



Medical Terminology

Musculoskeletal System

4th Lecture

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MUSCULOSKELETAL SYSTEM (LOCOMOTOR SYSTEM)

It consists of: Bones, muscles, cartilages, tendons, ligaments, joints, and other connective tissue that supports and binds tissues and organs together.

FUNCTIONS OF THE MUSCULOSKELETAL SYSTEM

- It provides support, stability, and movement to the body.
- It protects the internal organs.
- It stores minerals and fat.
- It produces blood cells.

BONES -

- Bone tissue is called **osseous tissue**.
- It is a type of dense connective tissue.
- Ossification or osteogenesis is the process of bone formation by osteoblasts.
- Osteogenesis: oste/o= bone, genesis= production, formation or origin.
- Ossification: Oss= bone, facio= latin word means make.



CLASSIFICATIONS OF BONES ACCORDING TO THEIR SHAPES

- 1- **Long bones:** are longer than they are wide. Examples: femur and humerus.
- 2- **Short bones:** roughly cube shaped with nearly equal vertical and horizontal dimensions. Examples: carpals and tarsals.
- 3- **Flat bones:** thin, flattened, and usually curved. Examples: sternum, scapula and pelvis.
- 4- **Irregular bones:** have irregular shapes. Example: vertebrae.

Compact bone (cortical bone): dense and hard.

It forms the outer layer of the bone (cortex), found in epiphysis and diaphysis.

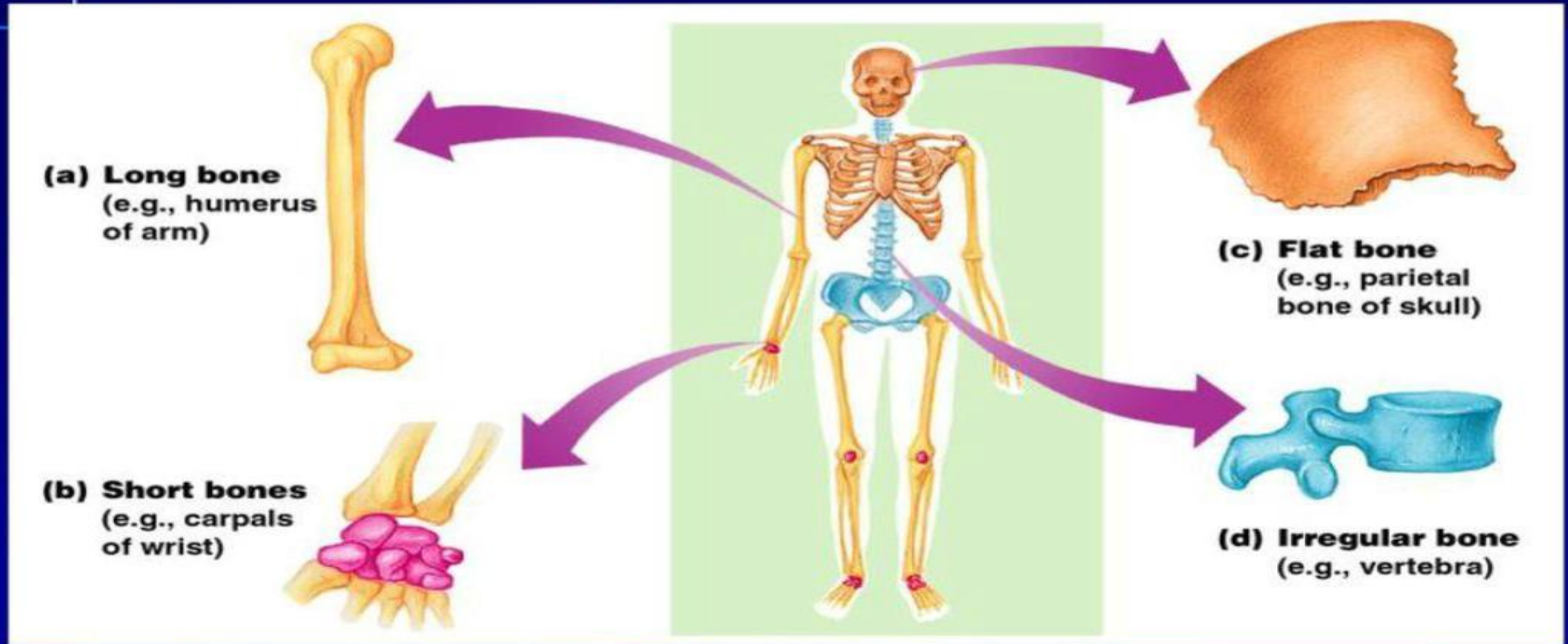
Cancellous bone (Spongy bone, trabecular bone):

It is found inside the bone.

It has spaces containing red bone marrow.

It manufactures blood cells.

Classification of Bones on the Basis of Shape

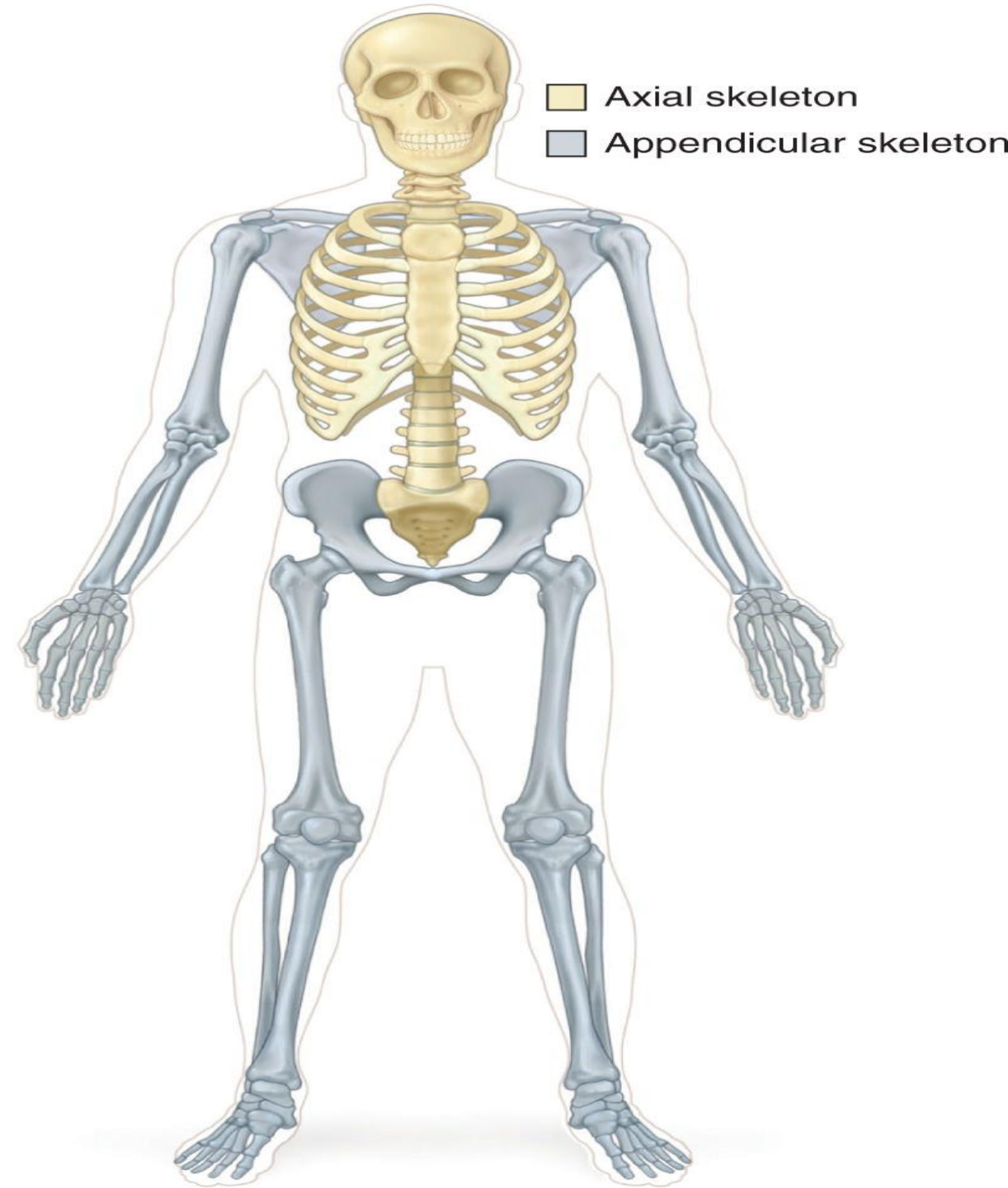


SKELETAL SYSTEM DIVISIONS

The axial skeleton: It forms the vertical axis of the body and includes the bones of the head, neck, back, and chest of the body.

It consists of 80 bones that include the skull, laryngeal skeleton, vertebral column, and thoracic cage.

The appendicular skeleton: It consists of 126 bones and it includes bones of the upper limbs, lower limbs, shoulder and pelvic girdles.



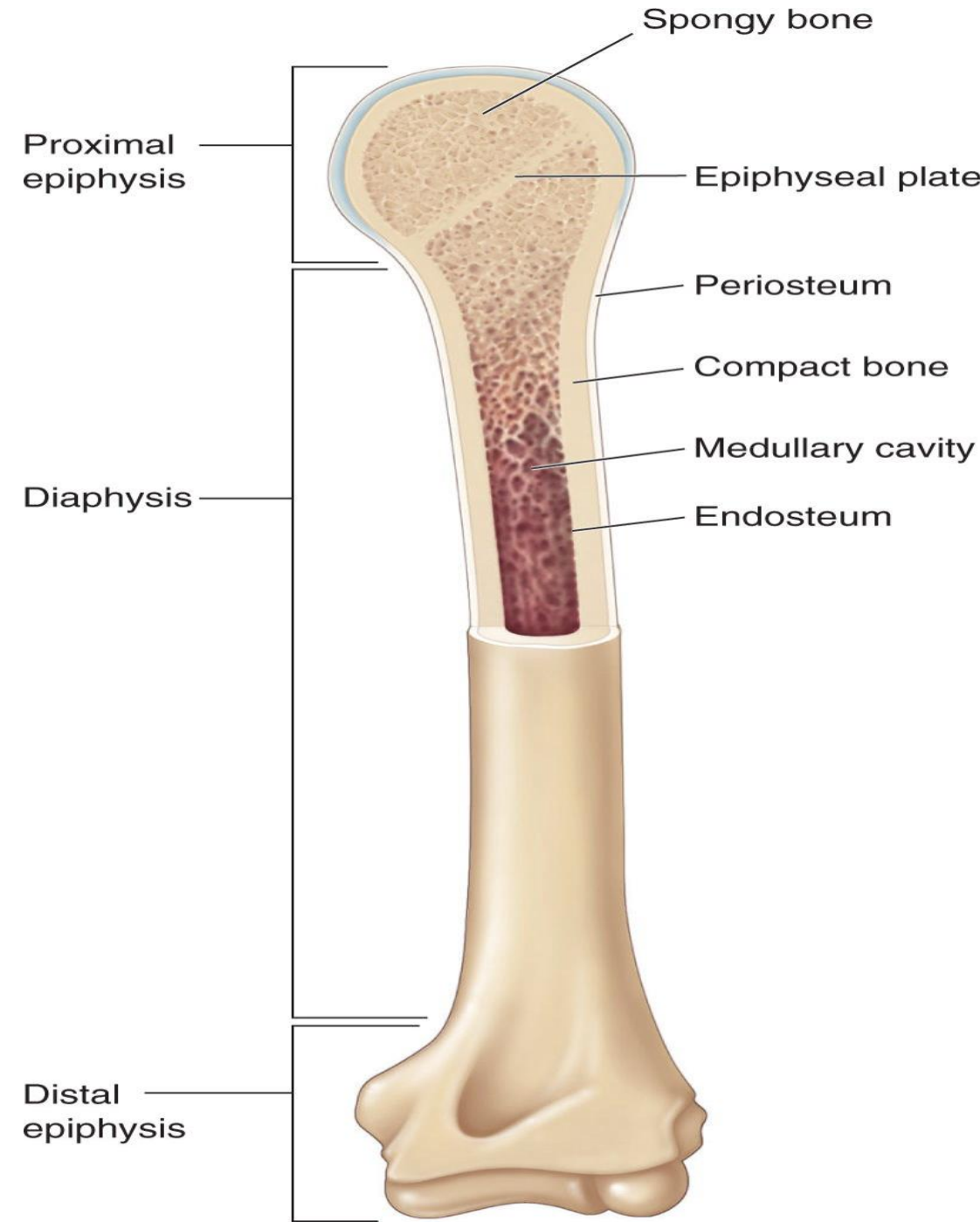
Long bones have subparts:

Diaphysis: the shaft or the central part of the long bone. Dia means through, physis means growth.

Epiphysis: (proximal and distal epiphysis) the end part of the long bone. Epi means above.

Medullary cavity: open canal within the diaphysis, it contains yellow bone marrow.

Articular cartilage: it covers the epiphysis and provides a smooth lubricated surface for low friction articulation.



Joints:

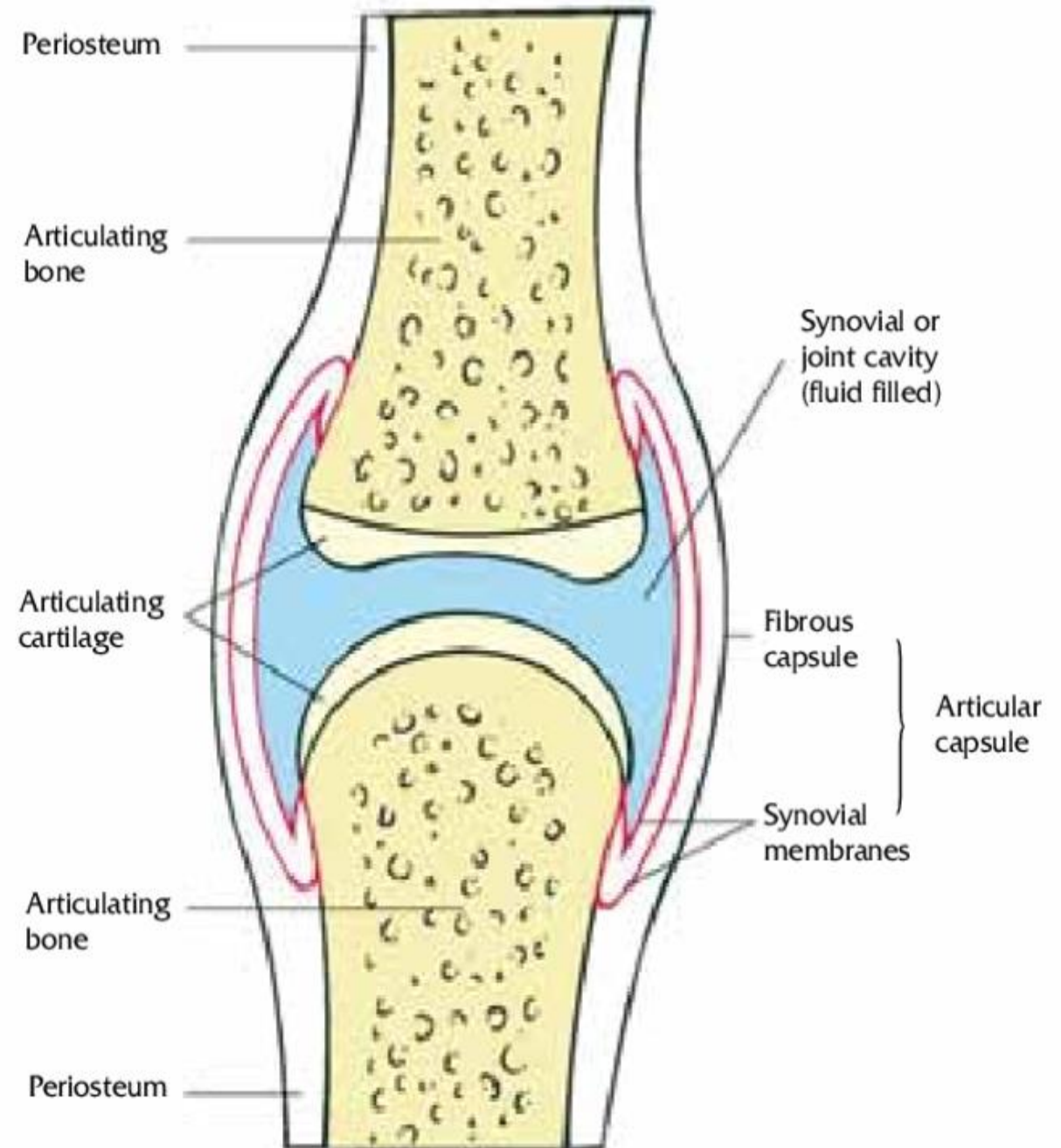
are the area where two bones meet.
They are held together by ligaments.
They give flexibility to the skeleton.

TYPES OF JOINTS

1- Synarthrosis: an immobile or nearly immobile joint. Example, the joints between the skull bones.

2- Amphiarthrosis: a slightly moveable joint. Example, the pubic symphysis.

3- Diarthrosis: a freely moveable joint. Example: synovial joints such as elbows and knees.

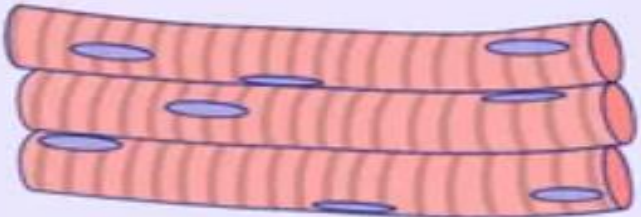
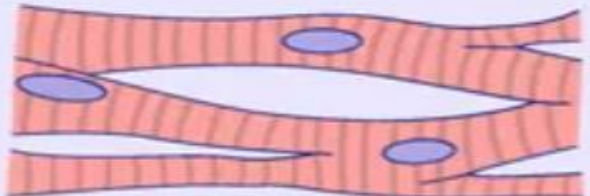


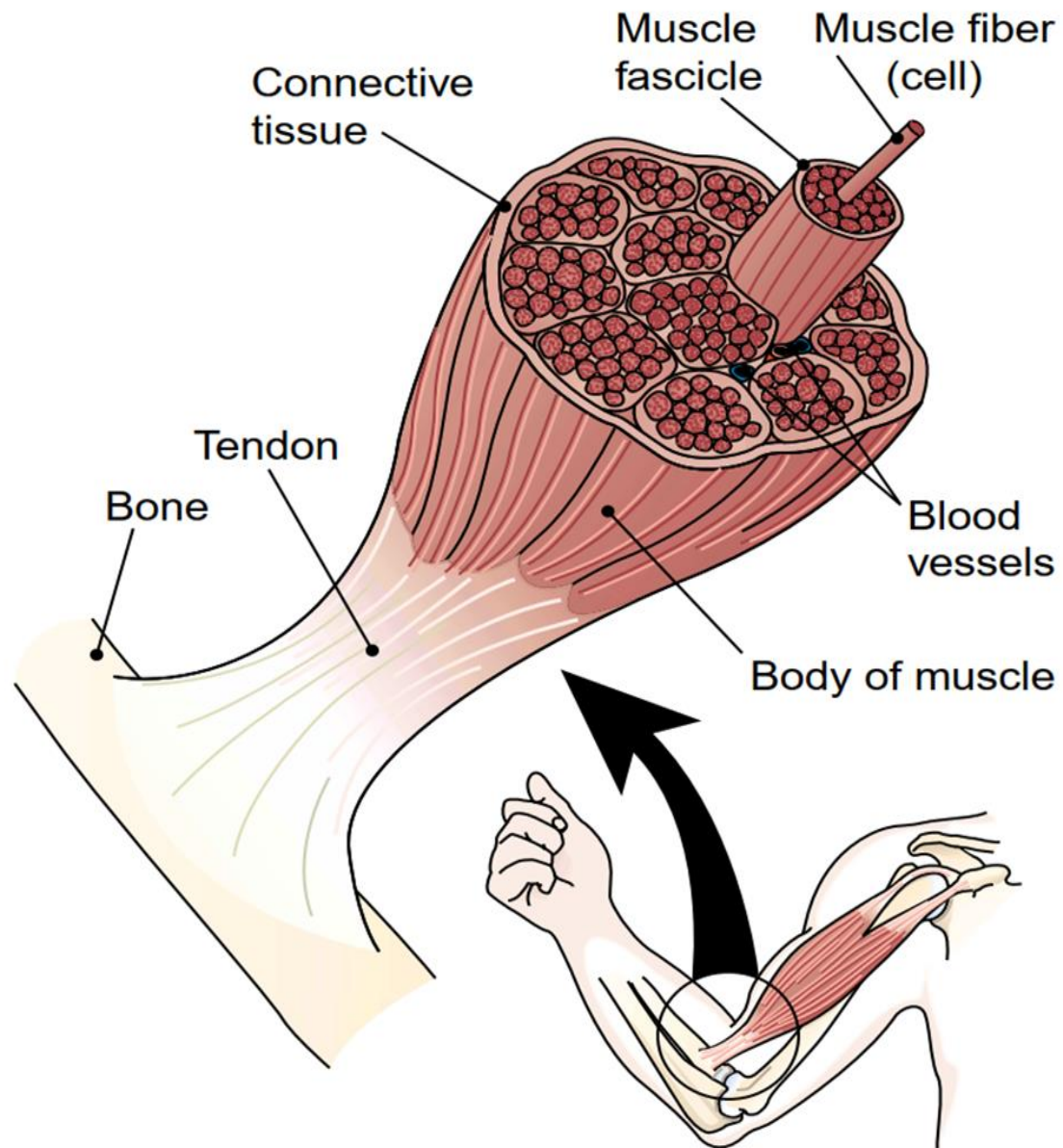
Muscles: The main characteristic of muscle tissue is its ability to contract. When stimulated, muscles shorten to produce movement of the skeleton, vessels, or internal organs. Muscles also may remain partially contracted to maintain posture. In addition, the heat generated by muscle contraction is the main source of body heat.

Types of Muscle

There are three types of muscle tissue in the body:

- **Smooth (visceral) muscle.** This makes up the walls of the hollow organs and the walls of ducts, such as the blood vessels and bronchioles. This muscle operates involuntarily and is responsible for peristalsis, the wavelike movements that propel materials through the systems.
- **Cardiac muscle.** This makes up the myocardium of the heart wall. It functions involuntarily and is responsible for the pumping of the heart.
- **Skeletal muscle.** This is attached to the bones of the skeleton and is responsible for voluntary movement. It also maintains posture and generates a large proportion of body heat. All of these voluntary muscles together make up the muscular system.

	Main features	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	



Structure of a skeletal muscle showing connective tissue coverings.

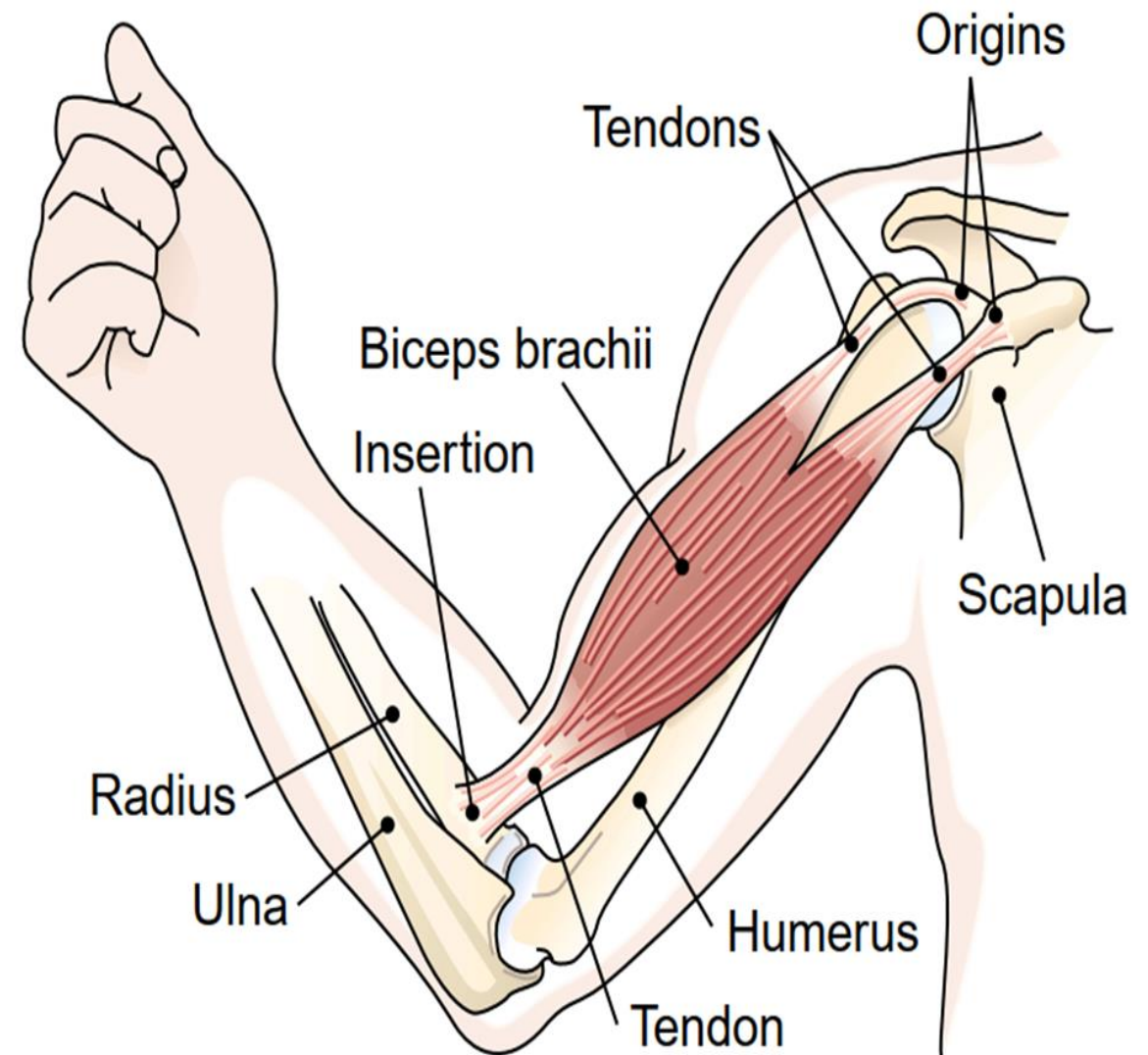


Diagram of a muscle showing three attachments to bones—two origins and one insertion.

ROOT	MEANING	EXAMPLE	DEFINITION OF EXAMPLE
my/o	muscle	myositis* <i>mī-ō-sī-tis</i>	inflammation of muscle
muscul/o	muscle	musculoskeletal <i>mus-kū-lō-SKEL-e-tal</i>	pertaining to muscle and skeleton
ten/o, tendin/o	tendon	tenorrhaphy <i>ten-OR-a-fē</i>	suture of a tendon
ton/o	tone	cardiotonic <i>kar-dē-ō-TON-ik</i>	having a strengthening action on the heart
kine, kinesi/o kinet/o	movement	dyskinesia <i>dis-kī-NĒ-zē-a</i>	abnormality of movement

Chondrogenesis: formation of the cartilage.

Chondr/o means cartilage, genesis means production, formation or origin.

Myasthenia : Muscle weakness, My/o= muscle, asthenia= weakness.

ostealgia (oss-tee-AL-jee-uh)	<i>oste/o</i> (bone); <i>-algia</i> (pain)	pain in a bone; also called osteodynia
osteitis (oss-tee-EYE-tihs)	<i>oste/o</i> (bone); <i>-itis</i> (inflammation)	inflammation of bone
osteochondritis (OSS-tee-oh-konn-DRY-tihs)	<i>oste/o</i> (bone); <i>chondr/o</i> (cartilage); <i>-itis</i> (inflammation)	inflammation of bone and associated cartilage
osteodynia(oss-tee-oh-DINN-ee-uh)	<i>oste/o</i> (bone); <i>-dynia</i> (pain)	pain in a bone; also called ostealgia
osteomalacia (OSS-tee-oh-muh-LAY-she-uh)	<i>oste/o</i> (bone); <i>-malacia</i> (softening)	softening of bone
osteomyelitis (OSS-tee-oh-my-eh-LY-tihs)	<i>oste/o</i> (bone); <i>myel/o</i> (marrow); <i>-itis</i> (inflammation)	inflammation of bone marrow
osteopenia (oss-tee-oh-PEEN-ee-uh)	<i>oste/o</i> (bone); <i>-penia</i> (deficiency)	abnormally low bone density
osteoporosis (OSS-tee-oh-puh-RO-sihs)	<i>oste/o</i> (bone); <i>por/o</i> (porous); <i>-sis</i> (condition)	atrophy and thinning of bone tissue

arthrectomy (ar-THREK-tuh-mee)	<i>arthr/o</i> (joint); <i>-ectomy</i> (surgical removal)	excision of a joint
arthrocentesis (arth-roh-senn-TEE-sihs)	<i>arthr/o</i> (joint); <i>-centesis</i> (surgical puncture for aspiration)	removing fluid from a joint through a needle puncture
arthrogram (ARTH-roh-gram)	<i>arthr/o</i> (joint); <i>-gram</i> (record or picture)	imaging of a joint after injecting a contrast dye to aid visualization
arthrometry (arth-ROM-uh-tree)	<i>arthr/o</i> (joint); <i>-metry</i> (process of measuring)	measurement of the amount of movement in a joint
arthroplasty (ARTH-roh-plass-tee)	<i>arthr/o</i> (joint); <i>-plasty</i> (surgical repair)	surgical repair of a joint
arthroscope (ARTH-roh-skope)	<i>arthr/o</i> (joint); <i>-scope</i> (instrument for viewing)	device used in arthroscopy
arthroscopy (ahr-THRAW-skoh-pee)	<i>arthr/o</i> (joint); <i>-scopy</i> (use of instrument for viewing)	examination of the interior of a joint
arthrotomy (ar-THRAWT-uh-mee)	<i>arthr/o</i> (joint); <i>-tomy</i> (cutting operation)	surgical incision into a joint

chondroplasty (KONN-droh-plass-tee)	<i>chondr/o</i> (cartilage); <i>-plasty</i> (surgical repair)	surgical repair of cartilage
computed tomography (CT) scan	from the Greek <i>tomos</i> (slice, section) and <i>graphy</i> (image)	noninvasive imaging test; imaging anatomical information from a cross-sectional plane of the body
costectomy (koss-TEK-tuh-mee)	<i>cost/o</i> (rib); <i>-ectomy</i> (surgical removal)	excision of a rib
magnetic resonance imaging (MRI)	from Latin <i>resonantia</i> (echo)	a diagnostic radiograph in which the magnetic nuclei of a patient are aligned in a magnetic field; these signals are converted into tomographic images
myelogram (MY-el-loh-gram)	<i>myel/o</i> (bone marrow); <i>-gram</i> (record or picture)	X-ray of the spinal column using contrast medium
narcotic (nahr-KAH-tik)	<i>narc/o</i> (sleep)	drug derived from opium with potent analgesic effects; potential effects of dependency through prolonged use

nonsteroidal anti-inflammatory drug (NSAID)	from the Greek <i>stereos</i> (solid lipid)	medication that exerts analgesic and anti-inflammatory actions
ostectomy (oss-TECK-tuh-mee)	<i>oste/o</i> (bone); <i>-ectomy</i> (surgical removal)	surgical removal of bone
osteoplasty (OSS-tee-oh-plass-tee)	<i>oste/o</i> (bone); <i>-plasty</i> (surgical repair)	surgical repair of bone
osteorrhaphy (OSS-tee-oh-raff-ee)	<i>oste/o</i> (bone); <i>-rrhaphy</i> (surgical suturing)	suturing together the parts of a broken bone
osteotomy (oss-tee-AW-tuh-mee)	<i>oste/o</i> (bone); <i>-tomy</i> (cutting operation)	surgical cutting of bone

orthopedics (or-thoh-PEE-diks)	<i>orth/o</i> (straight or correct); <i>ped-</i> (child); <i>-ic</i> (adjective suffix)	the medical specialty concerned with the development, preservation, restoration, and function of the musculoskeletal system
orthopedic surgeon (or-thoh-PEE-dik SUR-juhn)	<i>orth/o</i> (straight or correct); <i>ped-</i> (child); <i>-ic</i> (adjective suffix)	a physician in the field of orthopedics (can be MD or DO)
physical therapist (FIZ-i-kul THER-uh-pist)	<i>physicalis</i> (Latin for nature); <i>therapia</i> (Latin for curing the sick)	practitioner who works to restore correct muscle movement and ability
rheumatologist (ROO-mah-tah-logist)	<i>rheumat/o</i> (flux); <i>-logist</i> (one who studies a certain field)	physician who treats joint and connective tissue disorders such as arthritis
rheumatology (ROO-mah-tah-lo-gee)	<i>rheumat/o</i> (flux); <i>-logy</i> (the study of)	field of specialty that deals with joints and connective tissue disorders