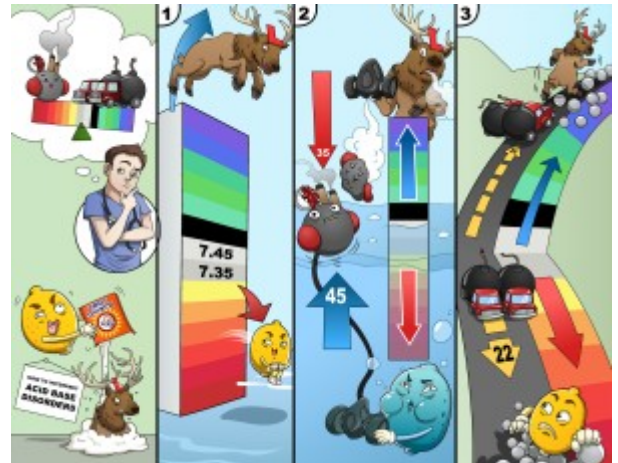


## How to Interpret Acid Base Disorders

Interpreting Acid-Base disorders is an essential nursing skill that involves a three-step process: checking the pH, partial pressure of carbon dioxide in the blood ( $p\text{CO}_2$ ), and bicarbonate levels ( $\text{HCO}_3^-$ ). These indicators will allow you to determine the type of disorder.



PLAY PICMONIC

### pH, $p\text{CO}_2$ , $\text{HCO}_3^-$ (Bicarbonate)

[pH-strip](#), [Partial-pressure-gauge  \$\text{CO}\_2\$](#) , and [Bi-car-bomb](#)

Mastering quick interpretation of acid-base lab values is a key element to the success of the Nurse. Three components are included in typical lab value assessment: pH,  $p\text{CO}_2$ , and  $\text{HCO}_3^-$  (Bicarbonate).

#### Step 1

##### pH

[pH-strip](#)

The first step to acid-base lab value interpretation is to look at pH. Blood pH is normally 7.35-7.45. pH is determined by the amount of hydrogen ions contained in the blood.

##### Acidosis

[Acidic-lemon](#)

A pH of less than 7.35 is termed acidosis. Acidosis indicates a buildup of carbonic acid in the blood.

##### Alkalosis

[Elk-loser](#)

A pH higher than 7.45 is termed alkalosis. Alkalosis indicates a buildup of bicarbonate (bases) and/or a general decrease in carbonic acid in the blood.

#### Step 2

##### $p\text{CO}_2$

[Partial-pressure-gauge  \$\text{CO}\_2\$](#)

The second step is to examine the partial pressure of carbon dioxide in the blood.  $p\text{CO}_2$  is normally 35-45 mmHg and is regulated primarily through respiration.

##### Opposite Direction as pH

[Showing the Opposite Direction on pH-strip](#)

Opposite Respiratory and pH directions indicate a respiratory disorder. If the  $p\text{CO}_2$  is not in the opposite direction of the pH, then check the  $\text{HCO}_3^-$  next.

##### Respiratory Acidosis

[Respirator Acidic-lemon](#)

Respiratory acidosis is often indicated by a pH of less than 7.35 and a  $p\text{CO}_2$  of higher than 45 mmHg.

##### Respiratory Alkalosis

[Respirator Elk-loser](#)

Respiratory Alkalosis is indicated by a pH of more than 7.45 and a  $p\text{CO}_2$  of less than 35 mmHg.

### Step 3

#### **HCO<sub>3</sub><sup>-</sup> (Bicarbonate)**

[Bi-car-bomb](#)

The normal value of bicarbonate is 22-26 mmol/L. The amount of the base HCO<sub>3</sub><sup>-</sup>, bicarbonate, in the blood is regulated in the kidneys.

#### **Same Direction as pH**

[Showing the Same Direction as pH-strip](#)

If the HCO<sub>3</sub><sup>-</sup> (bicarbonate) is going in the same direction as pH, then the problem is most likely a metabolic problem.

#### **Metabolic Acidosis**

[Metal-ball Acidic-lemon](#)

The patient with Metabolic acidosis can grossly be determined as Down, Down, Down (Decreased pH, Decreased pCO<sub>2</sub>, Decreased HCO<sub>3</sub><sup>-</sup>).

#### **Metabolic Alkalosis**

[Metal-ball Elk-loser](#)

Metabolic alkalosis can grossly be determined as UP, UP, UP (Increased pH, Increased pCO<sub>2</sub>, Increased HCO<sub>3</sub><sup>-</sup>).