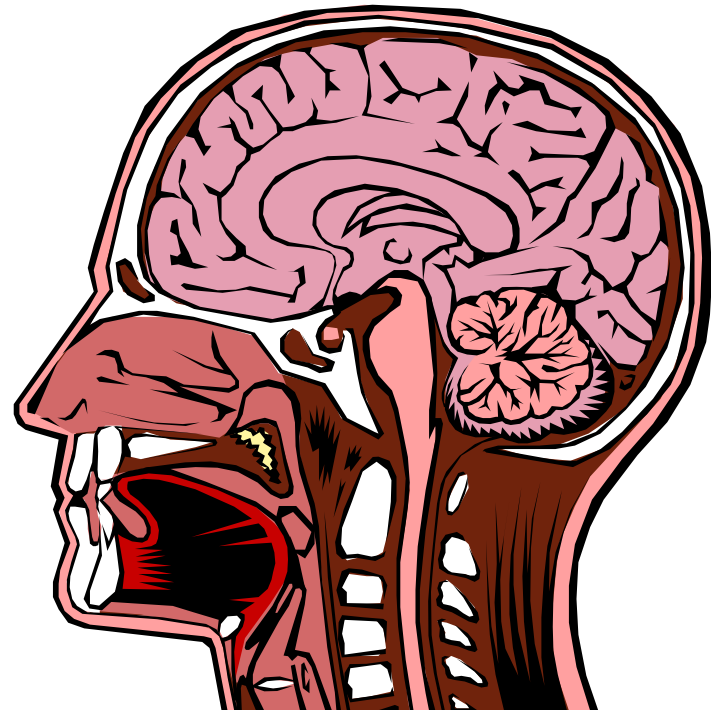


CHAPTER 14

Bones, Muscles, Skin

SECTION 1

Body Organization and Homeostasis



Levels of Organization

Basic to Complex...

- ☑ Cells
- ☑ Tissues
- ☑ Organs
- ☑ Organ Systems



CELLS



TISSUES



ORGANS



SYSTEMS



MeridianLife
The Art of Personal Wellness

CELLS

⌘ Basic unit in living thing

⌘ Main Parts:

☑ Cell membrane- outside boundary of cell

☑ Nucleus- control center

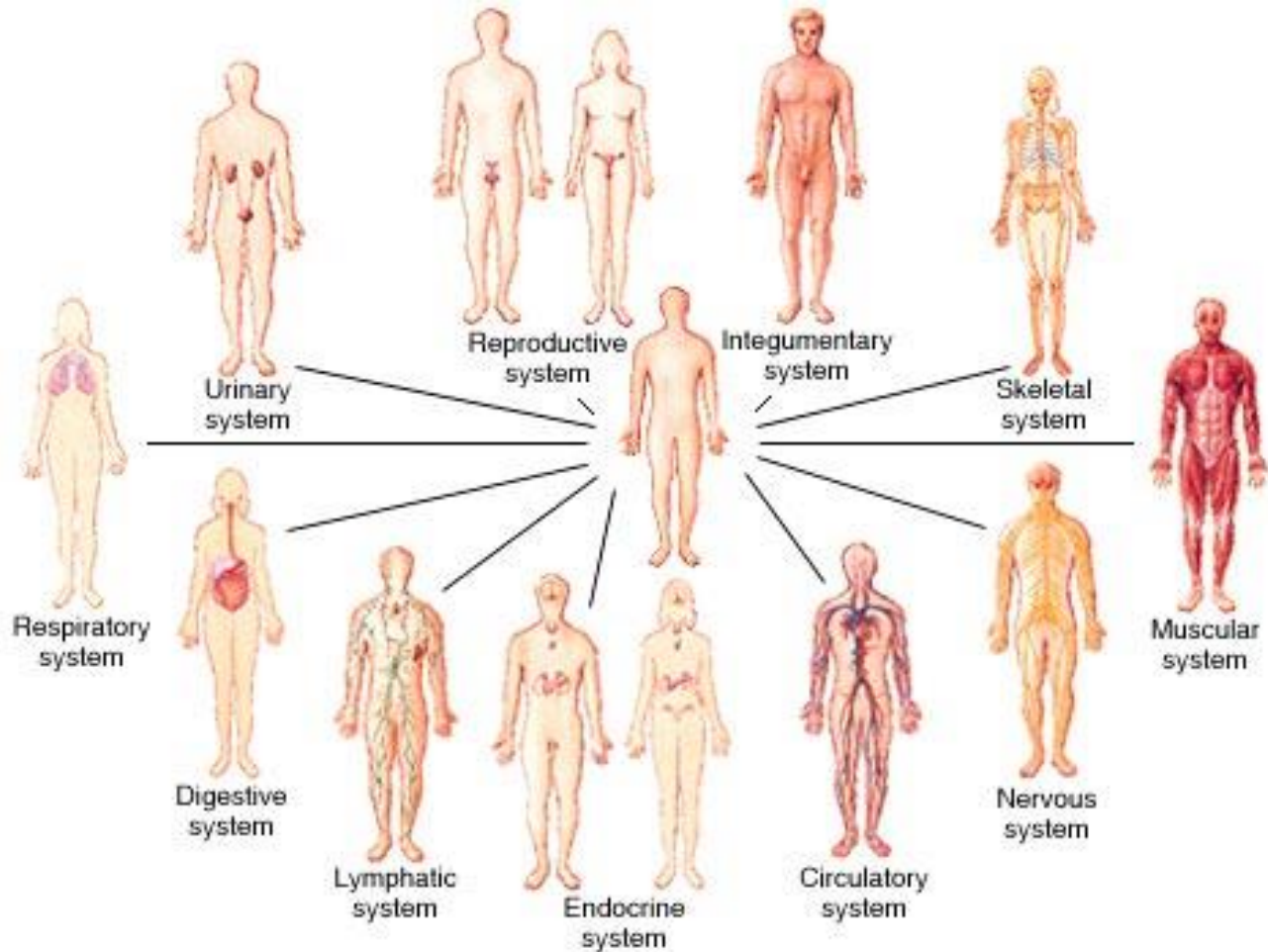
☑ Cytoplasm- jellylike substance inside cell

Tissues



- ☒ Muscle tissue – contracts (or shortens) to create movement
- ☒ Connective tissue – provides support for your body and connects all its parts
- ☒ Nerve tissue – carries messages back and forth between the brain and spinal cord
- ☒ Epithelial tissue – protective covering (skin) as well as lines cavities and hollow spaces

Systems and Functions



Homeostasis



⌘ Body's way of maintaining internal balance

⌘ Examples:

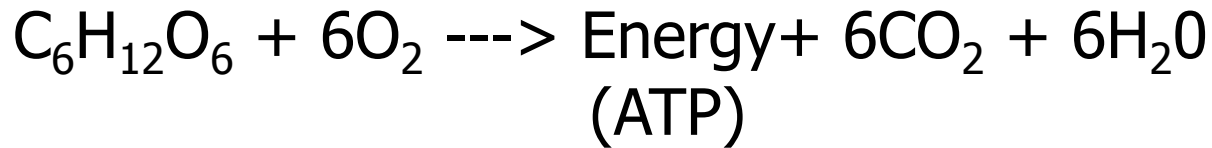
- thirst + urinating occurs for water control
- hunger occurs for glucose control
- shivering + sweating for temp control

⌘ Stress= reaction of a threat to homeostasis maintenance

Energy

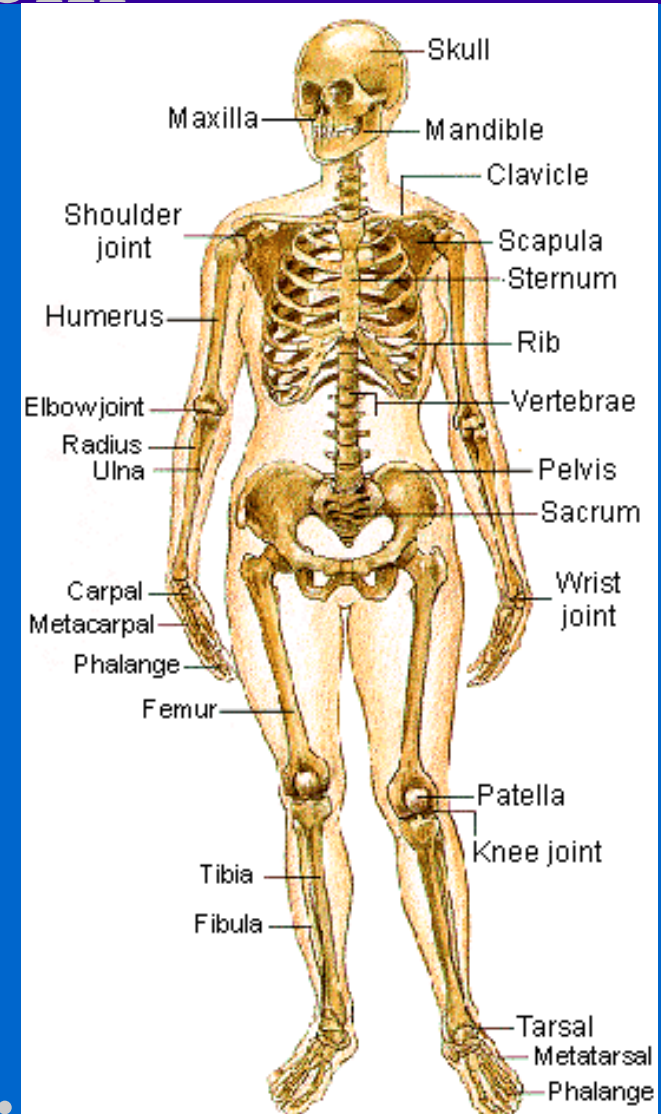


Cellular Respiration = source of energy
for cells



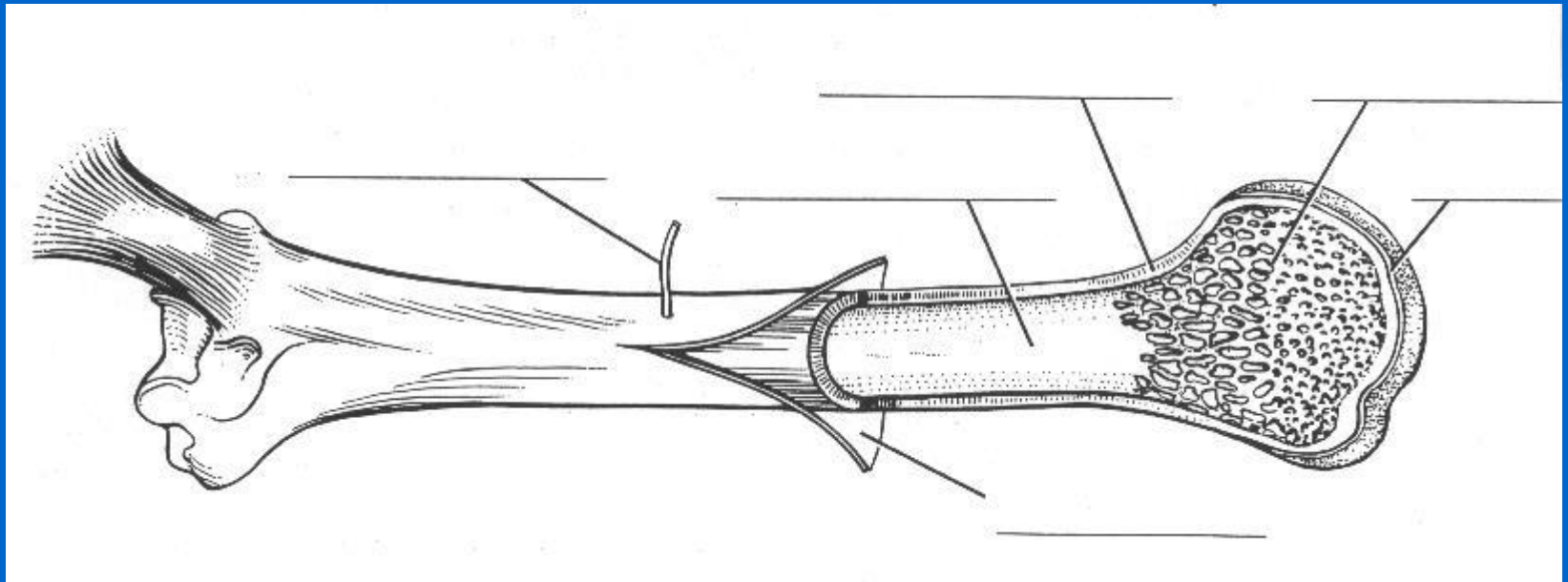
5 Functions of the Skeletal System

1. framework (shape/support)
2. protection
3. movement
4. blood cell production
5. storage of Ca & P



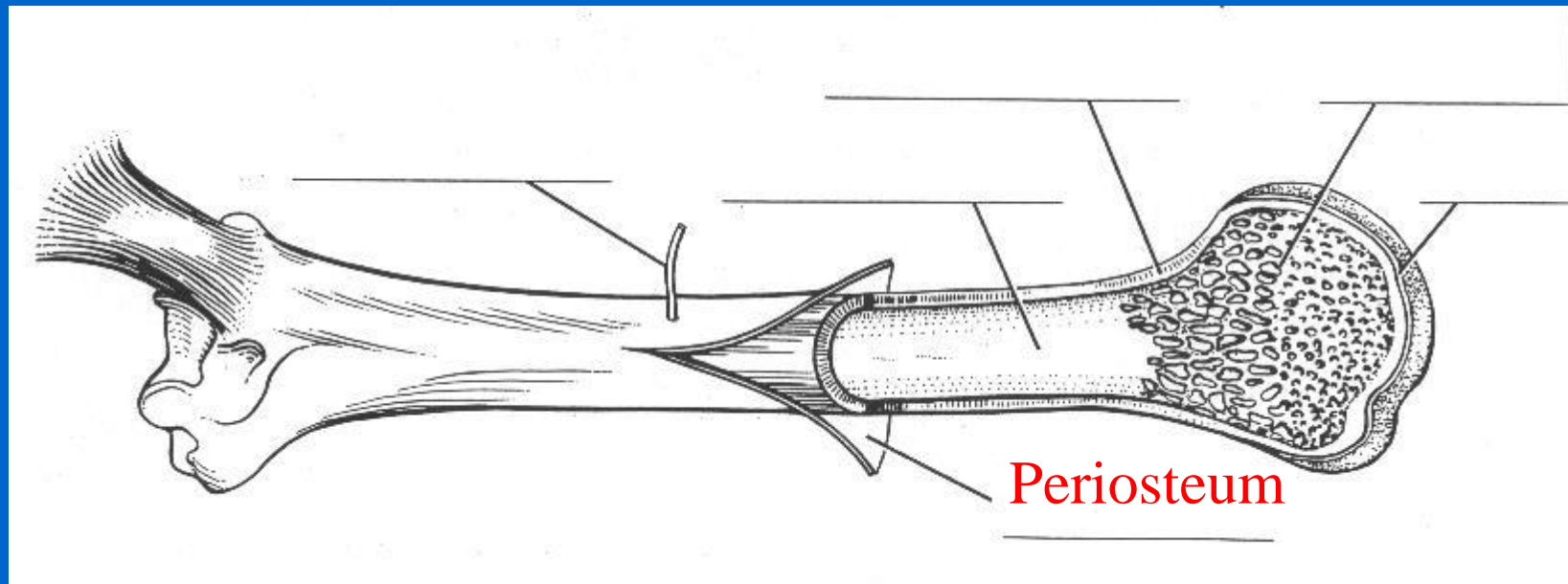
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In the next few slides, can you label the bone below according to the descriptions provided?



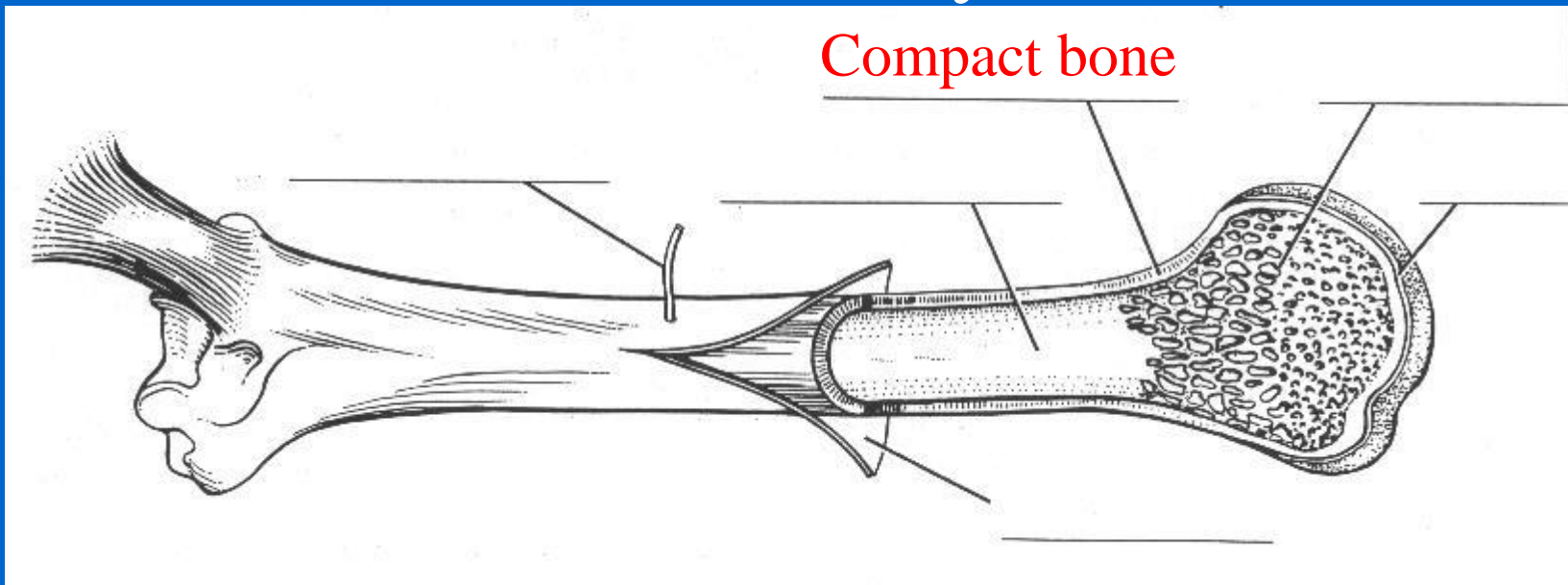
Bone Parts: Periosteum

- covers & protects
- growth & repair
- blood supply



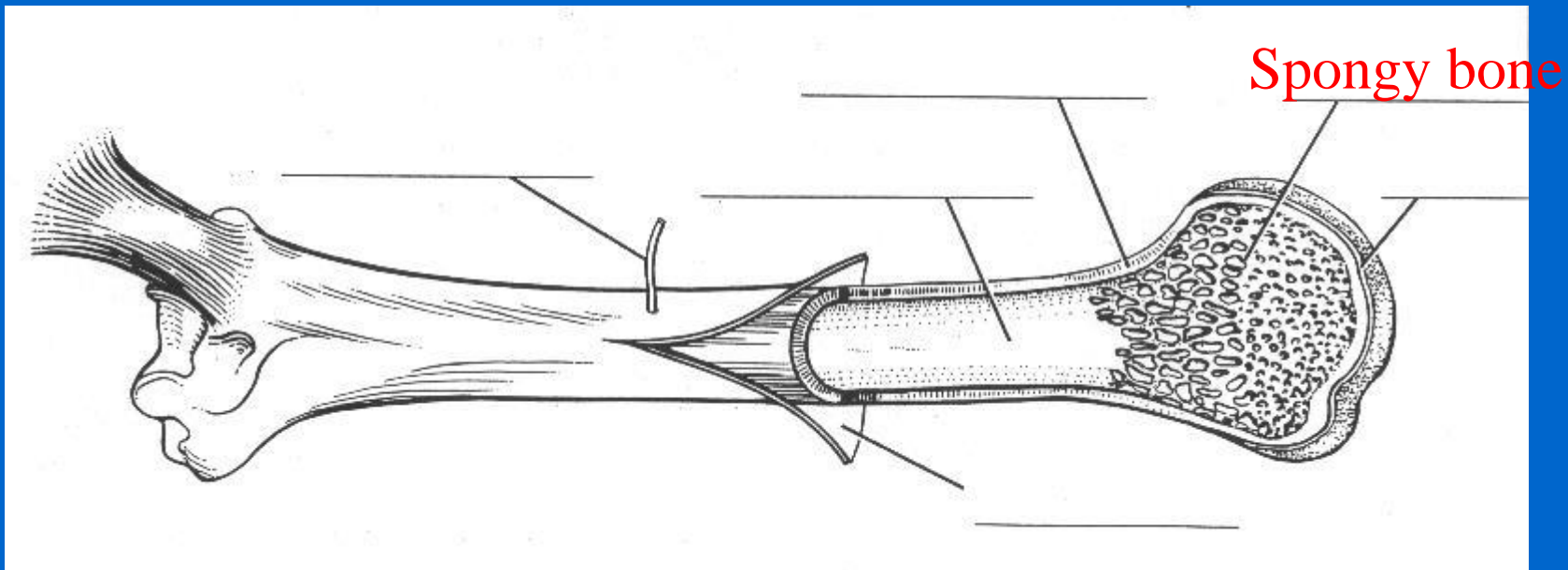
Compact Bone

- Dense outside of bone:
 - Ca & P (hardness)
 - elastic fibers (flexibility)



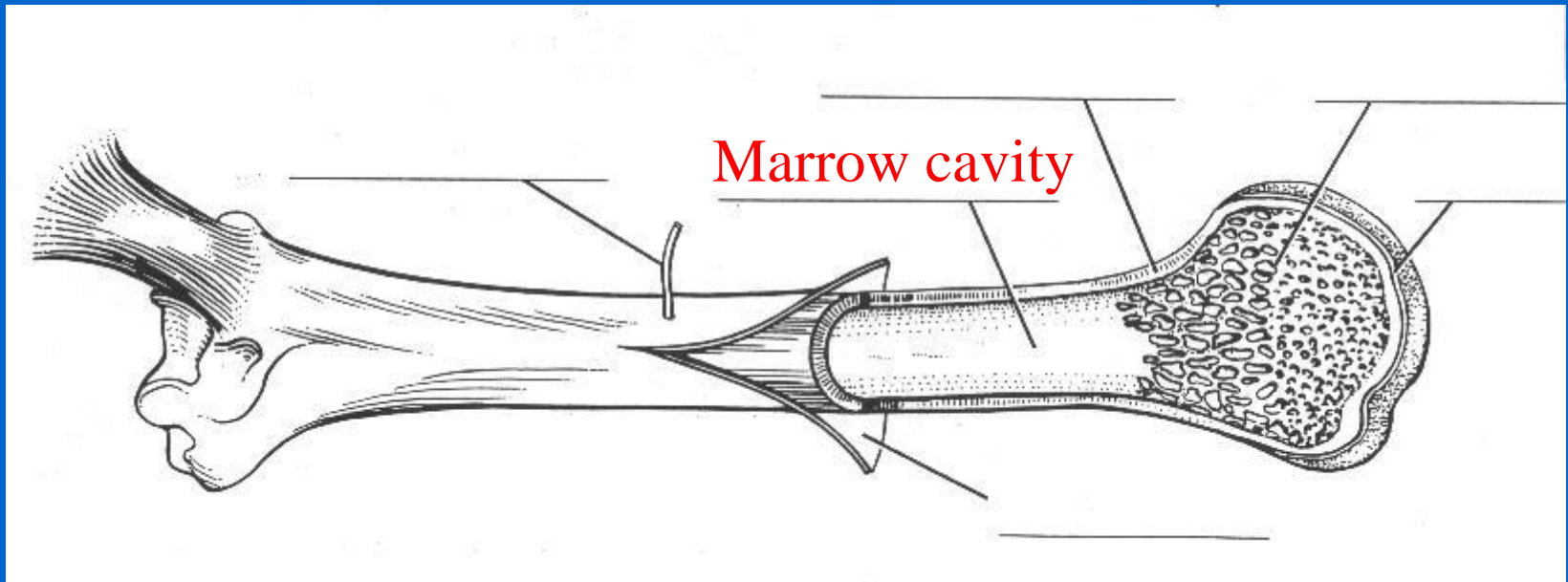
Spongy Bone

- open spaces (lightweight)
- contains red marrow
 - makes blood cells



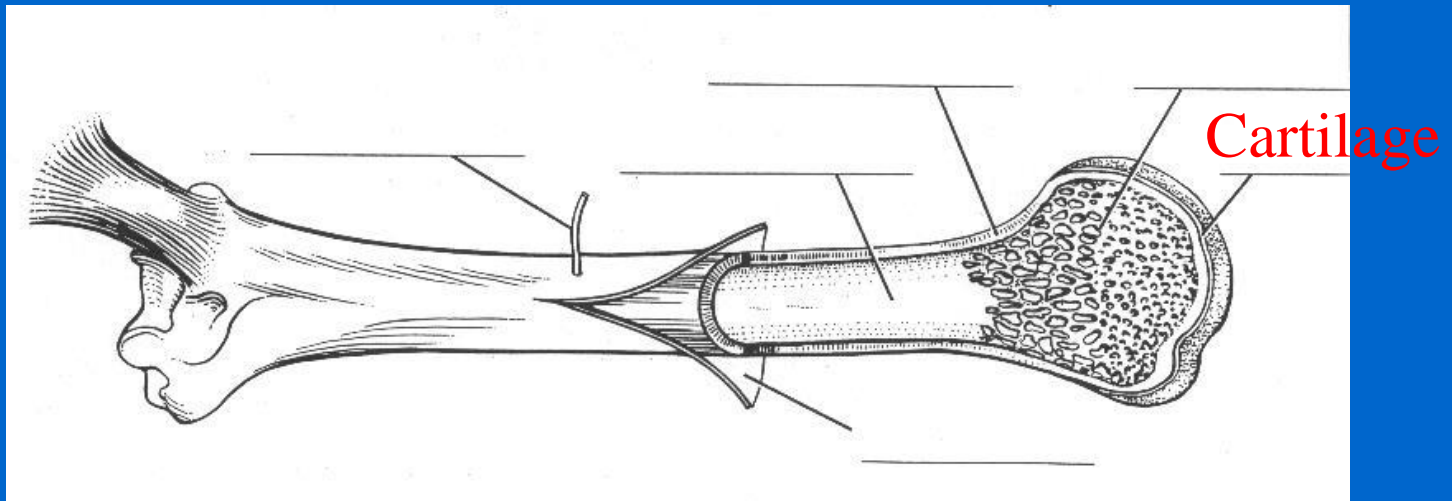
Marrow cavity

- hollow center
- contains yellow marrow
 - fat storage

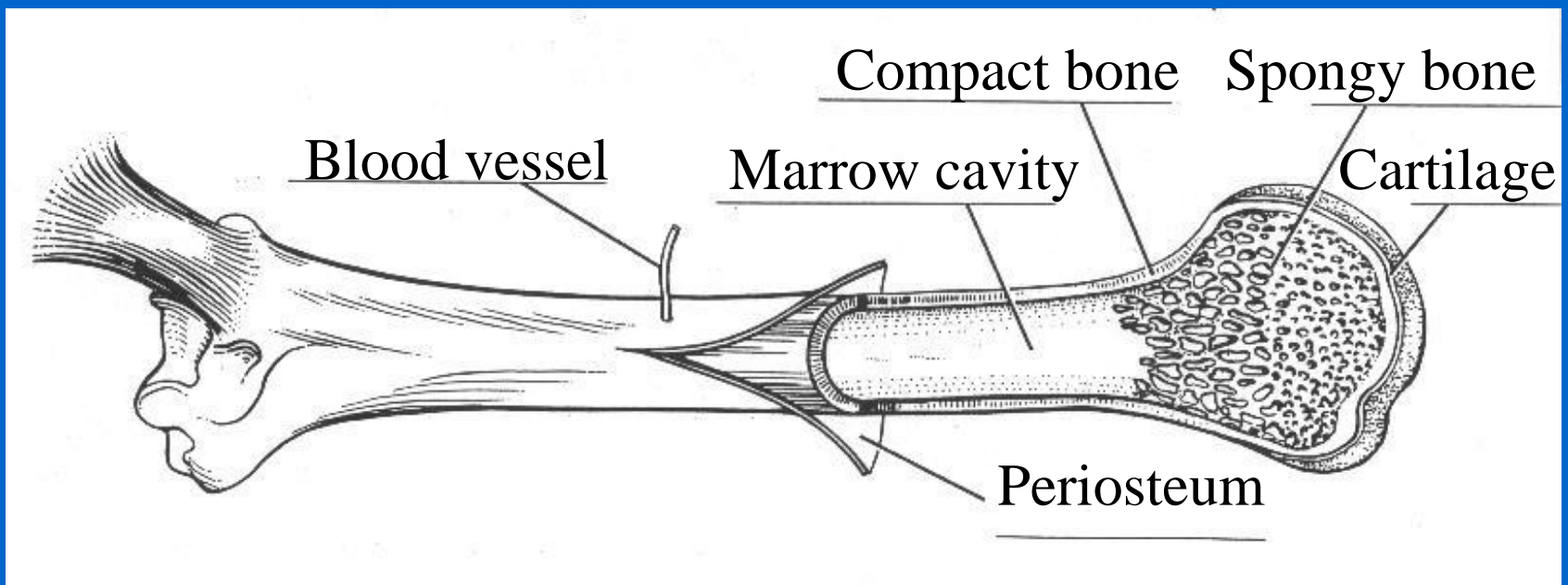


Cartilage

- Flexible
- absorbs shock; cushions
- makes movement easier

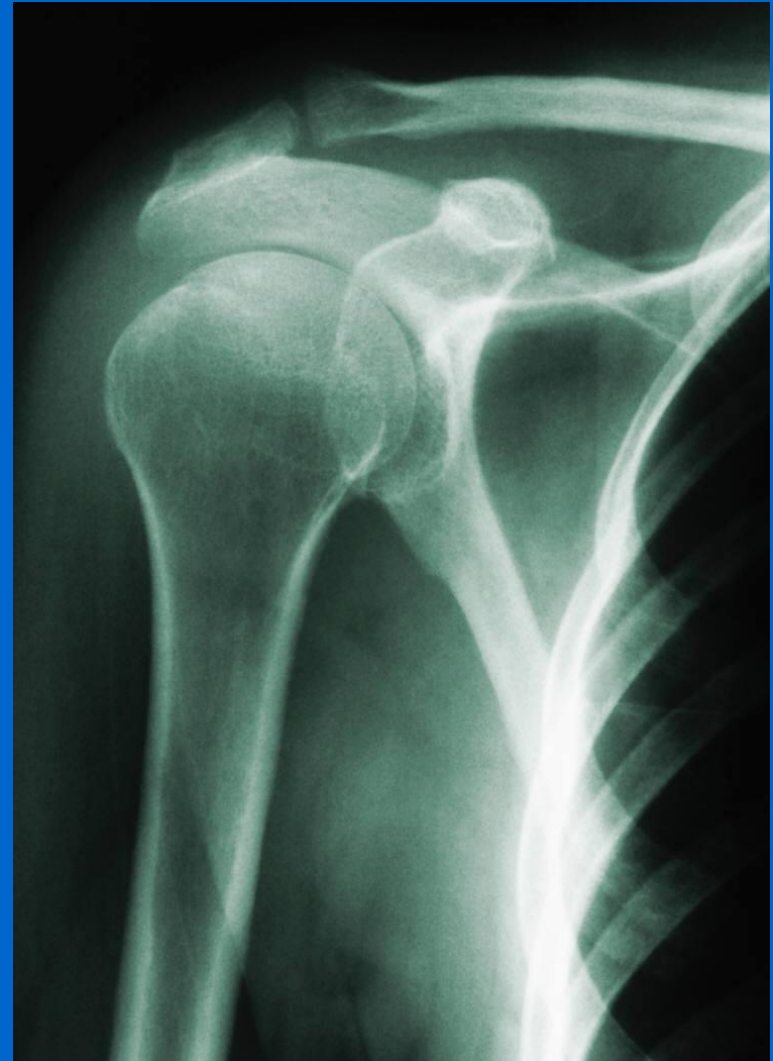


Long Bone Answer KEY



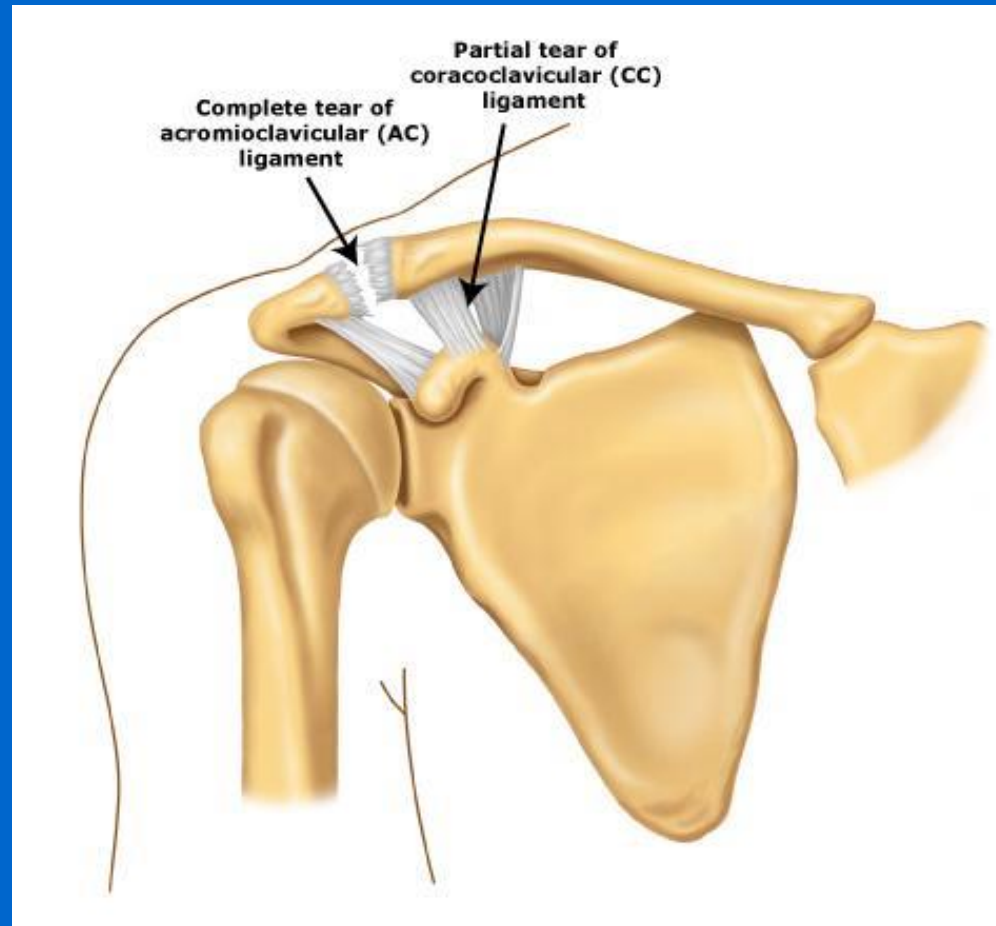
Joint- 2+ bones coming together

- Fixed
 - immovable
 - ex: skull, teeth
- Movable
 - Pivot – head+neck
 - Ball & socket - shoulder
 - Hinge - elbow
 - Gliding- wrist
 - Saddle- base of thumb
 - Ellipsoidal- base of fingers



⋮
⋮
⋮

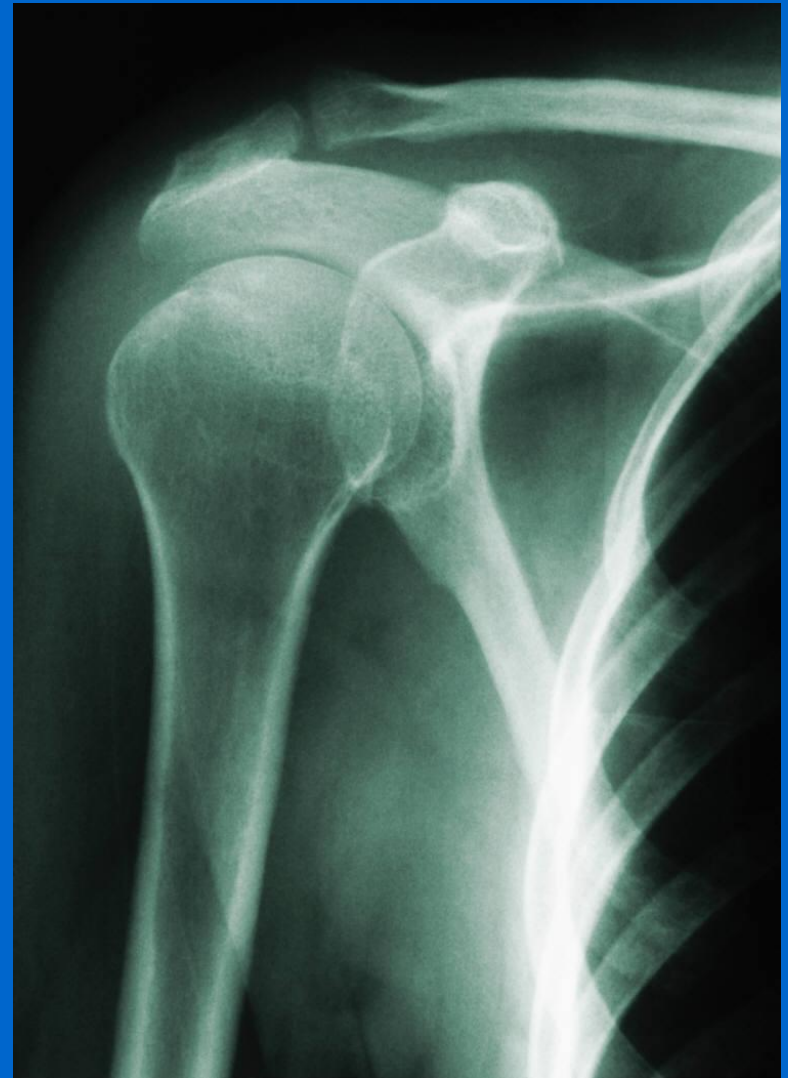
Ligaments- tough connective tissue that connects bone to bone



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Check for Understanding...

1. What type of joint is this?
2. What bones are involved?

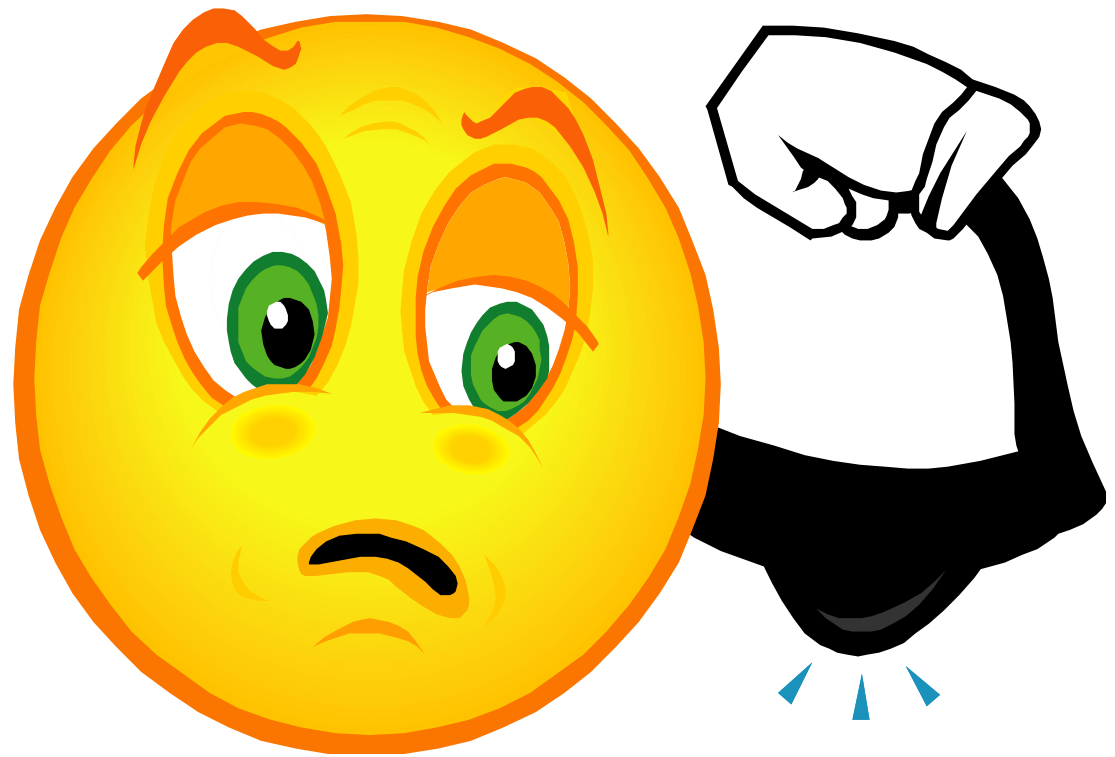


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Give the general name of the bones in the x-ray below

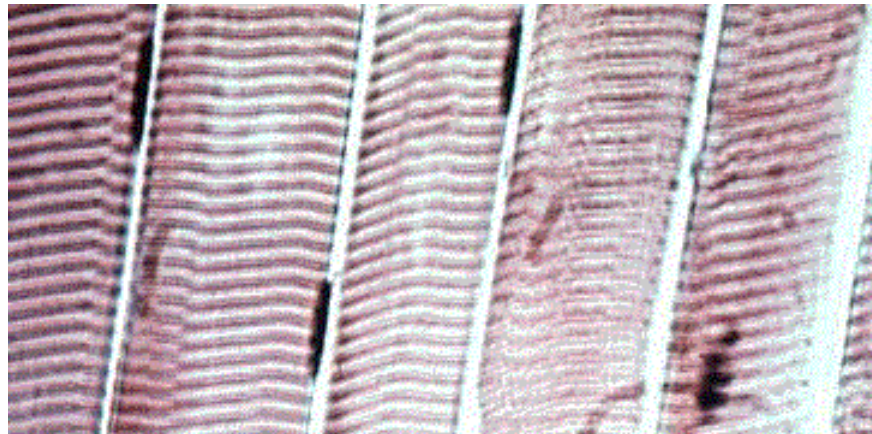


MUSCULAR SYSTEM



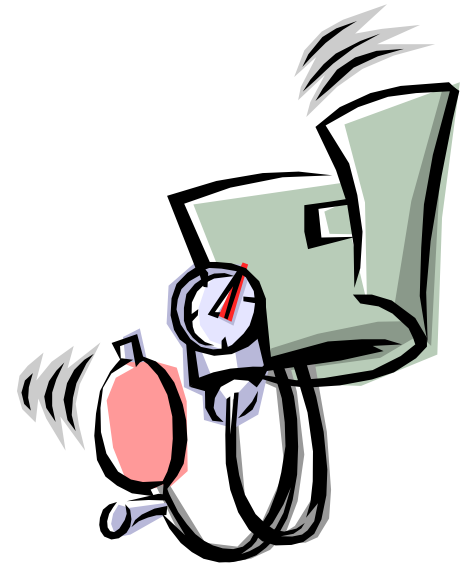
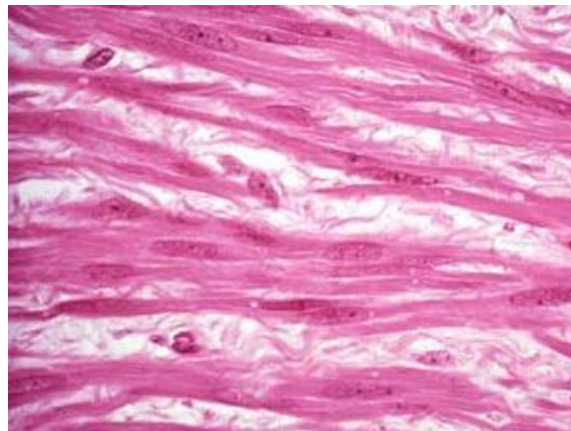
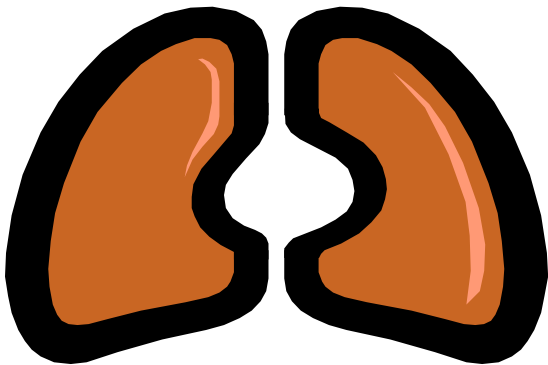
Skeletal Muscle

- moves bones- How?
- Striated- what does that mean?
- voluntary
- contraction only -work in pairs
- react quickly; tire easily
- Multi-nucleated- Why?



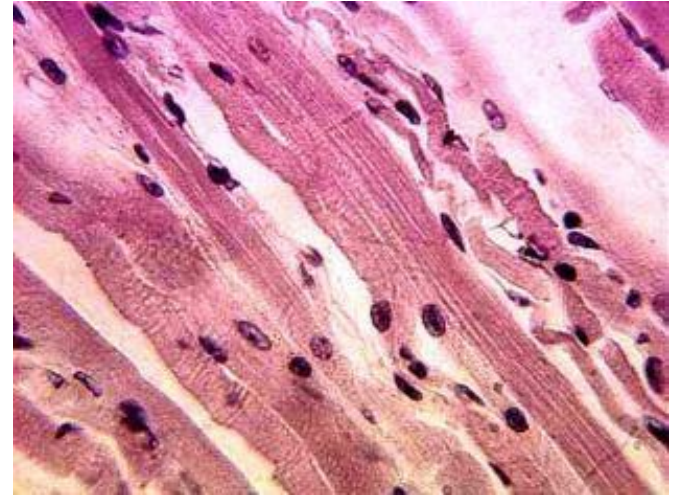
Smooth Muscle

- Moves internal organs
 - breathing, blood pressure, digestive system
- Not striated
- Involuntary
- Reacts slowly; tires slowly

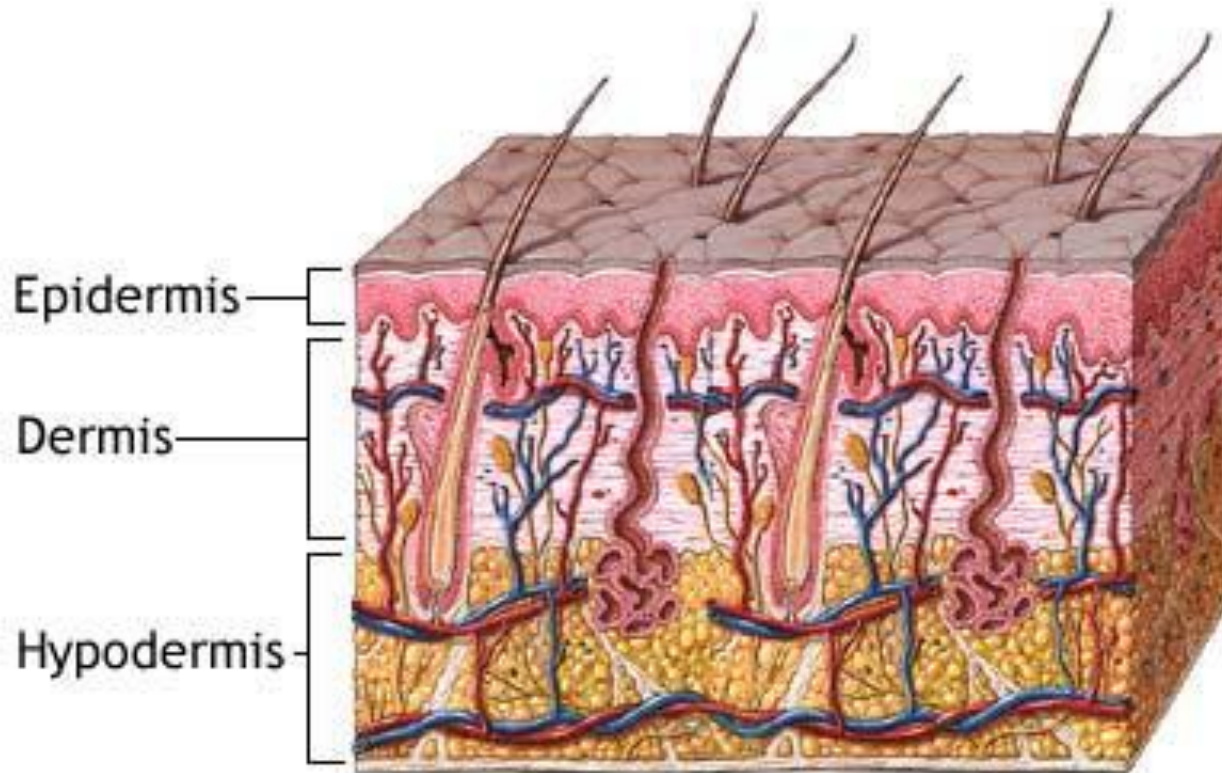


Cardiac Muscle

- Heart muscle
- Striated and branched
- Involuntary
- Reacts quickly
- Does not tire

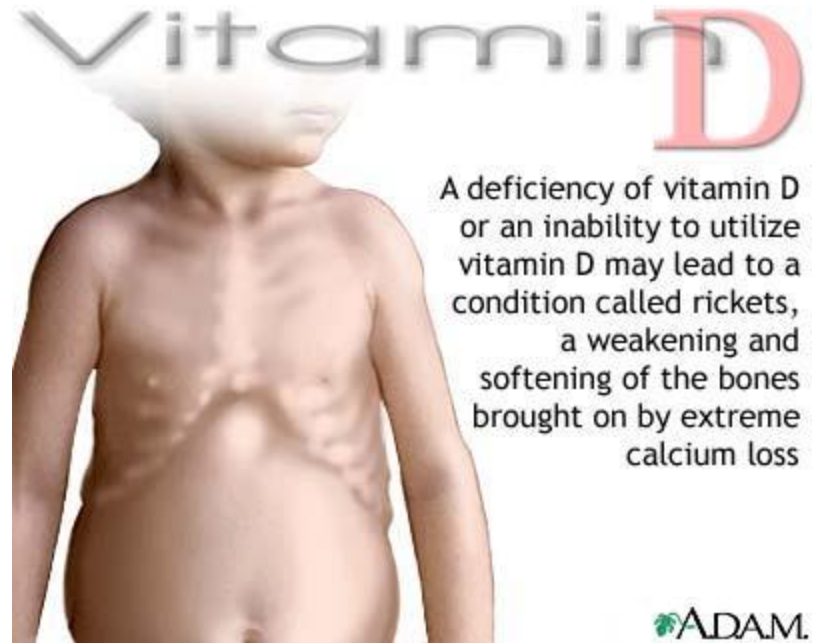


The Skin



Functions of the Skin

1. Protection
2. Maintaining Temperature
3. Eliminating Wastes
4. Gathering Info
5. Producing Vitamin D



A deficiency of vitamin D or an inability to utilize vitamin D may lead to a condition called rickets, a weakening and softening of the bones brought on by extreme calcium loss

Layers of the Skin

A. Epidermis

A. Outer layer of skin

B. Contains Melanin

A. Pigment that gives skin its color

B. Dermis









A. Inner layer of skin

B. Contains Pores (openings for sweat)

C. Contains Follicles (hair growth structure)

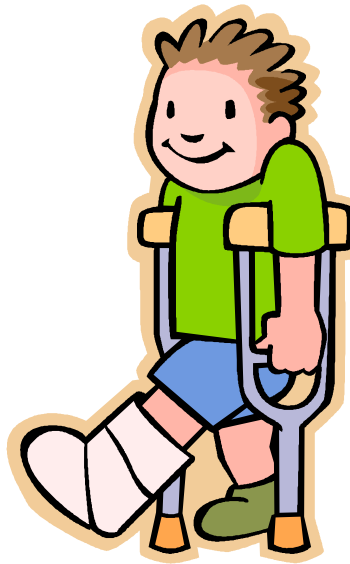
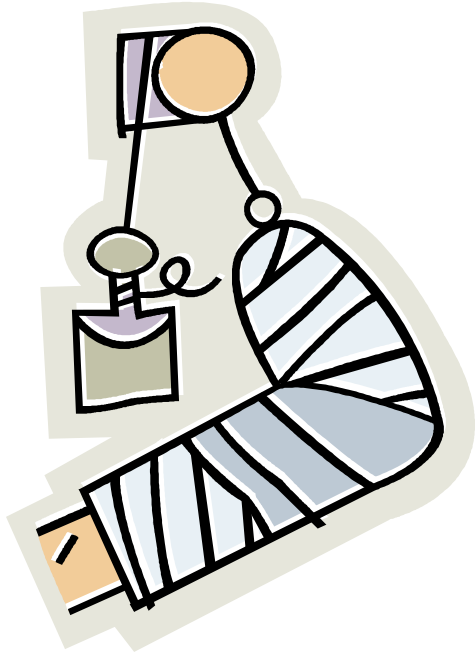
Caring for Your Skin

- **Healthful Diet**- how could this affect skin health?
- **Keeping Skin Clean**- how could this affect skin health?
- **Limiting Sun Exposure**- why? How does sun exposure affect our skin?

Normal Mole	Melanoma	Sign	Characteristic
		Asymmetry	when half of the mole does not match the other half
		Border	when the border (edges) of the mole are ragged or irregular
		Color	when the color of the mole varies throughout
		Diameter	if the mole's diameter is larger than a pencil's eraser

Photographs Used By Permission: National Cancer Institute

Diagnosing Bone and Joint Injuries



Fractures

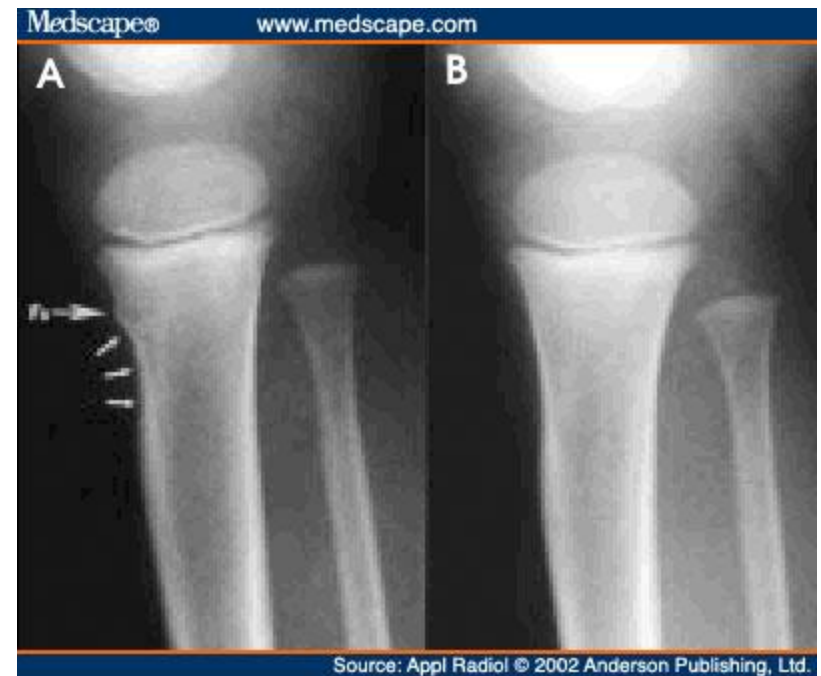
⌘ Break in a bone

☑ Simple

- ☑ Bone is cracked or broken into 2 or more pieces

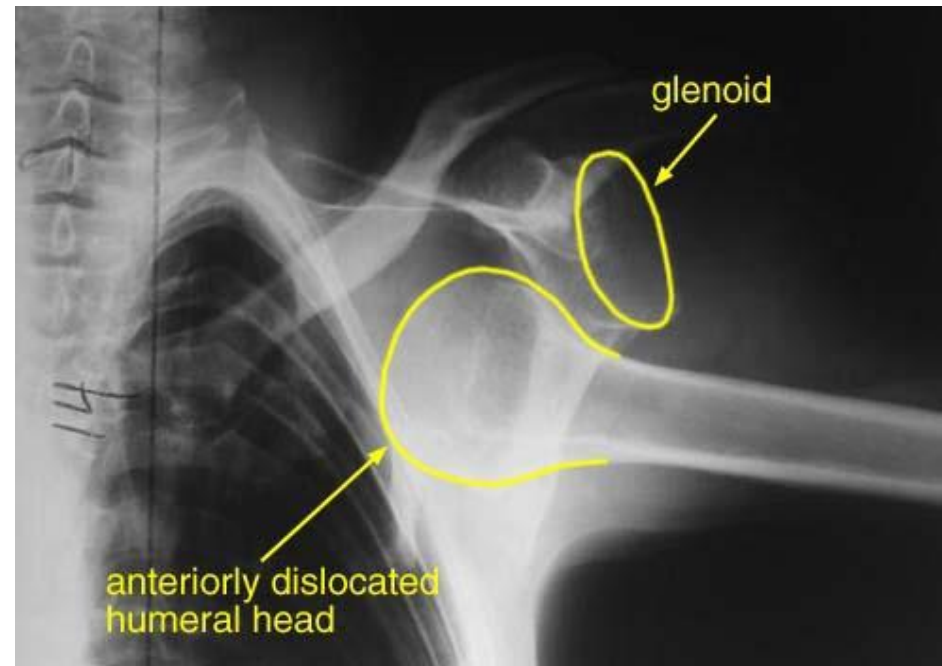
☑ Compound

- ☑ Broken ends of bone stick out through skin



Dislocation

- ⌘ Injury that occurs when bone is forced out of its joint
- ⌘ Can be corrected by a doctor
- ⌘ Often includes a sprain



Sprain

⌘ Stretching or tearing of ligaments

⌘ 3 degrees of *sprain*:

☒ 1st degree: stretched

☒ 2nd degree: partially torn

☒ 3rd degree: completely torn



Strain



⌘ An injury to muscle or tendon

☑ Tearing may cause muscle to lose ability to contract

☑ Caused by a sgl incident or built up over time

☑ 3 Degrees of *strain*:

☑ 1st degree- stretching of a few fibers

☑ 2nd degree-damage is more significant

☑ 3rd degree- complete rupture of the muscle

Identifying Injuries

⌘ X-Rays

- ☑ form of energy that travels in waves

⌘ Magnetic Resonance Imaging (MRI)

- ☑ Taking images of both bones and soft tissue in the body



Treating Injuries



⌘ Joint Replacement

- ☑ Arthritis- disease of joints that makes movement painful

⌘ Arthroscopy

- ☑ Surgical procedure that doctors use to diagnose joint problems

Joint Damage

Some basic First Aid...

⌘ RICE

☑ rest

☑ ice

☑ compression

☑ elevation

