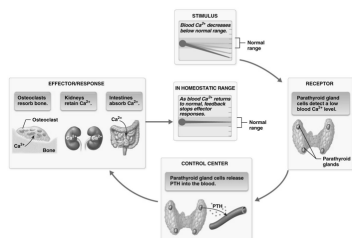


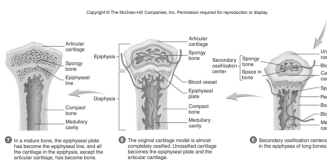
PTH and Calcium



Musculo skeletal system

the muscular and skeletal systems work together to support and move the body. The bones of the skeletal system serve to protect the body's organs, support the weight of the body, and give the body shape. The muscles of the muscular system attach to these bones, pulling on them to allow for movement of the body.

epiphyseal plate



Connective Tissue Proper

CONNECTIVE TISSUE PROPER	COMPONENTS	FUNCTION	LOCATION
Laxest CT	Fibroblast Ground substance Protein fibers	• Support • Protection • House blood vessels supplying epithelium	• Deep to epithelium • Bulk of dermis • epiglottis • membranes lining body cavities
Dense CT	Fibroblast Collagen fibers Ground substance	• Strength • Resistance to stress in all three planes	• Deepest layer of skin • Around joints, organs
Irregular	Fibroblast Collagen fibers Ground substance	• Strength • Resistance to stress in all three planes	• Tendons, ligaments
Regular collagenous	Fibroblast Collagen fibers Ground substance	• Strength • Resistance to stress in one plane	• Large blood vessels • Certain ligaments
Regular elastic	Elastic fibers Ground substance	• Allow tissues to stretch and recoil	• Lymph nodes • Epiglottis, vocal cords, ligamentum nuchae • Basement membrane around vessels and nerves
Reticular CT	Reticular fibers Leukocyte	• Form internal structure of many organs • Supports on outer vessels and nerves	• Spleen, thymus, tonsils • Deep to the skin in characteristic areas surrounding the heart and abdominal organs
Adipose CT	Adipocyte Protein fibers	• Warmth, insulation • Shock absorption, protection • Major energy reserve in the body	

compact bone

location makes up 80% of bone in body, Under the Periosteum: It lies just beneath the periosteum, the outer membrane covering bones. In the Diaphyses of Long Bones: The diaphysis refers to the shaft of long bones, where compact bone provides support and protection

function Strength and Rigidity

histology

Terminology

Sagittal plane a vertical plane which passes through the body longitudinally. It divides the body into a left section and a right section

median sagittal plane passes down the midline of the body, separating it into equal halves

Terminology (cont)

Coronal plane a vertical plane which also passes through the body longitudinally – but perpendicular (at a right angle) to the sagittal plane It divides the body into a front (anterior) section and back (posterior) section

Transverse planes a horizontal plane. It is perpendicular to both the sagittal and coronal planes, and parallel to the ground. It divides the body into an upper (superior) section and a lower (inferior) section. Transverse planes are also known as transaxial planes or axial planes.

Medial towards the midline

Lateral away from the midline

Terminology (cont)

Anterior to the front

Posterior to the back

Superior Higher

Inferior lower

Proximal Closer to origin (of limb)

Distal further away (of limb) from origin

The integumentary system and other systems

Immune system it's the first line of defense against bacteria and infection. It also sends white blood cells to injuries to begin the healing process.

Endocrine system helps you absorb vitamin D, which acts as a hormone and is crucial to your bone health because it affects calcium absorption.

Respiratory system nose hairs filter out dust and other particles before you inhale them into your lungs

Cheatography

A and P Unit 1 Lecture Cheat Sheet by tamar1493 via cheatography.com/200741/cs/42441/

Function of skeletal system

Protection

Blood cell formation-Red blood marrow is the site of blood cell formation

Mineral storage- calcium, phosphorus, and magnesium salts

Fat storage-yellow bone marrow

Movement-provide movement from the muscles attached to the bones

Supports the weight of the body

Osteoporosis

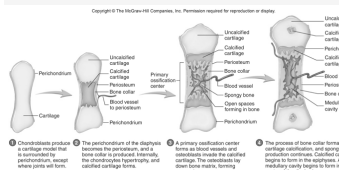
A disease that causes bones to become weak and brittle.

More prevalent in females, older and slender, thin boned people, if someone in your family had it, a diet low in calcium and vitamin D, Long-term use of certain medications, Not getting enough exercise and being inactive for long periods of time, Long-term heavy drinking of alcohol, Smoking

To prevent osteoporosis-intake the recommended amount of calcium, exercise regularly, add more lean protein to diet, get enough vitamin D, Limit your alcohol consumption, Maintain a healthy weight, If you smoke, quit,

Intramembranous Ossification

Process



Ossification

Intram- built on a model
emb- (starting material)
ranous made of a membrane
of embryonic
ossifi- of connective tissue
cation connective tissue

endoch built on a model of
ondral hyaline cartilage
ossifi-
cation

Yellow bone marrow

Location Yellow bone marrow is located in the cavities of long bones.

Function It stores fat (adipocytes) and contains mesenchymal stem cells. Yellow bone marrow can convert to red marrow if needed

What and functions

Organ System	Function	Organ System	Function
Digestive	Ingests and breaks down food so that it can be absorbed by the body Chapter 7	Cardiovascular	Enables the transport of nutrients, gases, hormones, and wastes to and from cells of the body Chapter 9
Urinary	Eliminates liquid wastes; regulates water balance Chapter 11	Endocrine	Secretes hormones into bloodstream for regulation of body activities Chapter 16
Respiratory	Enables gas exchange; supplies blood with oxygen and removes carbon dioxide Chapter 10	Nervous	Senses environmental information; communicates and coordinates responses Chapters 14 and 15
Skeletal	Provides mechanical support for the body; stores minerals; produces red blood cells Chapter 6	Lymphatic and Immune	Protects against infections Chapter 12
Muscular	Enables movement, posture, and balance via contraction and relaxation of muscles Chapter 6	Reproductive—Female	Produces eggs and supports development of offspring Chapter 16
Integumentary	Protects body from environmental injury and infection; stores fat Chapter 6	Reproductive—Male	Produces and delivers sperm and associated fluids Chapter 16

Endocrine vs Exocrine Glands

Endocrine Glands secrete hormones; ductless; secrete hormones directly into the bloodstream

Exocrine Glands secrete substances like enzymes, digestive juices, sweat, saliva, etc.; contain ducts; release substances through ducts onto surfaces or into cavities

Spongy bone

location usually located at the ends of the long bones (the epiphyses), with the harder compact bone surrounding it. It is also found inside the vertebrae, in the ribs, in the skull and in the bones of the joints

function deal for making and storing bone marrow within the lattice-like trabeculae network, Spongy bone contains red bone marrow that is used in erythropoiesis.

Simple epithelial tissue

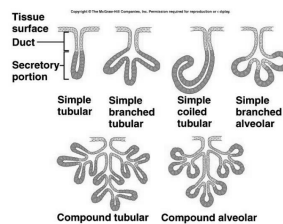
SIMPLE EPITHELIAL TISSUE CONSIST OF ONE LAYER OF CELLS	COMPONENTS	FUNCTION	LOCATION
Simple squamous epithelium	Single layer of flat cells Flattened, central nuclei	• Provides a barrier through which gases and fluids can be exchanged • Produce serosa	• All sacs of lungs • Inner lining of ventral body cavity and blood vessels • Certain parts of kidney
Simple cuboidal epithelium	Single layer of cube-shaped cells Round, central nuclei	• Absorption • Secretion of mucus and other substances • Production of egg through oogenesis	• Kidney tubules • Lumen respiratory passages • Thyroid, salivary, and mammary glands
Simple columnar epithelium	Single layer of rectangular cells Ovoid, basal nuclei	• Absorption • Secretion of mucus and other substances • Production of egg through oogenesis	• Digestive tract from stomach to anus • Ducts of kidney • Gallbladder
Pseudostratified columnar epithelium	Single layer of columnar cells of different heights, giving a stratified appearance Cilia	• Secretes mucus and propels it with ciliary motion	• Nasal cavity • Parts of male ureter • Upper respiratory passages

Stratified Epithelial Tissue

STRATIFIED EPITHELIAL TISSUE CONSIST OF MORE THAN ONE LAYER OF CELLS	COMPONENTS	FUNCTION	LOCATION
Stratified squamous epithelium	Multiple layers of squamous cells Apical cells dead, flat, and filled with keratin Cuboidal to squamous toward basal layer	• Protection from mechanical stresses and microorganisms • Cells are replaced through mitosis	• Epidermis • Parts of oral cavity
Stratified columnar epithelium	Apical cells being and very flat Cells more cuboidal toward basal layers	• Protection from mechanical stresses and microorganisms • Anal canal	
Stratified cuboidal epithelium	Two or more layers of cuboidal cells	• Some absorption and secretion	• Ducts of sweat glands
Stratified columnar epithelium	Two or more layers of columnar cells	• Protection • Some absorption and secretion	• Ducts of certain glands • Parts of male urethra
Transitional epithelium	Multiple layers of cells Apical cells dome-shaped when relaxed and flattened when stretched	• Protection • Cells flatten and add density	• Urinary bladder • Uterus • Penis

Exocrine glands

Structures of Exocrine Glands





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Page 2 of 4.

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Spongy bone (cont)

histology contains osteocytes housed in lacunae, but they are not arranged in concentric circles. Instead, the lacunae and osteocytes are found in a lattice-like network of matrix spikes called trabeculae

Joint classification

Summary of Joint Classification

Structural Class	Characteristics	Types	Mobility
Plane	Bones united by collagen fibers	1. Suture 2. Symphysis 3. Gomphosis	1. Involuble (sutures) 2. Slightly movable (symphysis) 3. Involuble (gomphosis)
Cartilaginous	Bone ends united by cartilage	1. Synchondrosis 2. Symphysis 3. Fibrocartilage	1. Involuble 2. Slightly movable
Synovial	Bone ends covered with articular cartilage and enclosed within a synovial membrane	1. Plane 2. Hinge 3. Pivot 4. Condyloid 5. Saddle 6. Ball and socket	Freely movable (diarthrosis which depends on joint design)

Joints, bones, and movement

Your joints, connective tissue and muscles all work together to push and pull parts of your body every time you move

Depending on how much a joint moves, it fits into one of three categories-Synarthroses, Amphiarthroses, Diarthroses

Specialized Connective Tissue

CONNECTIVE TISSUES

FIG 4-29 Summary of Connective Tissues. © 2010 Pearson Education

Membranes

SKIN AND BODY MEMBRANES

Membrane	Tissue type	Location	Function
Mucous	Top layer: Epithelial Bottom layer: Connective	Respiratory, Digestive, Urinary, and Reproductive tract	Protect, lubricate, secrete, and absorb
Serosa	Top layer: Epithelial Bottom layer: Connective	Ventral body cavities and organ linings	Lubricate
Cutaneous	Top layer: Epithelial Bottom layer: Connective	Body's exterior	Protects deeper body tissue from external hazards
Synovial	Connective tissue	Joint cavity linings and bone ends	Lubricates to reduce friction

Muscle tissue

	Main features	Location	Type of cells	Histology
Skeletal muscle	- Fibers: striated, tubular and multi nucleated - Voluntary - Usually attached to skeleton			
Smooth muscle	- Fibers: non-striated, spindle-shaped, and uninucleated. - Involuntary - Usually covering wall of internal organs.			
Cardiac muscle	- Fibers: striated, branched and uninucleated. - Involuntary - Only covering walls of the heart.			

Bones classifications

Bone Types	Appearance	Function	Picture	Example(s)
Long Bones	Longer Than They Are Wide	Mechanical Strength		Femur Tibia Fibula Humerus Ulna Radius
Short Bones	Cube-shaped	Multi-directional Motion		Carpal Bones (Of The Hand/Wrists) And The Tarsal Bones (Of The Feet/Ankles).
Flat Bones	Thin And Flat Has Large Surfaces For Muscle Attachments	Mechanical Protection to Soft Tissues Beneath Provides Major Mechanical Support for the Body		-Cranial Bones -Sternum -Iliac -Scapulae
Irregular Bones	Complicated Shapes that cannot be Classified as "Long", "Short" or "Flat".	Vertebra Protects the Spinal Cord		-Vertebrae -Hyoid Bone -Osseous Sclerites -Facial Bones.
Sesamoid Bones	Most Sesamoid Bones Are Un-named.	Protects From Additional Friction And Use - can form in Palms And Soles		Only One Type Of Sesamoid Bone is Present In All Normal Human Skeletons So It Has A Name: The Patella.

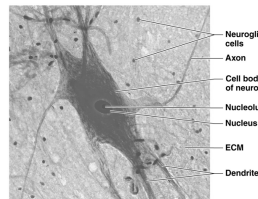
Red bone marrow

consists of loose connective tissue that supports islands of blood-forming hematopoietic cells,

Amount of red marrow decreases as a person ages

Nervous tissue

NEURONS



Tissue repair

Replacing cells, Epithelium tissue, most connective tissue, smooth muscle tissue

Divide by mitosis, collagen that fills in gap and tissue loses some level of functional ability, End result of fibrosis is development of scar tissue composed of dense irregular connective tissue, cartilage (connective tissue), skeletal and cardiac muscle tissue, nervous tissue

Sensory receptors

Lamellated (Pacinian) corpuscles found embedded within reticular layer; sensory receptors that respond mainly to changes in pressure and vibration associated with skin

Sensory receptors (cont)

Tactile (Meissner) corpuscles also found in dermal papillae; sensory receptors that respond to light touch stimuli; more numerous in regions of body where sensation is a primary function; skin of fingertips, lips, face, and external genitalia

Bone terms

Articular cartilage specialized connective tissue present in synovial joints that does not ossify, and persists through life, to provide an optimal surface for enabling movement in the joint. More specifically, it prevents friction between the bones and facilitates the transmission of loads to the underlying bone.

Bone terms (cont)

periosteum Fibrous sheath that covers bones, Supplying blood and nourishment to the bone, Giving the bone and the surrounding area sensation, Protecting the bone from damage, Growing and repairing the bone when needed

Medullary cavity The medullary cavity (medulla, innermost part) is the central cavity of bone shafts where red bone marrow and/or yellow bone marrow (adipose tissue) is stored; hence, the medullary cavity is also known as the marrow cavity

Bone terms (cont)

endosteum The endosteum (pl.: endosteia) is a thin vascular membrane of connective tissue that lines the inner surface of the bony tissue that forms the medullary cavity of long bones.[1][2] This endosteal surface is usually resorbed during long periods of malnutrition, resulting in less cortical thickness

Osteo-

- **clasts** break down and reabsorb bone
- **blasts** bone-forming cells
- **cytes** mature bone cells

3 layers

Epidermis Structure: superficial layer that consists of keratinized stratified squamous epithelium resting on a basement membrane
Function: It protects your body from harm, keeps your body hydrated, produces new skin cells and contains melanin, which determines the color of your skin.

3 layers (cont)

Dermis Structure: deep to epidermis and basement membrane; consists of loose connective tissue and dense irregular connective tissue
Function: to cushion the body from stress and strain, and to also provide: elasticity to the skin, a sense of touch, and heat.

Epidermal derivatives

Thermoregulation

How does the skin regulate the body's temperature?

sweat glands, accessory structures to the skin, secrete water, salt, and other substances to cool the body when it becomes warm,