SKIN COMPOSITION

The Integumentary System.

The skin has two main layers: the **epidermis** on top and the dermis below. There are several layers in the epidermis. The top layer is made up of dead cells that die and fall off at regular intervals. New cells are made from the bottom layer and move up to replace the old ones. The dermis connects the epidermis to the hypodermis. It has collagen and elastin fibers, which give it strength and flexibility. The hypodermis is made up of connective tissue that links the dermis to the structures below. It also has adipose tissue, which stores and protects fat.

How the Skin Works

Even though you might not think of the skin as an organ, it is made up of different tissues that work together as a single structure to do important and unique things. The integumentary system is made up of the skin and its supporting structures. It protects the body as a whole. Multiple layers of cells and tissues make up the skin. Connective tissue holds these layers to the structures below (Figure 1). The deeper part of the skin has a lot of blood vessels and has numerous blood vessels. It also has many nerve fibers that send messages to and from the brain. These nerve fibers are sensory, autonomic, and sympathetic.

DIAGRAM OF THE SKIN.(figure 1)

The Skin is made up of three layers.

EPIDERMIS – Outer Layer also known as Cuticle/scarf

DERMIS – Also known as the derma ,cutis, corium, true skin.

HYPODERMIS -hypo, under dermis/subcutis/subcutaneous layers.

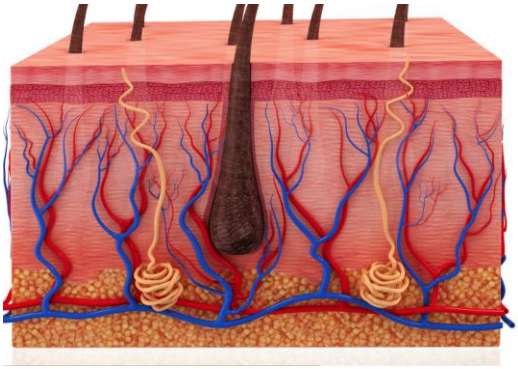

DIAGRAM OF THE SKIN

Ø The skin's outer layer is the Epidermis,

Ø The epidermis is the layer of skin that is on the outside. It keeps getting new with a 21-day cycle of renewal.

Ø It has several layers underneath:

This layer are mentioned below-

Stratum Basale/Stratum Germinativum/Malpighian Layer. The stratum basale, which is also known as the stratum germinativum, is the deepest layer of the epidermis. It connects the epidermis to the basal lamina, and the layers of the dermis lie below it. The basement membrane is made up of intertwining collagen fibers that connect the cells in the basal layer to the cells in the dermis. In the top layer of the dermis, there is a projection or fold that looks like a finger. This is called a dermal papilla (plural: dermal papillae). The connection between the epidermis and dermis is made stronger by dermal papillae. The more folds there are, the stronger the connection.

The basal layer is made up of a single layer of cells, which are mostly basal cells. A basal cell is a stem cell in the shape of a cube that gives rise to

keratinocytes in the epidermis. All keratinocytes come from this single layer of cells, which are always making new cells through a process called mitosis. As new cells are made, the old ones are pushed away from the stratum Basale on the surface. In the stratum basale, there are two other types of cells that are spread out among the basal cells. The first is a Merkel cell, which acts as a receptor and sends signals to nerves that the brain interprets as touch. The hands and feet have a lot of these cells on their surfaces. The second one is a melanocyte, which is a cell that makes melanin. Melanin is what gives hair and skin their color. It also helps protect the living cells of the epidermis from damage caused by ultraviolet (UV) light. When a fetus is growing, fingerprints are made where the cells of the basal layer meet the papillae of the dermal

layer below (called the papillary layer). This makes the ridges on your fingers that you know as fingerprints. Fingerprints are unique to each person and are used in forensics because the patterns don't change as people grow or get older.

KEYPOINT-The basal layer is the epidermis's most deep layer. This is the layer where melanocytes are found. Melanocytes make melanin, which protects against UV rays and is what gives you a tan. It also derives nutrients fluid from the capillary blood vessels of the dermis. A healthy basal layer will give a youthful glow and a passive basal layer will cause formation of lines and wrinkles.

Stratum Spinosum- The cell processes that stick out of the stratum spinosum and connect the cells with a structure called a desmosome give it

a spiny look. Desmosomes connect to each other and make the link between cells stronger. It's interesting to note that this layer's "spiky" look is a result of how it was stained. Samples of epidermis that haven't been stained don't have this look. The cells that make up the eight to ten layers of keratinocytes in the stratum spinosum divide in the stratum basale .This layer's keratinocytes are interwoven with Langerhans cells, which act as immune cells by ingesting bacteria, foreign particles, and damaged cells. In the stratum spinosum, keratinocytes start making keratin and release a water-repelling key to protecting. This helps keep water from leaving the body and makes the skin waterproof. As new keratinocytes are made on top of the stratum basale, the keratinocytes of the stratum spinosum are pushed into the stratum granulosum.

keypoint- The stratum spinosum is found between the stratum granulosum and stratum basale. The stratum spinosum helps the epidermis withstand friction and abrasion by providing flexibility. The stratum spinosum is thicker in areas with more abrasion, such as the soles of the feet and palms of the hands. In these areas, the sub-layer seems thick enough to provide strength and flexibility.

Stratum Granulosum- As the keratinocytes move out of the stratum spinosum, they change even more, giving the stratum granulosum a grainy look. Three to five layers of cells get flatter, their cell membranes get thicker, and they make a lot of the protein molecules keratin and keratohyalin, which build up as granules inside the cells . The keratinocytes in the stratum granulosum are mostly made up of these two proteins, which

gives the layer its grainy look. As cells die, their neutrons and other cell types break down, leaving behind keratin, keratohyalin, and cell membranes that will become the stratum lucidum, stratum corneum, and other parts of hair and nails.

Keypoint - **The stratum granulosum is the third layer of the epidermis that lies below the stratum corneum and stratum** lucidum, The waterproofing ability of **stratum granulosum** is also effective at keeping the moisture trapped in the deeper layers of epidermis. It helps retain moisture and does not allow them to dehydrate.

Stratum Lucidum

The stratum lucidum is a layer of the epidermis that is smooth and seems to be see-through. It is right above the stratum granulosum and below the stratum corneum. Only the thick skin of the palms, soles, and fingers has this thin layer of

cells. The dead and flattened keratinocytes that make up the stratum lucidum. These cells are full of eleiden, a clear protein that is high in lipids and comes from keratohyalin. This protein gives these cells their clear (or "lucid") look and keeps water out.

Keypoint- The stratum lucidum is a layer of dead skin cells within the epidermis. The epidermis is present throughout the human body, but the stratum lucidum is only on the soles of the feet and palms of the hands. This transparent layer helps the body manage friction.

Stratum Corneum

The top layer of skin is called the stratum corneum. It is the layer that is open to the outside world. The cells in this layer have become more "keratinized," which is another way of saying

"cornified." This is how the name of the layer came about. Most of the time, there are 15 to 30 layers of cells in the stratum corneum. This dry, dead layer helps keep microbes out and keeps the tissues underneath from drying out. It also keeps the layers underneath it from getting scratched. This layer is made up of cells that die and are replaced by cells from the stratum granulosum (or stratum lucidum in the case of the palms and soles of feet). The whole layer is changed over the course of about 4 weeks. Secondary Cleansing can helps remove some of the skin's keratinized top layer. The goal is for the skin to always look "fresh" and healthy.

Keypoint -The stratum corneum is the topmost layer of skin. It is made up of flat cells and corneocytes, which together make an

impenetrable lining. This surface is always peeling off.

Stratum disjunctum-is the top layer of the cornea. Because it contains air, it looks different from the layers below it. Horny cells detach by dissolving cell contacts. Most of the time, this process can't be seen. If there is a problem with how the skin sheds, the corneocytes separate in larger groups. Skin flakes are groups of 500 or more cells that can be seen with the naked eye.

Keypoint- The outermost layer of desquamating keratinized cells of the stratum corneum. (advanced stage of keratinization) Flaking of cells commonly known as furfur(exfoliation).