

DERMATOLOGIC FORMULATION AND TREATMENT OF ACNE

**By
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LECTURE OBJECTIVE

TO know about different dermatologic formulations and their features

To know about acne and its

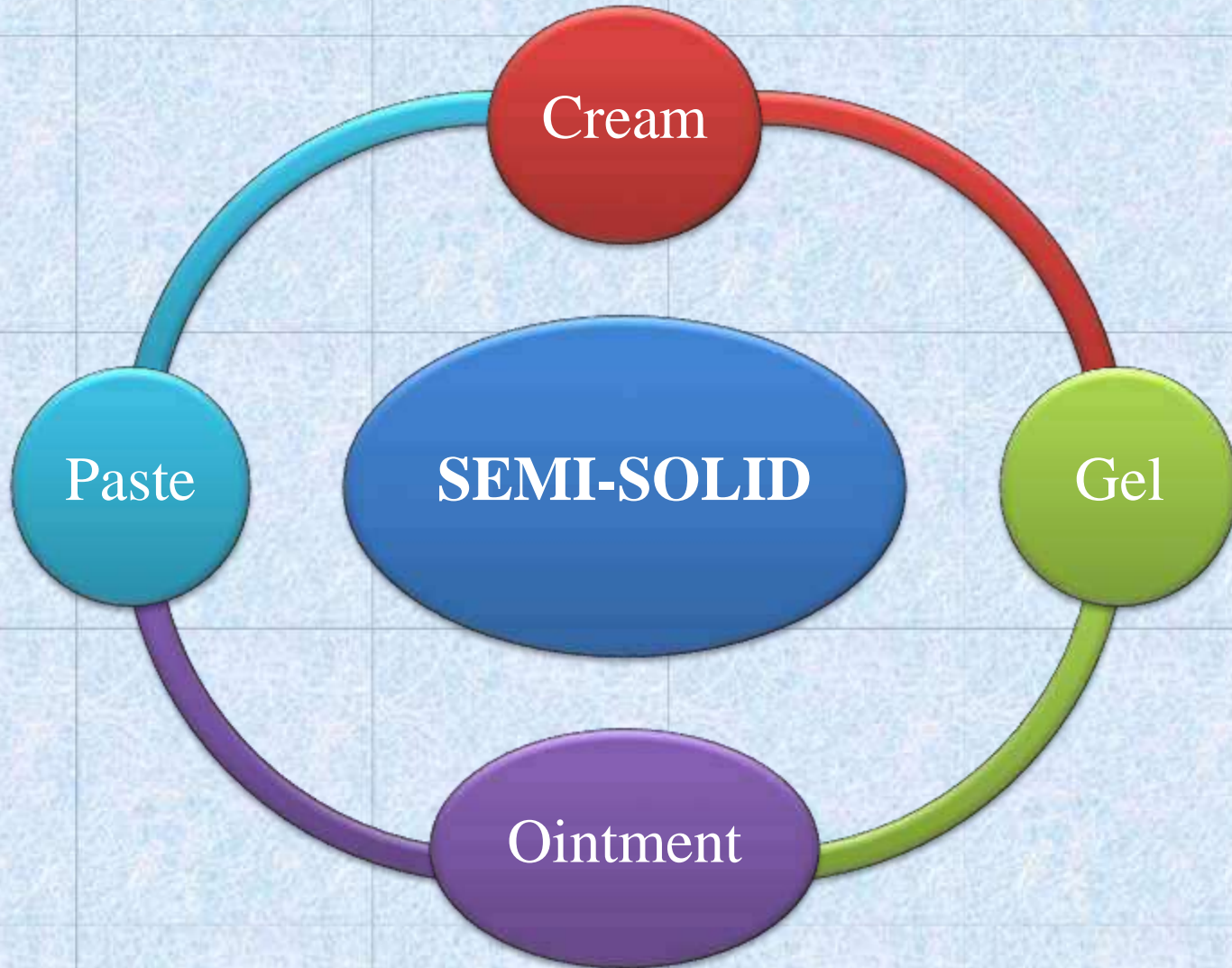
Pathophysiology

Clinical features and

Treatment

DERMATOLOGICAL FORMULATION

SEMI-SOLID DOSAGE FORMS





Main dermatologic formulations are

ointments

creams

lotions

Gels

Pastes etc

Different ratios of water and oil give these substances unique textures, which can have some effect on the product's intended purpose.

1 – OINTMENTS



- Ointments are semi-solid, greasy preparations for application to the skin..
- Base is usually anhydrous and immiscible with skin secretions.
- Ointments may be used as emollients or dissolved medicaments to the skin.

2 – CREAMS



Oil-in-water (O/W)

- It composed of small droplets of oil dispersed in a continuous aqueous phase.
- Less greasy and more easily washed off using water.

Water-in-oil (W/O)

- It composed of small droplets of water dispersed in a continuous oily phase.
- More difficult to handle but used for hydrophobic drug preparation.
- Reduces water loss from the stratum corneum maintain moisture of skin.

3: LOTION

Lotion is a low viscosity topical preparation intended for external use)

Usually considered thinner than a cream and more likely to contain oil as well as water or alcohol.

can be used for the topical delivery of medications such as antibiotics, antiseptics, antifungals, corticosteroids, antiacne agents, and soothing/protective agents (such as calamine)

4:GEL

Gel products typically contain a combination of cellulose, water, and alcohol. It's also possible to find gel-lotion combination products, which go on much like a lotion.

- Oil-free gels tend to work well for extremely oily skin, since they provide hydration without leaving residue and excess oil on your skin.. It is used for medication, lubrication and some miscellaneous uses

5 – PASTES



- Pastes are basically ointments into which a high percentage of insoluble solid has been added.
- The extra ordinary amount of particulate matter stiffens the system.
- It provide less heating and penetration than ointment.
- It make good protective barrier when placed on the skin, the solid they contain can absorb and thereby neutralize certain noxious chemicals before they ever reach the skin.e.g zinc oxide paste

Greasy Pastes

- Leaser'spaste

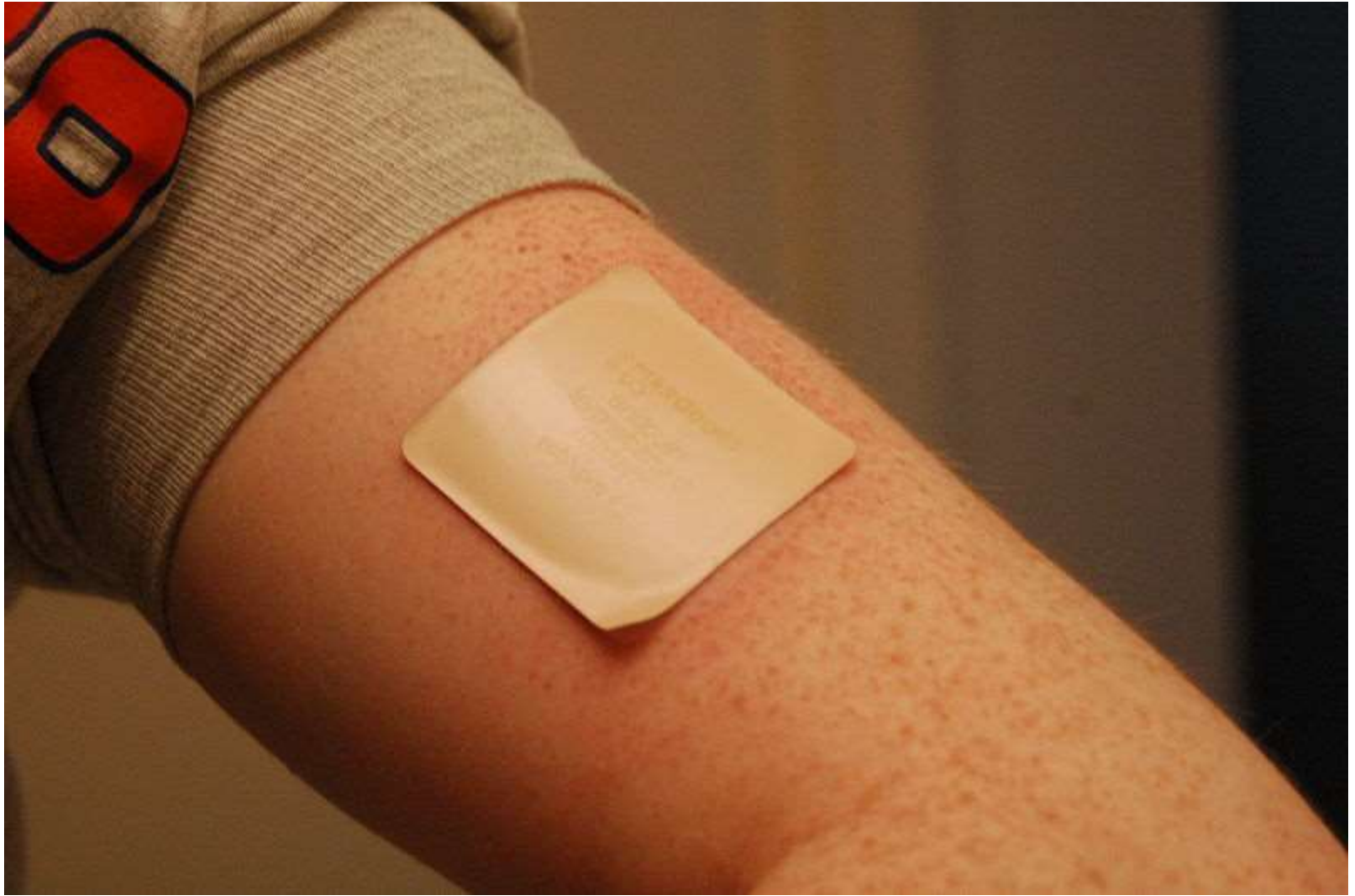
Non-greasy Paste

- Bassorinpaste

6 :Transdermal patch

Transdermal patches can be a very precise time released method of delivering a drug. Cutting a patch in half might affect the dose delivered.

Cutting a patch might cause rapid dehydration of the base of the medicine and affect the rate of diffusion.e.e nicotine patch,Fentanyl patch



7: Powder

Powder is either the pure drug by itself (talcum powder), or is made of the drug mixed in a carrier such as corn starch (- miconazole powder)



What's the difference between cream and ointment?

Both creams and ointments can have medicinal or cosmetic uses.

The primary difference between the two lies in the ratio between oil and water. While a cream has equal parts oil and water, ointments contain about 80 percent oil.

Many people consider creams and lotions much the same product, but they have very different formulations.

Again, creams contain equal parts oil and water. Lotions, on the other hand, contain much more water than oil, though some might also contain alcohol. You can also find oil-free lotions, which might be ideal for combination, oily, or acne-prone skin.

Acne



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Introduction

- Acne vulgaris is a common follicular disorder affecting susceptible hair follicles, most commonly found on the face, neck, and upper trunk.

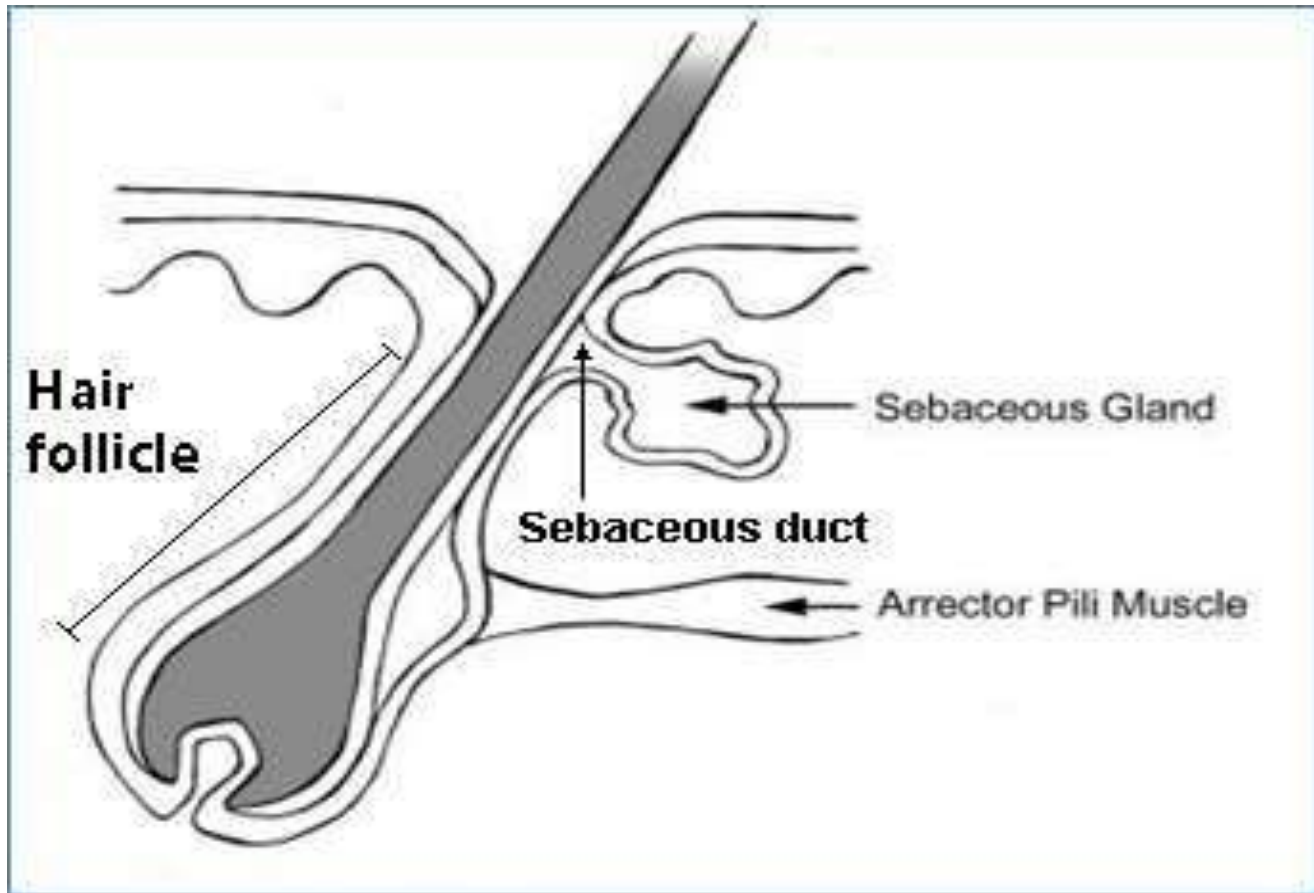
Etiology

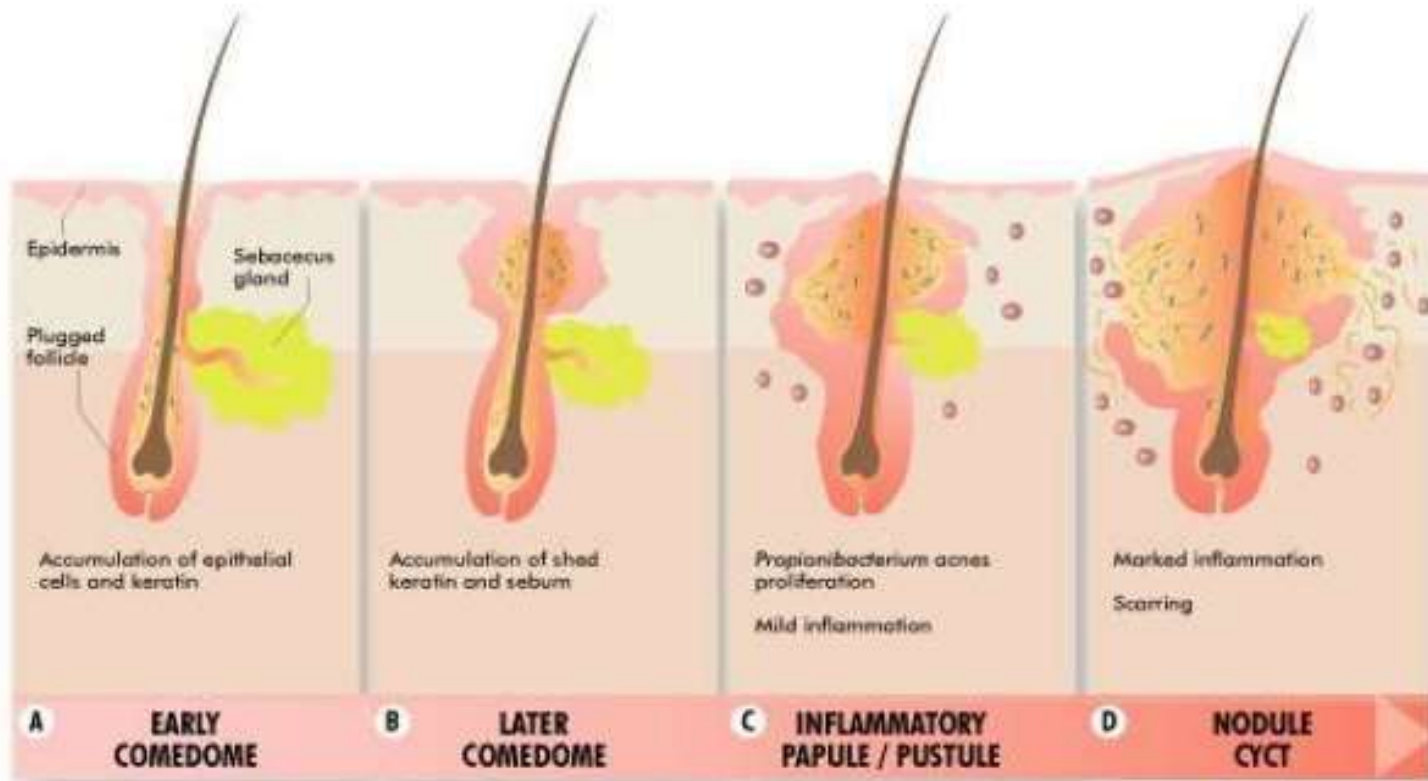
- Genetic
- Hormonal
- Bacterial factors
- Family history of acne

Pathophysiology

- During puberty, androgens stimulate the sebaceous glands, causing them to enlarge and secrete a natural oil, sebum, which rises to the top of the hair follicle and flows out onto the skin surface.
- In adolescents who develop acne, androgenic stimulation produces a heightened response in the sebaceous glands so that acne occurs when accumulated sebum plugs the pilosebaceous ducts.
- This accumulated material forms comedones.

Pilosebaceous Unit





Pathogenesis of Acne

Clinical Manifestations

- The primary lesions of acne are comedones.
- Closed comedones (i.e, whiteheads) are obstructive lesions formed from impacted lipids or oils and keratin that plug the dilated follicle.
- They are small, whitish papules with minute follicular openings that generally cannot be seen.
- These closed comedones may evolve into open comedones, in which the contents of the ducts are in open communication with the external environment.

- The color of open comedones (ie, blackheads) results not from dirt, but from an accumulation of lipid, bacterial, and epithelial debris.
- Some closed comedones may rupture, resulting in an inflammatory reaction caused by leakage of follicular contents (eg, sebum, keratin, bacteria) into the dermis due to the action of certain skin bacteria, such as *Propionibacterium acnes*
- The resultant inflammation is seen clinically as erythematous papules, inflammatory pustules, and inflammatory cysts.

White Heads



Black Heads



Diagnostic studies:

- History Collection
- Physical Examination
- Biopsy Of Lesions

Medical Management

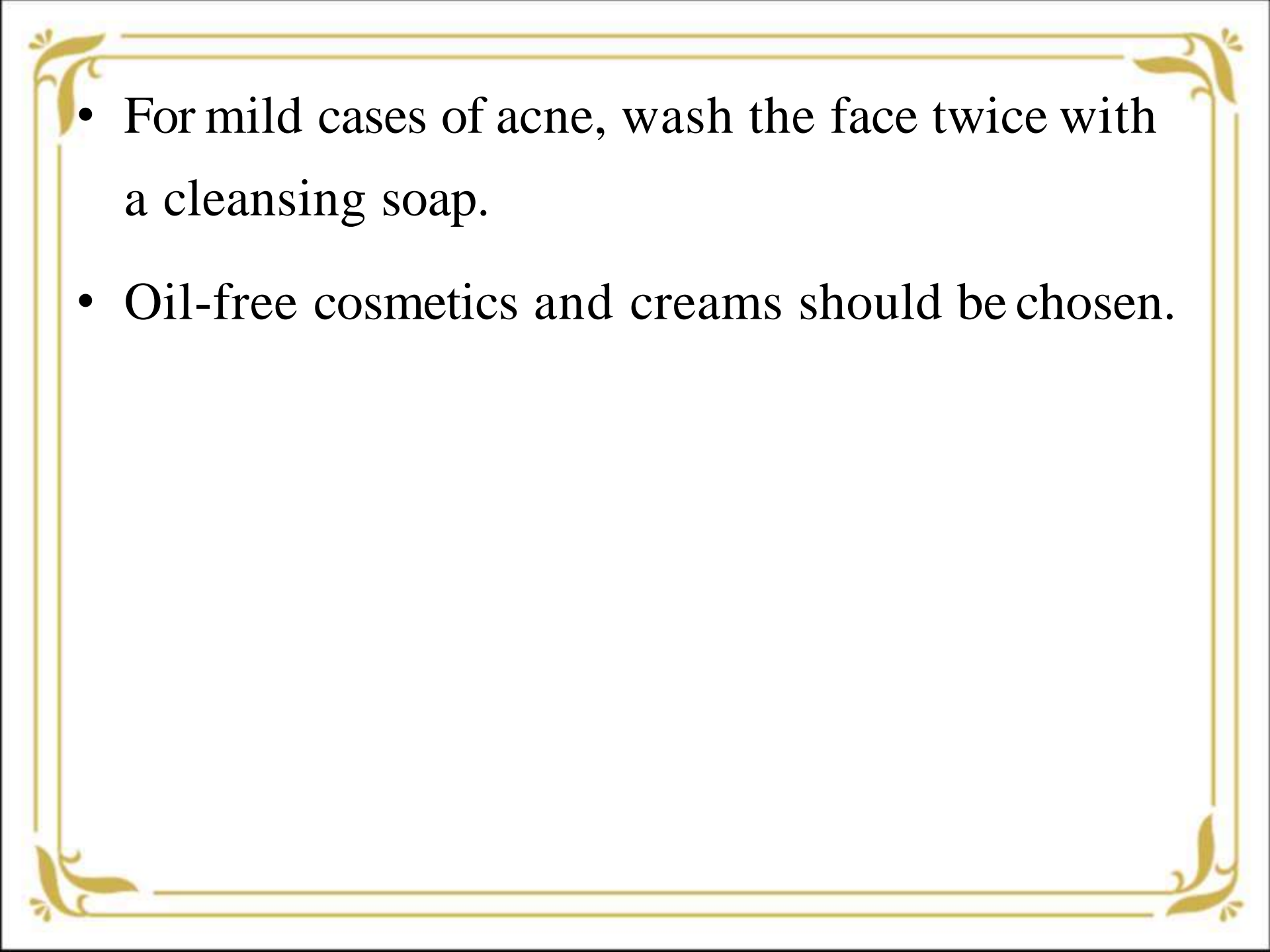
The goals of management are:

- To reduce bacterial colonies
- To Decrease sebaceous gland activity
- To Prevent the follicles from becoming plugged
- To Reduce inflammation
- To Combat secondary infection
- To Minimize scarring
- To Eliminate factors that predispose the person to acne

- There is no predictable cure for the disease, but combinations of therapies are available that can effectively control its activity.
- Topical treatment may be all that is needed to treat mild to moderate lesions and superficial inflammatory lesions
- Systemic treatment may be necessary for severe and extensive acne

NUTRITION AND HYGIENE THERAPY

- Diet is not believed to play a major role in therapy..
- Maintain good nutrition to equip the immune system for effective action against bacteria and infection.

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- For mild cases of acne, wash the face twice with a cleansing soap.
 - Oil-free cosmetics and creams should be chosen.

TOPICAL PHARMACOLOGIC THERAPY

- **Benzoyl Peroxide.** Benzoyl peroxide preparations are widely used because they produce a rapid and sustained reduction of inflammatory lesions.
- They depress sebum production and promote breakdown of comedo plugs.
- They also produce an antibacterial effect by suppressing *P. acnes*.

Mechanism of action

It acts as a bactericidal, sebostatic and comedolytic.

It releases free radicals that damage bacterial cell wall (bactericidal)

Side effects.

Dry skin, itching, red patches on skin

- Benzoyl peroxide, benzoyl erythromycin, and benzoyl sulfur combinations are available over the counter and by prescription.

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- **Vitamin A acid(Tretinoin)**
- **Mechanism of action.**
- Comedolytic, decreases hyperoliferation and also keratinization.
- applied topically,it is used to clear the keratin plugs from the pilosebaceous ducts.
- Vitamin A acid speeds the cellular turnover, forces out the comedones, and prevents new comedones.

Topical Antibiotics:

- Topical antibiotic treatment for acne is common.
- Topical antibiotics suppress the growth of *P.acnes*; reduce superficial free fatty acid levels; decrease comedones, papules, and pustules.
- Common topical preparations include tetracycline, clindamycin, and erythromycin.

SYSTEMIC PHARMACOLOGIC THERAPY

- **Antibiotics:**
- Oral antibiotics, such as tetracycline, doxycycline, and minocycline, administered in small doses over a long period are very effective in treating moderate and severe acne, especially when the acne is inflammatory and results in pustules, abscesses, and scarring.

Oral Retinoids:

- Synthetic vitamin A compounds (ie, Retinoids) are used in patients who are unresponsive to conventional therapy.
- Isotretinoin is used for active inflammatory papular and pustular acne that has a tendency to scar.
- Isotretinoin reduces sebaceous gland size and inhibits sebum production.
- It also causes the epidermis to shed, thereby unseating and expelling existing comedones.
- Side effect: potent teratogen

Hormone Therapy:

- Estrogen therapy (including progesterone–estrogen preparations) suppresses sebum production and reduces skin oiliness.
- Estrogen in the form of estrogen-dominant oral contraceptive compounds may be administered on a prescribed cyclic regimen.
- Estrogen is not administered to male patients because of undesirable side effects.



Androgen receptor blockers

Flutamide,

5 alpha reductase inhibitors

finasteride

SURGICAL MANAGEMENT

- Extraction Of Comedo Contents
- Drainage Of Pustules And Cysts
- Excision Of Sinus Tracts And Cysts
- Intralesional Corticosteroids For Antiinflammatory Action
- Cryotherapy
- Dermabrasion For Scars
- Laser Resurfacing Of Scars

Nursing Management

- Major nursing activities include patient education, particularly in proper skin care techniques, and managing potential problems related to the skin disorder or therapy.

PREVENTING SCARRING

- Patients should be warned that discontinuing these medications can exacerbate acne, lead to more flare-ups(sudden out burst), and increase the chance of deep scarring.
- Manipulation of the comedones, papules, and pustules increases the potential for scarring

Teaching Patients Self-Care.

- Taking prescribed medications, patients are instructed to wash the face and other affected areas with mild soap and water twice each day to remove surface oils and prevent obstruction of the oil glands.
- Caution the patient to avoid scrubbing the face.
- Patients are instructed to avoid manipulation of pimples or blackheads.

