Objectives
To review the regulation of acid-base homeostasis.
To identify the different types of fluids found in the body.
To identify the way that water moves to achieve balance between intake and loss.
To outline the steps involved with the thirst mechanism.
To assign the kidney urinalysis case study.

Acid/Base Regulation
Respiratory Acidosis
- Distinguished by a rise in CO2.
- May be caused by respiratory failure
- Impaired ventilation
Proximate causes
  1) Drug overdose
  2) Chest injury
  3) Pulmonary edema
  4) Sudden airway obstruction

Respiratory acidosis
Symptoms
- Dilation of cerebral blood vessels, resulting in increased blood flow to brain.
  - Cerebral edema
  - Increased acid and ammonium in urine
  - Hyperkalemia (increased K+ ions)
  - Dysrhythmias

Respiratory Alkalosis
Very common in critically ill patients.
- Distinguished by a distinct fall in CO2.
- Excessive respiratory activity
Proximate causes
  1) Anxiety
  2) Early COPD
  3) Early aspirin toxicity
  4) Excessive mechanical ventilation
  5) High altitude

Respiratory alkalosis
Symptoms
- Cerebral vasoconstriction, with fall in cerebral blood flow.
  - Lightheadedness due to vasoconstriction
  - Numbness and tingling due to declining Ca+ ionization
  - Carpopedal spasms
  - Declining levels of consciousness

Metabolic Acidosis
Bicarbonate ion deficit
- May be caused from excessive acid or loss of the base.
- Accumulation of acid metabolites in the blood e.g. lactic acid.
- Loss of bicarbonate can occur with severe diarrhea.
Metabolic Acidosis
Symptoms
1) Headache, nausea & vomiting
2) Confusion and drowsiness
3) Kussmaul Breathing – deep respirations
4) Hyperkalemia
5) Muscle weakness and tingling in extremities
6) Hypercalcimia (higher calcium load)

Metabolic Alkalosis
Bicarbonate excess
Acid may be lost due to vomiting or excessive use of K+ wasting diuretics
May occur due to antacid abuse or excessive bicarbonate consumption.

Metabolic Alkalosis
Symptoms
1) Decreased calcium ionization.
2) Tingling of fingers and toes
3) Dizziness
4) Tetany
5) Hypocalcemia
6) Hypokalemia