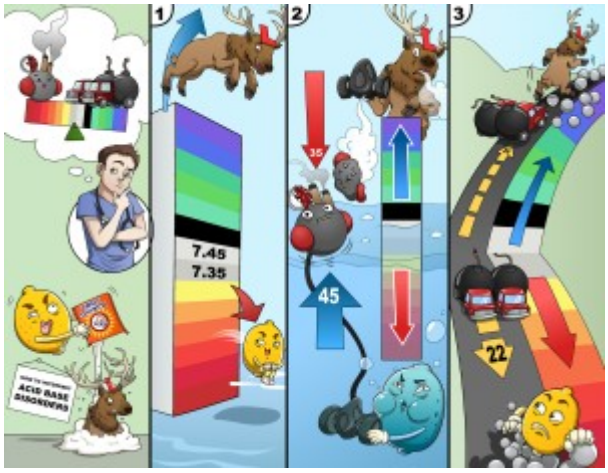
How to Interpret Acid Base Disorders

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?), and bicarbonate levels (HCO?). These indicators will allow you to determine the type of disorder.



PLAY PICMONIC

pH, pCO?, HCO? (Bicarbonate)
pH-strip, Partial-pressure-gauge CO?, 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?, and HCO? (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?
Partial-pressure-gauge CO?
The second step is to examine the partial pressure of carbon dioxide in the blood. pCO? 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? is not in the opposite direction of the pH, then check the HCO? next.

Respiratory Acidosis
Respirator Acidic-lemon
Respiratory acidosis is often indicated by a pH of less than 7.35 and a pCO? 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? of less than 35 mmHg.

Step 3

HCO? (Bicarbonate)
Bi-car-bomb
The normal value of bicarbonate is 22-26 mmol/L. The amount of the base HCO?, bicarbonate, in the blood is regulated in the kidneys.

Same Direction as pH
Showing the Same Direction as pH-strip
If the HCO? (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?, Decreased HCO?).

Metabolic Alkalosis
Metal-ball Elk-loser
Metabolic alkalosis can grossly be determined as UP, UP, UP (Increased pH, Increased pCO?, Increased HCO?).