Lecture (2)

Covering of the body

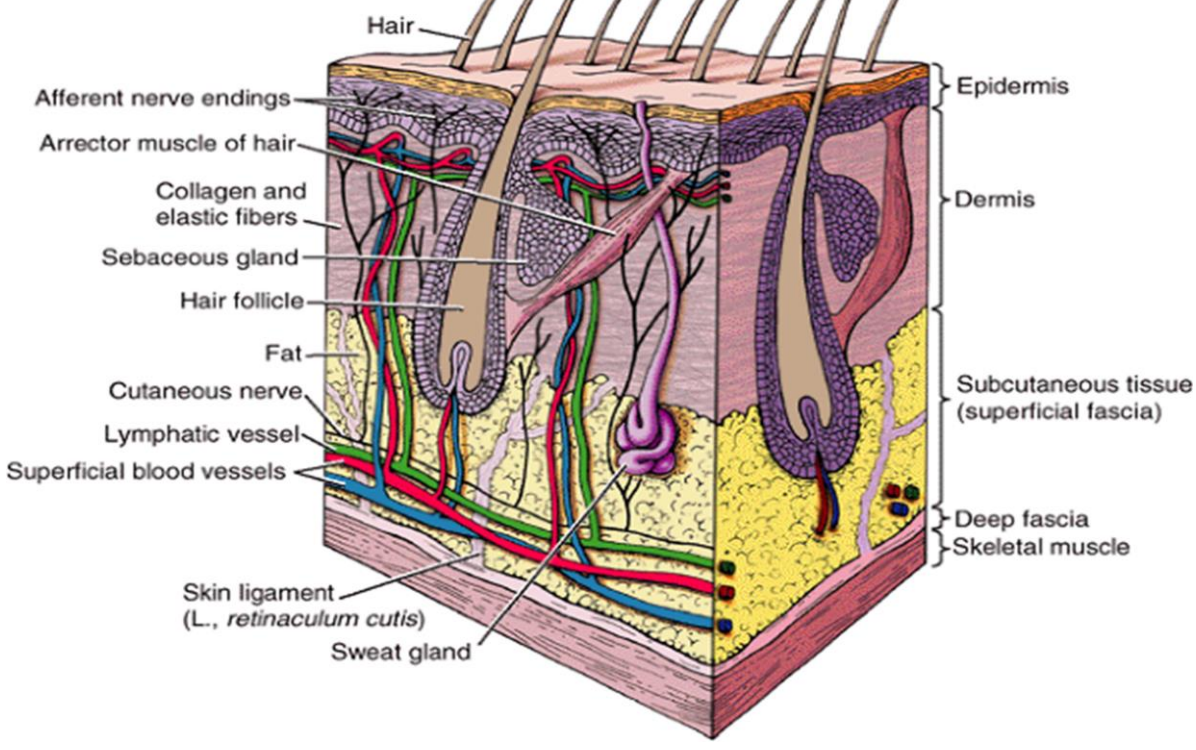
Learning objectives:
After this lecture, student should be able to:
- Know the structure of the skin.
- Know the appendages of the skin (Nails, Hairs, sebaceous glands, sweat glands).
- Describe the cleavage lines of the skin.
- Know the structure and function of fascia.
- Know the division of fascia (superficial and deep fasciae)
- Know fascial planes, fascial compartments and potential spaces.
- Understand important clinical conditions e.g. skin incisions, skin infections, sebaceous cyst, burns and fascia and infections.

THE INTEGUMENT PROPER (SKIN)

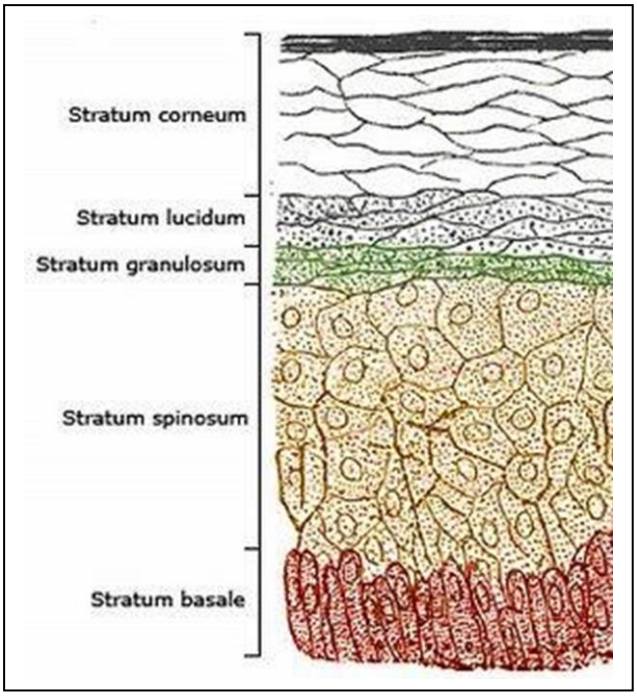
The integument proper is the outermost layer of the human body. It is usually known as the skin. The skin has two layers

(a) Superficial or outer layer called the epidermis

(b) Deeper or inner layer called the dermis.



The skin



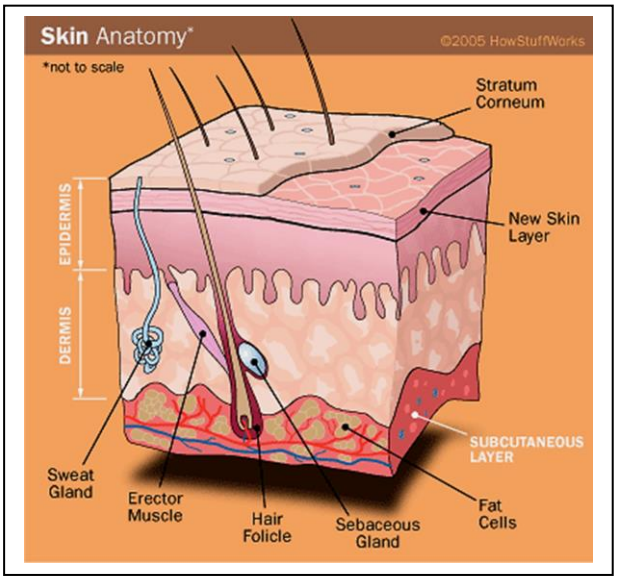
a. The Epidermis: The epidermis is a stratified squamous epithelium. This means that it is made up of several layers of cells, the outermost being flat-type epithelial cells.

(1) The outer layers of the epidermis include cells which are transparent, flattened, dead, and without nuclei. These hardened cells of the outermost layers are completely filled with keratin and are known as cornified cells.

These dead flat cells in the outermost layers resemble scales. Day by day, these cells are scraped away or just fall away from the body. They are replaced by cells from the intermediate layers.

(2) In the intermediate layers of the epidermis, the cells change their shapes. As the cells move towards the surface, they gain granules, begin to manufacture a hardening material called keratin, and lose their nuclei.

(3) The innermost layer of the epidermis is especially important because it is the source of all the other layers of the epidermis. It is known as the **basal or germinative layer.** The cells of this layer are capable of multiplication (mitosis).



b. The Dermis (Dermal Layer) is the layer of the skin lying just beneath the epidermis. It is dense fibrous connective tissue consisting of white and yellow fibers.

The dermis has finger-like projections called papillae. These papillae extend into the epidermis and keep the dermis and epidermis from sliding on each other. The dermal layer includes blood vessels, lymph vessels, nerve endings, hair follicles and gland.

INTEGUMENTARY DERIVATIVES

The integumentary derivatives are formed from the tissues of the integument proper (dermis and epidermis). All are appended (attached) to the integument proper and are often known as the appendages of the skin .

These include the glands, hairs, and nails associate with the skin.

HAIRS

♦Hairs are distributed over the whole surface of the body except the lips, the palms of the hands, the sides of the fingers, some areas of external genitalia and the soles and sides of the feet and the sides of the toes.

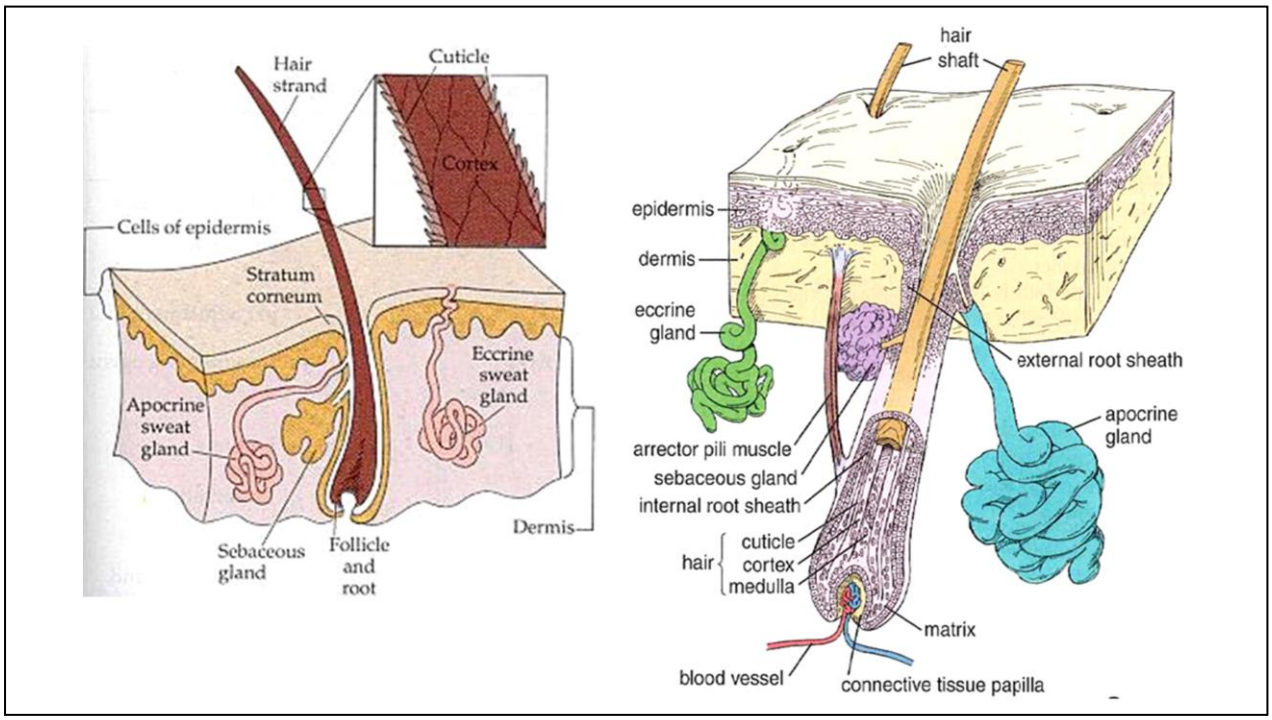
♦**Hair follicle** is formed by the extension of the skin (dermis and epidermis) deeper into the surface of the body. Follicles may extend into the subcutaneous layer.

♦At the base of the hair follicle is **the hair root.** The hair shaft grows out from the root. The hair shaft is made of cells from the outermost layers of the epidermis.

♦Scalp and facial hairs grow continuously. Other hairs of the body grow to fixed lengths. The types and patterns of hairs are determined for each individual by genetics, including his/her sex.

GLANDS

The types of glands included are the sweat glands and the sebaceous (fat/ oil) glands.

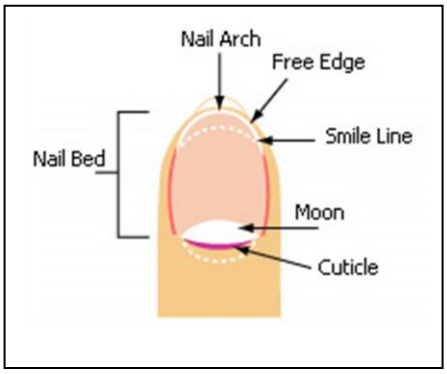


1-Sweat Glands: consist of a coiled secretory portion and a wavy duct which leads to the surface of the skin. The coiled secretory portion is located in the dermis or deeper. Sweat glands are distributed over the surface of the body except the red margins of the lips, the nail beds, external ear canal, and the glans penis and clitoris.

2- Sebaceous Glands: produce an oily substance which lubricates the skin and hairs. The oil keeps the skin and hairs flexible.

The sebaceous glands are usually found as a part of the walls of hair follicles and their oil flows into the follicle. In a few places without hairs, they open directly to the skin surface.

♦ **NAILS:** are found on the ends of the digits (fingers, and toes). Nails help to protect the ends of these digits. Each nail bed is attached to the top of the terminal phalanx (bone) of each digit. The nail itself is made up of cornified (hardened) outer cell layers of the epidermis. The nails grow continuously from their roots.



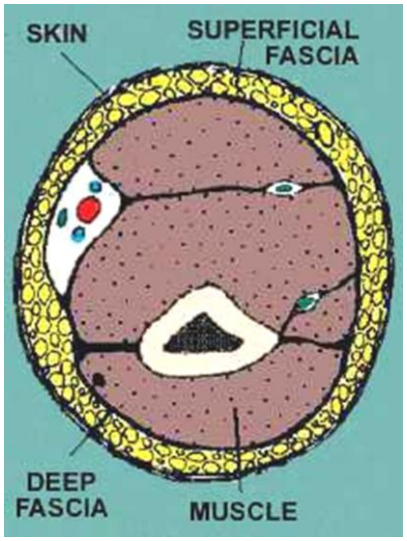
SKIN COLORATION

The skin includes red, black, and yellow pigments. The proportions of these pigments determine the skin color. This proportion is determined by genetics.

The absence of all pigments is called albinism. In albinism, white light is reflected and a pink hue results from the color of the blood shining through the transparent skin.

THE SUPERFICIAL FASCIA

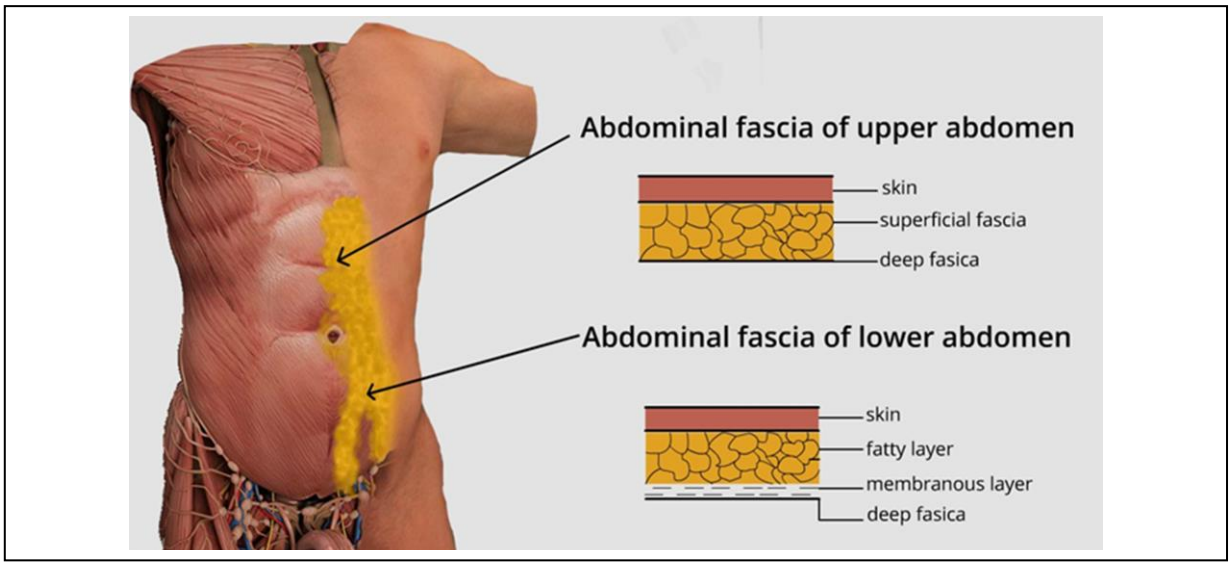
♦The superficial fascia is the second envelope of the body. It is the layer between the skin and the investing deep fascial envelope. It is often called **subcutaneous layer.**



♦The superficial fascia is made up primarily of loose areolar fatty tissue with the spaces filled by fatty tissue and tissue fluid.

♦The thickness of the superficial fascia is more in females (secondary sex character). It varies from one person to another and from region to another with the amount of fat in its meshes.

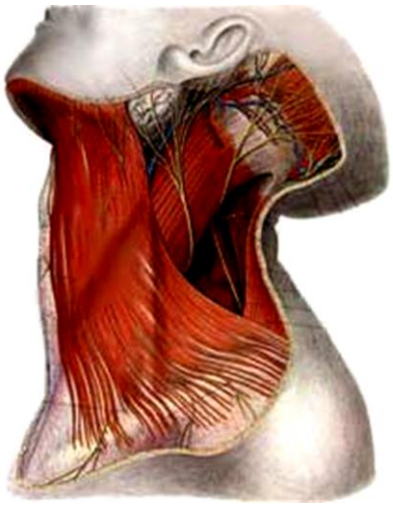
♦It is thickest in the anterior abdominal wall, where it is differentiated into two layers superficial fatty layer and deep membranous layer.



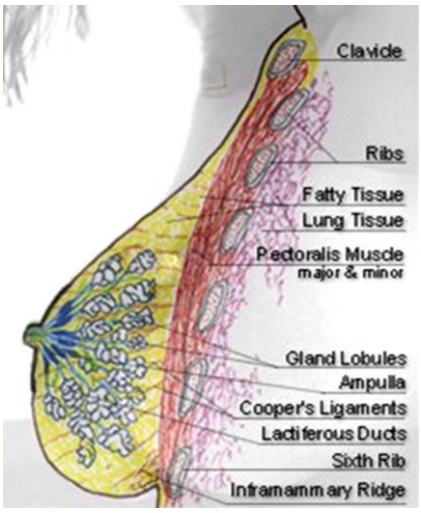
♦It is thinnest in the eye lids and the nipples of the breast and in some parts of the external genitalia where there is no fat.

♦It contains superficial or cutaneous branches of nerves, arteries, veins, and lymphatics of the skin. In some regions it contains muscles such as the scrotum (dartos muscle) and the neck (platysma muscle). In the pectoral region it contains the mammary gland.

♦The fat in the superficial fascia acts as an insulator helping in regulation of body temperature, giving the body its contour and allowing movement of the skin on the underling structure.



Platysma muscle



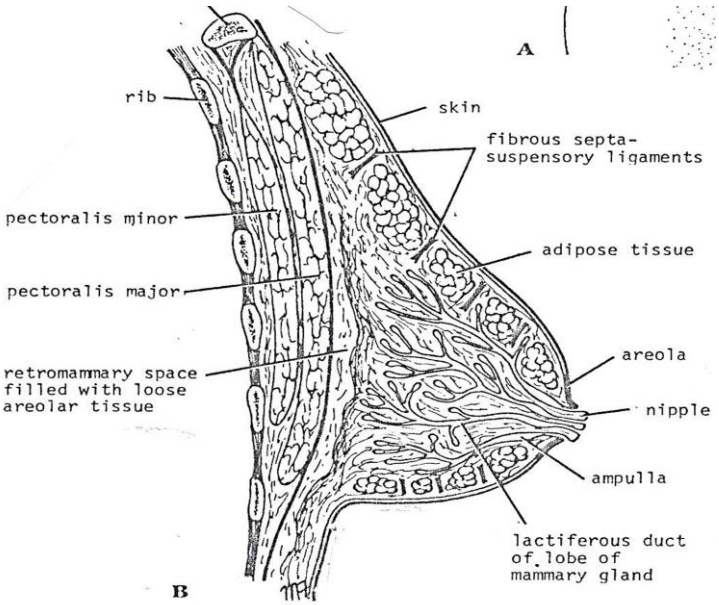
Mammary gland

***Mammary Glands*:**

■In the adult human female, the mammary gland lies in the subcutaneous layer anterior to the chest muscle (pectoralis major M.). Its function is to nourish the newborn. A nipple is located near the center of each breast. Around each nipple is a darkened area known as the areola.

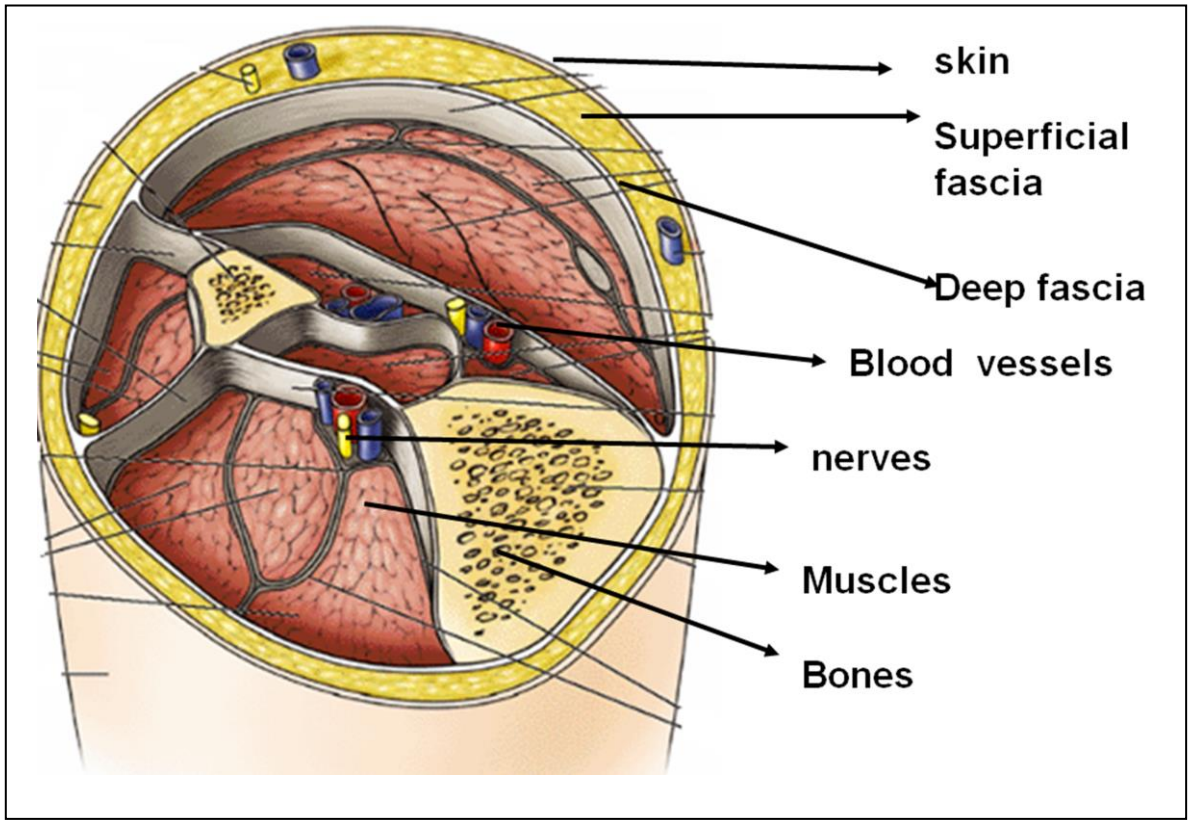
■The tip of the nipple has many small openings to allow the passage of the milk from the milk ducts. These ducts are connected to lobes of glandular tissue located throughout the breast. Fat and fibrous connective tissue fills in the spaces among the lobes.

■The fat in the superficial fascia acts as an insulator helping in regulation of body temperature, giving the body its contour and allowing movement of the skin on the underling structure.



Mammary gland

THE DEEP FASCIA



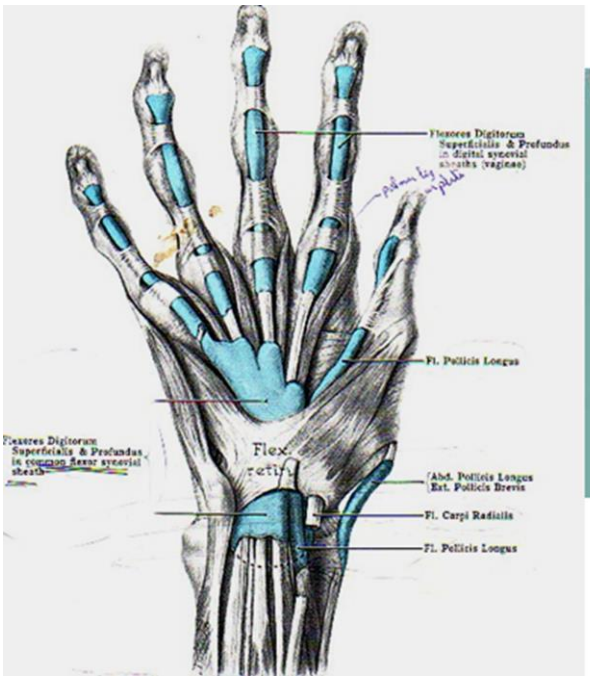
(a) The deep fascia envelops the entire body as the third envelope. This third envelope is known as the investing deep fascia. It is beneath the skin and subcutaneous layer.

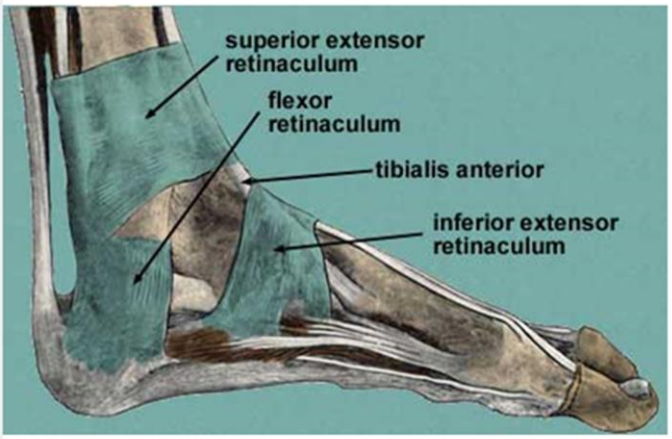
(b) Deep fascia also includes the envelopes of the muscles (sheath)and other organs. Around individual organs (for example, the kidney), it is called a capsule.

(c) It sends partitions or septa between the muscles (intermuscular septa) and ensheathes the blood vessels and nerves between them. These partitions form a major part of the attachment of many muscles.

(d) In some regions (distal joints), the deep fascia is thickened to form retinacula that hold the tendons in position and form pulley within which the tendons slide where they change direction e.g : at wrist (flexor and extensor retinacula) and ankle (flexor, extensor and peroneal retinacula).

(e) Another form of deep fascia is found in the collections of loose areolar CT and fat that are found as filling among the organs. Similar deep fasciae attach organs to the body wall.





Retinacula

Concerning the skin all are true EXCEPT:

a. It covers the body surface.

b. It regulates body temperature.

c. The dermis is the outer layer.

d. The epidermis is avascular layer.

Regarding the deep fascia, choose one false statement:

a. It is thickened in the palm of hand.

b. It is thickened in the abdomen allowing it to change its volume.

c. It forms sheath for muscles.

d. It sends intermuscular septa.