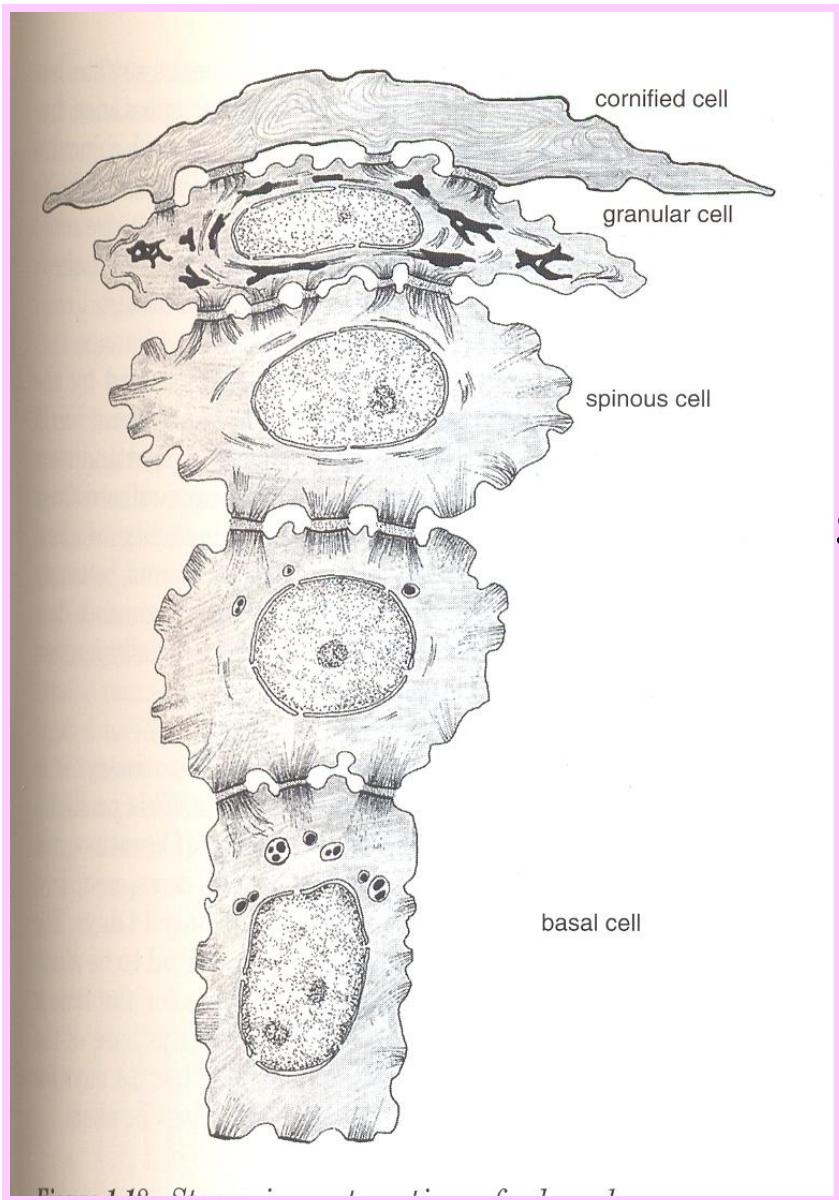


Disorders of keratinization

Neira Puizina-Ivić, Ph.D., Prof.

Epidermis - cell differentiation



stratum corneum

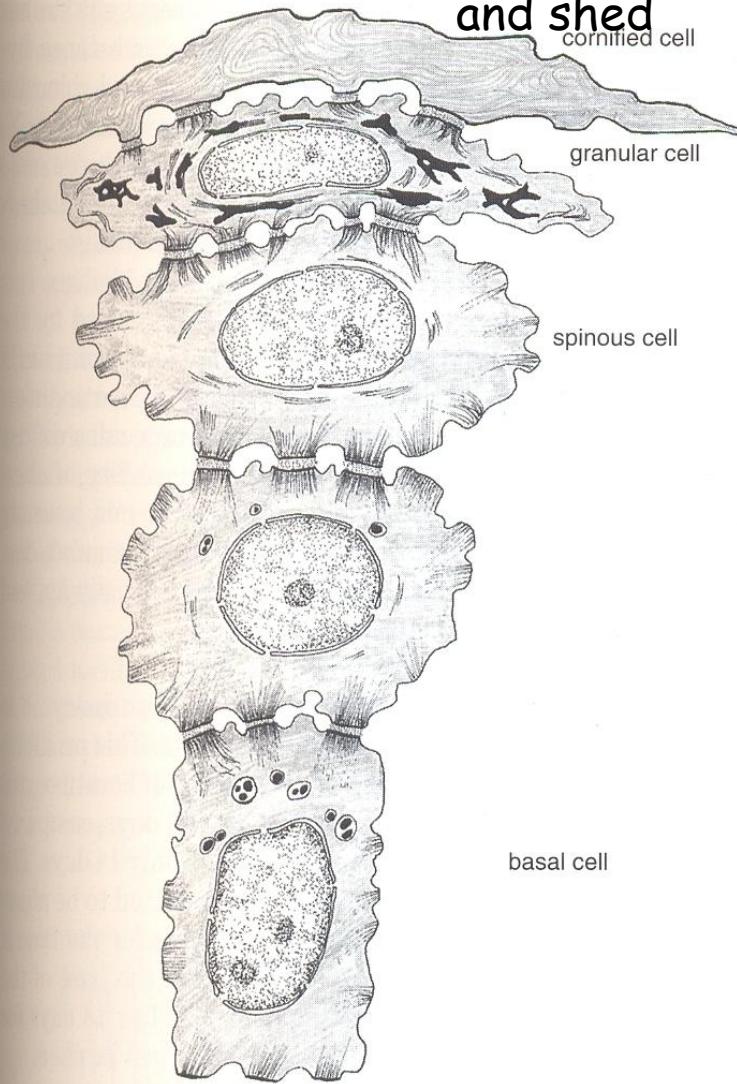
stratum granulosum

stratum spinosum

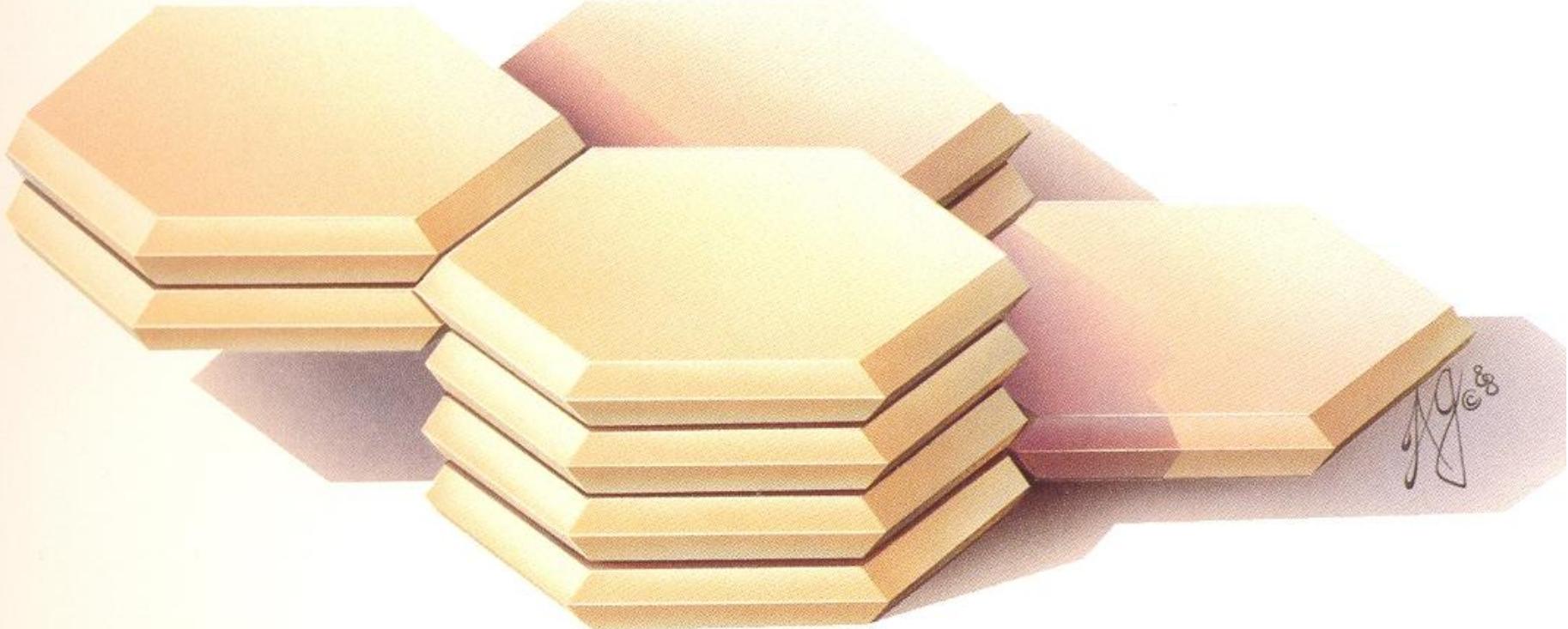
stratum basale

Epidermis

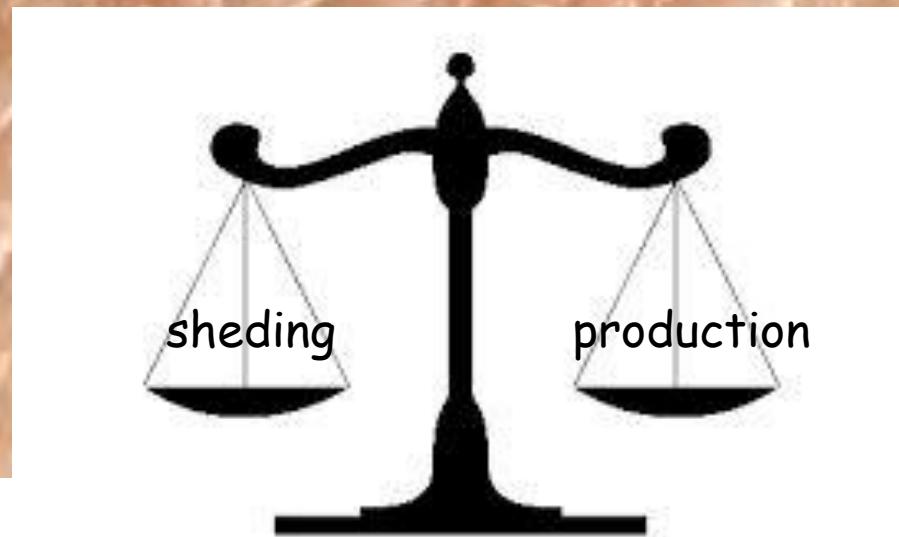
the dead cells are
connected with lipids
and shed



turn over
28 days

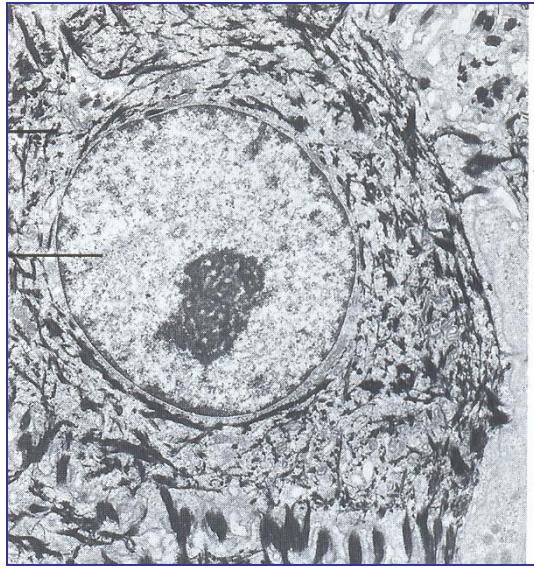


they are shed in such a way that the surface of normal skin does not seem
scaly to the naked eye

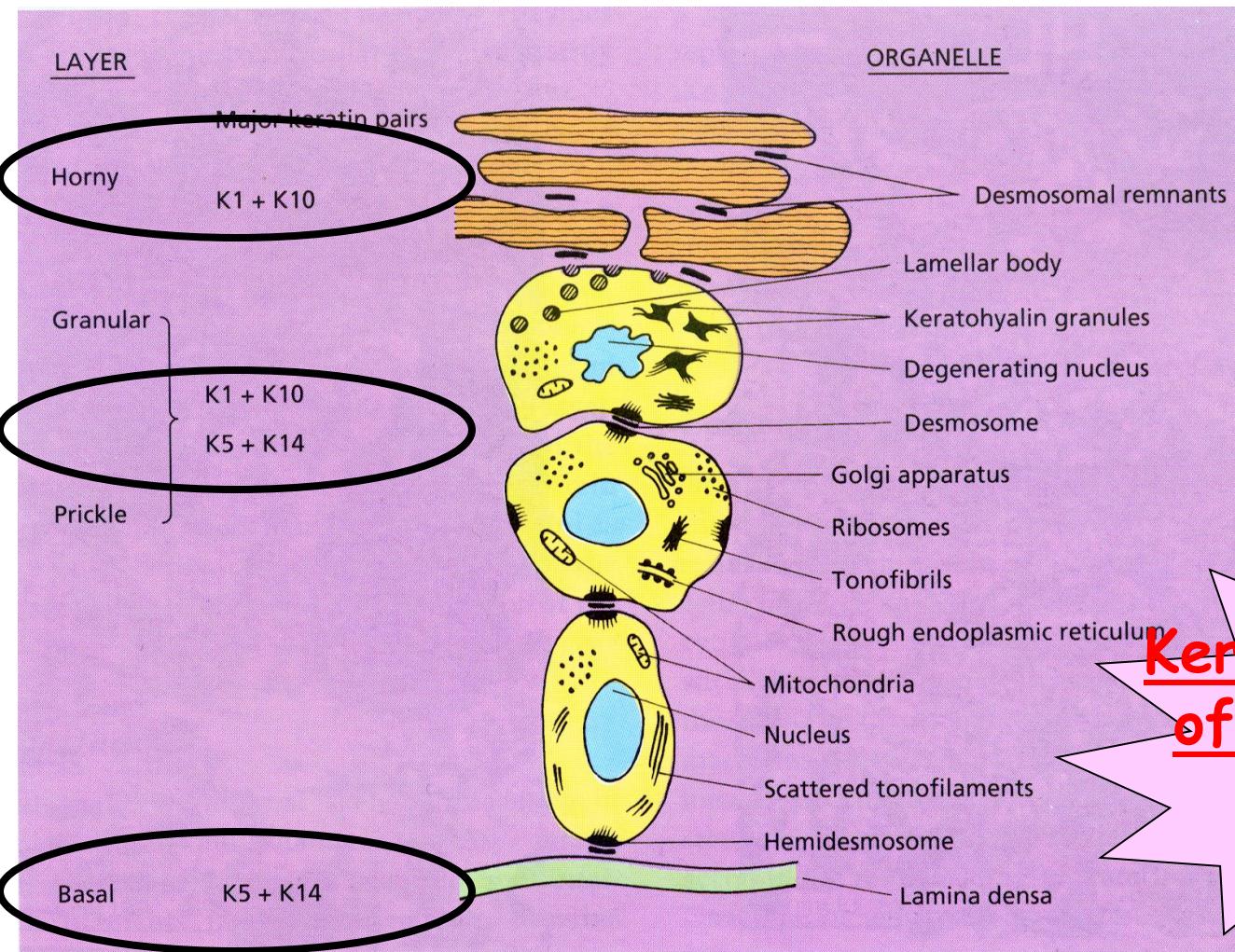


shedding balances production

internal cell skeleton



Keratin...



**Keratin is marker
of keratinocyte
maturation**

K6 i K16 are in psoriasis found

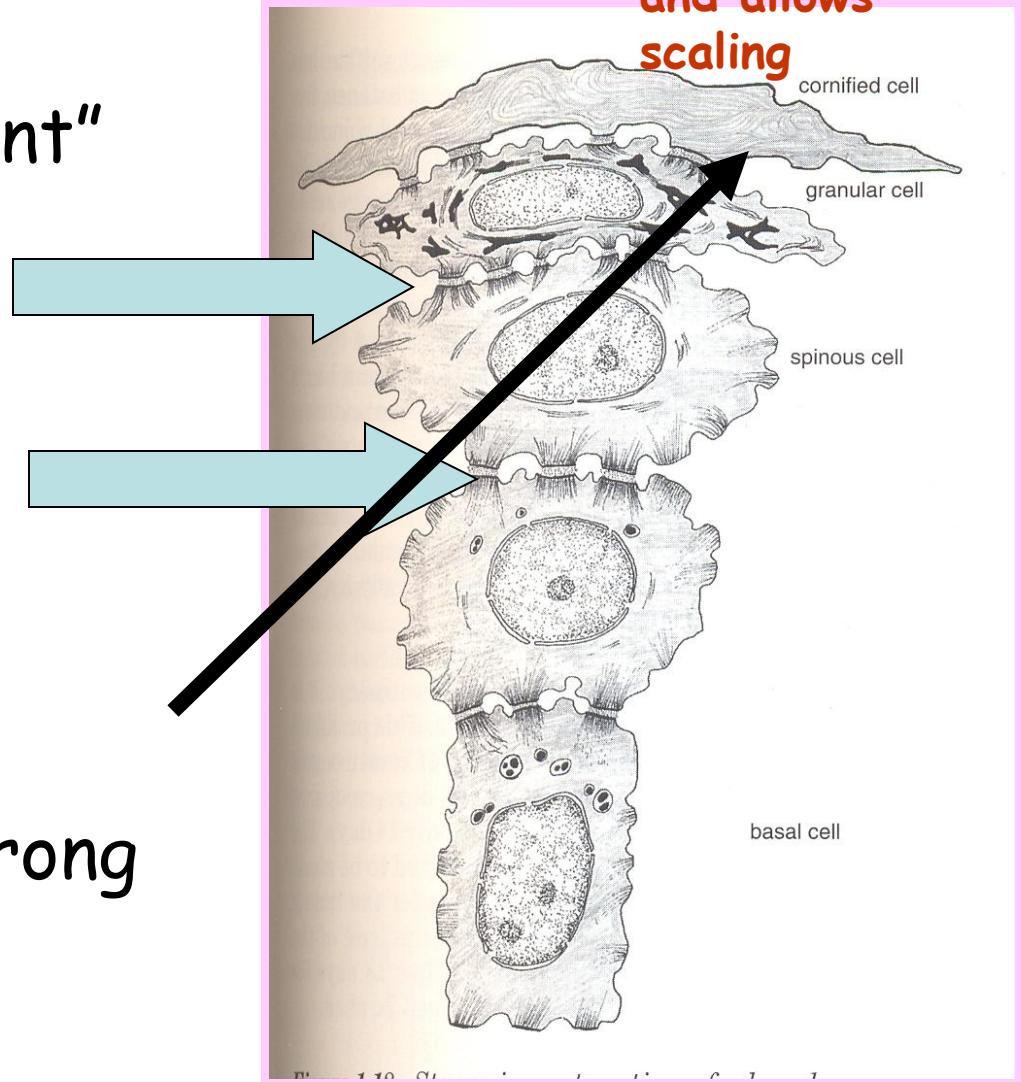
Cell cohesion:

Glycoproteins –
intercellular “cement”

Desmosomes and
tonofibrils

Lipids and sterol
sulphate – very strong
connection

Steroid
sulphatase
activates in
horny layer
and allows
scaling



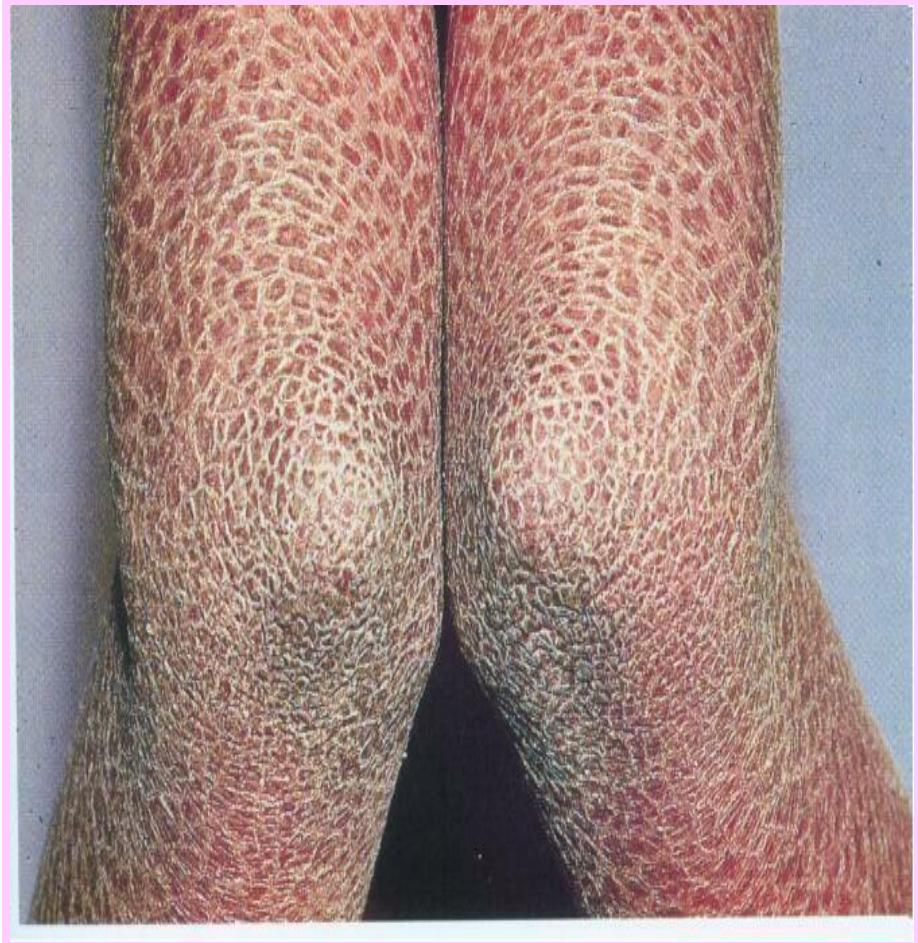
Disorders of keratinization

Main features

dry skin

hyperkeratosis

scaling



Disorders of keratinization

Proliferative hyperkeratosis
accelerated cell division

Retentional hyperkeratosis

normal cell division - abnormal and strong cohesion

localized

generalized

Disorders of keratinization

Proliferative hyperkeratosis
accelerated cell division

Retentional hyperkeratosis
normal cell division - abnormal and strong cohesion

localized

generalized

Generalized:

Ichthyosis vulgaris

Ichthyosis vulgaris recessiva X-linked

Collodion baby

Ichthyosis lamellosa and non-bullous ichthyosiform erythroderma

Epidermolytic hyperkeratosis (bullous ichthyosiform erythroderma)

Generalized:

Ichthyosis vulgaris

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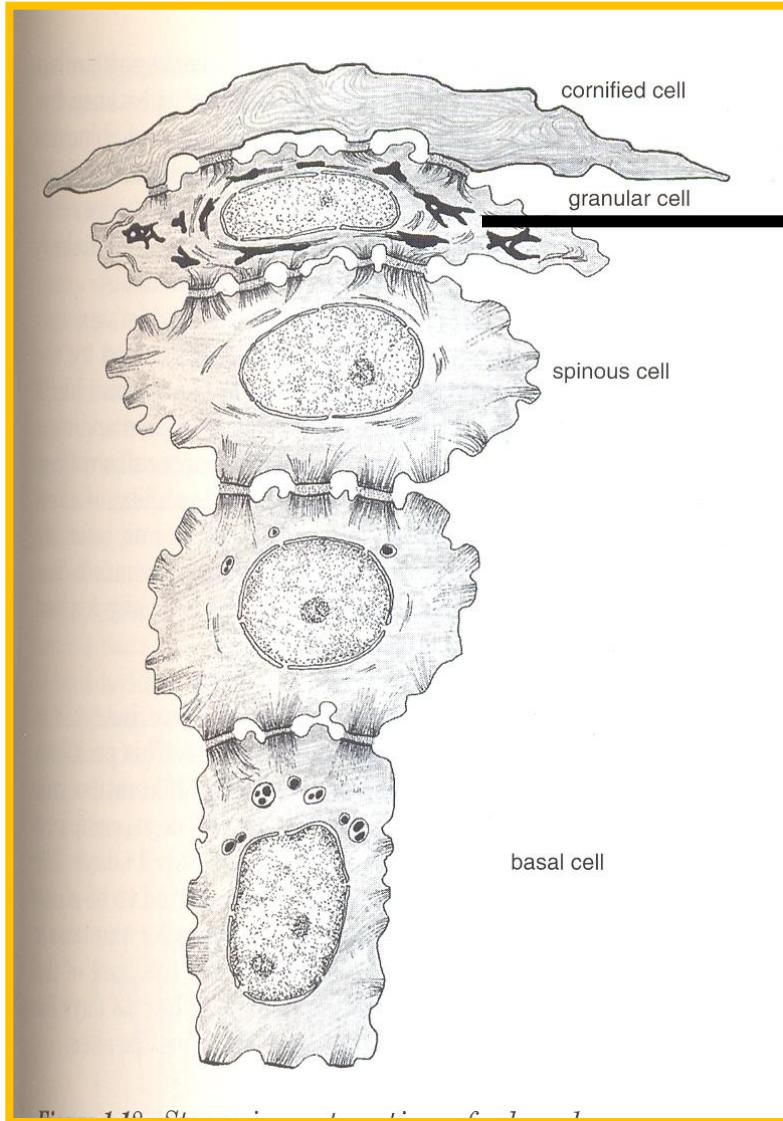
(ΙΧΤÚΣ - fish)

Inherited AD

1: 250 (very common)

Mutation of filaggrin gene

Skin barrier



proteins of granular layer
- keratine
- filaggrin



hyperlinearity of palms

cause of ichthyosis vulgaris

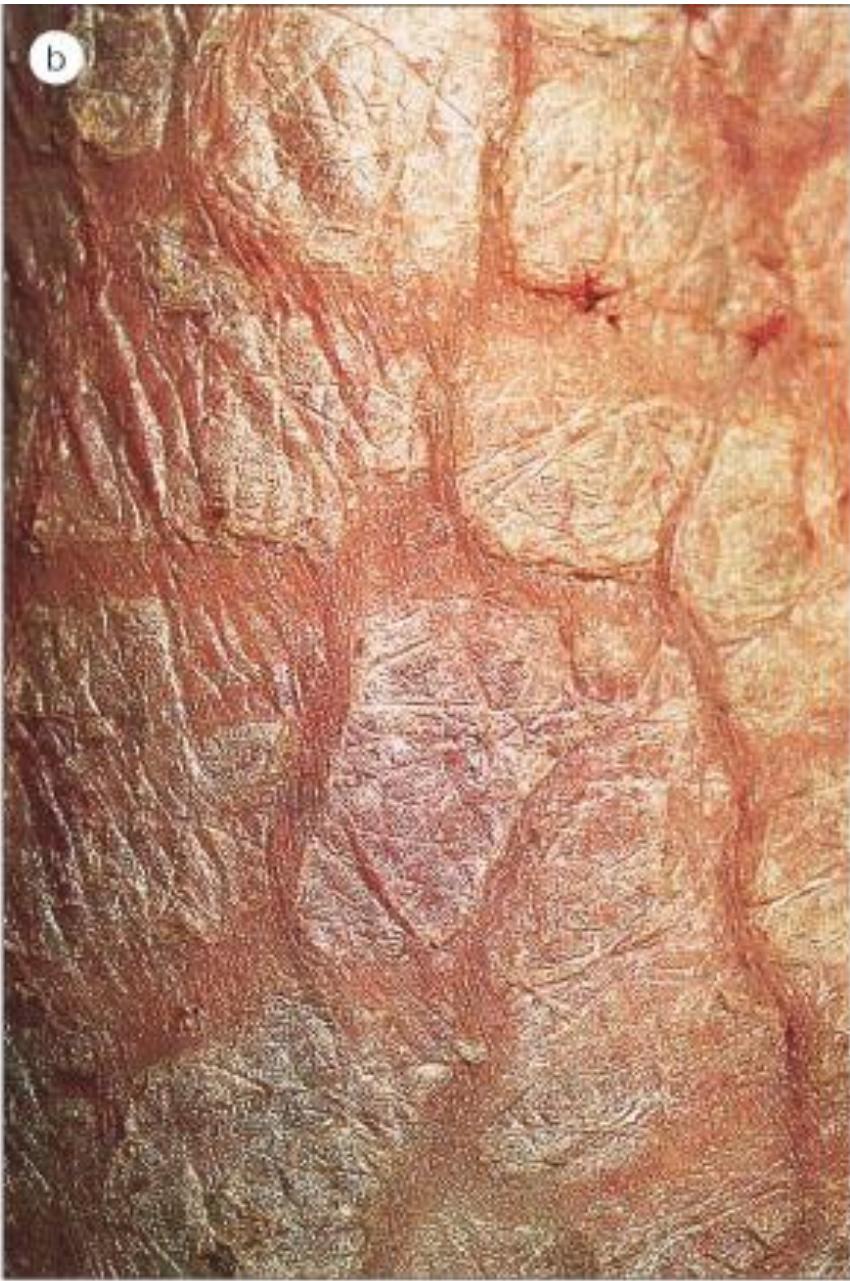
risk for atopic dermatitis

loss or mutation gene
for filaggrin in
4-10% population

severe form of
atopic asthma

risk for development of
asthma and AD

mutation in filaggrin gene lead to loss or reduction of profilaggrin - the major component of the keratoxylin granules and when cleaved to filaggrin is responsible for aggregating keratin filaments in cornified cell envelope



Ichthyosis vulgaris

heterozygites have milder disease than homozygotes

Ichthyosis vulgaris

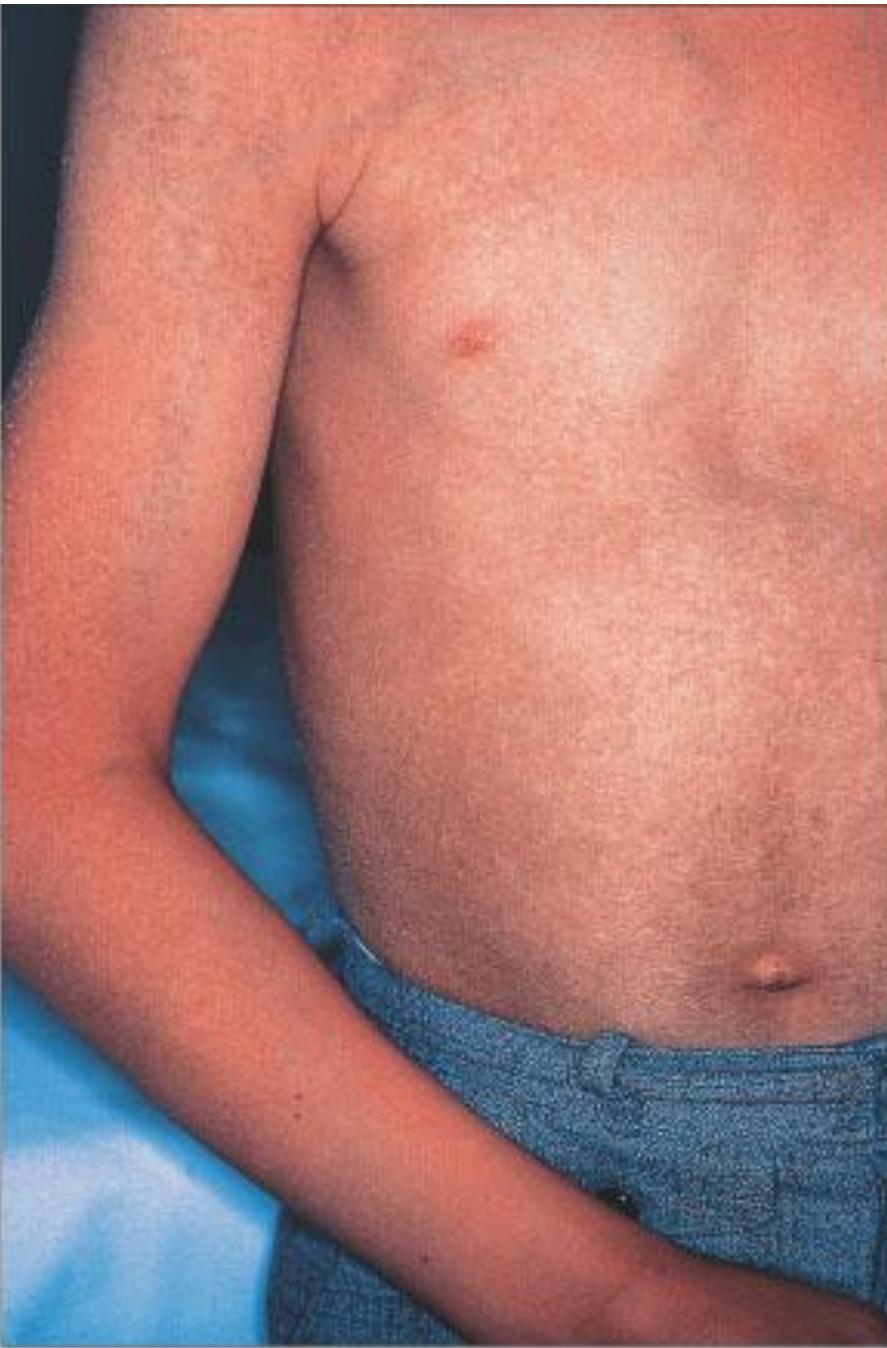
appearance over the first few years

small grey-white scales

least obvious in the major flexures

most obvious on extensor surfaces of the limbs





Ichthyosis vulgaris

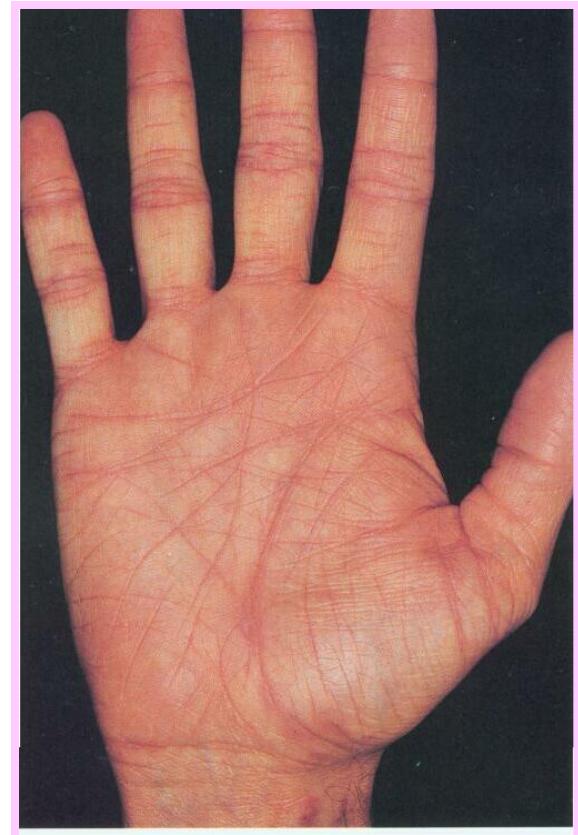
Ichthyosis vulgaris

the skin creases on the palms may be accentuated

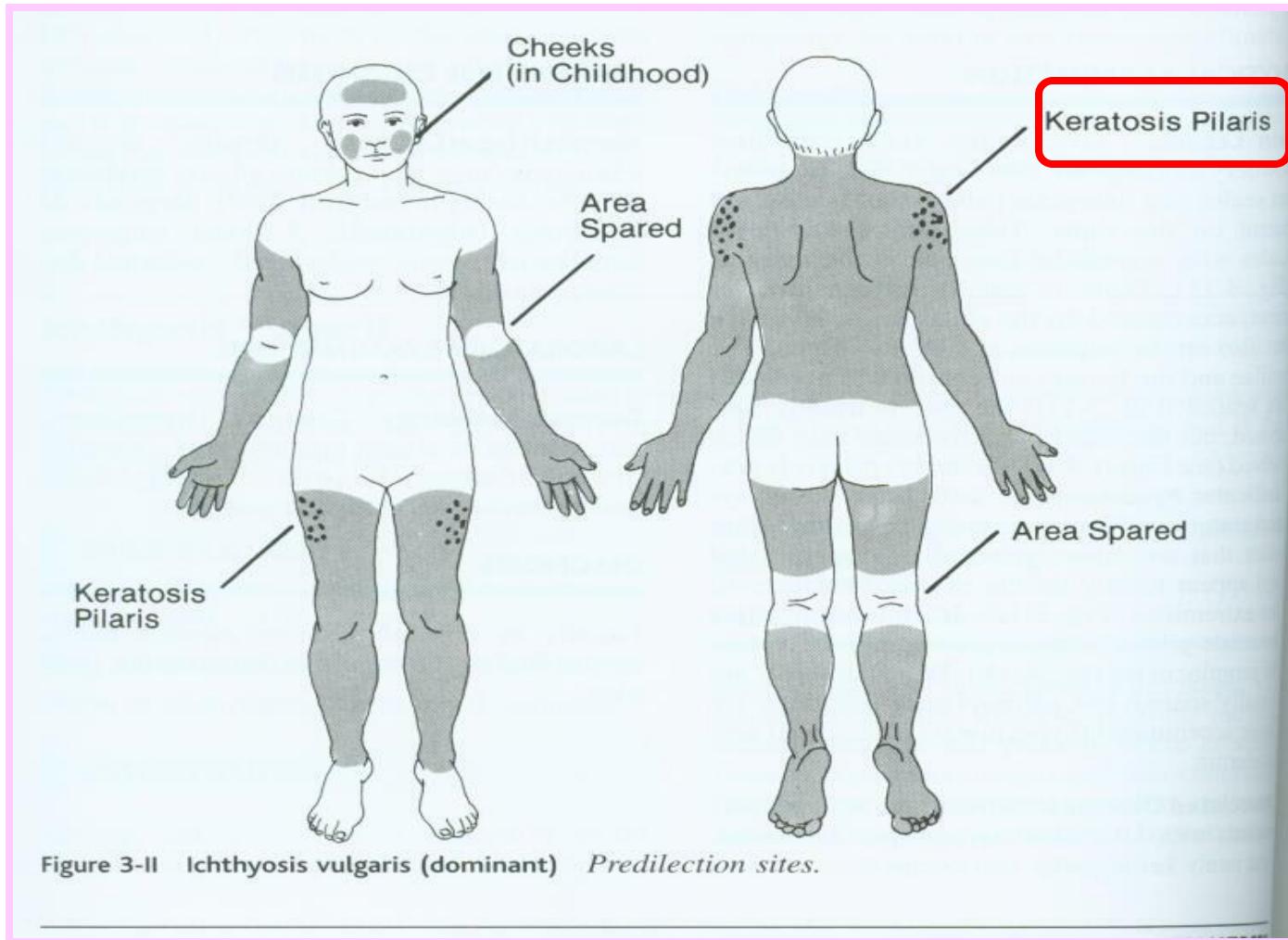
keratosis pilaris is often present

improve during warm weather
and in adult life

50% have atopic eczema



Ichthyosis vulgaris



Treatment:

emollients

emulsifying ointment, soft white paraffin

bath oils and creams with humectants
(glycerin, urea, lactic acid)

Generalized:

Ichthyosis vulgaris

Ichthyosis vulgaris recessiva X-linked

Collodion baby

Ichthyosis lamellosa and non-bullous ichthyosiform erythroderma

Epidermolytic hyperkeratosis (bullous ichthyosiform erythroderma)

Ichthyosis vulgaris recessiva

X-linked recessive ichthyosis
(seen only in males)

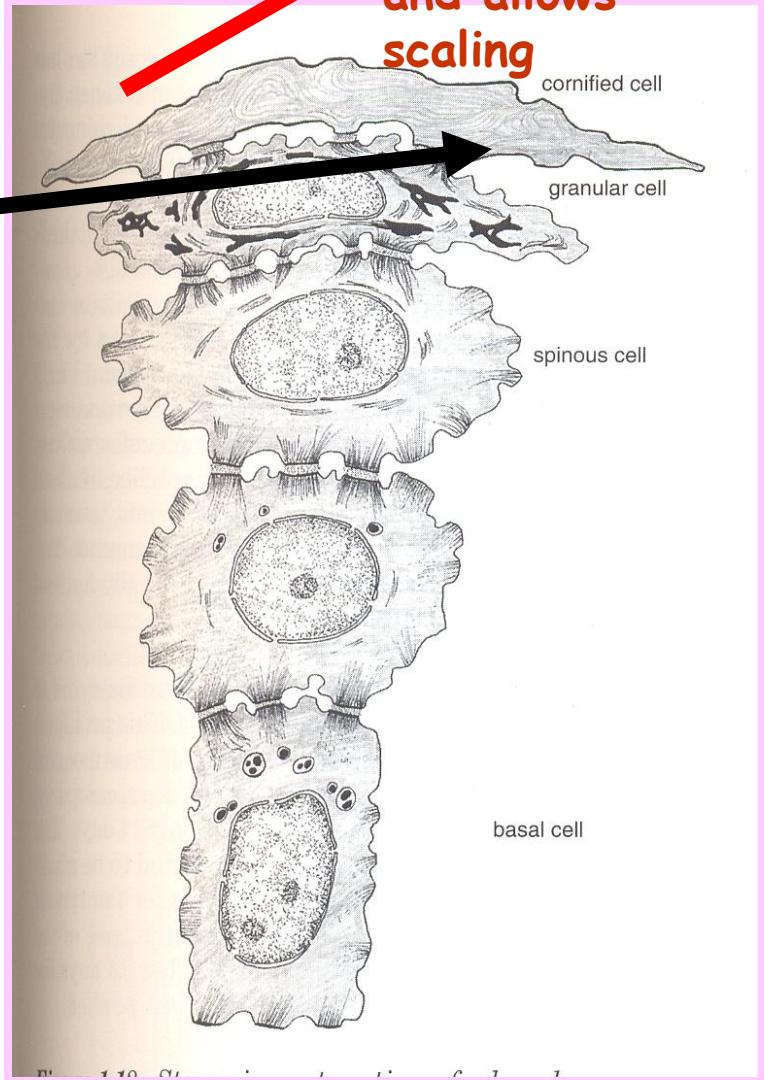
affects 1:6000 males

associated with a deficiency of
enzyme **steroid sulphatase**

Cell cohesion

Lipids and sterol sulphats – very strong connection

Steroid sulphatase
activates in horny layer
and allows scaling



Ichthyosis vulgaris recessiva

appearance often soon after birth

scales are larger and browner

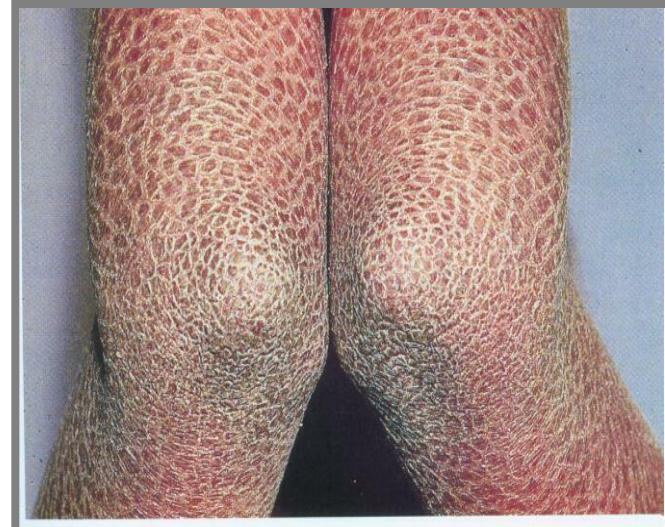
involve neck, popliteal and cubital area

palms and soles normal

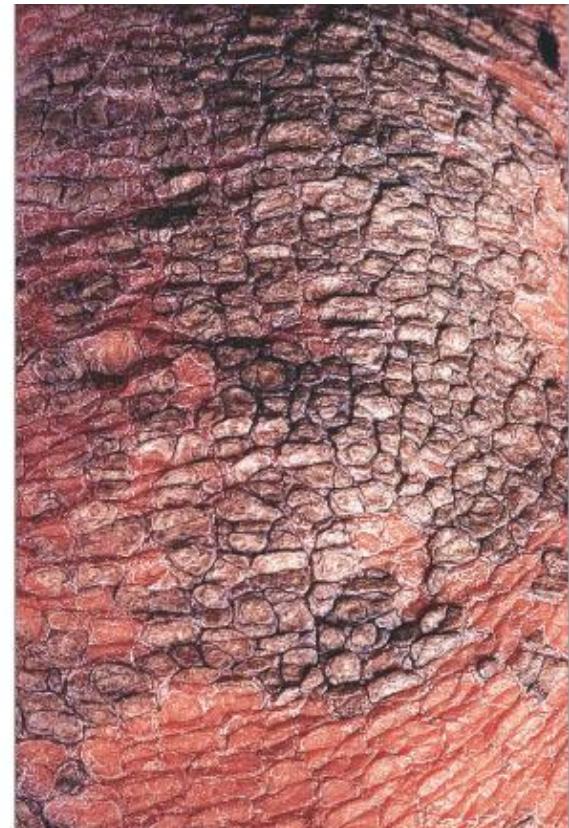
no keratosis pilaris

the condition **persists throughout life**

in 25% cryptodirhism and asymptomatic corneal opacity



Ichthyosis vulgaris recessiva



Ichthyosis vulgaris recessiva



flexures are affected

Treatment:

emollients

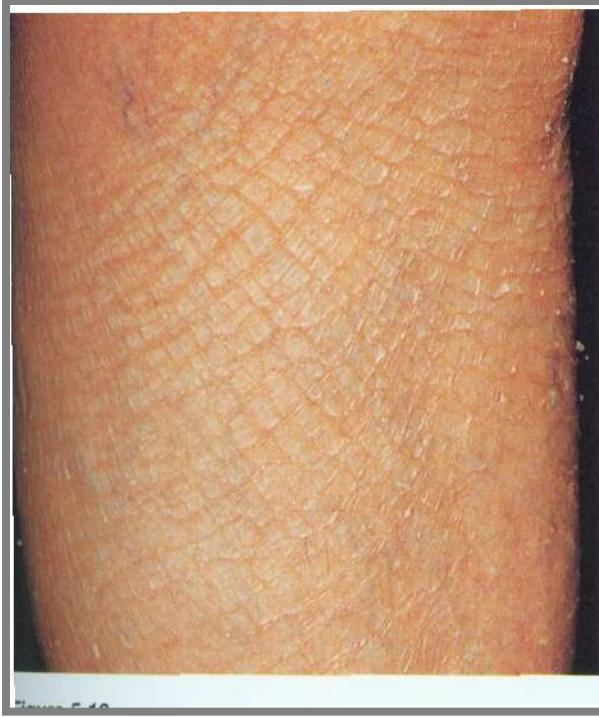
emulsifying ointment, soft white paraffin

bath oils and creams with humectants
(glycerin, urea, lactic acid)

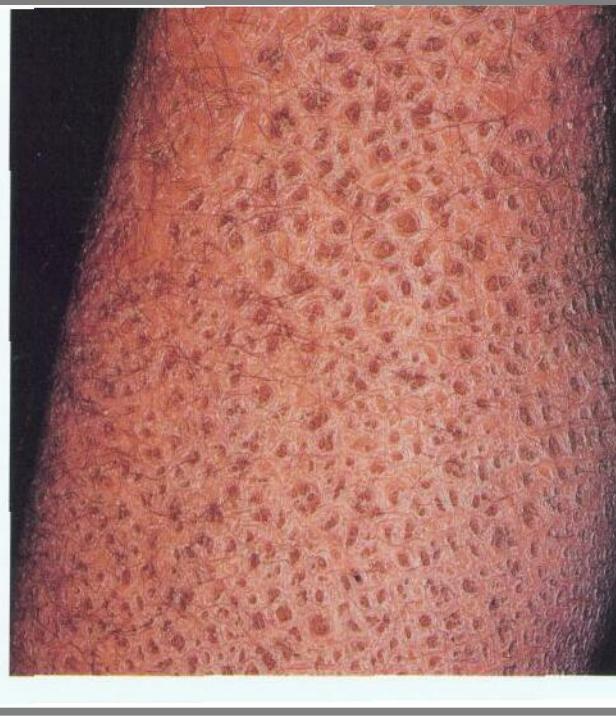
Ichthyosis vulgaris

Ichthyosis vulgaris

**Ichthyosis vulgaris
recessiva**



small white scales



large black scales

Generalized:

Ichthyosis vulgaris

Ichthyosis vulgaris recessiva X-linked

Collodion baby

Ichthyosis lamellosa and non-bullous ichthyosiform erythroderma

Epidermolytic hyperkeratosis (bullous ichthyosiform erythroderma)

Collodion baby



this is description
not a diagnosis

horny layer is smooth
and shiny -like covered
with cellophane

its tightness cause ectropion and feeding difficulties



its tightness cause ectropion
and feeding difficulties

they must be in high-humidity incubator



the shiny outer surface is shed within a few days leaving
behind red scaly skin

the most often caused by non-bullous ichthyosiform erythroderma,
less often lamellar ichthyosis (both are caused by mutation of
glutaminaze-1 gene)

Treatment:

greasy emollient - limit fluid loss

emulsifying ointment, soft white paraffin

bath oils and creams with humectants
(glycerin, urea, lactic acid)



Harlequin fetus
(mutation of ABCA12 gene)
role in forming skin lipid barrier

infants die early



©2010 Trinh Nguyen

Generalized:

Ichthyosis vulgaris

Ichthyosis vulgaris recessiva X-linked

Collodion baby

Ichthyosis lamellosa and non-bullous ichthyosiform erythroderma

Epidermolytic hyperkeratosis (bullous ichthyosiform erythroderma)

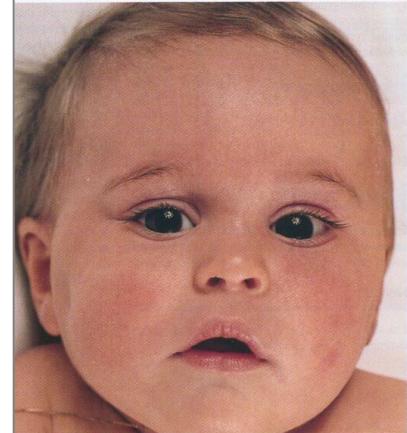
Ichthyosis lamellosa and non-bullous ichthyosiform erythroderma

In the past often were confused - look similar

both are AR trait

at birth both like collodion baby

both last for life





non-bullous ichthyosiform
erythroderma

finer scaling
more obvious redness

ichthyosis lamellosa
plate - like scales



Generalized:

Ichthyosis vulgaris

Ichthyosis vulgaris recessiva X-linked

Collodion baby

Ichthyosis lamellosa and non-bullous ichthyosiform erythroderma

Epidermolytic hyperkeratosis (bullous ichthyosiform erythroderma)

Epidermolytic hyperkeratosis

- bullous ichthyosiform
erythroderma



AD

after birth baby's
skin becomes red
with blisters

the redness and
blisters fades
over a few months

Epidermolytic hyperkeratosis

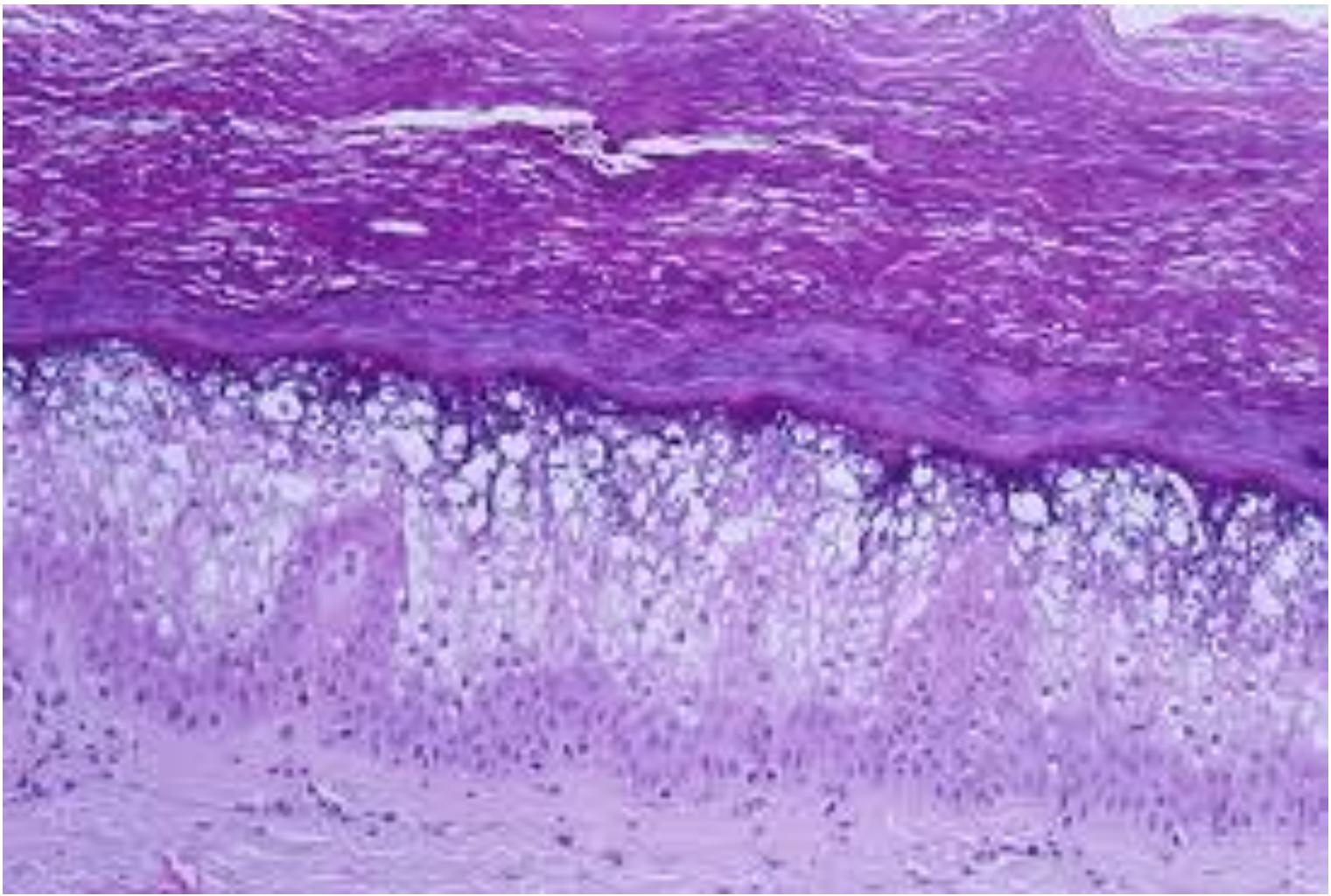
- bullous ichthyosiform
erythroderma



during childhood a gross brownish
warty hyperkeratosis appears

worst in the flexures

bad odour



histology is distinctive
a thickened granular cell layer
containing large granules and clefts

Treatment:

symptomatic treatment

antibacterial washes, masking fragrances

antibiotics

acitretin in severe cases

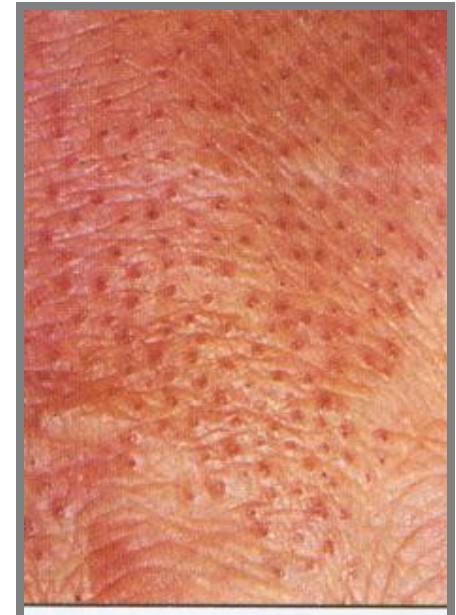
Keratosis pilaris

AD common condition

heterozygote for abnormal profilaggrin gene often
have keratosis pilaris

abnormality in the keratinization of hair
follicles (filled with horny plugs)

less obvious in adult life





skin feels rough

**keratosis pilaris - outer aspects of the thighs
and upper arms**



Keratosis pilaris

an association with
ichthyosis vulgaris

less often affect the sides of the face with subsequent loss of eyebrow hairs



Treatment:

salicylic acid and urea in a cream base

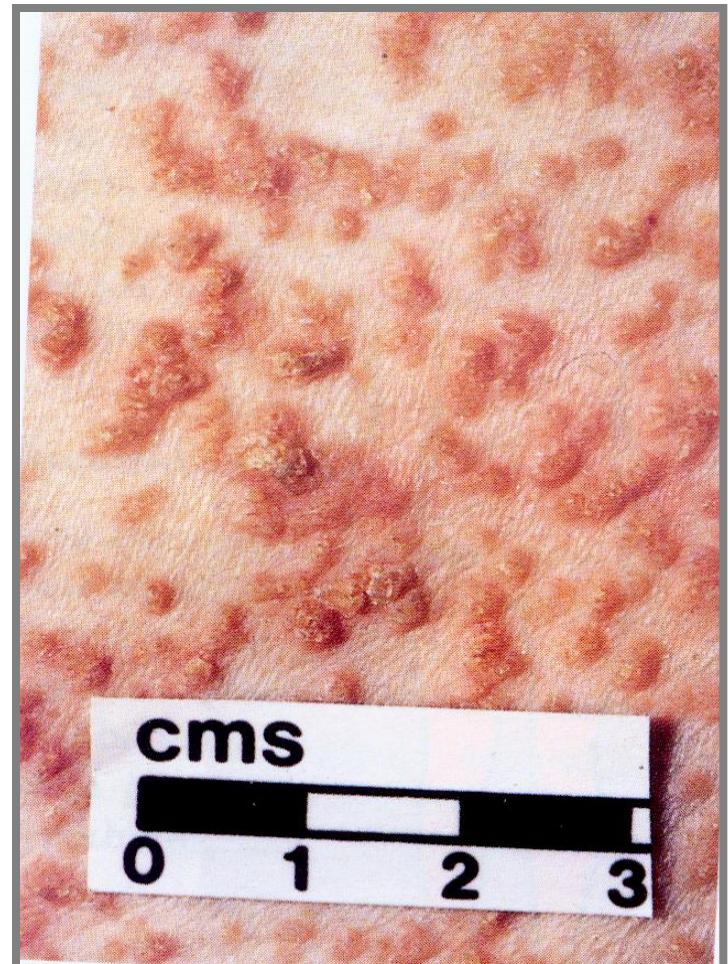
UV radiation provides temporary benefit

move in humid climate is helpful

Dyskeratosis follicularis (Morbus Darier):

AD, but new mutation

abnormal gene encodes molecule important in a pump that keeps a high concentration of Ca^{++} in the endoplasmatic reticulum

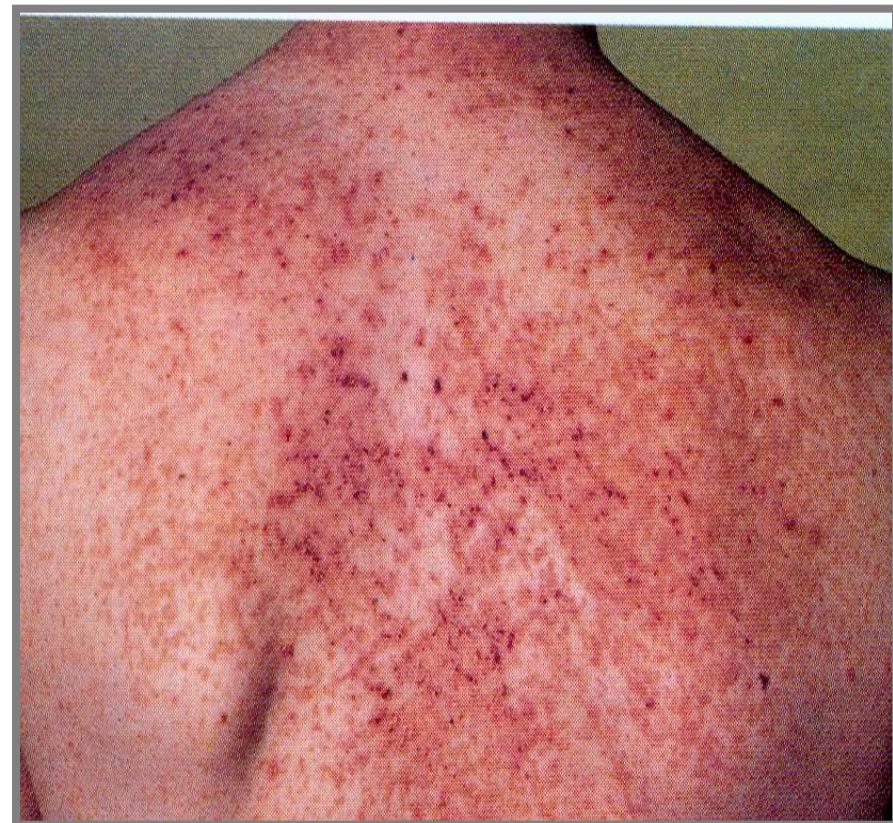


Dyskeratosis follicularis (Morbus Darier)...

The first signs appear
from 8.- 15. years

often after overexposure
to sunlight

small pink or brownish
papules in seborrhoic
distribution

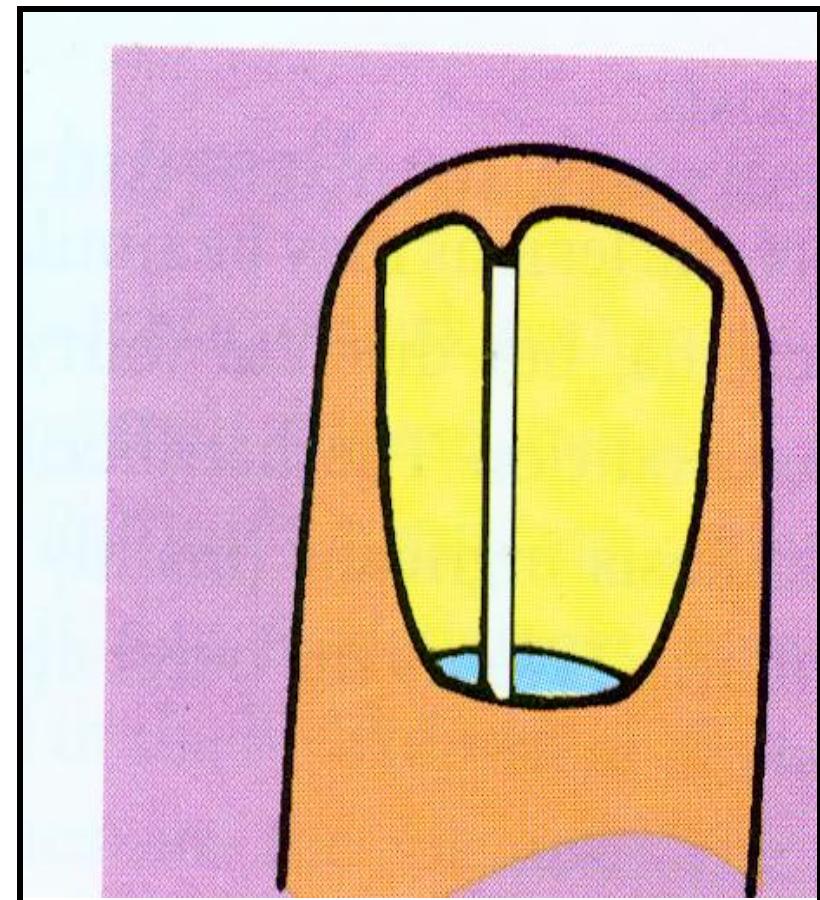


Dyskeratosis follicularis (Morbus Darier)...

distinctive nail dystrophy

one or more longitudinal ridges run longitudinally to the free edge of nail

exacerbation during
warm weather



Treatment:

can be dramatically alleviated by long-term acitretin
topical keratolytics (salicylic acid)
antibiotics
avoidance of sunbathing and warm weather

Disorders of keratinization

Proliferative hyperkeratosis
accelerated cell division

Retentional hyperkeratosis
normal cell division - abnormal and strong cohesion

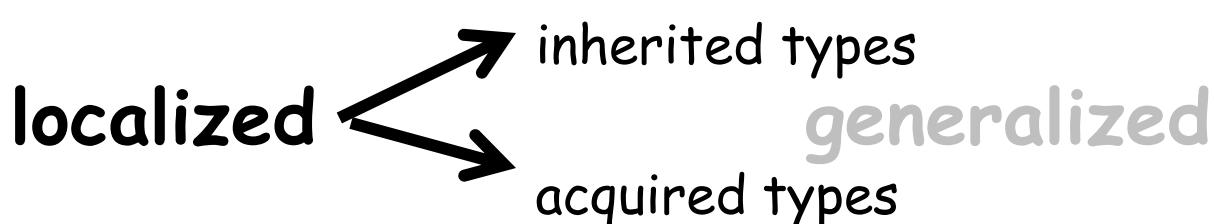
localized

generalized

Disorders of keratinization

Proliferative hyperkeratosis
accelerated cell division

Retentional hyperkeratosis
normal cell division - abnormal and strong cohesion



Keratosis palmoplantaris

clinical patterns and mode of inheritance vary from family to family

punctate, striate, diffuse,
mutilating with metabolic
disorders and changes
elsewhere





A



B

punctate keratoderma of palms and soles



keratoderma striata



keratoderma striata



diffuse keratoderma (tylosis)

Keratoderma diffusa (tylosis)

AD trait
hyperhydrosis

sometimes associated with
carcinoma of the oesophagus



Treatment:

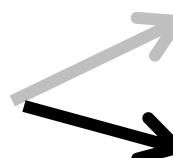
keratolytics (5-20% salicylic acid, urea)

Disorders of keratinization

Proliferative hyperkeratosis
accelerated cell division

Retentional hyperkeratosis
normal cell division - abnormal and strong cohesion

localized



inherited types

generalized

acquired types

Acquired types of keratoderma

Keratoderma of palms and soles may be part of the clinical feature of some generalized skin diseases:

- pityriasis rubra pilaris
- lichen ruber
- related to internal malignancy
- arsenic ingestion





natural arsenic contamination at global scale



From
arsenic
tainted
water



Keratoderma climactericum

a distinctive pattern is sometimes seen in middle-aged women



painful fissures
interfere with
walking

keratoderma climactericum
around borders of the heels

Treatment:

regular paring

keratolytic ointments (40% urea)

acitretin in low doses may be worth a trial

the condition tends to settle over few years

Knuckle pads

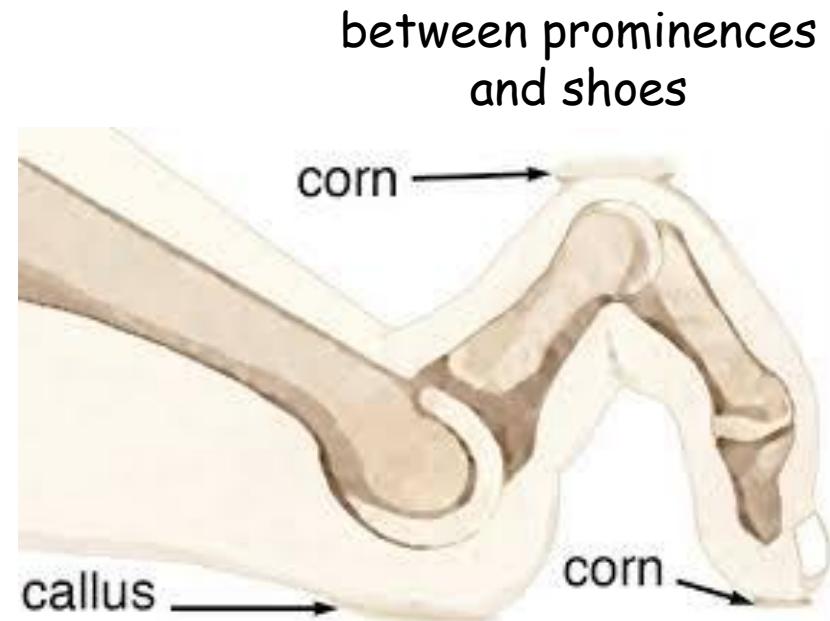


fibromatous and hyperkeratotic areas begin in late childhood and persist thereafter

only sometimes familiar trauma is not important

Treatment:
surgery

Callosities and corns



both are responses to pressure



callosity - more diffuse type of thickening of the keratin layer (often occupational)

Calluses



Corn



Callus

ADAM

corns - have central core of hard keratin which can hurt if forced inwards



callosity
(repeated
friction or pressure
painless)



corns
(very high
local pressure,
painful)



"soft" corn toes are
squeezed together
by tight shoes

Treatment:

to eliminate the pressure
regular paring
well-fitting shoes are essential
orthopaedic surgery

Shoes should fit
comfortably



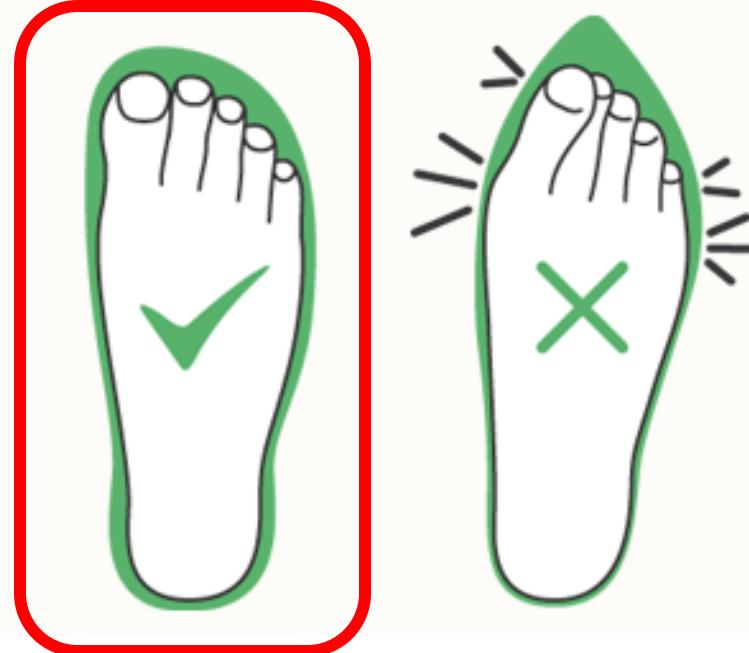
Avoid poor-fitting
shoes



ADAM.



correct foot wear



right



wrong



Correct fitting shoes

The End

