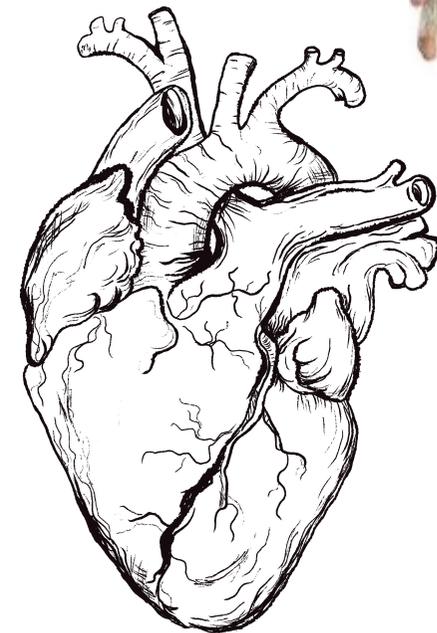


INTRODUCTION TO HUMAN ANATOMY

topic:

- ✘ Anatomical Position
- ✘ Anatomical planes
- ✘ Terms of position
- ✘ TERMS OF MOVEMENT
- ✘ LAYERS OF THE BODY
 - *Skin
 - . Nails
 - . Hair
 - * FASCIA
- ✘ Muscle



INTRODUCTION TO HUMAN ANATOMY

🔗Anatomical Position

The anatomical position refers to the body position as if the person were standing upright with the:



- 1❖The head, gaze (eyes) (forward)
- 2❖The arms adjacent to the sides
- 3❖The palms facing anteriorly,
- 4❖The lower limbs close together
- 5❖The feet parallel.
- 6❖The toes directed anteriorly (forward)

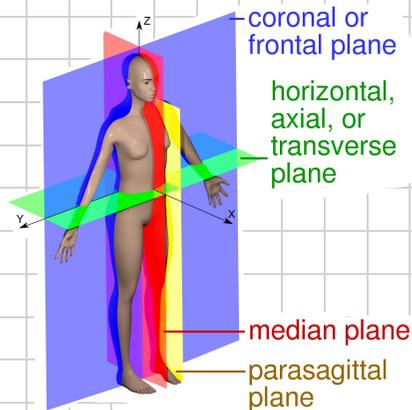
🔗Anatomical planes

Median sagittal plane: vertical Plane pass through the middle of the body divide it into 2 equal halves

Paramedian plane (sagittal Plane)

Coronal plane: divide the body into anterior and posterior

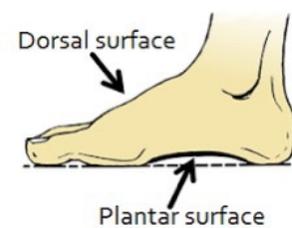
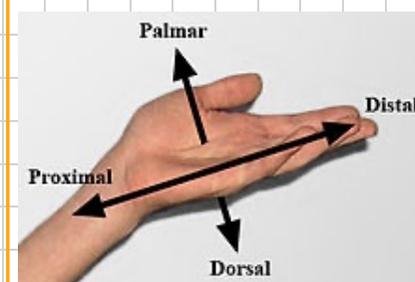
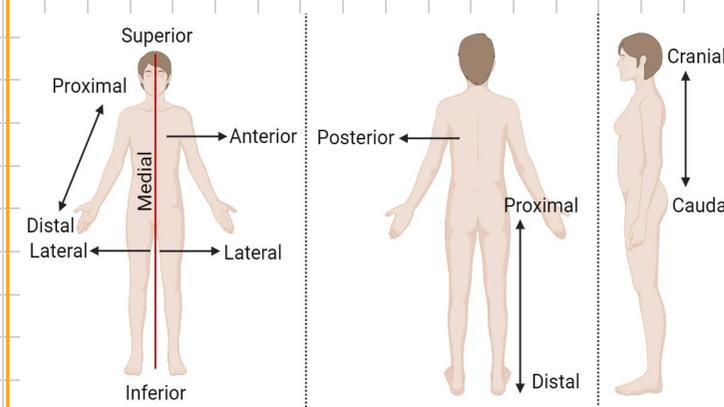
Horizontal plane: divide the body into upper and lower parts



🔗Terms of position

- Superior= cranial**
- inferior= caudal**
- medial: near to the midline**
- lateral: away from midline**
- anterior= ventral**
(near to the front of the body)
- posterior= dorsal**
(near to the back of the body)
- Superficial :near to the skin**
- deep: far away from the skin**
- proximal: near to the root of the limb**
- distal: far away from the root of the limb**

- ❑In describing the hand, the terms **palmar and dorsal surfaces** are used in place of **anterior and posterior**,
- ❑in describing the foot, the terms **plantar and dorsal surfaces** are used instead of **lower and upper surfaces**

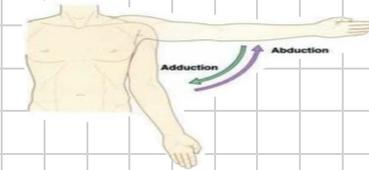


🔗TERMS OF MOVEMENT

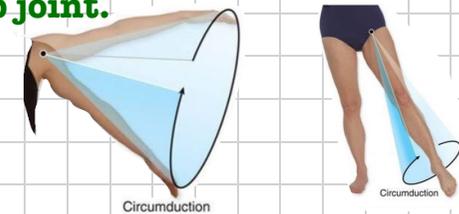
- Flexion: means bending.**
- Extension: means straightening.**



- Abduction: means movement away from the median plane**
- Adduction: means movement towards the median plane.**



Circumduction: It is a circular movement which includes the previous movements (flexion, abduction, extension and adduction). Circumduction occurs in few joints as the shoulder and the hip joint.



Supination: It is the normal resting position of the forearm, where the palm of the hand faces forwards and the thumb is lateral.

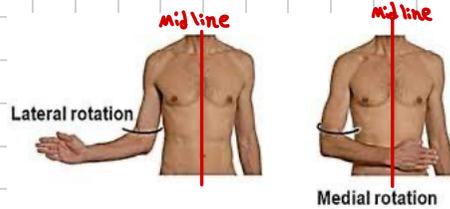
-Pronation: It is opposite to supination, that is the palm of the hand faces backwards and the thumb is medial.



❖ **Rotation** is the term applied to the movement of a part of the body around its long axis.

Medial rotation: where the anterior surface of the bone faces medially.

-Lateral rotation: where the anterior surface of the bone faces laterally.



Inversion: This movement occurs only in the feet where the planter surface of the foot faces medially.

Eversion: It is opposite to inversion, where the planter surface of the foot faces laterally.



(b) Inversion



(c) Eversion

LAYERS OF THE BODY

skin

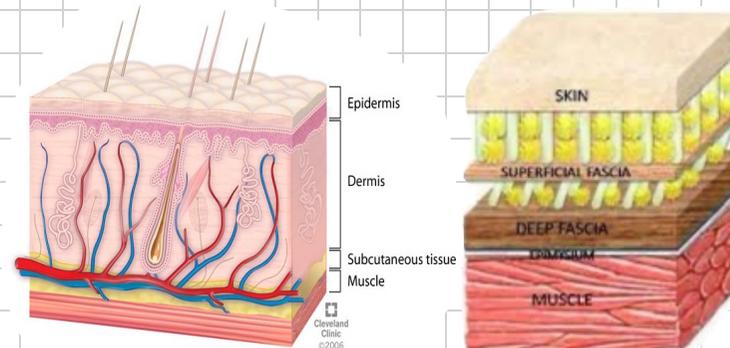
The skin is divided into two parts:

- 1-The superficial part, the epidermis;
- 2-The deep part, the dermis

The epidermis is a **stratified epithelium**. On the palms of the hands and the soles of the feet, the epidermis is extremely thick.

The dermis is composed of **dense connective tissue** containing many blood vessels, lymphatic vessels, and nerves. The dermis of the skin is connected to the underlying deep fascia or bones by the superficial fascia known as subcutaneous tissue.

توضيح : اللفافة (Fascia) هي عبارة عن غشاء رقيق وقوي يتواجد في الجسم، ويحيط بالعضلات والأعضاء والأوعية الدموية والأعصاب، ويساعد في تقديم الدعم والحماية والحركة السليمة لهذه الأجزاء. يعمل اللفافة كغلاف للعضلات، ويساعد في نقل السوائل والغذاء بين الخلايا والأنسجة. كما يعتبر اللفافة جزءاً هاماً من الجهاز العضلي الهيكلي والجهاز الليمفاوي في الجسم.



It is **thick** in some places (palm of the hand) and thin in other places (eye-lids).

It is **hairy** in some places (فروة الرأس scalp) and non-hairy in other places (lips, palm of hand and sole of feet).

The skin has **4 appendages**.

These are: nails, hair, sebaceous glands and sweat glands.

It also contains muscle (**arrector pili** عضلات صغيرة مُرتبطة بالشعر في الثدييات، ويؤدي انقباض هذه العضلات إلى توقف الشعر (انتصاب الشعر)، والمعروف باسم القشعريرة), vessels, nerves, and lymphatics.

❖ The skin over joints always folds in the same place, the **SKIN CREASES** الجلد المجعد

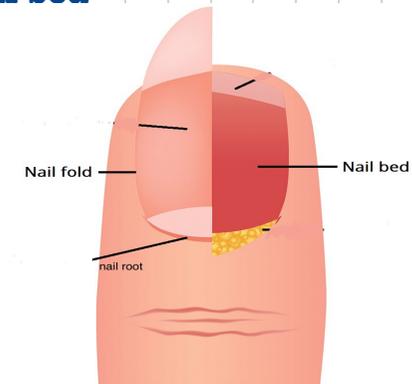
nails

❖ The nails are keratinized plates on the dorsal surfaces of the tips of the fingers and toes.

❖ The proximal edge of the plate is the **root of the nail**.

❖ the nail is surrounded and overlapped by folds of skin Known as **nail folds**.

❖ The surface of skin covered by the nail is the **nail bed**



Hair

APPLIED ANATOMY

- ✓ Hairs grow out of **follicles**, which are invaginations of the epidermis into the dermis and their expanded extremities, called **hair bulbs**,
- ✓ Each hair bulb is concave at its end, and the concavity is occupied by **vascular connective tissue called hair papilla**.
- ✓ A **band of smooth muscle**, the **arrector pili**, connects the undersurface of the follicle to the superficial part of the dermis
- ✓ **Sebaceous glands** pour their secretion (the sebum), onto the **shafts** of the hairs as they pass up through the **necks of the follicles**.
- ✓ **Sweat glands** are long, spiral, tubular glands distributed over the surface of the body, except on the red margins of the lips, the nail beds, and the glans penis and clitoris.

✓ تنمو الشعر من البصيلات، وهي انغماسات من الطبقة الخارجية إلى الطبقة الداخلية، وتنتهي بما يُسمى بالمستدق الشعري.

✓ كل مستدق شعري مقعر في نهايته، وه التقعر هو عبارة عن نسيج وعائي يسمى المستدق الشعري

✓ شريط من العضلات الناعمة، يعرف بعضلة الشعيرات اللواتح، يربط السطح السفلي للبصيلة بالجزء السطحي من الطبقة الداخلية.

✓ تصب الغدد الدهنية إفرازاتها، السييوم، على سياقات الشعر أثناء تمريرها عبر أعناق البصيلات.

✓ الغدد العرقية هي غدد أنبوبية طويلة، ملتوية، موزعة على سطح الجسم، ما عدا على الحواف الحمراء للشفاه، وسرر الأظافر، وغدة العضو الذكري والبظر (العضو الانثوي).

Langer's Lines are groups of collagen fibers running deep in the dermis parallel to each other .

It is **important** for surgeons , when they make an incision not to injure too much collagen fibers. Incisions made across "Langer's Lines" result in gapping of the wound and prominent scar tissue.

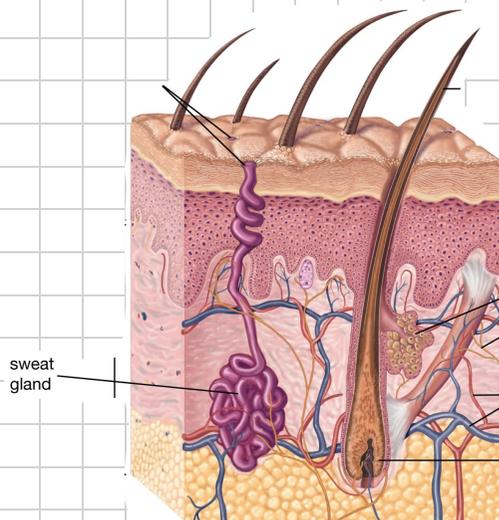
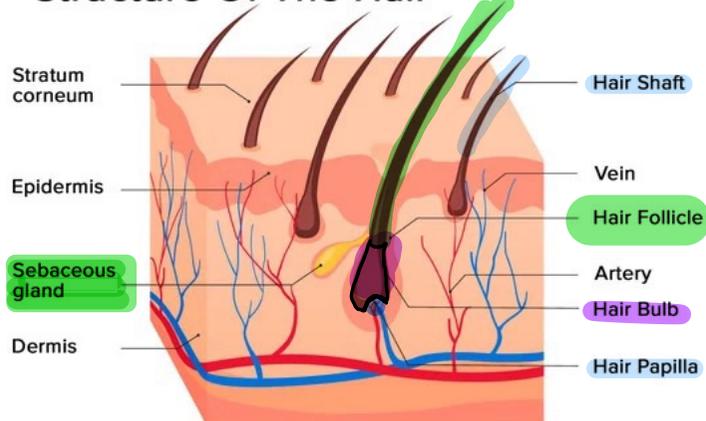
● **Skin Incisions:** The incisions are mostly parallel to Langer's Lines in order to leave **narrow scars** جروح.

● **Burns:** During burns the skin is removed from the area burnt.

Burns are classified into degrees according to the depth of the burn and its size.

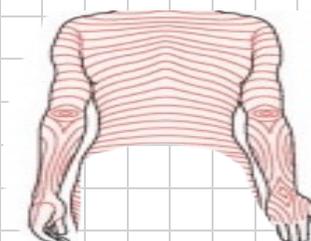
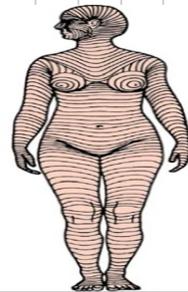
● **Albinism:** Is the absence of the **melanin pigment from the skin. The skin looks white in color with a pinkish ting** لمعان of the underlying

Structure Of The Hair

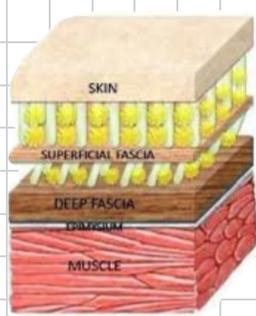


Karl Langer

1861



FASCIA



Fascia is defined as a collection of connective tissue and lie between the skin and the underlying muscles and bones that can be divided into two types

❖The deep fascia is a membranous layer of connective tissue that invests the muscles and other deep structures

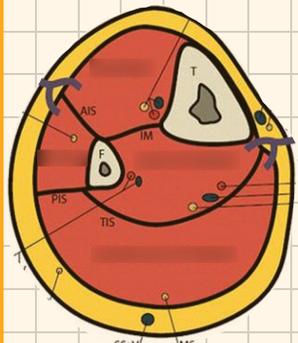
✓In the thorax and abdomen, it is merely a thin film of areolar tissue covering the muscles and aponeuroses.

✓ In the limbs, it forms a definite sheath around the muscles and other structures, holding them in place.

TYPES OF DEEP FASCIA:

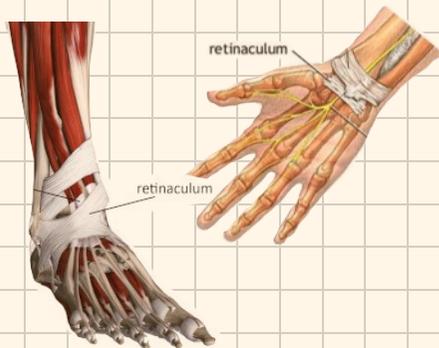
❖The superficial fascia, or subcutaneous tissue, is a mixture of loose areolar and adipose tissue that unites the dermis of the skin to the underlying deep fascia

1-deep fascia sends fibrous tissue septa separating the muscles which are attached to the bone. These are called "intermuscular septa".



Send → separating → i septa

2-In some places the deep fascia is thickened to form "retinacula" around the wrist and ankle to keep the long tendons in place close to bones.



thicken → form retinacula → keep long tendons

3-Around the big vessels the deep fascia thickens in a form of a sheath surrounding vessels and nerves to protect them as the Femoral Sheath and the Carotid Sheath

thicken → surrounding → protect them

Functions of SUPERFICIAL FASCIA:

I. The Superficial Fascia Contains Fat That:

1. Acts as a food reservoir. مخزن للطعام
2. Insulates the body heat from the environment.
3. Gives the rounded contour of female body

(يشير إلى التشكيل المستدير الذي يميز جسم الإناث بشكل عام، والذي يتميز بوجود توزيع الدهون بشكل أكبر في مناطق معينة مثل الأرداف والوركين والثديين).

II. The Superficial Fascia Contains Vessels and Nerves:

1. The vessels help in regulating body temperature.
2. The nerves carry the sensations from the skin.

In some places it contains muscles as:

face the fascial muscles.

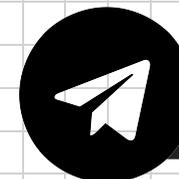
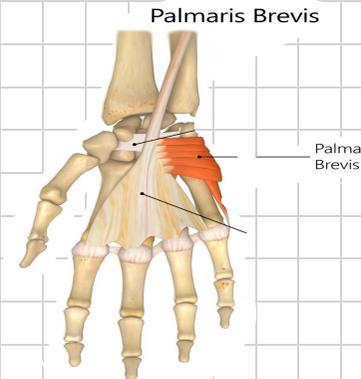
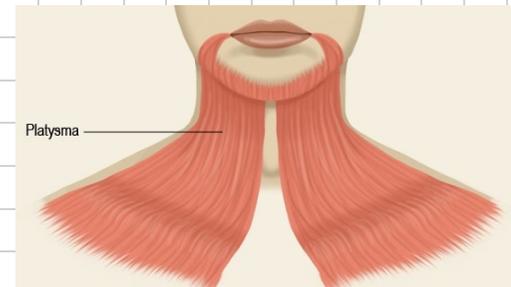
neck platysma muscle. في الرقبة عظمة البلاتيسما.

palm palmaris brevis muscle. في اليد عظمة القصيرة الكفية.

scrotum the dartos muscle في الصفن عظمة الدرتوس

In some places it contains glands as:

The mammary gland in the pectoral region المنطقة الصدرية

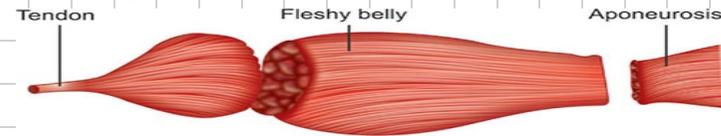


MEDICINE_GANG

Muscle

Muscle tissue is characterized by the property of contraction which is the ability of the muscle fibers to become short. The three types of muscle are skeletal, smooth, and cardiac

SKELETAL MUSCLE



produce the movements of the skeleton; they are sometimes called **voluntary muscles** and are made up of **striated muscle fibres**. A skeletal muscle has two or more attachments.

✓The fleshy part of the muscle is referred to as its belly -

..الجزء اللحمي من العضلة يُشار إليه بأنه "البطن"، وهو الجزء الأكبر والأكثر سمكاً من العضلة الذي يحتوي على الألياف العضلية والأوعية الدموية والأعصاب

✓The ends of a muscle are attached to bones, cartilage, or ligaments by cords of fibrous tissue called **tendons**

✓Occasionally, flattened muscles are attached by a thin but strong sheet of fibrous tissue called an **aponeurosis**

- في بعض الأحيان، تُرتبط العضلات المسطحة بشكل مضغوط بواسطة ورقة رقيقة ولكن قوية من النسيج الليفي تُسمى الأبونيوروز.

✓The fixed and proximal attachment is called **origin** - الالتصاق الثابت والقريب يُسمى المنشأ.

✓The mobile and distal attachment is called **insertion** - الالتصاق الحركي والبعيد يُسمى الإدراج.

✓A raphe is an interdigitation of the muscle fibers of **flat muscles** - الراف هو تشابك ألياف العضلات المسطحة.

Work of the Muscles:

● Prime mover: It is the chief muscle responsible for a particular movement e.g. brachialis in elbow flexion.

● Antagonist: a muscle that antagonizes تعارض the action of the prime mover e.g. triceps during elbow flexion.

● Fixator: a muscle that stabilizes the origin of the prime mover or stabilize the joint upon which the muscle acts.

For example, the muscles around the scapula fix and stabilize the scapula and shoulder joint during contraction of the prime movers acting on the humerus .

■ Synergist: Sometimes the prime mover muscle crosses many joints before it reaches its insertion.

■ Synergistic muscles will contract to eliminate the unwanted movements at the crossed joints. Therefore, the action of the prime mover on the desired joint becomes maximal.

the extensors of the wrist act during flexion of the fingers to prevent the flexors of the fingers from acting on the wrist.

Types of Skeletal Muscles According to Arrangement of Fibers

- Skeletal muscles vary in shape and arrangement of their fibers to produce a specific force and range of contraction.
- The muscle form depends on the arrangement of the muscle fibers in relation to the line of pull of the muscle.
- Line of Pull: The line of pull of a muscle is the line extending between its origin and insertion.
- The fibers of the muscle are either arranged parallel to the line of pull or oblique to it.

A) Muscles which have fibers lie parallel to the line of pull:

1. Strap-like muscle: e.g. sartorius muscle.

هي أطول (بالإنجليزية: Sartorius muscle) العضلة الخياطية. عضلة في جسم الإنسان، وهي رقيقة تعمل باستمرار، تمتد من الحوض وحتى الركبة



2. Strap-like muscle with tendinous intersections e.g. rectus abdominis muscle.



3. Quadrilateral muscle e.g. thyrohyoid muscle.



4. Fusiform muscle: e.g. biceps brachii muscle.

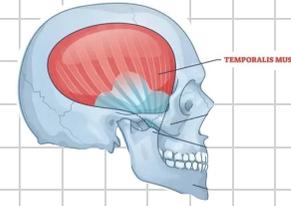


B) Muscles which their fibers lie oblique to the line of pull:

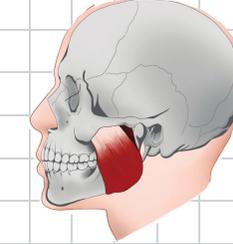
I. Pennate muscles : (feather-like) The muscle fibers lie oblique to the tendons, they are 4 types:

II. Non-pennate fibers:

a. Triangular muscles e.g. temporalis muscle.



b. Cruciate muscles e.g. masseter muscle.



c. Spiral muscles e.g. supinator muscle.



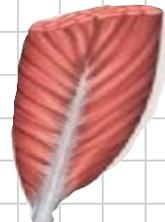
d. Circular muscles e.g. orbicularis oris.



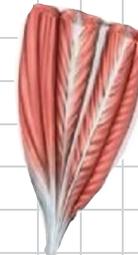
a-Unipennate muscles: The fibers lie on one side of the tendon, e.g. flexor pollicis longus muscle.



b-Bipennate muscles: The fibers lie on both sides of the tendon, e.g. rectus femoris muscle.



c-Multipennate muscles: Each is formed of many bipennate units lying beside each other e.g. Deltoid muscle.



d- Circumpennate muscles: Each muscle is cylindrical with a central tendon and bipennate units converging from the periphery towards the tendon e.g. tibialis anterior muscle.

