MEDICAL-SURGICAL NURSING I · STUDY GUIDE

Exam 7 Study Guide

This guide covers the last two chapters. You will learn to read the kidney’s quiet signals, treat hyperkalemia in the right order and protect a dialysis access, then recognize shock while the blood pressure still looks normal, run the primary survey and triage a crowd. Work one chapter at a time. Read the "what to know" paragraphs, copy the tables out by hand, then try each worked case with the steps covered. Finish each chapter with its ten self-test items. The cram sheet at the end puts every number and rule in one place.

WHAT THIS GUIDE COVERS

- Chapter 13 · the nephron and its hormones, creatinine, BUN and eGFR, urine output and urinalysis, casts, prerenal, intrarenal and postrenal AKI, FeNa, the four phases, hyperkalemia in order, CKD staging and complications, renal diet, dialysis access, peritoneal dialysis, transplant, UTI, pyelonephritis and CAUTI, stones, BPH and retention, incontinence and hematuria.
- Chapter 14 · shock as cellular oxygen failure, the four stages, hemodynamic fingerprints, hypovolemic shock and massive transfusion, cardiogenic and obstructive shock, sepsis and the Hour-1 bundle, anaphylaxis and IM epinephrine, neurogenic shock, the primary and secondary survey, GCS and raised ICP, the lethal triad, ESI and START triage, cardiac arrest, environmental emergencies and poisoning.

CHAPTER 13

Renal and Urinary Disorders

Read it in full: **Chapter 13 in the textbook**. Practice it in the lab: **AKI Triage Bench: Three Doors and the Potassium Clock** and **Access Safety Bench: Fistula Rounds and the Dialysis Call**.

What to know

About 180 L of plasma is filtered a day and only 1 to 2 L leaves as urine. Protein or blood in the urine means the filter is damaged. The kidney also makes **renin** (blood pressure and sodium), **erythropoietin** (red cells) and activates **vitamin D** (calcium). Lose those and you get the hypertension, anemia and bone disease of CKD.

Creatinine (0.6 to 1.2) is late and depends on muscle: a frail older woman with 1.1 may have lost half her function, so look at the eGFR (normal over 90) and the **trend**. BUN (10 to 20) also rises with dehydration, GI bleeding and steroids; a BUN:creatinine ratio over 20:1 points to prerenal. Urine output goal is 0.5 mL/kg/hr; oliguria is under 400 mL a day; anuria under 100 mL. Weigh daily: 1 kg is about 1 L. Specific gravity fixed near 1.010 means tubules cannot concentrate. Casts: muddy brown is ATN, RBC casts glomerulonephritis, WBC casts pyelonephritis.

AKI is a creatinine rise of 0.3 in 48 hours, 1.5 times baseline in 7 days, or urine under 0.5 mL/kg/hr for 6 hours. Prerenal (about two thirds) is a perfusion problem; NSAIDs, ACE inhibitors and diuretics in a dry patient are the triple whammy. Intrarenal is tissue damage (ATN from ischemia, contrast, aminoglycosides, vancomycin, myoglobin; interstitial nephritis from drugs; glomerulonephritis). Postrenal is obstruction: scan the bladder and check the catheter first. FeNa under 1% suggests prerenal but is invalid after a diuretic; use fractional excretion of urea instead.

AKI runs onset, oliguric (1 to 3 weeks; potassium, phosphorus, acid and water build up), diuretic (3 to 5 L a day; now watch for low volume and low potassium) and recovery (up to a year). Ask what the care did to the kidney. Dialysis indications: AEIOU (acidosis, electrolytes, intoxication, overload, uremia).

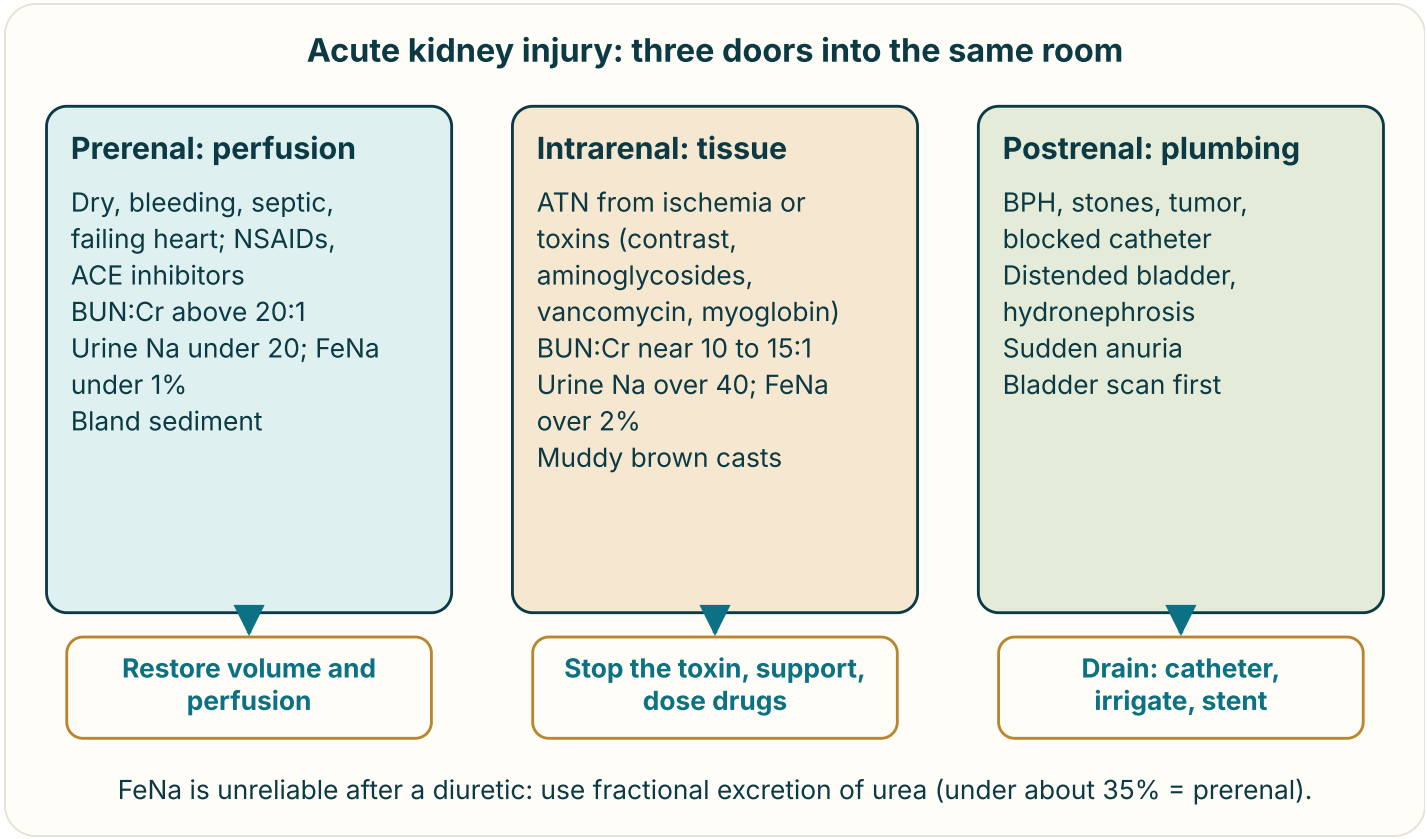
Hyperkalemia order: monitor and 12-lead, hold all potassium sources, then calcium gluconate 1 g IV over 2 to 3 minutes (protects the heart, does not lower K), regular insulin 10 units with 25 g dextrose (shift; check glucose), albuterol 10 to 20 mg nebulized, bicarbonate only if acidotic, then remove it with a loop diuretic, patiromer or zirconium, or dialysis. Shifting is not removing.

CKD is stage G1 to G5 by eGFR (G3a 45 to 59, G3b 30 to 44, G4 15 to 29, G5 under 15) plus albuminuria A1 to A3. Diabetes and hypertension cause most of it, and heart disease kills most patients. Anemia: iron first, then an ESA to Hgb 10 to 11, never higher. Mineral and bone disorder: phosphorus up, calcium down, PTH up; binders go **with meals**. ACE inhibitors and ARBs (accept up to about a 30% creatinine rise; hold for K over 5.5), SGLT2 inhibitors and statins slow progression. Protein 0.6 to 0.8 g/kg before dialysis, 1.0 to 1.2 on hemodialysis. Sodium under 2 g, potassium 2 to 3 g, phosphorus 800 to 1,000 mg, fluid about 1,000 mL plus yesterday’s urine.

A **fistula** needs 6 weeks to 3 months to mature. Feel a thrill and hear a bruit every shift; their absence means a clot and an urgent call. No BP, sticks, IVs or tight clothing on that arm. Watch for steal syndrome. Weigh before and after hemodialysis; hold antihypertensives if ordered; time dialyzable drugs after. Disequilibrium syndrome (headache, confusion, seizure) occurs in early treatments. In **peritoneal dialysis**, cloudy effluent is peritonitis; poor outflow is often constipation. Transplant rejection: falling urine, rising creatinine, fever, graft tenderness; never miss an immunosuppressant dose.

Cystitis: dysuria, urgency, frequency, positive leukocyte esterase and nitrites; culture before the first antibiotic. Phenazopyridine turns urine orange and is not an antibiotic. **Pyelonephritis**: fever, flank pain, CVA tenderness, WBC casts; infection behind an obstruction must be drained. CAUTI prevention: indication only, closed system, bag below the bladder and off the floor, daily review and early removal. Older adults may show only confusion; do not treat asymptomatic bacteriuria.

Stones: renal colic to the groin, fluids, NSAID or opioid, tamsulosin, **strain all urine**. For calcium oxalate stones, do not restrict dietary calcium. BPH: tamsulosin (rise slowly), finasteride (6 months; pregnant people must not handle it). After TURP, keep CBI outflow pink and subtract irrigant from output. Scan the bladder before catheterizing; residual over 150 to 200 mL is abnormal. Match incontinence type to treatment (functional needs a commode and call light, not a catheter). Painless gross hematuria is bladder cancer until proven otherwise.



Perfusion, parenchyma or plumbing. The door decides the treatment: give volume, remove the toxin or drain the obstruction.

LOCK THESE IN

- Urine output at least 0.5 mL/kg/hr; oliguria under 400 mL/day; anuria under 100.
- AKI: creatinine up 0.3 in 48 h, or 1.5 x baseline in 7 days, or low urine for 6 h.
- Prerenal: BUN:Cr over 20:1, FeNa under 1% (not valid after a diuretic).
- Muddy brown casts = ATN; RBC casts = glomerulonephritis; WBC casts = pyelonephritis.
- Hyperkalemia: calcium, then insulin plus dextrose and albuterol, then remove.
- Phosphate binders with meals; ESA to Hgb 10 to 11 only.
- Fistula: thrill and bruit every shift; nothing on that arm.
- Scan before cath; culture before antibiotics; strain every urine with stones.

Three doors of AKI

Finding	Prerenal	Intrarenal (ATN)	Postrenal
BUN:creatinine	Over 20:1	Near 10 to 15:1	Variable
Urine sodium	Under 20	Over 40	Variable
FeNa (no diuretic)	Under 1%	Over 2%	Variable
Urine osmolality	Over 500	Under 350	Variable
Sediment	Bland, hyaline	Muddy brown casts	Bland, crystals
First move	Restore volume	Stop toxin, support	Drain

Hyperkalemia in order

Step	Agent	Note
1	Calcium gluconate 1 g IV over 2 to 3 min	Stabilizes membrane; lasts 30 to 60 min; no K change
2	Regular insulin 10 units IV with 25 g dextrose	Shift; check glucose at 30 min and hourly
3	Albuterol 10 to 20 mg nebulized	Shift; tachycardia, tremor
4	Sodium bicarbonate	Only if acidotic
5	Loop diuretic, patiromer, zirconium	Removes K; binders act over hours
6	Hemodialysis	Definitive removal

CKD stages

Stage	eGFR	Focus
G1 / G2	90 or more / 60 to 89 with damage	Control BP and glucose; avoid nephrotoxins
G3a / G3b	45 to 59 / 30 to 44	Complications appear; adjust drug doses
G4	15 to 29	Plan access, modality, transplant
G5	Under 15	Dialysis, transplant or comfort care

Worked cases

WORKED CASE 1 · WHICH DOOR IS IT

Mr. Boyd, 70 kg, is post-op day two after bowel resection on lisinopril and ketorolac. Creatinine 0.9 two days ago, now 1.3; BUN 52. Urine 150 mL in 6 hours. No diuretic given.

STEP 1 · AKI CRITERIA

Rise = 1.3 minus 0.9 = **0.4** in 48 hours (at least 0.3). Urine goal 0.5 x 70 = 35 mL/hr, or 210 mL in 6 hours; he made 150. Both criteria met.

THE RATIO

BUN:creatinine = 52 ÷ 1.3 = **40**, over 20:1: prerenal pattern.

THE CAUSE

A dry post-op patient on an ACE inhibitor and an NSAID: the drugs cut renal perfusion.

STEP 4 · ACT

Check the bladder and catheter, then call: hold lisinopril and ketorolac, expect isotonic fluid, review all renally cleared doses.

WORKED CASE 2 · HYPERKALEMIA WITH PEAKED T WAVES

Mrs. Lane, CKD G4, missed dialysis. K 6.8 with peaked T waves.

STEP 1 · FIRST

Continuous monitor and 12-lead; stop every potassium source; notify.

STEP 2 · PROTECT

Calcium gluconate 1 g IV over 2 to 3 minutes. It does not lower potassium.

STEP 3 · SHIFT

Regular insulin 10 units with 25 g dextrose; glucose check at 30 minutes and hourly. Albuterol nebulized as ordered.

STEP 4 · REMOVE

She makes little urine, so dialysis is the definitive step. Recheck potassium after.

WORKED CASE 3 · A HEMODIALYSIS DAY

Mr. Fox weighs 84.6 kg before hemodialysis and 82.1 kg after. Yesterday his urine output was 350 mL.

STEP 1 · FLUID REMOVED

84.6 minus 82.1 = **2.5 kg**, about 2.5 L.

STEP 2 · FLUID ALLOWANCE

About 1,000 mL plus yesterday's urine: 1,000 + 350 = **1,350 mL** for today.

STEP 3 · PROTEIN

On hemodialysis, 1.0 to 1.2 g/kg; at 70 kg dry weight that is 70 to 84 g a day (it was 42 to 56 g before dialysis).

STEP 4 · AFTER THE RUN

Check BP, dizziness, cramps, needle-site bleeding, and the thrill and bruit.

WORKED CASE 4 · CHARTING OUTPUT WITH BLADDER IRRIGATION

After TURP, Mr. Ito's drainage bag holds 3,400 mL over 8 hours. 2,800 mL of irrigant was infused.

STEP 1 · SUBTRACT

True urine = 3,400 minus 2,800 = **600 mL** in 8 hours, 75 mL/hr.

STEP 2 · COLOR

Keep outflow pink to light red. If it darkens or clots appear, increase the irrigation rate per order.

SAFETY

If outflow stops and he has bladder spasm and pain, suspect a clot; follow the order to irrigate and notify.

TRAPS PEOPLE FALL INTO

- **Calling a creatinine of 1.1 normal in a frail older adult.** Look at the eGFR.
- **Reading FeNa after furosemide.** Diuretics force sodium out; use fractional excretion of urea.
- **Hanging fluid for sudden anuria before scanning.** Rule out obstruction first.
- **Thinking calcium lowers potassium.** It protects the heart only.

- **Giving binders between meals.** They must meet the food.
- **Pushing the hemoglobin to normal with an ESA.** Targets above 11 raise stroke and death.
- **Taking a BP on the fistula arm.** It can clot the access.
- **Restricting calcium for oxalate stones.** Low dietary calcium raises oxalate absorption.

Chapter 13 self-test · ten items

1. What is the minimum hourly urine output for a 60 kg adult?

A. 15 mL
B. 60 mL
C. 120 mL
D. 30 mL

D. 30 mL 0.5 x 60 = 30 mL/hr.

2. Which urine finding points to acute tubular necrosis?

A. Muddy brown granular casts
B. Red blood cell casts
C. White blood cell casts only
D. Hyaline casts only

A. Muddy brown granular casts Muddy brown casts are near diagnostic of ATN.

3. A patient suddenly makes no urine. What should the nurse check first?

A. A serum creatinine level
B. Bladder scan and catheter
C. A 500 mL fluid bolus
D. IV furosemide 40 mg

B. Bladder scan and catheter Obstruction is the easiest cause to fix.

4. Potassium is 6.5 with peaked T waves. Which drug is given first?

A. Patiromer powder
B. IV furosemide
C. Calcium gluconate
D. Sodium bicarbonate

C. Calcium gluconate Protect the myocardium first.

5. After insulin and dextrose for hyperkalemia, what must the nurse monitor?

A. Serum calcium
B. Blood glucose
C. Urine pH
D. Hemoglobin

B. Blood glucose Hypoglycemia is common and can be delayed.

6. When are phosphate binders given?

A. At bedtime
B. Two hours after meals
C. With antacids
D. With meals

D. With meals They bind dietary phosphorus in the gut.

7. Which finding at an AV fistula needs an urgent call?

A. A strong thrill
B. A swishing bruit
C. No thrill or bruit
D. Mild warmth

C. No thrill or bruit Absent thrill and bruit means clotting.

8. Peritoneal dialysis effluent is cloudy. What is suspected?

A. Peritonitis
B. Normal drainage
C. Constipation
D. Too much dwell time

A. Peritonitis Send cell count, Gram stain and culture.

9. What does phenazopyridine do?

A. Cures the infection
B. Prevents kidney stones
C. Relieves bladder burning
D. Shrinks the prostate

C. Relieves bladder burning It is an analgesic and turns urine orange.

10. Which patient do you see first?

A. Dialysis patient with K 6.8
B. Renal colic, pain 9 of 10
C. Distended bladder post-op
D. New cloudy urine

A. Dialysis patient with K 6.8 Potassium is a circulation threat; pain hurts but kills less often.

CHAPTER 14

Shock, Trauma and Emergency Care

Read it in full: **Chapter 14 in the textbook**. Practice it in the lab: **Shock Stage & Hemodynamic Fingerprint Lab** and **Trauma Bay: Primary Survey & Neuro Watch**.

What to know

Shock is too little oxygen for the cells. Without oxygen, cells switch to anaerobic metabolism (2 ATP instead of about 32) and make lactate, so lactate is the key lab. The sodium pump fails, cells swell and leak, and the damage feeds itself. Oxygen delivery depends on cardiac output (rate x stroke volume) and hemoglobin with its saturation.

Four stages. **Initial**: lactate rises with normal vital signs. **Compensatory**: tachycardia, narrowed pulse pressure, cool clammy skin, urine under 0.5 mL/kg/hr, restlessness, respiratory alkalosis, with a normal BP; this is the window to act. **Progressive**: hypotension, metabolic acidosis, ARDS, anuria, DIC. **Refractory**: no response; goals of care. Blood pressure is a late sign.

Fingerprints: hypovolemic, cardiogenic and obstructive shock run **cold** with high SVR and low output; distributive shock runs **warm** early with low SVR. CVP 2 to 8, cardiac output 4 to 8 L/min, SvO_2 60 to 80%. For all shock: oxygen, two large-bore IVs (16 gauge or wider in trauma), MAP of at least 65, hourly urine, lactate trend, warmth.

Hypovolemic: the early hemoglobin can look normal. Give about 1 L of warmed balanced crystalloid, then blood in a balanced 1:1:1 ratio for nonresponders; tranexamic acid within 3 hours of injury (1 g over 10 minutes, then 1 g over 8 hours). Permissive hypotension (SBP about 80 to 90) in penetrating trauma, but keep SBP at least 100 to 110 in brain injury. Watch ionized calcium in massive transfusion.

Cardiogenic: SBP under 90 for 30 minutes, cardiac index under 2.2, wedge over 15; cold with JVD, crackles and an S3. Revascularize; dobutamine or milrinone; norepinephrine. **Do not bolus fluid** into a congested patient. **Obstructive**: tamponade (Beck triad: hypotension, JVD, muffled sounds; pericardiocentesis), tension pneumothorax (needle decompression now) and massive PE (thrombolysis). Fluid does not fix any of them.

Septic shock needs pressors for MAP 65 with lactate over 2 after fluids; mortality exceeds 40%. Hour-1: lactate, cultures before antibiotics, antibiotics within 1 hour, 30 mL/kg crystalloid for hypotension or lactate of 4 or more, vasopressors. Norepinephrine first, vasopressin 0.03 units/min second; hydrocortisone 200 mg a day if pressors persist. Phentolamine for norepinephrine extravasation. Afebrile confusion in an older adult can be sepsis.

Anaphylaxis: IM epinephrine 0.3 to 0.5 mg of 1 mg/mL into the anterolateral thigh, repeat every 5 to 15 minutes; airway first; antihistamines and steroids are extras; watch 4 to 8 hours for a biphasic reaction; glucagon if on a beta blocker. **Neurogenic shock** (injury at or above T6): hypotension with bradycardia and warm dry skin; cautious fluid, norepinephrine, atropine, MAP 85 to 90 for 7 days. Tachycardia and cool skin in the same patient means a missed bleed.

Primary survey **ABCDE**: airway with C-spine (jaw thrust; intubate for GCS 8 or less), breathing (needle decompression, three-sided dressing), circulation with hemorrhage control (pressure, tourniquet, pelvic binder; catastrophic bleeding may come first), disability (GCS, pupils, glucose), exposure (then warm). No urinary catheter with blood at the meatus. GCS 13 to 15 mild, 9 to 12 moderate, 8 or less severe; a 2 point drop is an emergency. Cushing triad (wide pulse pressure hypertension, bradycardia, irregular breathing) is late herniation. CPP = MAP minus ICP, goal 60 to 70. Secondary survey: AMPLE and head to toe; ask about anticoagulants early. The lethal triad is hypothermia, acidosis and coagulopathy.

ESI level 1 needs a life-saving intervention now; level 2 is high risk. In a disaster, **START** inverts priorities: walking is green; no breathing after one airway maneuver is black; RR over 30, refill over 2 seconds or no radial pulse, or not following commands is red; the rest are yellow. Call a rapid response for RR under 8 or over 28, HR under 40 or over 130, SBP under 90 or a 40 point drop, SpO_2 under 90% on oxygen, or your worry. CPR: 100 to 120/min, 2 to 2.4 inches; shock VF and pulseless VT; epinephrine 1 mg every 3 to 5 minutes. Heat stroke: cool to about 38.9 °C, no antipyretics. Hypothermia: handle gently; not dead until warm and dead.

Shock fingerprints: preload, pump and pipes

Shock type	Preload	Cardiac output	SVR	Skin
Hypovolemic	Low	Low	High	Cold
Cardiogenic	High	Low	High	Cold, JVD
Obstructive	High	Low	High	Cold, JVD
Septic (early)	Low/normal	High/normal	Very low	Warm
Anaphylactic	Low	Variable	Very low	Hives
Neurogenic	Low	Low	Very low	Warm, dry

Three run cold with high resistance; distributive shock runs warm with low resistance.

Neurogenic shock is the one with hypotension and bradycardia together.

Warm or cold first. Look at the neck veins and lungs before a fluid bolus: full veins and crackles mean the pump or an obstruction, not an empty tank.

LOCK THESE IN

- Compensatory shock: tachycardia, narrow pulse pressure, cool skin, low urine, restlessness, normal BP.
- Cold shocks: hypovolemic, cardiogenic, obstructive. Warm: distributive.
- TXA within 3 h of injury: 1 g over 10 min, then 1 g over 8 h.
- Cardiogenic or obstructive: no fluid bolus into full neck veins and crackles.
- Sepsis Hour-1: lactate, cultures, antibiotics, 30 mL/kg, pressors to MAP 65.
- Anaphylaxis: epinephrine 0.3 to 0.5 mg IM in the thigh, first.
- Neurogenic shock: hypotension plus bradycardia plus warm dry skin.
- ABCDE; GCS 8 or less, intubate; CPP = MAP minus ICP, goal 60 to 70.

Shock stages

Stage	What you see	Focus
Initial	Normal vitals; lactate may exceed 2	Suspect from the mechanism; draw lactate
Compensatory	Tachycardia, narrow pulse pressure, cool skin, urine under 0.5 mL/kg/hr, restlessness	Recognize and escalate now
Progressive	Hypotension, acidosis, crackles, anuria, DIC	ICU, vasoactive support
Refractory	No response to fluids or pressors	Comfort, goals of care

Hemorrhage classes (teaching model)

Class	Loss	HR	BP	Urine
I	Up to 15% (750 mL)	Under 100	Normal	Over 30 mL/hr
II	15 to 30%	100 to 120	Normal SBP, narrow pulse pressure	20 to 30 mL/hr
III	30 to 40%	120 to 140	Low	5 to 15 mL/hr
IV	Over 40%	Over 140	Very low	Negligible

Primary survey

Step	Assess	Intervene
A	Speech, stridor, blood, neck hematoma	Jaw thrust, suction, airway; C-spine protection
B	Rate, chest rise, breath sounds, trachea	Oxygen, needle decompression, three-sided dressing
C	Pulses, BP, skin, bleeding, pelvis	Pressure, tourniquet, binder, IVs, blood, TXA
D	GCS, pupils, glucose	Treat low glucose; manage ICP
E	Undress, log roll	Then warm blankets and fluids

START triage

Tag	Meaning	Findings
Green	Minor	Can walk
Red	Immediate	RR over 30, refill over 2 s or no radial pulse, cannot follow commands
Yellow	Delayed	Significant injury with stable signs
Black	Expectant	No breathing after one airway maneuver

Worked cases

WORKED CASE 1 · COMPENSATED SHOCK WITH A NORMAL PRESSURE

Mr. Salcedo, 24, fell from a ladder. BP 112/94, HR 128, cool and clammy, restless, urine 20 mL last hour.

STEP 1 · PULSE PRESSURE

112 minus 94 = **18**: narrowed as the diastolic rises with vasoconstriction.

STEP 2 · STAGE

Tachycardia, narrow pulse pressure, cool skin, low urine and restlessness with a normal SBP: compensatory shock.

STEP 3 · ACT

Two 16 gauge or wider IVs, warmed fluid, type and cross, look for the bleeding source (FAST), and escalate now.

WHY NOW

This is the reversible window. Waiting for hypotension means waiting for about 30% blood loss.

WORKED CASE 2 · A SEPSIS BUNDLE BY THE NUMBERS

Mr. Cole, 70 kg, is post-op day two: BP 84/48, HR 124, warm and flushed, newly confused, urine 15 mL/hr, lactate 4.8.

STEP 1 · MAP

(84 + 96) ÷ 3 = **60**, under 65.

STEP 2 · BOLUS

30 mL/kg x 70 kg = **2,100 mL** of crystalloid.

STEP 3 · ORDER

Cultures from two sites, then broad-spectrum antibiotics within the hour, while fluids run; pressors if still hypotensive.

STEP 4 · LACTATE CLEARANCE

Repeat lactate 3.6: (4.8 minus 3.6) ÷ 4.8 = **25%** clearance, a good sign (10 to 20% or more predicts survival).

WORKED CASE 3 · A HEAD INJURY SCORE

Ms. Ward opens her eyes to pain (2), speaks inappropriate words (3) and localizes pain (5). BP 150/90; ICP 25.

STEP 1 · GCS

2 + 3 + 5 = **10**: moderate injury.

STEP 2 · MAP

(150 + 180) ÷ 3 = 110.

STEP 3 · CPP

110 minus 25 = **85**, above the 60 to 70 goal.

STEP 4 · NURSING

Head of bed 30 degrees, head midline, avoid hypoxia and hypotension, recheck GCS often; a 2 point drop is an emergency.

WORKED CASE 4 · ANAPHYLAXIS AFTER AN ANTIBIOTIC

Ten minutes into IV cefazolin, Mrs. Ford has hives, hoarseness and wheeze. BP 86/50.

STEP 1 · STOP

Stop the infusion; call for help.

STEP 2 · EPINEPHRINE FIRST

0.3 to 0.5 mg of 1 mg/mL (0.3 to 0.5 mL) IM in the anterolateral thigh; repeat every 5 to 15 minutes as needed.

STEP 3 · SUPPORT

Airway, oxygen, IV fluids; then antihistamines, steroid and albuterol as extras.

STEP 4 · AFTER

Observe 4 to 8 hours for a biphasic reaction. If she takes a beta blocker and does not respond, glucagon is the rescue.

TRAPS PEOPLE FALL INTO

- **Waiting for hypotension to call shock.** BP is a late sign.
- **Bolusing fluid into a congested patient.** Check neck veins and lungs first.
- **Waiting for an x-ray in tension pneumothorax.** Decompress now.
- **Giving an antihistamine before epinephrine.** Epinephrine IM is first-line.
- **Using phenylephrine in neurogenic shock.** Pure alpha worsens bradycardia; norepinephrine is preferred.
- **Inserting a urinary catheter with blood at the meatus.** Suspect urethral injury.
- **Leaving the trauma patient uncovered.** Hypothermia feeds acidosis and coagulopathy.
- **Treating the sickest first in a mass casualty event.** START gives resources to the most salvageable.

Chapter 14 self-test · ten items

1. Which lab best tracks tissue hypoperfusion in shock?

A. Serum sodium
B. Serum lactate
C. Hemoglobin
D. Platelet count

B. Serum lactate Lactate rises with anaerobic metabolism.

2. Which finding marks the compensatory stage?

A. Marked hypotension
B. No response to pressors
C. Narrowed pulse pressure
D. Anuria with DIC

C. Narrowed pulse pressure The diastolic rises with vasoconstriction while SBP holds.

3. Which shock runs warm with low SVR early?

A. Hypovolemic
B. Cardiogenic
C. Obstructive
D. Septic shock

D. Septic shock Distributive shock is the warm one.

4. A hypotensive patient has JVD, crackles and an S3. What should the nurse avoid?

A. A fluid bolus
B. Raising the head
C. Giving oxygen
D. Calling the provider

A. A fluid bolus The pump is failing; fluid causes pulmonary edema.

5. Hypotension, JVD and muffled heart sounds suggest what?

A. Septic shock
B. Hypovolemic shock
C. Anaphylaxis
D. Cardiac tamponade

D. Cardiac tamponade Beck triad: prepare for pericardiocentesis.

6. What fluid volume begins the sepsis bundle for an 80 kg patient with a lactate of 4.2?

A. 800 mL
B. 2,400 mL
C. 1,200 mL
D. 4,000 mL

B. 2,400 mL 30 mL/kg x 80 kg.

7. Where is epinephrine given in anaphylaxis?

A. Anterolateral thigh, IM
B. Deltoid, subcutaneous
C. IV push, 1 mg
D. Abdomen, subcutaneous

A. Anterolateral thigh, IM IM thigh gives the fastest, highest peak.

8. A cord-injured patient has BP 78/40, HR 48 and warm dry skin. Which shock is this?

A. Hypovolemic
B. Cardiogenic
C. Neurogenic
D. Anaphylactic

C. Neurogenic Hypotension with bradycardia and warm skin.

9. A trauma patient has a GCS of 7. What is needed?

A. A definitive airway
B. A head CT only
C. Oral fluids
D. Hourly neuro checks only

A. A definitive airway GCS 8 or less cannot protect the airway.

10. In START, a nonwalking patient has RR 34. Which tag?

A. Yellow tag
B. Red tag
C. Green tag
D. Black tag

B. Red tag RR over 30 is immediate.

ONE PAGE

Cram sheet

Everything from chapters 13 and 14 in one place. Cover the right column and see if you can rebuild each row.

Numbers to know

Item	Value	Note
Creatinine / BUN / eGFR	0.6 to 1.2 / 10 to 20 / over 90	Trend beats value
Urine output	At least 0.5 mL/kg/hr; oliguria under 400 mL/day; anuria under 100	Specific gravity 1.005 to 1.030
AKI	Creatinine up 0.3 in 48 h or 1.5 x in 7 days	Or under 0.5 mL/kg/hr for 6 h
Albuminuria	A1 under 30; A2 30 to 300; A3 over 300 mg/g	Staged with eGFR
CKD diet	Na under 2 g; K 2 to 3 g; phos 800 to 1,000 mg	Fluid about 1,000 mL plus urine
Protein	0.6 to 0.8 g/kg before dialysis; 1.0 to 1.2 on HD	Reverses on dialysis
ESA target	Hgb 10 to 11 g/dL	Iron first
Fistula	Matures 6 weeks to 3 months	Graft 2 to 3 weeks
Retention	Post-void residual over 150 to 200 mL	Scan before cath
Hemodynamics	CVP 2 to 8; CO 4 to 8 L/min; SvO_2 60 to 80%	MAP at least 65
Sepsis	Lactate over 2; 30 mL/kg; vasopressin 0.03 units/min	Hydrocortisone 200 mg/day if pressors persist
TXA	1 g over 10 min, then 1 g over 8 h	Within 3 h of injury
Anaphylaxis	Epinephrine 0.3 to 0.5 mg IM thigh	Repeat every 5 to 15 min; watch 4 to 8 h
Neurogenic shock	MAP 85 to 90 for 7 days	Atropine 1 mg, max 3 mg
GCS	13 to 15 mild; 9 to 12 moderate; 8 or less severe	CPP 60 to 70
CPR	100 to 120/min; 2 to 2.4 in; 30:2	Epinephrine 1 mg every 3 to 5 min

Item	Value	Note
Rapid response	RR under 8 or over 28; HR under 40 or over 130; SBP under 90	Or the nurse is worried
Heat stroke	Core over 40 °C with CNS change	Stop cooling near 38.9 °C

Key terms and comparisons

Term	Meaning
Prerenal vs intrarenal vs postrenal	Perfusion; tissue damage; obstruction
Shift vs remove potassium	Insulin, albuterol hide K in cells; diuretic, binder, dialysis remove it
Hemodialysis vs peritoneal dialysis	Machine and access, 3 times a week; own peritoneum, daily, cloudy fluid means peritonitis
Stress vs urge vs overflow vs functional	Leak with cough; sudden urge; dribbling full bladder; cannot reach toilet
Cold vs warm shock	Hypovolemic, cardiogenic, obstructive; distributive
Neurogenic vs spinal shock	Hemodynamic: hypotension and bradycardia; neurological: flaccid areflexia
ESI vs START	Sickest first; most salvageable first

Rules that are not equations

Topic	The rule
AKI	Ask what care did to the kidney; scan the bladder; hold nephrotoxins.
Hyperkalemia	Monitor, hold K sources, calcium, shift, remove, recheck.
Fistula arm	No BP, sticks, IVs, restraints or tight clothing.
Urine culture	From the sampling port, before the first antibiotic.
Shock basics	Oxygen, two large IVs, MAP 65, hourly urine, lactate trend, warmth.
Fluid check	Flat veins and clear lungs: volume. JVD and crackles: no bolus.
Trauma	ABCDE in order, then AMPLE and head to toe; ask about anticoagulants early.
Delegation	UAP may do vitals on stable patients, compressions if trained, warming blankets; RN assesses, triages, titrates.

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