**Acidosis**

**Two types:**

**1-Respiratory acidosis.**

**2-Metabolic acidosis.**

**1-Respiratory acidosis:**

Characterized by an increase in PCO2 of artertial blood more than 45 mmHg ,which is normally 40 mmHG , this leads to an increase in H2CO3 in the blood ,while HCO3 remains constant.

**Causes.**

1-Inadequate ventilation to remove the produced CO2 leading to its retention as in bronchial asthma and emphysema that leads to inadequate alveolar ventilation.

2-Disorders in diffusion of CO2 from the blood to alveolar air across the pulmonary membrane e.g pulmonary fibrosis, pulmonary edema and pneumonia.

3-Disorders that lead to decreasing the movement of thoracic cage e.g chest trauma ,deformities ,weakness or paralysis of respiratory muscles e.g due to poliomyelitis

4-Conditions of decreased rate or depth of respiration caused usually by depression of respiratory center due to use of some narcotic drugs ( e.g morphine ) or sedatives e.g barbiturates

**Compensation.**

Because the proplem is of respiratory origin ,the body can not carry respiratory compensation , any compensation must be through renal mechanisms that secrete H+ and absorb HCO3

Secreted H+ allows urine to be more acidic

Reabsorption of HCO3 provides additional buffer that combines with H+ lowering the amount of free H+ and also raising the PH.

**Metabolic Acidosis:**

It occur when dietary and metabolic input of acids exceeds acid excretion

Metabolic causes include.

1-Lactic acidosis which result from anaerobic metabolism.

2-Keto- acidosis when there is excessive breakdown of fats or certain amino acids.

3-Ingested toxins that cause metabolic acidosis as methanol, asprin ,and ethylene glycol.

4-Diarrhea ,due to loss of HCO3 from intestine.

There is elevated H+ concentration

Decreased HCO3 concentration.

**Compensation.**

Elevated H+ and CO2 stimulate ventilation leading to decreased PCO2 to normal or even below normal due to hyperventilation.

Renal compensation also takes place by increased secretion of H+ ,with Reabsorption of HCO3

Renal compensation takes several days to reach full effectivness so usually no seen in acute disturbances since it start within 24 – 48 hours.

**Alkalosis**

2 types:

1-Respiratory alkalosis

2-Metabolic alkalosis.

1-Respiratory alkalosis.

Causes.

1-Hyperventilation due to wash of CO2.

Drop of CO2 decreases both H+ and HCO3 ,so low HCO3 in alkalosis indicate respiratory disorder ,the most common physiological cause of respiratory alkalosis is hysterical hyperventilation due to anexiety .The proplem can be corrected by allowing the patient to rebreath the exhaled CO2 by allowing the patient to breath into a paper bag ,the rise of arterial PCO2 corrects the proplem.

2-Metabolic alkalosis.

Caused by.

1-Excessive vomiting of acidic gastric contents.

2-Excess ingestion of bicarbonate containing antacids.

In both cases the resulting alkalosis reduces H+ concentration.

Metabolic alkalosis is characterized by

Decreased H+ concentration and PCO2

Increased HCO3 concentration.

Compensation.

Respiratory compensation is very rapid

Increased PH and drop of PCO2 depress ventilation leading to increased CO2 and creating more H+ and HCO3 so ventillatory compensation help to correct PH but elevates HCO3.

Renal compensation.

By HCO3 excretion and H+ Reabsorption.