

SKIN AND FASCIA





INTRODUCTION

1. SKIN

2. SUPERFICIAL FASCIA

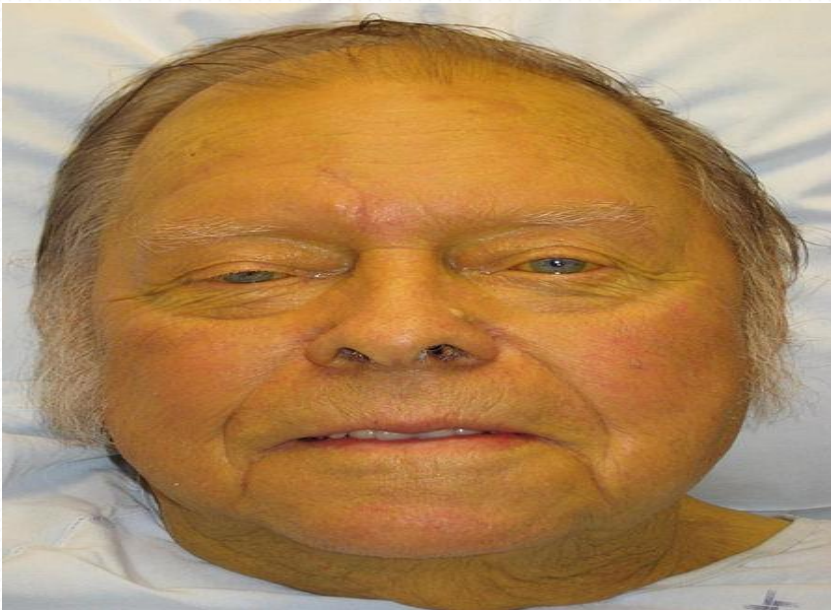
3. DEEP FASCIA

SKIN

- TOTAL AREA OF BODY COVERED BY SKIN- 2 SQ M
- SKIN THICKNESS-0.3 TO 3 MM

Skin coloration

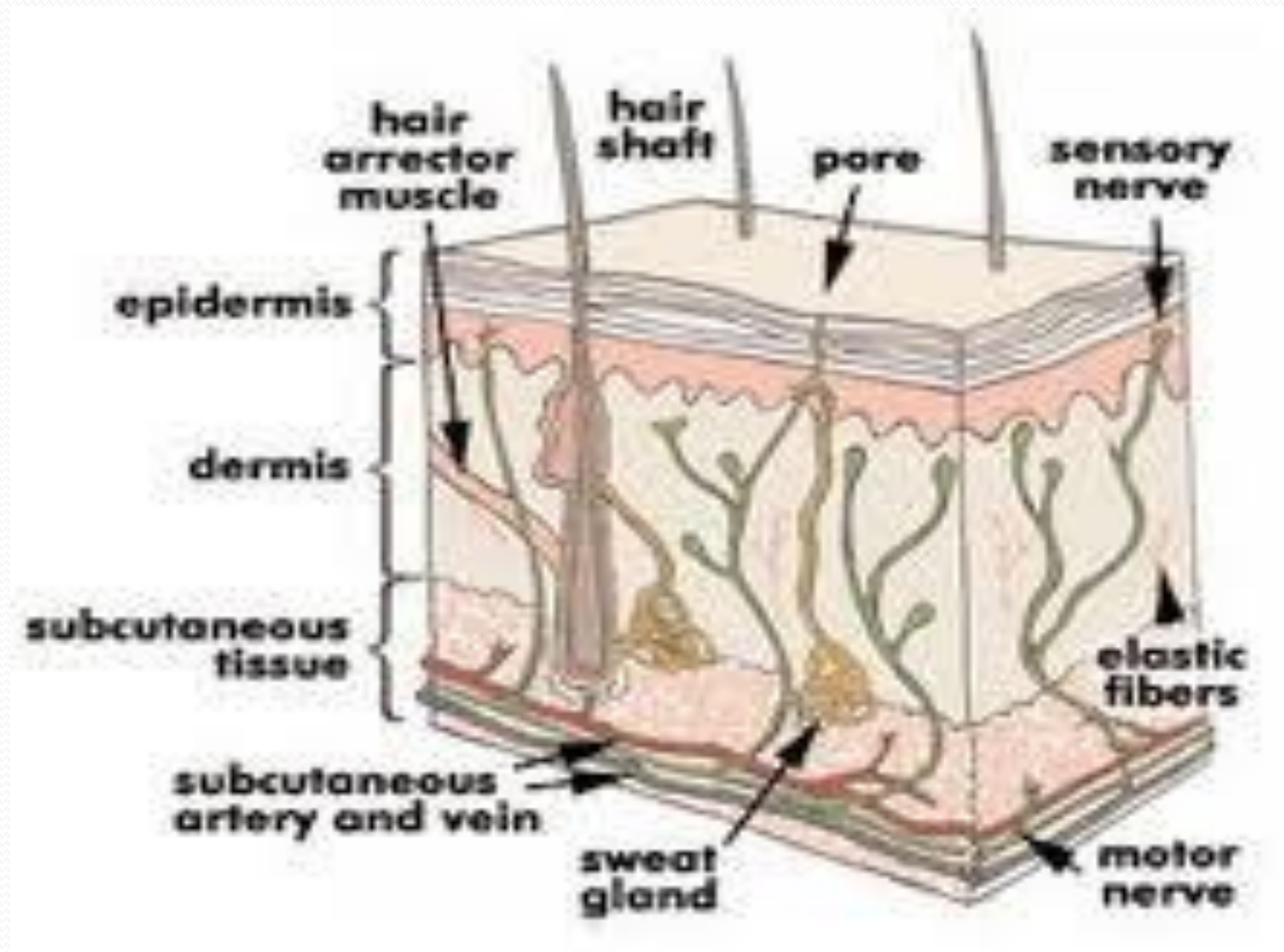
- Skin is the best indicator of general health
- Three skin pigments
 - Melanin
 - carotene
 - Hemoglobin



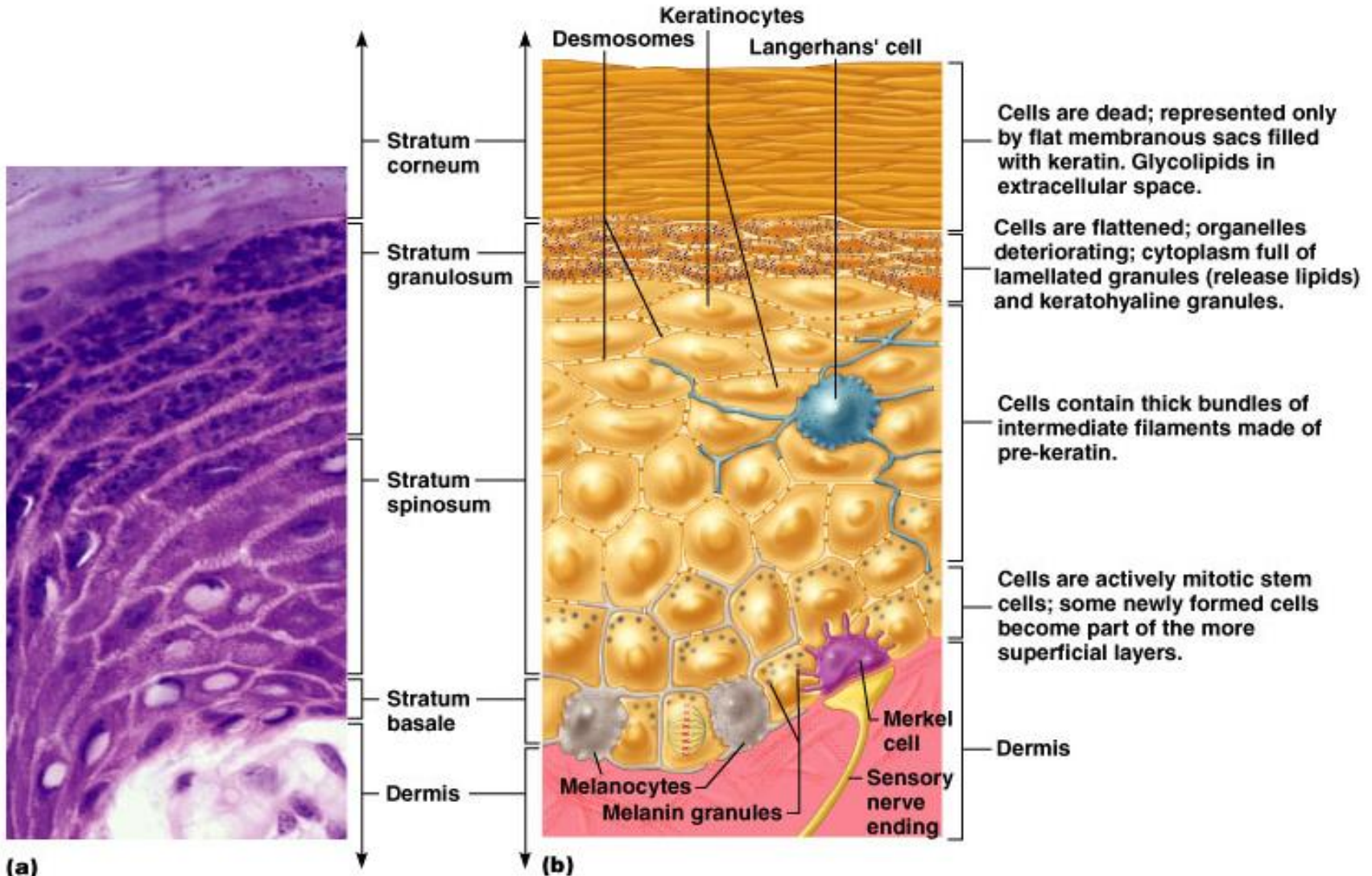
Functions of skin

- Protection
 - Cushions and insulates and is waterproof
 - Protects from trauma, chemicals, heat, cold, bacteria
 - Screens UV
- Synthesis and storage of vitamin D
- Capable of absorption (drugs) and excretion (sweat)
- Regulates body temperature
- Prevents insensible water loss
- Sensory perception (nerve endings)
- Ability to regenerate

SKIN



EPIDERMIS



Layers of epidermis

Stratum Basale

- Lowest epidermal layer, near dermis
- Good nutrient supply
- Reproduces by mitosis
- Cuboidal, columnar in shape
- Moves to upper epidermis in 27 days

Stratum Spinosum

- Living cells
- Dividing
- 8-10 cells thick
- Polygonal in appearance

Cont...

Stratus Granulosum,

- Poor nutrient supply.
- Flatten layer of cells.
- 3-5 cells thick.
- No cell division.
- Keratin accumulates

Stratus Lucidum

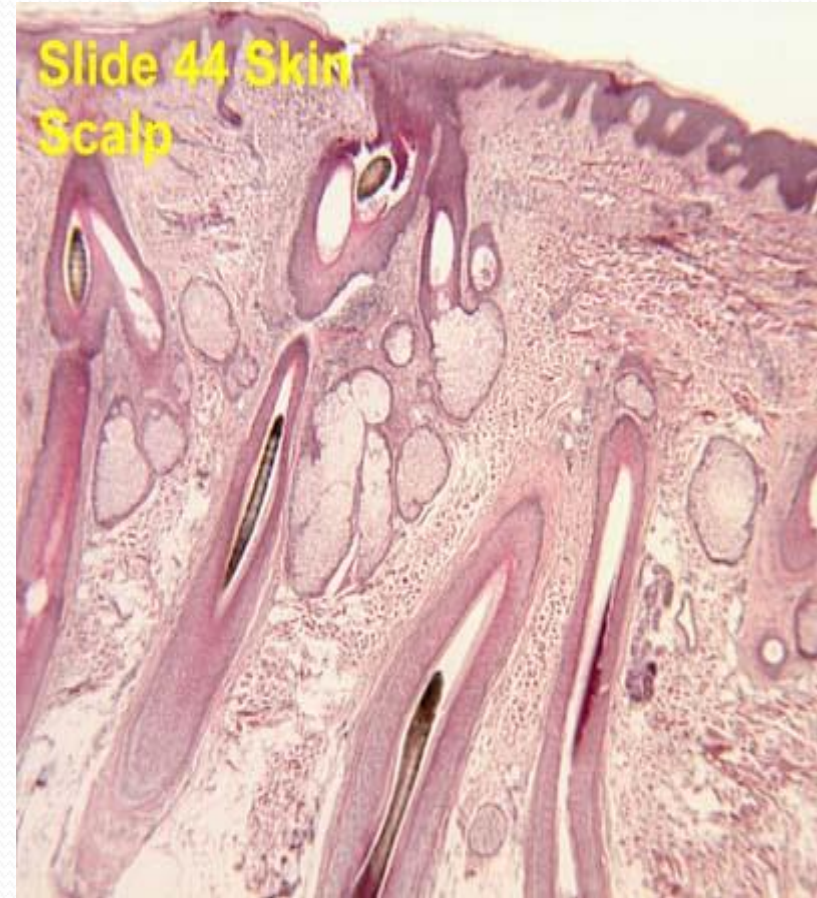
- Found only in very thick skin.
- Translucent.
- Highly keratinized.
- Dead cells

Stratum Corneum

- 25-30 cells thick.
- Cells are filled with keratin and hardened.
- Sloughed off
- Outer most layer of epidermis
- Keratinocytes

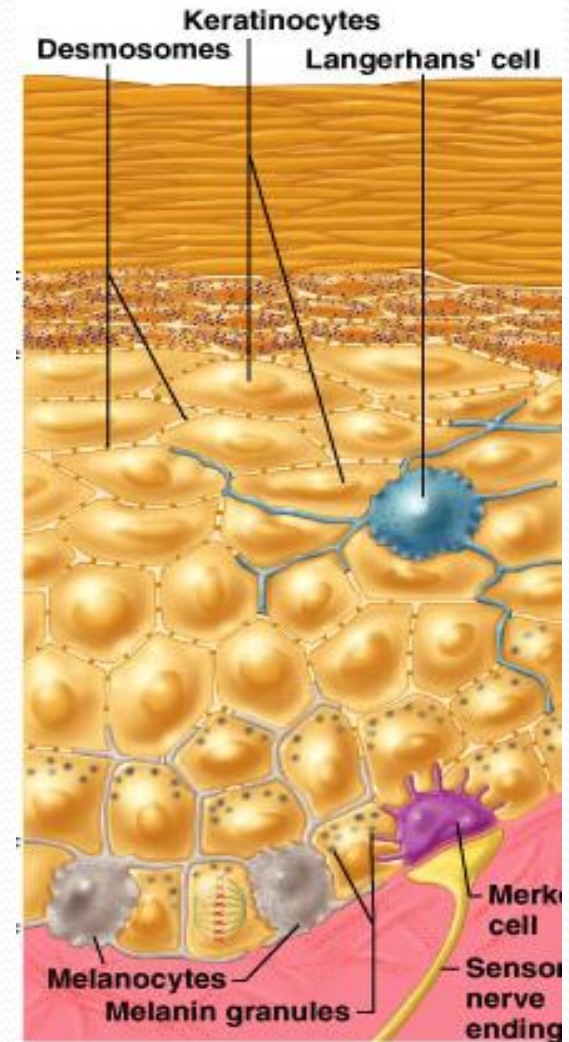
Skin.....

- Thick skin
 - No hairs
- Thin skin
- Devoid of Stratum lucidum



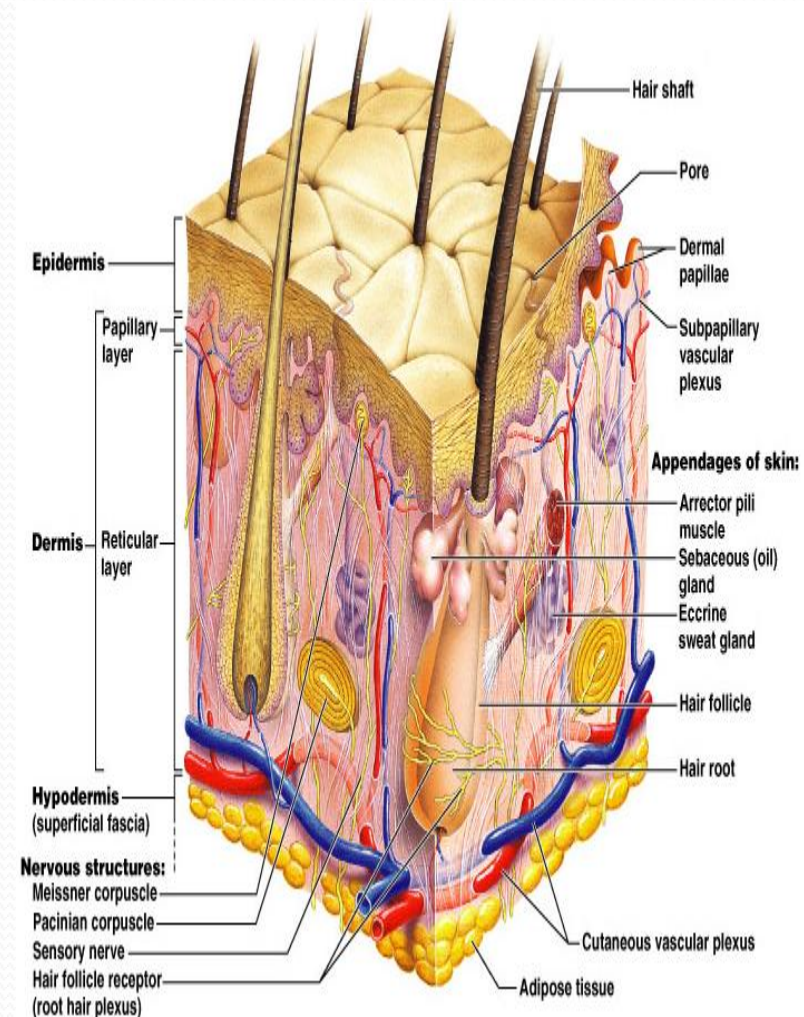
CELL TYPES IN EPIDERMIS

- **Keratinocytes** – produce keratin (tough fibrous protein)
- **Melanocytes** - Neural crest origin
- **Merkel cells** – Neural crest origin, associated with sensory nerve endings and specialized in the perception of light touch.
- **Langerhans cells** – Bone marrow origin, located in basal, spinous and granular layers, act as antigen-presenting cells.



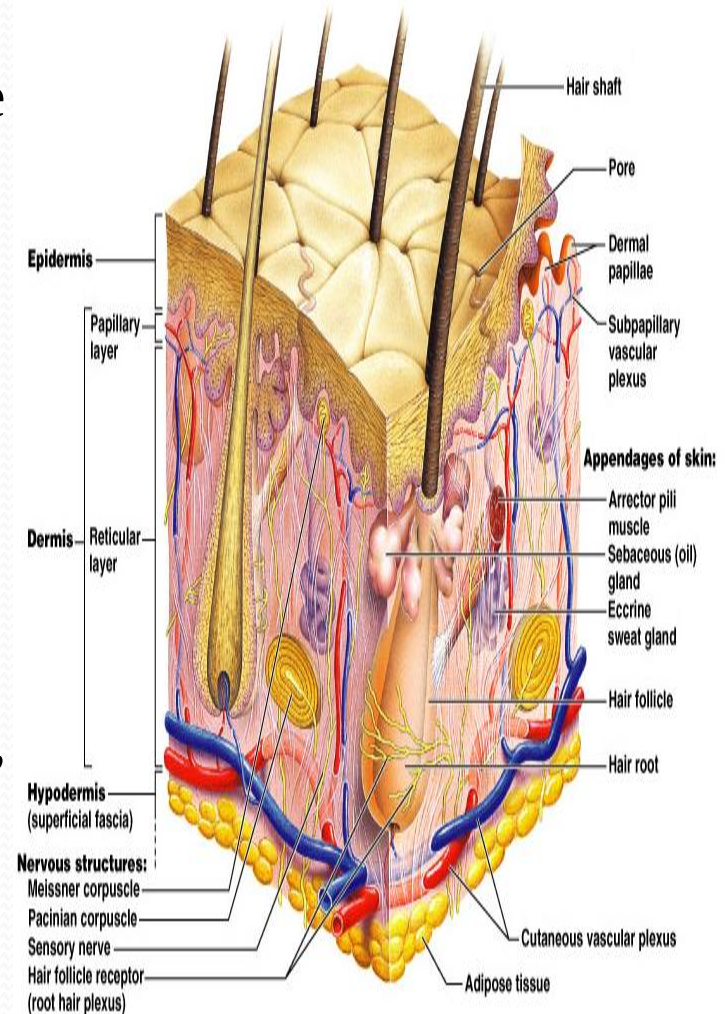
LAYERS OF DERMIS: Papillary layer

- Composed of loose areolar connective tissue.
- Fingerlike projections called *papillae*, that extend toward the epidermis.
- The papillae provide the dermis with a "bumpy" surface that interdigitates with the epidermis, strengthening the connection between the two layers of skin.



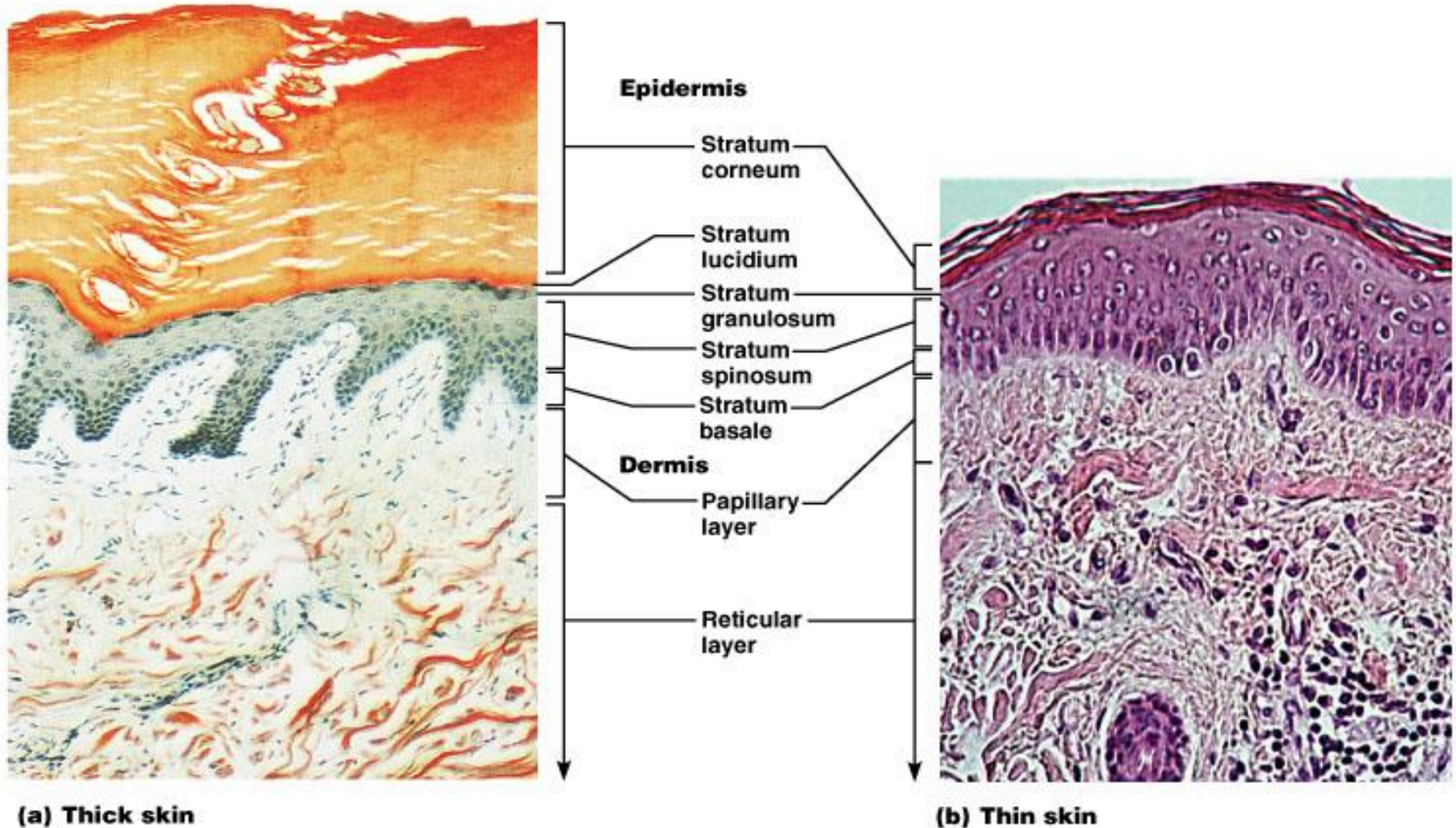
Reticular layers

- The reticular region lies deep in the papillary region and is usually much thicker contains the **skin appendages**
- It is composed of dense irregular connective tissue
- **Fibers:** are collagen, elastic and reticular, give the dermis its properties of strength, extensibility, and elasticity.
- **Cells:** fibroblasts, macrophages, mast cells, WBCs



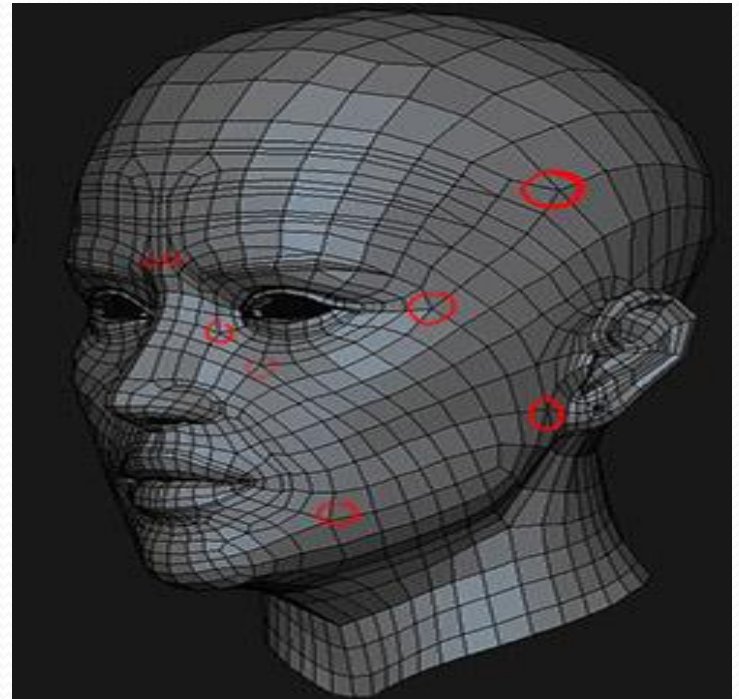
THIN HAIRY SKIN

THICK NONHAIRY/GLABROUS SKIN



Surface tension lines/ skin creases

- Form a network of linear furrows which divided the surface into polygonal or lozenge shaped areas . These lines to some extent correspond to variations in the pattern of fibers in the dermis.



Cleavage lines/Langer lines

- These are tension lines of skin, due to the patterns of arrangement of collagen fibers in the dermis.
- These lines were first described by *Langer* in 1861 on cadaver.
- Tend to spiral longitudinal in the limbs and run transversely in the neck and trunk.
- At the elbow, knee, wrist and ankles are parallel to the transverse creases that appear when the limbs are flexed.



Skin incisions

- Skin incisions that are given parallel to the tension lines usually heal well with minimal scarring because of minimum disruption of collagen fibers.

Stretch marks in skin

- Damage to the collagen fibers in dermis due to over stretching as in pregnancy or abdominal enlargement.



Wrinkle lines

- Caused by contraction of underlying muscles, present perpendicular to their axis of shortening.
- On face, they are known as lines of facial expression, aging makes them permanent due to loss of skin elasticity.



Flexure lines or joint lines

- Major markings found in the vicinity of synovial joints where the skin is attached strongly to underlying deep fascia.
- Prominent on the flexor surfaces of palms, soles and digits.
- Skin lines don't necessarily coincide with the underlying joint line.

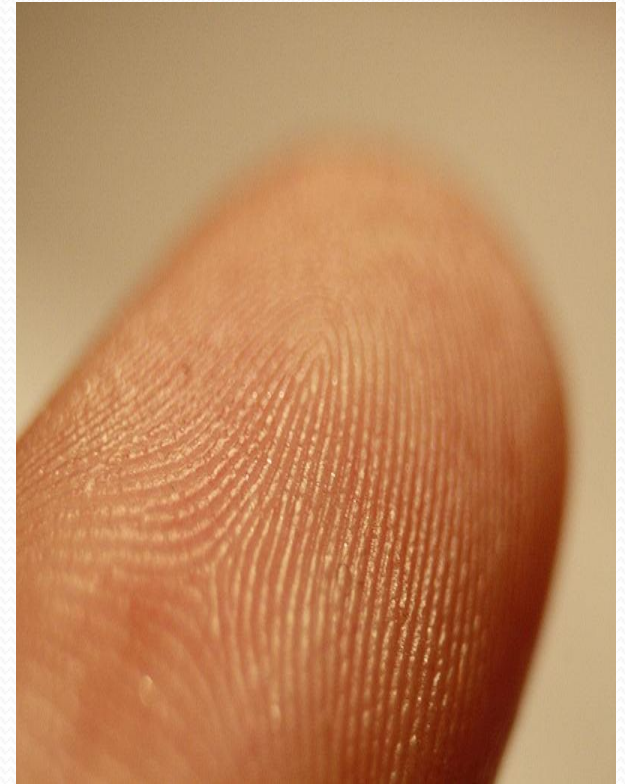


Flexure lines



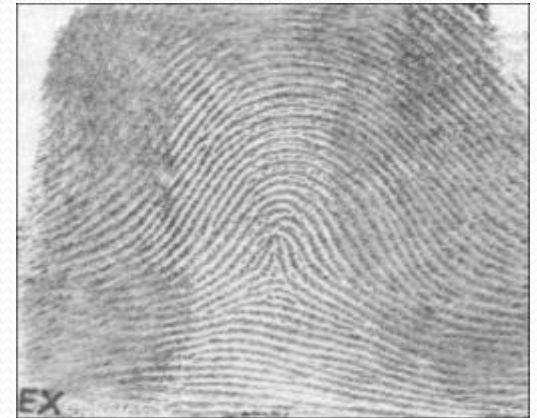
Papillary/epidermal/friction ridges

- A friction ridge is a raised portion of the epidermis on the fingers and toes, the palm of the hand or the sole of the foot.
- Are caused by the underlying interface between the dermal papillae of the dermis and the interpapillary (rete) pegs of the epidermis.
- along the summit of each ridge the apertures of sweat ducts open at regular intervals.
- **Dermis determines the developmental pattern of epidermis**



FINGER PRINT

- A **fingerprint** is an impression left by the friction ridges of a human finger
- This is genetically determined, unique to the individual, stable through out life & serves as a mean of personal identification.
- The analysis of ridge patterns by studying finger and foot prints is known as **dermatoglyphics**.



The dermis is the receptive site for the pigment of tattoos

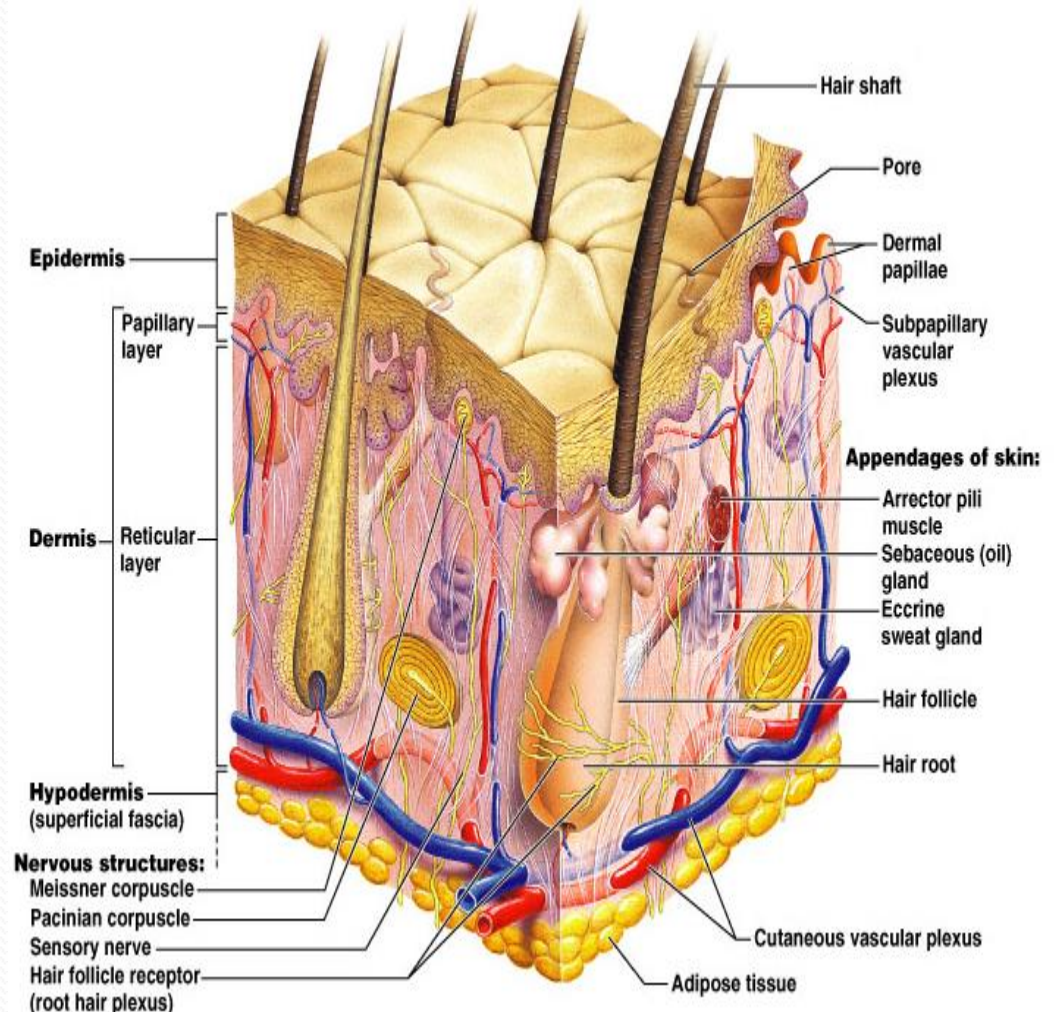


Rule of 9

- HNF-9%
- EACH UL-9%
- FRONT OF TRUNK 18%
- BACK OF TRUNK-18%
- EACH LL- 18%
- PERINEUM-1%

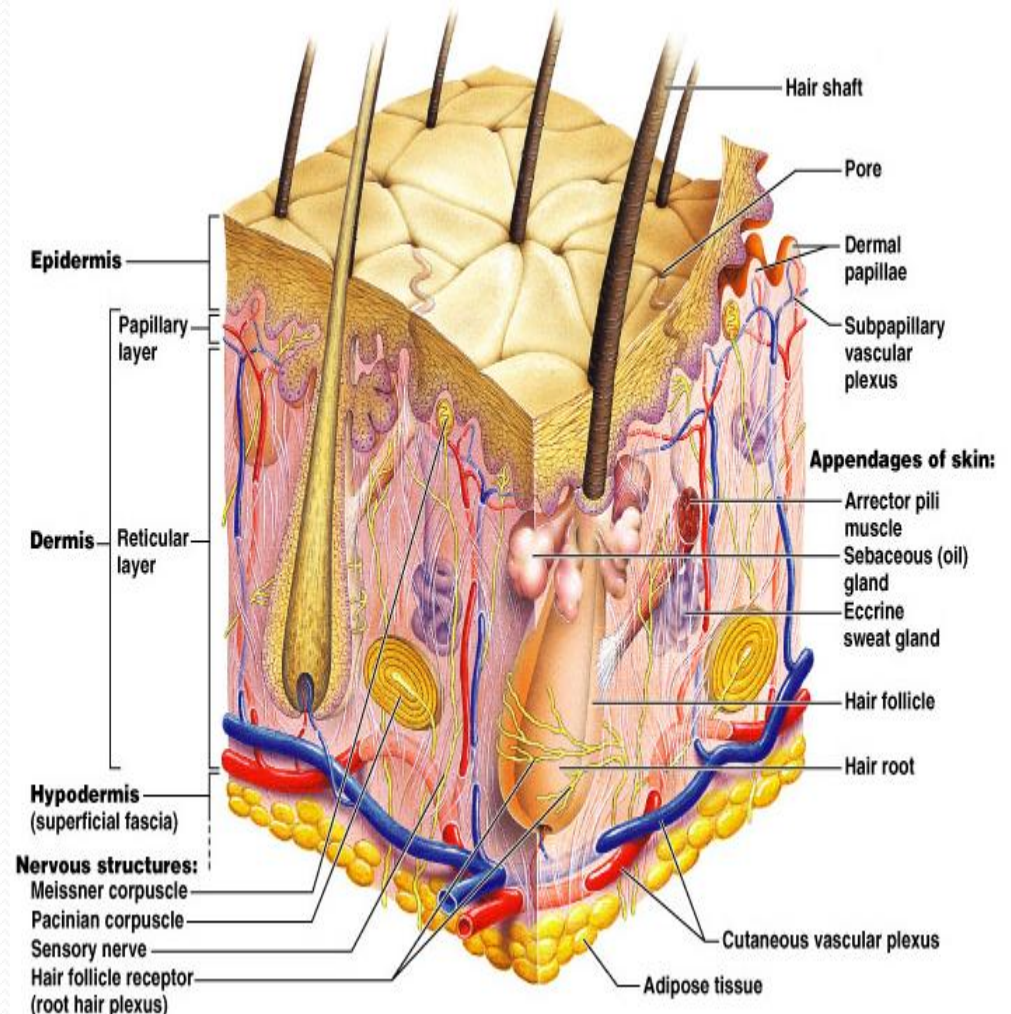
Cutaneous blood supply

- The dermis contains horizontally arranged superficial and deep plexuses, which are interconnected via communicating vessels oriented perpendicular to the skin surface.



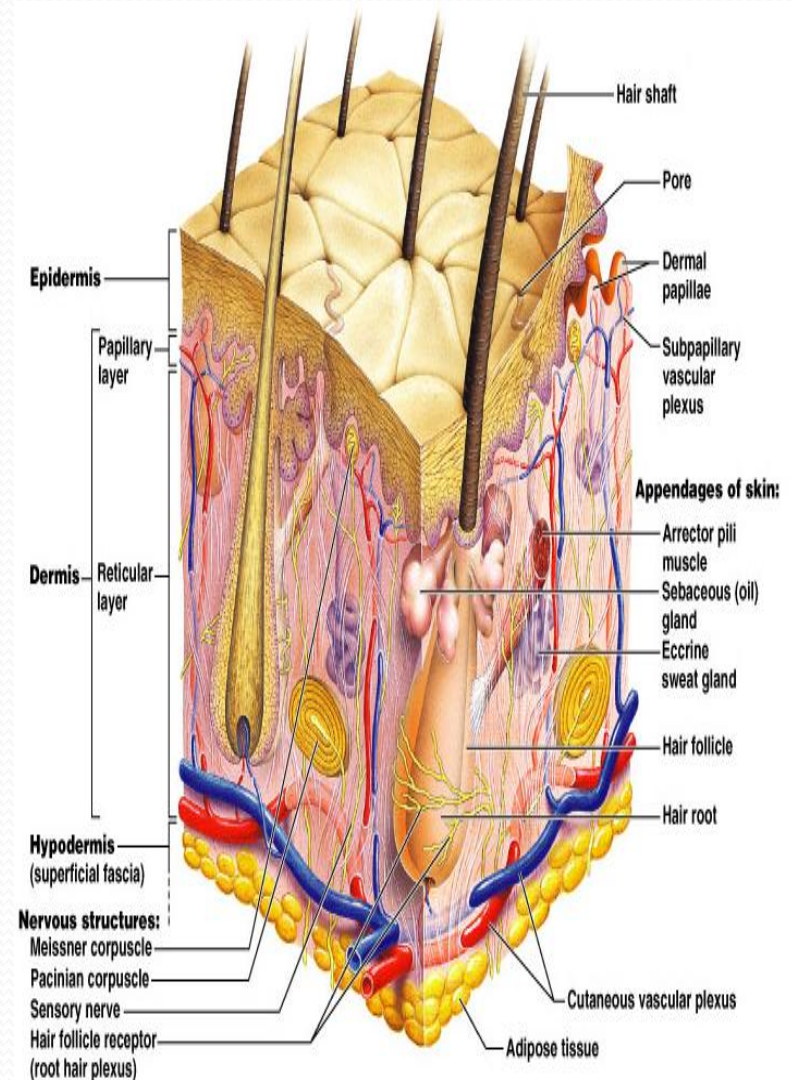
Lymphatics

- Blind-ended lymphatic capillaries arise within the interstitial spaces of the dermal papillae. These unvalved, superficial dermal vessels drain into valved deep dermal and subdermal plexuses.

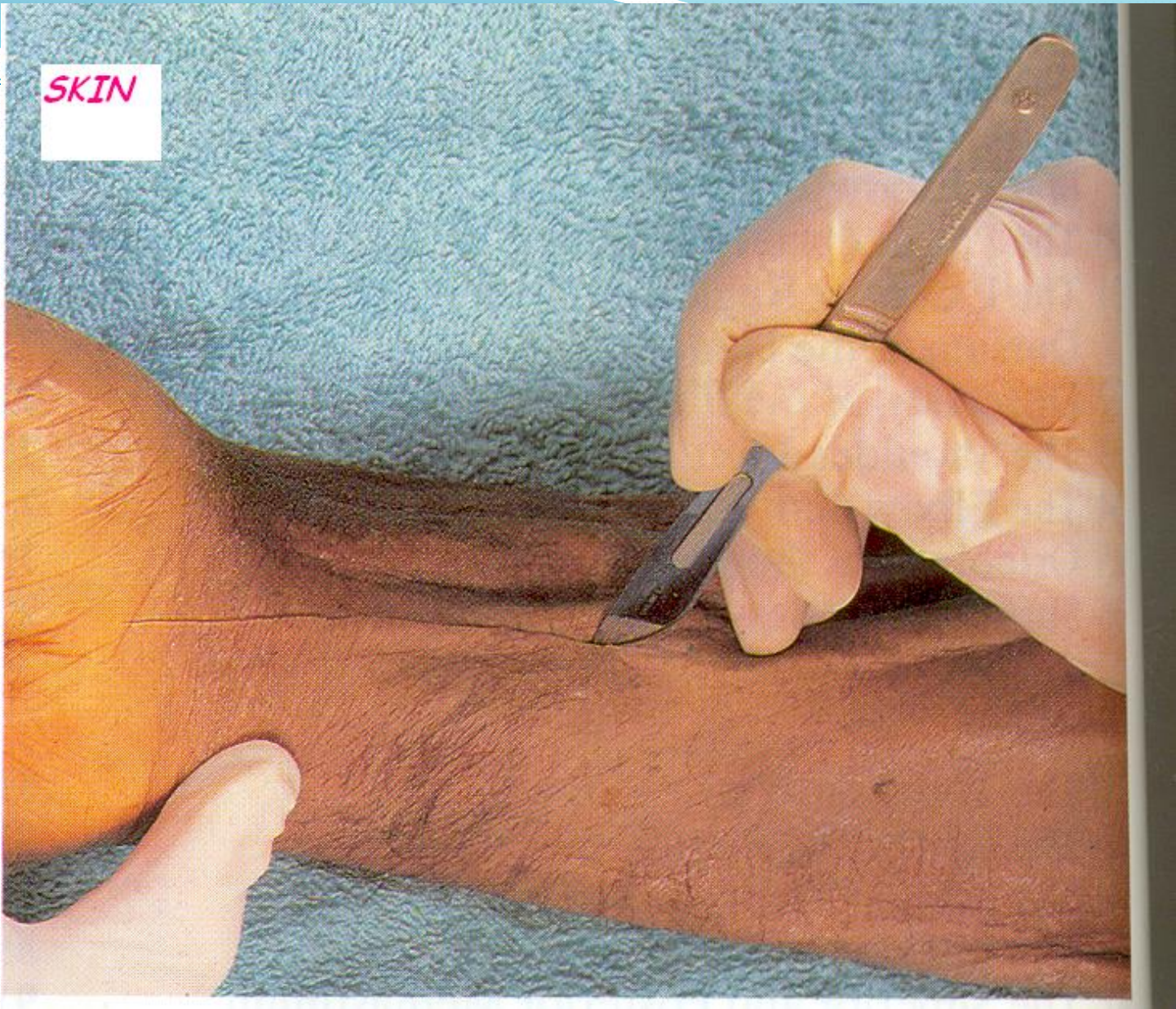


Skin Innervation

- Free nerve endings in the basal layer of the epidermis detect pain
- Merkel cells of the epidermis detect light touch.
- Meissner's corpuscles also detect light touch. These are found in the dermal papillae and are most concentrated in the fingertips.
- Pacinian corpuscles are found deep within the dermis or even in the subcutaneous tissue. These structures detect pressure.



SKIN





Fascia

Collection of connective tissue



Superficial fascia

Deep fascia

Fascia

- Masses of connective tissue
- Structure is highly variable
- Collagen fibres are interwoven

Types

- Superficial
- Deep

Superficial Fascia

- Loose C.T. of variable thickness that merges with deep aspect of dermis (hypodermis)
- It is often adipose (between muscle and skin)
- Allows mobility of skin
- Adipose component contributes to thermal insulation and constitutes store of energy for metabolic use

Superficial fascia

Superficial fascia:

- Loose, mixture of adipose and loose areolar tissues.
- It unites the skin to the underlying structures.
- It is dense in some places as scalp, palm of hand and sole of foot and contains collagen bundles
- It is thin in the eyelids, auricle, scrotum, penis and clitoris (devoid of adipose tissue).

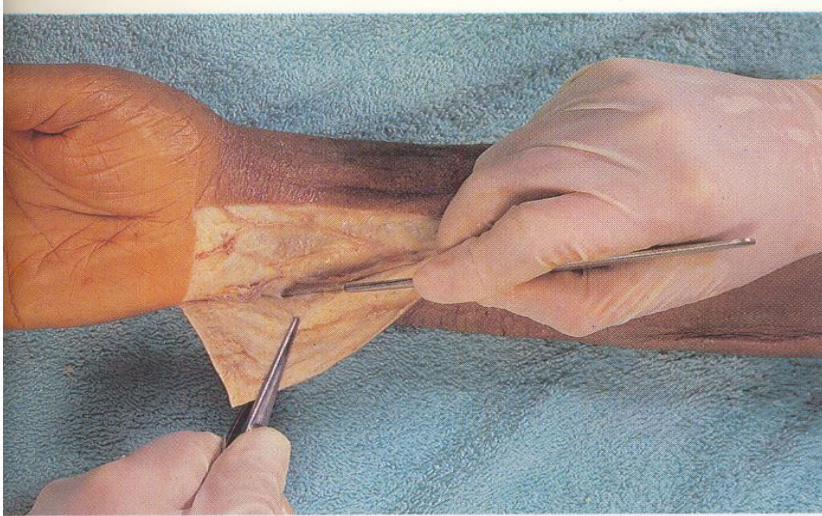
Functions:

- Facilitates movement of skin over underlying structures.
- Passage for cutaneous vessels, nerves...

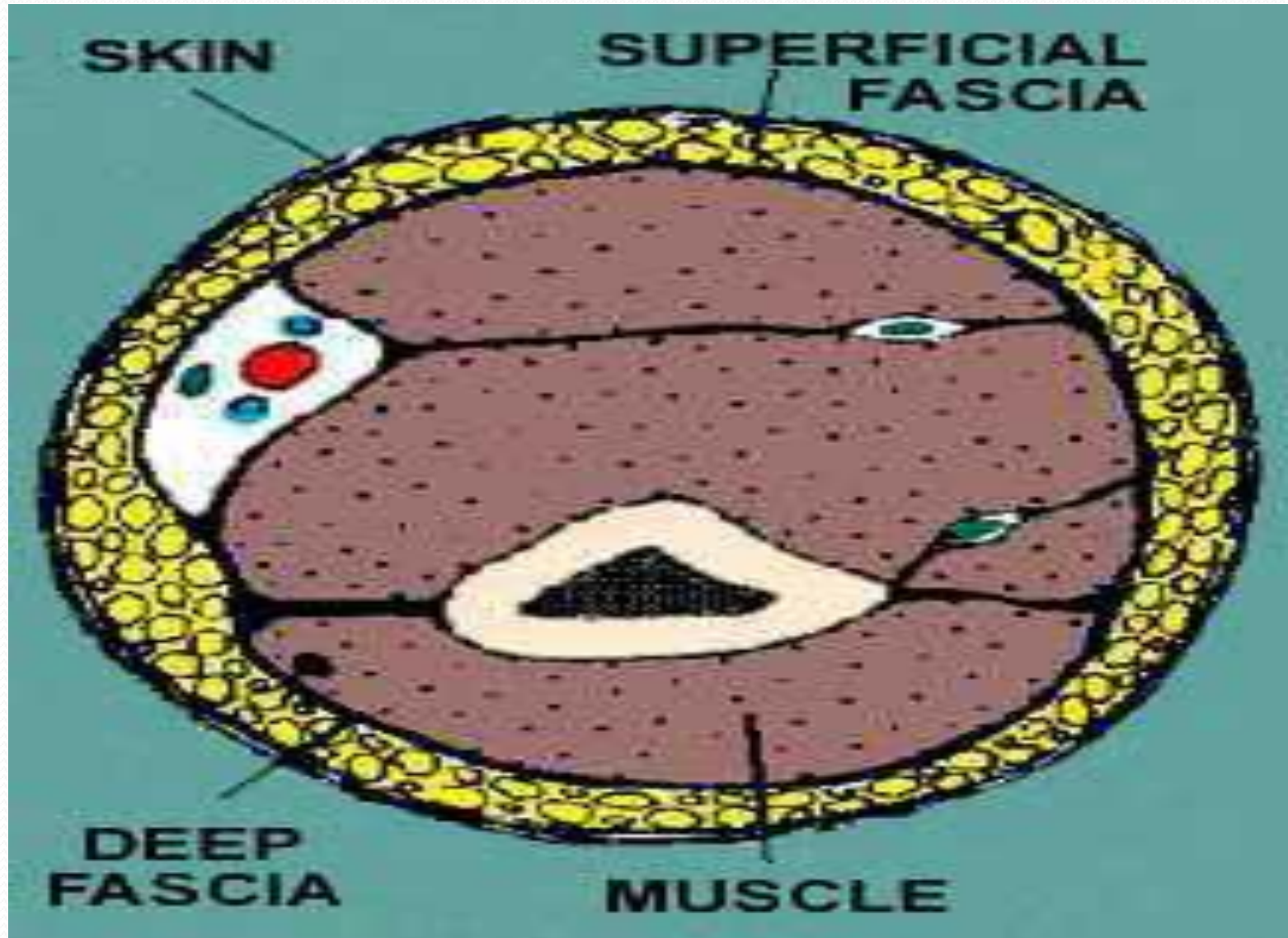
Protects the body against heat loss.

Hypodermis/ superficial fascia

- Fibrous mesh filled with fat, connects the dermis to underlying layer of deep fascia
- Fat is absent in eyelids, pinna of ear, scrotum
- Muscle fibers are present in the subcutaneous tissue of scalp, face and scrotum



Superficial fascia

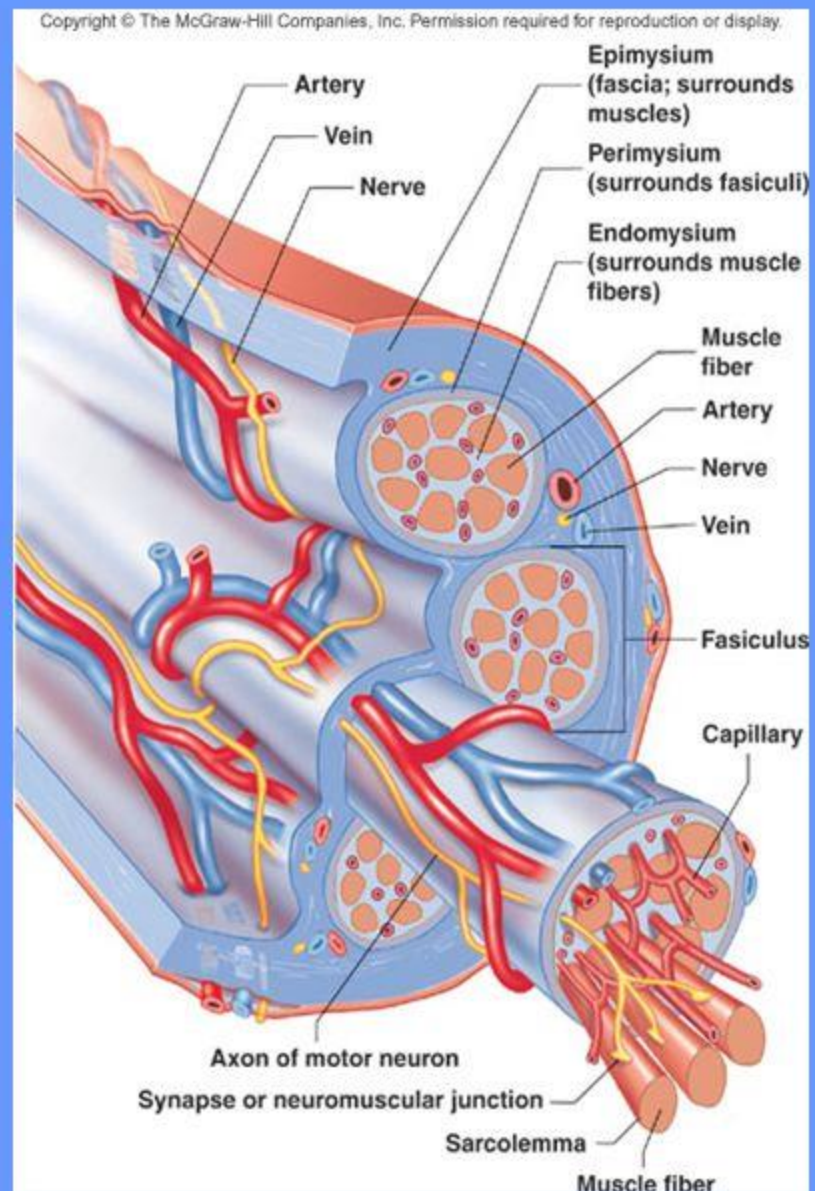


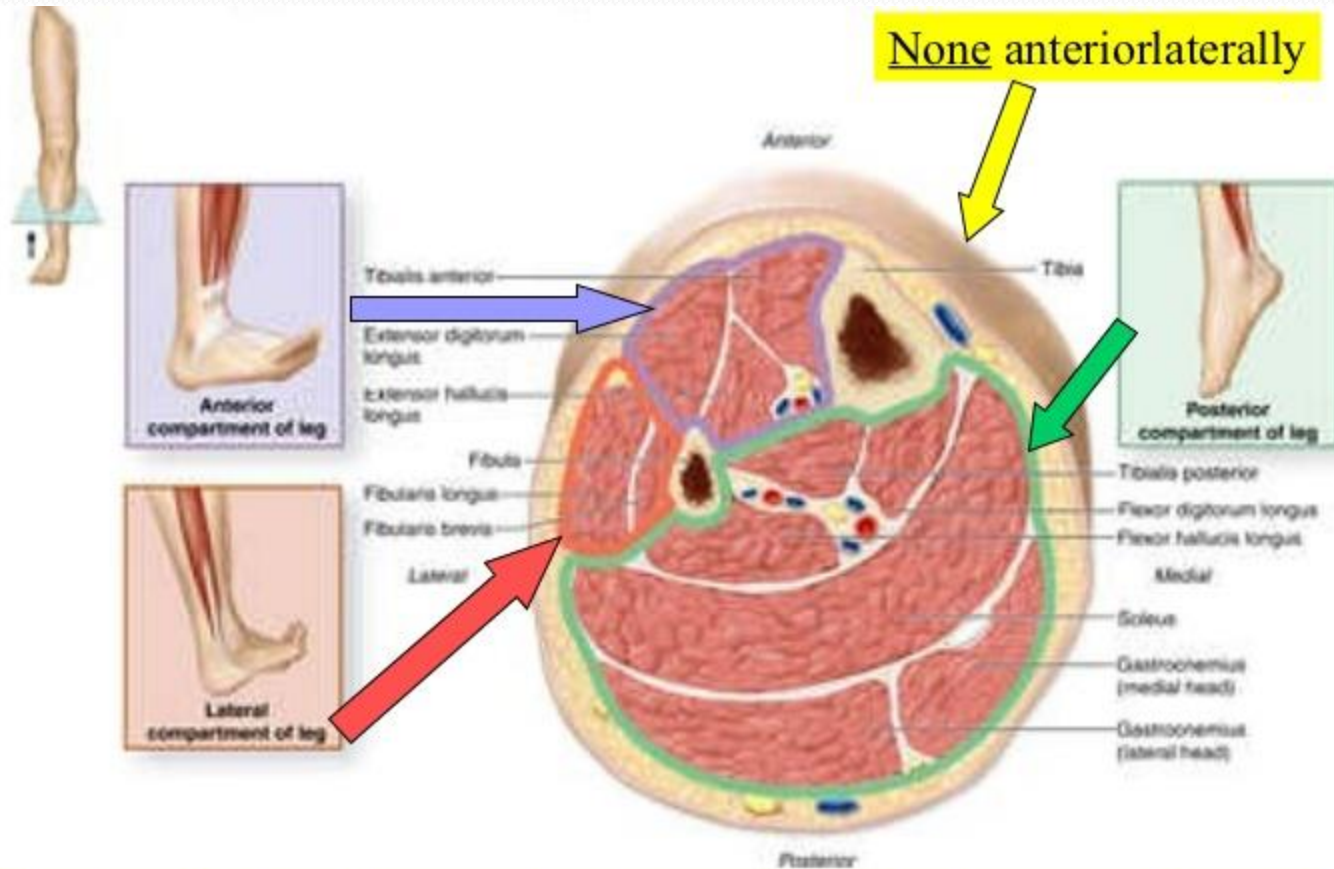
Function

- Mechanical
- Constitutes loose packing around vessels, nerves

SKELETAL MUSCLE STRUCTURE

- **Epimysium (fascia)** - sheath surrounding entire muscle
 - holds muscle together and separates them into groups
 - allows freedom of movement
 - carries nerves, blood vessels, lymphatic vessels
 - continuous with connective tissue of tendons and periosteum
- **Muscle Fasciculi** - muscle bundles
 - composed of several muscle fibres
 - surrounded by connective tissue layer called **perimysium**
- **Endomysium** - connective tissue surrounding individual muscle fibres





The deep fascia of the crural region partitions the leg musculature into **three compartments (anterior, lateral, and posterior)**, each with its own nerve and blood supply. Note none anteriorlaterally

Connective Tissue Framework of Body

Superficial Fascia

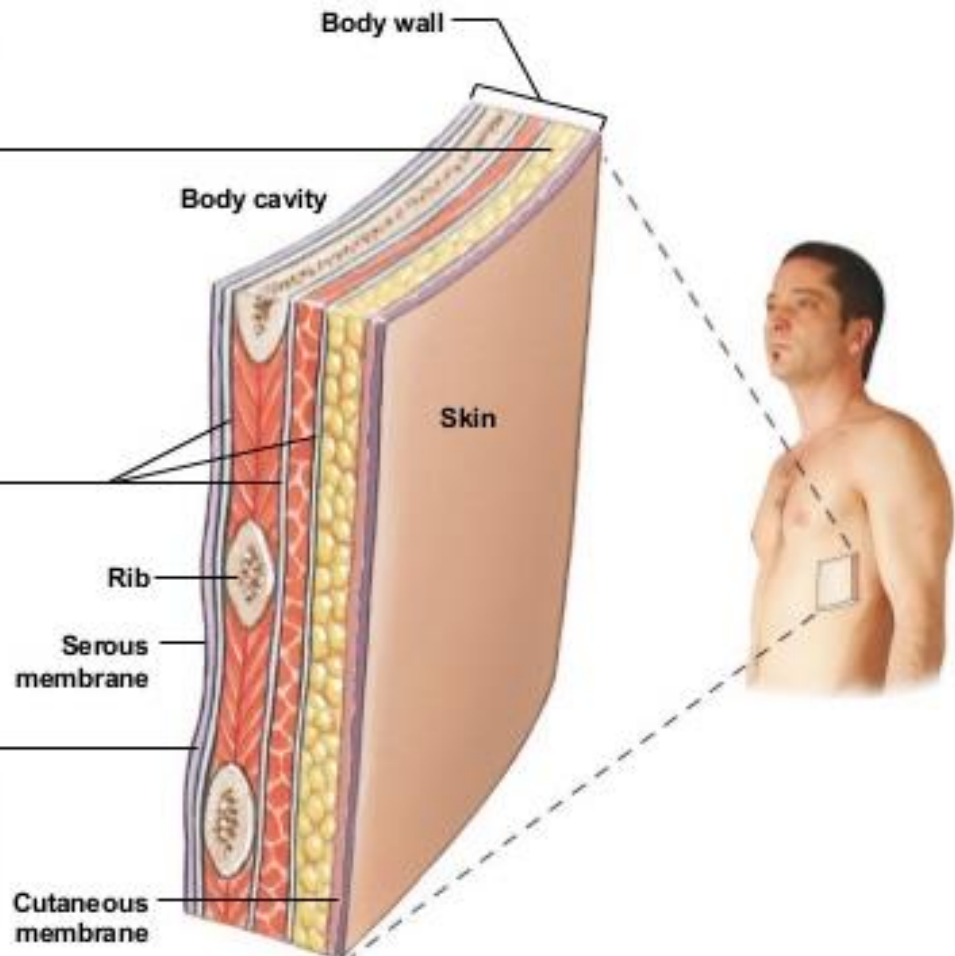
- Between skin and underlying organs
- Areolar tissue and adipose tissue
- Also known as subcutaneous layer or hypodermis

Deep Fascia

- Forms a strong, fibrous internal framework
- Dense connective tissue
- Bound to capsules, tendons, ligaments, etc.

Subserous Fascia

- Between serous membranes and deep fascia
- Areolar tissue

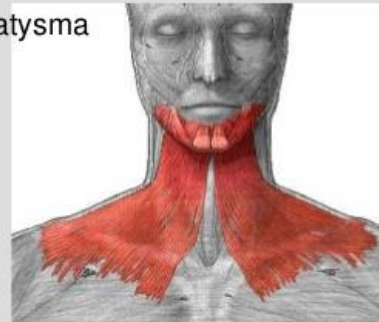


- Subcutaneous nerves, vessels and lymphatics travel in superficial fascia.
- In HFN- MUSCLES OF FACIAL EXPRESSION

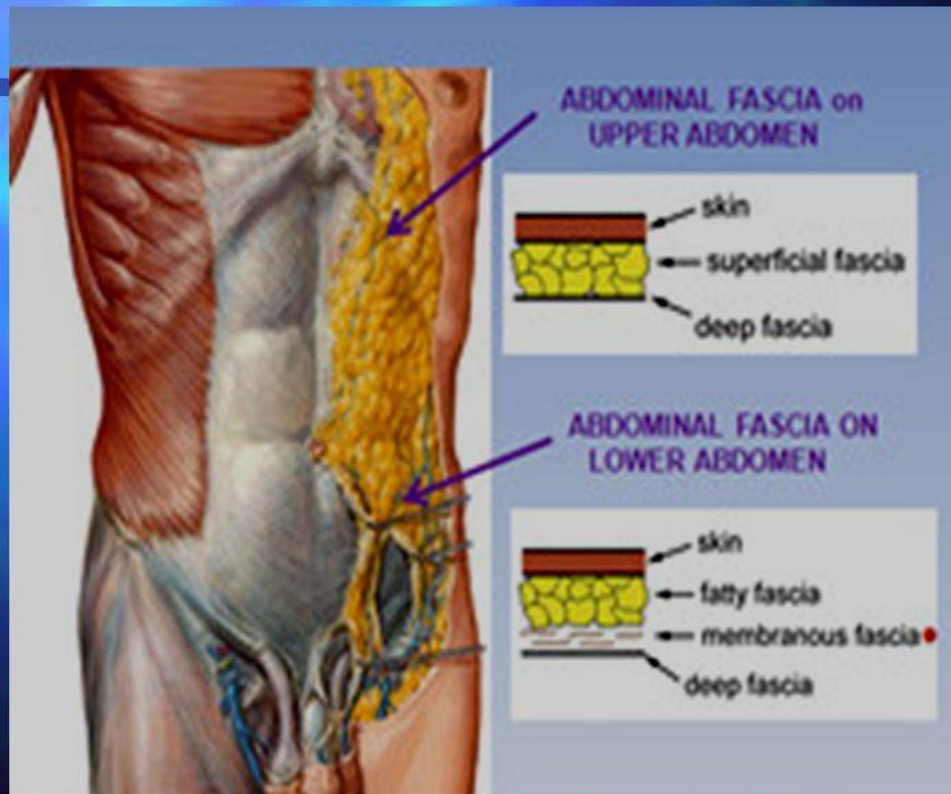
FASCIA DESCRIBED UNDER:

•SUPERFICIAL CERVICAL FASCIA

- || Thin layer of connective tissue that lies between dermis of the skin and investing layer of deep cervical fascia
- Contains cutaneous nerves, blood and lymphatic vessels, superficial lymph nodes and variable amount of fat
- || Anteriolaterally it contains the platysma



Superficial Fascia

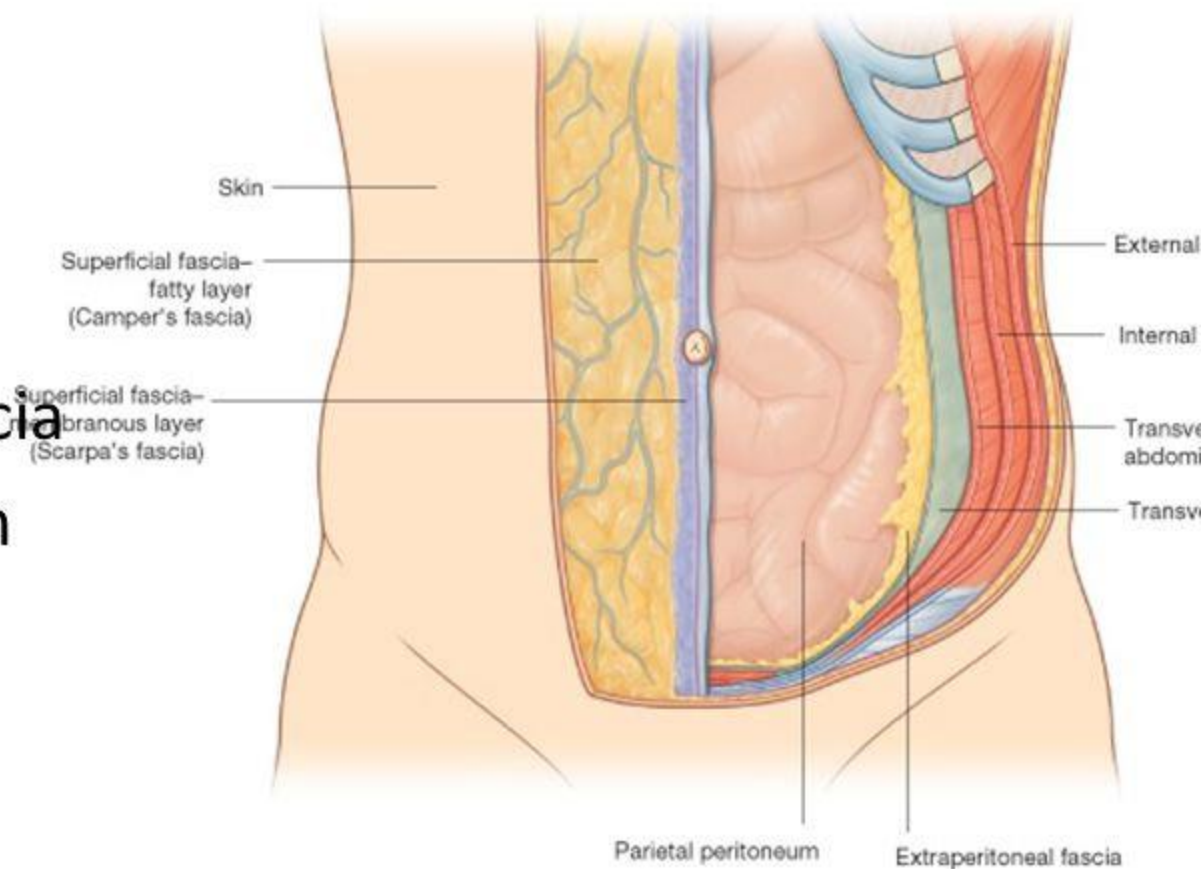


Anterior Abdominal Wall

Abdominal wall is divided into **Anterior and Posterior walls**.

Structure of Anterior Abdominal Wall:

1. Skin
2. Superficial fascia
3. Deep fascia
4. Muscles
5. Extraperitoneal fascia
6. Parietal peritoneum



Superficial Fascia – Membranous layer

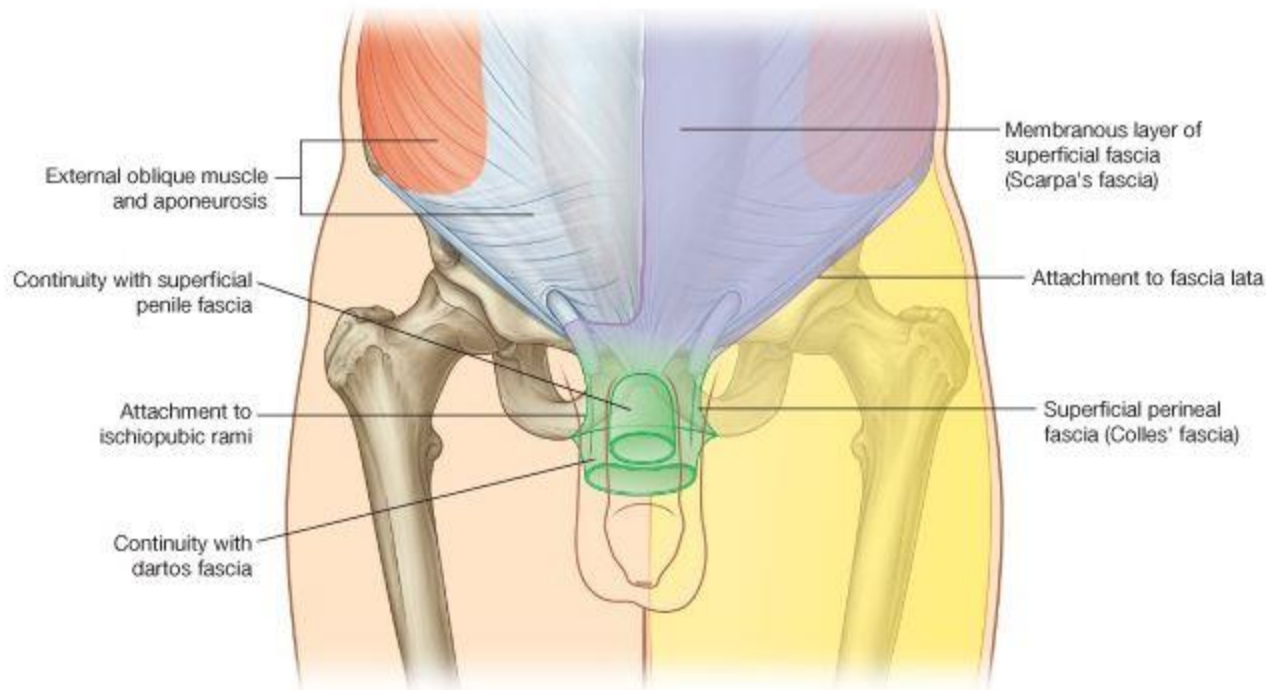
Scarpa's fascia is thin membranous layer & has the following relations

Laterally, continuous with superficial fascia of the back.

Superiorly, continuous with superficial fascia of the thorax.

Inferiorly, fuses with the deep fascia of thigh (fascia lata) one fingerbreadth below the inguinal ligament.

In the midline inferiorly, the membranous layer of fascia is not attached to the pubis but forms a tubular sheath for the penis (or clitoris).



Cervical Fascia

Consists of:

- 1- superficial fascia
- 2- deep cervical fascia
 - a. superficial (investing) layer
 - b. pretracheal layer
 - c. prevertebral layer

Neck fascia

SUPERFICIAL CERVICAL FASCIA

Subcutaneous tissue

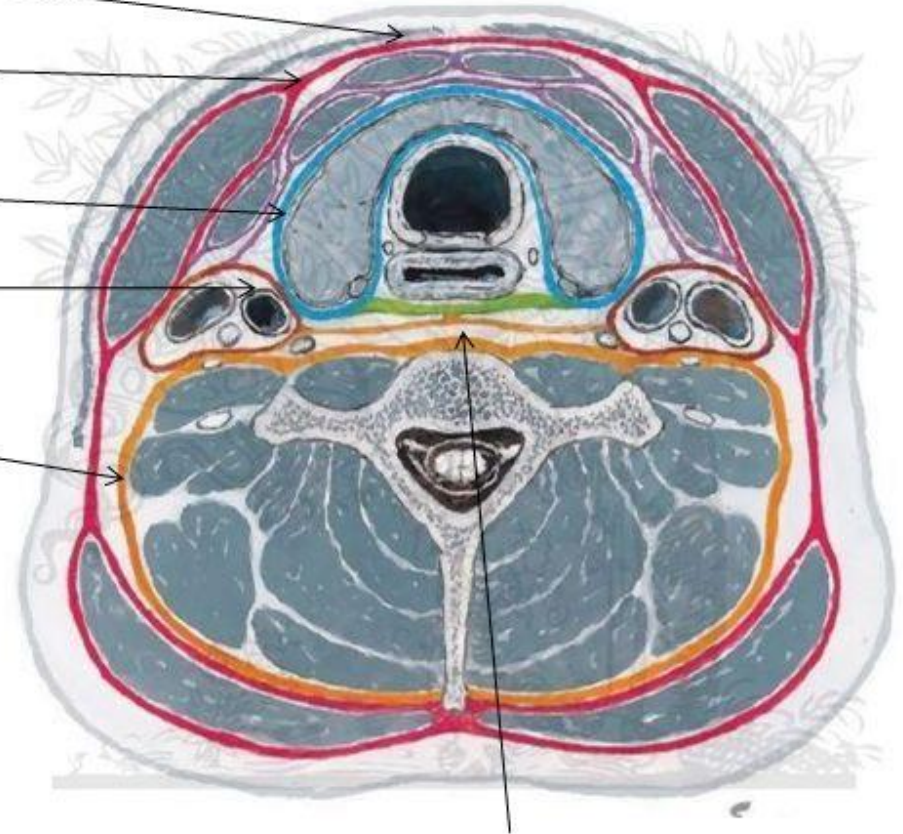
Investing layer

Pretracheal layer

Carotid sheath

Pre vertebral layer

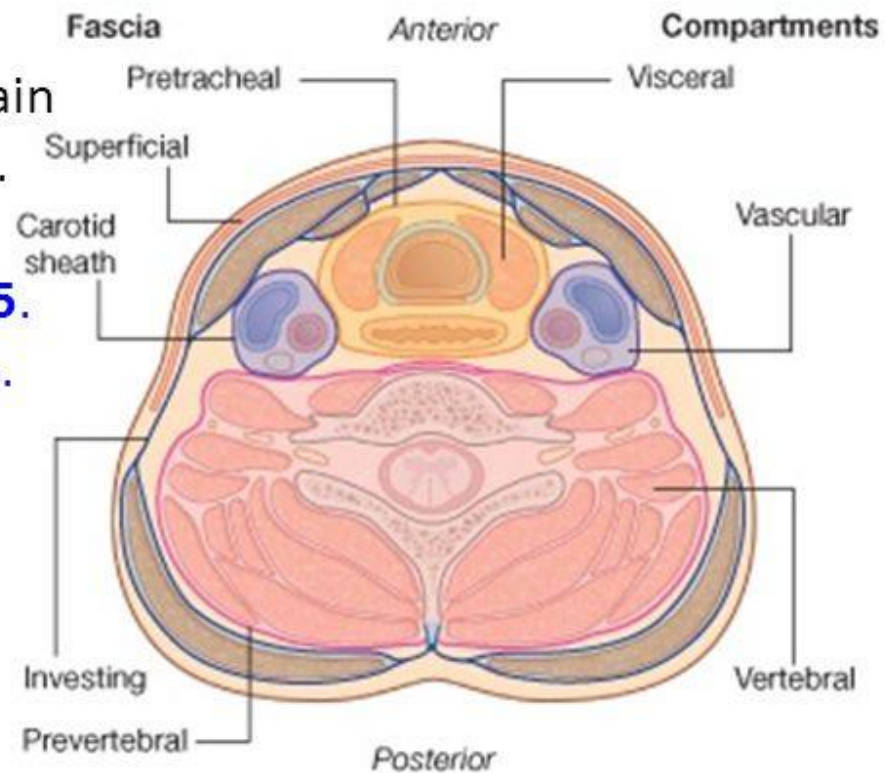
DEEP CERVICAL FASCIA



Retropharyngeal space

Neck Superficial structures

- 1. Skin of the Neck:** Natural cleavage lines are horizontal around the neck
- 2. Superficial Cervical Fascia:** thin layer enclosing other structures of the neck
platysma muscle, cutaneous nerves, superficial veins & superficial lymph nodes
- 3. Platysma** is a thin muscular sheet embedded in superficial fascia.
- 4. Deep Cervical Fascia:** It is deep to superficial layer and is condensed in certain areas to form well-defined fibrous sheets.
- 5. Cutaneous Nerves of the neck:**
Posterior rami of cervical nerves C2 to C5.
Anterior rami of cervical nerves C2 to C4.
- 6. Superficial Veins of the neck:**
A. External Jugular Vein
B. Anterior Jugular Veins
- 7. Superficial Lymph Nodes:** lie along external jugular vein superficial to sternocleidomastoid muscle.



Superficial Fascia

- Site with Very less fat

- *Eyelids*

- *Pinna*

- *Penis*

- Site with more fat

- *Breast*

- *Abdomen*

- *Gluteal region*

Deep fascia

- It is more dense than superficial fascia
- Collagenous bundles are more compact and more regularly arranged
- It is usually present in the form of membranes
- It provides connection and communication in the form of retinaculum, joint capsule and septa

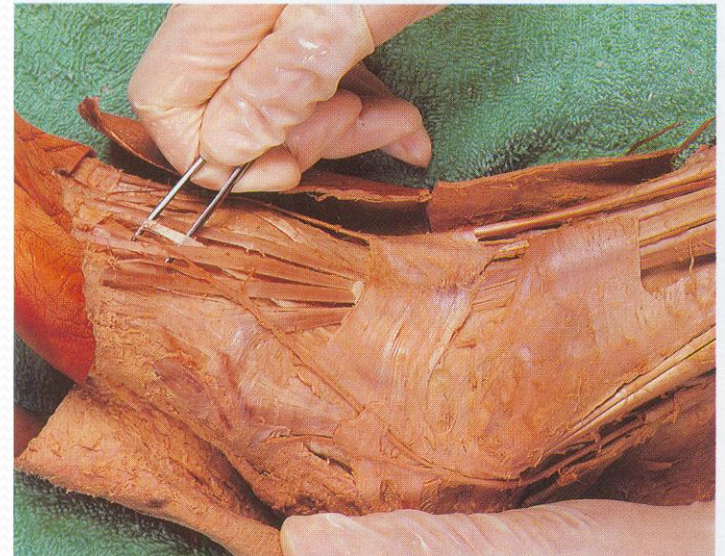
DEEP FASCIA

- Dense inelastic sheet or membrane, separates superficial fascia from underlying structures.
- It either invests or bind structures.
- Named according to the area of body it covers.

MODIFICATIONS:

Intermuscular septum

Retinacula



Examples of deep fascia

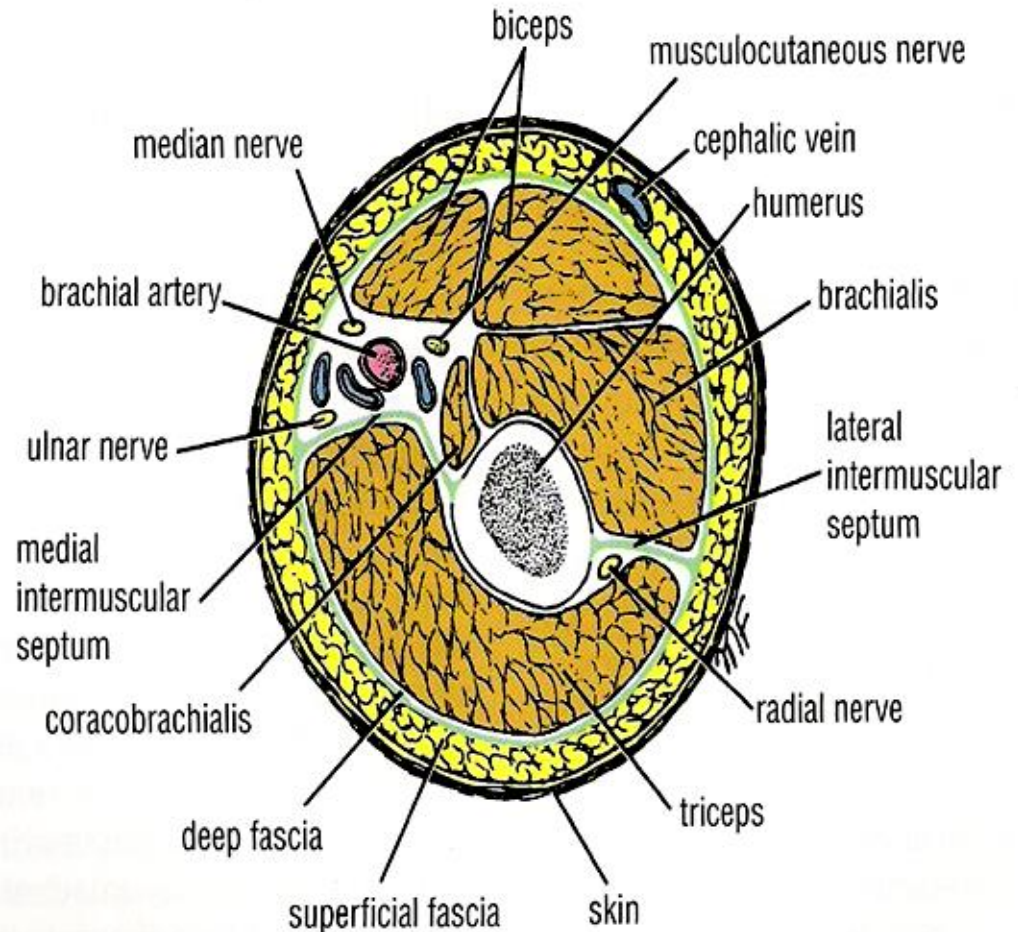
A. Investing fascia

- Covers the surfaces of muscles
- In the neck: it forms well-defined layers, bounds fascial spaces so limits spread of infection or determine the path of infection
- In the abdomen: it is thin
- In the limbs: forms a definite sheath around the muscles
-

Examples of deep fascia.....

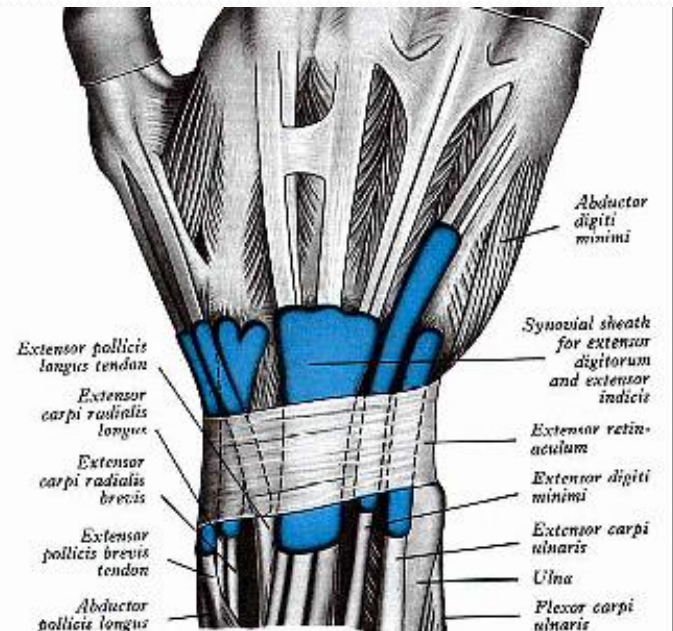
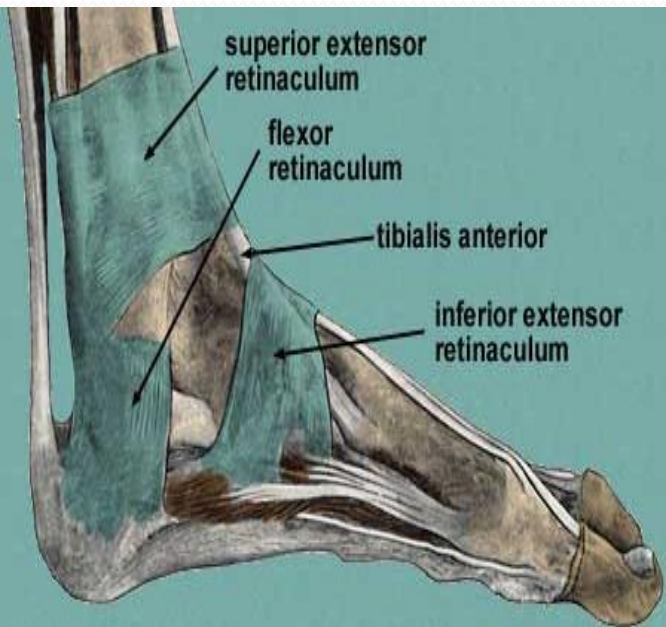
B. Inter muscular septa

lie between muscles dividing the limb into compartments

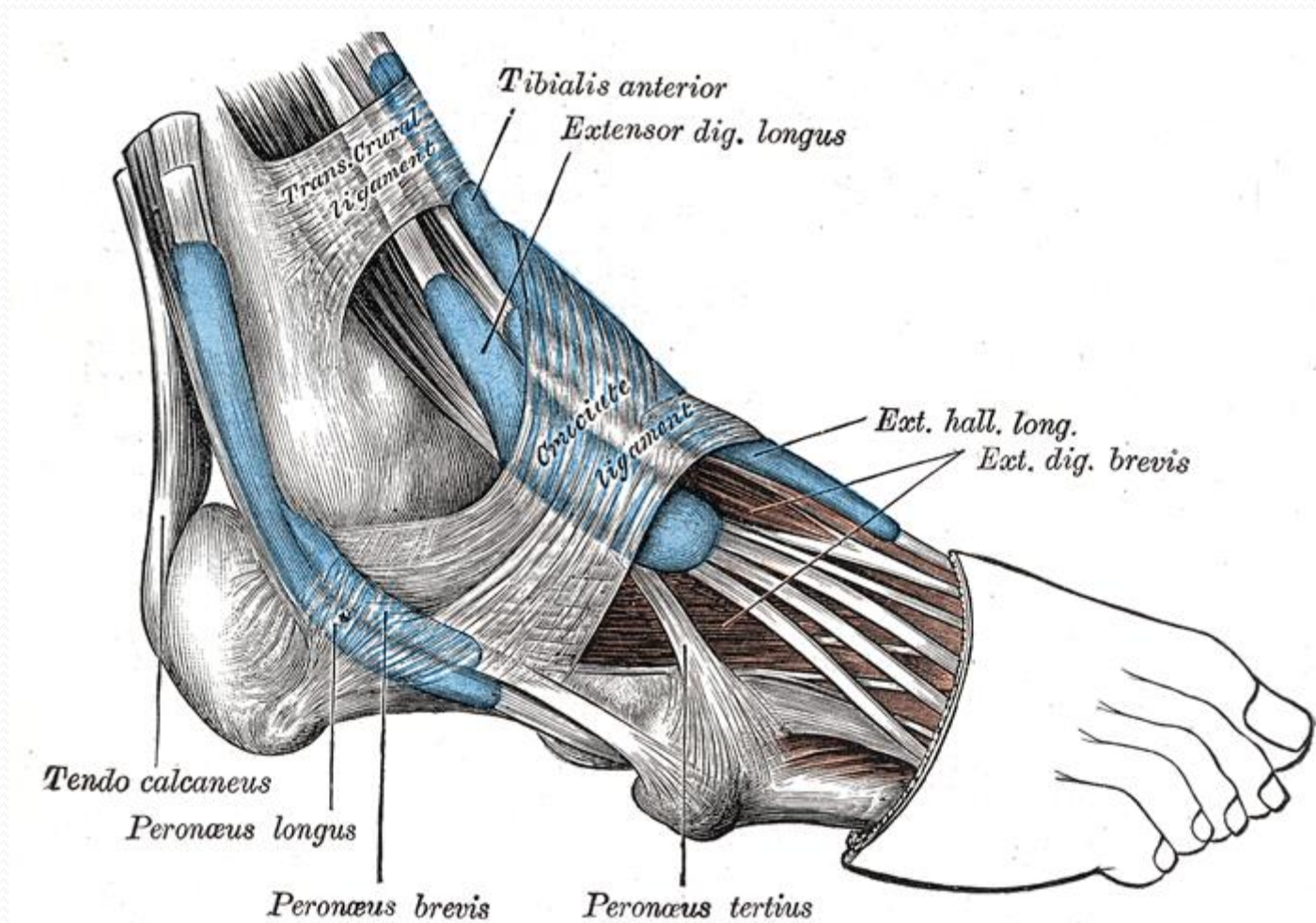


Examples of deep fascia.....

C. Retinacula



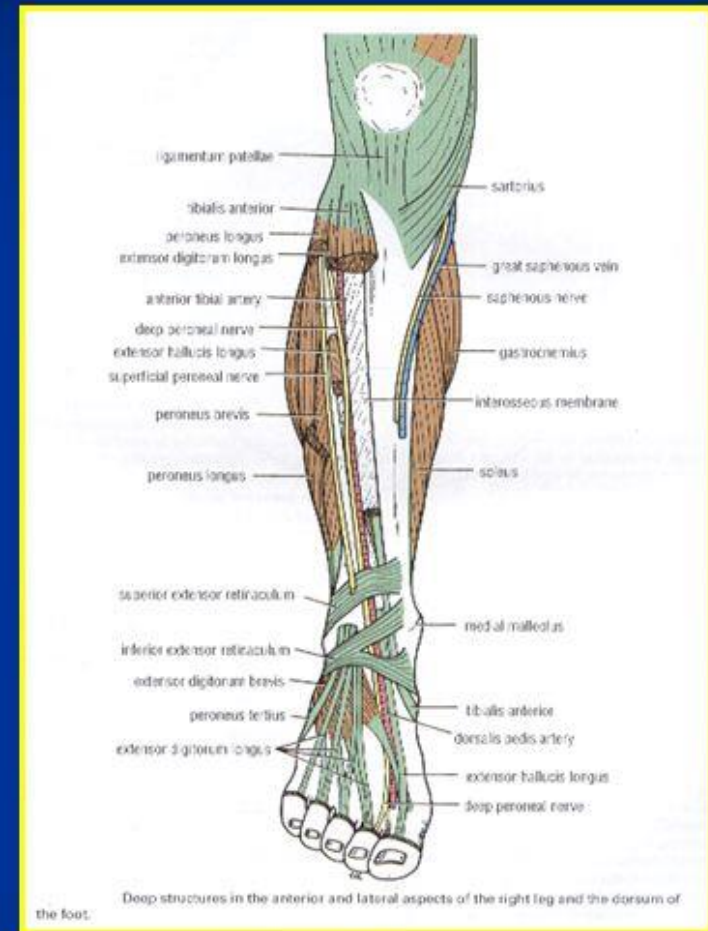
Localized thickening of deep fascia around joints, hold the tendons in place, prevent bowstringing of tendon



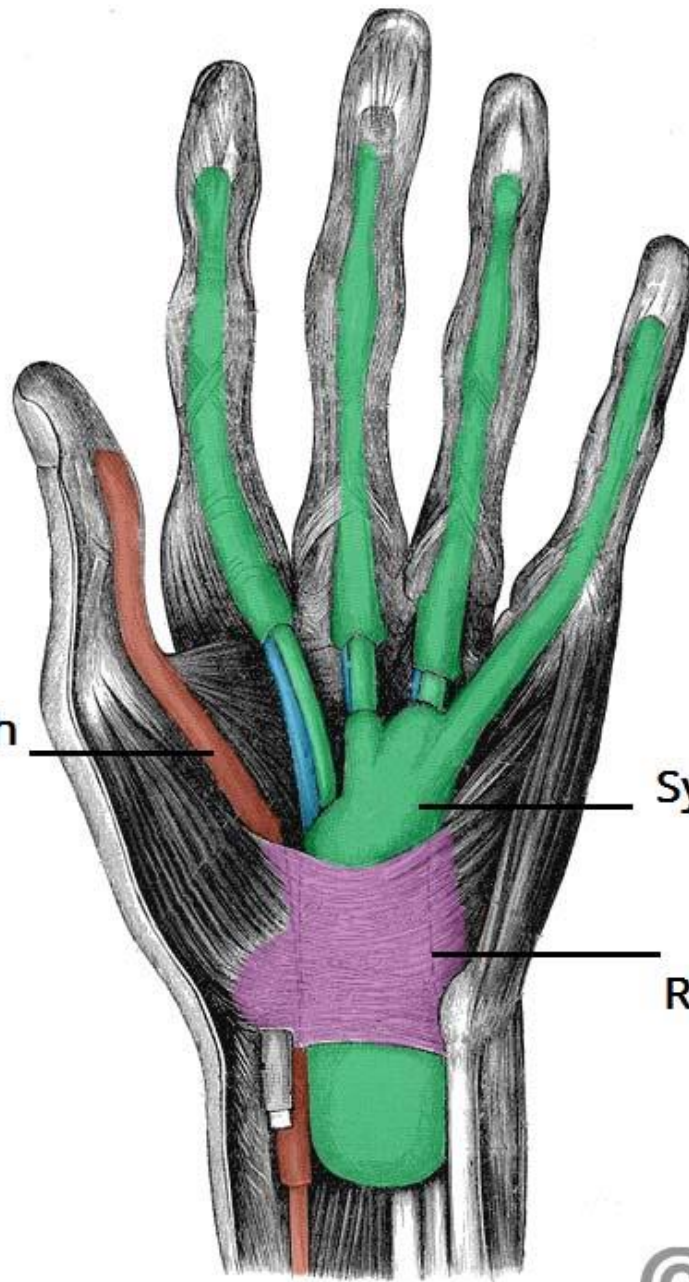
RETINACULA OF THE ANKLE

The inferior extensor retinaculum

- ❖ It is a Y-shaped band of deep fascia that is attached by its stem to the upper surface of the calcaneum.
- ❖ The upper limb of the Y is attached to the medial malleolus and the lower limb is continuous with the plantar fascia on the medial border of the foot.
- ❖ The muscles of the anterior group of the leg pass through the retinaculum.



Synovial sheath
of the FPL



Synovial sheath of the
FDS and FDP

Flexor
Retinaculum

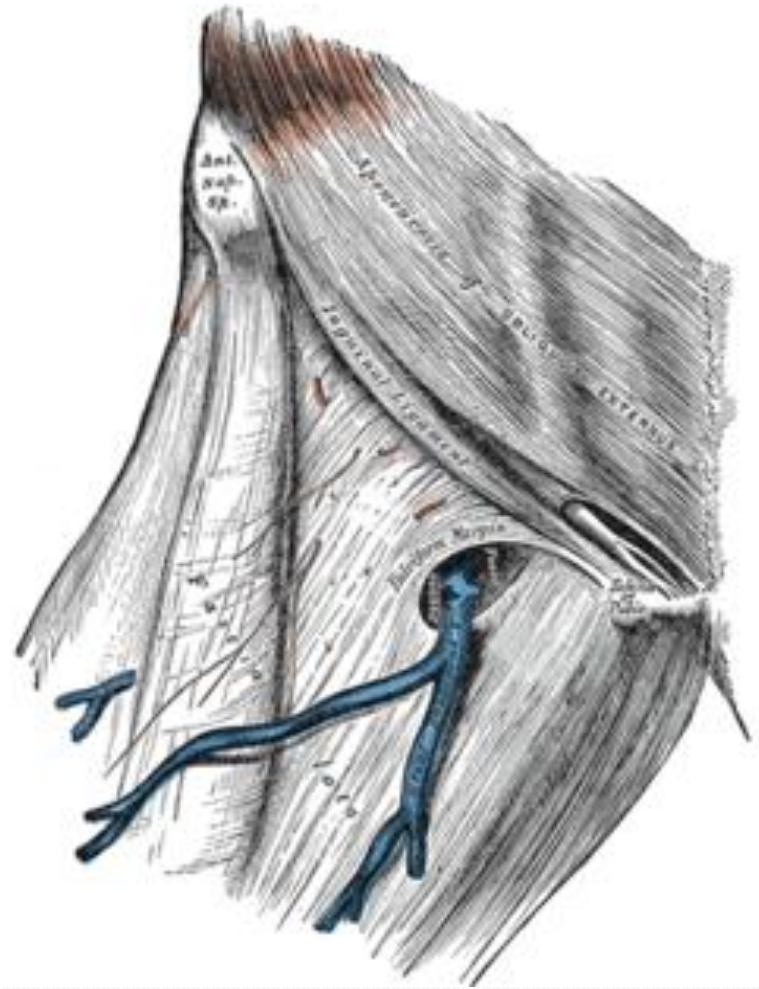


teachmeanatomy

The #1 Applied Human Anatomy Site on the Web.

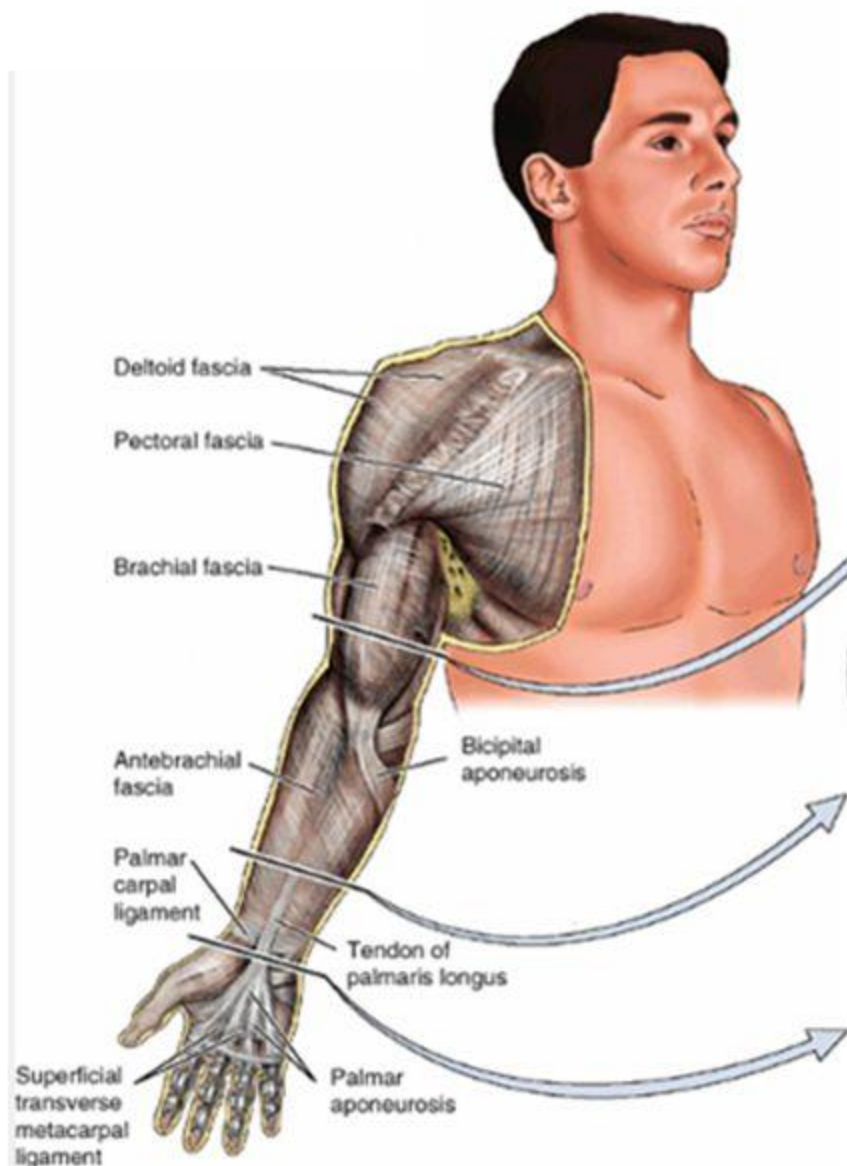
Fascia lata

The fascia lata is the deep fascia of the thigh. It encloses the thigh muscles and forms the outer limit of the fascial compartments of thigh, which are internally separated by intermuscular septa. The fascia lata is thickened at its lateral side where it forms the iliotibial tract, a structure that runs to the tibia and serves as a site of muscle attachment.



Fascia of the Upper Limb

- Deep fascia of the upper limb surrounds and contains the structures of the upper limb as an expansion-limiting membrane deep to the skin and subcutaneous tissue.
- Deep fascia forms **fascial compartments** containing individual muscles or muscle groups of similar function and innervation
- The compartments also contain or direct the spread of infection or hemorrhage



The Palmar Aponeurosis

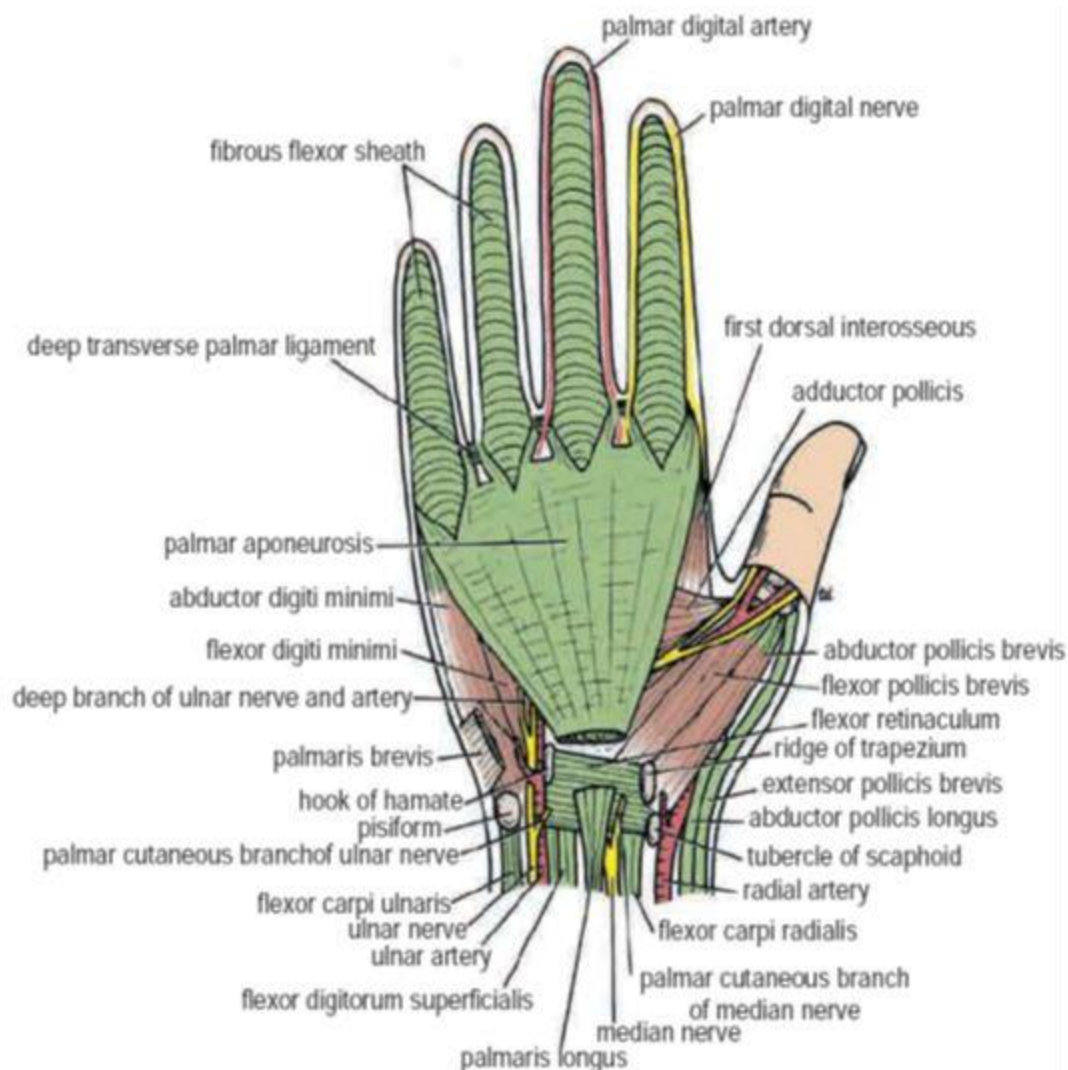
Triangular condensation of deep fascia of hand and occupies the central area of the palm

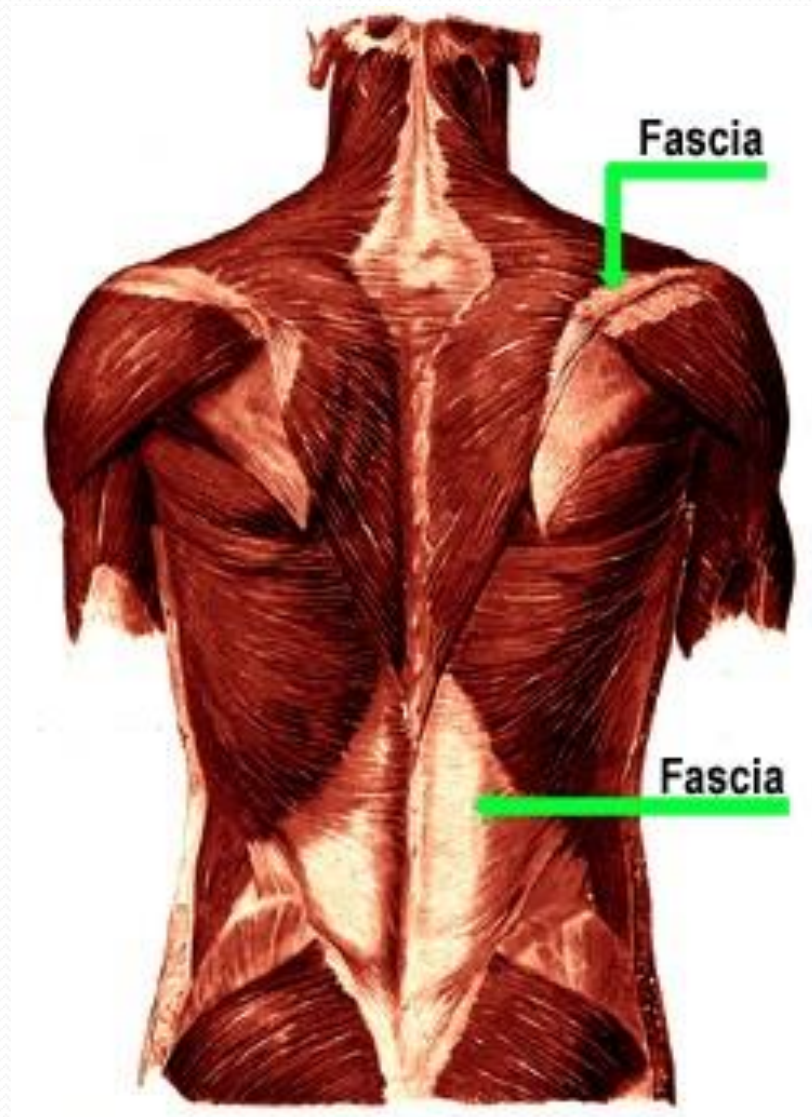
The apex: attached to the distal border of the flexor retinaculum and receives the insertion of the palmaris longus tendon

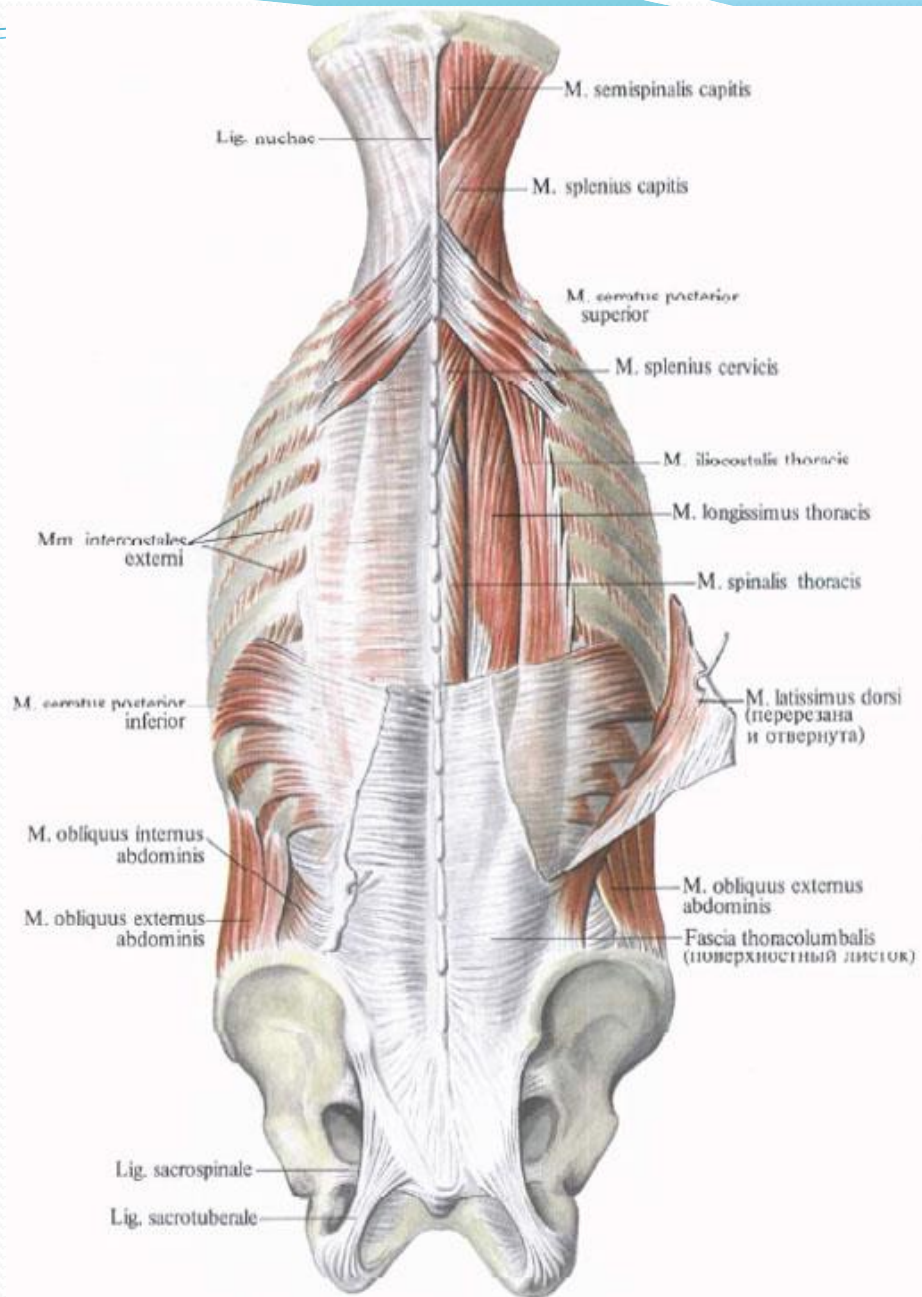
The base: divides at the bases of the fingers into four slips. Each slip divides into two bands:

1- Superficial: to the skin

2- Deep: to the root of the finger here fuse with the fibrous flexor sheath and the deep transverse ligaments.







Examples of deep fascia.....

- **Fibrous sheath**
 - *eg. Carotid sheath Axillary sheath*
- **Fibrous capsule**
 - eg Parotid capsule*
- **Ligaments**

Absence of deep fascia

- Face
- Breast
- Penis



THANK YOU