Gram positive bacteria	
Bacitracin	Topical use —poorly absorbed— systemic toxicity rare MOA — inhibits bacterial cell wall synthesis Form— crams, ointment , aerosol preparation Side effect— topical allergic reaction 1- Allergic contact dermatitis (common 2- Immunological allergic contact urticaria (rare) Note — combination with other drug (polymyxin B and neomycin) , anti inflammation are added (hydrocortisone)
Gramicidin	Topical use Combination with other antibiotics (neomycin, polymyxin B , bacitracin, nystatin) Side effect— hemolysis

Gram negative bacteria	
Polymyxin B sulfate	Given by skin ,not highly absorbed, but if there is denuded area in the skin the absorption rate will be higher so total daily dose applied not exceed 200 mg Side effect— neurotoxicity & nephrotoxicity Allergic contact dermatitis (not common) Note— cortisone is added to decease the inflammation
Neomycin &Gentamicin **(very toxic) (toxic)**	MOA— aminoglycoside antibiotics — ribosomes inhibitors so they are protein synthesis inhibitors Side effect — 1-allergic contact dermatitis & 2- if we use the drug in the open wound — systemic effect—(neurotoxicity &nephrotoxicity) Note—1- hospital acquired resistant ,2- gentamicin more active against P aeruginosa Staphylococci , S pyrogens (group A beta hemolytic)

Note : Neosporin → known as triple antibiotic ointment, it's composed of Neomycin + Bacitracin + polymyxin B.

Topical Antibacterial in acne	
Roaccutane	*Scientific name is Isotretinoin *given orally (systematically) as pills that will enter the GI system and get absorbed *MOA — inhibit sebaceous gland size and function * Side effect — dryness, itching , headache, corneal opacities, pseudotomor cerebri (elevation in the cranial pressure) , (muscle and joint pain &lipid abdominalitie -common) (inflammation bowel disease & anorexia& alopecia —rare), teratogenic(should not get pregnant woman) , also can cause depression Note — restricted for severe cystic acne resistance to standard treatment(topical such as clindamycin)
Clindamycin	*10%absorbed * MOA—protein synthesis inhibitors * Side effect—1. pseudo membranous colitis 2. Allergic contact dermatitis (not common) * Note—1. we have different formulations a.hydroalcoholic vehicle and foam formulation (may cause drying , irritation of the skin with complaints of burning and stinging) b. Water based gel and lotion formulations (less likely to cause irritation) 2. available in fixed combination topical with benzoyl peroxide and with tretinoin
Metronidazole	*Topical administration acts as anti inflammatory agent by direct effect on neutrophils cellular function * the mechanism of action is unknown * Used : 1. Treat rosacea ^^ 2. Antibiotics for parasite 3. Treat Amebiasis 4. Treat anaerobic bacteria and GI infection * Side effect — local effect include dryness, burning and stinging * Note — if we use cream of it we will have less irritation problem

Erythromycin	*MOA— protein synthesis inhibitors * Side effect— 1. Development of antibiotic resistance strain of organisms including staphlococci (possible complication) 2. burning sensation at the time of application & drying and irritation of the skin *Note— erythromycin base rather than a salt is used to facilitate penetration (topical preparation) Available in a fixed combination preparation with benzoyl peroxide to treatment of acne vulgaris
Sodium sulfacetamide & Dapsone	Belong to the family of isotretinoin , used to prevent the infection of the bacteria that causes acne k

Topical anti fungal agents	
Azole derivatives : **Clotrimazole** **Econazole.** **Ketoconazole.** **Miconazole.** **Oxiconazole.** **Sulconazole.** **Only for Candida albicans** : **Naftifine and Terbinafine.** **Tolnaftate.**	Activity against dermatophytes that cause Tinea disease & yeasts including Candida albicans *Available as topical preparation, oral suspension(to treat the fungal infection in the GI tract) , or vaginal tablets *Side effect— these drugs are highly toxic that causes nephrotoxicity so shouldn't be used systemically and used for certain cases * Note — given IV injection in the case of treating infection Terbinafine recommended for onychomycosis (6 week for fingernail and 12 week for toenails)

Ciclipirox olamine	is the best drug to treatment Tinea versicolor (fungal infection) which the color of the skin changes in certain area
Nystatin & Amphotericin b	*Topical therapy of Candida albicans (cutaneous and mucosal candida infection , infection of oral cavity as well) ,but ineffective against dermatophytes * doesn't get absorbed to the systemic circulation because toxicity related to systemic administration , it's given intravenously in the treatment of many systemic mycoses where we keep monitoring the kidney function • Note— nystatin doesn't get absorbed through membranes so we can use it as mouth wash or treat infection of the GI tract .

Oral anti fungal agent

Azole derivatives : **Fluconazole** **Itraconazole** **Ketoconazola**	*MOA— affect the permeabllity of fungal cell membrane through alteration (inhibition) of sterol synthesis * Used: 1. Effective in systemic mycosis 2. mucocutaneous candidiasis and other cutaneous infection * Side effect— systemic effect —hepatitis and liver enzyme elevations (dysfunction in liver enzymes) so must monitored these enzymes when these drugs are used for a long period of time and interaction . *Note— ketoconazole used orally and topically
Griseofulvin	*Used— treat the different fungal infections, and depending on the organ the period is decided (Requires prolonged treatment):>>> 4-6 weeks for the scalp. (in Tinea capitis) >>>6 months for fingernails. >>>8-18 months for toenails. *Note —Has many side effect

but if the topical treatment didn't work out we must revert to systematic treatment.

Topical Antiviral Agents	
Acyclovir. **Valacyclovir.** **Penciclovir.** **Famciclovir,**	*MOA—inhibitors of viral replication by incorporated into DNA of the virus * Form — ointment and creams are useful for recurrent orolabial herpes simplex infection . *We may have other skin infections like the herpes zoster infection (dormant pathogen, it gets stored in the dorsal root ganglia and it gets reactivated when our immunity gets low) a severe condition of it we will use systematic antiviral agents, but usually we use them as a cream to treat skin or mucous membrane, lips, or the face. *Note—These drugs should be given early on, once the patient felt the symptoms, if you give it after 2 or 3 days, the virus has already affected the cell so the drug will not be beneficial.

^^Rosacea —> skin condition where there is a reddening of the face or an area of the skin, blushing or flushing and visible blood vessels in the face, caused by Demodex brevis parasite can be associated with this disease. it's not a severe infection but it can bother some patients).

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Immunomodulators	
Imiquimod	*MOA—1. Stimulates peripheral mononuclear cell to release interferon Alpha 2. Stimulate macrophage to produce interleukins 1,6,8 and tumor necrosis factor alpha * Used : 1. For external genital and perianal warts 2. Actinic keratosis on the face and scalp 3. Primary basal cell carcinoma
Tacrolimus **Pimecrolimus**	Calcineurin inhibitors *MOA—1. Inhibit T lymphocyte activation 2. Prevent release of inflammatory cytokines and mast cell mediators *Used — atopic dermatitis (is a form of eczema) *Side effect—nephrotoxicity & immunosuppressive *Note—Black box warning ^^

Black box warning ^^ – these wearing are intended to bring the consumer's attention to the major risk of the drug

Ectoparasiticides	
Permethrin	*Form— use in the format shampoo or lotion depending where that the infection is occurs . *Used : 1.toxic to Pediculus humans that causes pediculosis which the cream applied for 10 minutes and then rinsed off with warm water 2.Toxic to Sarcoptes Scabiei that causes Scabies which cream applied for the whole body for 8-14 hours
Lindane	*10% absorbed and concentrated in fatty tissues * Side effect— can cause neurotoxicity and hematotoxicity (blood dyspraxia)

There are many drug that affect the pigmentation which one increase the pigmentation and other decreases
This discoloration happened due to different reasons

1. Aging 2. High exposure to sunlight 3. Sometimes during pregnancy because of changes in the hormones

Agents affecting pigmentation	
Hydroquinone &Monobenzone	*MOA—toxic to melanocytes resulting in permanent depigmentation
Mequinol	*MOA—inhibiting the enzyme tyrosinase which will interfere with biosynthesis of melanin * Used —reduce hyperpigmentation of skin
Methozsalen Trioxsalen	*MOA— they intercalate with DNA *Used— repigmentation of depigmented mucuses of vitiligo ^^ *Side effect — can cause cataract and skin cancer * Note — psoralen(drug need light to be activated) , so must be photoactivated by long wave length ultraviolet light (320-400nm) to produce a beneficial effect

Vitiligo ^^ condition in which white patches develop in the skin

Acne preparation	
Benzoyl peroxide	*MOA—penetrates the stratum corneum or follicular opening and converted to bezoic acid within the epidermis and dermis *Used—1. has antimicrobial activity against P.acne and peeling and comedolytic effect^^ 2. Potent contact sensitizer *Side effect — can cause bleaching of hair or colored fabrics * Note —can be combined with erythromycin or clindamycin Similar to other chemical compounds (hydrogen peroxide)which use in sterilization and bleaching of teeth
Retoinoic acid (tretinoin) and derivatives	*acid form of Vitamin A *MOA— vitamin A work in nuclear receptor, in this case we have retinoic acid receptor which drug bind to it , then translocate to the nucleus— bind to the DNA cause modulation change in the expression in pattern of certain gene — this will lead to proliferation of these cells , so will give me part of effect of these drug for treatment of acne: 1. Stabilizes lysosomes, increases RNA polymerase activity, increases PGE2, CAMP, and cGMP levels, and increases the incorporation of thymidine into DNA . 2. Decreases cohesion between epidermal cells and epidermal cell turnover. This will result expulsion of comedones and transformation of closed comedones into open ones 3. promotes dermal collagen synthesis, new blood vessel formation, and thickening of the epidermis, which helps diminish fine lines wrinkles *Side affect —A.can cause erythema , B. dryness so can use face or body moisturizer & eye drops &use sunscreen& drink a lot of water C. Can cause depression D. Affect the liver enzymes, that's why the physician asked you to perform monthly check of your enzyme E. affect also on lipid profile (cause lipid abnormalities) F. Tumerogenic in animals G. teratogenic

Azelaic Acid	* has antimicroibial activity and inhibits conversion of testosterone to dihydrotestosterone (hormone responsible for the secondary sex characteristic, also responsible for the hormonal change that happen in puberty and adolescence)

Comedolytic effects ^^ mean expulsion of open comedones and transformation of closed comedones into open ones

Comedones—pores or hair follicles that have gotten blocked with bacteria, oil, and dead skin cell to form a bump on your skin.

Drug for psoriasis (autoimmune disease)	
Acitretin	*Given orally *Side effect — hepatotoxic and teratogenic *Note— related to isotretinoin Patient should not become become pregnant for 3 years after stopping treatment, and also should not donate blood because the long half life for this drug
Tazarotene	*topical *Used — anti inflammatory & anti proliferation action *Side effect —teratogenic, can cayburning , stinging , peeling , erythema and localitedema of skin
Calcipotiene	Synthetic vitamin D3 derivatives The mechanism of action is unknown

In psoriasis we use biologic agent and anti inflammatory agent
So when we have patient of psoriasis— start treatment by using anti inflammatory rather than biological because it suppress the immune system so the patient has chance of having bacterial infection

Biologic Agents	
Alefacept	Immunosuppressive dimer fusion protein of CD2 linked to the Fc portion of human IgG1.
Efalizumab	*recombinant humanized IgG monoclonal antibody *can cause: —Withdrawn — progressive multifocal leukoencephlopathy (PML) —thromobocytopenia
Etanercept	Dimeric fusion protein of TNF receptor linked to Fc portion of human IgG1

Anti inflammatory agent	
Topical corticosteroids **Hydrocortisone.** **Prednisolone and Methylprednisolone.** **Dexamethasone and Betamethasone.** **Triamcinolone.** **Fluocinonide.**	*MOA— inhibits phospholipase 2 which convert arachidonic acid to prostaglandin , so this drug blocking the immune response or the inflammatory response * Absorption — increased with inflammation (tissue is haggle vascularized) , increasing the concentration does not proportionally increase the absorption * given by intralesional injection (this mean inject the drug inside the legion) * Side effect —suppression of pituitary (adrenal axis)^^ , systemic effect (moon face & buffalo hump) , skin atrophy , erythema, pustules, acne , infection , hypopigmentation, allergic contact dermatitis *Used— dermatological disorders very responsive to steroids : Atopic dermatitis , seborrheic dermatitis, Lichen simplex chronicus , allergic contact dermatitis, eczematous dermatitis, psoriasis *Note —because this drug suppression of immunity we can see more back or fungal infection , such as inhalers corticosteroids— suppression of immune system then imbalance in the normal flora so Candida overgrowth casing fungal infection in the oral cavity .

Tar compounds	*Used — psoriasis, dermatitis, and lichen simplex chronicus *Side effect— can cause irritant folliculitis , photo toxicity and allergic contact dermatitis

^^ We know that the body can produce corticosteroids by Adrenal gland so when use exogenous source the adrenal gland will stop synthesis it , so it will atrophy

Lichen simplex chronicus— skin condition where we have white flaky karatinase tissue formation in the skin (it is autoimmune problem)

Sunscreen & Sunshades	
Sunscreen	*absorb UV light * Example are para amino benzocaine acid (PABA) and its esters
Sunshades	*are opaque materials that reflect light like titanium dioxide *Used — polymorphous light eruption, lupus erythematosus , and drug induced photosensitive