

Organization of the body

Pathophysiology

- Pathology = study of diseased function
- Health = optimal state of physical, mental, and social wellbeing, not merely the absence of disease or infirmities.
- Example: a person could be physically fit, able to run the mile under 10 minutes, have a lot of friends, but still be clinically depressed to the point where they take their own life

Homeostasis

- ◉ Stable environment
- ◉ Required for normal body functions
- ◉ “ideal” set point
- ◉ Amount and composition of body fluids
- ◉ Body temperature
- ◉ Blood pressure
- ◉ Respiration rate
- ◉ Blood glucose levels

Homeostasis control systems

- Nervous System

- > Controls by processing electrochemical impulses

- Endocrine System

- > Controls by secretion of hormones

Homeostasis regulated by

- ◉ Feedback = process by which homeostasis is maintained through a series of sensors and receptors
- ◉ Negative Feedback
- ◉ Positive Feedback

Negative Feedback

- Either shuts off the system or reduces the intensity
- Occur frequently in our nervous and endocrine system
- Stimulus creates a reaction, the body forms a response, the body's response then eliminates the stimulus
- Causes a change opposite the original stimuli, if receptors sense something is too high it will bring the level down
- Examples:

Positive Feedback

- ◉ Stimulus creates a reaction, the body forms a response, the response encourages the stimulus to continue and or increase
- ◉ Example: Blood clotting – you want your blood to clot if you cut yourself
- ◉ Uncontrolled Fevers = 104 a switch flips and the fever continues to go up
- ◉ Labor contractions = stronger and stronger is good – you need to progress

Normal Body Measurements

- ◉ Temp
- ◉ Blood Pressure
- ◉ Heart Rate
- ◉ Respiratory Rate
- ◉ pH
- ◉ The body is made up of 60% water in an adult and 80% in a newborn

Requirements to maintain life functions

- ◉ Water
- ◉ Food for energy, repair, and growth
- ◉ Gas Exchange
- ◉ Maintain core body temperature
- ◉ Growth – physically and mentally
- ◉ Eliminate waste through urine and sweat
- ◉ Reproduce offspring for future of mankind

Body Processes

- ATP = cells use for energy
- Fluid Balance = vital to maintain proper system function, accounts for 60% of adult's total body weight
- 2 types of fluid
 - Extracellular
 - Intracellular

Metabolism

- Sum of all the chemical reactions in the body
- Catabolism = Decomposition = the breakdown of a complex material into simpler forms
- Examples: breakdown of food
- Anabolism = Synthesis = building larger, necessary materials from individual building blocks
- Requires ATP to occur
- Building new proteins such as muscle

Metabolism

- A measurement of metabolism is the amount of heat given off by the organism
- BMR – Basal Metabolic Rate = metabolism at rest
- TMR – Total Metabolic Rate = metabolism including all activity in the day
- TMR is a much better determinant of overall health