TOPICAL THERAPY IN DERMATOLOGY

Treatment in dermatology

- is **very specific**, unlike in other medical specialties **we intensively treat with topical preparations** and also have a **wide array of possible treatment options**

Drugs

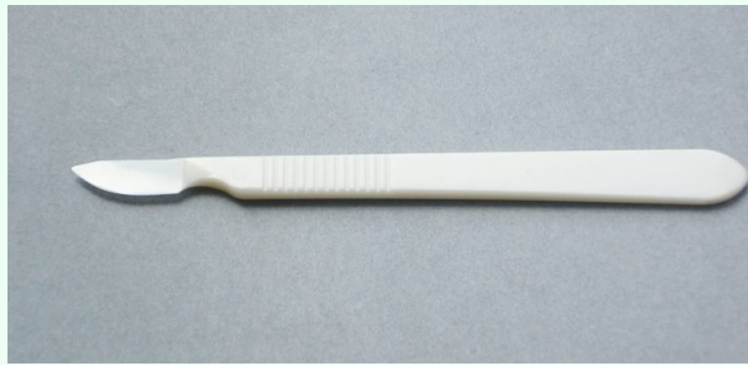
- Topical
- Systemic

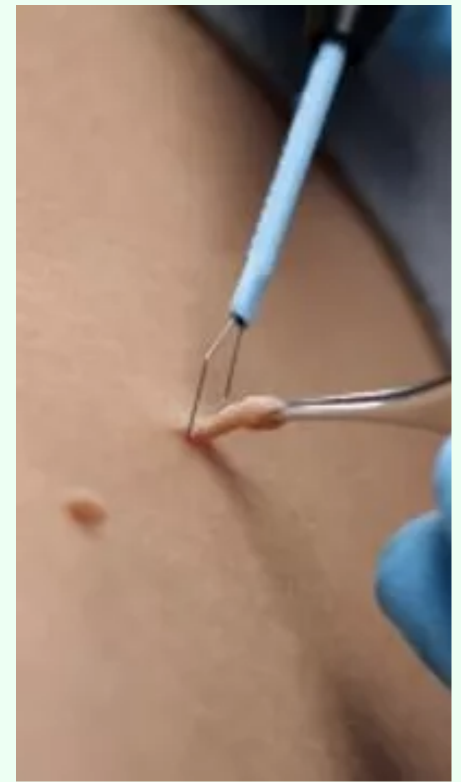
Dermatosurgery

Physical therapy

- phototherapy
- cryotherapy
- laser
- electrotherapy

Balneotherapy, thalassotherapy





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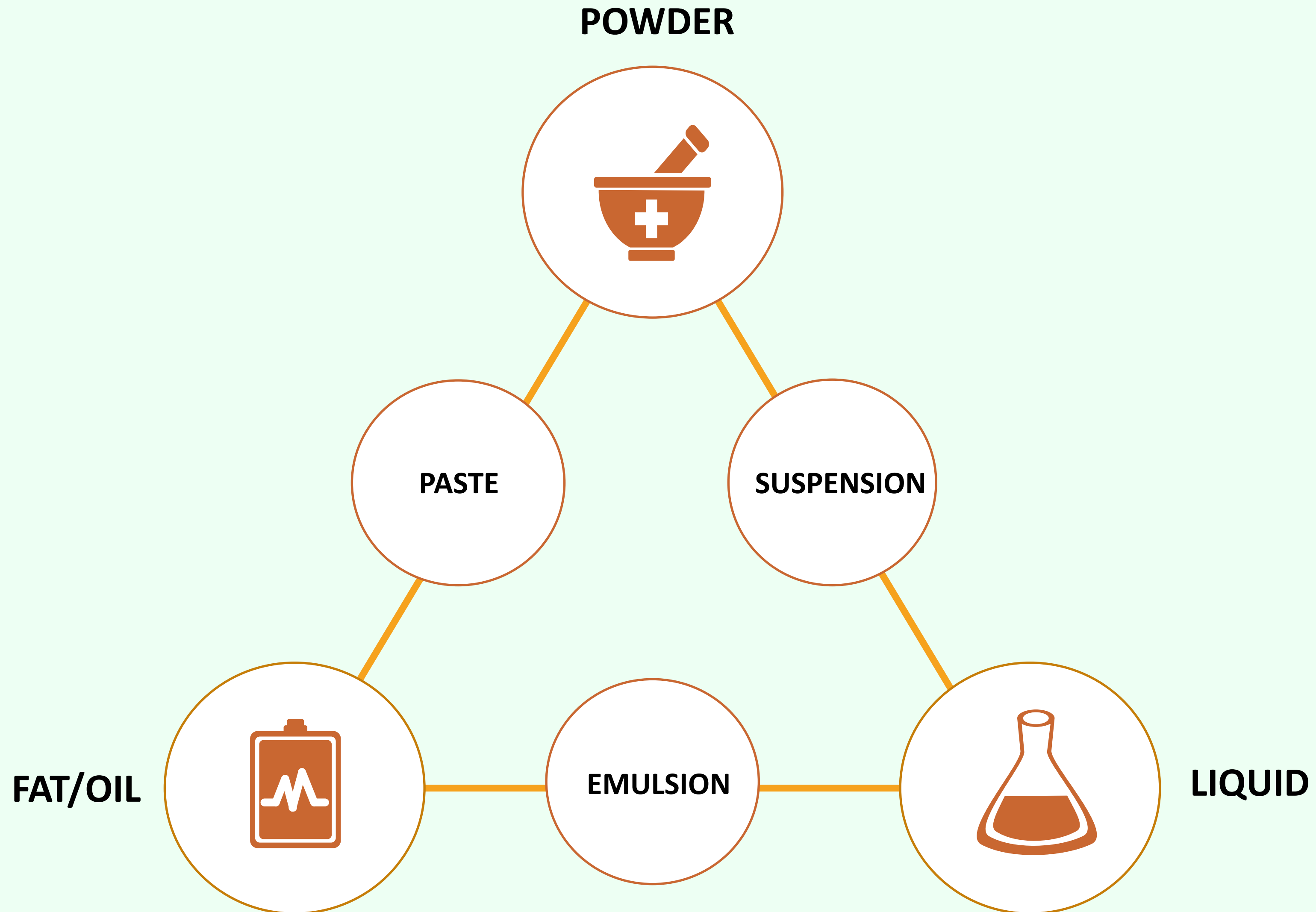
TOPICAL THERAPY TRIANGLE



TOPICAL THERAPY TRIANGLE

EXPLANATION

We have 3 basic substances: ointment bases (fat/oil), powders and liquid substances. We can mix them and create different preparations.

<u>Powder + liquid base = suspension</u>

- we have to shake it, so the particles are dispersed evenly

<u>Ointment + liquid base = emulsion</u>

- creams (w/o – oleo cream, o/w – hydro (water) cream
- lotions
- emulsifiers help to keep the correct texture

<u>Powder + ointment = paste</u>

- powder makes at least 20% of the mixtur

BASIC TREATMENT RULES

For the therapy to work, we must have the correct diagnosis, know the stage of the disease and think of the particular body area we are going to treat.

1. First of all, we must have the correct diagnosis, for example:

Tinea incognita - when we use anti-inflammatory creams for infectious diseases, the lesions fade a bit, but do not heal, they ignite rapidly again after the treatment stops. We have to use antimycotics to treat it.

Eczema herpeticum – there is an endogenous immune disorder in patients with eczema, microbes readily multiply there – e.g. Staphylococcus aureus, Herpes simplex. Most often, when a person with eczema has herpes labialis, the virus can be introduced from the viral lesion onto the eczematous skin, where the virus spreads easily, thousands of new lesions can appear + also some systemic symptoms such as raised temperature, lethargy arise - **we must not use local steroids!!!**

BASIC TREATMENT RULES

2. Another criterion for successful therapy is to know the stage of the disease,for example:

Acute eczema:
Exudes fluid, blisters form, we use a topical **preparation that dries** the lesions, **we must not close it with an ointment**. We use solutions, foams, lotions, gels.

Subacute eczema:
Is dominated by inflammation and redness. We use **hydrophilic creams and lotions** (gels and solutions would dry too much in this phase).

Chronic eczema:
is characterized by excoriations, hyperkeratosis, dryness. We use **fatty ointments generously**. Patients with atopic dermatitis sometimes have to be treated every 2 hours if the dryness is too severe.

BASIC TREATMENT RULES

3. Lastly, we must think about the location of the skin problem:

Face: it is a photosensitive zone, do not apply photosensitizers (tetracycline paste, retinoids - be careful, apply at night, SPF during the day is important).

Palms, soles: e.g. keratoderma, palmoplantar pustulosis. The skin is hard and thick, we often find painful cracks and fissures, we use strong ointment bases.

Scalp: we use easily removable products - lotions, solutions, gels, foams, shampoos. To remove scale deposits, we use ointments (classic lard works as well), which loosen the scales, that can later be combed out. Be careful with staining preparation (tar products) because they can change hair color (for example turn blonde hair into dark or violet)

Intertriginous localization: there is increased friction, heat and occlusion. Beware of substances that are readily absorbed under occlusion – e.g. strong corticoids can cause stretch marks, increase the growth of microflora. In this area, we tend to use preparations with an antimicrobial component.

TOPICAL THERAPY TYPES

ANTIBIOTICS

- most often, we use **fusidic acid** (brand names Fucidin, Fucicort, FucidinH)
- **mupirocin** (Bactroban)
- **tetracycline, chloramphenicol** (must be compounded)

- used for impetigo, bacterial superinfections…
- antibiotics can sensitize + lose their effectiveness, we use them sparingly and only for a limited amount of time

VIROSTATICS

- **Acyclovir** - indicated for herpes simplex, not relevant for herpes zoster. It makes sense for the first 24 hours, when it should be applied every 4 hours. For herpes simplex, we rather use healing gels that calm the skin and prevent skin cracking.

NOTE: *With all the before and after mentioned preparations, there are often outages in distribution, so there is little value in learning company names of products, it often changes.*

ANTIMYCOTICS

- fungal infections are very common - onychomycosis, interdigital mycosis, pityriasis versicolor…
- there are many products available **- clotrimazole** for yeasts and G + microbes (Canesten), **ciclopirox-olamin** (Batrafen), **naftifin** (Exoderil), **terbinafin** (Lamisil)….

ANTIPARASITICS

- **Permethrin** - for scabies, a relatively safe insecticide, not toxic to humans, can also be used in children and pregnant women. Lindane (Scabicide) has been used in the past and banned by the EU 10 years ago for toxicity.
- **Sulfur ointment** - for scabies, application for at least 5 days
- **Dimethicone** - suffocates lice

RETINOIDS - vitamin A derivatives – adapalene, tretinoin

- have **keratolytic** effect, normalize the keratinization process, **lower sebum production**, **stimulate immunity**
- used for acne, psoriasis, ichthyosis, actinic keratosis….generally said, conditions where excessive keratinization plays a role
- beware of their **teratogenicity!!!**, the use must be discontinued when a woman gets pregnant or is actively trying to get pregnant
- they tend to **dry out skin and make it more sensitive to sun**, it is generally better to apply them at night and wear high SPF on treated areas during the day

DELTOIDS - vitamin D derivatives - tacalcitol, calcipotriol

- developed for the treatment of psoriasis
- they have **anti-inflammatory effects like corticosteroids, but they do not have their side effects, they act against atrophy**
- therefore they are often combined with local steroids (Daivobet gel)
- they **can be overdosed** – e.g. if a psoriatic patient uses too many tubes per week on large areas of the body

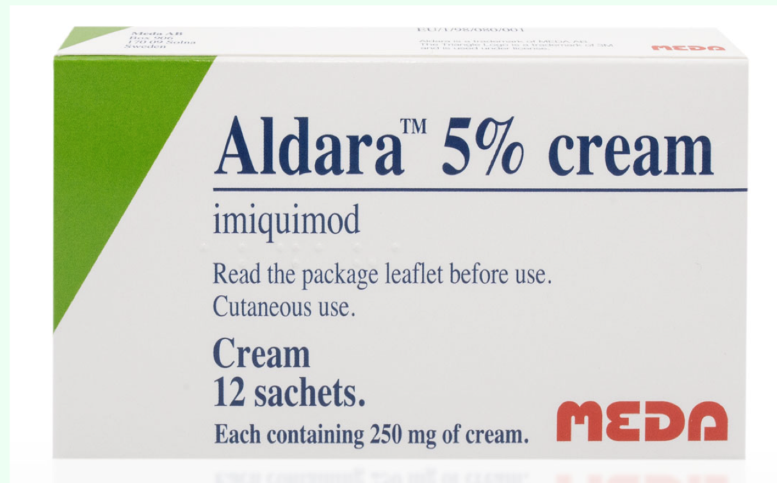
IMMUNOMODULATORS

Imiquimod (Aldara)

- modulator of the immune response at the site of application, increases the production of cytokines and activates T-lymphocyte, it has **antiviral and antitumor effect**
- **condyloma acuminata** (HPV infection) responds well to this treatment, but there is a strong local reaction – exudation and redness
- can be used for skin tumors - **actinic keratoses, basal cell carcinomas** - for example, after an surgical incomplete excision in difficult localities - face, around the nose

Ingenol-Mebutat (Picato)

- used until recently for actinic keratoses, but he European drug commission has **banned** it for an increased incidence of squamous cell carcinoma



CYTOSTATICS

Podophyllotoxin

- derived from plants, useful **for viral warts**, in paste form for **mycosis fungoides**, a **significant inflammatory reaction occurs after application**, the lesions hurt, ooz liquid, peel, the patient needs to be warned about it, it is a standard reaction

Fluorouracil

- used for **actinic keratoses**, not available here, available in Austria

EMOLLIENTS

Emollients are externally applied substances that **help to restore and maintain the epidermal barrie**r. They are **commonly referred to as moisturizers**; their name is derived from the Latin emollire, to soften. They lubricate and hydrate the skin.

ANTISEPTICS

- we prefer them to antibiotics, because resistance to them rarely develops
- **povidone iodine** - beware of iodine allergy, always ask the patient before application!!!
- **chlorhexidine**, **hypermanganese solution** (light pink color is desirable - 1 grain per bath, higher concentrations stain and burn), **polyhexanide** (Prontosan), **octenidine** (Octenisept), **bleach** (sodium hypochlorite)

ASTRIGENTS
They generally cause constriction or contraction of tissues, therefore reduce discharge. Externally applied astringents cause mild coagulation of skin proteins, dry, harden and protect the skin, they can relieve minor skin irritations – cuts, insect bites and fungal infections such as athlete’s foot.

- **black tea** - tannin has astringent effects
- **Burrow's solution** (aluminum triacetate) – insect bites, poison ivy rash…
- **witch hazel** - for oily skin and acne

KERATOLYTICS
- **urea** (15-20% concentration is keratoplastic, 40% keratolytic - for nails)
- **salicylic acid** (1, 2, 5% max.)

COAL TAR
- has excellent anti-inflammatory and antiproliferative effects - excellent for psoriasis
- but has a series of side effects – it’s phototoxic and carcinogenic with prolonged use

ANTIMICROBIAL SUBSTANCES

- **chloroxine** (Endiaron), often added to corticoids

IMMUNOSUPRESSANTS – tacrolimus (Protopic), pimecrolimus (Elidel)

- similar to cyclosporine, they are **calcineurin inhibitors**, used for severe atopic dermatitis
- advantage: they do not cause skin atrophy
- disadvantage: danger of superinfection, herpes, higher risk of cancer in the future - increased possibility of systemic lymphomas and local tumors – spinalioma

CORTICOSTEROIDS

…. mentioned later in the lecture

TOPICAL TREATMENT FORMULATIOS

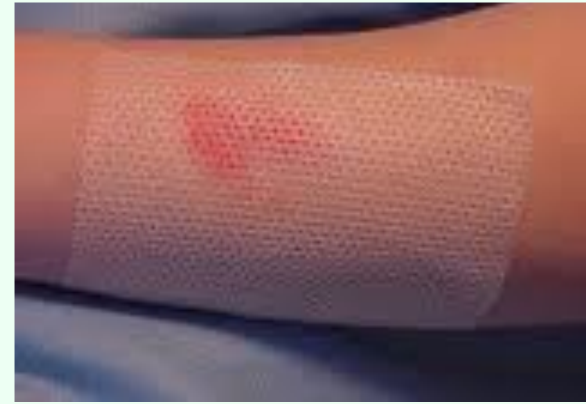
- **solutions, baths** (in healing oils), **wet dressings**
- **tinctures** - contain alcohol, dry and cool the skin
- **shampoos** - for psoriasis, seborrheic dermatitis
- **sprays** - for larger areas, in between fingers for mycoses
- **powders** - for intertriginous areas, when we powder an applied cream (e.g. with zinc oxide) one application a day is enough
- **lotions**- into a box
- **gels** – less accessible, not many on the market – e.g. Heparoid, Lioton gel (anti-inflammatory, local heparin)
- **pastes** - ointment saturated with powder
- **oils** - great for taking off pastes - patients often try to scrape them from the skin, which causes further damage to the skin
- **fatty ointments, creams**

OTHER:

- **antiperspirants, depilatory creams**
- **protective UV factors**
    1) mineral filters - inert, usually create a white cast on the skin, suitable for children
    2) chemical filters - often sensitize
- **depigmenting agents**, **camouflage preparations**, **antifungal nail polishes**

OTHER:

Special cotton overalls made for small atopic children so that they do not scratch.



External wound dressing - silicone grids

Healing mud from the Dead Sea

Worms - used in wound healing to eliminate necrotic coating

LOCAL CORTICOSTEROIDS

- **anti-inflammatory** effect
- **vasoconstrictive** effect - disappears over time – tachyphylaxis
- **antiedematous** effect - excellent for acute allergic reactions
- **antiproliferative** effect - psoriasis, bullous diseases...
- **itch reduction**
- **anti-scarring** effect **–** intralesional application into keloids

According to their strength, we divide them into 4 classes:

I. **mild** – hydrocortisone acetate (Hydrocortison, Pimafucort)
II. **moderate** – triamcinolone acetonide (Triamcinolon-E)
III. **potent** – hydrocortisone butyrate (Locoid), momethasone furoate (Elocom), methylprednisolone aceponate (Advantan), betamethasone dipropionate (Beloderm)
IV. **very potent** - clobetasol propionate (Dermovate)

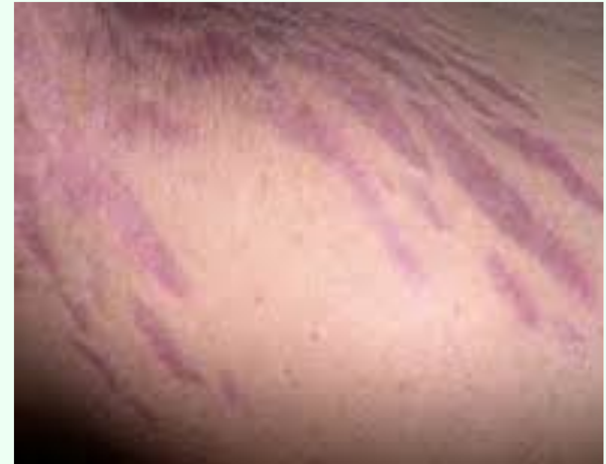
According to chemical structure:

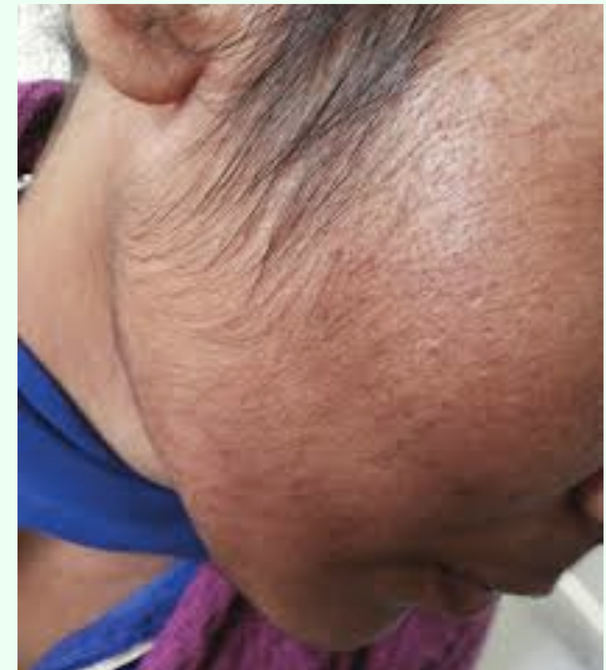
- **non-halogenated** (hydrocortisone)

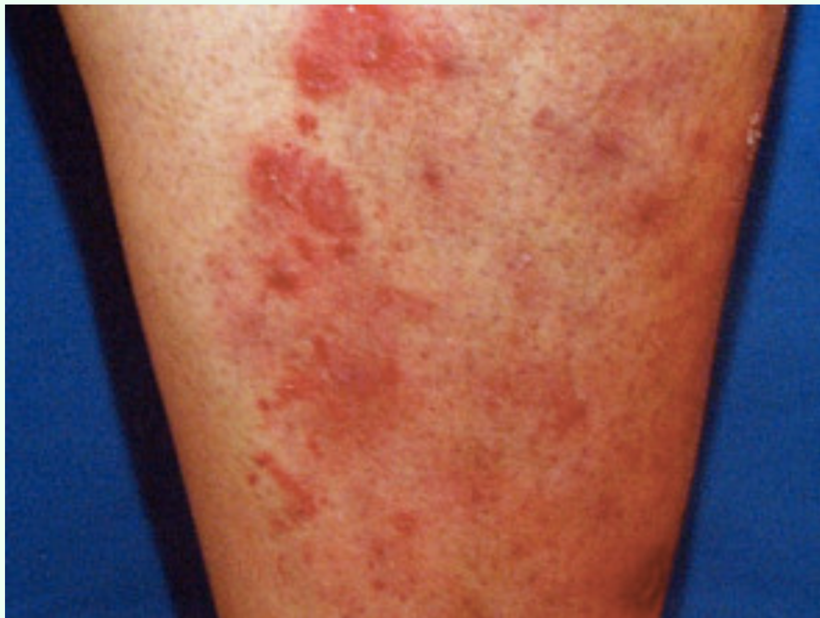
- **halogenated** (dexamethasone, betamethasone)
  - contain a halogen atom (chlorine, fluorine), enhance the efficacy of corticosteroids but often increase side effects, such as skin atrophy, adrenal suppression, and telangiectasia
  - they **should not be used on the face** – risk o perioral dermatitis

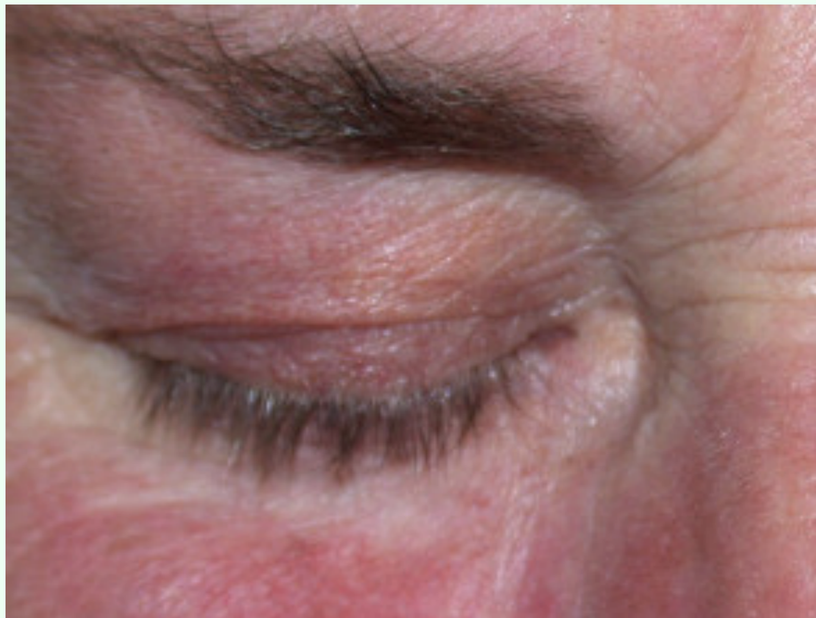
SIDE EFFECTS:

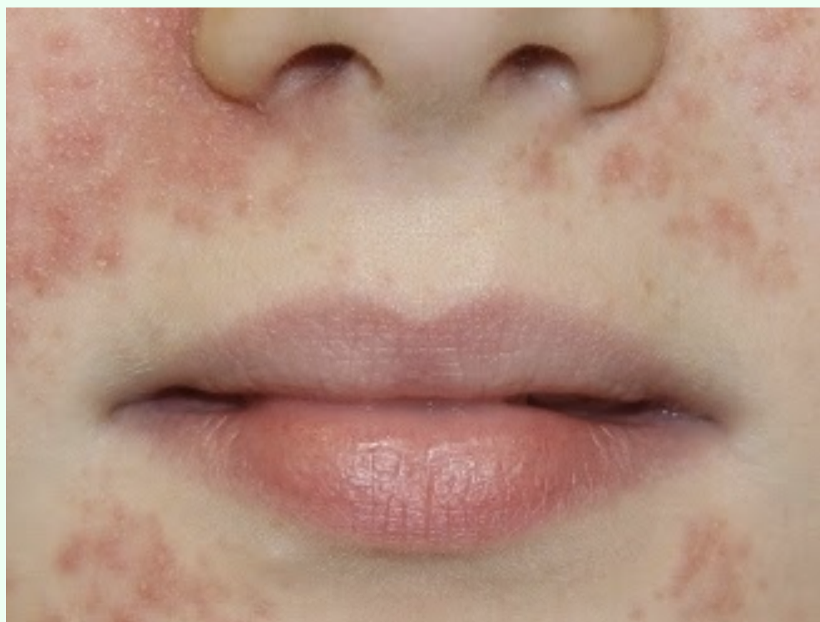
- **tachyphylaxis -** sudden decrease in response to a drug after its administration
- **rebound phenomenon** – occurs when a therapy with a strong corticoid is abruptly stopped, we must discontinue the use gradually by lengthening the application intervals (e.g. from once a day to 3 times a week) or switching to weaker corticoids
- **atrophy, stretch marks**
- **slower wound healing**
- when vasoconstriction is depleted, **telangiectasia** is formed
- **hypertrichosis**
- **perioral rosacea like dermatitis**
- **immunosuppression**

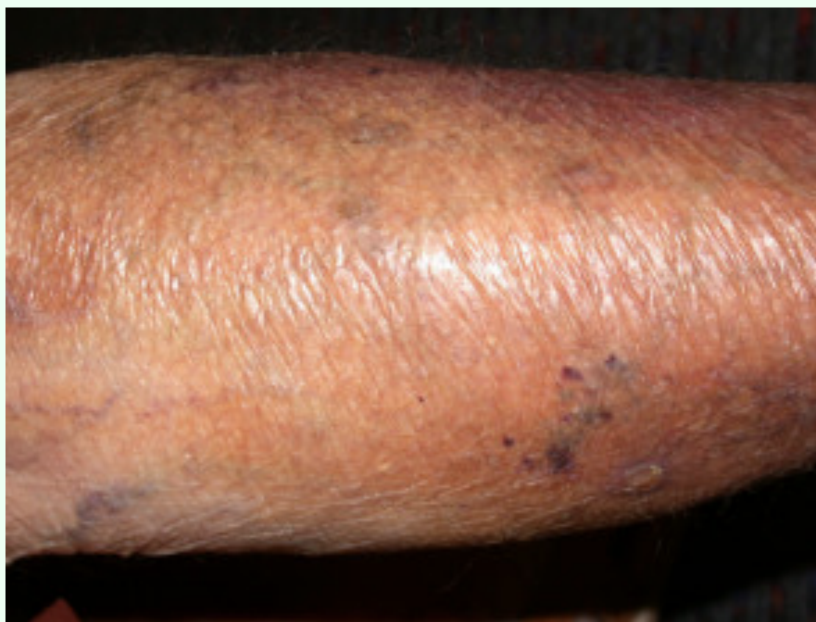












THANK YOU FOR YOUR ATTENTION :)