NCLEX ABG interpretation cheat sheet

Normal ABG values

Value	Normal range	Acidosis	Alkalosis
pH	7.35 to 7.45	Below 7.35	Above 7.45
PaCO	35 to 45 mm Hg	Above 45	Below 35
HCO	22 to 26 mEq/L	Below 22	Above 26
PaO	75 to 100 mm Hg		
Oxygen saturation	95 to 100%		

Source: StatPearls, Arterial Blood Gas. Ranges vary slightly between laboratories: use the ranges a question gives you. Last checked: 19 November 2026.

ROME

Respiratory Opposite: pH and PaCO move in opposite directions.

Metabolic Equal: pH and HCO move in the same direction.

The 4 steps

1. Read the pH. Below 7.35 is acidosis, above 7.45 is alkalosis. If normal, note which side of 7.40 it sits on.
2. Find the cause. The value (PaCO or HCO) that matches the pH's direction is the primary problem.
3. Check compensation. Is the other value normal (none) or moving to pull the pH back (compensating)?
4. Check oxygenation. Read PaO and oxygen saturation separately from carbon dioxide.

Compensation

Status	pH	PaCO and HCO
Uncompensated	Abnormal	One abnormal, one normal
Partially compensated	Abnormal	Both abnormal
Fully compensated	Normal	Both abnormal

Lungs compensate within minutes. Kidneys take hours to days.

Causes and first nursing actions

Imbalance	Common causes	First nursing actions

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Respiratory acidosis	Opioids or sedatives, COPD, airway obstruction, respiratory muscle fatigue	Open airway, sit up, prescribed oxygen, prepare naloxone if opioid-related, no sedatives
Respiratory alkalosis	Anxiety, pain, fever, hypoxaemia, high ventilator rate	Check oxygen saturation first, treat the cause, coach slow breathing
Metabolic acidosis	DKA, shock, kidney failure, severe diarrhoea	IV access, prescribed fluids, check potassium before insulin, cardiac monitoring
Metabolic alkalosis	Vomiting, NG suction, diuretics, excess bicarbonate	Measure losses, antiemetics, replace fluid, chloride and potassium as prescribed, ECG

Watch for

- Acidosis can make serum potassium look normal or high while total body potassium is low.
- Insulin moves potassium into cells: check potassium before starting it.
- Potassium chloride is never given by IV push.
- Kussmaul's respirations are compensation: treat the cause, don't sedate.
- A good oxygen saturation on oxygen does not show carbon dioxide is being cleared.

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