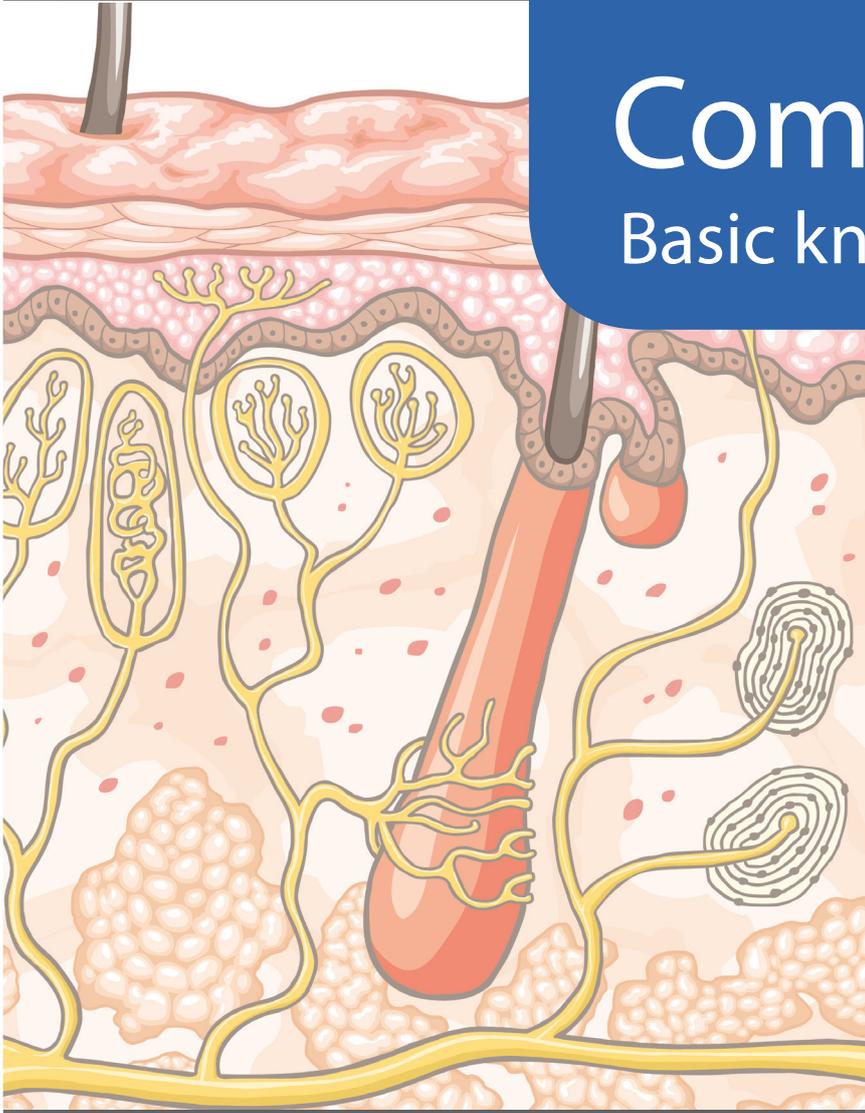


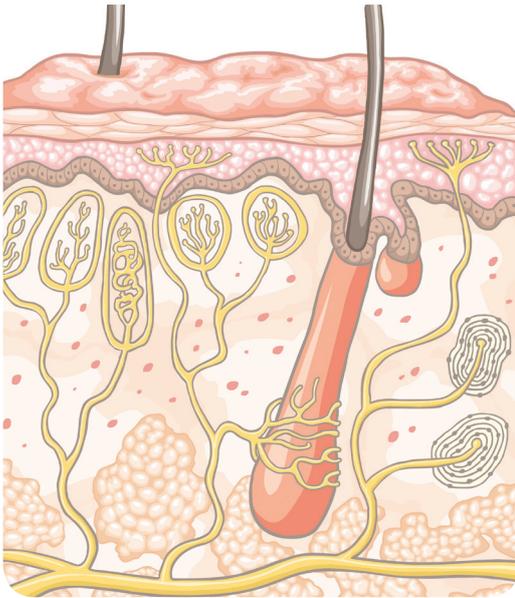
Compendium

Basic knowledge SKIN



- Structure
- Functions
- Size

The skin (dermatologically called “cutis”) is an organ which is built up in layers.



Structure of the Skin

The skin consists of three basic layers:

- ◆ Epidermis
- ◆ Dermis
- ◆ Subcutaneous Tissue (Subcutis)

Epidermis – The Skin’s Upper Layer

The epidermis is composed of different layers or rather cell types:

- ◆ Cornified / Horny Layer (Stratum corneum)
 - As compact, flattened packages, the horny cells (keratinocytes) are an important part of the cells within the epidermis. Initially, they are built inside of the basal /germinal layer (Stratum basale) and they gradually wander towards the upper surface and the acid mantle. Parts of the cornified / horny layer are shed by desquamation daily. The layer’s thickness is approximately 10 - 20 cells.
- ◆ Acid Mantle
 - More and more, the acid mantle is regarded as a component of the cornified / horny layer and no longer as a clearly definable layer consisting of water and fat which was even thought to have an autonomous structure and function. Nowadays, the acid mantle is rather regarded as a humid zone in the upper cornified / horny layer which has a certain antimicrobial defense function and which stabilizes the pH of the cornified / horny layer. In many (older or promotional) illustrations, the zone is simplified as a “layer“ with protective function.
 - While considering these new findings, it is still possible to use the classic argumentation in a consultation by saying that the acid mantle plays a central role in the skin’s protective function.

- ◆ Basal / Germinal Layer (Stratum basale)
 - The so-called basal cells are the lowest layer of the epidermis. Here, new skin cells are formed by cell division. These new skin cells wander permanently towards the skin surface or they die off on their way there. The dead cells, which have a high amount of the hard protein keratin, form the skin's outer cornified / horny layer. Pigment cells (melanocytes) lie in between basal cells and constitute the skin colour melanin which serves as light protection simultaneously.
- ◆ Basement Membrane (Basal lamina)
 - This membrane structure is the border between epidermis and dermis.



Dermis

The dermis is a structure similar to the connective tissue and it has a high amount of fibroid and reticular proteins (collagen und elastin). Together, they form the typical connective tissue of the dermis. From a technical point of view, this skin layer is the main component of the old material leather. Due to tanning and under removing the epidermis and the subcutaneous tissue, the product leather is obtained.

An essential difference between dermis and epidermis is the lack of blood vessels inside of the epidermis. While the dermis covers its need of oxygen through the blood vessels, the epidermis receives it from deeper skin layers or from the outside air.

Simplified, the dermis can be regarded as the “actual” skin and the epidermis “only” as a protective layer that protects lower, vital parts and that is responsible for the exterior.

Subcutaneous Tissue (Subcutis)

The main function of the subcutaneous tissue is to store fat and water. Moreover, it is a “shock absorber“ which is crucially responsible for the mechanical protection of deeper layers against pressure and shocks from the outside.

Skin Appendages

Skin appendages belong to the skin as well. They include:

- ◆ Hairs
- ◆ Nails
- ◆ Oil and sweat glands

Skin diseases (dermatosis) are often disfiguring and therefore, they impair the social acceptability of the ill person.



The size of the skin clearly indicates that it is our most important organ.



Functions of the Skin

Predominantly, the skin protects deeper layers of the body and stores fat and water. The skin also forms the outer appearance at the same time. Occasionally, this high social meaning is a psychological component which is underestimated, but which explains the high emotional stress caused by skin diseases (dermatosis).

The protection against harmful substances invading from the outside (exogenous noxa) is executed by the epidermis, especially by the cornified / horny layer. Harmful substances are kept away from the deeper dermis which is supplied with blood. If the noxa were able to invade these blood vessels or the lymph vessels, the entire body would be stressed / poisoned (so-called systemic absorption of harmful substances). Simultaneously, the cornified / horny layer is the dominant evaporation barrier which protects the body from massive water loss. An epidermis without a cornified / horny layer would evaporate as easily as a puddle of water. The skin has relatively few metabolic functions, but the formation of vitamin D is important since it influences the maturity of bones. In former times of famine, rickets (a form of nutritional bone tenderness) was a widely spread childhood disease.

Size of the Skin

- ◆ **Weight:**
 - With up to 10 % of the body weight, the skin is the heaviest organ of the human being.
- ◆ **Surface Area:**
 - With 1,5 – 2 m², the skin is the largest human organ as well.
- ◆ **Thickness:**
 - 1 – 4 mm, dependent on the body site. In the face, especially around the eyes, the skin is at its thinnest. In the palm of the hands and on the sole of the feet, the skin can be distinctly thicker since there is massive cornified / horny skin.
 - The thickness of the epidermis mostly is 0,1 mm and the one of the cornified / horny layer is 0,01 – 0,5 mm.
 - However, these thin skin layers are crucial for the protection against exogenous noxa.
- ◆ **Layers:**
 - Three main layers

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