



Zanzibar University

جامعة زنجبار

Spring of Education and Virtue

Zanzibar
University

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NUR 215: PHARMACOLOGY

BROAD OBJECTIVES

At the end of the session the learner should be able to understand:

- ✦ Drugs used in skin and mucous membrane and nurses responsibilities**

INTRODUCTION

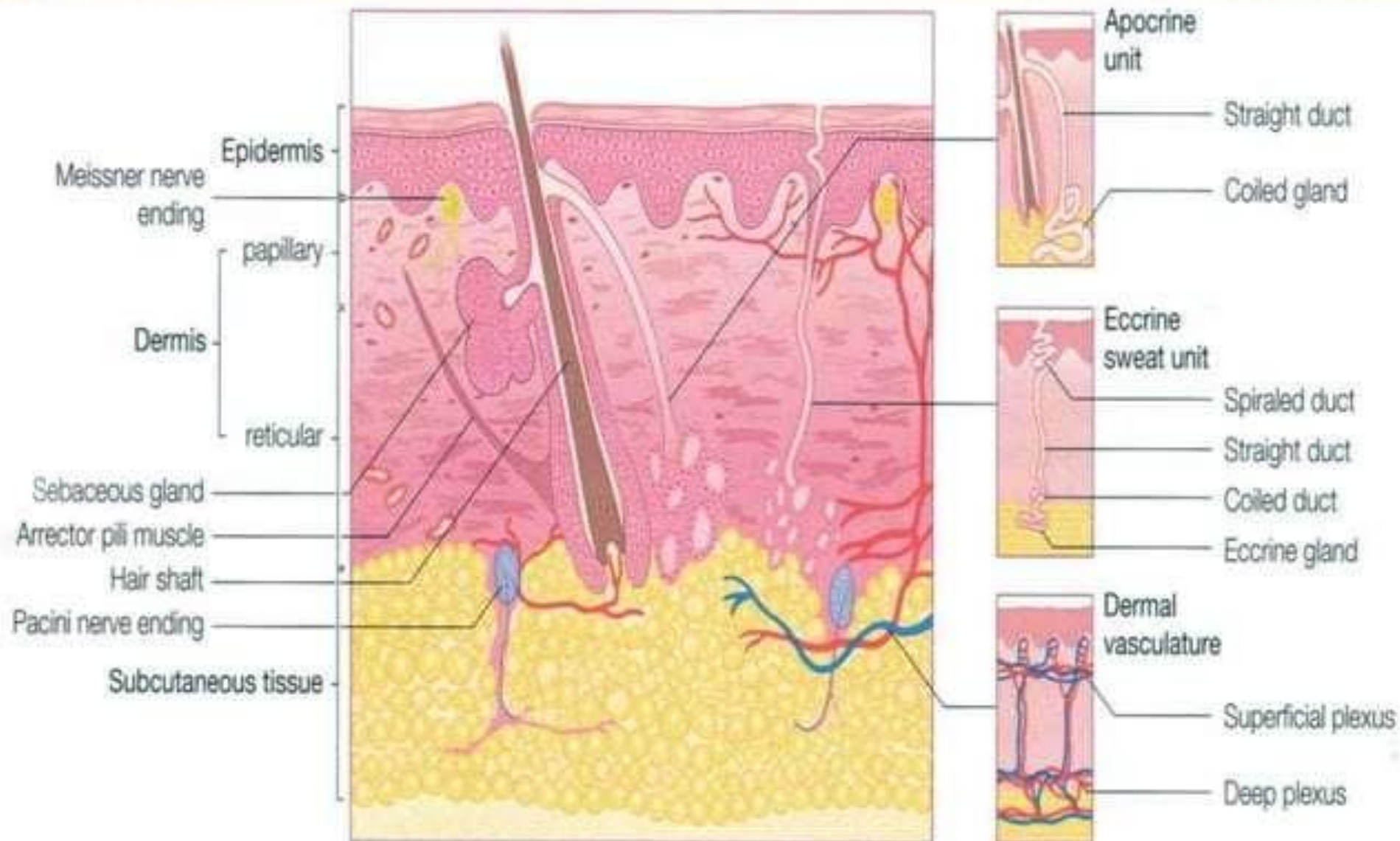
What is skin?

- ✦ The skin is the largest organ of the body, accounting for about 15% of the total adult body weight. It performs many vital functions, including protection against external physical, chemical, and biologic **assailants**, (attack or defence mechanism) as well as prevention of excess water loss from the body and a role in thermoregulation.

CONTI....

- ✦ The skin is continuous, with the mucous membranes lining the body's surface. The skin is composed of three layers: the epidermis, the dermis, and subcutaneous tissue

LAYERS OF SKIN



TROPICAL MEDICATION

- ✦ What is the topical route of administration?
- ✦ It is the administration of drugs via the epidermis (outer layer of the skin) and external mucous membranes to achieve local or systemic effects.

REASONS FOR USING TROPICAL MEDICATION

- ✘ Permits local rather than systemic absorption of the drug
- ✘ Reduces side effects
- ✘ Some drugs are slow release over 24 hours therefore continuous action

ROUTES WHICH CAN BE USED IN TROPICAL MEDICATION

- ✘ Eye
- ✘ Ear
- ✘ Nose
- ✘ Transdermal
- ✘ Rectal
- ✘ Vaginal

DRUGS USED IN SKIN AND MUCUS MEMBRANE ARE DIVIDED INTO SEVERAL GROUPS WHICH ARE:

- ✘ Antifungal
- ✘ Antibacterial
- ✘ Anti inflammatory
- ✘ Antipuretics and local anaethetics
- ✘ Keratolytics
- ✘ Keratoplastics and
- ✘ Antiviral

ANTIFUNGAL

- ✦ There several antifungal which are as follows:

ANTIBACTERIAL

- ✦ Antibiotics are used for systemic and topical skin diseases treatment, taking advantage of their antiseptic, bacteriostatic and also their anti-inflammatory and immunomodulating properties. In case of localized external skin layers infections, a topical treatment is adequate.

CONTI....

- ✦ In case of widespread and deeper infections a systemic treatment is needed. The latter dermatological diseases are mostly treated by beta-lactam antibiotics (penicillins and cefalosporins) macrolides and tetracycline. In topical treatment mostly erythromycin, clindamycin, mupirocyne and fusidic acid are used

CONTI.....

- ✘ There are several antimicrobial drugs are:
- ✘ Erythromycin gel
- ✘ Clindamycin gel
- ✘ Bacitricin
- ✘ Fusidate sodium

ERYTHROMYCIN GEL

Description:

- ✦ Erythromycin topical is an antibiotic that fights skin infection caused by bacteria.
- ✦ Erythromycin Topical Gel contains erythromycin for topical dermatologic use. Erythromycin is a macrolide antibiotic produced from a strain of *Saccaropolyspora erythraea*



CONTI....

Indication

- ✦ Erythromycin topical (for the skin) is used to treat bacterial infections such as severe acne
- ✦ Minor cuts
- ✦ burns

CONTI....

- ✦ Mechanism of action
- ✦ Erythromycin acts by inhibition of protein synthesis in susceptible organisms by reversibly binding to 50s ribosomal subunits
- ✦ It inhibit translocation of aminoacyl transfer-RNA and inhibiting polypeptide synthesis.
- ✦ Antagonism has been demonstrated *in vitro* between erythromycin, lincomycin, chloramphenicol, and clindamycin

CONTI....

Uses

- ✘ This medication is for use on the skin only
- ✘ . Clean and dry the affected area as directed.
- ✘ Then apply a thin layer of the medication on the skin, usually once or twice a day or as directed.
Wash your hands after use.
- ✘ Do not use large amounts or apply this more often or for a longer period than directed.

CONTI....

Nursing consideration

- ✘ Use this medication regularly in order to get the most benefit from it.
- ✘ Remember to use it at the same time(s) each day.
- ✘ Avoid getting this medication in your eyes or inside the nose or mouth.
- ✘ If this occurs, rinse thoroughly with water.

CONTI....

Side effects

Less serious side effects may include:

- ✘ mild skin irritation or tenderness;
- ✘ dry skin

CONTI....

Severe side affects

- ✗ Tightness of the chest
- ✗ Difficult breathing
- ✗ Blood stool
- ✗ Irritation of the eyes
- ✗ Itching
- ✗ Stomach cramp
- ✗ Severe diarrhoea
- ✗ Redness of skin
- ✗ Severe allergic reaction(rashes, hives)
- ✗ Swelling of mouth, face, lips and tongue

CONTI....

✦ **Contraindications**

- ✦ Erythromycin Gel is contraindicated in those individuals who have shown hypersensitivity to any of its components

CLINDAMYCIN PHOSPHATES CREAM

Indication

- ✘ Treatment of bacterial vaginosis e.g. haemophilus vaginitis

Mechanism of action

- ✘ It inhibits bacterial protein synthesis at the level of bacterial ribosome.

Dose

- ✘ Complete content of a single pre-filled applicator containing 5g of clindamycin cream administered once vaginally at any time of a day



CONTI....

Side effects

- ✘ Pruritic rash, diarrhea, vomiting, fatigue, back pain, constipation, dizziness, dysfunctional uterine bleeding, pelvic pain, vaginal irritation

Precaution

- ✘ Accidentally exposure to the eyes
- ✘ Fungal vaginal infection
- ✘ Lactation mother
- ✘ Pregnancy woman

CONTI....

- ✘ **Contraindication**
- ✘ Hypersensitivity to Clindamycin
- ✘ History of bowel disease

ANTI-INFLAMMATORY

- ✦ A steroid hormone produced by the adrenal cortex that regulates carbohydrate metabolism and maintains blood pressure. Also called *cortisol*.
- ✦ A preparation of this hormone obtained from natural sources or produced synthetically and used to treat inflammatory
- ✦ A steroid hormone produced by the adrenal glands that provides resistance to stress

CONTI...

- ✘ There are several anti-inflammatory which are:
- ✘ Hydrocortisone
- ✘ Zinc sulphate
- ✘ Budesoniden
- ✘ betamethasone

HYDROCORTISONE



HYDROCORTISONE

Generic name : Hydrocortisone.

Trade name: Cortaid.

Availability

Cream, gel, lotion, ointment, solution:

CONTI....

Action

Suppresses inflammatory and immune responses, mainly by inhibiting migration of leukocytes and phagocytes and decreasing inflammatory mediators, also interacts with steroid cytoplasmic receptors to induce anti-inflammatory effects; possesses antipruritic, anti-inflammatory actions

CONTI....

Indication: It is prescribed for the topical treatment of skin inflammation includes :

- ✘ psoriasis, eczema, contact dermatitis, allergies, pruritus, collagen diseases, adrenocortical insufficiency, and certain neoplasm

CONTI....

Contraindication

- ✦ Viral and fungal diseases of the skin that occur where circulation is impaired or known hypersensitivity to steroids prohibits its use.
- ✦ Hypersensitivity to drug, alcohol.

CONTI....

- ✘ Systemic fungal infections
- ✘ Concurrent use of other immunosuppressant corticosteroids
- ✘ Concurrent administration of live-virus vaccine

CONTI...

Adverse effects.

- ✦ Among the more serious adverse effects are various systemic side effects that may result from prolonged or excessive use. Local irritation of the skin may occur. conditions including : adrenal failure, headache, nervousness nausea, vomiting, dry mouth, muscle pain or weakness rash, pruritus, urticaria, contact dermatitis insomnia; appetite changes

CONTI....

- ✦ **Route for administration.**
- ✦ Injection: 25 mg/ml, 50 mg/ml; 100 mg/vial, 250 mg/vial, 500 mg/vial, 1,000 mg/vial.
- ✦ Oral suspension: 10 mg/5 ml
- ✦ Spray (topical): 1%
- ✦ Tablets: 5 mg, 10 mg, 20 mg

CONTI....

Dose

20 to 240 mg/day P.O.[Suspension].

5 to 75 mg by intra-articular injection
(depending on joint size) 2to 3 weeks.

One applicatorful of intrarectal foam daily or
b.i.d. for 2 to 3 weeks; then one applicatorful
every other day

CONT.....

15 to 240 mg/day subcutaneously, I.M., or I.V.,
adjusted according to drug.

100 to 500 mg I.M. or I.V.; may repeat at 2-, 4-
, or 6-hour intervals, depending on response
and condition response

CONTI....

✦ **Precautions**

Caution should be taken of patient with :

- ✦ Hypertension, osteoporosis, glaucoma, renal or GI disease, hypothyroidism, cirrhosis, thromboembolic disorders, myasthenia gravis,
- ✦ Heart failure
- ✦ Pregnant
- ✦ Breastfeeding patient
- ✦ Children ages 6 and younger (safety not established).

CONTI....

Administration

- ✘ • Give oral form with food or milk to avoid GI upset.
- Give I.V. injection of sodium succinate form over 30 seconds to a few minutes.
- Know that drug may be given as intermittent or continuous I.V. infusion. Dilute in normal saline solution, dextrose 5% in water, or dextrose 5% in normal saline solution.
- Inject I.M. deep into gluteal muscle. Rotate injection sites to prevent muscle atrophy.

- ✘ • Be aware that subcutaneous administration may cause muscle atrophy or sterile abscess. Never abruptly discontinue high-dose or long-term systemic therapy.
- Know that systemic forms typically are used for adrenal replacement rather than inflammation.
- Be aware that occlusive dressings, heat, hydration, inflammation, denuding, and thinning of skin increase topical drug absorption

CONTI....

Patient teaching

- ✦ Instruct patient to take daily P.O. dose with food by. Urge patient to immediately report unusual weight gain, face or leg swelling, epigastric burning, vomiting of blood, black tarry stools, irregular menstrual cycles, fever, prolonged sore throat, cold or other infection, or worsening of symptoms.
- ✦ Tell patient using topical form not to apply occlusive dressing unless instructed by prescriber.

CONTI....

- ✦ Advise patient to discontinue topical drug and notify prescriber if local irritation occurs.
- ✦ Instruct patient to eat small, frequent meals and to take antacids as needed to minimize GI upset.
- ✦ Tell patient that response to drug will be monitored regular.

BETAMETHASONE

Description:

- ✦ Betamethasone Valerate Cream, Ointment and Lotion contain betamethasone valerate USP, a synthetic adrenocorticosteroid
- ✦ for dermatologic use. Betamethasone, an analog of prednisolone, has a high degree of glucocorticoid activity and a slight degree of mineralocorticoid activity



CONTI....

- ✦ **The mechanism of action**
- ✦ Anti-inflammatory activity of the topical corticosteroids is unclear. Various laboratory methods, including vasoconstrictor
- ✦ assays, are used to compare and predict potencies and/or clinical efficacies of the topical corticosteroids. There is some evidence to
- ✦ suggest that a recognizable correlation exists between vasoconstrictor potency and therapeutic efficacy in man.

CONTI....

Indication:

- ✘ Topical corticosteroids are indicated for the relief of the inflammatory and pruritic manifestations of corticosteroid-responsive dermatoses.

Contraindications:

- ✘ Topical corticosteroids are contraindicated in those patients with a history of hypersensitivity to any of the
- ✘ components of the preparation.

CONTI....

- ✦ **Precautions:**
- ✦ Systemic absorption of topical corticosteroids has produced reversible hypothalamic-pituitary-adrenal (HPA)
- ✦ axis suppression, manifestations of Cushing's syndrome, hyperglycemia, and glucosuria in some patients.

ANTIPRURITICS DRUGS

- ✦ An antipruritic agent or substance is by nature or design something that helps to preventing or relieving the discomfort associated with itching.
- ✦ Topical antipruritic are available in a variety of formulations like creams, ointments, powders, lotion and even the occasional spray could assist

CONTI....

- ✦ **How to use Antipruritic topical**
- ✦ This medication is used to treat a variety of skin conditions for reduces the swelling, itching, and redness that can occur in these types of conditions (e.g., eczema, dermatitis, allergies, rash) This medication is a mild corticosteroid

CONTI....

- ✦ The medication use on the skin only .Wash and dry your hands before using. Clean and dry the affected area. Apply a small amount of medication to the affected area and gently rub in, usually 2-4 times daily or as directed by your doctor. Do not bandage, cover, or wrap the area unless directed to do so by your doctor. If used in the diaper area on an infant, do not use tight-fitting diapers or plastic pants

CONTI....

There are several antipuritics drugs but common one are:

- ✘ Calamine lotion
- ✘ Hydrocortisone Antipruritic topical

CALAMINE LOTION



- ✘ Lotion (BP 15% calamine, USP 8% calamine)
- ✘ **Uses:** Symptomatic topical treatment of mild pruritus and insect stings.
- ✘ **Dosage:** Shake well before using. Apply to affected skin 3–4 times daily.

CALAMINE LOTION

- ✦ **Precautions:** Avoid contact with the eyes and mucous membranes
- ✦ **Adverse effects:** May rarely cause sensitization rating superficial wounds, tropical ulcers and the skin lesions.



HYDROCORTISONE ANTIPRURITIC TOPICAL

Dosage:

- ✦ A thin film should be applied to the affected area 1–4 times daily. When a favorable
- ✦ response occurs, reduce the frequency of application to the minimum necessary to maintain control and avoid relapse. Treatment should be stopped as soon as all lesions have resolved.



CONTI....

- . The cream is suitable for most dermatoses and the ointment is often used for dry,
 - ✘ scaly lesions. Occlusive dressings should only be used for severe or resistant lesions.

CONT....

Precautions:

- ✦ The use of occlusive dressings increases the penetration of hydrocortisone into keratinized lesions. Use occlusive dressings only at night and for no longer than two nights. Occlusive dressings should never be used on weeping lesions. If secondary infection occurs, stop hydrocortisone and give an appropriate antimicrobial.

CONTI....

Adverse effects:

- ✦ Exacerbation of untreated infections. Prolonged use can induce local atrophic changes, particularly on the face and in skin folds, characterized by thinning of the dermis, depigmentation, dilatation of superficial blood vessels and formation of striae. Hypercorticalism and suppression of the hypothalamic-pituitary-adrenal axis are possible with prolonged use or widespread use on large areas of the body. However, local atrophic changes are much less common with hydrocortisone

KERATOLYTIC AGENT

There are several keratolytic agent drugs which are:

- ✦ Adapalene gel
- ✦ Benzoyl peroxide cream

ADAPALENE GEL

- ✘ **Common brand name:** Defferin
- ✘ **Generic name:** Adapalene
- ✘ **Adapalene gel 0.1**



CONTI....

Indication

- ✦ Is the medication used to treat acne vulgaris in patients 12 years of age and . It may decrease the number of severity of acne pimples and promote quick healing of pimples that do development.
- ✦ It works by affecting the growth of cell and decreasing swelling and inflammation

CONTI....

Dosage

Each gram of DIFFERIN Gel, 0.3% contains 3 mg adapalene in an off-white aqueous gel.

Use adult dose for acne

- ✘ 0.1% or 0.3% gel

Use for pediatric dose for acne

- ✘ 12 18 years the same dose

- ✘ 45 laminate tube NDC

- ✘ 75 laminated tube NDC

CONTI....

Mechanism of Action

- ✦ Adapalene binds to specific retinoic acid nuclear receptors but does not bind to cytosolic receptor protein. Biochemical and pharmacological profile studies have demonstrated that adapalene is a modulator of cellular differentiation, keratinization, and inflammatory processes. However, the significance of these findings with regard to the mechanism of action of adapalene for the treatment of acne is unknown.

CONTI....

Drug interaction

- ✦ Adapalene gel has potential to produce local irritation in some patients, concomitant use of other potentially irritating topical products e.g. medicated soap and cosmetics have strong dry effects and product with high concentration of alcohol.

CONTI.....

- ✘ **Adverse effects**
- ✘ Erythema scaling
- ✘ Dryness
- ✘ Pruritus
- ✘ Burning which occur (10-40)
- ✘ Skin irritation

CONTI....

Precaution

- ✘ During the use of Adapalene the patient should avoid expose him/herself to sunlight
- ✘ Sensitivity to sun
- ✘ Avoid contact with eyes, lips and angles of nose
- ✘ Also should not be applied on cuts, abrasion, eczematous skin or sunburn skin
- ✘ Allergic to vitamin A
- ✘ Avoid electrolysis, waxing, and chemical depilatories for hair removal on the treated area

CONTI....

Contraindication

- ✦ Should be not be administered to individual who are hypersensitivity adapalene

BENZOYL PEROXIDE



CONTI....

- ✦ Cream or lotion 2.5%, 5%, 10%
- ✦ Benzoyl peroxide is a bacteriostatic agent that is used primarily in acne because of its activity against propionibacterium acnes
- ✦ It is absorbed by the skin after topical application and metabolized to benzoic acid

CONTI....

✦ **Uses**

- ✦ Treatment of mild and moderate acne vulgaris and as an adjunct to therapy in more severe cases

✦ **Dosage and administration**

- ✦ Adult and adolescent: a thin layer of 2.5% or 5% cream or lotion should be applied to skin initially once daily on alternate days
- ✦ The frequency of application is to gradually increase up to twice daily as tolerance develops. Unresponsive cases may require treatment with the 10% preparation

CONTI....

Contraindication

- ✘ Known hypersensitivity to benzoyl peroxide

Precaution

- ✘ It should not applied to open sores or broken skin.
- ✘ Contact with eyes

CONTI....

Adverse effects

- ✦ Skin irritation is common after topical application but subside with continued treatment

Side effects

- ✦ Mild burning, Dryness, itching, peeling, redness, stringing or swelling of treated area

KERATOPLASTIC AGENTS

- ✘ There are several keratoplastic agent drugs which are:
 - ✘ Coal tar
 - ✘ Salicylic acid

COAL TAR



CONTI....

Solution 5-10%

Ointment(crud coal tar) 1%

shampoo

General information

- ✦ Coal tar is the keratoplastic agent that inhibits excessive proliferation of epidermal cells by reducing DNA synthesis and mitotic activity to normal levels

CONTI....

✦ **Uses**

- ✦ Treatment of chronic psoriasis either alone or in combination of exposure to ultraviolet light

CONTI....

Dosage and administration

- ✦ Adults and children: 100 of solution should be thoroughly mixed with bath water and the patient should soak for 10-20 minutes. Treatment may be repeated daily until the lesions have resolved
- ✦ Alternatively a thin layer of ointment is applied to the affected areas once daily until the lesion have resolved.
- ✦ Phototherapy should not be started until at least 24 hours after treatment and until all traces of the coal tar preparation have been removed from the skin

CONTI...

Contraindication

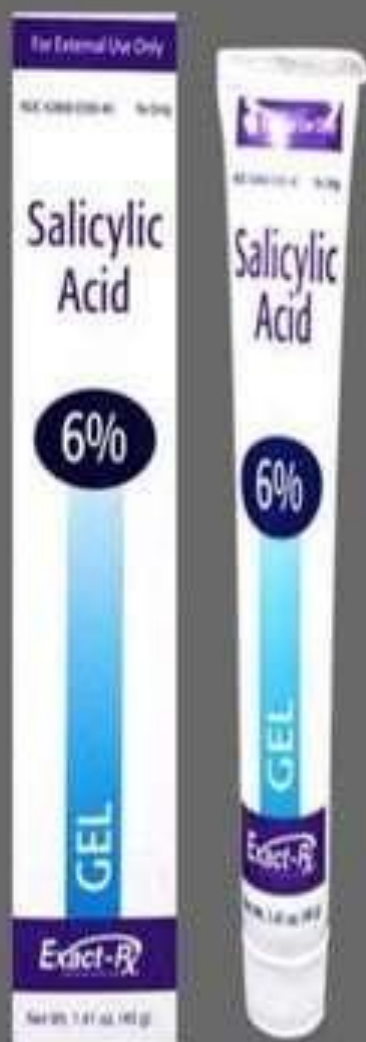
- ✘ Known hypersensitivity to tar preparation
- ✘ Coal tar preparation should not be applied to inflamed broken or infected skin
- ✘ Exposure direct to sunlight should be avoided as far as possible for at least 24 hours after treatment because of the risk of photosensitivity reaction
- ✘ Although coal tar is potential carcinogen there is no evidence that it increases the risk of skin cancer at the doses used therapeutically

CONTI....

Adverse effects

- ✦ Skin irritation, rarely allergic sensation.
Staining of the skin and hair
- ✦ Side effects
- ✦ Itching, burning tenderness, redness and sensitivity to sunlight

SALICYLIC ACID



- ✘ **Generic name: salicylic acid**
- ✘ **Brand name: Keralyt scalp**
- ✘ **Uses**
- ✘ Removing excess skin in a certain condition including scaling associated with scalp psoriasis or calluses

CONTI...

- ✘ Salicylic acid is a tropical salicycate. It is working by causing the skin to swell and slough, soften or peel; in areas where it is applied



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CONTI....

Mechanism of action

- ✘ It facilitate desquamation by solubilizing the intracellular cement binds scales in the stratum corneum, thee for loosing keratin.

Contraindicated

- ✘ Allergic to any ingredients in salicylic acid
- ✘ Child or teenage with flue, chicken pox or shingles
- ✘ Children less than 2 years of age
- ✘ Diabetes mellitus

CONTI....

Dosage

Use adult dose for acne

- ✘ Salicylic acid topical 1% pad
- ✘ Clean affected area. Apply 2 to 3 times daily.

Usual adult dose for dermatological disorder

- ✘ **Salicylic acid topical 16.7% liquid**
- ✘ Wash and dry area thoroughly. Apply enough to cover each wart 1 to 2 times daily

CONTI....

Salicylic acid topical soap

- ✦ Apply to affected area at least twice a weekly

Salicylic acid topical 6% cream

- ✦ Apply affected area once daily

Salicylic acid topical 6% lotion

- ✦ Apply affected area once daily

Salicylic acid topical 6% form

- ✦ Apply to the affected area once daily at bed time

Precaution

- ✘ Pregnancy
- ✘ Breastfeeding
- ✘ Pediatrics

Side effects

- ✘ Skin irritation and skin ulceration or erosion

ANTIVIRAL AGENT

- ✘ There are several antiviral agent drugs which are:
 - ✘ Acyclovir
 - ✘ Ketaconazole
 - ✘ Miconazole nitrate

ACYCLOVIR

- ✘ Is the mostly widely prescribed anti viral drug in the world.
- ✘ Is a synthetic compound with similar molecules structure to purine nucleoside



CONTI....

Indication

- ✘ Acyclovir is used in the treatment of
- ✘ Primary herpes simplex
- ✘ Recurrent of episodes of genital herpes
- ✘ Suppression of HSV infection
- ✘ The first few of the herpes zoster infection
- ✘

CONTI....

Dosing Regimes

- ✘ Herpes simplex
- ✘ For initial in adult and 2 yrs
- ✘ Oral 200mg or 400mg tds /10day
- ✘ In children over 2yrs- half of adult dose so is 100mg-200mg
- ✘ Also it available as a cold sore cream for the lips and face and as an ophthalmic ointment for eye infection. it should be applied at the first sign of infection
- ✘ Also applied on the skin at the affected areas

CONTI....

- ✘ N.B it is not suitable for the mouth or other mucus membrane.
- ✘ Varicella zoster –acyclovir is an important treatment for herpes zoster but it can also be used to treat Varicella (chicken pox) in adult or severe infection in children.
- ✘ Tabs 800mg five times a day for 7 days accelerates the rates of healing of blisters
- ✘ Immunocompromised patients: with chicken pox
- ✘ Disseminated herpes zoster or severe herpes simplex
- ✘ Acute herpes zoster when it affects the trigeminal nerve (for head and eye lids)

CONTI....

- ✘ extensive eczema herpeticum
- ✘ -herpes infection of the brain (encephalitis)
- ✘ -herpes infection in new born babies
- ✘ We can intravenous acyclovir which is given over one hour every 8hrs for 7days in a dose of 5mg/kg for HSV and 10mg /kg for VZU (Varicella zoster virus)

CONTI....

Mechanism of action

- ✦ To become effective, acyclovir must first be charged to acyclovir monophosphate by an enzyme that is only found in viruses, called thymidine kinase (TK) then converted to its active triphosphate from human enzymes found inside the cells. Acyclovir triphosphate is the active form of the drug. It reduce production of viral DNA by competing with natural

CONT....

- ✘ compound, deoxygnanorisen, triphosphate, for the viral DNA polymerase enzyme incorporation of AT into viral DNA completely prevent the synthesis of new DNA
- ✘ Viral DNA polymerase. Binds 10-30 times more strongly to AT than the cellular DNA polymerase. This means acyclovir is not toxic
- ✘ Unfortunately , only about 13-20% of the dose of acyclovir is absorbed through the gut wall, which means it must be taken frequently as it only active for two or three hrs in the blood streams

CONTI....

Side effect

- ✦ The side effect are un common but include-
nausea or vomiting, diarrhea headache,
fever, confusion, lymphadinopathy,
generalized muscle ache itchy skin transient
burning, stinging, and pruritus.

CONTI....

Precaution

- ✦ Kidney disease pts –the dose should be reduced to prevent accumulation of drug contents that may lead to damage the kidney or nerves system
- ✦ It can cause abnormal liver function, blood test and rarely a lowering of the white cell count
- ✦ Pregnancy

KETACONAZOLE

- ✦ **Description**
- ✦ Ketoconazole is used to treat infection by cutaneous and mucous membrane dermatophyte fungus or yeast. Its work by killing the fungus or yeast or preventing its growth. It is broad spectrum of antifungal agent



CONTI....

Uses

- ✘ Athlete's foot (tinea pedis, ring worm of the foot)
- ✘ Ring worm of the body
- ✘ Sun fungus (tinea versicolor)
- ✘ Yeast infection of skin (cutaneous candidas)

Dosage

- ✘ It is recommended ketaconazole cream to be applied once daily to cover the affected area and surrounded area
- ✘ Ketaconazole cream, 2% 15,30 and 60 grams tube

CONT....

Drug interaction

- ✦ Both rifampin and isoniazid lower plasma ketoconazole levels, and concomitant administration should be avoided Phenytoin serum levels should be monitored closely when ketoconazole is prescribed. Ketoconazole

CONTI....

Precaution

- ✘ Carcinogenesis, mutagenesis and impairment fertility
- ✘ Pregnancy: teratogenic effect
- ✘ Lactation mother

Side effects

- ✘ Erythema, itching, bleeding discomfort, dryness, inflammation, irritation and paraesthesiae

Contraindicated

- ✘ Hypersensitivity to the active or excipient ingredient of this formulation

REFERENCE

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- ✦ Godman and Gilman's. The pharmacological basis of therapeutics (10/e) by J.G Hardman L.E Lambird and alferd Goodman Gilman

**THANKS FOR
WATCHING AND
READ**