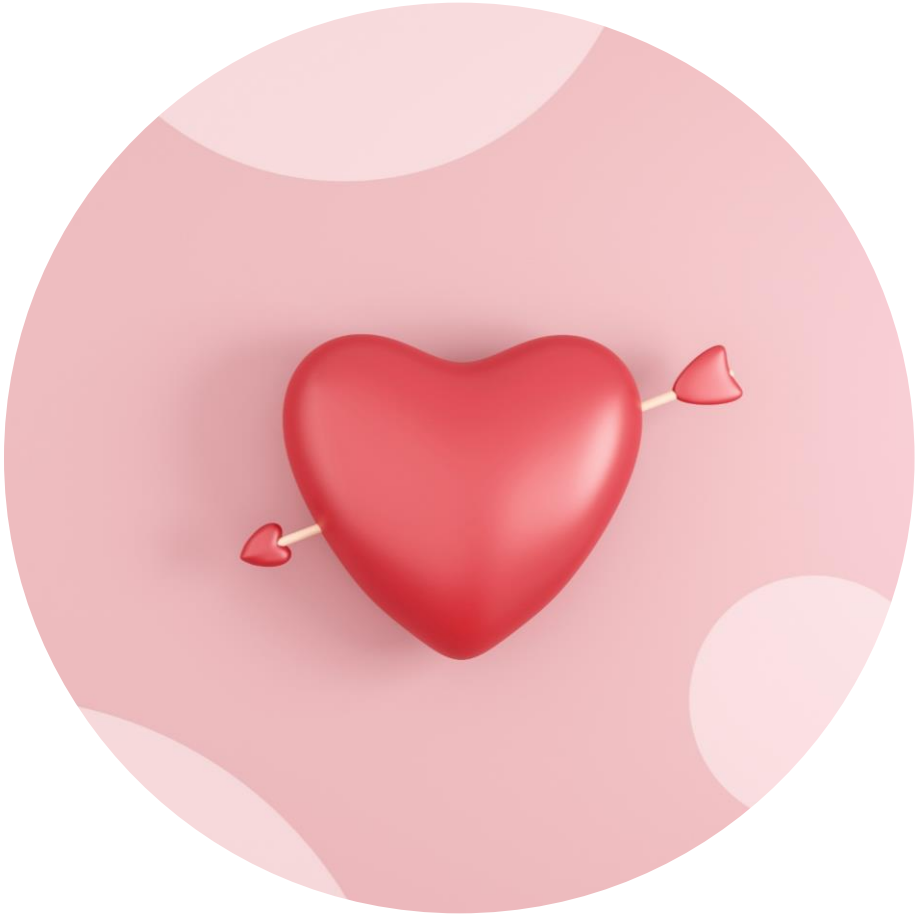
(BAKER & JANKE, 2024; LOWDERMILK ET AL., 2024)

OTHER BLOOD COMPONENTS

- Clotting factors and fibrinogen
  - Remain elevated immediately postpartum
  - Increases risk of thrombus formation and pulmonary embolism
- Platelets
  - Initially decrease as a result of placental separation
  - Increase by 3 to 4 days postpartum
  - Return to nonpregnant levels around 6 weeks postpartum

(DAVIDSON ET AL., 2024 LOWDERMILK ET AL., 2024)

CARDIAC ASSESSMENT



- Perfusion
- Chest pain
- Heart palpitations or “racing heart”
- Neck vein distention
- Arrhythmia
- Edema
- In addition to: LOC, dyspnea, orthopnea, extreme fatigue, dizziness, syncope, pallor, cyanosis, weight gain

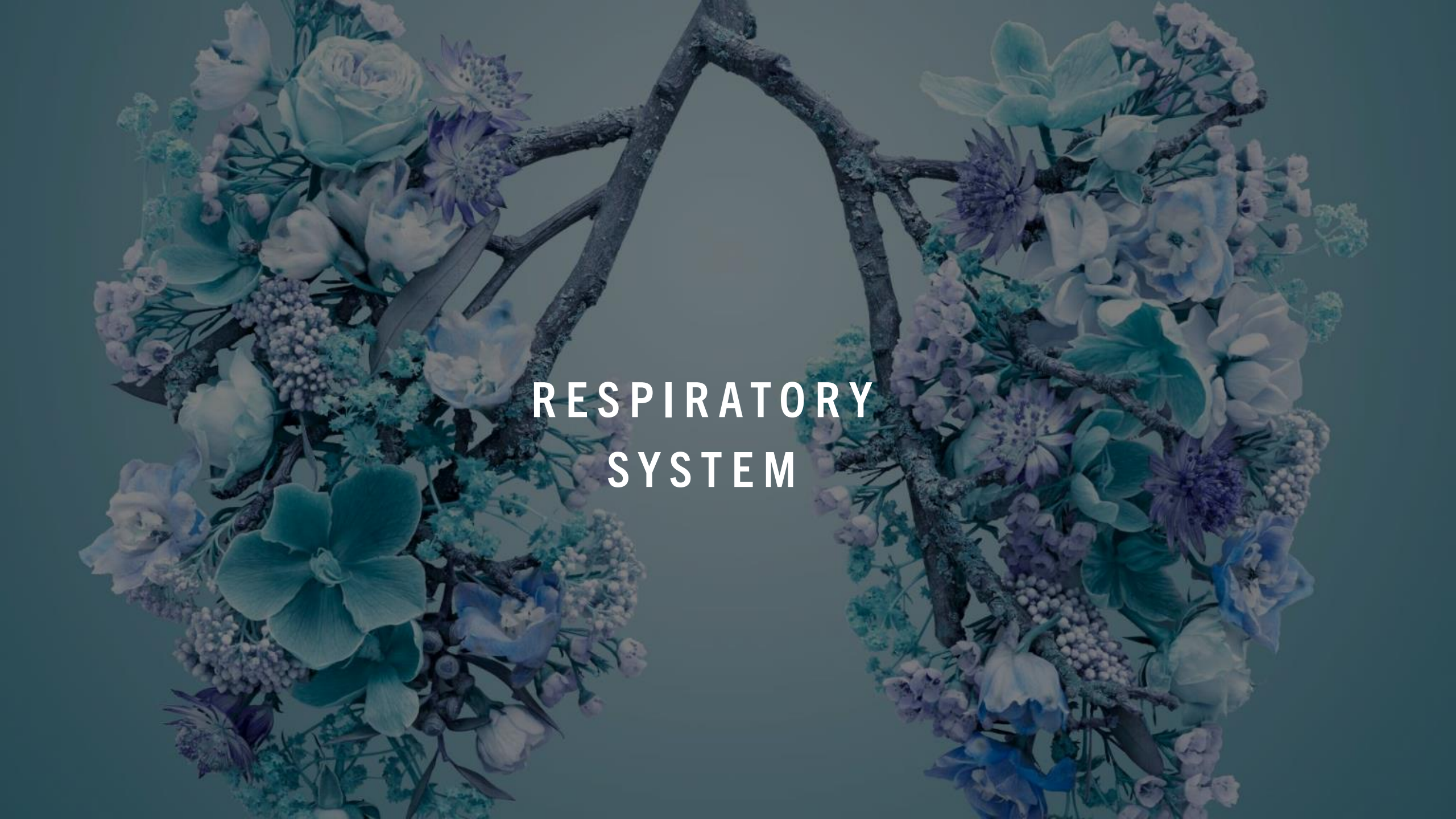
CARDIAC

Ask if the patient has:

- History of cardiac disease (Congenital heart disease, valvular disease, rheumatic heart disease, coronary artery disease, etc.)

Educate your patient to call a healthcare provider if:

- Heart palpations or racing heart
- Sudden or worsening swelling in face, hands, and legs
- + Chest pain or pressure
- + Difficulty breathing or shortness of breath
- 911


RESPIRATORY
SYSTEM

RESPIRATORY SYSTEM IN PREGNANCY

- Increased oxygen demand & consumption
- Pregnancy related dyspnea is common
- Respiratory rate is unchanged
- State of compensated respiratory alkalosis

  PaO2 increases, PaCO2 decreases, Base excess/Serum Bicarb decreases, and pH increases slightly

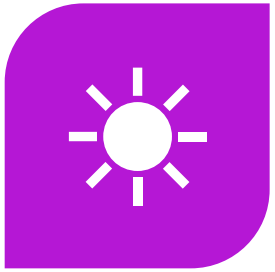
(DAVIDSON ET AL., 2024 & LOWDERMILK ET AL., 2024)

RESPIRATORY SYSTEM

- Immediate decrease in intraabdominal pressure
- Decreased diaphragmatic pressure and pulmonary blood flow
- Rise in partial pressure carbon dioxide (PaCO2) levels
- Oxygen debt from labor extending into postpartum period

(LOWDERMILK ET AL., 2024; SIMPSON & CREEHAN, 2021)

RESPIRATORY



Auscultate the lungs

Monitor oxygen saturation, rate, and depth

Observe for shallow or labored breathing, restlessness

Have supplemental oxygen, reversal agents, and respiratory support equipment available

(DAVIDSON ET AL., 2024; LOWDERMILK ET AL., 2024)

RESPIRATORY

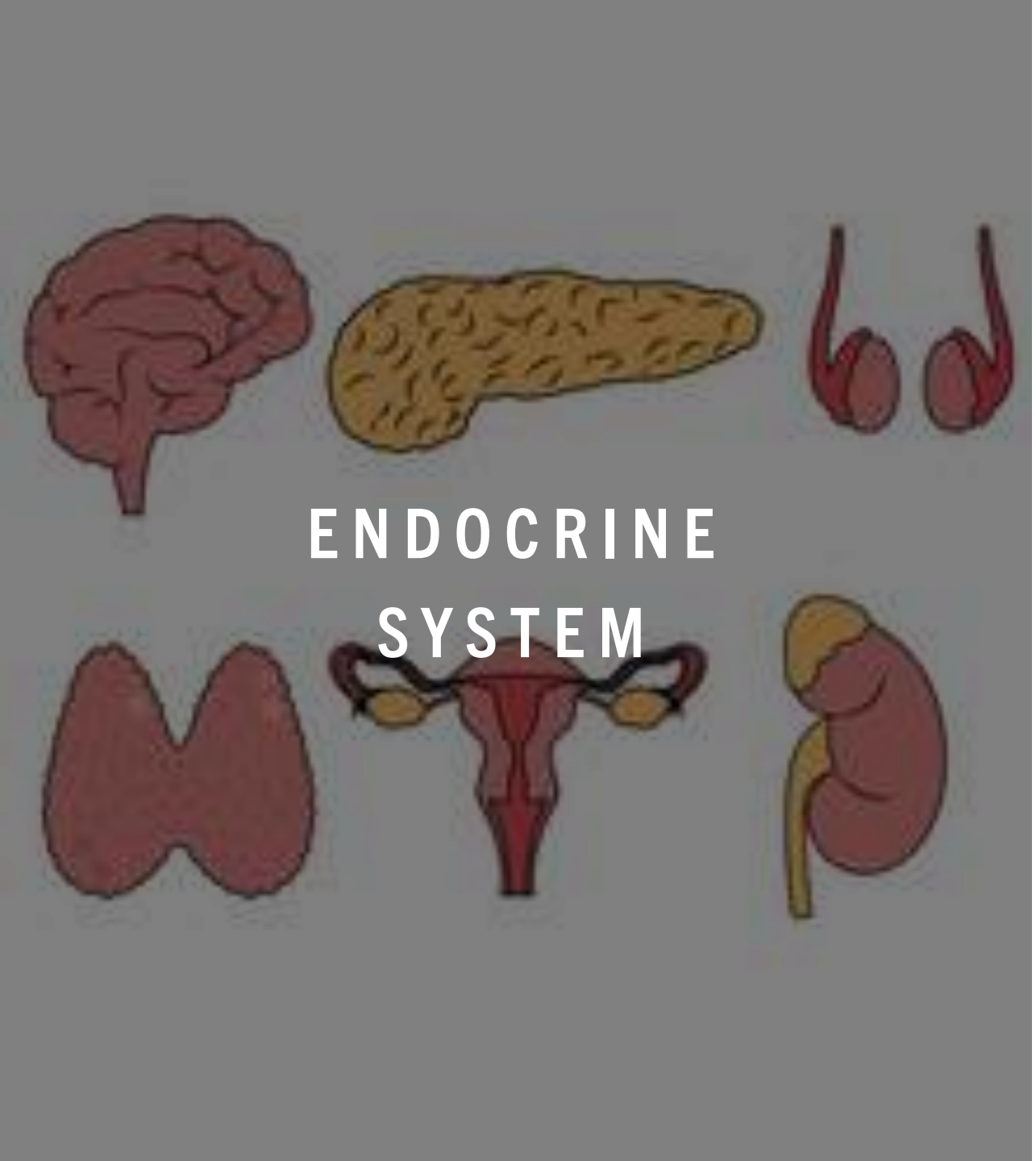
Is your patient experiencing:

- Dyspnea
- SOB
- Orthopnea
- Cough

Educate your patient to call a healthcare provider if:

- Difficulty breathing or shortness of breath
- Heart palpations or racing heart
- Chest pain
- Persistent cough
- Unable to breath while laying down
- 911

(DAVIDSON ET AL., 2024; LOWDERMILK ET AL., 2024; SIMPSON & CREEHAN, 2014; SUPLEE ET AL., 2017)



- Placental hormones
- Pituitary hormones
- Metabolic changes

ENDOCRINE SYSTEM IN PREGNANCY

- Enlargement of thyroid gland and increased production of thyroid hormones
- Increased estrogen & progesterone
- Pituitary gland increases in size from increase in prolactin producing cells
- Increased insulin needs
- Pancreas cells may become stressed to meet insulin demands

(DAVIDSON ET AL., 2024 & LOWDERMILK ET AL., 2024)

PLACENTAL HORMONES

- Estrogen and progesterone levels drop significantly after birth
- Estrogen decrease correlated with diuresis of extracellular fluid
- hCG levels decrease
- Reversed diabetogenic effects of pregnancy results in significantly lower blood glucose levels in the immediate postpartum period

(LOWDERMILK ET AL., 2024)

PITUITARY HORMONES

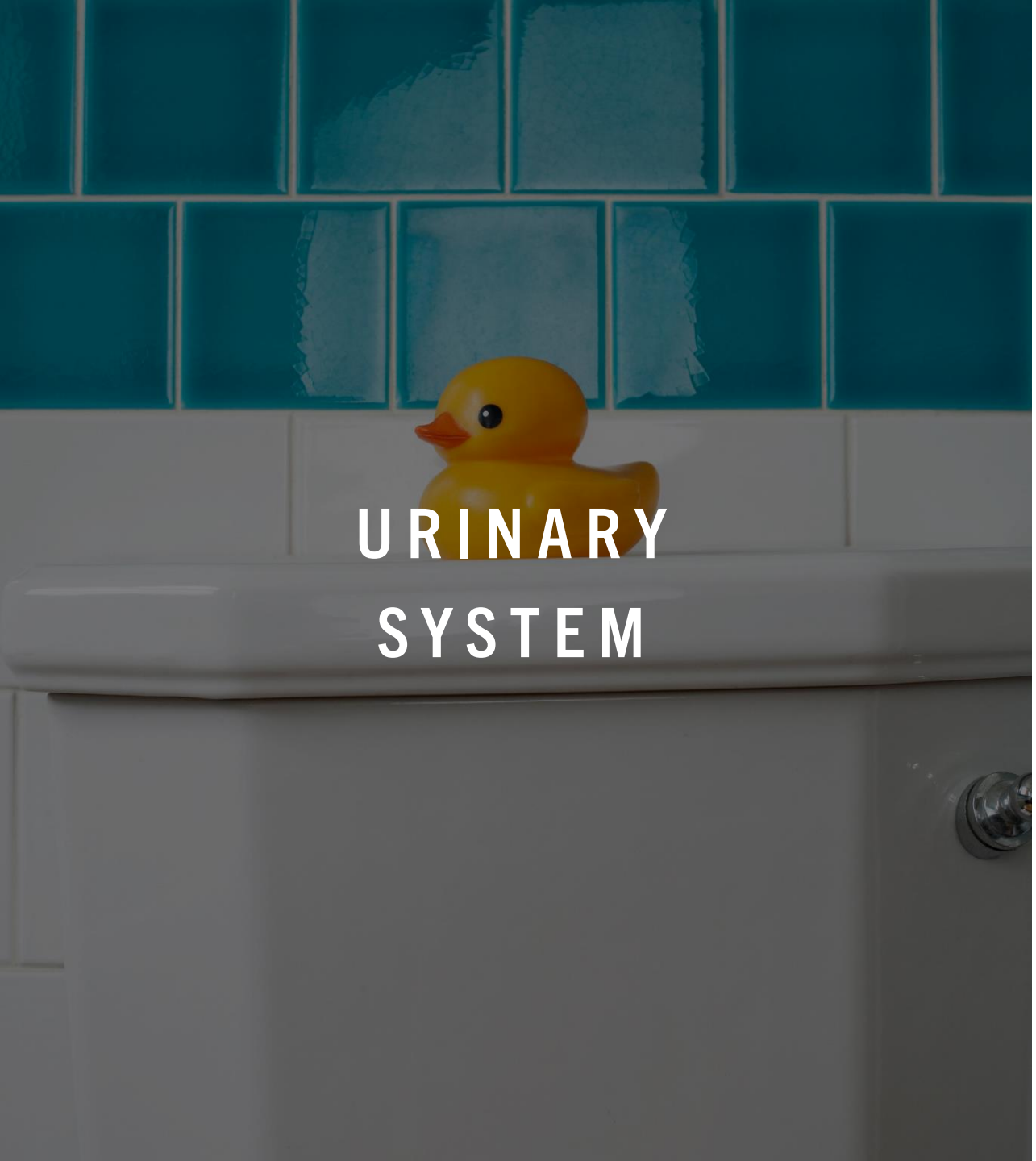
- Fall in progesterone → **rise in prolactin**
- Rise in prolactin → **stimulates milk production**
- Prolactin levels are highest the first month postpartum in a breastfeeding patient & are influenced by breastfeeding
- In nonbreastfeeding patients, prolactin levels decline after birth
- Oxytocin is produced by posterior pituitary in response to infant suckling or nipple stimulation with milk expression

(LOWDERMILK ET AL., 2024)

METABOLIC CHANGES

- Basal metabolic rate remains elevated for 1-2 weeks postpartum
- Thyroid gland returns to nonpregnant state by 3 months postpartum
- Increased risk for transient autoimmune thyroiditis in the postpartum period

(LOWDERMILK ET AL., 2024)



URINARY SYSTEM

- Renal function
- Fluid loss
- Urethra and bladder

URINARY SYSTEM IN PREGNANCY

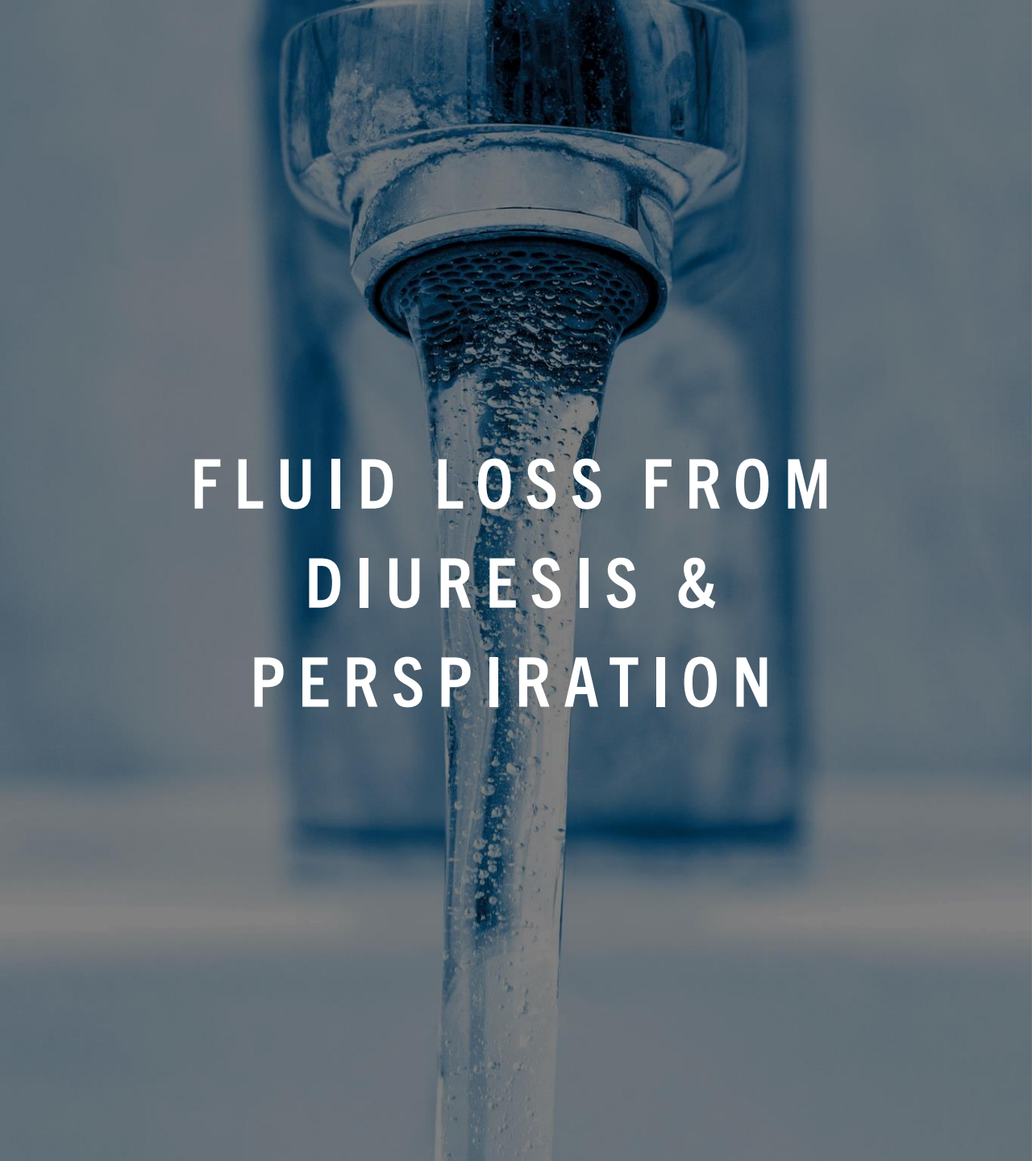
- Enlargement of kidneys
- Ureters dilate, undergo hyperplasia and hypertrophy, and muscle tone relaxes
- Urinary stasis occurs
- Decreased bladder tone increases bladder capacity
- Increased renal function

  Glomerular filtration rate increases which results in ↑ creatinine clearance, **↓** serum creatinine, **↓** blood urea nitrogen (BUN) & **↓** uric acid levels
- Increase in total body water of 6.5-8L
- Glycosuria & Proteinuria may occur

RENAL FUNCTION

- Decreased steroid levels after birth may contribute to reduced renal function postpartum
- Ureters return to nonpregnant state around 8 weeks postpartum
- Increased risk of UTI postpartum
- Renal glycosuria from pregnancy disappears by 1 week postpartum
- Blood urea nitrogen level increase postpartum
- Plasma creatinine levels return to normal by 6 weeks postpartum
- Pregnancy related proteinuria resolves by 6 weeks postpartum
- Ketonuria may occur

(LOWDERMILK ET AL., 2024)



FLUID LOSS FROM DIURESIS & PERSPIRATION

- Begins within 12 hours postpartum
- Urine output of 3,000ml or more each day for 2-3 days postpartum is expected
- Profuse diaphoresis occurs for 2-3 days postpartum
- Delayed with oxytocin infusion

(LOWDERMILK ET AL., 2024)

URETHRA AND BLADDER

- Decrease in void urge
- Reduced or altered void reflex
- Increased risk of bladder distention
- Bladder tone restored 5-7 days postpartum with adequate emptying
- Increased risk of stress incontinence with vaginal birth

(LOWDERMILK ET AL., 2024)

URINARY

Assess for:

- I&O's - # IV fluid bags, etc.
- Urine Characteristics
- Voiding pattern & amount
- Bladder distention
- Dysuria
- Catheter

Bladder distention

- Can occur as soon as 1-2 hours PP r/t normal PP diuresis
- Increased risk: anesthesia, episiotomy/lacerations, operative vaginal delivery, prolonged labor, cesarean section r/t indwelling catheters

(DAVIDSON ET AL., 2024; LOWDERMILK ET AL. 2016)

URINARY NURSING CONSIDERATIONS

- Removal of indwelling catheter after C/S ideally by 8-12 hours
- Avoid bladder distention
- Measure first several voids (⊙150ml-200ml)
- Techniques to help spontaneous voiding
- Indication for insertion of straight catheter:
  1. Distended & unable to void
  2. Voiding small amounts frequently (<100ml)
  3. No void within 8 hours PP

(DAVIDSON ET AL., 2024)

URINARY

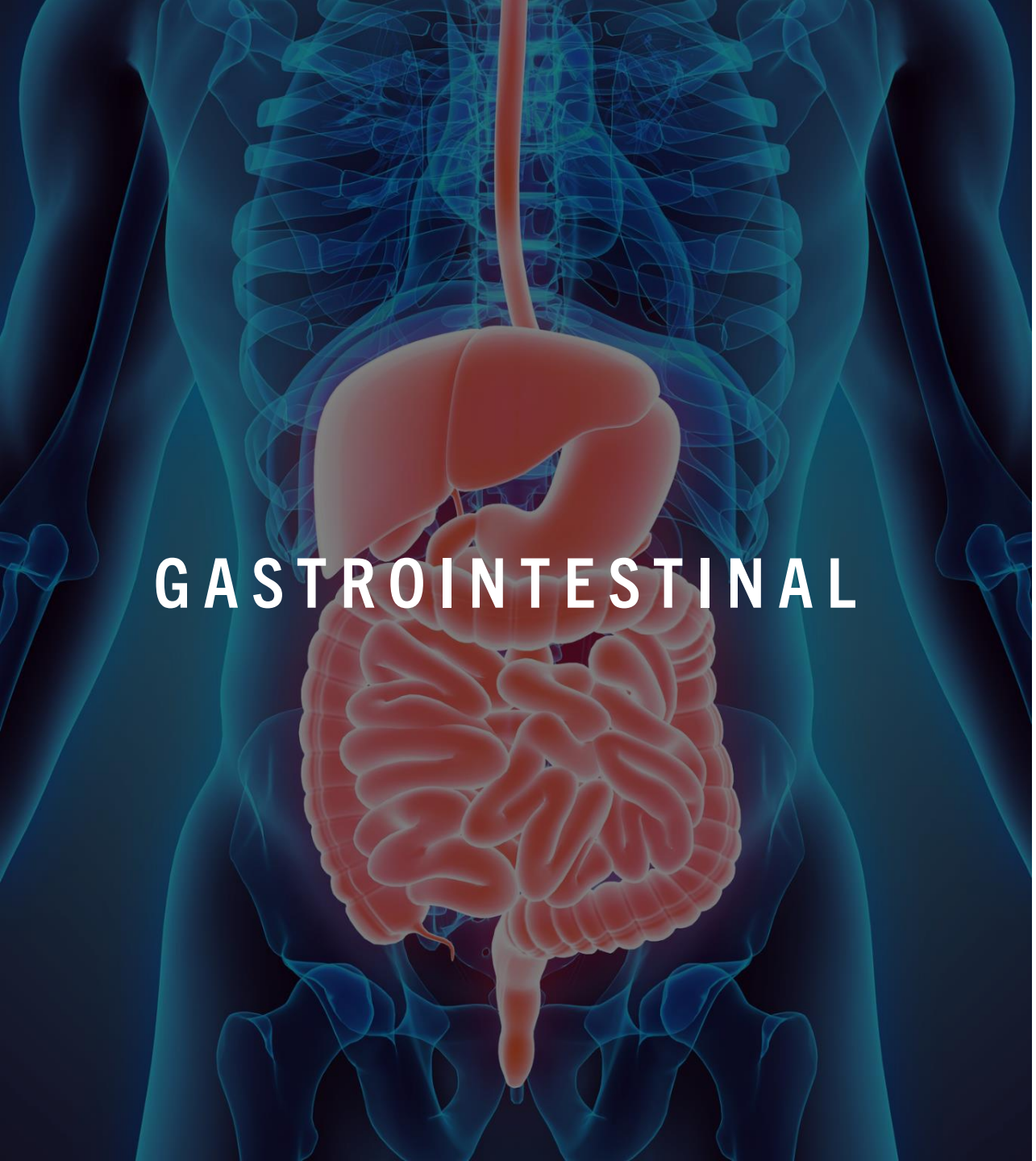
Teach your patients:

- Peri-bottle use
- Hand hygiene before and after peri-care
- Wipe front to back
- Change peri-pad often
- Void Q2-4H
- Increase clear fluid intake
- Avoid caffeinated beverages

Call provider if experiencing UTI S/S:

- Urinary frequency
- Urgency
- Hesitancy
- Dysuria
- Dribbling
- Nocturia
- Suprapubic pain
- Hematuria
- Odor

(DAVIDSON ET AL., 2024; LOWDERMILK ET AL., 2024)



- During pregnancy, decreased tone, motility, & gastric emptying time increases the incidence of constipation
- Normal bowel elimination resumes at 2-3 days postpartum
- Decreased gastrointestinal muscle tone and motility
- Pre-pregnancy elimination patterns resume around 2 weeks postpartum
- Risk of postpartum anal incontinence

(LOWDERMILK ET AL., 2024)

GASTROINTESTINAL

1

Palpate the abdomen:

- Soft?
- Firm?
- Distended?

2

Auscultate bowel sounds:

- Present in all 4 quadrants?
- Hypoactive? Hyperactive?

3

Ask your patient:

- Nausea or vomiting?
- When was her last BM?
- Passing gas?
- Appetite?

GASTROINTESTINAL

- Nausea and vomiting interventions:
  - Non pharmacologic interventions
  - Pharmacologic interventions

- Gas pain interventions:
  - Ambulation early and often
  - Chewing gum
  - Rocking in a rocking chair
  - Heat therapy
  - Avoid gaseous foods (legumes, beans, broccoli)
  - Antiflatulent medication (i.e. simethicone)

(DAVIDSON ET AL., 2024; LOWDERMILK ET AL., 2024)

GASTROINTESTINAL

- Interventions to facilitate return of normal bowel function
- Educate on medication side effects
- Educate to call healthcare provider if:
  - No bowel movement by 3-4 days after postpartum
  - Concerns of constipation or inability to pass stool

(DAVIDSON ET AL., 2024; LOWDERMILK ET AL., 2024; SUPLEE ET AL., 2017)


INTEGUMENTARY

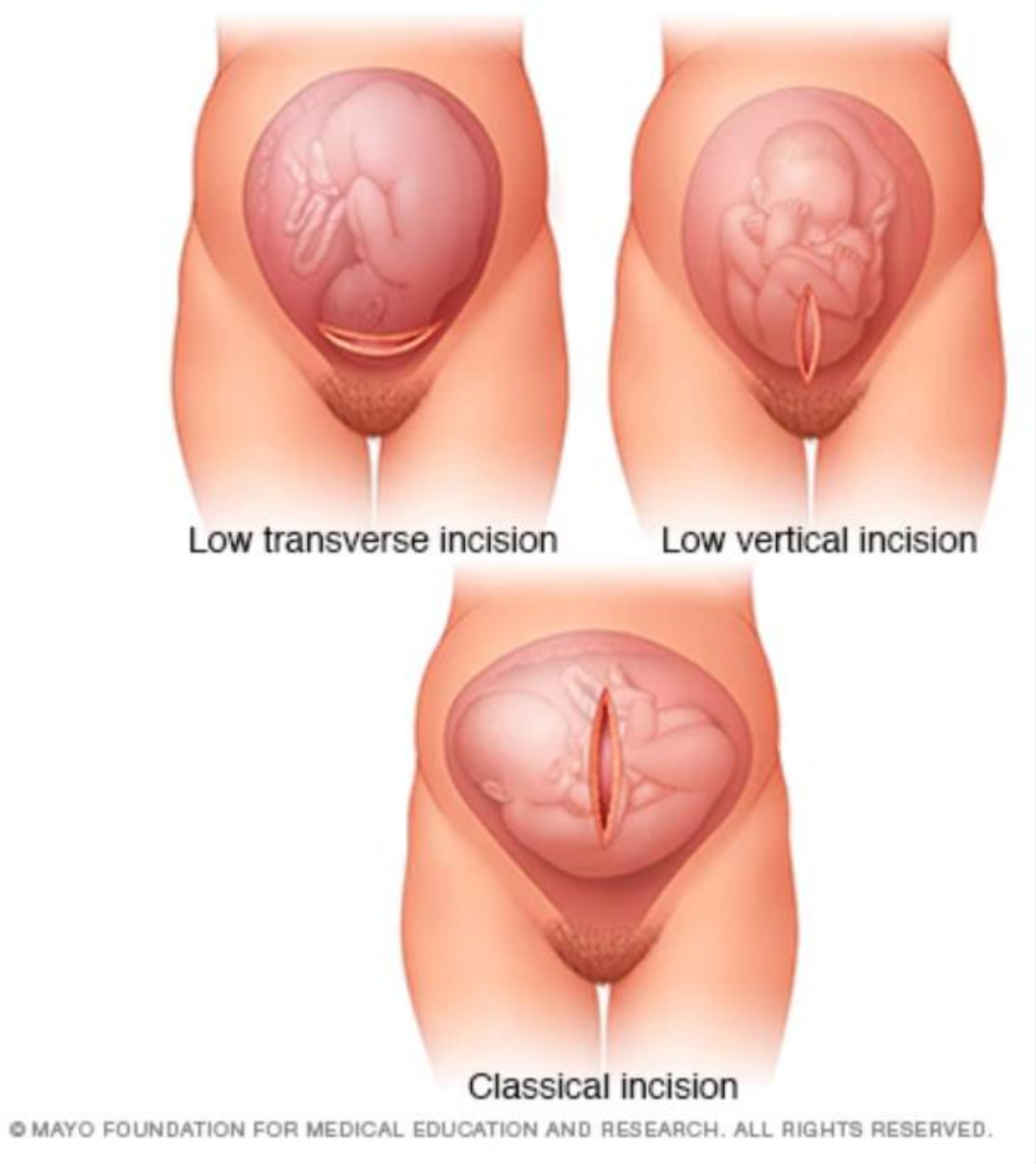
Pregnancy	Postpartum
Melasma	Usually disappears but can persist past postpartum period
Linea nigra	Hyperpigmentation will fade but may not go away completely
Striae gravidarum	Fade but do not disappear completely
Angiomata	Usually disappear within 3 months postpartum but may not completely go away
Fine hair accumulation & hair loss slows	Hair loss occurs for approximately 3 months postpartum

(LOWDERMILK ET AL., 2024)

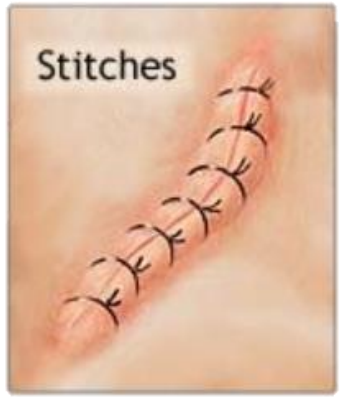
CESAREAN SECTION INCISION

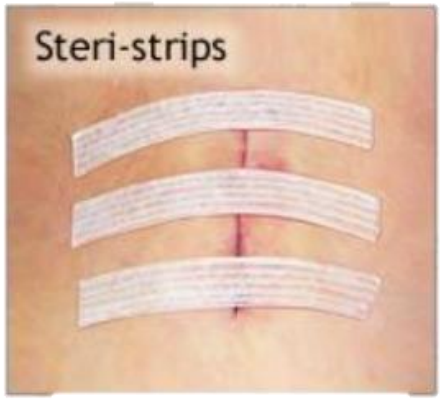
Assess for:

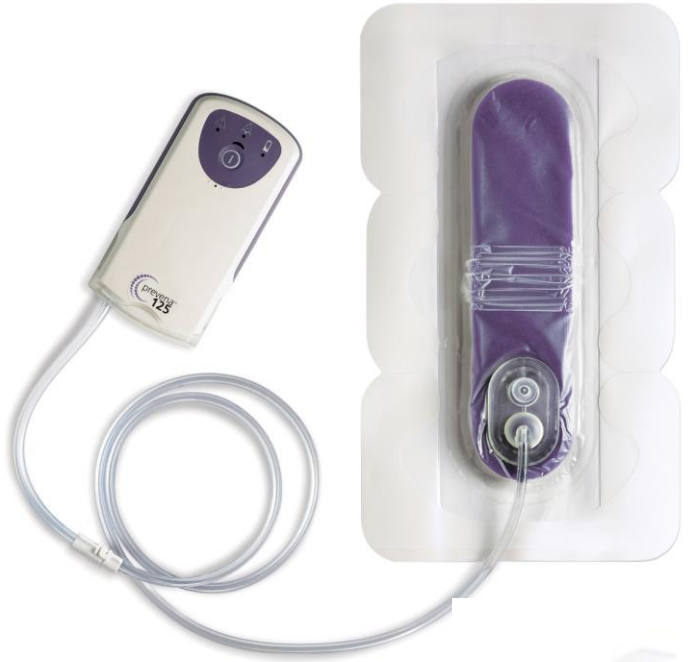
- Type
- Healing – REEDA
- Surrounding skin
- Pain



CESAREAN SECTION INCISION

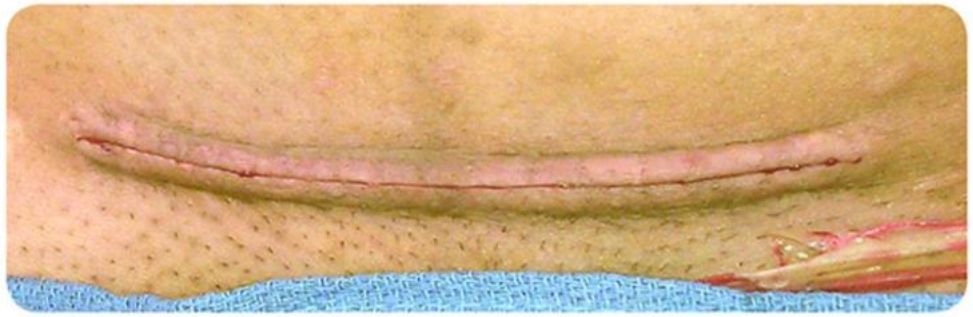






Prevena

Prineo

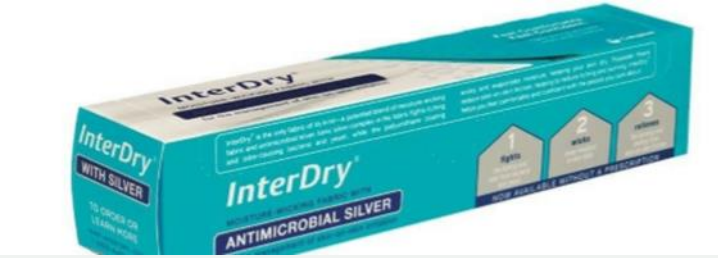


Insorb staples

C/S INCISION CARE

- Keep clean – shower as usual; no submersion baths
- Keep dry – pat/air dry; interdry
- Allow steri strips to fall off spontaneously
- Staples usually removed day of d/c
- Provena and Prineo remain in place during PP stay

INTERDRY



Moisture Wicking Fabric: helps skin stay dry and eliminate friction

Antimicrobial Silver: helps to fight itching and odor causing bacteria

Wash skin & pat dry before application

Apply in a single layer placing one edge at the base of the fold and the other edge exposed outside the fold

Allow minimum 2” fabric exposed outside skin fold for moisture evaporation

Duration: can be used up to 5 days

Population: Any patient with the potential risk for skin breakdown related to moisture/friction

Not to be used in conjunction with powders, creams, or ointments

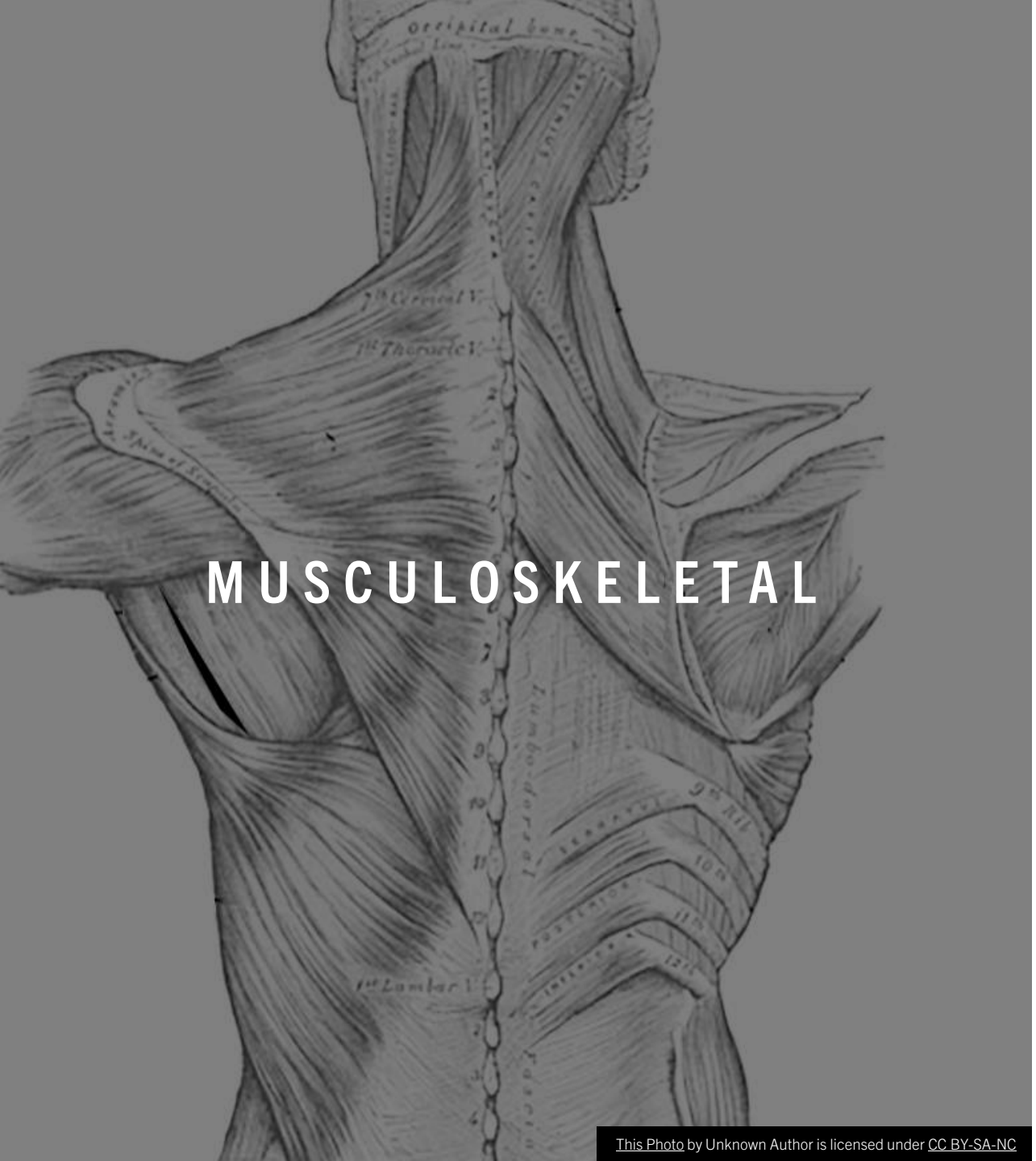
WOUND ASSESSMENT & EDUCATION

Hematoma
• Pronounced edema/fullness, bruising, pain • Excessive discomfort 1-2 days PP
Infection
• Redness, edema, drainage, bruising, gaping stitches • Excessive discomfort after day 3 PP

Educate your patient to call a healthcare provider if:

- Temperature $\geq$ 100.4
- Foul smelling vaginal or incisional blood or discharge
- Increased redness or pus from incision/episiotomy/laceration
- Incision that is not healing

(DAVIDSON ET AL., 2024; LOWDERMILK ET AL., 2024)



MUSCULOSKELETAL

- During pregnancy, abdominal muscles stretch and lose some tone
- Abdominal wall relaxed for 2 weeks postpartum
- Return of muscle tone varies
- Diastasis recti abdominis may occur during pregnancy and persist postpartum
- Relaxation & hypermobility of joints occurs during pregnancy & stabilizes 6-8 weeks postpartum
- Restless leg syndrome is common during pregnancy & subsides a few weeks postpartum

(LOWDERMILK ET AL., 2024)

ASSESSMENT OF LOWER EXTREMITIES

Assess for:

- Redness, warmth, tenderness
- Edema
- Circumference
- DTRs
- Clonus

All postpartum women are at risk of developing thromboembolism…
Increased risk factors include:

- Hypercoagulability (factor V, DVT, PE)
- Severe anemia
- Obesity
- Traumatic delivery
- C/S
- Mag recovery

(LOWDERMILK ET AL., 2024)

- How to perform: support the leg with one hand and dorsiflex the foot
- Positive sign:
  - •Results in pain or discomfort in the calf
  - •May indicate the presence of a thrombus
- Evidence is contradictory

(LOWDERMILK ET AL., 2024)
HTTPS://MEDISAVVY.COM/HOMANS-TEST/

LOWER EXTREMITIES INTERVENTIONS

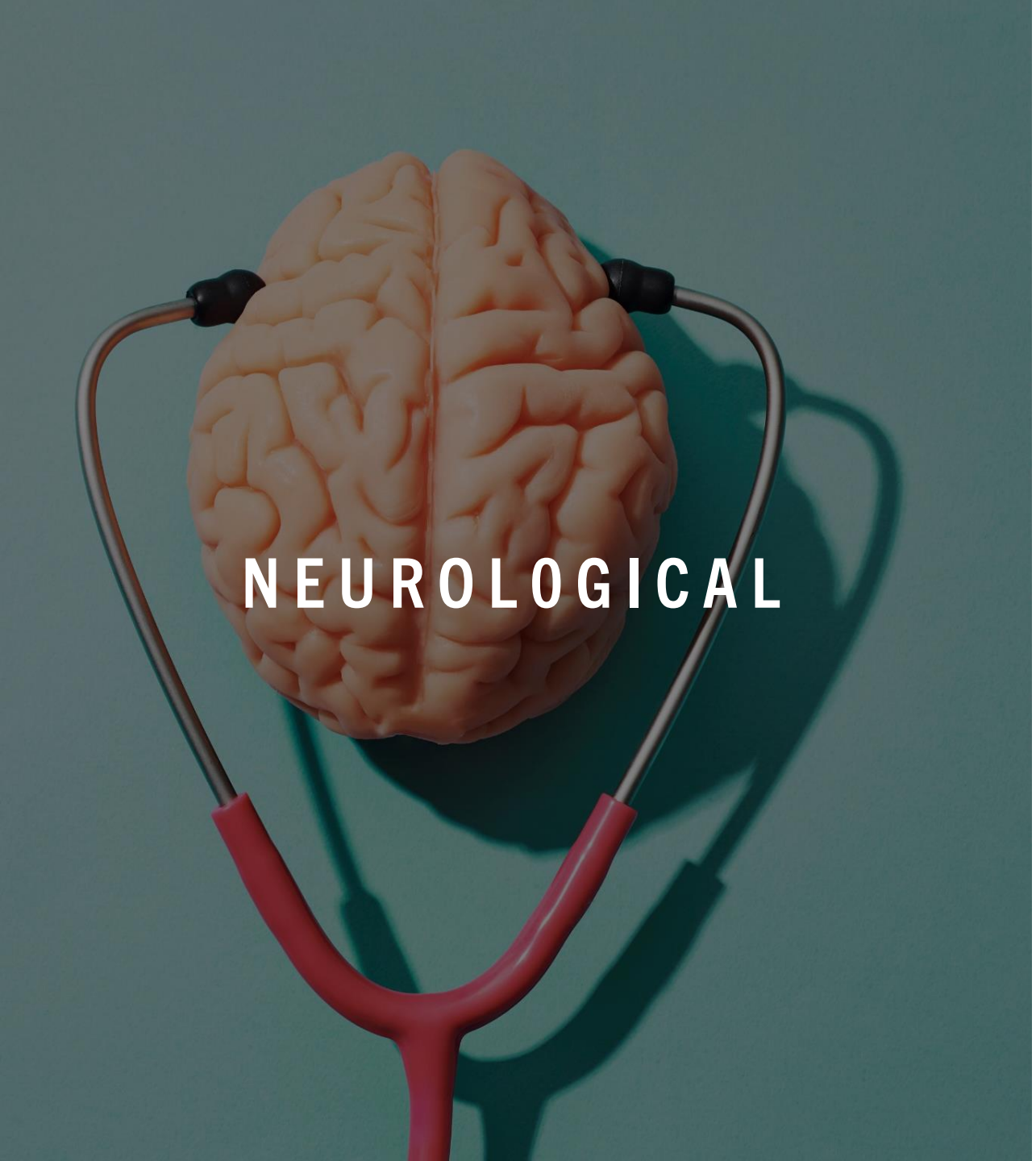
Nursing Interventions:

- Ambulation
- Leg exercises
- Antiembolism stockings, sequential devices
- Avoid pressure behind knees, prolonged sitting, crossing legs
- Elevate legs while sitting
- Hydration

Educate your patient to call a healthcare provider if:

- Red or swollen leg that is
- Painful
- Warm to the touch

(LOWDERMILK ET AL., 2024)



NEUROLOGICAL

- Headaches are common during pregnancy and postpartum but require careful assessment
- Cognitive changes may occur
- Carpal tunnel syndrome from pregnancy is relieved

(DAVIDSON ET AL., 2020; LOWDERMILK ET AL., 2024; SIMPSON & CREEHAN, 2021)

NEUROLOGICAL

Assess for:

- LOC
- Headaches
- Dizziness
- Syncope
- Visual disturbances
- Tinnitus
- Reflexes
- Clonus

Educate your patient to call a healthcare provider if:

- Headache that does not get better or go away, even after rest, hydration & OTC medicine
- Vision changes/disturbances
- Changes in LOC
- Seizure - 911

(DAVIDSON ET AL., 2024; LOWDERMILK ET AL., 2024; SIMPSON & CREEHAN, 2014; SUPLEE ET AL., 2017)

SPINAL HEADACHE
POSTDURAL PUNCTURE HEADACHE (PDPH)

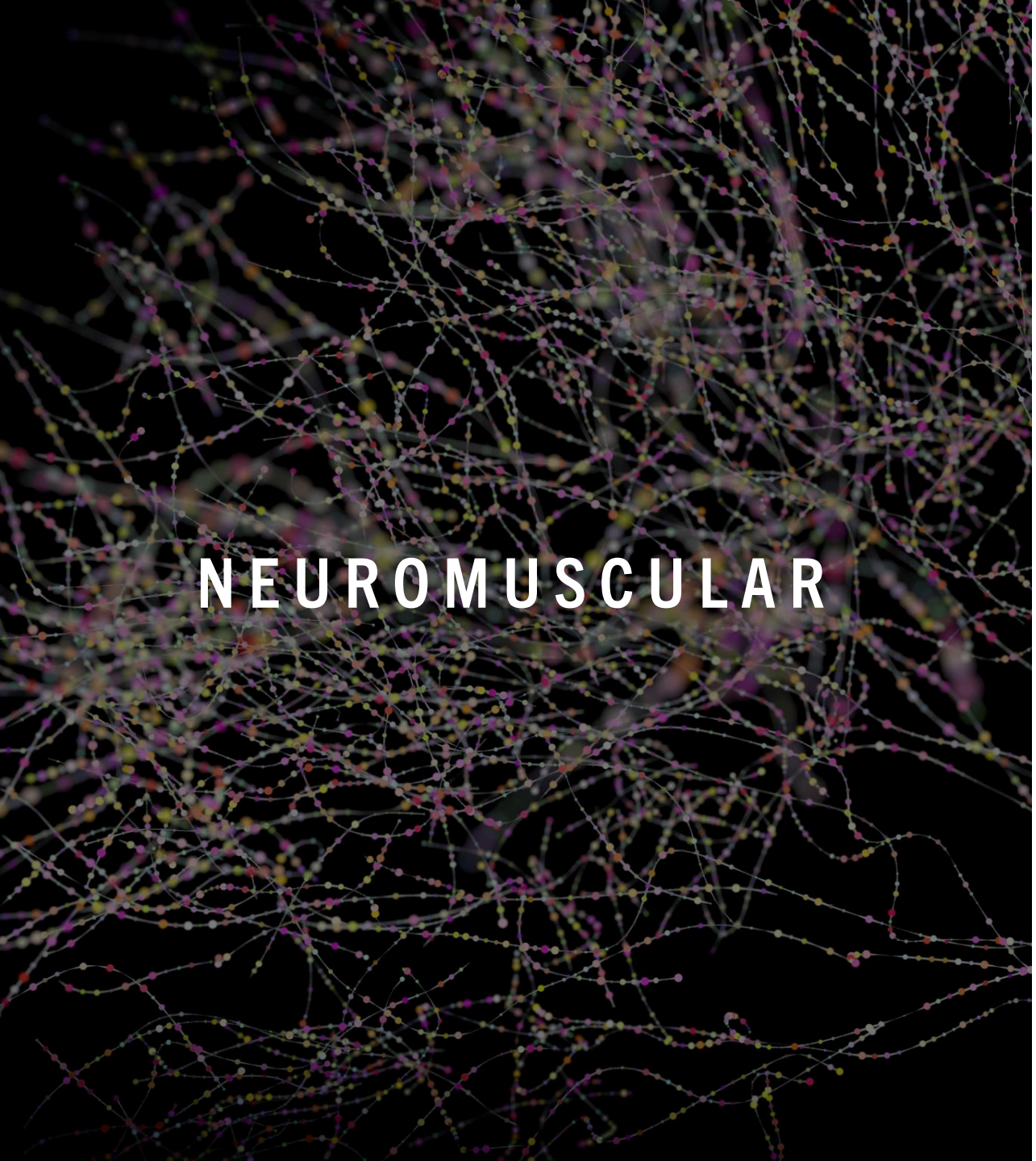
- More common with epidural vs. spinal
- Caused by leakage of cerebrospinal fluid from puncture of dura mater
- Signs and symptoms begin within 2 days and may persist for days or weeks
- Assuming an upright position triggers a change in volume of CSF and leaking

(LOWDERMILK ET AL., 2020)

SPINAL HEADACHE

- Conservative treatment
  - •Oral analgesics
  - •Hydration
  - •Methylxanthines (caffeine or theophylline)
  - •Bed rest
- Blood patch
  - •Most rapid & reliable treatment method
  - •20 ml of the patient's blood is injected slowly into the lumbar epidural space which creates a blood clot to patch the dura mater
  - •Very few complications

(LOWDERMILK ET AL., 2020)



- Assess lower extremities sensation and strenth
- Assist with ambulation
- Postpartum Chills:
  - May occur immediately after birth
  - Benign finding if afebrile
  - Nursing interventions: warm blanket, encourage to breathe slowly while relaxing shoulders (remind when shakes return)

(DAVIDSON ET AL., 2024)

IMMUNE SYSTEM

- Immune suppression from pregnancy gradually resolves
- Exacerbation of autoimmune conditions may occur

(LOWDERMILK ET AL., 2024)

POSTPARTUM INFECTION PREVENTION

Effective maternal & staff hand hygiene

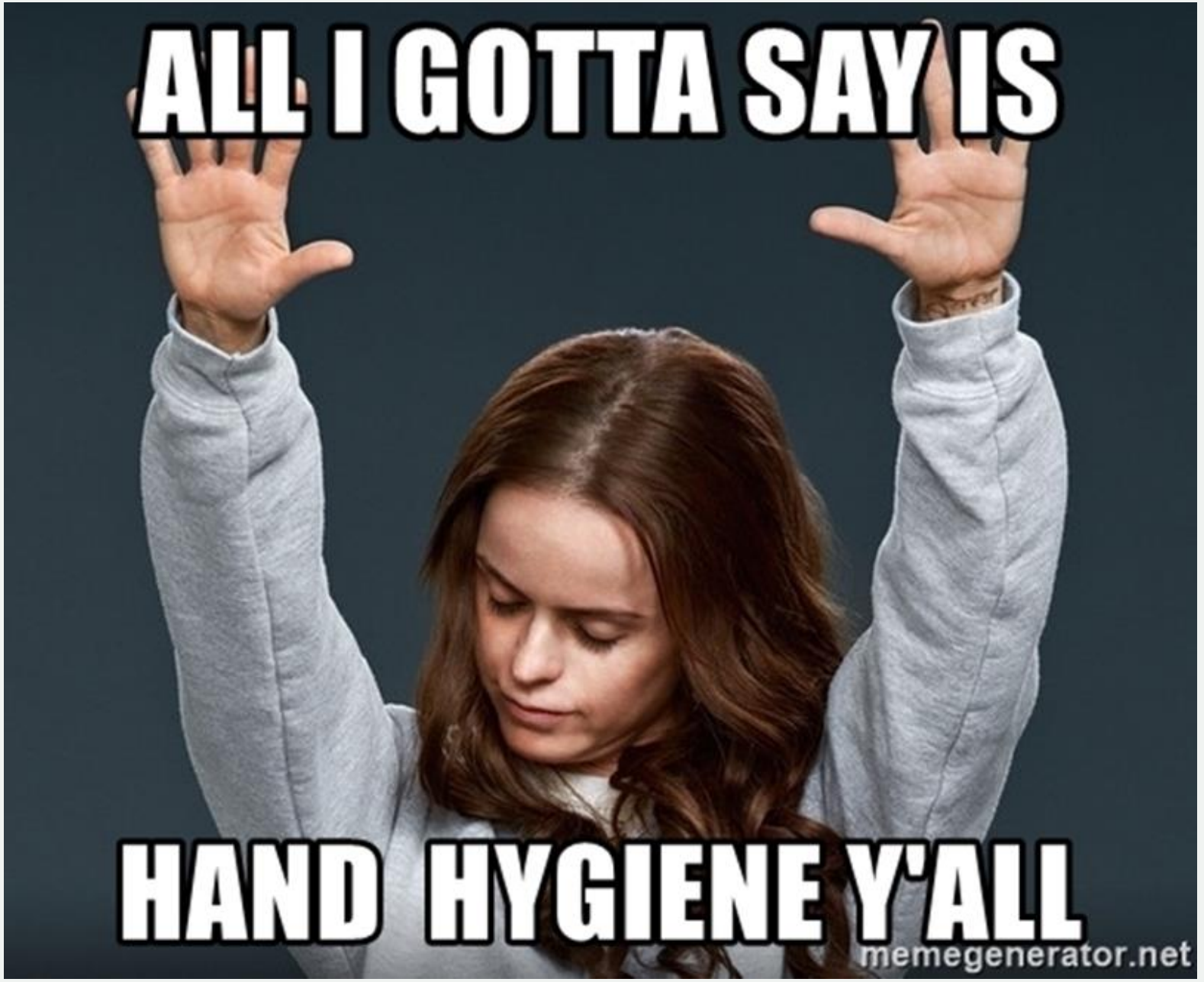
Adherence to aseptic techniques

Facilitate complete bladder emptying

Assess breastfeeding to ensure proper technique, adequate emptying, and prevention of nipple trauma

Proper maternal breast and perineal hygiene

((LOWDERMILK ET AL., 2024))


ALL I GOTTA SAY IS
HAND HYGIENE Y'ALL
memegenerator.net

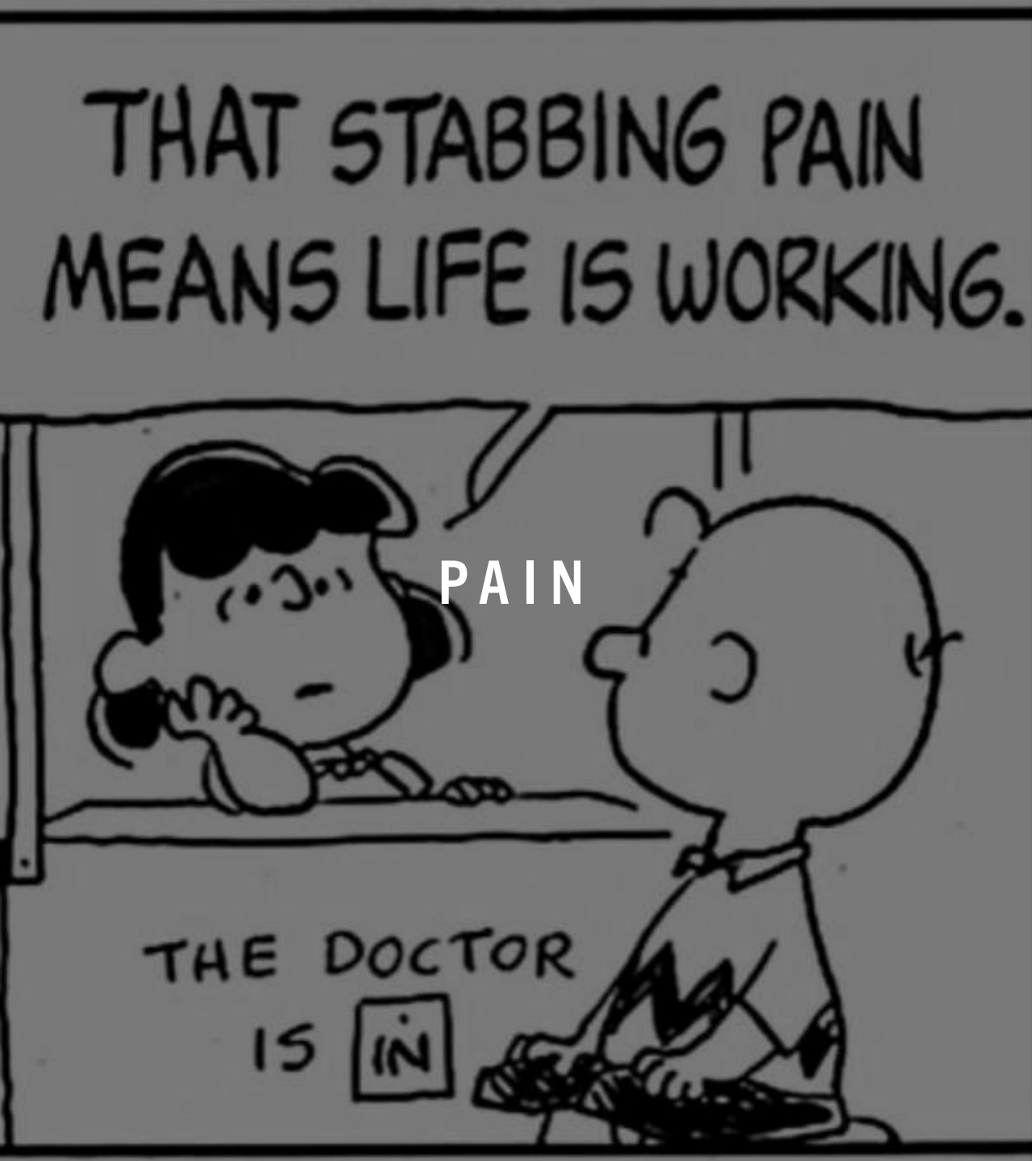
POSTPARTUM INFECTION EDUCATION

- Provide anticipatory teaching before D/C
  - •Preventative measures
  - •Signs and symptoms
  - •When to call provider

Educate your patient to call a healthcare provider if:

- •Temperature ≥100.4
- •Signs of REEDA
- •Foul odor
- •Flu like symptoms
- •Pain

((DAVIDSON ET AL., 2024)



- Intensity
- Quality
- Location
- Radiating elements
- Duration and onset
- Aggravating and alleviating factors
- Impact on the patient

PICTURE FROM: HTTPS://WWW.PINTEREST.COM/PIN/691725442622324199/

PAIN

- Common complaints of discomfort:
  - •Perineal: laceration or episiotomy
  - •Hemorrhoids
  - •Afterpains
  - •Muscle strain
- Nonpharmacological interventions
- Pharmacological interventions

(LOWDERMILK ET AL., 2024)

TRANSITION TO PARENTHOOD

- Maternal Role Attainment (MRA)
- Becoming a Mother (BAM)
- Helpful assessment for maternal mental health and maternal/infant bonding
- Influencing factors

(BAKER & JANKE, 2024; LOWDERMILK ET AL., 2024)

ASSESS BONDING

- Reaching or calling by name
- Identification
- Body contact
- Stimulation
- Eye contact
- Comfort level
- Affection
- Comforting

(LOWDERMILK ET AL., 2024)

FACILITATE BONDING

Skin to skin

Rooming in

Instruct & involve in newborn cares

Create awareness of and responsiveness to newborn

Promote maternal – newborn bonding and family – newborn bonding

(LOWDERMILK ET AL., 2024)

ENERGY AND EMOTIONS

	Normal PP Findings	Signs of Potential Complications	Nursing Interventions
Energy	• Able to care for self and infant • Able to sleep	• Lethargy • Extreme fatigue • Difficulty sleeping	• Cluster cares • Avoid frequent interruptions • Encourage daily rest periods
Emotions	• Excited • Happy • Interested and/or involved in infant care	• Sad • Tearful • Excessive weepiness • Irritability • Disinterested in infant care	• Skin to skin • Positive reinforcement • Supportive environment • Nonjudgmental approach

(LOWDERMILK ET AL., 2024)

REST AND ACTIVITY

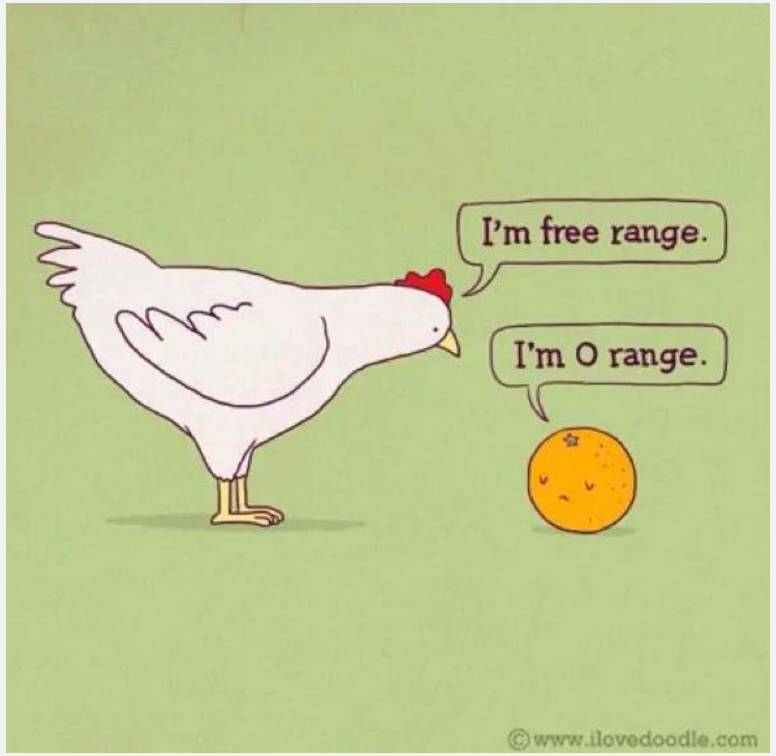
- Promote rest
- May resume nearly all activities by 4-6 wks PP
- Encourage 1-2 daily naps
- Sexual Activity

- Avoid:
  - Heavy lifting >10 lbs after cesarean birth
  - Driving while taking narcotics
  - Strenuous activity

(DAVIDSON ET AL., 2024; LOWDERMILK ET AL., 2024)

NUTRITION

- Healthy, well-balanced diet
- Consider cultural preferences
- Provide dietary counseling related to breastfeeding, constipation, anemia, etc.
- If mother is breastfeeding:
  - Additional 500 kcal daily
  - Multivitamin/prenatal supplement



(DAVIDSON ET AL., 2024; LOWDERMILK ET AL., 2024)

COMMON IMMUNIZATIONS

Tdap

- Administered during each pregnancy
- Recommended timing is 27-36 weeks gestation
- Given early, maximizes the maternal antibody response and passive antibody transfer to the fetus
- Administered postpartum to women who have not previously received the vaccine

Influenza

- Administer immediately PP if: not immunized & delivered during current flu season

(ACOG, 2017; LOWDERMILK ET AL., 2024)

COMMON IMMUNIZATIONS

MMR

- Administered if rubella non-immune or equivocal
- Live virus
- Avoid pregnancy for 4 weeks after administration
- Administering with RhoGAM may interfere with desired immune response
  - Post-vaccination serology test in 3 months PP to verify immunity
- SubQ

RhoGAM

- Indication: Rh- mother, Rh+ infant
- Prevents sensitization in Rh- mothers by preventing production of anti-Rh (D) antibodies after exposure to Rh+ blood
- Administer within 72 hours PP
- Workup needed to determine dose: usually 300 mcg
- IV push or IM
- Protects again erythroblastosis fetalis (hemolytic disease of the newborn)

(LOWDERMILK ET AL., 2024)

POSTPARTUM VITAL SIGNS CHANGES

Temperature	• May increase to 100.4 for *up to* 24 hours postpartum • Should be afebrile *after* 24 hours postpartum
Pulse	• Remains elevated for approximately 1 hour postpartum • Gradually decreases over first 48 hours postpartum • Puerperal bradycardia common, decreasing to 40-50 bpm
Respirations	• Respirations return to baseline soon after birth • Rate should be within prepregnancy baseline soon after birth
Blood Pressure	• 5% transient increase may occur during first four days postpartum • Return to pre-pregnancy levels weeks to months postpartum • Orthostatic hypotension is common in first 48 hours postpartum
Oxygen	• Saturations should remain $\geq$ 95%

(DAVIDSON ET AL., 2024; LOWDERMILK ET AL., 2024)

NORMAL/ABNORMAL POSTPARTUM VITAL SIGNS

Temperature 97.2-100.4F, 36.2-38C	• >38C (100.4F) ≥ 24hours postpartum = infection/sepsis • <96.8 = sepsis
Pulse 50-90 beats/min	• Tachycardia: pain, fever, dehydration, hemorrhage, infection/sepsis, CVD • Bradycardia: anesthesia effects, may be transient
Respirations 16-20 breaths/min	• Tachypnea: anxiety, respiratory disease, infection/sepsis, CVD • Bradypnea: opioid medication/anesthesia effects
Blood Pressure Should be consistent with pregnancy baseline	• Hypertension (>140/90mmHg): preeclampsia, essential hypertension, CVD, anxiety, renal disease • Hypotension (SBP <90, MAP <65): may be transient, hemorrhage, anesthesia effects, sepsis
Oxygen >95%	• <95%: respiratory disease, sepsis, preeclampsia, CVD

(DAVIDSON ET AL., 2024; LOWDERMILK ET AL., 2024)

POSTPARTUM ASSESSMENT TIPS

- Identify risk factors
- Choose an appropriate time
- Perform a full head to toe assessment
- Explain assessment component purposes
- Find your method & be consistent
- Stay organized
- Document in real time
- Incorporate discharge education early on & reinforce often

(DAVIDSON ET AL., 2024)

ASSESSMENT FREQUENCY

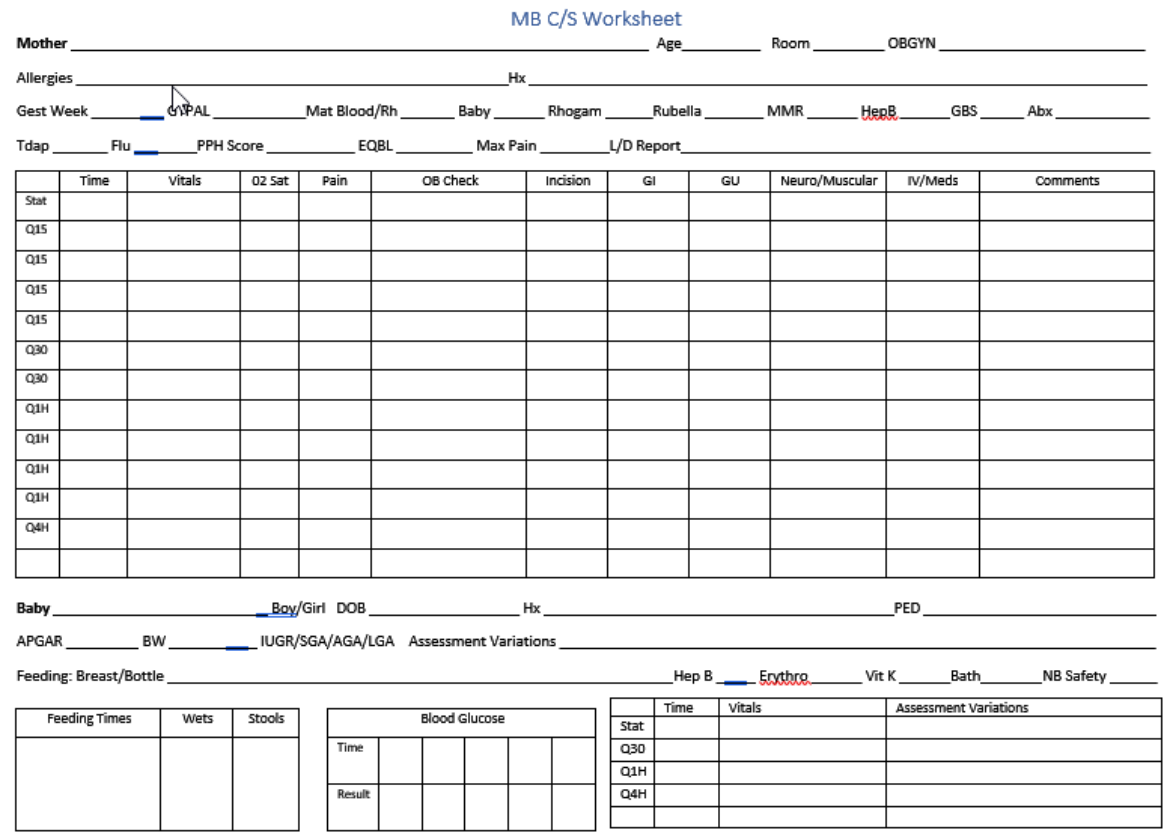
- Frequency varies based on delivery process, anesthesia used, and presence of complications
- Postpartum vital signs and postpartum assessment *at least*:

Every 15 minutes	Every 30 minutes	Every 4 hours
1st hour PP	2nd hour PP	12-24 hours PP

- More frequently w/complications
- Refer to your institution policies and procedures

(BAKER & JANKE, 2024)

POSTPARTUM ORGANIZATIONAL TOOLS



MB C/S Worksheet

Mother _____ Age_____ Room _____ OBGYN _____

Allergies _____ Hx _____

Gest Week _____ GTPAL _____ Mat Blood/Rh _____ Baby _____ Rhogam _____ Rubella _____ MMR _____ HepB _____ GBS _____ Abx _____

Tdap _____ Flu _____ PPH Score _____ EQBL _____ Max Pain _____ L/D Report _____

	Time	Vitals	02 Sat	Pain	OB Check	Incision	GI	GU	Neuro/Muscular	IV/Meds	Comments
Stat											
Q15											
Q15											
Q15											
Q15											
Q30											
Q30											
Q1H											
Q1H											
Q1H											
Q1H											
Q4H											

Baby _____ Boy/Girl DOB _____ Hx _____ PED _____

APGAR _____ BW _____ IUGR/SGA/AGA/LGA Assessment Variations _____

Feeding: Breast/Bottle _____ Hep B _____ Erythro _____ Vit K _____ Bath _____ NB Safety _____

Feeding Times	Wets	Stools

Blood Glucose					
Time					
Result					

	Time	Vitals	Assessment Variations
Stat			
Q30			
Q1H			
Q4H			

Mother _____

Room _____ OBGYN _____ Age_____

Vaginal or C/S _____

Allergies _____

Hx _____

Gest Week _____ GTPAL _____

Mat Blood/Rh _____ Baby _____ Rhogam _____

Rubella _____ MMR _____ HepB _____

GBS _____ Abx _____ Tdap _____ Flu _____

PPH Score _____ EQBL _____ Max Pain _____

EPDS _____ Consults _____

Assessments

Fundus _____ Lochia _____ Hem _____

Lac/Epis/Incision _____

Neuro: CNS Disturbances _____

Reflexes _____ Clonus _____ LOC _____

LS _____

Homans _____ Edema _____

GI _____ GU _____ I/O:

0800	1200	1600	1900

IV _____ PCA _____ VTE Prevention _____

Pain _____

Breasts _____

Misc _____

Motrin _____ Tylenol _____ Hydro/Oxy_____

0700		
0800		
0900		
1000		
1100		
1200		
1300		
1400		
1500		
1600		
1700		
1800		
1900	Goals_____ Charges_____ Update POC_____	Goals_____ Charges_____ Update POC_____

Baby _____ Boy/Girl

DOB _____ PED _____

APGAR _____ Hx _____

BW _____ IUGR/SGA/AGA/LGA

MN _____ DCW _____ 10% _____

Assessment Variations _____

Feeding: Breast/Bottle _____ Devices _____

_____ Assess. Charted_____

Blood Glucose _____

Feeding	Wets	Stools

Circ _____ Post Void _____

Hep B _____ Erythro _____ Vit K _____

Bath_____ HS_____ NBS_____

Cord Clamp_____ CCHD_____ Carseat Study_____

TCBili _____ TSBili _____ Tx _____

Discharge

Orders: OB/PED D/C Papers: Mom/Baby

Pharmacy _____

NB Safety _____ Videos_____ Car Seat Safety _____

EPDS _____ Birth Cert _____ Cry Plan _____

LET'S PLAY...
NAME
THAT
RISK FACTOR!

POSTPARTUM DISCHARGE EDUCATION

- Planning begins *on admission*
- Use standardized education materials
- Early recognition of maternal complications is critical
- Patients need consistent, comprehensive, evidence-based discharge instructions

(DAVIDSON ET AL., 2024; SUPLEE ET AL., 2017)

MATERNAL WARNING SIGNS

URGENT MATERNAL WARNING SIGNS

If you have any of these symptoms during or after pregnancy, contact your health care provider and get help right away.

If you can't reach your provider, go to the emergency room. Remember to say that you're pregnant or have been pregnant within the last year.

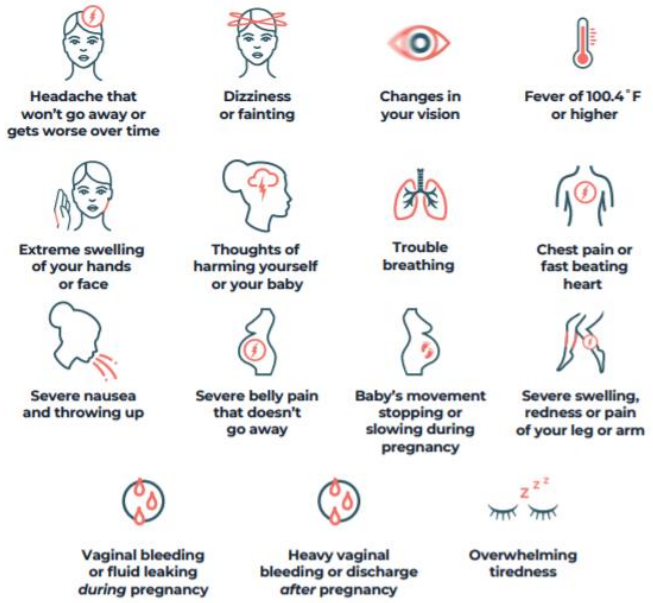
Learn more: safehealthcareforeverywoman.org/urgentmaternalwarningsigns

Take a photo to learn more

Standardization of health care processes and reduced variation has been shown to improve outcomes and quality of care. The Council on Patient Safety in Women's Health Care disseminates patient

Pregnant now or within the last year?

Get medical care right away if you experience any of the following symptoms:



These could be signs of very serious complications. If you can't reach a healthcare provider, go to the emergency room. Be sure to tell them you are pregnant or were pregnant within the last year.

Learn more at www.cdc.gov/HearHer

CDC

HEAR HER CONCERNS

This list of urgent maternal warning signs was developed by the Council on Patient Safety in Women's Health Care.

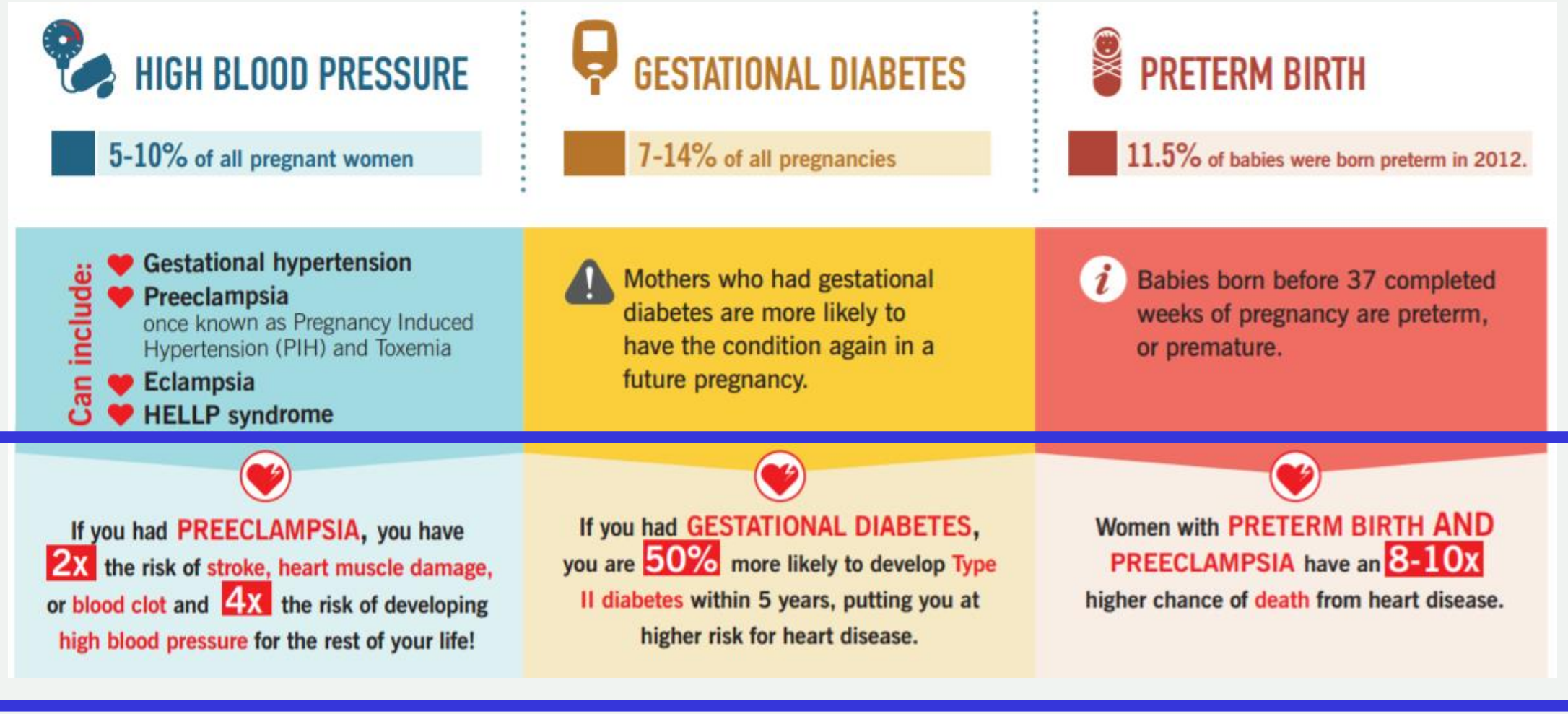
Methodist Health System
Post-Birth Warning Signs

Call YOUR Doctor	• **High Blood Pressure**:
	  • Unrelieved headache
	  • Any type of visual disturbance and/or vision change
	  • Excessive swelling of hands, feet or face
	• **Emotional Changes**
	  • Baby blues that last longer than 1 week
	  • Feeling of extreme sadness or anxiety, or a feeling that you don't want to be with your baby
	  • Thoughts of harming yourself and/or your baby
	• **Signs of Infection**
	  • Fever 100.4F or greater
	  • Breast redness
	  • Incision redness, foul odor or drainage
	  • Foul vaginal odor
	• **Pain**
	  • Unrelieved pain anywhere in your body that is more or different than at the time of your discharge
	• **Heavy Bleeding**
	  • Bleeding that soaks more than 1 pad in 1 hour or passing a clot greater than the size of a golf ball

Call 911	• **If you experience chest pain or shortness of breath**
Call your BABY's Doctor	***If your baby has:*** • Blue or pale colored skin • Yellow skin or eyes • Redness, drainage or foul odor from the umbilical cord • Temperature of 100.4°F or greater • Repeated vomiting or several refused feedings in a row • No stool for 48 hours and/or less than 6 wet diapers in 24 hours • Frequent bowel movements with excess fluid or mucus or unusually foul odor • Drastic changes in newborn behavior (examples: excessive crying, difficult to wake up, refusing to eat)

For more information about newborn and mother care, please refer to "A New Beginning" eBook at **Bestcare.org/newbeginning or Bestcare.org/mjenewbeginning**

Do not hesitate to call the doctor if you have questions or concerns about yourself or your baby's health.

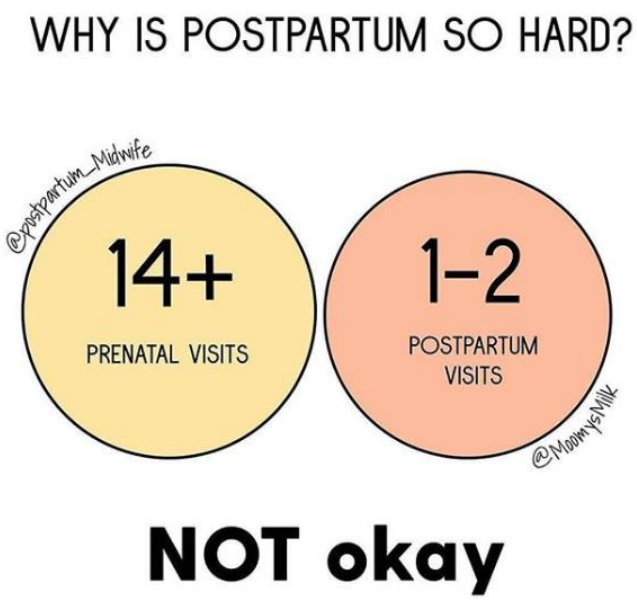


MATERNAL COMPLICATIONS RESULT IN LIFELONG HEALTH RISKS

(CMQCC, 2022)

FOLLOW UP AFTER DISCHARGE

- Timing should be individualized
- Initial assessment within 3 weeks postpartum
- Early follow-up warranted for complications
- Follow-up to initial assessment no later than 12 weeks postpartum
- Additional follow up support: home visits, telephone, support groups, community resources
- Schedule prior to discharge



(LOWDERMILK ET AL., 2024)


QUESTIONS?

REFERENCES

American College of Obstetricians and Gynecologists (2017). Update on immunization and pregnancy: tetanus, diphtheria, and pertussis vaccination. *ACOG Committee Opinion, 718.* Reaffirmed 2022. Retrieved from https://www.acog.org/Clinical-Guidance-and-Publications/Committee-Opinions/Committee-on-Obstetric-Practice/Update-on-Immunization-and-Pregnancy-Tetanus-Diphtheria-and-Pertussis-Vaccination

Davidson, M., London, M., & Ladewig, P. (2024). *Olds' maternal-newborn nursing & women's health across the lifespan* (12th ed.). Pearson Education, Inc.

Lowdermilk, D. L., Cashion, K., Alden, K. R., Olshansky, E. F. & Perry, S.E. (2024). *Maternity & women's health care* (13th ed.). St. Louis, MO: Elsevier.

Baker, B. & Janke, J. (2024). *Core curriculum for maternal newborn nursing (*6th ed.). Elsevier.

Simpson, K. R., Creehan, P. A., O'Brien-Abel, N., Roth, C. K., & Rohan, A. J. (2021). *Perinatal Nursing* (5th ed.). Wolters Kluwer.

Suplee, P. D., Kleppel, L., Santa-Donato, A., & Bingham, D. (2017). Improving postpartum education about warning signs of maternal morbidity and mortality. *Nursing for Women's Health 20*(6), 553-567. https://doi.org/10.1016/j.nwh.2016.10.009