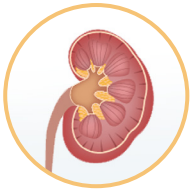
METABOLIC ACIDOSIS

Definition

- An accumulation of acid in the body caused by either increased acid generation, loss of bicarbonate, or diminished renal acid excretion
- Excess acid and decreased bicarbonate lead to pH imbalance.

Common Causes



Renal failure

ASA/antifreeze overdose

Diarrhea

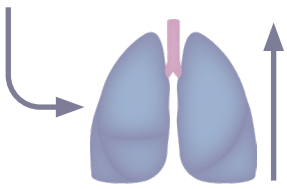
Diabetic ketoacidosis

Lab Values

Disturbance	pH	CO_2	HCO_{3-}	Cause	Compensation
Metabolic acidosis	⬇ Decreased	Normal or ⬇ decreased	⬇ Decreased	Kidneys control HCO_{3-}.	Lungs excrete CO_2.
Normal values	7.35–7.45	35–45 mm Hg	22–26 mmol/L	O_2 levels are not part of ABG imbalance determination.	

Compensation

Metabolic acidosis → Hyperventilation → Increase in pH → ⬇ Decreased CO2



Kussmaul breathing: an abnormal rapid, deep breathing pattern that helps the body blow off extra CO_2; often seen in DKA

Uncompensated:
Opposite system is not responding, pH remains imbalanced.

Partial compensation:
Opposite system is working to correct imbalance, pH not yet normalized.

Full compensation:
Homeostasis achieved, all lab values return to normal.

Example

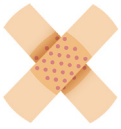
Steps:

1. Identify pH (acidosis or alkalosis).
2. Identify CO_2 (⬆, ⬇, normal).
3. Identify HCO_3 (⬆, ⬇, normal).
4. Which label matches pH?
5. Look at opposite system, evaluate if it is bringing pH back to normal.

Disturbance	pH	CO_2	HCO_{3-}
???	7.25	32	18

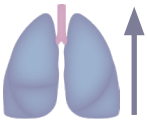
Answer: metabolic acidosis partially compensated

Treatment



Fix the underlying cause.

Consider sodium bicarbonate IV.



Body increases respiratory rate to decrease CO_2.

NOTES