

# Lab Values

THE “EVERYTHING” GUIDE TO  
MASTERING LAB VALUES FOR NCLEX

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# ABGs Outline

## Overview

- Arterial Blood Gas
  - Obtained directly from artery
    - Radial, brachial, or femoral stick
    - Indwelling arterial line
  - Acid-Base Balance
  - Assess full oxygenation capacity
  - Arterial results truly systemic
    - Eliminate 'tissue factors'
      - Levels may be affected by ability of tissues to use oxygen

## General

- "Partial Pressure"
  - Concentration of gasses dissolved in blood plasma
    - Lab values included
      - pH
      - pCO<sub>2</sub>
      - HCO<sub>3</sub><sup>-</sup>
      - PaO<sub>2</sub>
      - SaO<sub>2</sub>
      - Lactic Acid
      - Base Excess (or Deficit)
      - Electrolytes (K, Mg, Na, Ca)

## Assessment

- 7.35-7.45
- Partial pressure of hydrogen ions
- Indicates level of acidity or alkalinity
  - pCO<sub>2</sub>
    - 35 – 45 mmHg
    - Partial pressure of carbon dioxide
  - HCO<sub>3</sub><sup>-</sup>
    - 22 – 26 mEq/L
    - Level of bicarbonate
  - PaO<sub>2</sub>
    - 80 – 100 mmHg
    - On ROOM AIR (21% FiO<sub>2</sub>)
    - Partial pressure of oxygen in arterial blood
  - SaO<sub>2</sub>
    - 95-100%
    - Saturation of hemoglobin with oxygen in arterial blood
  - Lactic Acid
    - 0.5 – 1 mmol/L
    - Produced during anaerobic metabolism
  - Base Excess (or Deficit)
    - -2 to 2
    - Indicates level of "extra" base (alkaline)
    - Negative (base deficit) indicates acidosis

# ABG Quiz

## Questions

### Question 1

The nurse is caring for a client with newly resulted arterial blood gas values. The nurse notes the  $\text{HCO}_3$  is 18 mEq/L. Which of the following correctly describes what is happening?

- ☐ The kidneys are excreting excess bicarbonate
- ☐ The lungs are blowing off excess carbon dioxide
- ☐ The lungs are retaining excess carbon dioxide
- ☐ The kidneys are retaining excess bicarbonate

### Question 2

A client's ABG values reflect respiratory alkalosis. Which action by the nurse is most appropriate?

- ☐ Help the client raise their breathing rate by utilizing a sternal rub
- ☐ Give oxygen as ordered and look for an underlying cause such as an opioid overdose
- ☐ Help the client lower their breathing rate by breathing slowly into a paper bag
- ☐ Increase environmental stimulation by turning up the lights and engaging the client in conversation

### Question 3

The nurse is reviewing ABG results on a client, and understands the term 'partial pressure' to mean which of the following?

- ☐ The concentration of gas dissolved in blood plasma
- ☐ The arterial blood pressure
- ☐ The proportion of the 4 main blood components circulating in the arterial system
- ☐ The amount of pressure added to the client's blood pressure by bases in the blood

### Question 4

A client with a lung infection must undergo an ABG. The client asks the nurse why this lab test is necessary. Which of the following should the nurse include that would explain the reasons for this test?

*Select all that apply.*

- ☐ The test verifies the need for a blood transfusion
- ☐ The test will diagnose the type of lung infection the client has
- ☐ The test will determine if the client needs extra oxygen
- ☐ The test checks to see how well the lung treatments are working
- ☐ The test will assess for the acid and base balances in the bloodstream

### Question 5

A nurse is caring for a client who has an indwelling arterial line. The nurse notes that the waveform on the hemodynamic monitor appears flat and dampened. Which of the following would be the first step in troubleshooting this waveform?

- ☐ Clamp the line for 1 minute and then release and recheck the waveform
- ☐ Check the line for kinks or obstructions
- ☐ Ask the client to turn his head and cough
- ☐ Add extension tubing to the line

### Question 6

The nurse is reviewing ABG results on a client, and notes that the pH and the  $\text{HCO}_3$  are out of range, while the  $\text{pCO}_2$  is normal. This client is most likely experiencing a problem with which body system?

- ☐ The neurological system
- ☐ The cardiovascular system
- ☐ The respiratory system
- ☐ The renal system

**Question 7**

A client's ABG results show an elevated lactic acid level. The nurse appropriately suspects which of the following scenarios?

- ☐ Bowel obstruction
- ☐ Hyperventilation
- ☐ Sepsis
- ☐ Atrial fibrillation

**Question 8**

The preceptor is reviewing a client's ABG results with a student. The nurse correctly describes pH as measuring which of the following?

- ☐ The parameter of H&H (hemoglobin/hematocrit)
- ☐ The potential of hydrogen
- ☐ The proportion of hemoglobin
- ☐ The predominance of hyperglycemia

**Question 9**

The nurse is caring for a client with a COPD exacerbation who is on 2L O<sub>2</sub> via nasal cannula. The most recent arterial blood gas (ABG) result is: PaO<sub>2</sub> of 85% and PaCO<sub>2</sub> of 52. What is the appropriate nursing action?

- ☐ Continue to monitor
- ☐ Titrate the oxygen to 1LNC
- ☐ Increase the oxygen to 4LNC
- ☐ Administer a nebulizer treatment

**Question 10**

A client's arterial blood gas (ABG) results indicate metabolic acidosis. Which process is occurring in the kidneys that causes metabolic acidosis?

- ☐ The kidneys are excreting too much CO<sub>2</sub>
- ☐ The kidneys are excreting too much HCO<sub>3</sub>
- ☐ The kidneys are not excreting enough CO<sub>2</sub>
- ☐ The kidneys are not excreting enough HCO<sub>3</sub>

## Answers

### Question 1

The nurse is caring for a client with newly resulted arterial blood gas values. The nurse notes the  $\text{HCO}_3$  is 18 mEq/L. Which of the following correctly describes what is happening?

☒ **The kidneys are excreting excess bicarbonate**

*This is correct.  $\text{HCO}_3$ , or bicarbonate, has a normal range of 22-26 mEq/L. When the value is low, this means the kidneys are not holding on to the normal amount of bicarbonate because excess amounts are being excreted.*

- ☐ The lungs are blowing off excess carbon dioxide  
 *$\text{HCO}_3$  is a value related to the metabolic system, not the respiratory system.*
- ☐ The lungs are retaining excess carbon dioxide  
 *$\text{HCO}_3$  is regulated by the kidneys, not the lungs.*
- ☐ The kidneys are retaining excess bicarbonate  
*Normal  $\text{HCO}_3$  is 22-26 mEq/L. This client has a deficit of  $\text{HCO}_3$ , not an excess.*

### Question 2

A client's ABG values reflect respiratory alkalosis. Which action by the nurse is **most** appropriate?

- ☐ Help the client raise their breathing rate by utilizing a sternal rub

*This client needs to lower their breathing rate, not raise it.*

- ☐ Give oxygen as ordered and look for an underlying cause such as an opioid overdose

*The client's oxygen level is not given, so giving oxygen is not the appropriate action. Additionally, an opioid overdose causes hypoventilation and subsequent respiratory acidosis, so it would not be considered as a cause.*

☒ **Help the client lower their breathing rate by breathing slowly into a paper bag**

*Respiratory alkalosis occurs when a client blows off excess  $\text{CO}_2$ . This occurs when the client breathes too quickly and/or too deeply. When the nurse encourages the client to lower their breathing rate and re-breathe by utilizing a paper bag, it will help to correct the situation. Additionally, the nurse would be thinking about factors that led to the client hyperventilating, and treat these as well. Some factors include anxiety, a panic attack, or stimulant use.*

- ☐ Increase environmental stimulation by turning up the lights and engaging the client in conversation

*Respiratory alkalosis is the result of a deficit in  $\text{CO}_2$ . This occurs from hyperventilation. Increasing environmental stimulation is not going to help this client's hyperventilation. Decreasing stimulation would be a more appropriate approach by the nurse.*

### Question 3

Many components of blood can be measured by a physical measurement, such as red blood cells, white blood cells, and platelets. However, blood gases are different. When a gas dissolves, it must be measured by its pressure rather than by its physical measurement. The measurement is noted as a 'partial pressure'.

☒ **The concentration of gas dissolved in blood plasma**

- ☐ The arterial blood pressure

*While an arterial line may be in place on the client which measures blood pressure, the partial pressure does not refer to a client's blood pressure. Partial pressure refers to the amount of a gas dissolved in the blood plasma.*

- ☐ The proportion of the 4 main blood components circulating in the arterial system

*The 4 main components of blood are platelets, plasma, white blood cells and red blood cells. Partial pressure measures oxygen and carbon dioxide, which are gasses.*

- ☐ The amount of pressure added to the client's blood pressure by bases in the blood

*$\text{HCO}_3$ , or base, does not increase a client's blood pressure. Partial pressure refers to a dissolved gas, not an increase in blood pressure.*



To view the rest of the answers scan the QR code or click: [HERE](#)



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## 63 MUST KNOW LAB VALUES



### Complete Blood Count (CBC) with Differential

Value	Abbreviation	Unit	Normal
Red Blood Cell	RBC	$\times 10^6/\text{mCL}$	Male: 4.5 - 5.5 Female: 4.0 - 4.9
White Blood Cell	WBC	cells/mcL	4,500 - 10,000
Neutrophils		%	40 - 60
Band Forms		%	3 - 5 (>8 = left shift)
Eosinophils		%	1 - 4
Basophils		%	0.5 - 1
Lymphocytes		%	20 - 40
Monocytes		%	2 - 8
Platelets	PLT	cells/mcL	100,000 - 450,000
Hemoglobin	Hgb	g/dL	Male: 13.5 - 16.5 Female: 12.0 - 15.0
Hematocrit	Hct	%	Male: 41 - 50 Female: 36 - 44
Mean Corpuscular Volume	MCV	fL	80 - 100
Red Cell Distribution Width	RDW	%	<14.5

## 63 MUST KNOW LAB VALUES

### Blood Chemistry (Basic Metabolic Panel) (BMP)

Value	Abbreviation	Unit	Normal
Sodium	Na <sup>+</sup>	mEq/L	135 - 145
Potassium	K <sup>+</sup>	mEq/L	3.5 - 5.5
Chloride	Cl <sup>-</sup>	mEq/L	96 - 108
Glucose	Glu	mg/dL	70 - 115
Calcium	Ca <sup>2+</sup>	mg/dL	8.4 - 10.2
Creatinine	Cr	mg/dL	0.7 - 1.40
Blood Urea Nitrogen	BUN	mg/dL	7 - 20

### Cholesterol Levels

Value	Abbreviation	Unit	Normal
Cholesterol Total		mg/dL	<200
Low Density Lipoprotein	LDL	mg/dL	<70
High Density Lipoprotein	HDL	mg/dL	>60 optimal
Triglycerides	TG	mg/dL	<150

### Coagulation Studies

Value	Abbreviation	Unit	Normal
Prothrombin Time	PT	Seconds	11 - 14
Partial Thromboplastin Time	PTT	Seconds	25 - 35
International Normalized Ratio	INR		0.8 - 1.2
Activated Partial Thromboplastin Time	aPTT	Seconds	30-40

### Arterial Blood Gas

Value	Abbreviation	Unit	Normal
pH	pH		7.35 - 7.45
Partial Pressure of CO <sub>2</sub>	PaCO <sub>2</sub>	mmHg	35 -45
Partial Pressure of O <sub>2</sub>	PaO <sub>2</sub>	mmHg	80 - 100
Bicarbonate	HCO <sub>3</sub>	mEq/L	22 - 26
Base Excess	BE	mEq/L	-2 - +2
Oxygen Saturation	SaO <sub>2</sub>	%	95 - 100



## 63 MUST KNOW LAB VALUES

### Common Laboratory Tests

Value	Abbreviation	Unit	Normal
Albumin	Alb	g/dL	3.5 - 6.0
Alkaline Phosphatase	Alk Phos	U/L	40 - 130
Aspartate Aminotransferase	AST	U/L	12 - 37
Alanine Aminotransferase	ALT	U/L	13 - 69
Activated Partial Thromboplastin Time	aPTT	Seconds	30-40
Ammonia	NH <sub>3</sub>	mcg/dL	19 - 60
Amylase		U/L	0 - 130
Base Excess (Arterial)	BE	mEq/L	-2 - +2
Bicarbonate (Arterial)	HCO <sub>3</sub>	mEq/L	22 - 26
Bilirubin, Direct (Conjugated)		mg/dL	0 - 0.2
Bilirubin, Total	T.billi	mg/dL	0.1 - 1.2
Blood Urea Nitrogen	BUN	mg/dL	7-20
Brain Type Natriuretic Peptide	BNP	pg/mL	<100
C-Reactive Protein	CRP	mg/L	<1.0
Calcium	Ca <sup>2+</sup>	mg/dL	8.4 - 10.2
Chloride	Cl <sup>-</sup>	mEq/L	96 - 108
Cholesterol Total		mg/dL	<200
Creatinine	Cr	mg/dL	0.7-1.40
Creatinine Clearance		mL/min	85 - 125
Creatine Kinase	CK	U/L	55 - 170
Creatine Kinase MB	CK-MB	ng/mL	<2.40
D-Dimer	DDI	ng/mL	≤ 250
Erythrocyte Sedimentation Rate	ESR	mm/h	0 - 20
Ferritin		ng/mL	20-300
Folic Acid		ng/mL	2 - 20
Glomerular Filtration Rate	GFR	mL/min/1.73m <sup>2</sup>	90-120
Glucose	Glu	mg/dL	70 - 115
Glucose Tolerance Test	GTT	mg/dL	Fasting: 60-100 1 hour: <200   2 hours: < 140
Glycosylated Hemoglobin	HgbA1c	% of total Hgb	5.6-7.5
Growth Hormone	GH	ng/mL	Male: <5 Female: < 10
Hematocrit	Hct	%	Male: 41 - 50 Female: 36 - 44
Hemoglobin	Hgb	g/dL	Male: 13.5 - 16.5 Female: 12.0 - 15.0

## 63 MUST KNOW LAB VALUES

### Common Laboratory Tests

Value	Abbreviation	Unit	Normal
High Density Lipoprotein	HDL	mg/dL	>60 optimal
Homocysteine		mg/L	0.54 - 2.3
International Normalized Ratio	INR		0.8 - 1.2
Iron	Fe	µg/dL	50-175
Lactate Dehydrogenase	LDH	U/L	88-230
Lactic Acid		mEq/L	Venous Blood: 0.5-2.2 Arterial Blood: 0.5-1.6
Lipase		U/L	0 - 160
Low Density Lipoprotein	LDL	mg/dL	<70
Magnesium	Mg	mg/dL	1.6 - 2.6
Mean Corpuscular Volume	MCV	fL	80 - 100
Myoglobin	MB	ng/mL	5 - 70
Osmolality, Serum		mOSM/kg	261-280
Oxygen Saturation (Arterial)	SaO <sub>2</sub>	%	95 - 100
Partial Pressure of (Arterial) CO <sub>2</sub>	PaCO <sub>2</sub>	mmHg	35 -45
Partial Pressure of (Arterial) O <sub>2</sub>	PaO <sub>2</sub>	mmHg	80 - 100
Partial Thromboplastin Time	PTT	Seconds	25 - 35
pH (arterial)	pH		7.35 - 7.45
Phosphorus (phosphate)	PO <sub>4</sub>	mg/dL	3.0-4.5
Platelets	PLT	cells/mcL	100,000 - 450,000
Potassium	K <sup>+</sup>	mEq/L	3.5 - 5.5
Prealbumin	PAB	mg/dL	19-38
Prostate Specific Antigen	PSA	ng/mL	Male: < 4 Female: < 0.5
Protein (total)	Prot	g/dL	6-8
Prothrombin Time	PT	Seconds	11 - 14
Red Blood Cell	RBC	x10 <sup>6</sup> /ml	Male: 4.5 - 5.5 Female: 4.0 - 4.9
Red Cell Distribution Width	RDW		<14.5
Sodium	Na <sup>+</sup>	mEq/L	135 - 145
Triglycerides	TG	mg/dL	<150
Total Iron Binding Capacity	TIBC	µg/dL	250-460
Troponin I	cTnI	ng/mL	<0.035
White Blood Cell	WBC	cells/mcL	4,500 - 10,000

These lab tables are an excerpt from "Lab Values: 63 Must Know Labs for NCLEX" you can download the book [HERE](#) on Amazon.com.

# Nursing Mnemonic

## PISO

<b>P</b>	Potassium
<b>I</b>	Inside the cell
<b>S</b>	Sodium
<b>O</b>	Outside the cell

Potassium and sodium are the two most abundant cations in the body and have an inverse relationship in regards to intracellular and extracellular concentrations. Potassium is primarily located within the cell and sodium is primarily located outside the cell.



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“

Your journey is  
**UNIQUE**  
and that is why you  
will be a great nurse

You  
**CAN**  
do this and you are  
**NOT**  
alone.

”

**HAPPY  
NURSING!**



# Potassium Outline

## Overview

- Normal Range: 3.5 – 5.0 mEq/L

## General

- Main Functions
  - Most abundant intracellular cation
    - Even small changes in K levels lead to massive changes in the body
    - 98% of K is intracellular
  - Transmission of electrical impulses
    - Heart
    - Skeletal muscle
  - Acid-base balance
    - Trades places with Hydrogen ions to balance charges
    - 0.1 decrease in pH → 0.5 increase in K
- Causes
  - Hypokalemia
    - Excess insulin
      - Drives K into cell
    - Alkalosis
    - Vomiting/Diarrhea (K loss)
    - Diuretics (potassium-wasting)
      - Loop
      - Thiazide
    - Endocrine Disorders
      - ↑ Adrenals
  - Hyperkalemia
    - Renal Failure
    - Acidosis
    - Diabetes
      - DKA

- Dehydration
- Burns / Tissue Injury
- Infection
- Endocrine Disorders
  - ↓ Adrenals

## Assessment

- Hypokalemia
  - R → Shallow respirations
  - MS → Hyporeflexia, weakness
  - CV → Weak/thready pulse, dysrhythmias, orthostatic hypotension
  - N → altered mental status, lethargy, decreased LOC
  - GI → hypoactive bowel sounds, constipation/ileus, distention, N/V
- Hyperkalemia
  - CV → bradycardia, hypotension
  - EKG → tall peaked T-waves, prolonged PR, wide QRS, heart block, asystole, Vfib
  - MS → twitching, numbness, weakness
  - GI → hyperactive bowel sounds, spastic colon, diarrhea

## Therapeutic Management

- Hypokalemia
  - Prevent more loss (treat the cause)
  - Replace K IV or PO
    - SLOWLY
  - Change to K-sparing diuretics
  - K-rich foods (bananas, kale, avocados)
  - Cardiac monitor
  - Assess respiratory function
- Hyperkalemia
  - Potassium decreasing meds
    - Actual
      - Kayexelate
      - K-wasting diuretics

- Temporary
  - Insulin + D50
  - Albuterol
  - Bicarb
- Calcium Gluconate to protect the heart
- Cardiac monitoring
- K-restricted diet
  - Caution with salt substitutes
- Dialysis

## Patient Education

- Foods containing potassium – patients with renal failure should avoid
- Report any palpitations to provider or call 911 for chest pain

# Potassium Quiz

## Questions

### Question 1

A nurse must administer a dose of potassium chloride for a client with hypokalemia. 40 mEq of Potassium Chloride has been ordered IV to be given one time. The nurse understands which of the following items when administering this drug?

- ☐ Avoid giving the dose just after a meal
- ☐ Give the medication in a 500 mL bag of fluid
- ☐ Administer the medication followed by a 10 mL flush of normal saline
- ☐ Administer IV push over 5 minutes

### Question 2

The nurse is caring for 4 clients, all of whom have insulin scheduled. Which client will need insulin first?

- ☐ A client with a potassium of 6.2
- ☐ A client with a magnesium of 1.8
- ☐ A client with a POC glucose of 60
- ☐ A client with a POC glucose of 145

### Question 3

A nurse is reviewing the laboratory results for a client with a potassium level of 6.1 mEq/L. What EKG findings would the nurse expect?

*Select all that apply.*

- ☐ Prolonged QT interval
- ☐ Peaked T waves
- ☐ Atrial fibrillation
- ☐ Wide QRS
- ☐ U wave

### Question 4

A nurse in the ICU is working with a 67-year-old client with a potassium level of 2.9 mEq/L. An hour after admission to the hospital, the client develops a cardiac arrhythmia. The rhythm on the monitor shows pulseless electrical activity (PEA). Which action should the nurse perform first?

*Select all that apply.*

- ☐ Start CPR by using chest compressions at a rate of 100 per minute
- ☐ Charge the defibrillator to administer a shock
- ☐ Provide 2 rescue breaths and reassess the heart rhythm
- ☐ Administer adenosine and place the client in the recovery position

### Question 5

A client who has been suffering from severe diarrhea has developed hypokalemia and cardiac arrhythmias as a result. Which of the following treatments would most likely be ordered for this client to correct the situation?

- ☐ No intervention but continue to monitor the client's hemodynamic status
- ☐ IV administration of potassium
- ☐ Oral intake of potassium by electrolyte preparations
- ☐ Encouraged intake of potassium-rich foods, such as bananas

### Question 6

A 68-year-old client is undergoing an ECG. The nurse notes that the client has a prolonged PR interval and widening of the QRS complex. Which of the following interventions is most appropriate?

- ☐ Continue to monitor and recheck the potassium level in 1 hour
- ☐ Administer a dose of calcium gluconate as ordered
- ☐ Administer an ACE inhibitor as ordered
- ☐ Place the client supine and administer 100 percent oxygen via face mask

**Question 7**

The nurse is caring for a client with palpitations. Which lab value would be concerning for this client?

- ☐ Cl 102
- ☐ Na 139
- ☐ Mg 2.0
- ☐ K 5.9

**Question 8**

A nurse is reviewing the laboratory results for a client and notes that the client has hypokalemia. The nurse should monitor the client for which of the following EKG abnormalities?

- ☐ Wide QRS
- ☐ U wave
- ☐ Peaked T waves
- ☐ Atrial fibrillation

**Question 9**

A nurse is reviewing the laboratory results for a client and notes that the client has hypokalemia. The nurse should monitor the client for which of the following EKG abnormalities?

**Select all that apply.**

- ☐ Ask the provider when they would like to be notified
- ☐ Explain pertinent information about the situation
- ☐ Thank the provider before hanging up
- ☐ Apologize for bothering the provider with the call
- ☐ Have the chart and client's information ready when calling

**Question 10**

The nurse is caring for a client with palpitations. Which lab value would be concerning for this client?

- ☐ HCTZ
- ☐ Bumetanide
- ☐ Furosemide
- ☐ Spironolactone



## Answers

### Question 1

A nurse must administer a dose of potassium chloride for a client with hypokalemia. 40 mEq of Potassium Chloride has been ordered IV to be given one time. The nurse understands which of the following items when administering this drug?

- ☐ Avoid giving the dose just after a meal  
*IV potassium chloride is not affected by food intake.*
- ☒ **Give the medication in a 500 mL bag of fluid**  
*Potassium chloride can be very irritating to the vein when given quickly as a bolus, and diluting it will reduce the likelihood of irritation. To prevent phlebitis when administering this drug, the nurse would ensure that the medication is mixed into a 500 mL bag of fluid.*
- ☐ Administer the medication followed by a 10 mL flush of normal saline  
*Flushing with saline after a bolus is not a nursing consideration specific to potassium chloride, because this is done after every IV administration.*
- ☐ Administer IV push over 5 minutes  
*A bolus of potassium chloride over 5 minutes is much too rapid and would cause multiple problems.*

### Question 2

The nurse is caring for 4 clients, all of whom have insulin scheduled. Which client will need insulin first?

- ☒ **A client with a potassium of 6.2**  
*Insulin moves both glucose and potassium across the cell membrane, lowering the amount of potassium in the blood. Since hyperkalemia affects the heart, the client with a potassium level of 6.2 must be given insulin first.*
- ☐ A client with a magnesium of 1.8  
*This is a normal magnesium level.*
- ☐ A client with a POC glucose of 60  
*This client should not receive insulin, because the client is already hypoglycemic.*
- ☐ A client with a POC glucose of 145  
*A glucose of 145 will need insulin, but not emergently.*

### Question 3

A nurse is reviewing the laboratory results for a client with a potassium level of 6.1 mEq/L. What EKG findings would the nurse expect?

**Select all that apply.**

- ☒ **Prolonged QT interval**  
*Hyperkalemia tends to cause a shortened QT interval because the ventricles are more active due to the excess potassium.*
- ☒ **Peaked T waves**  
*Since potassium plays a role in ventricular depolarization and repolarization, hyperkalemia will present with peaked T waves and a wide QRS. This means the process of allowing the ventricles to fully contract and relax is slower and longer because there is TOO much potassium present.*
- ☐ **Atrial fibrillation**  
*Potassium abnormalities tend to cause ventricular dysrhythmias, NOT atrial ones.*
- ☒ **Wide QRS**  
*Since potassium plays a role in ventricular depolarization and repolarization, hyperkalemia will present with peaked T waves and a wide QRS. This means the process of allowing the ventricles to fully contract and relax is stronger and longer because there is TOO much potassium present.*
- ☐ **U wave**  
*A U wave would be caused by hypokalemia, not hyperkalemia.*



To view the rest of the answers scan the QR code or click: [HERE](#)



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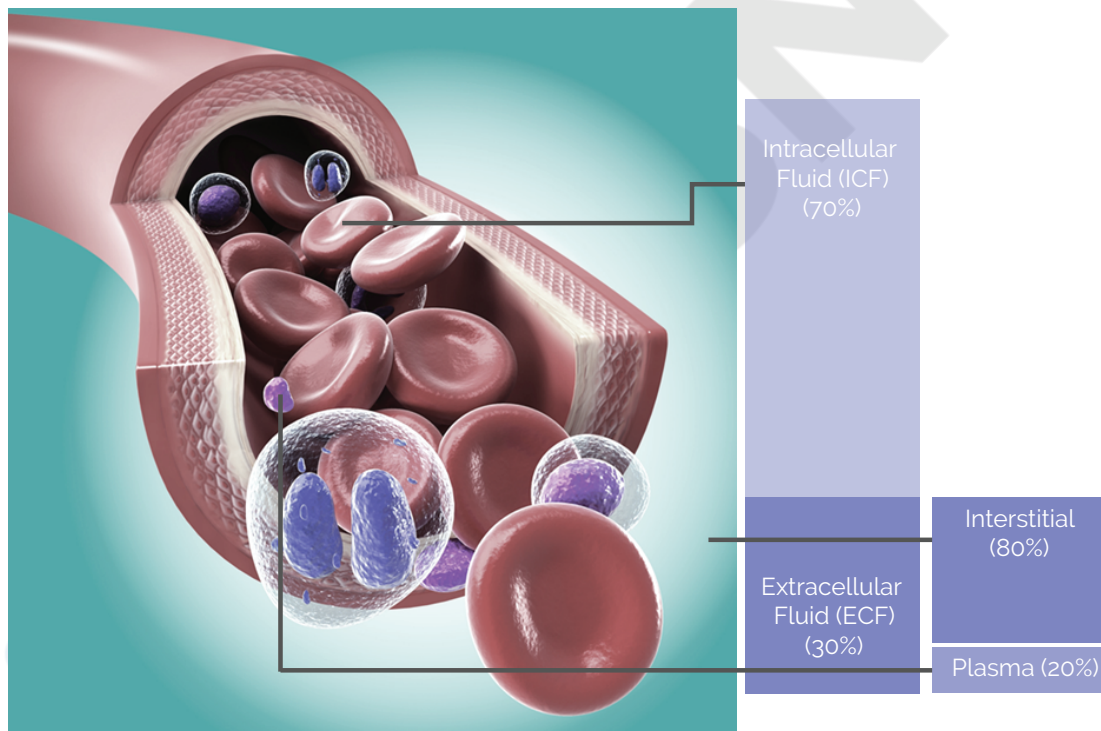
## FLUIDS AND ELECTROLYTES

Total body mass for adults is made up of 55-60% fluids. All fluids within the body contain electrolytes. Electrolytes are electrically charged ions dissolved in the fluid.

Each body compartment has a specific % of fluids and electrolytes.

To function properly these % must be maintained.

<b>Intracellular</b>	All fluid inside the cells. Makes up 70% of body fluids.
<b>Intravascular</b>	Fluid inside the blood vessels. Makes 20% of ECF.
<b>Extracellular</b>	All fluid outside the cells. Makes up 30% of body fluids.



### Major Body Electrolytes

<b>Na<sup>+</sup></b>	135-145: fluid regulation, neuronal and nerve signals	<b>Mg<sup>++</sup></b>	1.7-2.2: muscles, nerve function, bones
<b>Cl<sup>-</sup></b>	96-106: acid-base balance, fluid regulation	<b>Ca<sup>++</sup></b>	8.5-10.2: teeth, bones, clotting, heart
<b>K<sup>+</sup></b>	3.5-5.0: heart, kidneys, nerves, digestive	<b>HCO<sub>3</sub><sup>-</sup></b>	22-26: acid-base balance

# Nursing Mnemonic

## MACHINE

<b>M</b>	<b>Medications - ACE Inhibitors, NSAIDS, potassium-sparing diuretics</b>
<b>A</b>	<b>Acidosis - Metabolic and respiratory</b>
<b>C</b>	<b>Cellular destruction - burns, traumatic injury, hemolysis</b>
<b>H</b>	<b>Hypoaldosteronism - Addison's</b>
<b>I</b>	<b>Intake- excessive</b>
<b>N</b>	<b>Nephrons- renal failure</b>
<b>E</b>	<b>Excretion - Impaired</b>

Hyperkalemia is elevated potassium in the blood. Typical levels of potassium in the blood are 3.5 to 5.0 mEq/L. In acidosis and cellular destruction, potassium shifts from inside the cell to the blood stream. Medications and kidney damage can decrease urinary excretion of potassium. Excessive intake of potassium can also lead to hyperkalemia. Potassium is necessary for the transmission of electrical impulses in heart and skeletal muscle; therefore increased potassium can cause ECG changes.



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# Sodium Outline

## Overview

- Normal Range: 135 – 145 mEq/L

## General

- Main Functions
  - Most abundant extracellular cation
  - Controls fluid distribution between ICF and ECF
    - Osmolarity
  - Muscle contraction
  - Nerve Impulses
- Causes
  - Hyponatremia
    - Actual (Loss of Na)
      - Sweating
      - Wound drainage
      - Low Na diet
      - Diuretics
      - Hypoaldosteronism
    - Relative (Increase in fluids)
      - SIADH
      - Water intoxication
      - Freshwater submersion
      - Psychogenic polydipsia
      - Hypotonic fluids
  - Hypernatremia
    - Actual (Increased Na)
      - Steroids
      - Oral ingestion
      - Hypertonic Saline (1.5%, 3%, 5%)
      - Cushing's Syndrome
    - Relative (Loss of Fluids)
      - NPO
      - Fever
      - Hyperventilation
      - Dehydration
      - Infection

## Assessment

- Hyponatremia
  - N → behavior changes, ↑ ICP, cerebral edema, seizures
  - MS → weakness (esp. Resp muscles), ↓ DTR's
  - GI → ↑ motility, N/V/D, cramps
  - CV
    - Hypovolemia – weak pulse, tachycardia, hypotension, dizziness
    - Hypervolemia – bounding pulses, high BP
- Hypernatremia
  - N – related to cellular dehydration in the brain cells
    - Hypovolemic – irritable, confused, manic, cranky
    - Hypervolemic – lethargic, drowsy, stupor, coma
  - MS → twitching, cramps, weakness
  - CV → ↓ contractility
    - Hypovolemic – ↓ BP, weak pulses
    - Hypervolemic – ↑ BP, JVD, bounding pulses
  - Other → extreme thirst, dry mucous membranes, dry/hot skin

## Therapeutic Management

- Hyponatremia
  - Replace SLOWLY
    - Avoid volume overload (due to fluid shifts)
    - Prevent Central Pontine Myelinolysis (CPM)
      - Neuro damage caused by overcorrection of hyponatremia
      - ↑ Na level by 0.5 mEq/hr
  - Drugs
    - Stop Na-Wasting Diuretics
    - IV 0.9% NaCl if hypovolemic
    - Hypertonic saline (3%)
    - Osmotic Diuretics
      - Lose H<sub>2</sub>O, not Na

- Dietary Changes
  - Increase Na intake
  - Free Water Restriction
- Hyponatremia
  - Bring levels down SLOWLY
  - Hypotonic fluids –  $\frac{1}{2}$  NS, D5W
  - If hypervolemic, give Na wasting diuretics
  - Discuss with Dietician
    - Na restriction
    - Increase Free Water

## Patient Education

- Dietary restrictions – what is and is not allowed
- Report any numbness/weakness in the feet (may indicate CPM)

# Sodium Quiz

## Questions

### Question 1

A nurse is caring for a client who is recovering from surgery. The client has developed a headache, muscle weakness, and mental status changes. The nurse notes that the client's glucose level is 85 mg/dL, sodium is 126 mEq/L, potassium is 4.8 mEq/L and calcium is 8.6 mg/dL. What intervention is most appropriate for the nurse to perform in this situation?

- ☐ Administer 3% sodium chloride solution
- ☐ Administer calcium supplements orally
- ☐ Give potassium chloride in 5% dextrose
- ☐ Offer the client a drink containing glucose

### Question 2

A nurse is caring for a client who is being treated for SIADH with 3% hypertonic saline to correct a serum sodium of 129 mEq/L, which was drawn approximately 24 hours ago. A new BMP shows the latest sodium is 147 mEq/L. What is the **priority** nursing intervention at this time?

- ☐ Notify MD; anticipate additional dosing of hypertonic saline
- ☐ Administer ordered supplemental sodium tablets as scheduled
- ☐ Nothing at this time; this is a desired response
- ☐ Notify MD; perform detailed neuro assessment

### Question 3

A nurse is caring for a client who had blood drawn for laboratory work. The client's sodium level is 142 mEq/L. Which nursing intervention is most appropriate?

- ☐ Contact the provider for an order for vasopressin
- ☐ Administer diphenhydramine as ordered
- ☐ Increase the IV rate to counteract the effects
- ☐ Document the result and continue to monitor

### Question 4

A patient has developed hypernatremia as a result of TPN use. Which of the following signs or symptoms would the nurse see with this situation?

**Select all that apply.**

- ☐ Decreased urine output
- ☐ Vomiting
- ☐ Dry skin
- ☐ Thirst
- ☐ Bloating

### Question 5

The nurse is receiving report on a client with severe hypernatremia. The nurse anticipates which of the following findings upon assessment of this client?

**Select all that apply.**

- ☐ Seizures
- ☐ Agitation
- ☐ Dry mouth
- ☐ Diarrhea
- ☐ Muscle twitching

### Question 6

A client has developed hyponatremia as a result of syndrome of inappropriate anti-diuretic hormone. Which type of IV fluid would the nurse most likely administer?

- ☐ 3% Normal saline
- ☐ 0.9% NaCl
- ☐ D5W
- ☐ 0.45% NS

### Question 7

A client has developed hyponatremia as a result of syndrome of inappropriate anti-diuretic hormone. Which type of IV fluid would the nurse most likely administer?

- ☐ 3% NS IV at 250 cc/hr
- ☐ Insulin infusion at 2 units/hr
- ☐ LR IV 1000 bolus
- ☐ 0.45% NS IV at 50 cc/hr

**Question 8**

The nurse is caring for a client with a sodium level of 125 mEq/L. The client was previously alert, oriented, and ambulatory. The nurse notes that this client can no longer lift his arms and is beginning to demonstrate erratic behavior, such as attempting to climb out of bed. Which of the following medications does the nurse anticipate giving this client?

- ☐ Haloperidol
- ☐ Hydrochlorothiazide
- ☐ Indapamide
- ☐ Mannitol

**Question 9**

The nurse is caring for a client who takes a diuretic for heart failure. The nurse is assessing the client and notes confusion, muscle weakness, and diminished deep tendon reflexes. The nurse checks the client's lab values. Which of the following lab values is consistent with this client's symptoms?

- ☐ Na 121 mEq/L
- ☐ Mg 1.6 mg/dL
- ☐ Ca 10.8 mg/dL
- ☐ K 7.1 mEq/L

**Question 10**

A nurse is caring for a client who has developed severe hyponatremia and is confused. The nurse needs help with caring for the client's needs while keeping the client safe and restraint-free. Which of the following **best** demonstrates that the nurse is advocating for the safety of this client?

- ☐ Not telling the family about the client's behavior because it would embarrass the client
- ☐ Keeping the client's secrets when he or she tells the nurse something important
- ☐ Discussing the client's condition with other staff to determine the best course of action
- ☐ Placing the client in a room near the nurse's station



## Answers

### Question 1

A nurse is caring for a client who is recovering from surgery. The client has developed a headache, muscle weakness, and mental status changes. The nurse notes that the client's glucose level is 85 mg/dL, sodium is 126 mEq/L, potassium is 4.8 mEq/L and calcium is 8.6 mg/dL. What intervention is most appropriate for the nurse to perform in this situation?

#### Administer 3% sodium chloride solution

*This client is showing signs of hyponatremia, as well as lab values that reflect a low sodium level. A client with hyponatremia can develop symptoms that include skeletal muscle weakness, headache, confusion, hyperactive bowel sounds, nausea, abdominal cramping, increased urinary output, and dry mucous membranes. The nurse would most likely administer a hypertonic solution that contains extra sodium, such as 3% sodium chloride.*

- Administer the medication followed by a 10 mL flush of normal saline  
*The client's calcium level is normal.*
- Give potassium chloride in 5% dextrose  
*This is a treatment for hypokalemia, not hyponatremia.*
- Offer the client a drink containing glucose  
*The client does not have a low blood glucose level.*

### Question 2

A nurse is caring for a client who is being treated for SIADH with 3% hypertonic saline to correct a serum sodium of 129 mEq/L, which was drawn approximately 24 hours ago. A new BMP shows the latest sodium is 147 mEq/L. What is the **priority** nursing intervention at this time?

- Notify MD; anticipate additional dosing of hypertonic saline  
*The MD should be notified, but the nurse should anticipate the hypertonic saline will be STOPPED or at least decreased because the sodium level is increasing too quickly.*
- Administer ordered supplemental sodium tablets as scheduled  
*This would be inappropriate because it would increase the sodium levels even further. The sodium replacement needs to be slowed or stopped at this time.*

- Nothing at this time; this is a desired response  
*This is inappropriate. The MD needs to be notified because the client is at risk for neurologic injury due to the sodium being overcorrected.*

#### Notify MD; perform detailed neuro assessment

*Over-correction of serum sodium (more than an increase of 12 mEq/L in 24 hours) is concerning for central pontine myelinolysis, or CPM. This can result in profound neurological complications, and even death. The MD should be notified, as they will most likely discontinue the 3% hypertonic saline due to the risk of developing CPM.*

### Question 3

A nurse is caring for a client who had blood drawn for laboratory work. The client's sodium level is 142 mEq/L. Which nursing intervention is most appropriate?

- Contact the provider for an order for vasopressin  
*This is an inappropriate actions because the sodium level is normal.*
- Administer diphenhydramine as ordered  
*This is an inappropriate actions because the sodium level is normal.*
- Increase the IV rate to counteract the effects  
*This is an inappropriate actions because the sodium level is normal.*

#### Document the result and continue to monitor

*Serum sodium is measured as part of an electrolyte panel. A clients sodium level indicates an appropriate balance between fluid and electrolytes in the body. A normal sodium level is between 135 and 145 mEq/L. This client's results are within normal limits so the nurse should continue to monitor.*



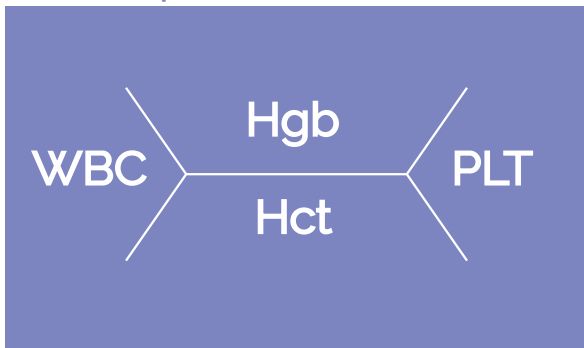
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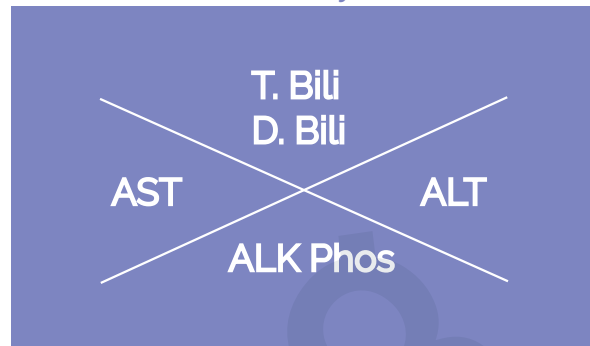
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## LAB VALUE SKELETONS

Complete Blood Count (CBC)



Liver Enzymes



Arterial Blood Gas (ABG)



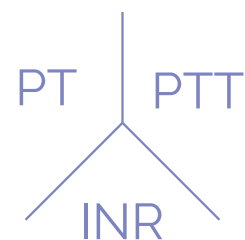
Basic Metabolic Panel (BMP or CHEM-7) and CHEM-10



Liver Profile



Bleeding Times



# Nursing Mnemonic

## AIRED

<b>A</b>	<b>Administer IV Calcium - to immediately decrease cardiac toxicity</b>
<b>I</b>	<b>Increase excretion - via both stool (kayexlate) and urine (diuretics)</b>
<b>R</b>	<b>Remove sources of potassium - from all sources, including enteral, parenteral, IV, and PO</b>
<b>E</b>	<b>Enhance potassium uptake into cells - insulin, glucose, sodium bicarb, beta-adrenergic antagonists</b>
<b>D</b>	<b>Emergent response for patients with lethal hyperkalemia</b>

Remember the word AIRED to know what interventions are used to manage hyperkalemia. The ultimate goal is to reduce the amount of circulating potassium and to protect the heart from the dangerous effects of hyperkalemia.



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**Be  
Your  
Best  
Self**



# WBC Outline

## Overview

- White Blood Cells
  - Normal Value Range
  - Pathophysiology
  - Special considerations
  - Abnormal values (high)
  - Abnormal values (low)

## General

- Normal value range
  - WBC
    - 4500-10000/mcL
  - Differential
    - Neutrophils
      - 40-60%
    - Bands
      - 3-5%
        - >8% indicates signal to WBC for more production
        - Infection or inflammation is severe
    - Eosinophils
      - 1-4%
    - Basophils
      - 0.5-1%
    - Lymphocytes
      - 20-40%
    - Monocytes
      - 2-8%
- Pathophysiology
  - WBC
    - Formed in the bone marrow
    - Responsible for responding to foreign invaders
      - Creating antibodies (immunity)
      - Phagocytosis (eating bacteria or fungi)
    - Multiple types with different purposes
      - Neutrophils –
        - inflammation and first response to invader
      - Eosinophils –
        - Inflammation
        - Allergic response
        - Parasites
      - Basophils
        - Inflammation
        - Allergic response
      - Lymphocytes
        - Create antibodies
        - Recognize antigens
        - Destroy cells
          - T Cells
          - B Cells
          - Natural Killer cells
      - Monocytes
        - Macrophages
          - Engulf and destroy invaders
        - Indicative of infection
- Special considerations
  - Lavender top tube
  - Will commonly be submitted for Complete Blood Count with differential
- Abnormal lab values
  - Increased White Blood Cell count (leukocytosis)
    - Infection
    - Inflammation
    - Trauma/Stress
    - Pregnancy
    - Asthma
    - Allergic Reaction
  - Decreased lab values (leukopenia)
    - Systemic Lupus Erythematosus (SLE)/ Rheumatoid arthritis
    - Cancers
    - Chemotherapy/Radiation
    - Medications

- Neutropenic precautions
  - Masks
  - Gloves
  - Wash hands
  - Consider yourself infectious
    - Prevent spread of infection to the patient

## Assessment

- Consider the overall WBC count plus abnormalities in differential
  - Evaluate patient
    - Signs or symptoms of:
      - Trauma
      - Inflammation
      - Infection

## Therapeutic Management

- Antibiotic therapies where indicated by infection (followed by cultures to determine efficacy of antibiotics)
- Anti-inflammatories for inflammation
- Provide neutropenic precautions when necessary

## Patient Education

- Educate patients on finishing any antibiotics completely. Do not stop prior, even if the patient says they are feeling better.

# WBC Quiz

## Questions

### Question 1

A provider orders a complete blood count (CBC) with a differential for a client who is suffering from allergic rhinitis due to pollen and environmental allergies. Which of the following results on the CBC would the nurse expect to see?

- ☐ Increased eosinophils
- ☐ Decreased MCV
- ☐ Increased hematocrit
- ☐ Decreased red blood cells

### Question 2

A nurse is reviewing a laboratory report for a client admitted with a suspected bacterial infection. The report indicates a white blood cell (WBC) count of  $15,000/\text{mm}^3$ . Which of the following actions should the nurse take first?

- ☐ Prepare the client for a bone marrow biopsy
- ☐ Increase the frequency of vital signs monitoring
- ☐ Educate the client on the importance of hand hygiene
- ☐ Administer prescribed antibiotics

### Question 3

A nurse admitted a client with a WBC count of 12,450 cells/mcL. Which medication is **most** likely causing this lab value?

- ☐ Bupropion
- ☐ Rayos
- ☐ Teriflunomide
- ☐ 5-fluorouracil

### Question 4

The nurse is caring for a client with abdominal cramps, nausea, vomiting, and diarrhea. What statement by the client causes the nurse to suspect trichinosis?

- ☐ "I just shot my first buck and was eating the venison"

- ☐ "I tried a new restaurant that looked dirty"
- ☐ "I ate hot dogs from a street vendor"
- ☐ "I was eating a piece of moldy bread, I almost ate the whole piece before I noticed"

### Question 5

A nurse has just received the results of a client's complete blood count with differential. Which of the following WBC elevation would indicate a left shift?

- ☐ Eosinophils
- ☐ Neutrophils
- ☐ Lymphocytes
- ☐ Monocytes

### Question 6

A nurse is caring for a client with leukopenia. Which of the following interventions is **most** important for the nurse to implement?

- ☐ Monitoring temperature every 4 hours.
- ☐ Placing the client in a private room.
- ☐ Encouraging fluid intake of at least 2 liters per day.
- ☐ Applying pressure to injection sites for at least 5 minutes.

### Question 7

A provider orders a CBC for a male client who has been admitted to the hospital for pneumonia. Which of the following results would be considered abnormal on the CBC? Select all that apply

**Select all that apply.**

- ☒ Hematocrit 50%
- ☒ WBC 8,000/mcL
- ☒ Platelets 200,000 cells/mcL
- ☒ RBC 3.8/mcL
- ☒ Hemoglobin 10.2 g/dL

**Question 8**

Prior to back surgery, the provider has ordered a complete blood count for a client. Which **best** describes the purpose of performing this test before surgery?

- ☐ Electrolyte imbalance
- ☐ Renal status
- ☐ Infection or immune status
- ☐ Transfusion readiness

**Question 9**

Which of the following clients should the nurse identify as having the greatest risk for a **decreased** white blood cell count?

- ☐ A client who has completed a course of antibiotics for a urinary tract infection
- ☐ A client receiving chemotherapy for breast cancer
- ☐ A client with a history of seasonal allergies
- ☐ A client diagnosed with hypertension, taking beta-blockers

**Question 10**

A nurse is educating a client with a high white blood cell count on measures to prevent infection. Which of the following instructions should the nurse include?

- ☐ "Perform exercises without rest periods."
- ☐ "Increase consumption of high-fat foods."
- ☐ "Avoid large crowds and individuals who are sick."
- ☐ "Limit intake of fresh fruits and vegetables."



## Answers

### Question 1

A provider orders a complete blood count (CBC) with a differential for a client who is suffering from allergic rhinitis due to pollen and environmental allergies. Which of the following results on the CBC would the nurse expect to see?

#### Increased eosinophils

A complete blood count (CBC) checks the count and types of blood cells in the client's blood. When a client is being tested for allergy sensitivities, the provider may order a CBC with differential. The cells that show up on the differential, which are specific types of white blood cells, can indicate what type of infection or reaction is present. In the case of an allergic reaction, the eosinophils may be elevated, indicating that the client's body is fighting an allergen.

#### ☐ Decreased MCV

MCV or mean corpuscular volume refers to the size of red blood cells. If the number is low, then RBCs are smaller than normal, which can be caused by iron deficiency. It is not caused by an allergen.

#### ☐ Increased hematocrit

If the hematocrit is increased, it is usually caused by dehydration, which increases the blood's concentration as water is lost. Some people with lung disease or who live at high altitudes may have an increased hematocrit, which is the body's way of compensating for less available oxygen by producing more red blood cells. Increased hematocrit is not caused by an allergic reaction.

#### ☐ Decreased red blood cells

A decrease in red blood cells (RBCs) is known as anemia. Allergens do not have this effect on the blood.

### Question 2

A nurse is reviewing a laboratory report for a client admitted with a suspected bacterial infection. The report indicates a white blood cell (WBC) count of  $15,000/\text{mm}^3$ . Which of the following actions should the nurse take first?

#### ☐ Prepare the client for a bone marrow biopsy

A bone marrow biopsy may be indicated for unexplained leukocytosis or hematologic disorders, not as a first response to an elevated WBC count due to suspected infection.

#### ☐ Increase the frequency of vital signs monitoring

While increasing the frequency of vital signs

monitoring is important for a client with infection, the priority is to address the infection directly with antibiotics.

#### ☐ Educate the client on the importance of hand hygiene

Educating the client on hand hygiene is important for infection control but not the priority action in the presence of elevated WBCs due to suspected bacterial infection.

#### Administer prescribed antibiotics

A WBC count of  $15,000/\text{mm}^3$  is elevated, indicating an infection. The first action is to administer prescribed antibiotics to combat the bacterial infection, addressing the client's immediate need and potential risk.

### Question 3

A nurse admitted a client with a WBC count of 12,450 cells/mcL. Which medication is **most** likely causing this lab value?

#### ☐ Bupropion

Bupropion hydrochloride is a norepinephrine-dopamine reuptake inhibitor approved for the treatment of depression and smoking cessation and may cause significant leukocytosis.

#### ☐ Rayos

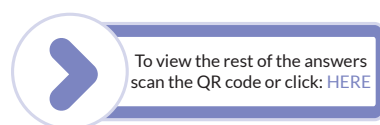
Rayos, a form of prednisone, even in small doses administered over a prolonged period of time, can induce extreme and persistent leukocytosis.

#### ☐ Teriflunomide

Teriflunomide may lower white blood cell (WBC) count and possibly suppress the immune system. Teriflunomide is used to treat relapsing forms of multiple sclerosis in adults (including clinically isolated syndrome, relapsing-remitting disease, and active secondary progressive disease).

#### ☐ 5-fluorouracil

5-fluorouracil (5-FU) is an antimetabolite used to treat leukemia, which suppresses the WBC counts, not increase.



Scan Me

## LAB VALUE FOR CLINICAL

CHEM-7				CBC			LFTs		
Na	Cl	BUN	Glu	WBC	Hgb	PLT	Ca	AST	Ca: 8.4 - 10.2 mg/dL TP: 6.8 g/dL Alb: 3.5 - 6 g/dL AST: 12 - 37 U/L ALT: 13 - 69 U/L ALP: 40 - 130 U/L TBili: 0.1 - 1.2 mg/dL
K	CO2	Cr			HCT		TP	ALT	
Na: 135 -145 mEq/L K: 3.5 - 5.0 mEq/L Cl: 96 - 108 mEq/L CO2: 22 - 26 mEq/L BUN: 7 - 20 mg/dL Cr: 0.7 - 1.4 mg/dL Glucose: 70 - 115 mg/dL				WBC: 4.5 - 10 x 10^3/L Hgb Male: 13.5 - 16.5 g/dL Hgb Female: 12 - 15 g/dL HCT Male: 41 - 50% HCT Female: 36 - 44% PLT: 100 - 450 x 10^3/L			Alb	ALP	
							TBili		









### Electrolyte Imbalances EKG Changes

ELECTROLYTE	EKG CHANGES
Hypocalcemia	Prolonged ST, Prolonged QT
Hypercalcemia	Shortened ST, Widened T
Hypokalemia	ST Depression, T Wave Changes, U Wave
Hyperkalemia	Peaked T, Flat P, Wide QRS, Prolonged PR
Hypomagnesemia	Tall T, Depressed ST
Hypernatremia	Prolonged PR, Wide QRS

### ABG Values

pH	Pa CO <sub>2</sub>	PaO <sub>2</sub>	HCO <sub>3</sub>
7.35-7.45	35-45	80-100	22-26

### Order of Blood Draws

Order of Draws	Tube	Additive
First	Blood Cultures	See Bottle
		Citrate
		Gel, Serum
		No Gel, Serum
		Heparin
		EDTA
		EDTA
		Sodium Fluoride
		Citrate Acid
Last		

### MY PATIENTS LAB VALUES

Na		HCT	
K		PLT	
CL		Ca	
CO <sub>2</sub>		AST	
BUN		ALT	
Cr		ALP	
Glucose		TP	
WBC		Alb	
HGB		TBili	

# Nursing Mnemonic

## MURDER

<b>M</b>	Muscle weakness
<b>U</b>	Urine- oliguria, anuria
<b>R</b>	Respiratory distress
<b>D</b>	Decreased cardiac contractility
<b>E</b>	ECG changes
<b>R</b>	Reflexes- hyperreflexia, or areflexia (flaccid)

Excess potassium is deadly and can kill a patient - so remember the word "Murder". This will help you remember the signs and symptoms of hyperkalemia.



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You Are Going To Be An

**AMAZING**

Nurse

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