ABG Interpretation Chart

Patient information	
Name: James Walker	**Date of birth:** June 2, 1965
Gender: Male	**Date and time of ABG:** July 21, 2025, 10:45 AM

ABG values

Parameter	Patient value	Normal range	Interpretation
pH	7.31	7.35 – 7.45	Low (acidosis)
$PaCO_2$ (mmHg)	52	35 – 45	High (hypercapnia)
HCO_3^- (mmol/L)	24	22 – 26	Normal
PaO_2 (mmHg)	68	80 – 100	Low (hypoxemia)
SaO_2 (%)	91%	≥ 95%	Low (mild desaturation)

Stepwise interpretation

Step 1: Assess pH

- ○ Normal: 7.35 – 7.45
- ◉ Acidosis: pH <7.40
- ○ Alkalosis: pH >7.40

Conclusion:

Acidosis

Step 2: Determine the primary disorder

a. Respiratory:

- ◉ Respiratory acidosis: pH ↓, $PaCO_2$ ↑ (> 45 mmHg)
- ○ Respiratory alkalosis: pH ↑, $PaCO_2$ ↓ (< 35 mmHg)

b. Metabolic:

- ◉ Metabolic acidosis: pH ↓, HCO_3^- ↓ (< 22 mmol/L)
- ○ Metabolic alkalosis: pH ↑, HCO_3^- ↑ (> 26 mmol/L)

Conclusion: Primary respiratory acidosis

Step 3: Assess compensation

a. Respiratory compensation (for metabolic disorders):

Not applicable

b. Metabolic compensation (for respiratory disorders):

No metabolic compensation yet

c. Compensation present?

○ Yes ◉ No ○ Partial ○ Full

Direction of compensation: Not compensating

Conclusion: No compensation; likely acute respiratory acidosis

Step 4: Assess oxygenation

Parameter	Patient value	Normal range	Interpretation
PaO_2	68 mmHg	80 – 100 mmHg	Hypoxemia
SaO_2	91%	≥ 95%	Mild oxygen desaturation

Conclusion: Mild to moderate hypoxemia

Summary of interpretation

Primary disorder:	**Compensation:**
Acute respiratory acidosis	None (uncompensated)
Oxygenation status:	**Overall impression:**
Hypoxemic	The patient is experiencing acute respiratory acidosis with associated hypoxemia, likely due to hypoventilation (possible COPD exacerbation, sedative overdose, or neuromuscular weakness). Immediate medical intervention is recommended.

Key interpretation notes

- **Respiratory disorders:** pH and $PaCO_2$ move in opposite directions.
- **Metabolic disorders:** pH and HCO_3^- move in the same direction.
- **Compensation:** Evaluate degree of compensation to understand severity and acuity.
- **Oxygenation:** Always assess PaO_2 and SaO_2 to determine if hypoxemia is present.

Additional notes

Recommend supplemental oxygen and close respiratory monitoring

Consider repeating ABG after treatment or ventilation adjustment

Healthcare professional information

Name: Dr. Sarah Thompson	**License ID:** MD-684732
Signature: S. Thompson	**Date and time of ABG:** July 21, 2025, 10:45 AM

Kaufman, D. (2019). *Interpretation of arterial blood gases (ABGs).* American Thoracic Society. https://www.thoracic.org/professionals/clinical-resources/critical-care/clinical-education/abgs.php

Puri, S., Paul, G., & Sood, P. (2010). Interpretation of arterial blood gas. *Indian Journal of Critical Care Medicine, 14*(2), 57–64.https://doi.org/10.4103/0972-5229.68215