The importance of understanding pH scale w.r.t. biological systems

Reference: Bettelheim & March

1. pH of blood normally 7.35 – 7.45
2. If pH drops to < 7.35, it leads to a condition known as **acidosis**.
3. At pH > 7.45, condition is known as **alkalosis**.
4. Both abnormal conditions.
   - Acidosis leads to depression of the acute nervous system
     - Mild case $\rightarrow$ fainting
     - Severe case $\rightarrow$ coma
   - Alkalosis leads to over-stimulation of the nervous system, muscle cramps, and convulsions.

If acidosis or alkalosis persists for a sufficient period of time, or if the pH gets too far away from the 7.35 – 7.45 range, the patient dies.

**Respiratory acidosis** caused by hypoventilation (obstruction breathing, asthma, pneumonia; holding your breath produces mild acidosis
   - pH of blood decreases b/c CO$_2$ is unable to escape fast enough, remains in the blood, and decreases the [HCO$_3^-$]/[H$_2$CO$_3^-$] ratio

**Respiratory alkalosis** ;----hyperventilation; pH increases; rapid breathing, excessive loss of CO$_2$