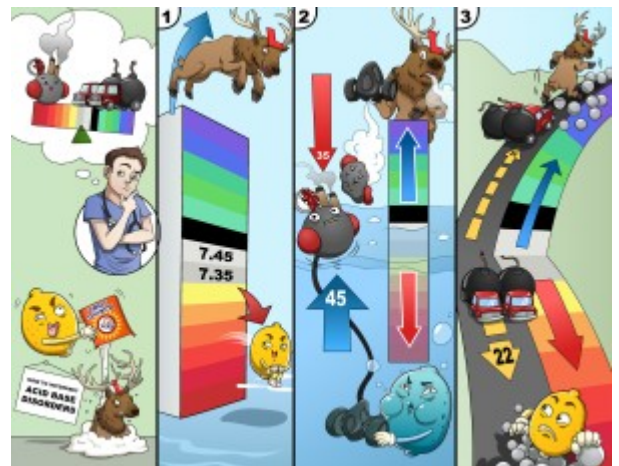


## How to Interpret Acid Base Disorders

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 ( $pCO_2$ ), and bicarbonate levels ( $HCO_3$ ). These indicators will allow you to determine the type of disorder.



PLAY PICMONIC

### pH, $pCO_2$ , $HCO_3$ (Bicarbonate)

[pH-strip](#), [Partial-pressure-gauge  \$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,  $pCO_2$ , and  $HCO_3$  (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

##### $pCO_2$

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

The second step is to examine the partial pressure of carbon dioxide in the blood.  $pCO_2$  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  $pCO_2$  is not in the opposite direction of the pH, then check the  $HCO_3$  next.

## Respiratory Acidosis

[Respirator Acidic-lemon](#)

Respiratory acidosis is often indicated by a pH of less than 7.35 and a pCO<sub>2</sub> of higher than 45 mmHg.

## Respiratory Alkalosis

[Respirator Elk-loser](#)

Respiratory Alkalosis is indicated by a pH of more than 7.45 and a pCO<sub>2</sub> of less than 35 mmHg.

### Step 3

## HCO<sub>3</sub> (Bicarbonate)

[Bi-car-bomb](#)

The normal value of bicarbonate is 22-26 mmol/L. The amount of the base HCO<sub>3</sub>, 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> (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>).

## 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>).