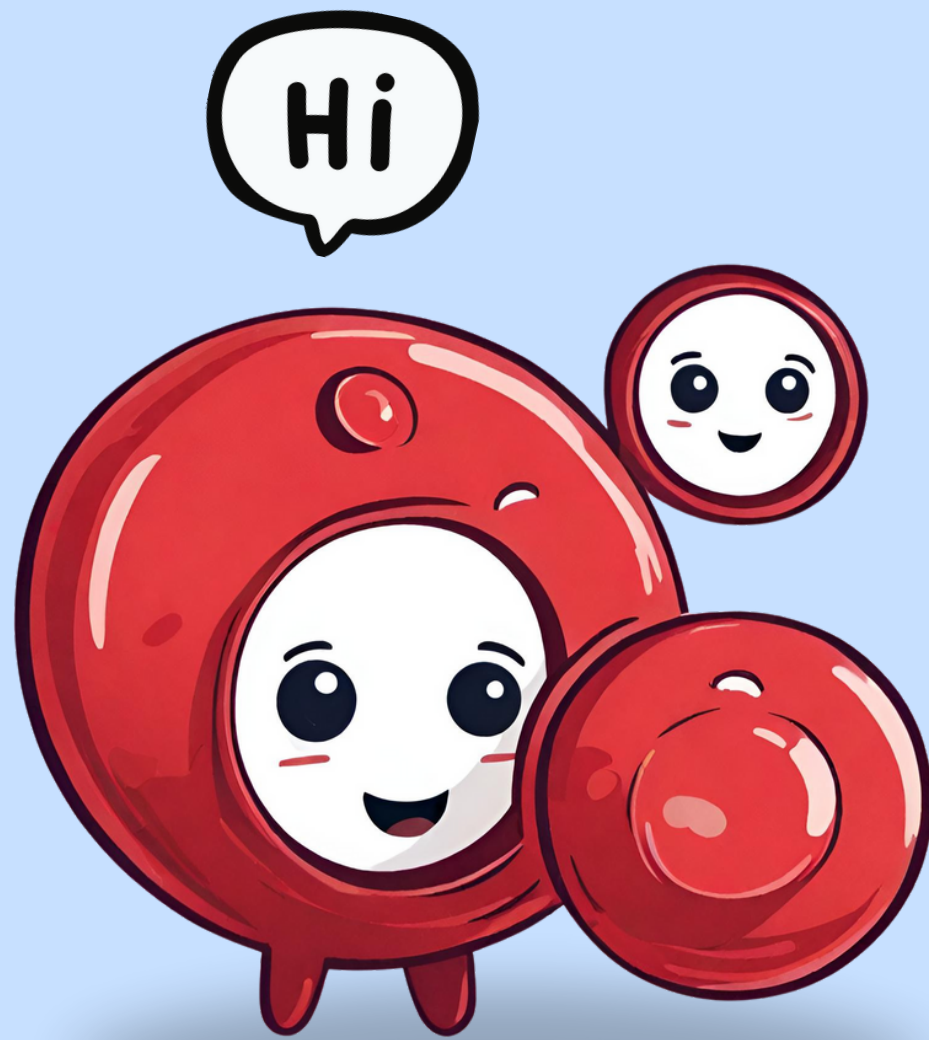




ARTERIAL BLOOD GAS (ABG)

MUMIM'S

WHAT DOES ABG DO?



ABG measures

- The balance of O₂ and CO₂ in your blood which reflects your lung function 🫁
- Acid-base balance in your blood which reflects kidneys and lung function ⚖️

WHY DO ABG?

To identify any **acid-base imbalance** which can lead to **acidosis or alkalosis**

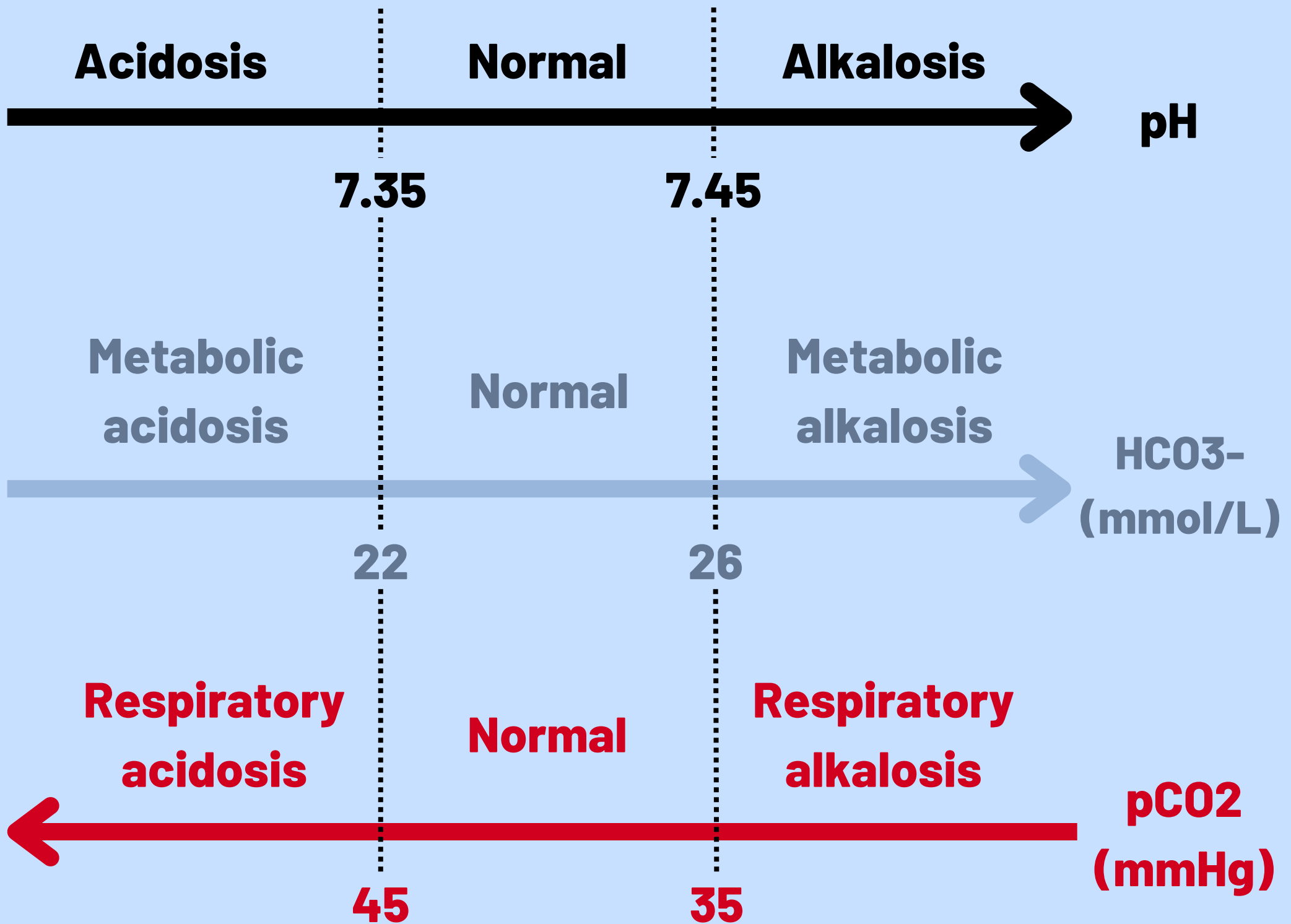
To identify the cause of acidosis/alkalosis as **respiratory or metabolic**



What is **acidosis/alkalosis**?
What are **respiratory/metabolic** causes?
Swipe left to find out!



ABG NORMAL VALUES



Check arterial pH

< 7.35

> 7.45

Acidemia

Alkalemia

$p\text{CO}_2 > 45$

$\text{HCO}_3^- < 22$

$p\text{CO}_2 < 35$

$\text{HCO}_3^- > 26$

Respiratory Acidosis

Metabolic Acidosis

Respiratory Alkalosis

Metabolic Alkalosis

Hypoventilation

Inhibition of medullary respiratory center

- Opiates
- Anesthetics

Weak respiratory muscles

- Guillain-Barre syndrome
- Multiple sclerosis

Airway obstruction

- OSA

Disorders of gas exchange

- ARDS
- COPD

High anion gap

- Diabetic ketoacidosis
- Lactic acidosis
- Uremia from chronic renal failure

Normal anion gap

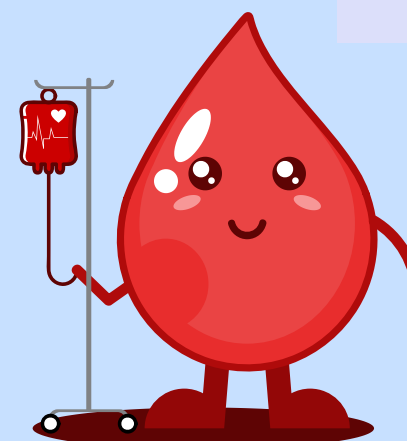
- Diarrhoea
- Renal tubular acidosis

Hyperventilation

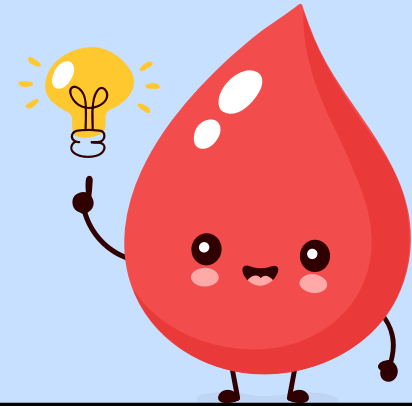
- Hysteria
- Hypoxaemia: high altitude
- Mechanical ventilation

H⁺ loss / HCO₃⁻ excess

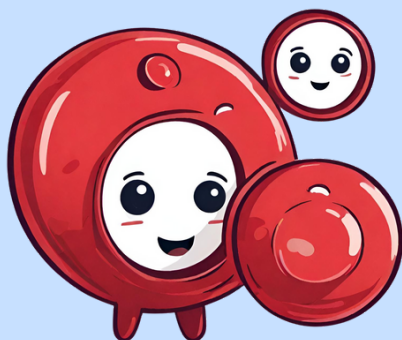
- Vomiting
- Hyperaldosteronism
- Ingestion of alkali in renal failure
- Loop/thiazide diuretics



SUMMARY



		pH	pCO ₂	HCO ₃ ⁻	Compensatory response
Primary changes in pCO₂ with secondary renal compensation	Respiratory acidosis	↓	↑	Normal	↑ HCO ₃ ⁻
	Respiratory alkalosis	↑	↓	Normal	↓ HCO ₃ ⁻
Primary changes in HCO₃⁻ with secondary respiratory compensation	Metabolic acidosis	↓	Normal	↓	↓ pCO ₂
	Metabolic alkalosis	↑	Normal	↑	↑ pCO ₂



SUMMARY

		pH	pCO ₂	HCO ₃ ⁻	Compensatory response
Primary changes in pCO ₂ with secondary renal compensation	Respiratory acidosis	↓	↑	Normal	↑ HCO ₃ ⁻
	Respiratory alkalosis	↑	↓	Normal	↓ HCO ₃ ⁻
Primary changes in HCO ₃ ⁻ with secondary respiratory compensation	Metabolic acidosis	↓	Normal	↓	↓ pCO ₂
	Metabolic alkalosis	↑	Normal	↑	↑ pCO ₂

LET'S TRY THIS QUESTION!

COMMENT YOUR ANSWER BELOW!



A patient has the following laboratory findings:

Bicarbonate: 13 mmol/L (22-26)

Arterial blood gas (ambient air): pH 7.29

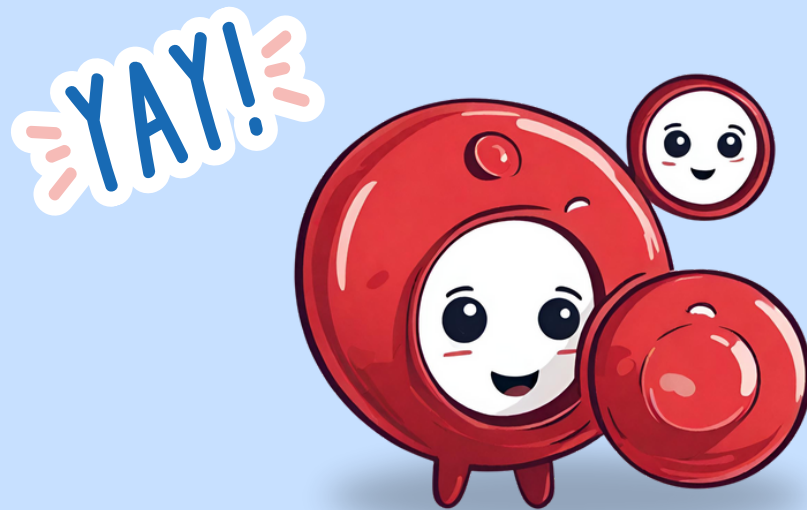
pCO₂: 28 mmHg (35-45)

Which of the following is the most likely acid-base status?

- A. Acute respiratory acidosis
- B. Chronic respiratory acidosis
- C. Metabolic acidosis
- D. Metabolic alkalosis



[WE HOPE THIS HELPS!]



FOLLOW US!



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REFERENCES

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2. Y3 friday workshop slides from Dr Lee
3. Costanzo physiology 6th ed.

