Fundamentals Study Guide

Elimination • Fluid balance • Oxygenation • Perfusion

This guide reviews elimination, fluid balance, oxygenation, and perfusion. As you study, connect the findings to what may be happening and what the nurse should do. The fluid section focuses on fluid balance and IV therapy.

How the topics fit together
Changes in elimination can affect fluid balance. Fluid volume affects circulation. The lungs bring oxygen into the body, and circulation carries it to the tissues. A problem in one area can affect another.

What is in each section

Topic	Pages	What to review
Elimination	2–5	Urine and stool assessment, common problems, and diversions.
Fluid balance and IV therapy	6–10	Fluid deficit and excess, fluid movement, intake and output, and IV safety.
Oxygenation	11–13	Breathing assessment, signs of deterioration, and COPD care.
Perfusion and hypertension	14–16	Circulation assessment, hypertension care, and medication monitoring.
Apply and check	17–18	Practice questions and answer explanations.

When you work through a case

Assess: What has changed? **Analyze:** What might the findings mean? **Plan:** What needs attention first? **Implement:** What action should the nurse take? **Evaluate:** Did the patient improve?

Try this as you study
Read a topic, then close the guide and explain what is causing the problem, what findings you would expect, what the nurse should do first, and how you would know the patient improved. Check the guide to fill in anything you missed, then try a few related questions.

After a few practice questions, review the topics you missed. Try them again later without the guide.

Based on the FND-01 Exam 3 objectives.

Assess urinary elimination

EL-01 • EL-02 • EL-03

The kidneys make urine, the bladder stores it, and coordinated nerves and muscles allow emptying. Low urine output can reflect low production, obstruction, or incomplete bladder emptying. Your assessment helps distinguish them.

Begin with the usual pattern

Ask about frequency, urgency, burning, difficulty starting, weak stream, leakage, and the feeling of incomplete emptying. Review fluid intake, recent surgery, medications, mobility, cognition, and conditions such as an enlarged prostate or neurologic disease. Provide privacy and ask about barriers to reaching the toilet.

Expected urine is generally clear and pale yellow, with comfortable emptying. Measure output and observe color, clarity, and visible blood. Compare findings with intake, vital signs, and the person's baseline. Concentrated urine can accompany low intake; urine appearance alone does not establish the cause.

Term	Meaning
Dysuria	Pain or burning with urination.
Hematuria	Blood in the urine.
Oliguria or anuria	Low output or almost no output; investigate the cause.
Polyuria or nocturia	Large urine volume or urination during the night.
Pyuria, proteinuria, glycosuria	White cells, protein, or glucose in urine; interpret with the clinical picture.

Choose assessment tools for the question

A **bladder scan and postvoid residual** help identify retained urine. Urinalysis examines urine characteristics and cellular or chemical findings. A urine culture helps identify an organism and guide prescribed therapy. Kidney-function tests and imaging may be ordered when impaired production or obstruction is suspected.

Priority cue
A painful, distended bladder with inability to void needs prompt assessment and escalation. Do not assume that drinking more fluid will resolve an obstruction.

Practice now
Explain why a bladder scan is useful when a patient is passing only small amounts of urine. Then search your available question bank for "urinary retention assessment" or "postvoid residual."

FND-09 slides 3 and 6–12; FND-11 slides 2–3.

Care for urinary problems

EL-01 • EL-02 • EL-03

Problem	Clues	Nursing focus
Retention	Hesitancy, distention, incomplete emptying, high residual; leakage can still occur.	Assess emptying and cause; use ordered drainage when indicated.
Overflow incontinence	Leakage from an overfilled bladder; residual may be high.	Assess retention rather than treating leakage alone.
Stress incontinence	Leakage with coughing, laughing, or exertion.	Pelvic-floor strengthening when appropriate.
Urge incontinence	Sudden strong urge before leakage.	Bladder training, toileting plan, and prescribed treatment.
Functional incontinence	The person cannot reach or use the toilet in time.	Improve access, assistance, mobility, and safety.
UTI	Dysuria, frequency, urgency; fever or flank pain may suggest a more extensive illness.	Assess symptoms, obtain ordered specimens, give prescribed therapy, and reassess.

Use the least invasive intervention that addresses the actual problem. Scheduled toileting, privacy, a bedside commode, and accessible clothing may help. An external collection device manages leakage; it does not empty a retained bladder. An indwelling catheter requires an appropriate indication.

Know what each medication does

Oxybutynin and related anticholinergics reduce unwanted bladder contractions; watch for dry mouth, constipation, and impaired emptying. **Tamsulosin** relaxes the bladder outlet and prostate; monitor dizziness and orthostatic symptoms. **Finasteride** reduces prostate size over time and does not provide immediate relief of acute retention.

Give UTI antibiotics as prescribed and review allergies, renal considerations, culture results, and response. Avoid choosing an antibiotic only from a memorized list of slide examples.

Evaluate the result
Look for easier emptying, lower residual when measured, fewer leakage episodes, improved comfort, and intact skin. For infection, assess the symptom and temperature trend rather than urine odor alone.

Practice now
Compare stress, urge, overflow, and functional incontinence from memory. Use the elimination scenario deck, slide 2, to practice identifying the cause before looking at its notes.

FND-09 slides 10 and 12–17; FND-11 slides 2–3.

Assess bowel function and common changes

EL-04 • EL-05

Bowel care begins with the person's normal pattern. Ask about the last usual bowel movement, stool consistency, straining, pain, leakage, blood, diet, fluid intake, activity, medication changes, and recent antibiotics. Assess the abdomen and hydration status. In a routine abdominal examination, auscultation comes before percussion and palpation.

Constipation and impaction

Opioids, immobility, low intake, and ignoring the urge to defecate can slow stool movement. Stool becomes harder as more water is absorbed. **Small amounts of liquid stool can leak around an impaction**, so leakage does not prove that constipation has resolved.

Promote a regular toileting routine and appropriate movement, fluids, and dietary fiber when suitable. Give ordered bowel medications and evaluate the response. Severe pain, vomiting, major distention, or suspected obstruction needs assessment before routine fiber, laxatives, or enemas.

Bowel incontinence and diarrhea

Assess the cause, stool frequency, skin, and fluid losses. Protect skin with gentle cleansing and a suitable barrier. Frequent new loose stools after antibiotics warrant assessment for infection and prescribed testing; follow infection-control policy. Stool odor alone does not diagnose C. difficile.

Irritable bowel syndrome

IBS involves recurring abdominal pain with changes in bowel habits, including diarrhea, constipation, or both. The supplied case links symptoms with stress and dietary habits. Ask about triggers and support a symptom diary, regular intake, and individualized treatment. New bleeding, fever, unintended weight loss, or worsening persistent symptoms requires further evaluation.

Practice now
Revisit scenario slide 5. Explain why loose seepage after several days without a usual stool can still point to impaction. Search "fecal impaction overflow diarrhea" for focused review.

FND-11 slides 4–6; FND-09 slide 13 notes. Supporting detail: Open RN elimination and NIDDK IBS.

Urinary and bowel diversions

EL-06

A diversion reroutes urine or stool when the usual pathway cannot be used or needs to heal. First identify what the diversion drains and whether it provides storage or continuous drainage. That determines the care.

Diversion	Purpose or expected pattern	Care connection
Ileal conduit	Urine drains continuously through a stoma into a pouch.	Maintain drainage and protect the skin.
Continent urinary reservoir or neobladder	Stores urine; emptying method depends on the surgical design.	Follow the prescribed emptying or catheterization schedule.
Nephrostomy	Drains urine directly from the renal pelvis.	Monitor output, tubing, dressing, and the prescribed flushing plan.
Colostomy	Diverts stool from the colon.	Stool consistency depends partly on the location.
Ileostomy	Diverts output from the ileum.	More liquid output increases fluid-loss concerns.

Keep care focused

A healthy stoma is moist and pink to red. Report a pale, dusky, purple, or black appearance promptly. Measure output, assess the surrounding skin, and maintain a pouch seal. Address leakage rather than repeatedly covering irritated skin. Empty the pouch before it becomes heavy and pulls on the seal.

Teaching includes output monitoring, pouch care, complication signs, and obtaining supplies. Ask the patient or caregiver to demonstrate the steps. Dexterity, vision, mobility, and body-image concerns can change the support needed.

Practice now
Without looking, explain the difference between an ileal conduit and an ileostomy. Then name one reason each could affect fluid balance. Review “urinary diversion versus bowel ostomy” if the names are confusing.

FND-09 slides 16–19. Supporting bowel-diversion detail: Open RN Nursing Skills 2e section 21.7.

Understand where water moves

FL-01 • FL-02 • FL-04

Fluid balance depends on how much water enters, how much leaves, and where it is distributed. **Intracellular fluid** is inside cells. **Extracellular fluid** includes interstitial fluid between cells and intravascular fluid in blood vessels. A patient can have swelling in the tissues while circulation is still inadequate.

Water movement explains the findings

Osmosis moves water across a selectively permeable membrane toward the side with a higher effective solute concentration. Tonicity helps explain whether a solution tends to move water into or out of cells. **Diffusion** moves particles down a concentration gradient. **Active transport** uses energy to move substances against a gradient.

Hydrostatic pressure pushes fluid out of capillaries. **Oncotic pressure**, generated largely by plasma proteins, helps draw water into them. Changes in these forces can contribute to edema. Memorizing "swelling" without its cause makes the next nursing decision harder.

How the body holds on to fluid

When effective circulating volume falls, the kidneys activate the renin–angiotensin–aldosterone system. It helps increase vascular tone and retain sodium and water. Antidiuretic hormone increases water reabsorption in the kidneys. Thirst supports intake. These responses help conserve volume, but illness can overwhelm them.

What this section covers
Use solutes to understand water movement and IV fluids. The main tasks here are fluid distribution, deficit or excess, intake/output, and IV therapy. Detailed electrolyte disorders and ABG interpretation belong to the separate Med-Surg review.

Practice now
Draw a cell beside a blood vessel. Explain where water moves with isotonic, hypotonic, and hypertonic solutions before checking page 8.

FND-08 slides 4–11 and 19–30.

Recognize fluid deficit and excess

FL-01 • FL-02 • FL-03 • FL-05

Assessment	Fluid volume deficit	Fluid volume excess
Common causes	Vomiting, diarrhea, bleeding, poor intake, excessive losses.	Reduced excretion, excess administration, impaired cardiac or renal function.
Pattern of cues	Thirst, dry mucosa, weight loss, low output, faster pulse, orthostatic symptoms; hypotension may develop.	Weight gain, edema, crackles, dyspnea, possible neck-vein distention; BP may rise.
Main concern	Reduced circulation and organ perfusion.	Congestion, especially impaired breathing.
Response to treatment	Improved perfusion, output, comfort, and vital-sign trend.	Easier breathing, less congestion, and improved weight/output trend.

Use a cluster and a trend. Compare daily weights taken under similar conditions, I&O, vital signs, lung sounds, edema, and mental status. About 1 kg of short-term weight change can represent roughly 1 L of fluid, but interpret it in context. A single sign does not establish the diagnosis.

Apply ADPIE to the actual problem

For deficit, identify ongoing losses and assess perfusion. Replace fluid by the prescribed route and reassess. Gastroenteritis connects GI losses to hypovolemia; oral rehydration may be appropriate when the person can tolerate it, while more severe illness may require IV therapy.

For excess, assess breathing promptly and position upright when tolerated. Review the infusion, monitor output, and implement ordered fluid limits or diuretics. New respiratory distress requires an immediate response and escalation under the setting's emergency protocol.

Practice now
Give three findings that would support deficit and three that support excess. For each, explain the mechanism. Search "fluid volume deficit versus excess nursing" to practice comparison questions.

FND-08 slides 32–34; FND-06 pages 3–11; supporting Open RN fluid assessment.

IV fluid types

FL-04 • FL-07

The fluid's tonicity helps predict water movement. The patient's condition determines whether that movement is useful or harmful. Check the prescribed fluid, concentration, rate, and reason rather than selecting from the name alone.

Type and examples	Main effect	Nursing concern
Isotonic 0.9% sodium chloride; lactated Ringer's	Expands extracellular volume without a major initial shift into or out of cells.	Monitor for fluid overload, especially with impaired cardiac or renal function.
Hypotonic 0.45% sodium chloride	Provides relatively more free water; water can move into cells.	Can worsen cellular swelling or reduce effective circulating volume.
Hypertonic 3% sodium chloride	Draws water toward the extracellular space and can expand intravascular volume.	Requires close monitoring and a specific protocol; watch for overload and unsafe correction.

Think through the patient response

If the goal is restoring circulating volume, assess whether perfusion improves. If the person develops new crackles or increased work of breathing during an infusion, evaluate for a complication promptly. A correctly programmed rate does not guarantee that the patient is tolerating the fluid.

Supporting detail
Hypertonic-saline access requirements depend on concentration, duration, and institutional protocol. Do not turn the slide's "Central Line" note into a universal rule for every setting. This guide does not prescribe a fluid or rate.

Practice now
Cover the middle column and predict the direction of water movement for each type. Then check the clinical meaning, not just whether the word sounds familiar.

FND-08 slides 19–24. Safe use always depends on the order, access, condition, and monitoring.

Keep IV therapy safe

FL-07 • FL-09

Before and during the infusion

Verify the order and patient, assess fluid status and access, and check the solution's label, integrity, expiration, compatibility, and prescribed rate. Prepare and prime the tubing, use aseptic technique, and trace the line from bag to patient. Insertion requires training, aseptic skin preparation, patency assessment, securement, and documentation according to the local skill protocol.

During therapy, reassess the patient and site, compare the delivered volume with the order, maintain the dressing and connections, and respond to alarms. Check for pain, swelling, temperature changes, redness, leakage, and altered flow. Do not force a flush against resistance.

Problem	What to recognize	Immediate direction
Infiltration	Nonvesicant fluid leaks into tissue; swelling, coolness, discomfort, or slow flow.	Stop the infusion; assess and manage the site according to policy.
Phlebitis	Vein inflammation; pain, warmth, redness, or a palpable cord.	Stop the infusion and follow policy for catheter removal and site care.
Possible extravasation	A tissue-damaging drug leaks outside the vein.	Stop the infusion and use the drug-specific protocol. Do not flush; the catheter may be needed for aspiration or antidote.

Priority cue

Site problems and systemic problems require different assessments. A painful swollen site suggests a local complication. New dyspnea or crackles during fluids suggests a systemic problem and needs prompt respiratory assessment.

Practice now

Explain why "stop the infusion" is common to these site problems, but removing the catheter immediately is not appropriate for every extravasation protocol. Review "infiltration phlebitis extravasation."

FND-08 objectives and slide 35; supporting Open RN Nursing Skills IV therapy guidance.

Calculate intake, output, and IV rates

FL-06 • FL-08

Count volume over the same time period

Intake includes measured oral fluids, tube feeding and water flushes, IV solutions, IV medications, and blood products. Include foods counted as liquid by the recording policy. Use the actual infused volume and avoid counting the same fluid twice. Output includes urine, measured emesis, liquid stool or ostomy output, and drainage. Net balance equals total intake minus measured output.

Worked I&O example
During one shift, oral intake is 480 mL, IV fluid is 75 mL/hr for 8 hours, and an IV medication adds 100 mL. Intake = 480 + 600 + 100 = 1,180 mL. Urine is 900 mL and emesis is 150 mL. Output = 1,050 mL. Net measured balance = +130 mL. Insensible losses are not captured by this total.

Use units to choose the equation

Pump rate in mL/hr = volume in mL ÷ time in hours. For 1,000 mL over 8 hours: 1,000 ÷ 8 = **125 mL/hr**. If time is given in minutes, convert to hours before dividing.

Gravity rate in gtt/min = volume in mL × drop factor in gtt/mL ÷ time in minutes. For 500 mL over 4 hours with 15 gtt/mL tubing: (500 × 15) ÷ 240 = 31.25, or **31 gtt/min** after rounding to a whole drop. Check the tubing label; do not assume a drop factor.

Try these before page 18
A: Calculate 750 mL over 6 hours by pump. B: Calculate 1,000 mL over 8 hours with 20 gtt/mL tubing. C: A 240 mL cup of ice chips is charted at half its measured volume in this exercise. What intake is recorded?

Follow the course's rounding directions and the device requirements. Estimate the answer before entering it, then verify the unit and clinical reasonableness. Search "IV pump mL per hour" and "gravity drip factor" for separate practice.

FND-08 slides 36–43; supporting Open RN Nursing Skills sections 5.14–5.15. Examples are original fictional practice.

Respiratory assessment

OX-01 • OX-03

Ventilation moves air. **Gas exchange** transfers oxygen and carbon dioxide between the alveoli and blood. **Perfusion** delivers blood to tissue. An open airway, effective breathing, enough functioning hemoglobin, and adequate circulation all matter.

Ask and observe together

Ask about onset, usual breathing, activity tolerance, cough, sputum, chest discomfort, exposures, smoking or vaping, infection symptoms, medications, and home oxygen. Observe respiratory rate, depth, symmetry, effort, ability to speak, position, and mental status. Listen to lung sounds and compare sides.

Interpret oxygen saturation alongside the person and the signal quality. Check the sensor, perfusion, movement, and whether the reading fits the assessment. **Pulse oximetry does not measure ventilation or carbon dioxide.** A reassuring number does not cancel increasing fatigue, confusion, or poor air movement.

Recognize deterioration

New restlessness, increasing work of breathing, inability to speak normally, falling saturation, cyanosis, or a change in alertness needs prompt attention. Severe distress or reduced responsiveness requires immediate emergency response. Support airway and breathing while help is activated; do not finish a long history first.

Supporting detail across the lifespan
Infants have smaller airways and less reserve. Older adults may have reduced respiratory reserve and less dramatic infection symptoms. Compare with the person's baseline and use age-appropriate assessment values rather than one adult range for everyone.

Practice now
Explain how a patient can have impaired oxygen delivery from a circulation problem even when air is entering the lungs. Search "ventilation versus oxygenation versus perfusion."

FND-07 slides 3–15; FND-04 slides 11–12; supporting Open RN oxygenation.

COPD and nursing care

OX-01 • OX-02 • OX-03

COPD causes persistent airflow limitation. Narrowed airways, mucus, and reduced elastic recoil make exhalation difficult. Air trapping increases the effort of breathing. This explains prolonged expiration, dyspnea, reduced activity tolerance, and the need for rest.

Notice a change from the usual pattern

Assess baseline breathing and oxygen use, then look for worsening dyspnea, cough or sputum changes, wheeze, fatigue, or infection symptoms. Diminishing breath sounds with exhaustion can be more concerning than loud wheezing. Diagnostic assessment may include spirometry, imaging, or ordered blood gases, depending on the situation.

Make each action address a problem

Position upright or in a supported forward lean when tolerated. Coach a slow exhalation through pursed lips, allow rest, and cluster care. Administer prescribed bronchodilators and oxygen, and reassess breathing effort, breath sounds, saturation, and comfort. Support secretion clearance and suitable hydration while respecting fluid restrictions.

Ongoing care includes inhaler technique, smoking cessation support, vaccination review, nutrition, exercise or pulmonary rehabilitation, and an action plan. Ask which activities are hardest so care supports function rather than only improving a number.

Evaluate
Improvement means less work of breathing, better ability to speak or perform the planned activity, movement toward the prescribed oxygen target, and a useful medication response. A tired patient who becomes unusually quiet may be deteriorating.

Practice now
Explain why pursed-lip breathing helps during difficult exhalation. Then teach a fictional patient how to pace washing and dressing. Search “COPD nursing care activity tolerance.”

FND-07 slides 15–17 and 24–34; supporting Open RN oxygenation and NICE NG115.

Use oxygen and respiratory medicines safely

OX-02 • OX-03

Match the device and monitor the response

A nasal cannula provides low-flow oxygen with a variable delivered concentration. A Venturi device provides a more controlled concentration when assembled and set correctly. A nonrebreather is used when higher oxygen delivery is needed; maintain its reservoir and use the prescribed device flow. Device choice depends on the clinical need and protocol.

Verify the order or emergency protocol, target saturation, device, and flow. Inspect the tubing, oxygen supply, skin, and response. Secure cylinders, keep ignition sources away, prevent tubing-related falls, and teach home equipment use. Oxygen supports combustion.

Priority cue
Give oxygen for hypoxemia according to the order or emergency protocol. COPD is not a reason to withhold needed oxygen. Titrate to the individual target and monitor closely; some patients need controlled oxygen because of hypercapnia risk.

Know the job of the medication

Albuterol rapidly opens airways; reassess relief, pulse, and tremor. **Inhaled corticosteroids and prescribed combination inhalers** help manage inflammation or provide maintenance treatment. Rinse the mouth after an inhaled corticosteroid. Rescue use depends on the specific prescribed product and action plan; do not assume every combination inhaler has the same role.

Prednisone or methylprednisolone may be prescribed during exacerbations; monitor adverse effects and the ordered schedule. **Mucolytics** thin secretions. Expectorants and cough suppressants have different purposes. Antibiotics treat an indicated bacterial infection rather than every cough. Have the patient demonstrate inhaler technique.

Practice now
State what you would reassess after albuterol and after changing an oxygen device. Use the lecture medication slides to explain purpose, monitoring, and teaching for each class.

FND-07 slides 18–34; supporting NICE COPD guidance and Open RN oxygenation.

Cardiovascular assessment

PF-01 • PF-03

Perfusion is blood flow through tissues. It depends on an effective pump, adequate circulating volume, and vessels that allow flow. **Cardiac output = heart rate × stroke volume.** A blood pressure reading is one part of the assessment, not a complete measure of organ perfusion. Approximate mean arterial pressure as **MAP = (systolic BP + 2 × diastolic BP) ÷ 3**; interpret the trend with organ findings.

History and focused assessment

Ask about chest discomfort, dyspnea, fatigue, exercise tolerance, dizziness, swelling, and leg pain. Review cardiac and vascular history, medications, family history, smoking, and usual function. Assess BP and pulse trends, rhythm, skin temperature/color, capillary refill, edema, mental status, and urine output.

Compare peripheral pulses and limbs. Palpate carotids one at a time. Listen to S1 and S2 and note new sounds. **An S3 occurs after S2** and may accompany fluid overload in an older adult; interpret it in context. Orthostatic symptoms call for safe position changes and protocol-based measurements.

Connect findings with diagnostics

An ECG evaluates electrical activity. Echocardiography evaluates structure and function, including ejection fraction. Troponin helps evaluate myocardial injury; a single result must be interpreted with timing and the clinical picture. BNP can support a heart-failure assessment, while renal tests and other ordered labs help explain associated problems.

Priority cue
New chest pain, altered consciousness, marked respiratory distress, or a newly cold pulseless limb requires immediate response and escalation. Act on the whole patient, not only the BP reading.

Practice now
Explain why crackles, weight gain, edema, and reduced activity tolerance belong together in the cardiac case. Review “cardiovascular assessment expected and unexpected findings.”

FND-04 slides 4–26; FND-05 pages 7–35; FND-06 pages 2–10.

Understand hypertension and its consequences

PF-01 • PF-02 • PF-04

Hypertension is persistently elevated arterial pressure. **Primary hypertension** develops through multiple contributing factors without one identified secondary cause. **Secondary hypertension** results from an identifiable condition or medication effect. It can be present without symptoms, so feeling well does not prove the BP is controlled.

Measure accurately before interpreting

Use the right cuff size, allow rest, support the back and arm, keep feet flat, and avoid talking during measurement. Compare repeated readings and context. Diagnosis is based on appropriate clinical confirmation rather than one isolated value.

Adult AHA category	Systolic	Diastolic
Normal	Below 120	and below 80
Elevated	120–129	and below 80
Stage 1 hypertension	130–139	or 80–89
Stage 2 hypertension	140 or higher	or 90 or higher

Long-term hypertension can damage the heart, brain, kidneys, eyes, and vessels. Assess modifiable factors such as smoking, diet, inactivity, weight, and medication use, alongside family history and age. Review renal disease and medications when considering secondary causes.

Severe readings with symptoms

BP above 180 systolic and/or 120 diastolic with symptoms such as chest pain, dyspnea, weakness, vision change, or difficulty speaking can indicate an emergency. Activate emergency help promptly. A persistent severe reading without those symptoms still requires prompt clinician contact.

Practice now

Explain why an asymptomatic patient still needs hypertension follow-up. Contrast primary hypertension with renal or medication-related hypertension using the reverse case activity.

FND-02 slides 3–4; FND-03 sections 1–5; FND-04 slides 15–17. BP categories: American Heart Association.

Make perfusion care practical

PF-02 • PF-03 • PF-04 • PF-05 • OX-04

Medications listed in the hypertension worksheet

Medication	Purpose	Monitoring and teaching
Metoprolol Beta blocker	Slows heart rate and reduces cardiac workload.	Check BP, pulse, symptoms, and ordered parameters. Teach against abrupt discontinuation.
Lisinopril ACE inhibitor	Reduces angiotensin II effects and lowers vascular resistance.	Monitor BP, renal function, and potassium. Report angioedema immediately; discuss cough. Contraindicated in pregnancy.
Furosemide or Lasix Loop diuretic	Increases sodium and water excretion; useful for volume overload.	Monitor BP, weight, I&O, renal function, and electrolytes. Watch dehydration and dizziness; plan safe toileting.

Medication administration follows the actual prescription and ordered hold parameters. A drug's presence on a worksheet does not make it appropriate for every scenario, especially pregnancy or renal disease. Evaluate whether BP and symptoms improve without impaired perfusion or troublesome adverse effects.

Plan care with the patient

Use a DASH-style eating pattern, an appropriate sodium plan, activity, smoking cessation support, and follow-up. Ask what foods the person normally eats, what changes are affordable, and whether medication or oxygen supplies are accessible. Arrange a qualified interpreter when needed and use teach-back. Ask about preferences, family involvement, and beliefs without assuming them from ethnicity.

Older adults may need slower position changes and fall precautions. Kidney disease changes fluid and medication monitoring. Pregnancy-associated hypertension needs its own clinical plan; the presence of that classroom scenario does not justify applying a general adult drug list unchanged.

Practice now
Teach one medication using four sentences: why it is used, what to monitor, what to report, and how to take it safely. Search "antihypertensive nursing monitoring" for focused questions.

FND-03 sections 5–6; FND-04 slides 27–31; FND-07 slides 15 and 21. Supporting patient-centered teaching.

Practice before checking the answers

Use the four concepts together

For each case, state the likely problem, the cue that matters most, the next nursing action, and what you would reassess. Answers are on page 18.

1 Urinary elimination

A patient with an enlarged prostate voids small amounts repeatedly, has lower abdominal discomfort, and has a bladder scan showing 450 mL remaining after voiding. Does the small output prove the kidneys are producing too little urine? What needs attention?

2 Bowel elimination

A postoperative patient takes an opioid, moves less, and has not passed the usual stool for four days. Small amounts of watery stool now leak into the brief. What should you consider before treating this as uncomplicated diarrhea?

3 Fluid balance

A patient receiving IV fluid develops new dyspnea and crackles and has gained weight since yesterday. What concern links the findings? What is the immediate nursing focus?

4 Oxygenation

A patient with COPD is more tired, speaks in short phrases, and has increasing accessory-muscle use. The pulse oximeter reading has barely changed. What makes this concerning?

5 Perfusion

A patient has a BP of 192/124 mmHg with new difficulty speaking and arm weakness. Is repeating the BP later the priority? What response is needed now?

Make practice count
After answering, identify whether you missed a cue, misunderstood the cause, or chose the wrong priority. Review that exact issue, then try a different case. In ATI, CoursePoint, PrepU, or another available bank, use the topic phrases in the review boxes; titles and available question sets may vary.

A second pass
The next day, explain one urinary problem, one fluid problem, one COPD intervention, and one hypertension medication without the guide. Use your explanation to decide what to review next.

Original fictional practice cases. These are study exercises, not actual patient records or instructor questions.

Answers and explanations

Reasoning and calculation answers

Calculation checks from page 10

A: 125 mL/hr. Divide 750 mL by 6 hr. **B: 42 gtt/min.** Divide 1,000 × 20 by 480 minutes = 41.67, then round to a whole drop. **C: 120 mL.** This exercise explicitly uses half the measured ice-chip volume. Follow the actual charting policy in practice.

1 Retention needs attention

The high residual and discomfort support incomplete emptying. Small frequent voids can occur with retention and do not prove low urine production. Assess and escalate promptly, following the ordered drainage plan. Reassess comfort, urine drainage, and residual when indicated.

2 Leakage may occur around an impaction

The opioid, immobility, and absence of usual stool raise concern for constipation or impaction. Assess the abdomen and bowel history and obtain further evaluation before selecting treatment. Reassess stool passage, pain, distention, and the response to the prescribed regimen.

3 Breathing is the immediate focus

The pattern raises concern for fluid overload affecting the lungs. Assess breathing promptly, position upright when tolerated, review and respond to the infusion under protocol, and escalate. Give ordered treatments and evaluate work of breathing, oxygenation, lung sounds, and urine output.

4 Fatigue can mean worsening ventilation

Increasing effort with short phrases and fatigue is concerning even if saturation changes little. Assess and support airway and breathing, activate help as indicated, and implement prescribed oxygen or respiratory treatment. Reassess alertness, effort, air movement, and response.

5 Possible hypertensive emergency

The severe BP and new neurologic deficits require immediate emergency response. Assess airway and breathing and activate the emergency or stroke pathway in the care setting. Do not delay action for a routine later recheck or attempt unprescribed rapid BP lowering.

Original fictional examples; answer logic follows the preceding source-based teaching.