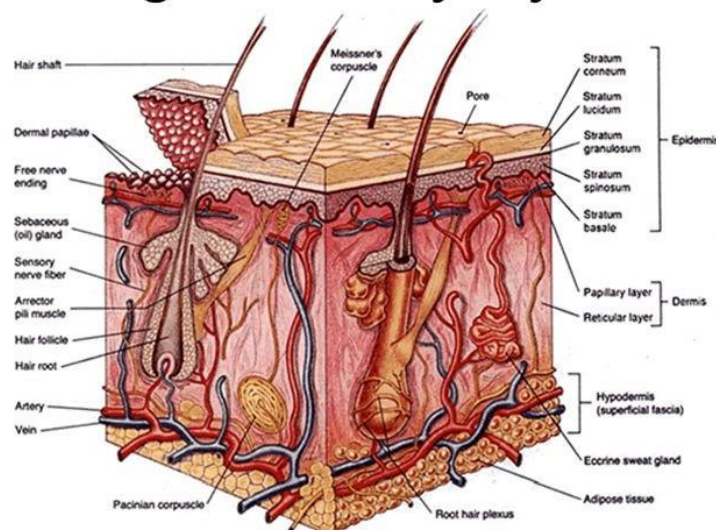


Introduction for paramedical students

skin

- * The science of study of skin is called **dermatology**.
- * **Structure of skin:**
 - The skin consists of **epidermis** and **dermis**, while the connective tissue beneath the skin forms what is called superficial fascia.
 - The **epidermis** of the skin is formed only of stratified squamous epithelium with no blood vessels, and no nerve fibers.
 - While the **dermis** consists of collagen and elastic fibers, blood vessels, terminations of nerve fibers and roots of hair follicles, sweat glands and sebaceous.

Integumentary System



Integumentary System consists of the Skin and its **accessory organs**

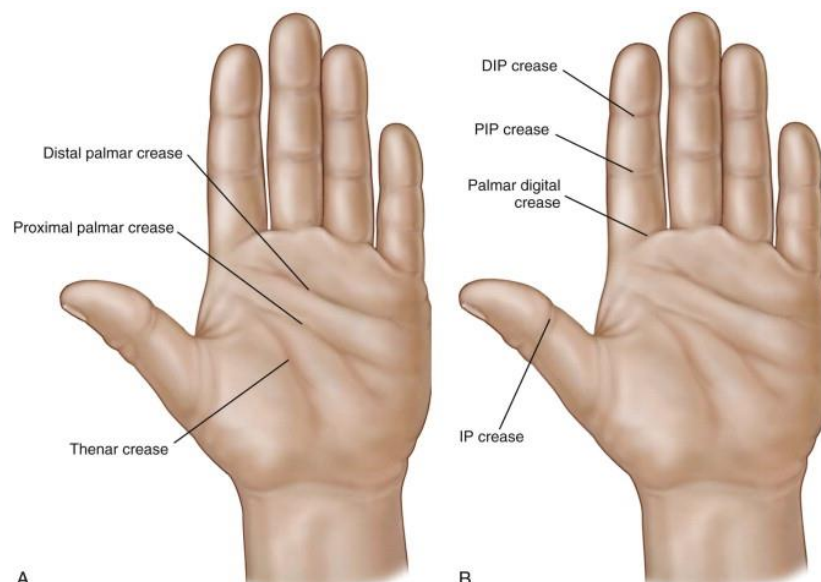
- The **collagen fibers** in the dermis are arranged in bundles which have specific directions according to the part of the body. These bundles form what is called **Langer's or cleavage lines**.
- A **surgical skin incision** in **parallel** to langer's lines leaves a fine scar, while an incision across these lines leaves a thick irregular scar.

Introduction for paramedical students

- In **old age**, the yellow elastic fibers in the skin degenerate, and consequently the skin loses its elasticity and shows wrinkles.
- **Over stretching** of the skin in a short period as in pregnancy may result in disruption of the collagen bundles with secondary formation of white lines in the skin called **lineae gravidarum**.



- **Skin creases** are flexure lines that lie opposite the joints especially in the hand. They are produced by firm attachment of the skin to the underlying deep fascia.

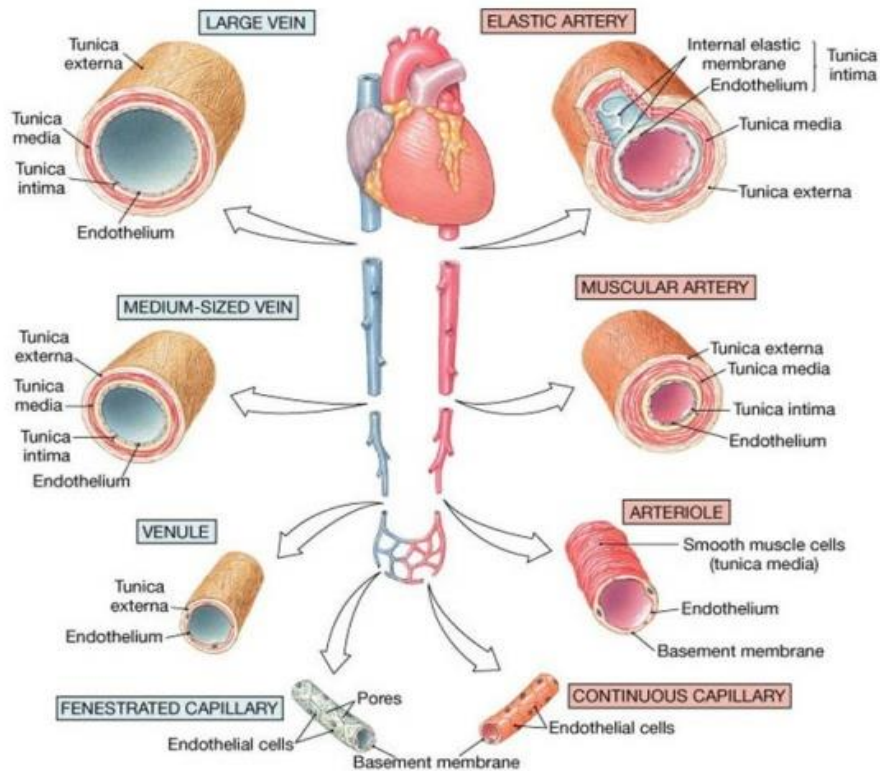


Introduction for paramedical students

- Papillary ridges are present on the surface of the skin especially the palm and fingers of the hand. They are permanent and form the basis of **finger prints** (dermatoglyphics).
- **Pigmentation of the skin** is produced by a brown pigment called melanin, present in the epidermis. Melanin granules are stored in cells called melanocytes that are found in the epidermis.
- * The skin contains **sweat** and **sebaceous glands** as well as **roots of hair** and smooth muscle fibers are attached to the roots of hair called **errector pilorum muscles**
- * The sweat glands and the errector pilorum muscles are supplied by **sympathetic fibers** that reach them mainly through spinal nerves.
- * The **nail bed** lies beneath the nail and consists of the **dermis** of the skin

Blood vessels

Blood vessel types and functions



* The blood vessels are **arteries** , **veins** , **capillaries** and **sinusoids**.

I) Arteries :

- The arteries have the **following features**:
 - They **transport** blood from the heart to all tissues.
 - They do **not have valves** .
 - Their branches join **around large synovial joints** to form **anastomosis** to allow collateral circulation if the main artery is occluded.
 - An **end-artery** does not anastomose with neighboring arteries, and thus if obstructed will lead to death of the tissues e.g. central artery of the retina and central arteries of the brain.

Introduction for paramedical students

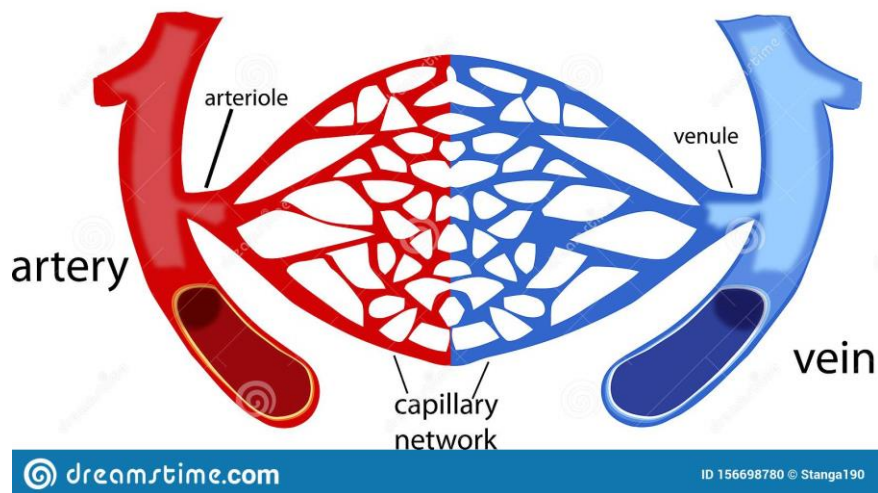
- The **smallest** arteries are called **arterioles** .
- According to the **structure** of the walls , the arteries are **elastic** arteries , **muscular** arteries or arterioles.
- **Elastic** arteries are of **large size** and their walls are rich in elastic fibers. In old age they are usually affected by **atherosclerosis** by deposition of cholesterol in their lining cells.
- The elastic fibers in the **aorta** are responsible for the **elastic recoil**, thus help convert the intermittent blood flow from the heart into a **continuous stream** in the arteries.
- **Muscular** arteries possess thick muscle layer in their walls, and thus they can **regulate the flow** of blood into the muscles, viscera and organs.
- The **arterioles** are called resistance arteries because they provide **peripheral resistance** to the blood circulation which is responsible for the blood pressure. They have a role in producing **hypertension** (high blood pressure).

II) Veins :

- The veins have the **following features**:
 - They **transport** blood from all tissues to the heart.
 - Many of them **have valves** but there are some veins which lack valves such as the caval veins and portal vein.
 - The smallest veins are called **venules**.
- They are **divided by deep fascia** into:
 - 1) **Superficial** veins in the superficial fascia just deep to skin.
 - 2) **Deep veins** deep to deep fascia in between muscles.
- **Venae comitantes** mean veins that accompany an artery, and run together.

III) Capillaries :

- **The capillaries have the following features:**
 - They are microscopic vessels form network immediately follow arterioles and connecting them with the venules.
 - There is no muscle layer in their wall .
 - The capillaries are of uniform narrow diameter, and form anastomotic networks in all tissues called **capillary bed**.
 - Their walls are permeable due to the presence of microscopic gaps between the endothelial lining allowing exchange between blood and extracellular fluid , therefore these vessels are called **exchange vessels**.



IV) Sinusoids :

- **The sinusoids similar to capillaries but have the following features:**
 - The sinusoids have **large irregular** lumens.
 - They **present in** certain organs like the liver , spleen , bone marrow and some glands.

Introduction for paramedical students

* **Special notes :**

- Cartilage, cornea and skin epidermis are **devoid of blood vessels**.
- In the tip of fingers and toes **anterio-venous anastomosis** occurs in which direct connection between arteries and vein without capillaries in between.

Introduction for paramedical students

Lymphatic system

- * The lymphatic system **consists of** the lymph nodes and lymph vessels as well as the spleen, and tonsils.
- * The fluid circulating inside lymph vessels is called **lymph** which is rich in lymphocytes, that combat infection, and contain large particles in the tissue fluid.
- * Lymph formation starts in the **intercellular tissue spaces** and flows inside the lymph vessels which are interrupted at various sites by masses of lymphoid tissues called **lymph nodes**.
- * The **thoracic duct** is the largest and longest lymphatic vessel which drains the body except the upper right quadrant of the body which drains into right lymph trunk. These lymph vessels drain into large veins in the root of the neck.
- * Lymph drains eventually into the **venous blood**.
- * Lymph vessels are **absent** in the CNS, cornea and cartilage

Introduction for paramedical students

