FUNDAMENTALS OF NURSING · STUDY GUIDE

Exam 5 Study Guide

This guide covers chapters 9 and 10, the two assessment skill chapters. Chapter 9 is vital signs: how each is regulated, how to measure it correctly, what the common errors do, and how to read a set of numbers as a trend. Chapter 10 is the physical assessment: the history, the four techniques, the shift head to toe check, the focused scales and when a finding must be reported at once. There is some arithmetic here (conversions, MAP, pulse deficit, orthostatic changes, BMI), and every worked number has been checked. Cover the steps and solve each case yourself.

WHAT THIS GUIDE COVERS

- Chapter 9 · the hypothalamic set point, radiation, conduction, convection and evaporation, temperature routes and offsets, fever, hyperthermia and hypothermia, pulse sites, grading and pulse deficit, counting respirations and abnormal patterns, pulse oximetry and its limits, blood pressure physiology, cuff size, technique and errors, adult categories, orthostatic hypotension, pain scales, lifespan values, trends, early warning scores and SBAR.
- Chapter 10 · types of assessment, subjective and objective data, the health history, interviewing, interpreters and lifespan, the general survey and BMI, inspection, palpation, percussion tones and auscultation, the abdomen order, positioning, the shift head to toe check, color changes, edema, pupils, lung and heart sounds, levels of consciousness, Glasgow, delirium versus dementia, the six Ps, Morse and Braden, documentation and urgent findings.

CHAPTER 9

Vital Signs

Read it in full: **Chapter 9 in the textbook**. Practice it in the lab: **Blood Pressure Bench** and **Vital Sign Trend Desk**.

What to know

The **hypothalamus** holds core temperature near a **set point** of about 37 C (98.6 F). Too warm: skin vasodilation and sweating. Too cold: vasoconstriction, shivering and piloerection. Heat leaves

by **radiation** (infrared to cooler objects not touching; most loss at rest), **conduction** (direct contact, such as a cooling blanket), **convection** (moving air, a fan) and **evaporation** (sweat, wet skin). Temperature is lowest about 0400 to 0600 and highest late afternoon. Newborns lose heat fast and rely on brown fat. Older adults run lower and mount smaller fevers, so 37.8 C or a rise of about 1.1 C over baseline may mean infection.

Routes: **oral** about 36.0 to 37.5 C; wait 15 to 30 minutes after eating, drinking or smoking; avoid in confusion, seizure risk, oral surgery, mouth breathing, young children. **Rectal** runs about 0.5 C higher; avoid in neutropenia, low platelets, rectal surgery, diarrhea and some cardiac patients. **Axillary** runs about 0.5 C lower and is least accurate. **Tympanic**: pull the pinna up and back for adults and children over 3, down and back under 3. **Temporal** artery reads low with sweat. F = C x 9/5 + 32. Anchors: 38 C = 100.4 F, 39 C = 102.2 F, 40 C = 104 F.

Fever is a regulated rise: pyrogens raise the set point, so the patient has chills and shivers while the temperature climbs, then flushes and sweats as it falls. Adult fever is commonly 38.0 C or higher. Fever raises metabolic rate and oxygen demand. Antipyretics work; avoid aspirin in children and teens (Reye syndrome); avoid inducing shivering. **Hyperthermia** is unregulated (normal set point), so antipyretics do not work and active cooling does. **Hypothermia** is core below 35 C; handle gently, rewarm the core and watch the rhythm.

The **pulse** is the pressure wave from each ejection. Tachycardia is an early sign of shock; falling pressure is late. Adult rate is 60 to 100. Use finger pads, not the thumb. Count 30 seconds and double if regular; a full 60 seconds if irregular, new to you or before a drug. The **apical** pulse (5th intercostal space, left midclavicular line) is used for infants and young children, irregular rhythms and before digoxin (commonly hold below 60 in adults). Grade strength on a stated scale, such as 0 to 4+. A **pulse deficit** is apical minus radial, counted at the same time by two nurses for a full minute.

Count respirations without telling the patient, often with fingers still on the wrist. Adult rate is 12 to 20. Note rate, depth, rhythm, effort (accessory muscles, flaring, tripod, can't finish sentences) and symmetry. Patterns: **Kussmaul** (deep and fast, metabolic acidosis such as DKA), **Cheyne-Stokes** (waxing and waning with apnea; heart failure, brain injury, near death), **Biot** (irregular

clusters with pauses; brainstem damage). Hyperventilation blows off CO2; hypoventilation retains it. Restlessness and tachycardia are early signs of hypoxia; cyanosis and bradycardia are late.

Pulse oximetry estimates SpO2; normal is 95 to 100%, and 88 to 92% is a common prescribed target in chronic CO2 retention. Around 90% SpO2 matches a PaO2 near 60 mm Hg, where the curve turns steep. Limits: poor perfusion, motion, carbon monoxide (falsely normal), methemoglobinemia, severe anemia, darker skin (can overestimate), and a lag. Oximetry says nothing about **ventilation**: on oxygen, a patient on opioids can keep a normal SpO2 while CO2 climbs. Watch sedation and respiratory rate.

Pulse pressure = systolic minus diastolic (about 40). It widens with stiff arteries and raised intracranial pressure and narrows with low stroke volume (shock, heart failure, tamponade). **MAP** = (systolic + 2 x diastolic) / 3; at least 65 is the usual perfusion target. The cuff bladder should be about 40% of the arm circumference wide and about 80% long. Prepare the patient (no caffeine, exercise or smoking for 30 minutes, seated 5 minutes, back supported, feet flat, no talking), arm supported at heart level, palpate to estimate systolic (avoids the auscultatory gap), inflate 20 to 30 above it, deflate 2 to 3 mm Hg per second. Avoid the arm with an IV, a dialysis fistula or graft, or lymph node removal.

Errors: cuff too small or arm below the heart reads **high**; cuff too large or arm above the heart reads low; deflating too fast lowers systolic and raises diastolic; legs crossed, talking and a full bladder read high. Adult categories (2017 guideline, kept in 2025): normal under 120 and under 80; elevated 120 to 129 and under 80; stage 1 130 to 139 or 80 to 89; stage 2 140 or higher or 90 or higher; severe above 180 and/or above 120. Use the higher category when the numbers split. Hypotension is judged by perfusion as well as by systolic under 90.

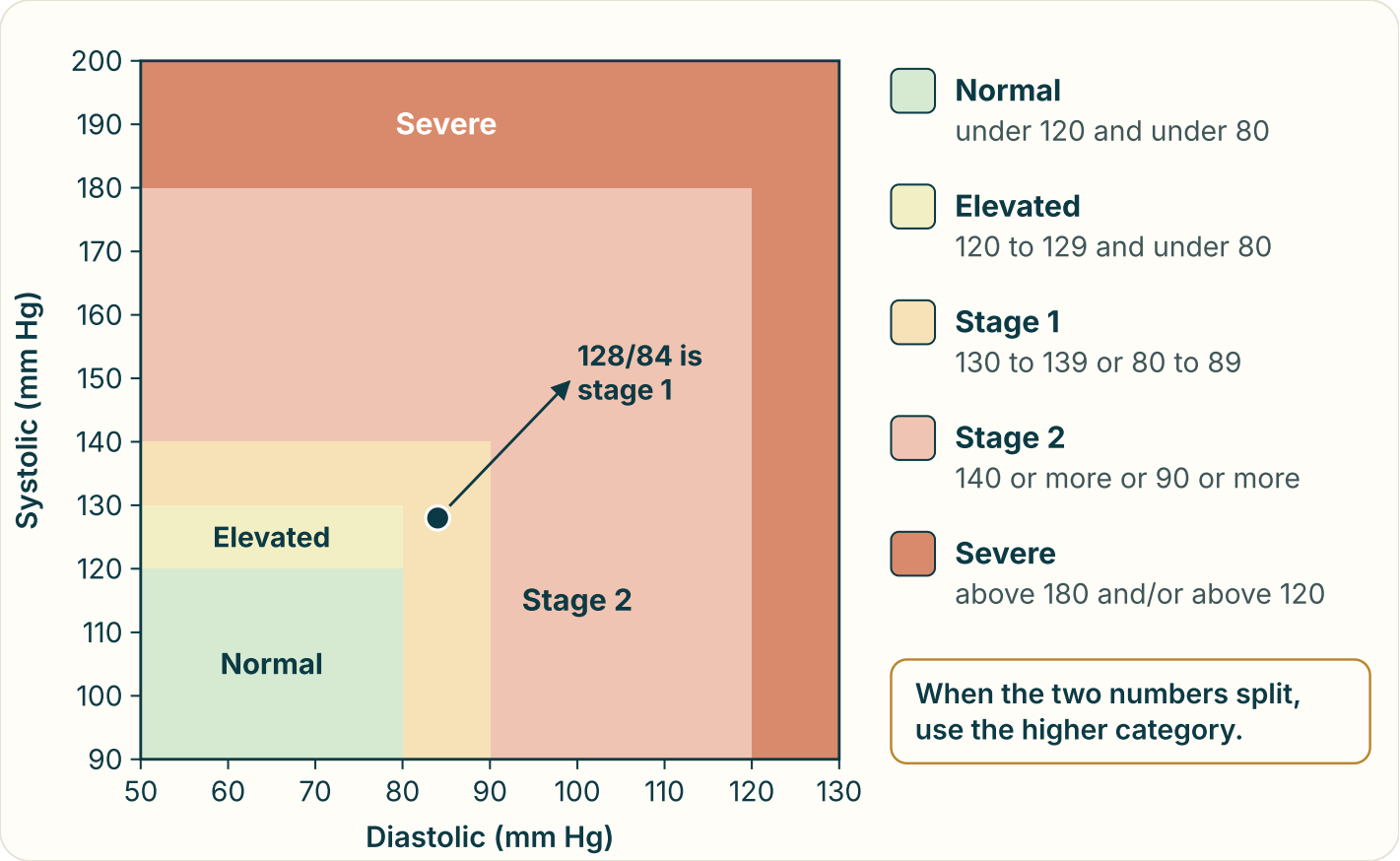
Orthostatic hypotension is a drop of at least 20 systolic or 10 diastolic within 3 minutes of standing. Measure after 5 minutes supine, then at 1 and 3 minutes standing (or dangling if standing is unsafe), staying with the patient. A heart rate rise of 20 or more supports volume depletion. It is a major fall risk: sit, dangle, then stand.

Pain is assessed regularly and is **subjective**: the patient's report is the most reliable measure. Normal vital signs do not rule out pain. Choose a scale that fits: numeric 0 to 10 (about 8 years

and up), faces (about 3 years and up), **FLACC** (2 months to 7 years and nonverbal patients), **PAINAD** (advanced dementia), CPOT (intubated adults). Reassess 15 to 30 minutes after IV and 30 to 60 minutes after oral drugs, with sedation level when opioids are used.

Read vital signs as a **trend**. Early shock: rising heart and respiratory rates, narrowing pulse pressure, anxiety, then falling pressure late. Sepsis: fever or low temperature, tachycardia, tachypnea, confusion. A **shock index** (HR / SBP) above about 0.9 is a warning. Cushing triad: rising systolic with widening pulse pressure, bradycardia and irregular breathing. **qSOFA** flags sepsis risk with two of RR 22 or more, altered mentation, SBP 100 or less. NEWS2 scores 5 to 6 need an urgent response and 7 or more an emergency response.

Report with **SBAR**. Common rapid response triggers: HR below 40 or above 130, RR below 8 or above 28, SBP below 90, SpO2 below 90% despite oxygen, acute mental status change, and staff worry. Measuring vital signs on stable patients can be delegated; interpreting them cannot.



Blood pressure categories, drawn to scale. The dot at 128/84 has a systolic in the elevated range but a diastolic in stage 1, so it is stage 1. Use the higher category.

LOCK THESE IN

- Fever raises the set point (antipyretics work); hyperthermia does not (cool actively).
- Rectal about 0.5 C higher, axillary about 0.5 C lower than oral. 38 C = 100.4 F.
- Irregular rhythm: full minute, apical. Pulse deficit = apical minus radial, counted together.
- SpO2 measures oxygenation, not ventilation. On oxygen, watch rate and sedation.
- MAP = (SBP + 2 DBP) / 3; target at least 65. Pulse pressure narrows in shock.
- Small cuff, big number. Arm below the heart also reads high.
- Orthostatic: drop of 20 systolic or 10 diastolic within 3 minutes of standing.
- Tachycardia and tachypnea come before hypotension; act on the trend.

Key terms and comparisons: adult values, routes and categories

Measure	Value or rule	Notes
Temperature (oral)	About 36.0 to 37.5 C; fever 38.0 C or higher	Hypothermia below 35 C
Rectal / axillary	About 0.5 C higher / about 0.5 C lower	No rectal in neutropenia or bleeding risk
Pulse	60 to 100 per minute	Full minute if irregular; apical before digoxin
Respirations	12 to 20 per minute	Count without telling the patient
SpO2	95 to 100% (often 88 to 92% target in CO2 retainers)	No information on ventilation
Normal BP	Under 120 and under 80	
Elevated	120 to 129 and under 80	
Stage 1 / Stage 2	130 to 139 or 80 to 89 / 140 or more or 90 or more	Use the higher category if they split
Severe	Above 180 and/or above 120	Organ damage signs make it an emergency

Priority rules: formulas and blood pressure errors

Item	Formula or effect
F from C	F = C x 9/5 + 32
C from F	C = (F minus 32) x 5/9
Pulse pressure	Systolic minus diastolic, about 40
MAP	(Systolic + 2 x diastolic) / 3; target at least 65
Shock index	Heart rate / systolic; above about 0.9 is a warning
Pulse deficit	Apical minus radial, counted at the same time
Cuff too small; arm below heart	Falsely high
Cuff too large; arm above heart	Falsely low
Deflating too fast	Systolic low, diastolic high
Missed auscultatory gap	Systolic falsely low; palpate first

Worked cases

WORKED CASE 1 · CONVERTING AND JUDGING A TEMPERATURE

A child's temperature is reported as 102.2 F. An older adult's oral reading is 38.6 C. Convert each and decide whether it is a fever.

STEP 1 · CONVERT F TO C

(102.2 minus 32) x 5/9 = 70.2 x 5/9 = **39.0 C**.

STEP 2 · CONVERT C TO F

38.6 x 9/5 + 32 = 69.48 + 32 = **101.5 F** (101.48).

STEP 3 · JUDGE

Both are at or above 38.0 C (100.4 F), so both are fevers.

CONTEXT

In the older adult, compare with baseline too; a smaller rise can still mean infection.

WORKED CASE 2 · MAP, PULSE PRESSURE AND THE TREND

Over three checks after laparoscopic gallbladder surgery, Ms. Fiore, 46, goes from pulse 84, RR 16, BP 128/80 to pulse 116, RR 24, BP 112/86. She feels anxious.

STEP 1 · PULSE PRESSURE

First: 128 minus 80 = 48. Last: 112 minus 86 = **26**. It is narrowing.

STEP 2 · MAP NOW

(112 + 2 x 86) / 3 = (112 + 172) / 3 = **94.7**, still above 65.

STEP 3 · SHOCK INDEX

116 / 112 = **1.04**, above about 0.9.

STEP 4 · INTERPRET

Rising pulse and respirations, narrowing pulse pressure and anxiety form an early hypovolemia pattern, possibly bleeding, even though MAP looks fine.

STEP 5 · ACT

Assess the abdomen, incisions and level of consciousness, increase monitoring and call the surgeon now with SBAR.

RULE

Hypotension is late. Do not blame pain and wait for SBP under 90.

WORKED CASE 3 · A PULSE DEFICIT

Mr. Brandt, 76, with heart failure, has an irregular radial pulse recorded as 84. Two nurses count together for one minute: apical 118, radial 84.

STEP 1 · SUBTRACT

118 minus 84 = **34**.

STEP 2 · INTERPRET

Thirty four beats per minute are too weak to reach the wrist. The true rate is 118 and the heart is beating fast but ineffectively.

STEP 3 · ACT

Report the new irregular rhythm and the deficit; the rhythm is confirmed with an ECG.

RULE

The radial count can never be higher than the apical count. If it seems to be, recount.

WORKED CASE 4 · AN ORTHOSTATIC CHECK

Mr. Haug, 67, has had three days of vomiting and diarrhea. Supine: 124/76, pulse 88. Standing at 1 minute: 98/64, pulse 114, and he feels lightheaded.

STEP 1 · SYSTOLIC CHANGE

124 minus 98 = **26**, at least 20.

STEP 2 · HEART RATE CHANGE

114 minus 88 = **26**, a rise of 20 or more.

STEP 3 · INTERPRET

Positive orthostatic test consistent with volume depletion.

STEP 4 · ACT

Help him sit or lie down now, keep him from falling, report, and expect IV fluids. Ask the provider before giving a scheduled antihypertensive.

RULE

He needs help every time he gets up: sit, dangle, then stand.

TRAPS PEOPLE FALL INTO

- **Treating hyperthermia with acetaminophen.** The set point is normal, so antipyretics fail. Cool actively.
- **Assuming a shivering patient is just cold.** Chills mean the temperature is still rising. Recheck in 30 minutes.
- **Counting an irregular pulse for 15 seconds.** Count a full minute, apically.
- **Trusting a normal SpO2 in a drowsy patient on opioids and oxygen.** Oxygen hides hypoventilation. Check rate and sedation.
- **Picking a cuff by how big the patient looks.** Measure arm circumference; the bladder is about 40% of it.
- **Calling 128/78 normal.** Systolic 120 to 129 with diastolic under 80 is elevated.
- **Waiting for hypotension to report bleeding.** Rising pulse and respirations come first.
- **Deciding a patient has no pain because vital signs are normal.** Pain is subjective; chronic pain often has normal vital signs.

Chapter 9 self-test · ten items

1. A patient has chills and is shivering under blankets. What does this most likely mean?

A. The fever has just broken
B. The antipyretic has worked
C. The temperature is still rising
D. The patient has hypothermia

C. The temperature is still rising Chills and shivering occur while the body climbs to a raised set point. Flushing and sweating mean it is falling.

2. For which adult is a rectal thermometer the wrong choice?

A. An adult who just drank a cup of hot coffee
B. An adult who is confused after a sedative
C. An adult on oxygen by simple face mask
D. An adult with neutropenia on chemotherapy

D. An adult with neutropenia on chemotherapy Rectal routes risk injury and infection in neutropenia. The others make oral routes a poor choice.

3. A radial pulse is irregular. How should the nurse measure the rate?

A. Count apically for a full 60 seconds
B. Use the pulse oximeter reading instead
C. Count radially for 30 seconds and double it
D. Count radially for 15 seconds and multiply by 4

A. Count apically for a full 60 seconds Irregular rhythms need a full minute apical count because weak beats may not reach the wrist.

4. A drowsy postoperative patient on an opioid and 2 L oxygen has RR 8 and SpO2 96%. What should the nurse conclude?

A. The patient is safe because the saturation is normal
B. The patient may be hypoventilating despite the SpO2
C. The patient needs the oxygen flow increased to 4 L
D. The oximeter must be faulty and needs to be replaced

B. The patient may be hypoventilating despite the SpO2 Supplemental oxygen keeps saturation up while CO2 rises. The low rate and sedation are the danger signs.

5. What is the effect of a blood pressure cuff that is too small?

A. No change in the reading
B. A falsely low reading
C. A falsely low diastolic only
D. A falsely high reading

D. A falsely high reading A narrow bladder needs more pressure to compress the artery. Small cuff, big number.

6. A reading of 134/78 falls into which adult category?

A. Stage 1 hypertension
B. Normal blood pressure
C. Elevated blood pressure
D. Stage 2 hypertension

A. Stage 1 hypertension Systolic 130 to 139 is stage 1 even though the diastolic is under 80. Use the higher category.

7. What is the MAP for a blood pressure of 90/60?

A. 80 mm Hg
B. 75 mm Hg
C. 70 mm Hg
D. 60 mm Hg

C. 70 mm Hg (90 + 2 x 60) / 3 = 210 / 3 = 70.

8. Which finding confirms orthostatic hypotension?

A. Diastolic falls from 80 to 76 within 3 minutes of standing
B. Systolic falls from 130 to 106 within 3 minutes of standing
C. Systolic falls from 130 to 122 within 3 minutes of standing
D. Pulse rises from 72 to 80 within 3 minutes of standing

B. Systolic falls from 130 to 106 within 3 minutes of standing A drop of at least 20 systolic or 10 diastolic within 3 minutes meets the definition. 130 to 106 is a drop of 24.

9. Which pain scale fits an adult with advanced dementia who cannot give a number?

A. Faces pain scale
B. Numeric 0 to 10
C. The PAINAD scale
D. Verbal rating scale

C. The PAINAD scale PAINAD is built for advanced dementia. Faces and numeric scales need the patient to self report.

10. Which trend most suggests early hypovolemic shock after surgery?

A. Pulse falling and pulse pressure widening with slow breathing
B. Pulse and respirations rising while pulse pressure narrows
C. Temperature rising slowly with a stable pulse and pressure
D. Pain score falling while vital signs stay at baseline

B. Pulse and respirations rising while pulse pressure narrows Compensation raises heart and breathing rates and narrows pulse pressure before pressure falls. Widening pulse pressure with bradycardia suggests raised intracranial pressure.

CHAPTER 10

Health Assessment Foundations

Read it in full: **Chapter 10 in the textbook**. Practice it in the lab: **Exam Technique Bench** and **Focused Risk Scorer**.

What to know

Assessment types: **comprehensive** (admission baseline), **ongoing** shift checks, **focused** (one problem or system) and **emergency** (airway, breathing, circulation and disability first). **Subjective** data are what the patient says, recorded in their words. **Objective** data are observed or measured. The patient is the **primary source**; family, the team, the record and results are secondary. **Validate** what does not fit, such as denying pain while guarding the abdomen.

The **health history** covers biographical data, the chief complaint in the patient's words, the history of present illness (OLDCARTS or PQRST), past history, medications including over the counter and herbal products, allergies with the reaction type (true allergy versus intolerance), family history, social history (pack years = packs per day x years smoked), function and psychosocial status, and a review of systems, which is subjective only.

The interview has orientation, working and termination phases. Use **open ended questions** for the story and closed questions for details or when the patient is acutely ill. Helpful: active listening,

silence, restating, reflecting, clarifying, summarizing. Avoid "why" questions, leading questions, false reassurance and jargon. Use a **qualified medical interpreter**, never a child, speak to the patient in short segments and confirm with teach back. Interview adolescents alone for part of the visit (HEEADSSS); give older adults more time with aids in place.

The **general survey** covers appearance, body structure, mobility, behavior and measurements. **BMI** = kg / m2: under 18.5 underweight, 18.5 to 24.9 healthy, 25 to 29.9 overweight, 30 or more obesity.

The four techniques: **inspection** (always first; sight, sound, smell), **palpation** (finger pads for fine detail and pulses, back of the hand for temperature, ulnar surface for vibration; light about 1 cm before deep about 4 to 5 cm; watch the face), **percussion** (resonance over healthy lung, tympany over air filled bowel, dullness over liver or consolidation, hyperresonance over emphysema or pneumothorax, flatness over muscle) and **auscultation** (diaphragm pressed firmly for high pitched sounds; bell placed lightly for low pitched sounds, S3, S4 and bruits). Most systems go inspect, palpate, percuss, auscultate. The **abdomen** goes inspect, auscultate, percuss, palpate, examining the painful area last.

Positions: sitting for head, chest and heart; supine for abdomen and pulses; dorsal recumbent relaxes the abdomen; lithotomy for pelvic exams; Sims (left lateral) for rectal exams and rectal temperatures; left lateral brings the heart closer. Drape so only the examined area shows, and offer a chaperone per policy.

The shift head to toe check takes 5 to 10 minutes after a safety scan. Skin: pallor (ashen in darker skin; check conjunctivae, mucosa, palms), **central cyanosis** (lips, tongue; urgent), jaundice (sclera first), erythema (in darker skin compare warmth and induration). Check turgor over the clavicle or sternum in older adults; capillary refill under 2 to 3 seconds; grade pitting edema and compare sides. Pupils normally 2 to 6 mm and equal (PERRLA); a newly dilated or sluggish pupil after head injury is an emergency. Check the trachea is midline and JVD at 30 to 45 degrees.

Lungs: listen side to side from apices to bases, posterior first. Normal: vesicular, bronchovesicular, bronchial over the trachea. **Crackles** (fluid in alveoli; do not clear with cough), **wheezes** (narrowed airways), **rhonchi** (secretions in large airways; may clear with cough), **stridor** (upper

airway obstruction, heard without a stethoscope, emergency), pleural friction rub, and diminished sounds. Heart: **APE To Man** landmarks (aortic is the only one on the right); S1 loudest at the apex, S2 at the base; S3 normal in children but heart failure in older adults; S4 with a stiff ventricle.

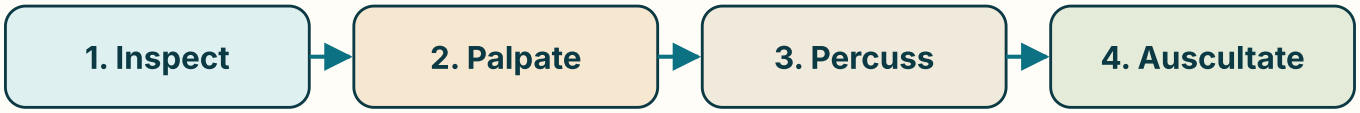
Abdomen: listen in all four quadrants starting in the right lower quadrant; normal bowel sounds about 5 to 30 per minute; hypoactive after surgery or with opioids, hyperactive with diarrhea or early obstruction. Neuro screen: level of consciousness, orientation, speech, pupils, equal grasps and foot push and pull. Strength is graded 0 to 5. New one sided weakness or facial droop suggests stroke (BE FAST).

Levels of consciousness from best to worst: alert, lethargic, obtunded, stuporous, comatose. Use the least stimulus that works. The **Glasgow Coma Scale** sums eye opening (1 to 4), verbal (1 to 5) and motor (1 to 6) for 3 to 15; 8 or below threatens the airway; a drop of 2 or more is reported at once. **Delirium** is acute, fluctuating and impairs attention, usually with a treatable cause. **Dementia** is gradual. Any acute change in mental status is a change in condition.

Neurovascular checks look distal to a cast, splint, surgery or injury and compare with the other side, often hourly for 24 hours. The six Ps: pain, paresthesia, pallor, pulselessness, paralysis, poikilothermia. Pain out of proportion and worse with passive stretch, plus paresthesia, are the **early** signs of **compartment syndrome**; a palpable pulse does not rule it out. Keep the limb at heart level and notify the provider at once.

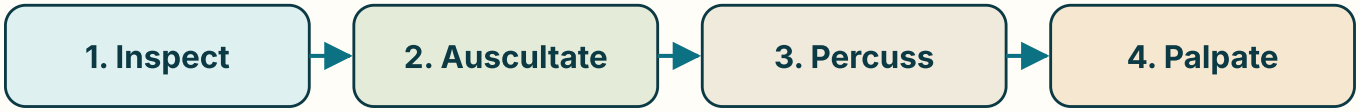
Morse Fall Scale: higher means more risk (45 or more commonly high). **Braden Scale**: six subscales, total 6 to 23, **lower** means more pressure injury risk (19 to 23 none, 15 to 18 mild, 13 to 14 moderate, 10 to 12 high, 9 or below very high). Document objectively with measurements and quotes, record actions and responses and who was notified. Report threats to airway, breathing, circulation or neurologic function at once, such as stridor, SpO2 under about 90%, new chest pain, a cold pulseless limb, GCS drop of 2, or urine under 0.5 mL/kg/hour for 2 hours.

Most body systems



Inspection always comes first: sight, sound and smell.

The abdomen



Listen before you touch: tapping and pressing can change bowel sounds.

Examine the painful area last, and watch the face while you palpate.
Light palpation (about 1 cm) comes before deep palpation (about 4 to 5 cm).

The abdomen changes the order. Everywhere else you palpate second and listen last. In the abdomen you listen second and touch last, saving the painful area for the very end.

LOCK THESE IN

- Subjective is reported; objective is observed or measured. Review of systems is subjective.
- Abdomen: inspect, auscultate, percuss, palpate. Everything else: inspect, palpate, percuss, auscultate.
- Diaphragm firm for high pitched; bell light for low pitched.
- Crackles do not clear with cough; rhonchi may. Stridor is an airway emergency.
- APE To Man; aortic is the only right sided landmark.
- Glasgow 3 to 15; 8 or below, protect the airway; drop of 2 is reportable.
- Compartment syndrome: pain out of proportion and paresthesia early; pulselessness late; limb at heart level.
- Braden lower is worse; Morse higher is worse.

Key terms and comparisons: sounds and tones

Finding	What it sounds like	Usual meaning
Crackles	Brief pops, usually inspiratory; do not clear with cough	Fluid in small airways or alveoli: heart failure, pneumonia, atelectasis
Wheezes	Continuous, high, musical, often expiratory	Narrowed airways: asthma, COPD
Rhonchi	Continuous, low, snoring; may clear with cough	Secretions in large airways
Stridor	Loud, high inspiratory crowing without a stethoscope	Upper airway obstruction: emergency
Pleural friction rub	Grating with breathing, stops with breath holding	Inflamed pleura
Resonance	Low, hollow percussion tone	Healthy lung
Dullness	Thud like tone	Liver, or lung with consolidation or effusion
Hyperresonance	Booming tone	Emphysema or pneumothorax in an adult
Tympany	High, drumlike tone	Gastric bubble, gas filled bowel

Priority rules: scales and when to report at once

Scale or finding	Rule
Glasgow Coma Scale	3 to 15; 8 or below airway at risk; drop of 2 or more reported
Braden	6 to 23; lower is worse; 9 or below very high risk
Morse	Higher is worse; 45 or more commonly high risk
BMI	Under 18.5, 18.5 to 24.9, 25 to 29.9, 30 or more
Six Ps	Pain and paresthesia early; pulselessness and paralysis late
Report at once	Stridor, SpO2 under about 90%, new chest pain, SBP under 90, HR under 40 or over 130, new pupil change, GCS drop of 2, rigid abdomen, cold pulseless limb
Urine output	Below 0.5 mL/kg/hour for 2 hours or more

Worked cases

WORKED CASE 1 · CONNECTING SEPARATE FINDINGS

Mrs. Lindahl, 77, with heart failure, has new fine crackles at both bases, 3+ pitting ankle edema, JVD at 45 degrees, orthopnea on three pillows and a weight gain of 1.8 kg since yesterday.

STEP 1 · RECOGNIZE

Crackles, edema, JVD, orthopnea and rapid weight gain.

STEP 2 · CLUSTER

Together they point to fluid volume excess from worsening heart failure.

STEP 3 · CHECK THE WEIGHT

A gain of more than about 1 kg (2 to 3 lb) in a day is commonly reportable; 1.8 kg is about 4 lb.

STEP 4 · ACT

Raise the head of the bed, check SpO2 and effort, and notify the provider, expecting a diuretic.

RULE

Charting each finding separately without linking them misses the pattern.

WORKED CASE 2 · COMPARTMENT SYNDROME UNDER A CAST

Mr. Kader, 20, had a tibia fracture casted 6 hours ago. Pain is 10/10 despite IV morphine, his toes feel "fuzzy," and he cries out when the nurse gently flexes his toes. The pedal pulse is present; capillary refill is 3 seconds.

STEP 1 · NAME THE EARLY SIGNS

Pain out of proportion, worse with passive stretch, and paresthesia.

STEP 2 · DO NOT BE REASSURED

A palpable pulse does not rule it out; pulselessness is late.

STEP 3 · ACT

Keep the limb at heart level (not raised above it), loosen constricting dressings per policy, and notify the provider at once.

RULE

More opioid and a recheck in an hour, or elevating the leg high on pillows, are the tempting wrong choices.

WORKED CASE 3 · SCORING THE GLASGOW COMA SCALE

After a fall, Mr. Ostrowski opens his eyes only to a painful stimulus, answers questions but is confused about where he is, and reaches toward the site of a painful stimulus.

STEP 1 · EYE OPENING

To pain: **2** of 4.

STEP 2 · VERBAL

Confused: **4** of 5.

STEP 3 · MOTOR

Localizes pain: **5** of 6.

STEP 4 · TOTAL

2 + 4 + 5 = **11** of 15.

USE

Compare with the next check. A fall of 2 or more points is reported at once, and 8 or below means the airway is at risk.

WORKED CASE 4 · BMI IN THE GENERAL SURVEY

Ms. Anand weighs 82 kg and is 1.75 m tall.

STEP 1 · SQUARE THE HEIGHT

1.75 x 1.75 = 3.0625.

STEP 2 · DIVIDE

82 / 3.0625 = **26.8**.

STEP 3 · CLASSIFY

25 to 29.9 is the overweight range.

NOTE

BMI is one measurement in the general survey; it is recorded objectively, without judgment.

TRAPS PEOPLE FALL INTO

- **Palpating the abdomen before listening.** Touch can change bowel sounds. Listen before you percuss and palpate.
- **Pressing the bell firmly.** Pressure turns the bell into a diaphragm. Place it lightly.
- **Calling crackles rhonchi.** Rhonchi may clear with a cough; crackles do not.
- **Feeling for temperature with fingertips.** The back of the hand senses temperature better.
- **Feeling safe because a pedal pulse is present.** Pulselessness is a late sign of compartment syndrome.
- **Raising a limb with suspected compartment syndrome.** Keep it at heart level.
- **Reading a Braden of 10 as low risk.** Braden is reversed: lower scores mean higher risk.
- **Writing "uncooperative" or "provider aware."** Describe behavior, and record who was told, when, what and the response.

Chapter 10 self-test · ten items

1. Which statement is objective data?

A. The patient says the pain is a 6 of 10
B. The patient states she feels nauseated
C. The patient reports feeling dizzy today
D. The patient vomited 200 mL of green emesis

D. The patient vomited 200 mL of green emesis Measured or observed findings are objective. Reports of feelings and ratings are subjective.

2. A nurse is about to assess a patient's abdomen. Which sequence is correct?

A. Inspect, auscultate, percuss, palpate
B. Palpate, percuss, inspect, auscultate
C. Inspect, palpate, percuss, auscultate
D. Auscultate, inspect, palpate, percuss

A. Inspect, auscultate, percuss, palpate Listening comes before touch so palpation does not change bowel sounds.

3. Which part of the hand best detects a difference in skin temperature?

A. The grasping thumb
B. The finger pads
C. The back of the hand
D. The ulnar surface

C. The back of the hand The thinner skin on the back of the hand senses temperature. The ulnar surface senses vibration.

4. Which sound suggests upper airway obstruction and needs immediate action?

A. Fine crackles
B. Inspiratory stridor
C. Vesicular sounds
D. Low pitched rhonchi

B. Inspiratory stridor Stridor is a loud inspiratory sound from upper airway narrowing and is an emergency.

5. Where is the aortic auscultation area?

A. 2nd intercostal space, right sternal border
B. 5th intercostal space, left midclavicular line
C. 4th intercostal space, left lower sternal border
D. 2nd intercostal space, left sternal border

A. 2nd intercostal space, right sternal border The aortic area is the only landmark on the patient's right. The others are pulmonic, mitral and tricuspid.

6. A 72 year old has a new S3 heart sound. What does this most likely suggest?

A. Narrowing of the large airways
B. An expected sign of dehydration
C. Fluid overload or heart failure
D. A normal finding at this age

C. Fluid overload or heart failure An S3 is normal in children and young adults but suggests heart failure in older adults.

7. A patient's Glasgow Coma Scale falls from 14 to 11. What should the nurse do?

A. Document it as an expected daily variation
B. Report it at once as a significant decline
C. Wait until the score reaches 8 to report it
D. Recheck in 4 hours at the next scheduled time

B. Report it at once as a significant decline A drop of 2 or more points is a significant change that is reported immediately.

8. Which finding is an early sign of compartment syndrome?

A. Absent pulse below the injury site
B. A cold, pale limb with no sensation
C. Inability to move the fingers at all
D. Pain that worsens with passive stretch

D. Pain that worsens with passive stretch Pain out of proportion and worse with passive stretch, with paresthesia, are early. Pulselessness and paralysis are late.

9. A patient has a Braden score of 11. How should the nurse interpret it?

A. Mild risk for pressure injury
B. High risk for pressure injury
C. No risk for pressure injury
D. Moderate risk for pressure injury

B. High risk for pressure injury Braden is reversed: 10 to 12 is high risk.

10. A patient who speaks Arabic needs an admission history. Who should interpret?

A. The patient's 15 year old son
B. A housekeeper who speaks Arabic
C. A qualified medical interpreter
D. A bilingual visitor in the hall

C. A qualified medical interpreter Qualified interpreters protect accuracy and privacy. Children and untrained staff should not interpret health information.

Cram sheet

Chapters 9 and 10 on one page. Practice every formula once with your own numbers.

Vital signs

Item	Rule
Set point	Fever raises it; hyperthermia does not
Heat loss	Radiation, conduction, convection, evaporation
Routes	Rectal about 0.5 C higher; axillary about 0.5 C lower
Conversions	F = C x 9/5 + 32; 38 C = 100.4 F; 40 C = 104 F
Pulse	60 to 100; full minute apical if irregular; deficit = apical minus radial
Respirations	12 to 20; Kussmaul in acidosis; Cheyne-Stokes near death
SpO2	95 to 100%; no ventilation data; CO falsely normal
MAP	(SBP + 2 DBP) / 3, at least 65
Cuff	Bladder about 40% of arm circumference; small cuff reads high
BP categories	Under 120/80; 120 to 129/under 80; 130 to 139 or 80 to 89; 140/90; above 180/120
Orthostatic	Drop 20 systolic or 10 diastolic within 3 min
Pain scales	Numeric, faces, FLACC, PAINAD, CPOT; reassess after each intervention

Physical assessment

Item	Rule
Data	Subjective reported; objective observed; validate
Technique order	IPPA; abdomen IAPP
Hand parts	Finger pads detail; back temperature; ulnar vibration
Stethoscope	Diaphragm firm, high pitch; bell light, low pitch
Lung sounds	Crackles fluid; wheezes narrowing; rhonchi secretions; stridor emergency
Heart	APE To Man; S3 heart failure in older adults
Bowel sounds	About 5 to 30 per minute; start right lower quadrant
BMI	kg / m2; 18.5 to 24.9 healthy
GCS	3 to 15; 8 or below airway; drop of 2 report
Delirium	Acute, fluctuating, inattention, treatable cause
Six Ps	Pain, paresthesia early; pulselessness, paralysis late
Braden and Morse	Braden lower worse; Morse higher worse

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