

SKIN - INTEGUMENT  
(INTEGUMENTUM COMMUNE,  
CUTIS)

# INTEGUMENT

skin

accessory skin organs

Keratinized skin derivatives - hair, nail

Skin glands - sebaceous

sweat

\* Mammary gland

\* small eccrine

\* apocrine (axilla, ciliary, nasal, circumanales....)



# SKIN - INTEGUMENT

## Functions:

- **Protection** (Barrier against biological, physical, chemical agents)
- **Homeostatic** (maintain constant body temperature - in warm-blooded animals, prevents water loss and thermoregulation)
- **Metabolic** - skin respiration, the sweat, sebaceous glands, storage
  - **Secretory** (Seat of other glands - poison, wax, warping, lubricants for hair, pheromones, bearer of individual color - pigments, converts precursor molecules to vitamin D)
  - **Excretory** (sweat)
- **Movement** - cilia, flagella, mucus glands
- **Sensory** (touch, pain and pleasure, seat of sensory organs, communication, emotional states, state of age, health, pathological)



# SKIN

AREA: 1.6 – 2.2 m<sup>2</sup>    THICKNESS: 1.5 – 4 mm    HEAVY: 4.5 kg

- **largest organ** of the body, with a total area of about 20 square feet.
- emotional states, state of health, age, pathological states (cyanosis, rash)



Head and neck = 9%

Upper limbs = 18%

Trunk = 36%

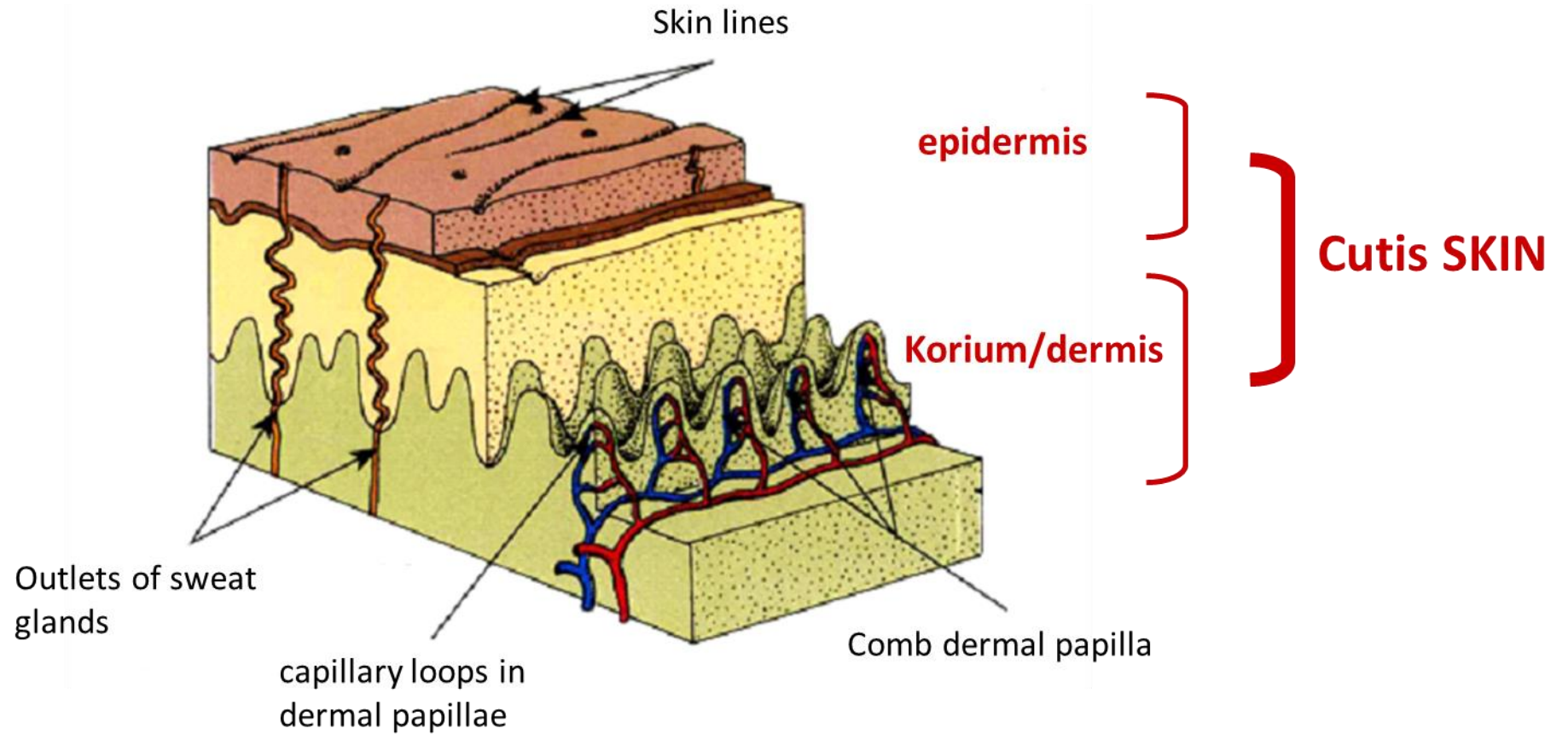
Lower limbs = 36%

Genitoanal region = 1%



# Structure of the skin

- The epidermis
- The dermis



# Epidermis

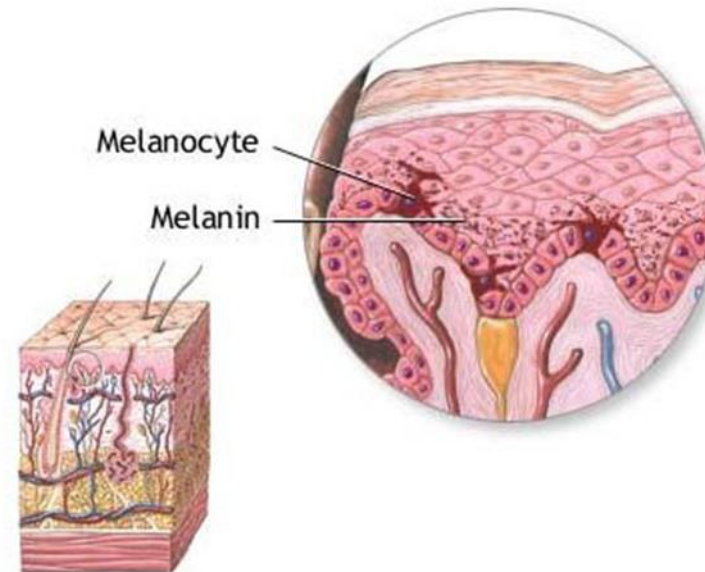
the outermost layer of skin, provides a waterproof barrier and creates our skin tone, 5 layers

The average thickness of 0.1 mm

Formed **multilayered squamous keratinised epithelium**

It contains **keratin** - a protein that is contained in the horny cells

**Melanin** - dark pigment which is produced by melanocytes that are in the deeper layers - absorbs the ultraviolet component of solar radiation



## Keratinization

- cells die and produce outer layer that resists abrasion and forms permeability layer

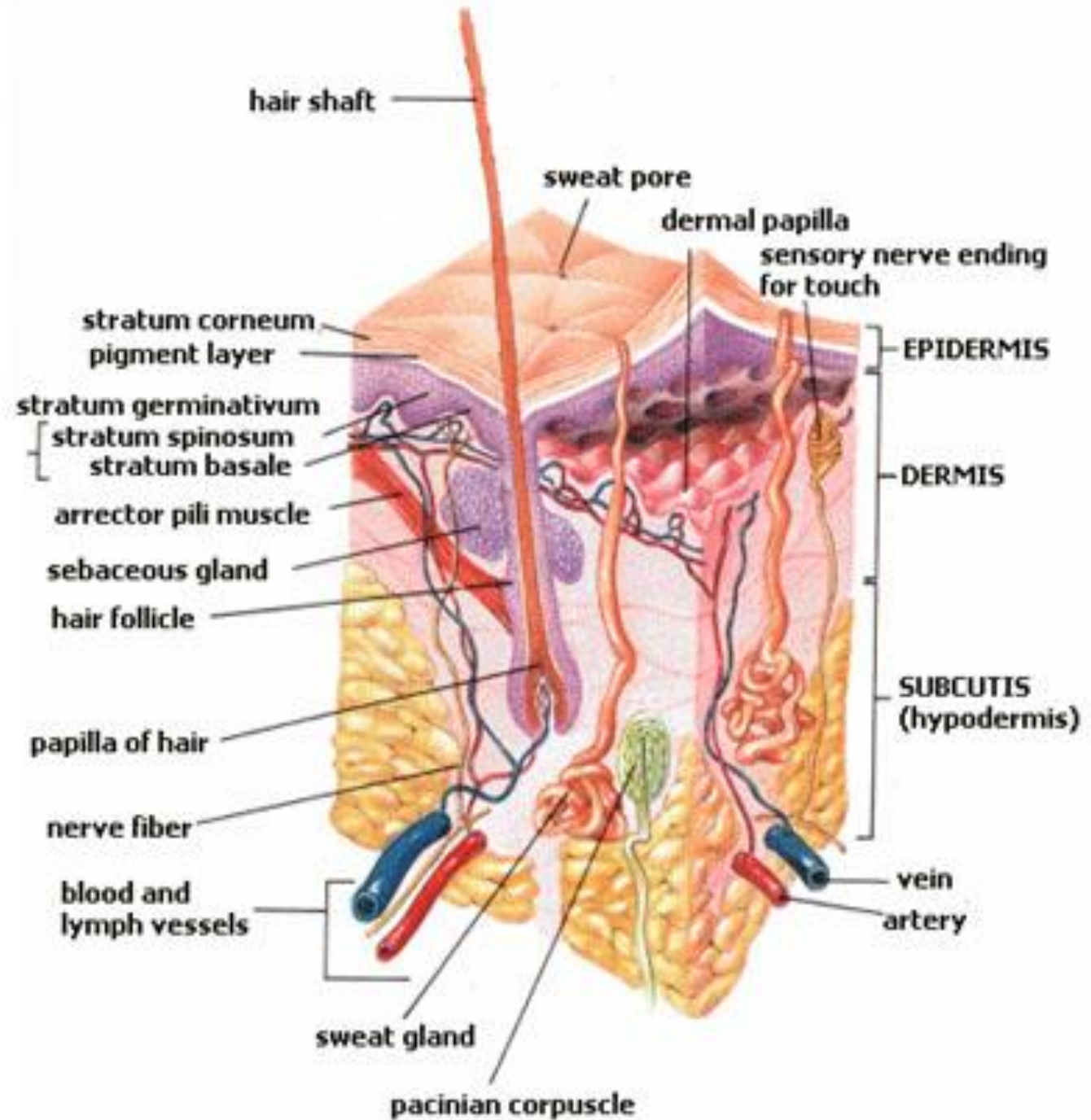
**EPIDERMIS**  
(0.03 – 0.1 mm)

**Str. basale**  
**Str. spinosum**  
**Str. granulosum**

**Str. lucidum**  
**Str. corneum**

**Keratinocytes**  
**Keratin**

**4 weeks**





## SKIN'S COLOR

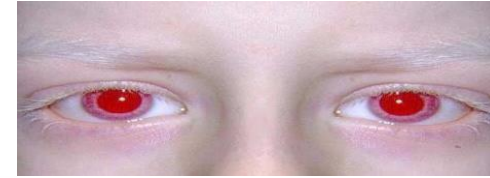
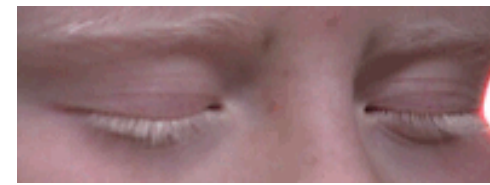
Melanocytes - melanosomes - melanin  
Melanocyte stimulating hormone



The skin's color is created by special cells called melanocytes, which produce the pigment melanin. Melanocytes are located in the epidermis.



**Albinism**  
color variation  
in living organisms caused  
by impaired formation  
of melanin pigment



**Melanocytic naevi (moles)**



is a type of lesion that contains nevus cell (a type of melanocyte)

**Melanoma**

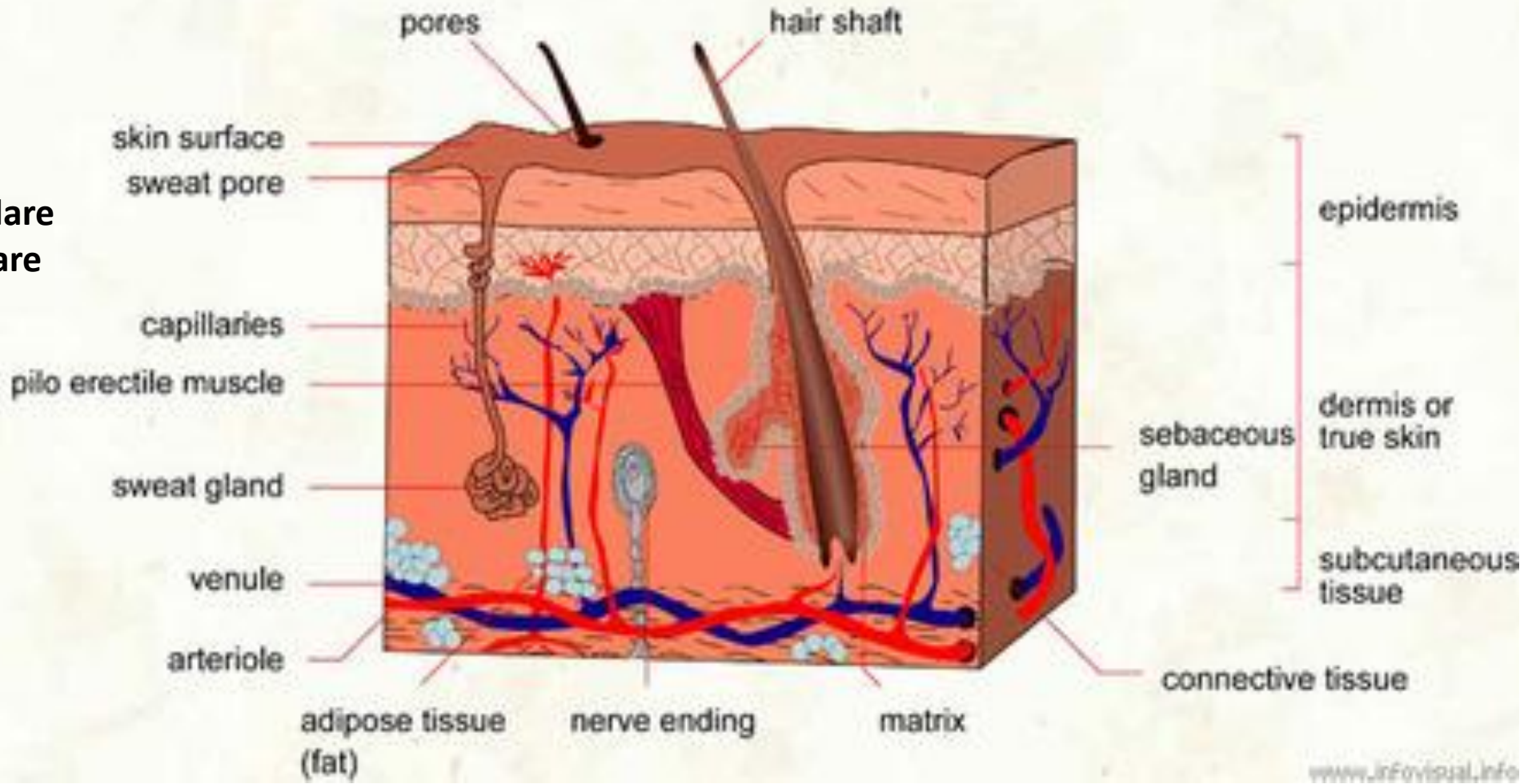


**7-dehydrocholesterole → vitamin D3 (cholecalciferole)**

# Dermis (corium)

- beneath the epidermis, contains tough connective tissue, hair follicles, and sweat glands
- fibrous layer
- Strong 0.5 to 2.5 mm
- The undulating papillary layer (dermal papillae) arches against the skin
- 2 layers: superficial - underneath epidermis - loose connective tissue
- deeper - dense connective tissue, stretch marks (striae)
- Contains receptors sensitive to changes in pressure, temperature, cold and pain:
  - Ruffini bodies - the heat
  - Krause bodies - cold
  - Vater - Pacciniho bodies - feeling
  - Free nerve endings - pain
- Connective cells and elastic fibers - provide flexibility, stretchability and strength,
- makes the direction of the digestibility of the skin (important during operations)
- Skin bar - on the balls of your fingers - it creates a characteristic drawing - dactyloscopy  
Contains glands - sebaceous and sweat
- It contains hair follicles

# CROSS SECTION OF SKIN



stratum reticulare  
stratum papillare



# Skin relief

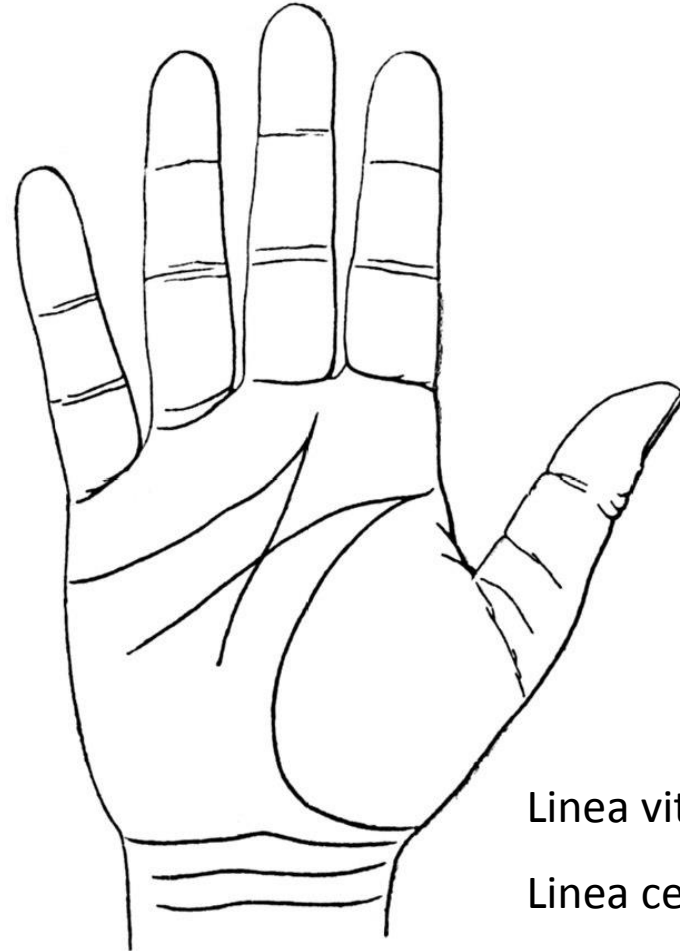
## \* Skin furrows

creases

fine furrows

## \* ridges

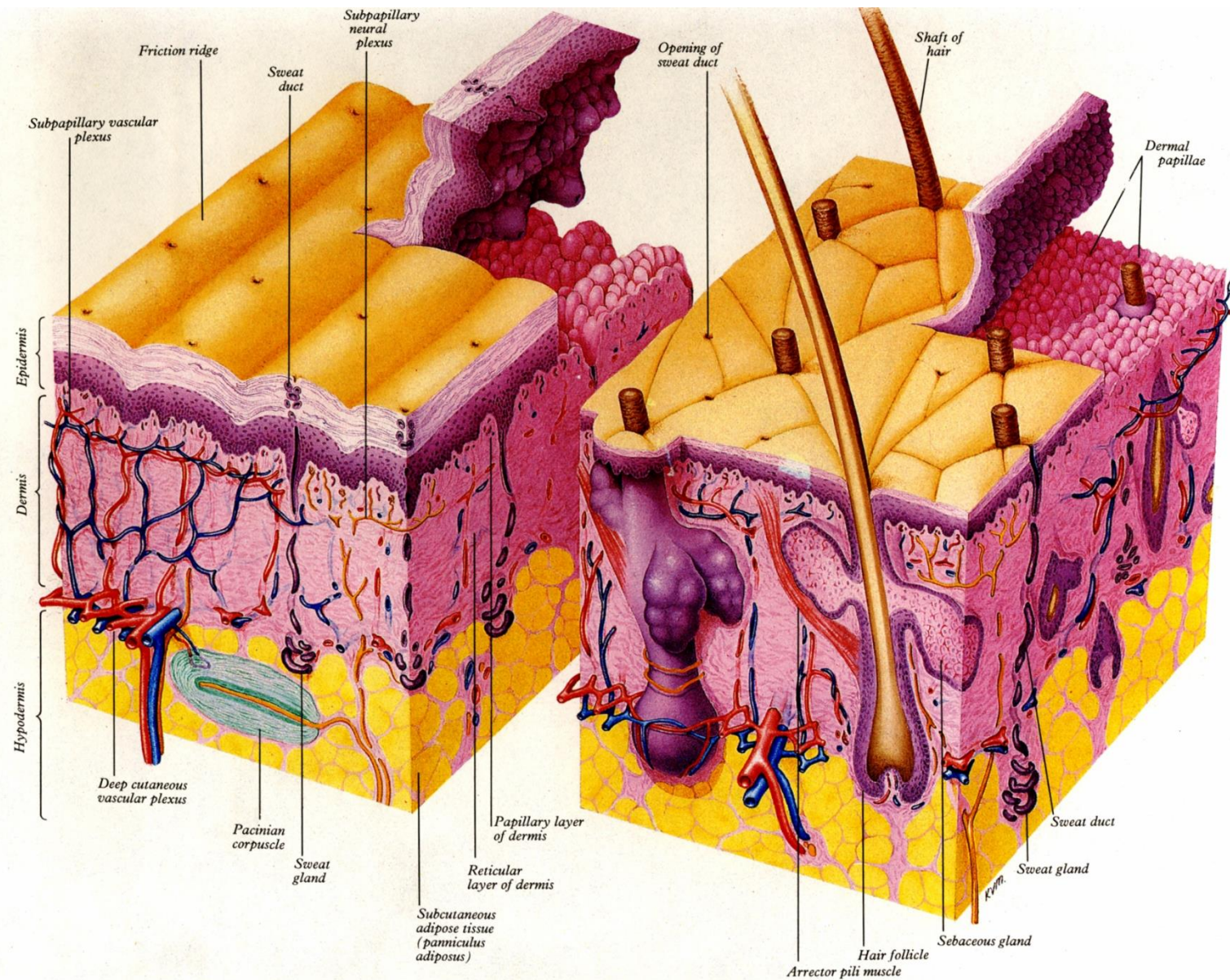
tactile strips



Linea vitalis

Linea cephalica





**Cristae cutis**

**Areae cutaneae**



## PAPILLARY RIDGES

Whorl

Loop

Arch



1.89 Photographs of the palmar aspect of a terminal phalanx in three different individuals to show the major types of pattern of the fingerprint

ridges. The pattern in A is commonly termed a whorl; B is composed of loops; C is composed of arches. Note interphalangeal flexure lines.

Lines and grooves

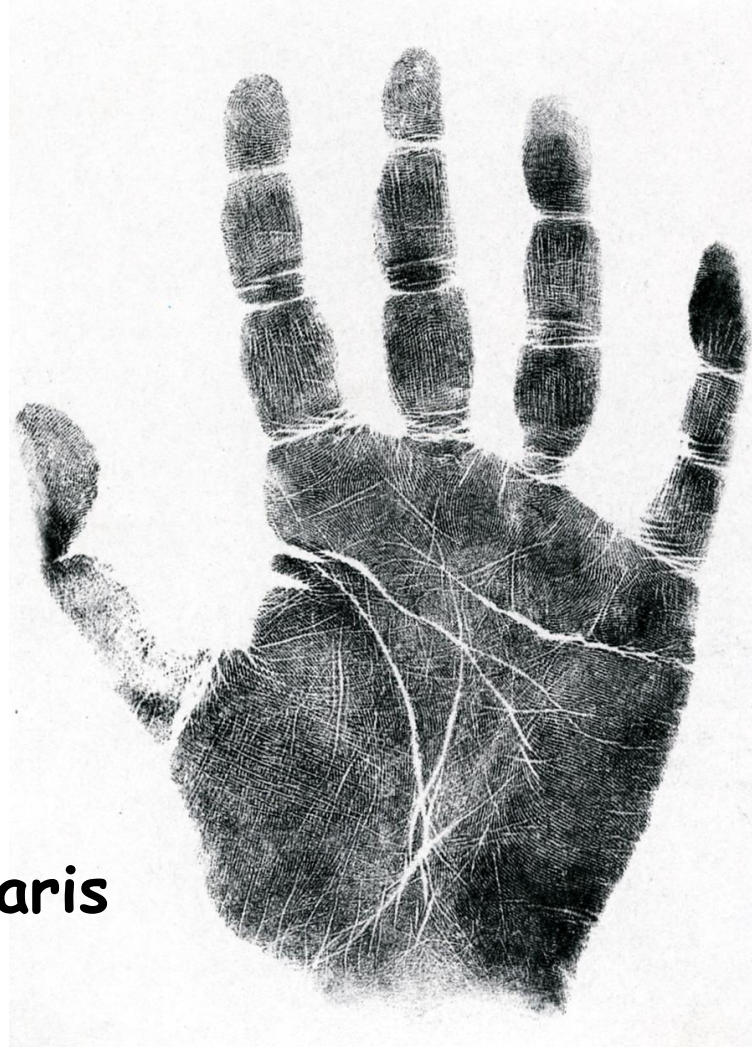
Sweat pore

Tactile strips



# Imprint of a right hand

Toruli tactiles

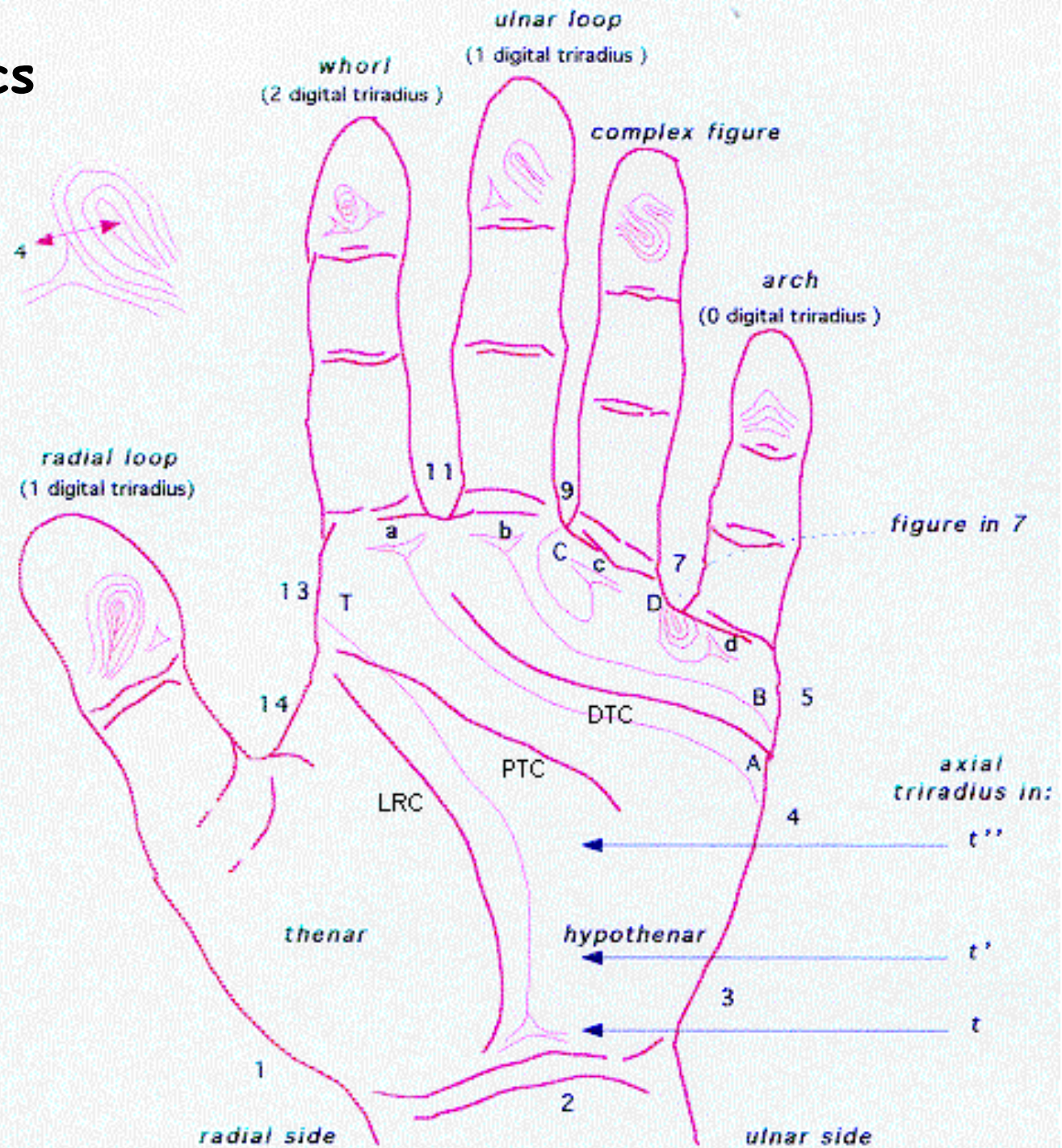


Eminentia thenaris

Eminentia  
hypothenaris

The basis of **fingerprint identification** is the premise that the configurations formed by the **raised ridges of the palmar surface of the hands are unique** and do not undergo any natural changes, except growth, from fetal life under decomposition.

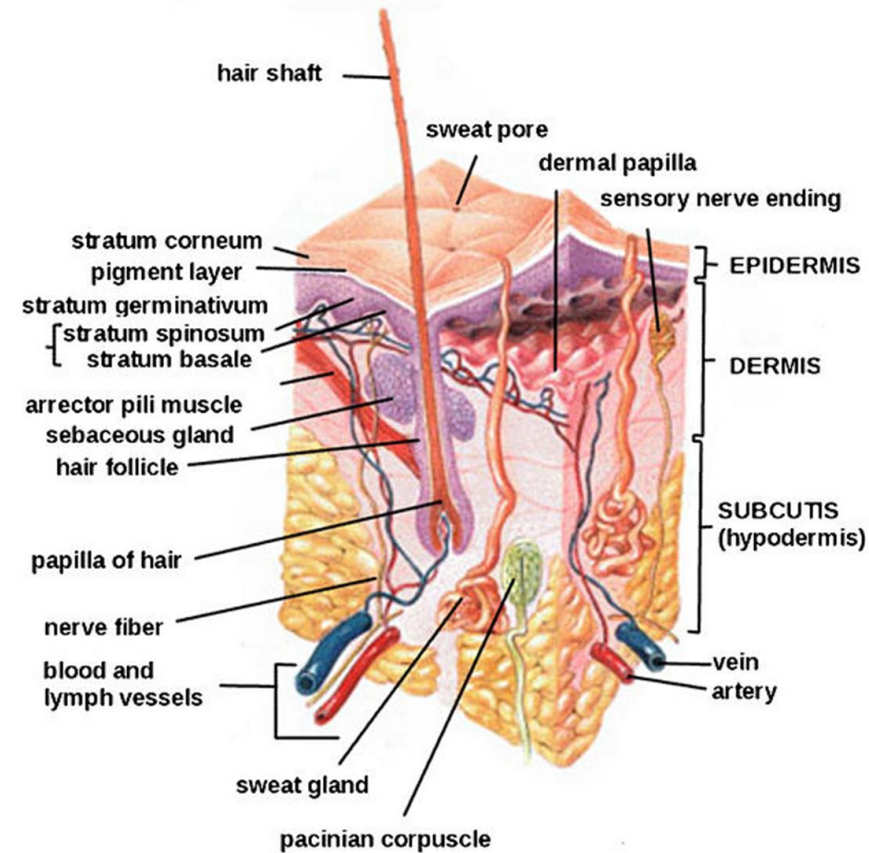
# Dermatoglyphics





# Hypodermis (deeper subcutaneous tissue)

- Subcutaneous adipose tissue:  
Loose connective tissue rich in fat cells
- Skin rests on this, but not a part!
- Also called:
- Subcutaneous tissue
- Superficial fascia  
The strongest on the abdomen, buttocks and thighs  
Method of influencing the distribution of sex hormones

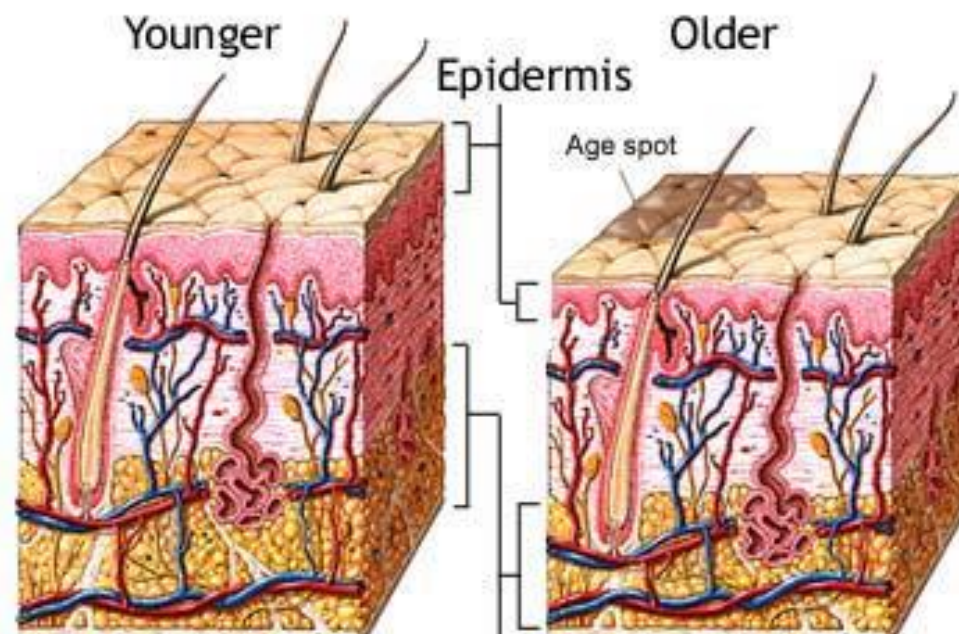




# SKIN AGING



Aging spots



Younger

Older

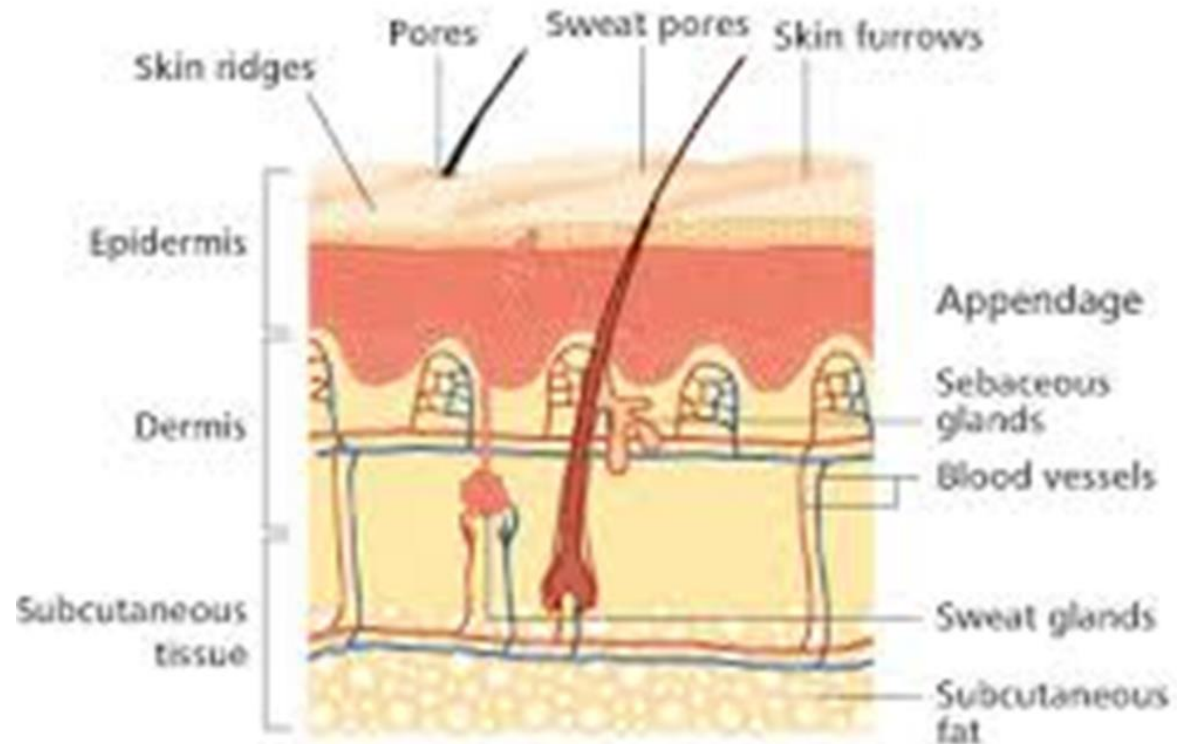
Epidermis

Age spot

Subcutaneous fat layer

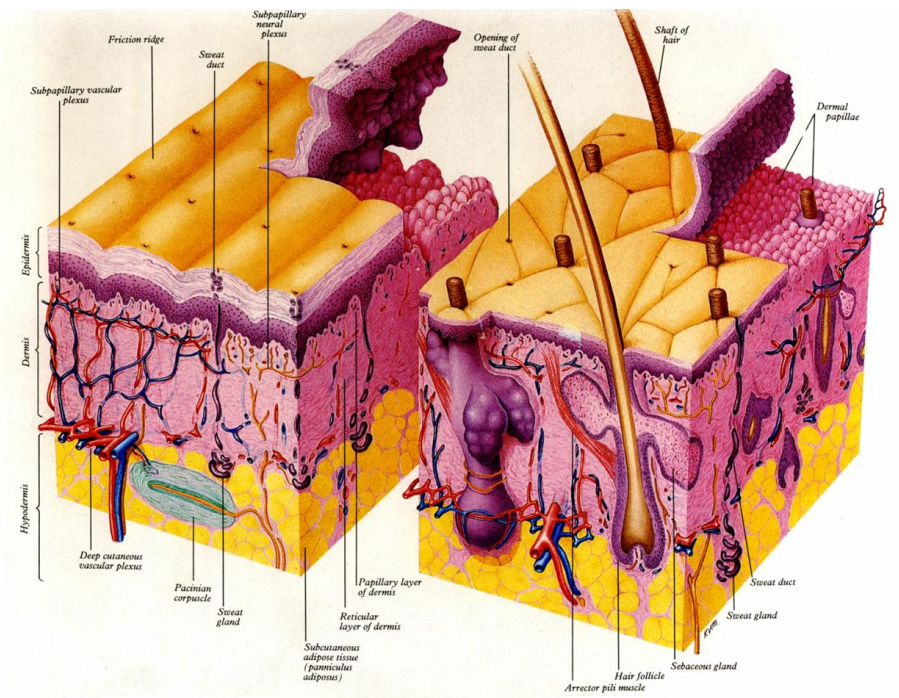
# Accessory skin organs

- Horny skin derivatives - hair, nails and hair
- Skin glands - sebaceous and sweat



# Hair

- They develop from the hair follicle
- to the hair vagina opens sebaceous gland
- Erector hair - smooth muscle - goose skin
- Hair found everywhere in the body except:  
palms,  
soles,  
lips,  
nipples,  
parts of external genitalia and  
distal segments of fingers and toes



Hairless (glabrous)

hairy (hirsute)



# PILUS

60 - 600/cm<sup>2</sup>

Scapus pili

Radix pili

Folliculus pili

Bulbus pili

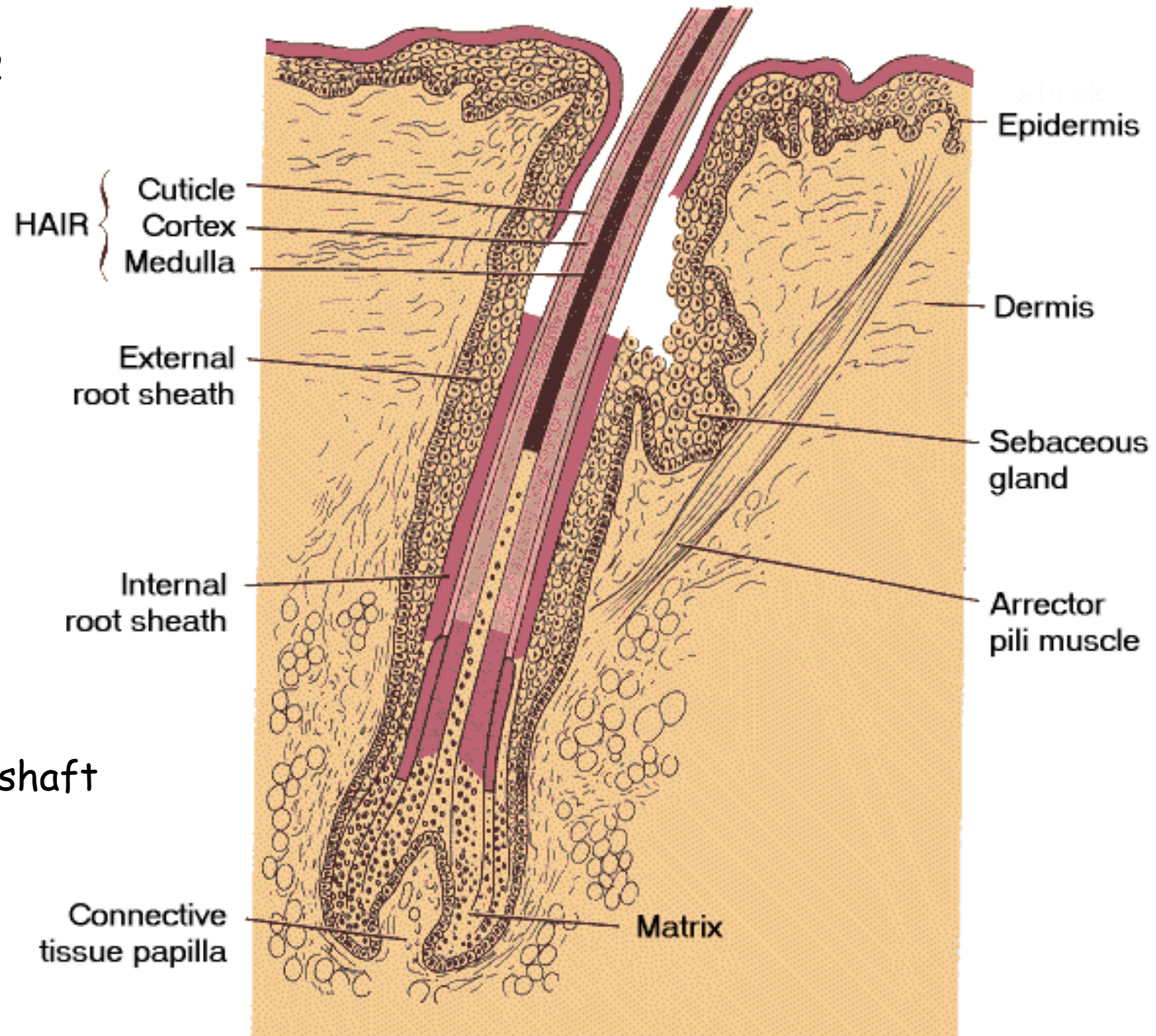
Papilla pili

Medulla pili

Cortex pili

Cuticula pili

Hair: follicle (hair bulb), root, shaft



# TYPES OF HAIR

\* **Primary hair** (lanugo, Flumina pilorum  
Vortices pilorum  
Hypertrichosis lanuginosa)



\* **Secondary hair** (hairs all over the body, hair, eyelashes, eyebrows)  
Pili, Capilli, Cilia, Supercilium



\* **Tertiary hair**

It grows in maturity under the influence of sex hormones:

total - hair all over the body

local - hirci - armpits, pubes - pubic landscape, beard - barbae,

tragi - hairs at the entrance to the external auditory canal

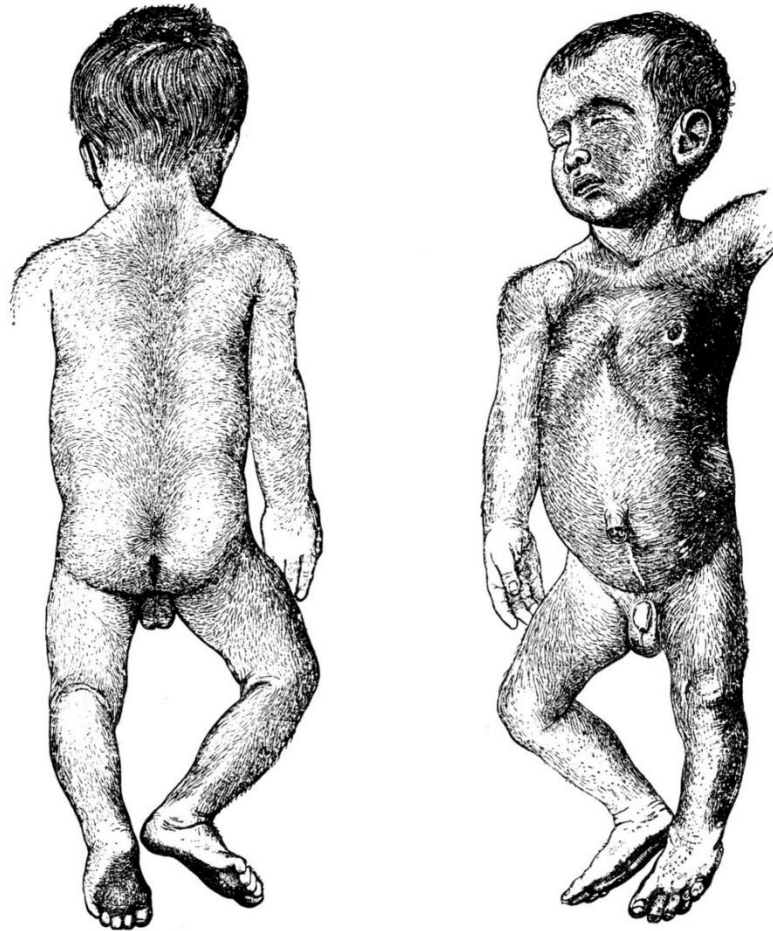
vibrisae - hairs at the entrance to the nose

Sinus hairs



## Primary hair - lanugo

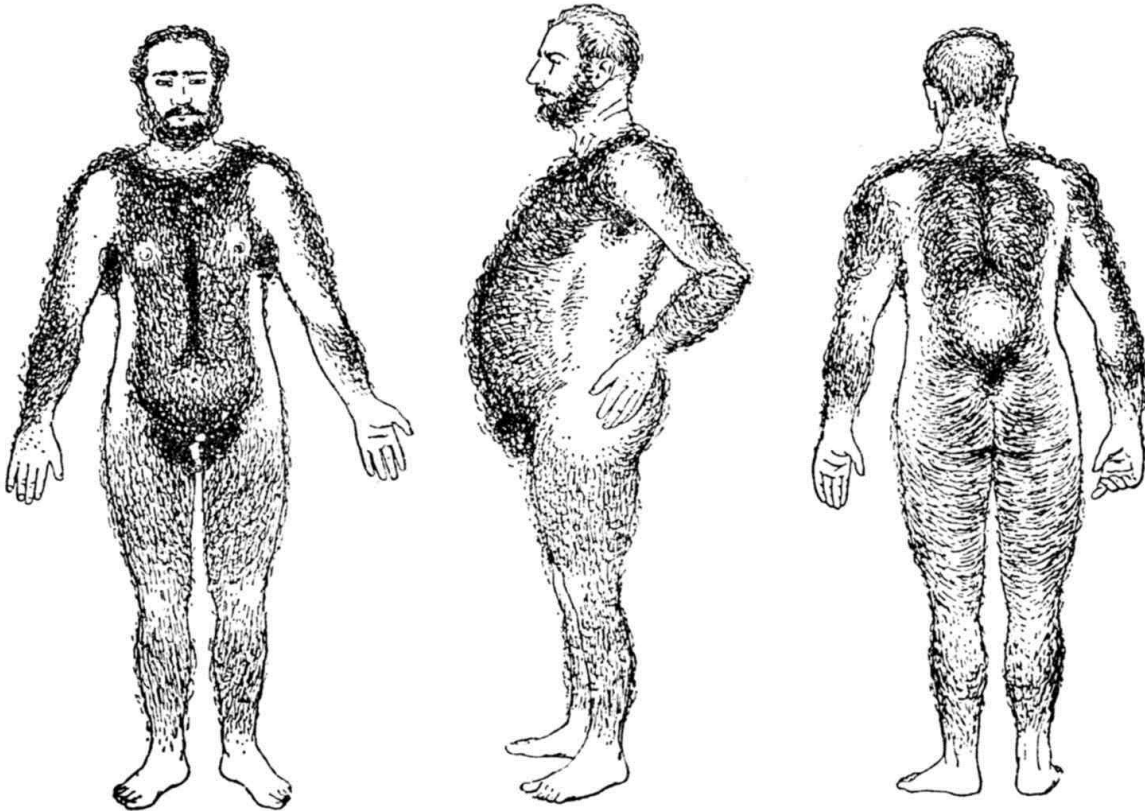
Flumina pilorum  
Vortices pilorum



Maximum development 7. to 8. month i. u. , before the birth fading into the amniotic fluid, the fetus partially swallows and it arises from his in first stool (meconium)



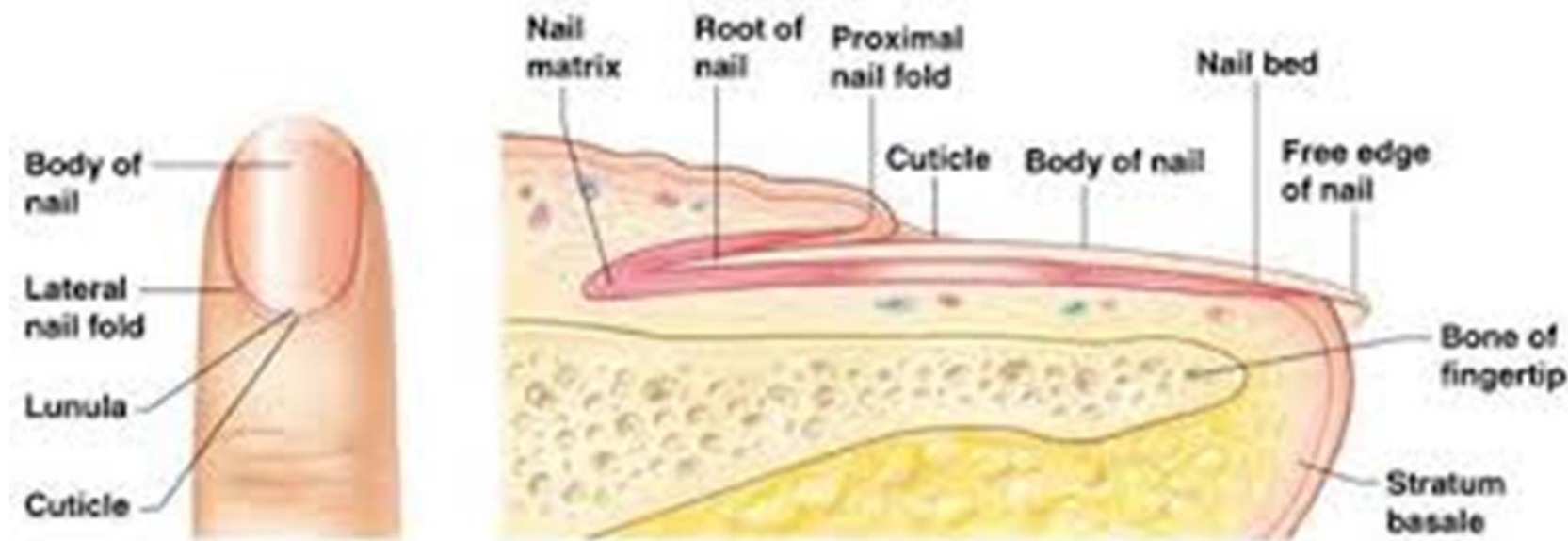
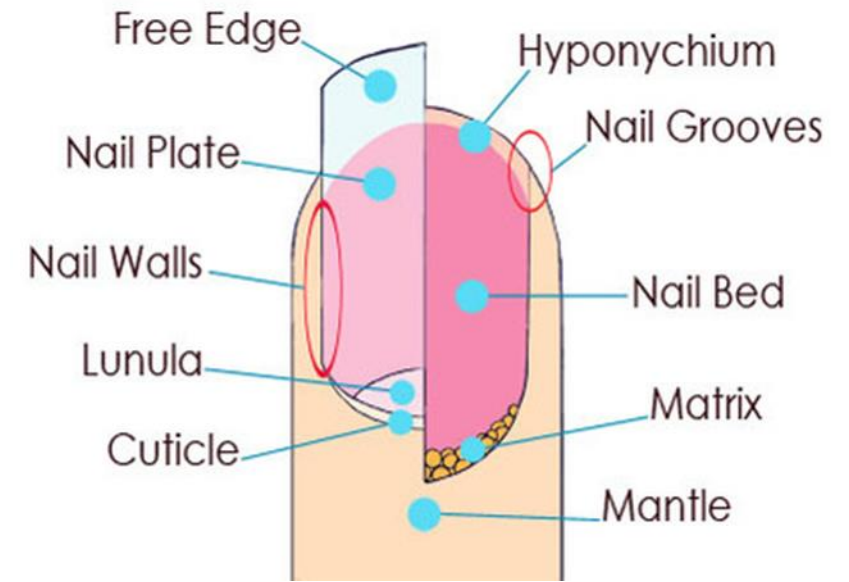
# Hirsutism



Hypertrichosis vera

# Nail - UNGUIS

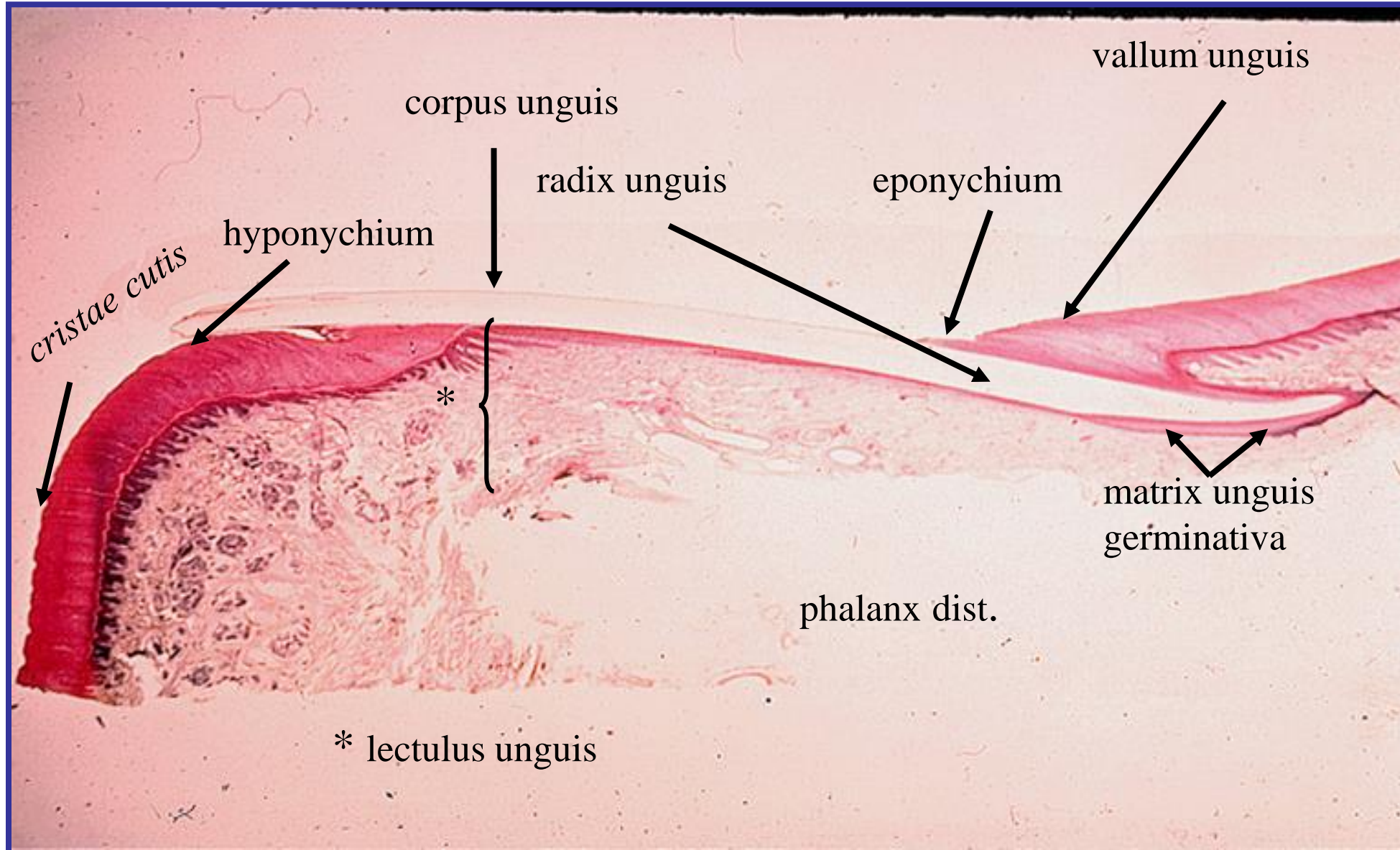
- It grows from the nail bed
- Overlaps the end phalanges



# UNGUIS (ONYX)

0.5 – 1 mm

# lunula unguis





## Oil/sebaceous glands

- Alveolar glands near the hair follicles
- Composition of sebum - fatty substances, proteins and salts
- Function of sebum - softens the skin and protects it from getting soaked

Sebum

Meibomian glands

Holocrine type of gland

Comedo - acne



# Sweat glands

- Thin blobby glands in the dermis
- Opens with separate ducts to the skin surface
- Maximum- forehead, palms and soles
- Composition of sweat - water, fatty acids and some organic substances (urea) and minerals
- The function of sweat - protection against microbes, heat regulation



- **GLANDULAE SUDORIFERAE**
- Eccrine - sudor - pH 5.5 - 6
- Apocrine glands - scent glands
  - - gl. s. axillares
  - - gl. circumanales
  - - gl. ceruminosae - cerumen
  - - gl. s. nasales
  - - gl. ciliares (Moll)
  - - gl. areolares
  - - gl. mammae

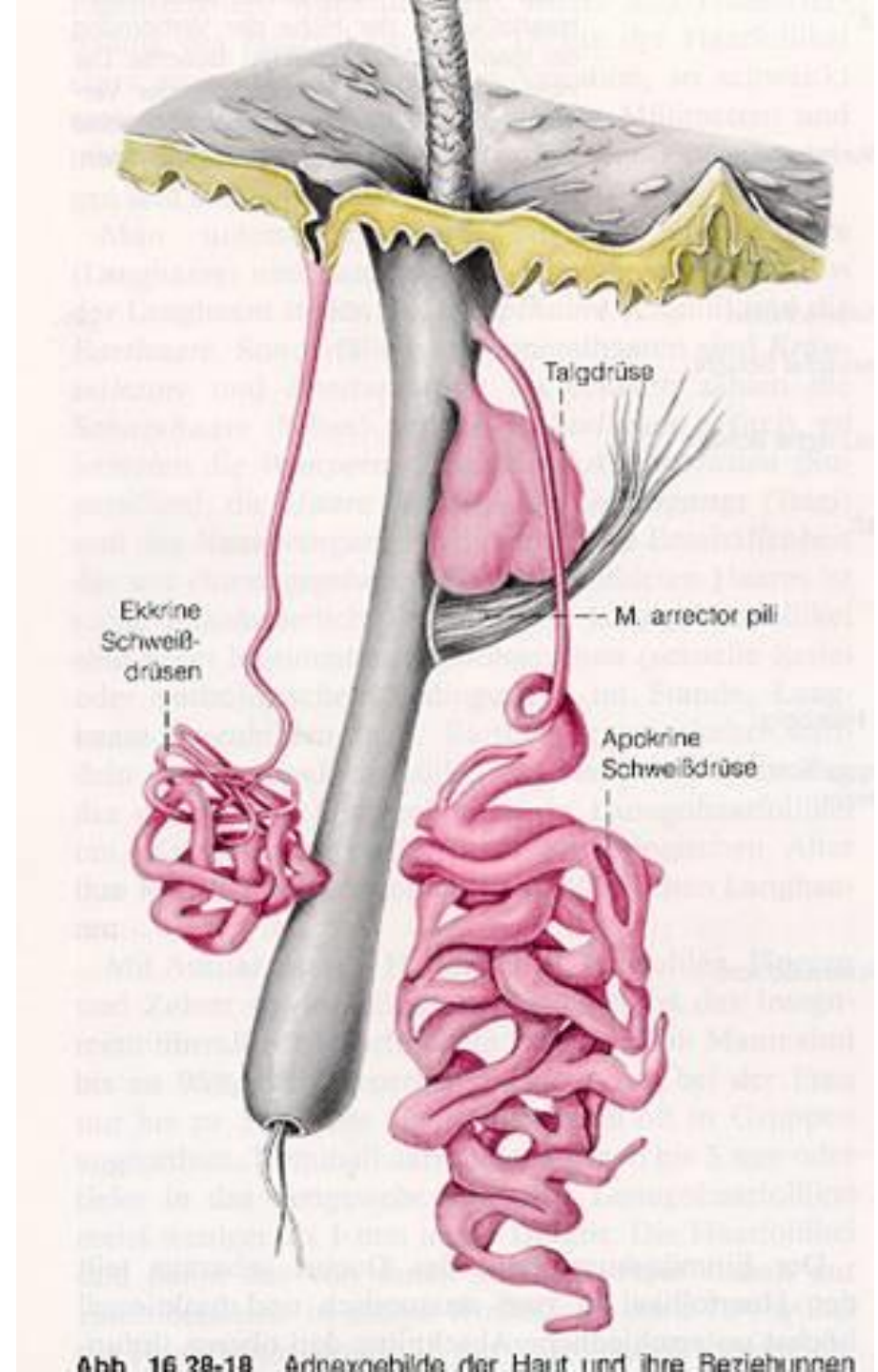
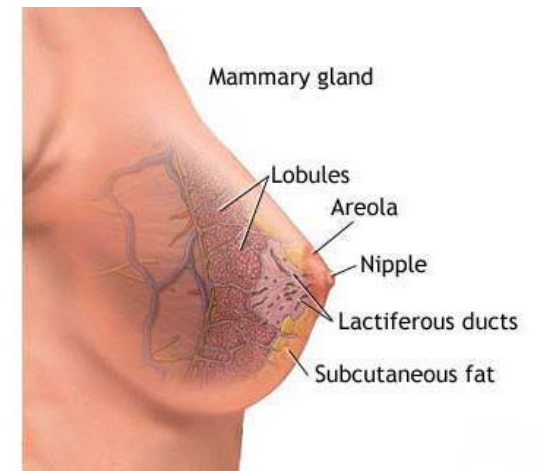


Abb. 16 28-18. Adnexgebilde der Haut und ihre Beziehungen



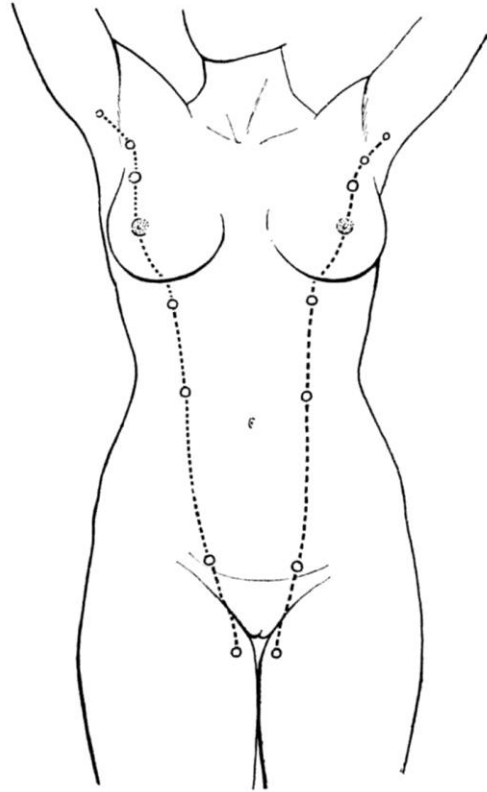
# Mammary gland

- Based in both sexes
- At puberty, the influence of sex hormones creates only in women
- Paired gland
- Stored in fat breast - mamma
- It contains 15 to 20 lobes
- Glandular outlets are gradually combined to galactophore
- Teat - papilla mammae - common outcome galactophore
- The shape and size of the breast depends on the size of the gland, fat tissue and the age and number of pregnancies
- Fully developed function of the mammary gland is at the end of pregnancy and during lactation



<http://medicalterms.info/anatomy/Mammary-Glands/>

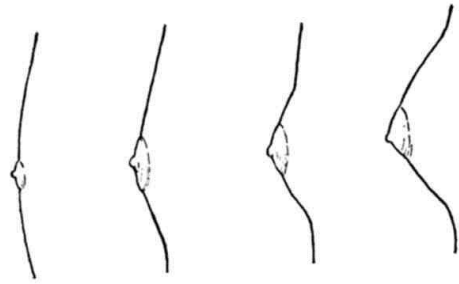
# Milk stripe



During axilloinguinal lines  
Various localization in different groups of mammals;  
Polythelia = supernumerary areola  
Polymastie = supernumerary mammary gland in humans



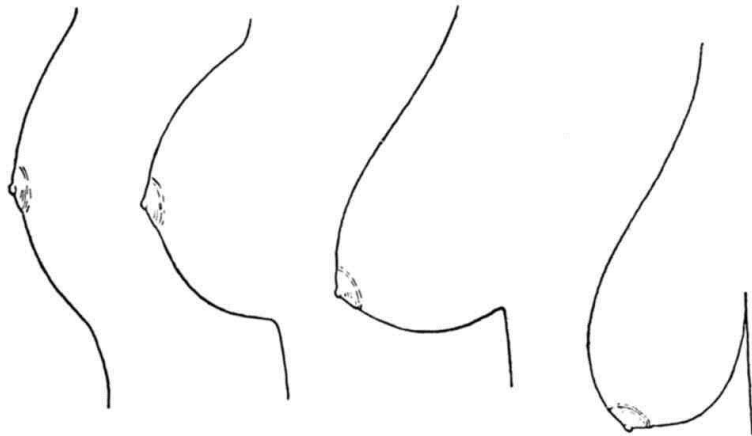
# Developmental stages and types of mammary gland



Infantile mamma

Mamma areolata

Mamma papillata



Mamma disciformis

Mamma sphaeroidea

Mamma piriformis

Mamma pendula



**MAMMA FEMININA**

**Areola mammae**

**Glandulae areolares**

**(Montgomery)**

**Papilla mammae**

**Area cribriformis papillae**



Ductus lactiferi  
Fascia pectoralis spf.  
Tela adiposa premammaria  
Tela adiposa retromammaria  
Lig. suspensorium Cooperi - retinacula cutis





# GLANDULA MAMMARIA

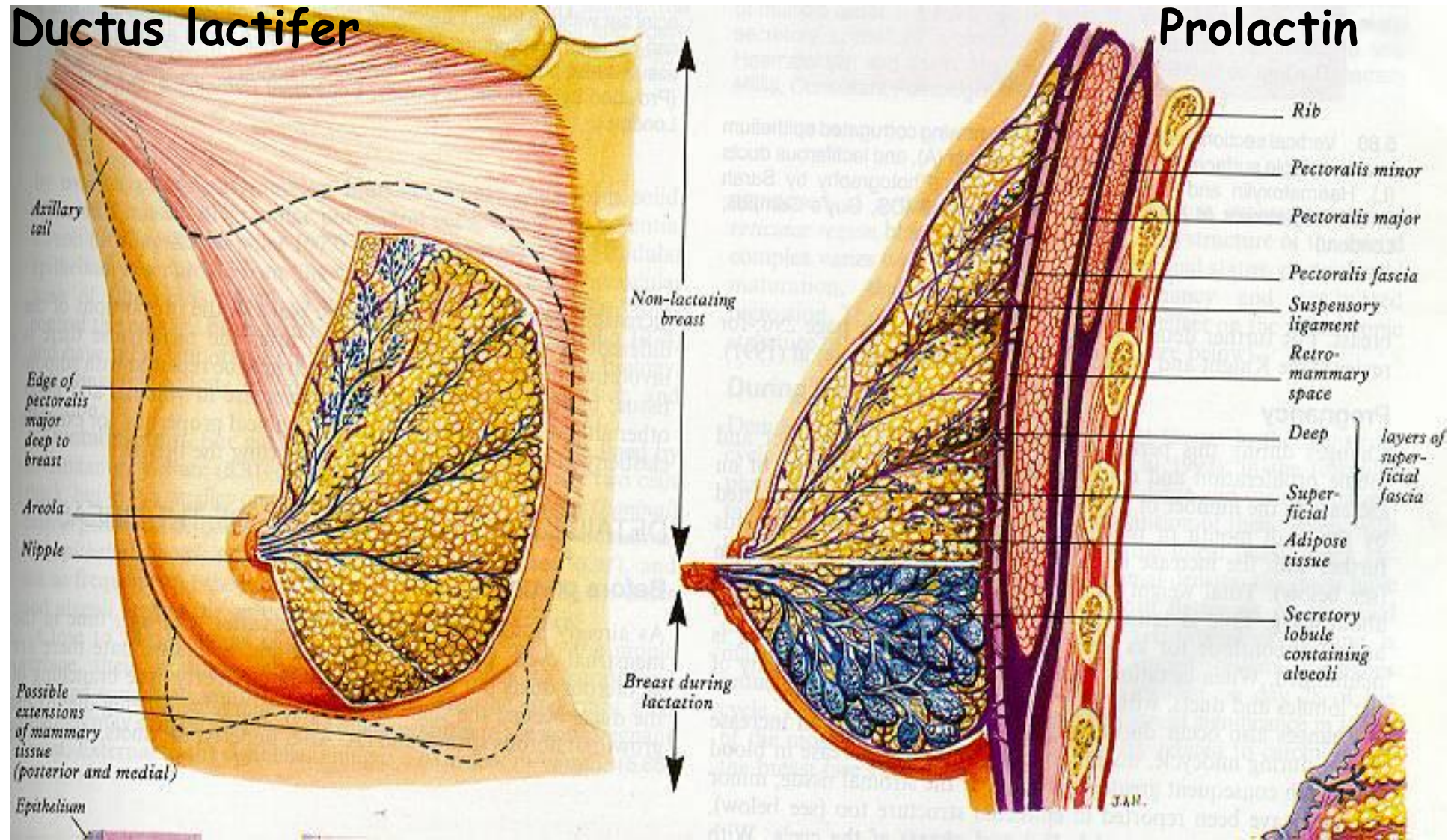
Processus axillaris

Colostrum

15 - 20 lobi mammae - lobuli mammae - alveoli      Lactation

Ductus lactifer

Prolactin





## ARTERIES:

A. thoracica int. -  
rr. perforantes

A. thoracica lat.

Aa. Intercostales

## VEINS:

Circulus venosus Halleri

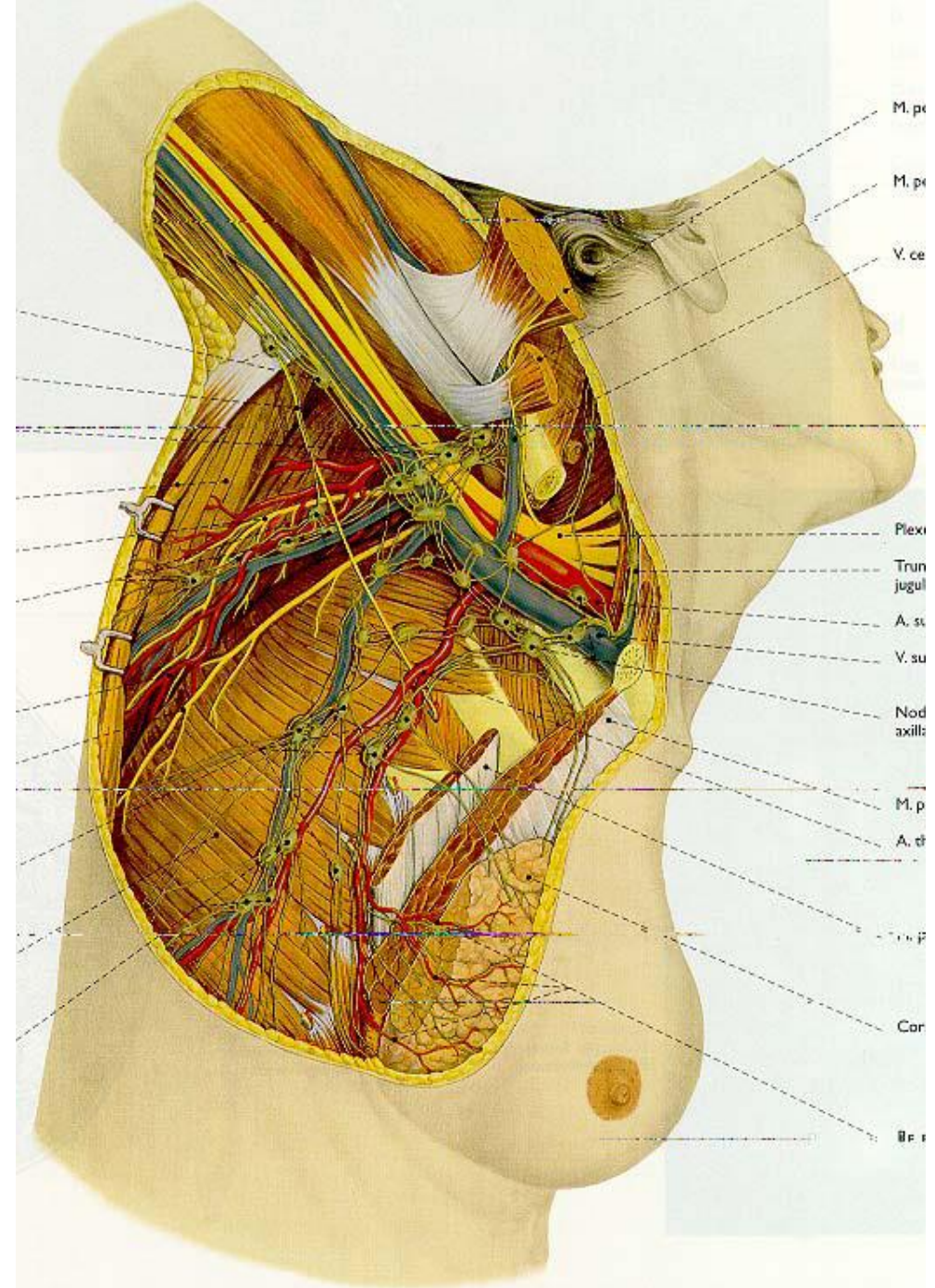
- v. thoracica int., lat.,

- vv. intercostales

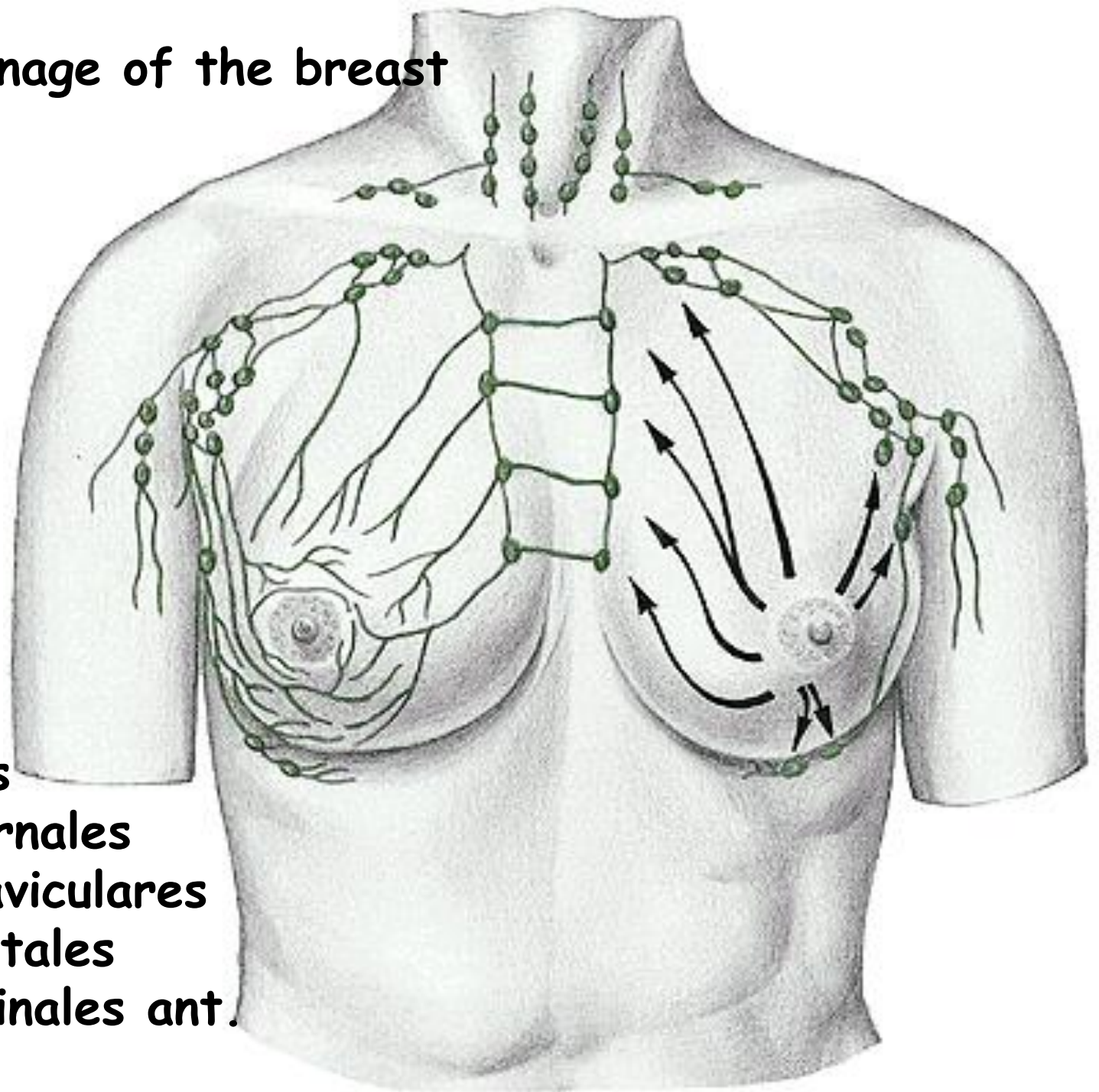
## NERVES:

Nn. intercostales

Nn. supraclaviculares



# Lymphatic drainage of the breast



- nll. axillares
- nll. parasternales
- nll. supraclaviculares
- nll. intercostales
- nll. mediastinales ant.

**MAMMOGRAPHY**

