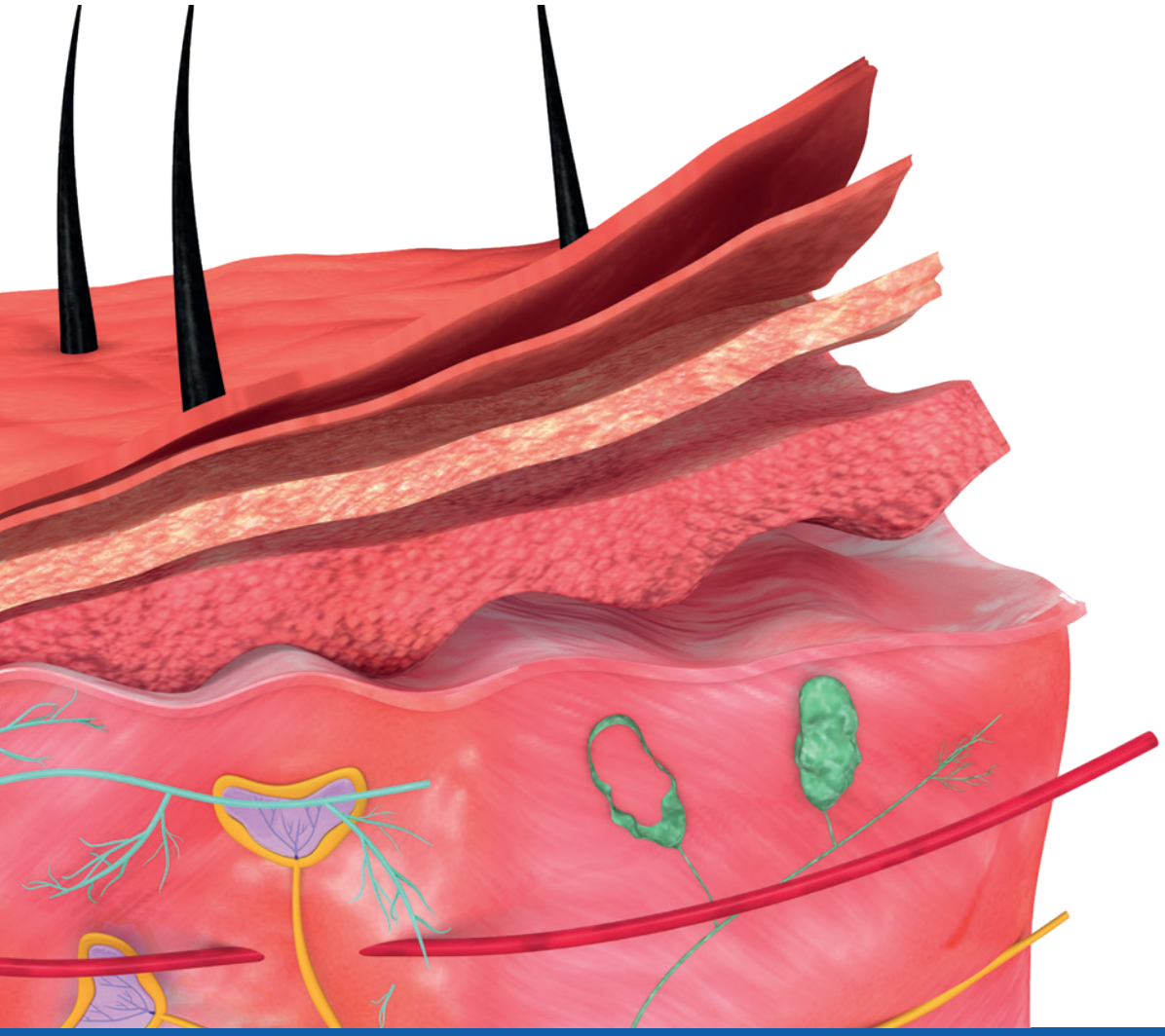
Integumentary system

The integumentary system consists of the skin, hair, nails, glands and nerves.

Functions

Its main function is to act as a barrier to protect the body from the outside world, but also retains body fluids, protects against disease, eliminates waste products and regulates body temperature.



Protection

- The skin is one of the first defence mechanisms of the immune system
- Provides a protective barrier from the environment and pathogens
- Helps to protect internal organs from impact and prevents them from dehydrating
- Nails protect the exposed tips of fingers and toes from physical injury
- Hair helps to protect the scalp from damaging ultraviolet radiation, cushions the head from physical blows and, and to a degree, insulates the scalp

Excretion

- Excretion is the formation of waste substances, such as sweat and urine, that are removed from the body
- Some metabolic wastes, electrolytes and water are lost by sweating

Sensation

- The skin houses numerous receptors (part of the nervous system) that function in the perception of external stimuli such as pain, pressure and temperature

Temperature regulation

- The nervous system regulates body temperature through the skin by controlling sweating and dermal blood flow
- The stimulation of sweat glands results in increased sweating that cools the body
- The dilation of dermal blood vessels helps cool the body, and their constriction helps reduce heat loss from the body

Production of Vitamin D

- In the presence of sunlight a sterol is converted to vitamin D3
- Vitamin D3 plays an important role in the intestinal absorption of calcium and in the regulation of phosphate

Structure

The skin has three main layers:

Epidermis - an elastic layer on the outside which is continually being regenerated.

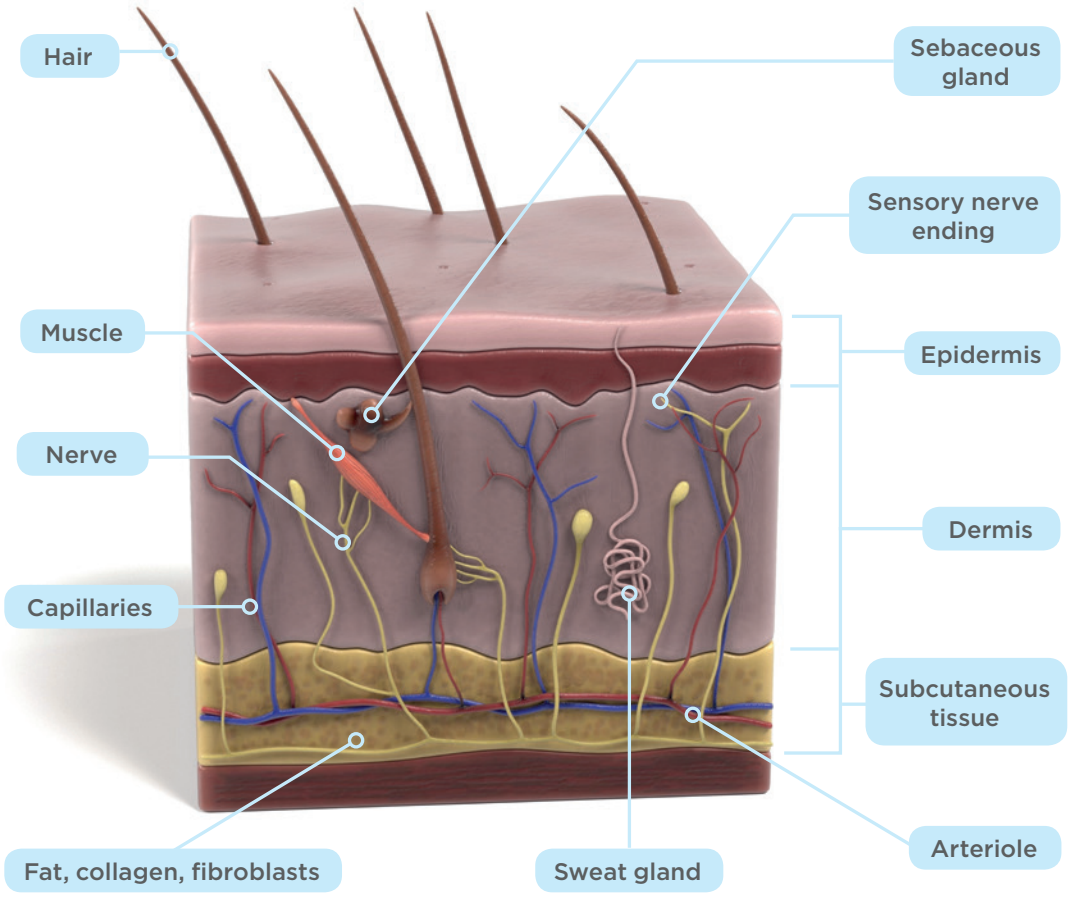
Dermis - a thick layer of fibrous and elastic tissue made mostly of collagen, elastin and fibrillin, giving the skin its flexibility and strength. The dermis contains nerve endings, sweat and oil (sebaceous) glands, hair follicles and blood vessels.

Subcutaneous - a tissue layer that assists with stability of body temperature, acts as a passageway for the nerves and blood vessels from the dermis to the muscles, and helps to protect the bones and muscles from damage.

How the skin heals itself

Skin can be damaged by laceration, graze, pressure, tear, bruise, burn or puncture. This may occur as a result of an accident, surgery, exposure to heat or as a result of immobility. Skin requires a good blood supply to function and if it is deprived of oxygen (transported in the blood), it could result in a pressure ulcer.

To heal, red blood cells help create collagen which are tough, white fibres that form the foundation for new tissue. The wound starts to fill with new tissue, called granulation tissue and the new skin begins to form over this tissue. As it heals, the edges pull inwards and the wound reduces in size.

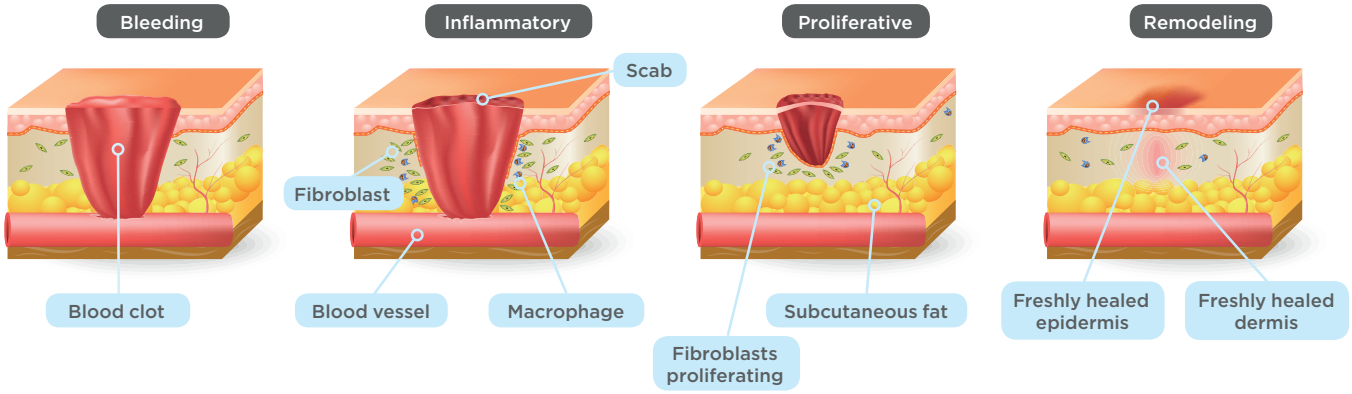


Facts

- The skin is only a few millimetres thick yet is by far the largest organ in the body
- The average person's skin weighs 4.5 kilograms and has a surface area of almost 1.85 square metres
- It is the most visible organ system and one of the most complex
- It receives approximately one third of all the blood circulating through the body
- The average person has about 300 million skin cells
- A single square inch of skin has about 19 million cells and up to 300 sweat glands
- Every minute our skin sheds 30,000 dead cells
- Lipids are natural fats that keep the outer layer of skin moist and healthy
- Skin colour is the result of a protein called melanin
- Large tentacle-like cells called melanocytes produce and distribute melanin
- Melanin is also responsible for eye colour
- The skin covering the eye is transparent

Integumentary system

Woundhealing

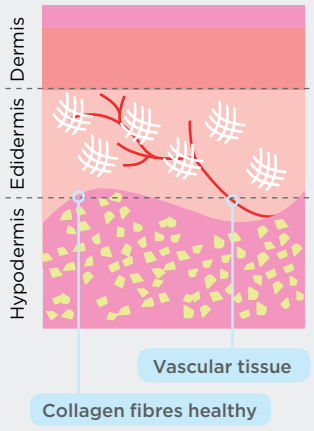


The ageing process

As we age, our stem cells lose their potency and the skin loses its ability to repair. The result can be fine lines, wrinkles, age spots, sagging skin and hair loss.

20s

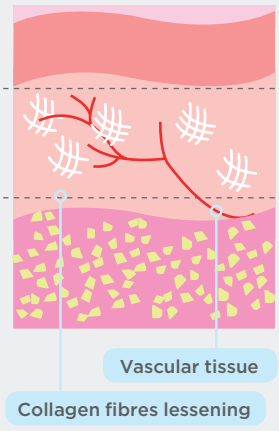
Free radicals attack surface. Environmental damage is high



▶ Constant exposure to the sun and a fast paced lifestyle leads to skin's premature ageing.

30s

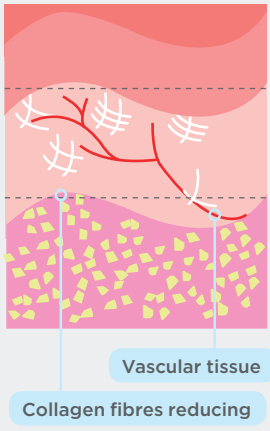
First signs of ageing appear. Dull, lackless, lifeless skin



▶ Skin regeneration is reducing, leading to dull complexion & uneven skin tone. Use of harsh skin care can become apparent. Elastin degredation can show first signs of ageing.

40s

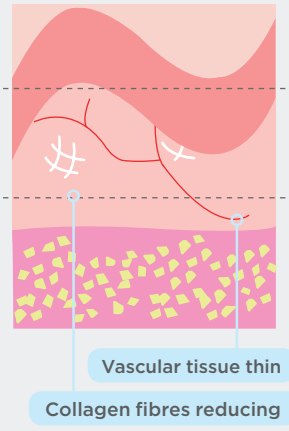
Significant dullness, ageing & dark spots. Skin sensitivity



▶ Skin thinning can cause sensitivity, redness, dry, oily, sudden redness. Photo ageing appears - dark spots – more prominent signs of ageing appear.

50+

Significant tension decrease. Moisture retension slowing



▶ Decrease in surface tension impairs skin structure and ability to defend itself. Barrier lessens leading to less efficiency in retaining moisture. Combined with excessive dryness sometimes accompanied by adult acne.

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