

1.1 Define Anatomy & Physiology

Anatomy

The study of the structure and shape of the body and its parts and their relationship to each other

Gross anatomy: easily observable, can be seen with the naked eye

Microscopic anatomy: only seen at high magnification (Cells & Tissues)

Physiology

The study of how the body and its parts work or function

Many sub-divisions e.g. neurophysiology, cellular physiology

1.4 Homeostasis, negative & positive feedback (cont)

Examples of how homeostatic imbalance affects body: imbalanced reproductive hormones could lead to infertility, imbalance of calcium could lead to osteoporosis

If the level of something falls, control systems rise it again

Communicates through neural and hormonal control systems:
Receptor (Detects change and sends information to control centre) -> Control centre (Determines set point, analyses information and determines appropriate response)-> Effector (Carries out necessary change)

1.4 Homeostasis, negative & positive feedback

Homeostasis

The body's ability to maintain a relatively stable internal environment

Involves all body systems

Must be maintained for normal body functions and to sustain life

Homeostatic imbalance is a disturbance in homeostasis resulting in disease, e.g., excessive sweating

Negative feedback

Most common homeostatic control mechanism

Shuts off the original stimulus, or reduces intensity of reaction

Works like a heater with a thermostat

if the level of something rises, control systems reduce it again

Positive feedback

Rather than reversing the direction of the response, creates a loop

Example is contractions in childbirth

Contractions cause pain, but the production of oxytocin creates a positive feedback loop, continuing the contractions to push baby out

Positive feedback loops back to homeostasis through response, negative feedback reverses to homeostasis by opposing stimulus

1.2 Levels of structural organisation

Chemicals - e.g. Atoms: Carbon, Hydrogen etc.

Molecules - e.g. water, sugar, protein

Organelles - e.g. mitochondria

Cells - e.g. bone cell, muscle cell

Tissues - e.g. connective

Organs - e.g. lungs

Organ system - e.g. cardiovascular

Organism - e.g. made up of many organs (humans)

1.3 Types of tissue

There are 4 types of tissue: Epithelial, Connective, Muscle & Nervous

Epithelial: Covers body surfaces and lines cavities; Forms glands; Closely packed; Always has a free surface (not covered by another tissue)

Nervous: Conducts electrical signals; Protects, binds, and supports the body and its organs; Stores energy & helps with immunity; Most abundant & widely distributed; Serves as transport system; Can be fluid, semi-solid, or solid

Muscle: Specialised cells that contract and shorten; In the process generates heat

Connective: Cells organised to provide protection, support, and 'holding together'; Detects changes to the internal and external body; Responds by generating electrical signals (action potentials)

1.5 Major organ systems and their major function

11 organ systems

Integumentary - Largest organ of the body; forms a protective layer from external environment; skin, hair, nails & associated glands (sweat, mammary, sebaceous and ceruminous)

Skeletal - Support structure for your body; allows movement; makes blood cells; stores minerals

Muscular - Attached to bones or organs and blood vessels; responsible for movement

Nervous - Transmits signals between brain and body; controls ability to see, move, think, breathe etc

Endocrine - Made up of the body's different hormones; regulates all biological processes;

Cardiovascular - Supplies body's organs with oxygen and nutrients; also carries CO₂ and waste for disposal

Digestive - Breaks down food into nutrients to make those nutrients absorbable

Lymphatic - Part of immune system; protects body from illness; maintains fluid levels etc

Respiratory - A group of organs and tissues that work together to make you breathe; moves fresh air in the body and removes CO₂ waste

Reproductive - Collection of organs that allow the body to impregnate/become pregnant

Urinary - Filter blood and create urine as a waste byproduct

All work together to maintain a healthy body



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