



# Arterial Blood Gas (ABG) Practice Questions with Answers

## 1. pH = 7.29, PaCO<sub>2</sub> = 47, HCO<sub>3</sub> = 24

Step 1: Check the pH and determine if we have acidosis or alkalosis. The pH = 7.29, so we have **ACIDOSIS**.

Step 2: What is causing acidosis? PaCO<sub>2</sub> = 47, which is out of range on the ACID side. Therefore, we have **RESPIRATORY ACIDOSIS**. HCO<sub>3</sub> = 24, which is in the normal range, so we do not have metabolic acidosis.

Step 3: Do we have compensation? HCO<sub>3</sub> is in the normal range, so it is NOT trying to compensate. Therefore, we have **UNCOMPENSATED RESPIRATORY ACIDOSIS**.

## 2. pH = 7.31, PaCO<sub>2</sub> = 49, HCO<sub>3</sub> = 30

Step 1: Check the pH and determine if we have acidosis or alkalosis. The pH = 7.31, so we have **ACIDOSIS**.

Step 2: What is causing acidosis? PaCO<sub>2</sub> = 49, which is out of range on the ACID side. Therefore, we have **RESPIRATORY ACIDOSIS**. HCO<sub>3</sub> = 30, which is out of range on the BASIC side. So we do not have metabolic acidosis.

Step 3: Do we have compensation? HCO<sub>3</sub> is trying to compensate for the respiratory acidosis, but it hasn't gotten the pH back in normal range. Therefore we have **PARTIALLY COMPENSATED RESPIRATORY ACIDOSIS**.

## 3. pH = 7.35, PaCO<sub>2</sub> = 48, HCO<sub>3</sub> = 29

Step 1: Check the pH and determine if we have acidosis or alkalosis. The pH = 7.35, which is **NORMAL but on the acidic side**.

Step 2: What is causing acidosis? PaCO<sub>2</sub> = 48, which is out of range on the ACID side. Therefore, we have **RESPIRATORY ACIDOSIS**. HCO<sub>3</sub> = 29, which is out of range on the BASIC side.

Step 3: Do we have compensation? HCO<sub>3</sub> has compensated for the respiratory acidosis, bringing the pH to be in normal range. Therefore we have **FULLY COMPENSATED RESPIRATORY ACIDOSIS**.



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## 4. pH = 7.49, PaCO<sub>2</sub> = 33, HCO<sub>3</sub> = 24

Step 1: Check the pH and determine if we have acidosis or alkalosis. The pH = 7.49, so we have **ALKALOSIS**.

Step 2: What is causing alkalosis? PaCO<sub>2</sub> = 33, which is out of range on the BASIC side. Therefore, we have **RESPIRATORY ALKALOSIS**. HCO<sub>3</sub> = 24, which is in the normal range, so we do not have metabolic alkalosis.

Step 3: Do we have compensation? HCO<sub>3</sub> is in the normal range, so it is NOT trying to compensate. Therefore, we have **UNCOMPENSATED RESPIRATORY ALKALOSIS**.

## 5. pH = 7.48, PaCO<sub>2</sub> = 31, HCO<sub>3</sub> = 20

Step 1: Check the pH and determine if we have acidosis or alkalosis. The pH = 7.48, so we have **ALKALOSIS**.

Step 2: What is causing alkalosis? PaCO<sub>2</sub> = 31, which is out of range on the BASIC side. Therefore, we have **RESPIRATORY ALKALOSIS**. HCO<sub>3</sub> = 20, which is out of range on the ACIDIC side. So we do not have metabolic acidosis.

Step 3: Do we have compensation? HCO<sub>3</sub> is trying to compensate for the respiratory alkalosis, but it hasn't gotten the pH back in normal range. Therefore we have **PARTIALLY COMPENSATED RESPIRATORY ALKALOSIS**.

## 6. pH = 7.45, PaCO<sub>2</sub> = 30, HCO<sub>3</sub> = 19

Step 1: Check the pH and determine if we have acidosis or alkalosis. The pH = 7.45, which is **NORMAL but on the BASIC side**.

Step 2: What is causing alkalosis? PaCO<sub>2</sub> = 30, which is out of range on the BASIC side. Therefore, we have **RESPIRATORY ALKALOSIS**. HCO<sub>3</sub> = 19, which is out of range on the ACIDIC side.

Step 3: Do we have compensation? HCO<sub>3</sub> has compensated for the respiratory alkalosis, bringing the pH to be in normal range. Therefore we have **FULLY COMPENSATED RESPIRATORY ALKALOSIS**.



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## 7. pH = 7.32, PaCO<sub>2</sub> = 40, HCO<sub>3</sub> = 16

Step 1: Check the pH and determine if we have acidosis or alkalosis. The pH = 7.32, so we have **ACIDOSIS**.

Step 2: What is causing acidosis? PaCO<sub>2</sub> = 40, which is the normal range. So we do not have respiratory acidosis. HCO<sub>3</sub> = 16, which is out of range on the ACIDIC side. So we have **METABOLIC ACIDOSIS**.

Step 3: Do we have compensation? PaCO<sub>2</sub> is in the normal range, so it is NOT trying to compensate. Therefore, we have **UNCOMPENSATED METABOLIC ACIDOSIS**.

## 8. pH = 7.31, PaCO<sub>2</sub> = 30, HCO<sub>3</sub> = 18

Step 1: Check the pH and determine if we have acidosis or alkalosis. The pH = 7.31, so we have **ACIDOSIS**.

Step 2: What is causing acidosis? PaCO<sub>2</sub> = 30, which is out of range on the BASIC side. So we do not have respiratory acidosis. HCO<sub>3</sub> = 18, which is out of range on the ACIDIC side. So we have **METABOLIC ACIDOSIS**.

Step 3: Do we have compensation? PaCO<sub>2</sub> is trying to compensate for the metabolic acidosis, but it hasn't gotten the pH back in normal range. Therefore we have **PARTIALLY COMPENSATED METABOLIC ACIDOSIS**.

## 9. pH = 7.35, PaCO<sub>2</sub> = 30, HCO<sub>3</sub> = 19

Step 1: Check the pH and determine if we have acidosis or alkalosis. The pH = 7.35, which is **NORMAL but on the ACIDIC side**.

Step 2: What is causing acidosis? PaCO<sub>2</sub> = 30, which is out of range on the BASIC side. So we do not have respiratory acidosis. HCO<sub>3</sub> = 19, which is out of range on the ACIDIC side. So we have **METABOLIC ACIDOSIS**.

Step 3: Do we have compensation? PaCO<sub>2</sub> has compensated for the metabolic acidosis, bringing the pH to be in normal range. Therefore we have **FULLY COMPENSATED METABOLIC ACIDOSIS**.



# Arterial Blood Gas (ABG) Practice Questions with Answers

## 10. pH = 7.48, PaCO<sub>2</sub> = 41, HCO<sub>3</sub> = 29

Step 1: Check the pH and determine if we have acidosis or alkalosis. The pH = 7.48, so we have **ALKALOSIS**.

Step 2: What is causing alkalosis? PaCO<sub>2</sub> = 41, which is the normal range. So we do not have respiratory alkalosis. HCO<sub>3</sub> = 29, which is out of range on the BASIC side. So we have **METABOLIC ALKALOSIS**.

Step 3: Do we have compensation? PaCO<sub>2</sub> is in the normal range, so it is NOT trying to compensate. Therefore, we have **UNCOMPENSATED METABOLIC ALKALOSIS**.

## 11. pH = 7.50, PaCO<sub>2</sub> = 50, HCO<sub>3</sub> = 30

Step 1: Check the pH and determine if we have acidosis or alkalosis. The pH = 7.50, so we have **ALKALOSIS**.

Step 2: What is causing alkalosis? PaCO<sub>2</sub> = 50, which is out of range on the ACIDIC side. So we do not have respiratory alkalosis. HCO<sub>3</sub> = 30, which is out of range on the BASIC side. So we have **METABOLIC ALKALOSIS**.

Step 3: Do we have compensation? PaCO<sub>2</sub> is trying to compensate for the metabolic acidosis, but it hasn't gotten the pH back in normal range. Therefore we have **PARTIALLY COMPENSATED METABOLIC ALKALOSIS**.

## 12. pH = 7.44, PaCO<sub>2</sub> = 49, HCO<sub>3</sub> = 28

Step 1: Check the pH and determine if we have acidosis or alkalosis. The pH = 7.44, which is **NORMAL but on the BASIC side**.

Step 2: What is causing alkalosis? PaCO<sub>2</sub> = 49, which is out of range on the ACID side. So we do not have respiratory alkalosis. HCO<sub>3</sub> = 28, which is out of range on the BASIC side. So we have **METABOLIC ALKALOSIS**.

Step 3: Do we have compensation? PaCO<sub>2</sub> has compensated for the metabolic alkalosis, bringing the pH to be in normal range. Therefore we have **FULLY COMPENSATED METABOLIC ALKALOSIS**.