Al-Maarif University	Clinical Pharmacy-I	4th Stage	College of Pharmacy

Skin Health
Psoriasis

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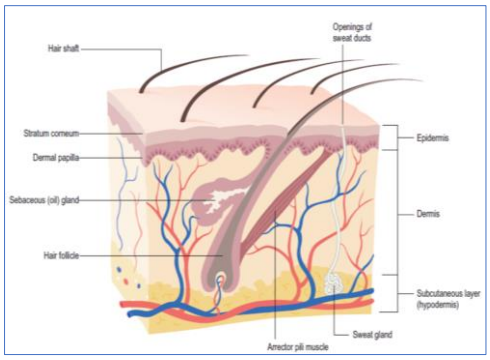
Lecture No. 5

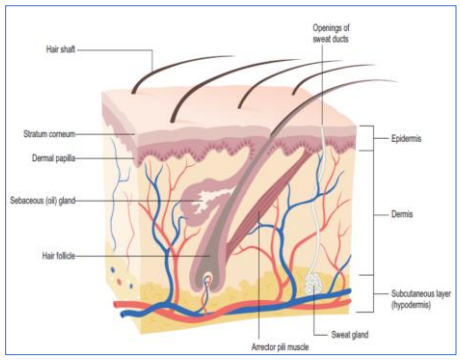
Structure of the Skin

- **Skin as an Organ**:
  - The largest organ, accounting for about 1/7 of body weight.
  - Covers approximately 1.75 m².
- **Three Layers of the Skin**:
  - **Epidermis:**
    - Outermost layer,
    - Thickness varies: from ~0.05 mm (e.g., eyelids) to ~1.5 mm (e.g., palms and soles).
    - Composed of keratinocytes, melanocytes, and Langerhans cells.

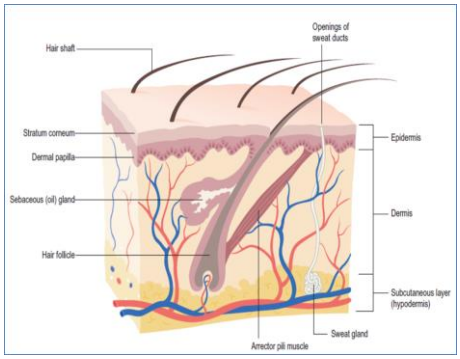


Structure of the Skin

- **Dermis**:
  - Located beneath the epidermis.
  - Thickness ranges from 0.3 mm (e.g., eyelids) to 3.0 mm (e.g., back).
  - **Composed of three types of connective tissue:**
    - **Collagen**: Provides structural strength.
    - **Elastic tissue**: Contributes to skin elasticity.
    - **Reticular fibers**: Offer support and resilience.
  - **Contains skin adnexa (epidermal appendages) such as:**
    - **Eccrine and Apocrine Glands**: Sweat glands with ducts that help regulate temperature and excrete waste.
    - **Pilosebaceous Units**: Hair follicles and associated sebaceous (oil) glands.

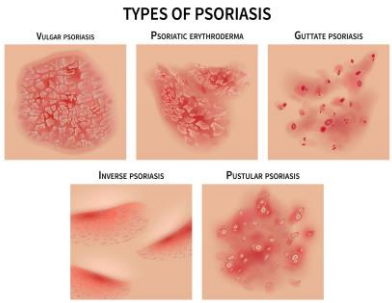


- **Subcutaneous Tissue (Fat)**:
  - Also known as the **hypodermis**.
  - Contains **lobules of fat cells** (lipocytes) separated by **fibrous septa** made of collagen.
  - Houses **large blood vessels**, providing **insulation**, energy **storage**, and **cushioning**.



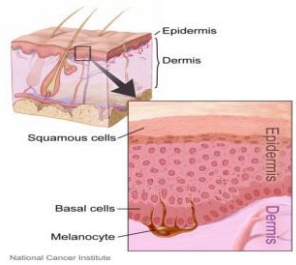
Psoriasis

- **Definition**:
  - Psoriasis is a **chronic**, **relapsing lifelong inflammatory skin disorder**.
  - It is marked by **recurring flare-ups** and a variety of skin lesions.
  - **Plaque Psoriasis** is the **most prevalent** type, accounting for 80-90% of cases.
  - Characterized by **raised, red patches covered with a silvery-white buildup of dead skin cells.**
- **Impact on Quality of Life**:
  - It is associated with increased levels of **anxiety and depression due to its potential effects on work, social interactions, and self-image.**
- **Prevalence**:
  - A common skin disorder, with a global prevalence estimated between **1% and 3%.**
  - Can affect **individuals at any age**, though it often appears in the second (20s) and fifth (50s) decades of life.

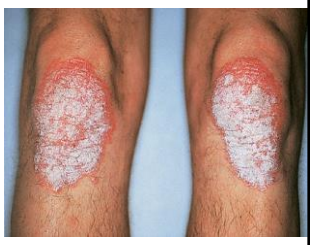


Pathology of Psoriasis

- **Immune-Mediated Disorder**:
  - Psoriasis is recognized as an **immune-driven condition** with a **genetic predisposition**.
  - Lesions can arise at sites of skin trauma, such as cuts or sunburn (a reaction known as the **Koebner phenomenon**).
  - Psoriasis may also be triggered or worsened by **streptococcal throat infections, stress**, and other **environmental factors**.
- **Pathogenesis**:
  - There is an **increased division rate** in the **basal cell layer**, leading to accelerated epidermal turnover.
  - **Normal skin cell turnover** time (about **28 days**) decreases to around 7 days, causing a buildup of cells on the skin surface.



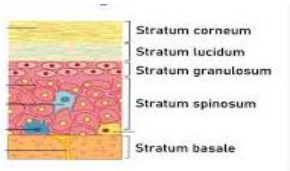
Clinical Features of Psoriasis



- **Lesions** can be **single** or **multiple** and vary in **size** from **pinpoint** to covering **extensive areas**.
- If the scales on the surface of the **plaque are gently removed** and the lesion then rubbed, it reveals **pinpoint bleeding** from the superficial dilated capillaries and this might be a **diagnostic feature**.
- **Most common sites** of involvement are **scalp**, **elbows**, **knees**, **hands**, **feet**, **trunk**, and **nails**.
- Subjective symptoms, such as **itching** or **burning**, may be present and may cause **extreme discomfort**.

Treatment of Psoriasis

- Treatment is limited to the use of emollients, keratolytics, coal tar, or dithranol
- **Emollients**
- **Emollients** are used to help **soften scaling** and **soothe the skin** to reduce irritation, cracking and dryness.
- **Keratolytics**
- Keratolytics, such as s**alicylic and lactic acid**, have been incorporated into emollients to aid the clearance of skin scaling.
- They **Breaks down the intercellular matrix in the stratum corneum**, leading to the softening and removal of scales.



Treatment of Psoriasis

- **Coal tar**
- It is used for **mild to moderate cases**.
- Coal tar has **anti-inflammatory** and **anti-proliferative** effects, making it effective in **reducing psoriatic symptoms.**
- A number of clinical studies have confirmed the **beneficial** effect of coal tar on psoriasis, although a major drawback in assessing the effectiveness of coal tar preparations is the **variability in their composition**, making meaningful comparisons between studies difficult.

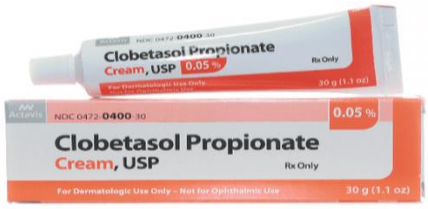
Treatment of Psoriasis

- **Dithranol**
- Its place in **practice is now generally limited** to psoriasis affecting the **limbs or trunk** in which other treatments have been ineffective and **should not be initiated by community pharmacists**.
- **Mechanism of Action**

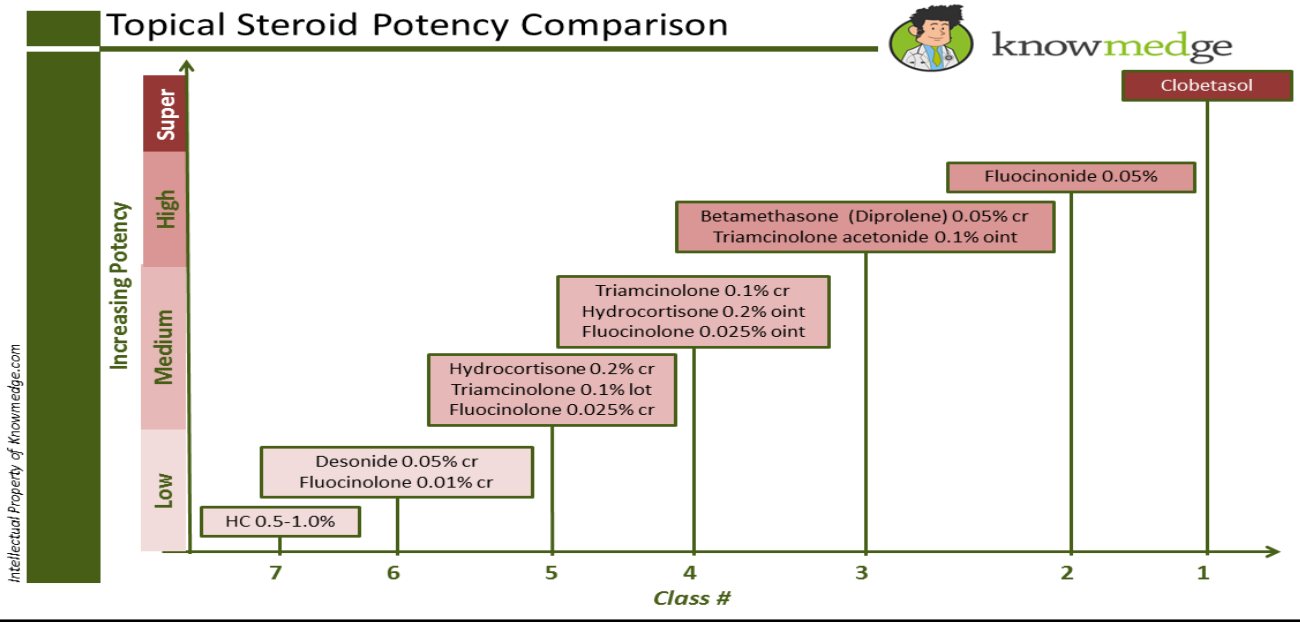
1. **Antiproliferative Effect**
2. **Anti-inflammatory Effect**
3. **Normalization of Keratinocyte Differentiation**

Treatment of Psoriasis

- **Topical Corticosteroids**
- **Usage**:
  - Class I corticosteroids are **suitable for short courses** (2 weeks) on most body areas.
  - Therapy can continue with **pulse applications on weekends** to minimize side effects.
- **Application Tips**:
  - **Hydration and Occlusion**: Hydrate the area before applying the corticosteroid and use an occlusive dressing (e.g., plastic wrap) to enhance absorption and effectiveness.
- **Side Effects**:
  - Potential side effects include:
    - **Epidermal atrophy** (thinning of the skin)
    - **Steroid acne** (acne-like eruptions)
    - **Sweat rash**
    - **Pyoderma** (bacterial skin infection)



Treatment of Psoriasis



Treatment of Psoriasis

- **Calcipotriene (Vitamin D3 Analog)**
- **Mechanism**:
  - **Vitamin D3**, through its **regulation of calcium in the skin**, **influences keratinocyte differentiation.**
  - **Calcipotriene**, a synthetic analog of Vitamin D3, is effective in treating plaque-type and scalp psoriasis.
  - **Calcipotriene is unstable** when used with certain other topical agents and degrades with exposure **to UV light**.
  - A combination of **calcipotriene and betamethasone dipropionate** is more effective than either treatment alone, providing enhanced results in plaque psoriasis.

- **Treatment Options for Limited Plaques:**
  1. **Topical Therapy**: Often the first-line for localized psoriasis.
  2. **Intralesional Triamcinolone**: Useful for thick or resistant plaques.
  3. **Laser and Intense Pulsed Light**: Effective for precise targeting in limited areas.
- **Management for Widespread Psoriasis:**
  1. **Phototherapy**: Highly cost-effective and practical for large surface areas.
  2. **Cyclosporine**: Quick-acting, but typically avoided for long-term use due to side effects.
  3. **Methotrexate**: The gold standard for systemic treatment comparisons.
  4. **Biologic Agents**: Offer high efficacy but come with significant costs, making patient selection essential.

Topical dosage form application

1. **Creams**:

- **Water-Miscible Corticosteroid Creams**: Ideal for **moist lesions**, as they are less occlusive and blend well with moisture, promoting drying without excess occlusion.

2. **Ointments**:

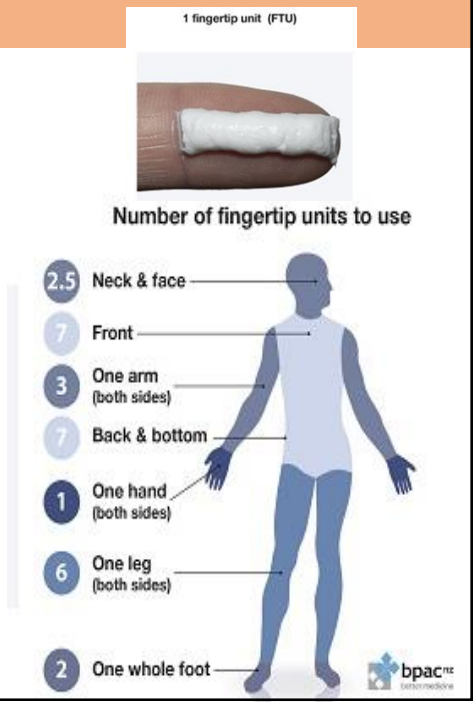
- Provide a more occlusive effect, which can help **retain moisture in the skin**, making them preferable for **drier conditions**.

3. **Lotions**:

- Lightweight and easy to spread, making them practical for **large areas or hair-bearing regions**.
- Suitable for **exudative (oozing) lesions**, as they are less occlusive and won't trap excess moisture.

Application Instructions:

- **Measuring Dosage with Fingertip Units**:
  - **Fingertip Unit (FTU)**: This is the distance from the tip of the adult index finger to the first crease (approximately 1 cm).
  - **Dosage Calculation**: One FTU (about 500 mg) from a tube with a standard 5mm nozzle can **cover an area roughly twice the size of an adult's flat handprint** (including palm and fingers). This provides a guideline for how much cream or ointment to use for effective coverage.

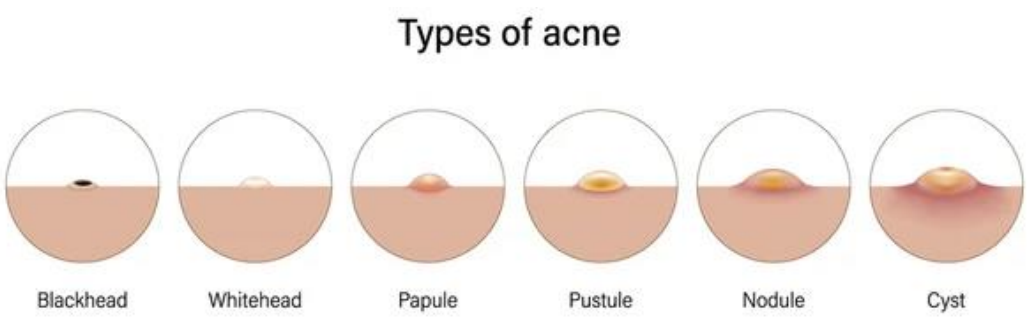


Application Instructions:

- **Application Technique**:
  - **Avoid Mixing Preparations**: When using multiple topical products, try to avoid mixing them on the skin. The ingredients in different preparations can interact, reducing effectiveness or causing irritation.
  - **Allow Time Between Applications**: A few minutes should pass between the application of different topical preparations to prevent interaction and ensure optimal absorption of each product.

Acne Vulgaris: Pathogenesis

- Acne can be defined as an **inflammatory disease of the pilosebaceous follicles**, causing comedones, papules and pustules on the face (99% of cases), chest (60%) and upper back (15%).
- It affects approximately **80% to 95%** of **adolescents**
- Acne often causes significant psychological impact, such as lack of confidence, low self esteem and depression.



Etiology

1. **Follicular Plugging (Comedone Formation)**: hair follicle becomes blocked with dead skin cells and sebum. This prevents the drainage of sebum, contributing to the formation of comedones (whiteheads or blackheads).
2. **Role of Androgens**: stimulate the sebaceous glands to produce more sebum. This excess sebum is one of the key contributors to acne formation.
3. **Bacterial Contribution (P. acnes)**: The bacterium **Propionibacterium acnes** (P. acnes) is naturally present in the skin's sebaceous glands.

- P. acnes produces **lipase**, which breaks down lipids in sebum, releasing **fatty acids**.
- These fatty acids can trigger an **inflammatory response** by activating immune mediators such as **interleukin-1 (IL-1)** and **tumor necrosis factor-alpha (TNF-α)**.
- This inflammatory response leads to the characteristic **redness**, **swelling**, and **pustules** associated with acne.

Etiology

4. **Emotional stress** can exacerbate acne, potentially by stimulating hormone release and increasing sebum production.
5. **Food and Acne**: Although certain foods may trigger flare-ups in some individuals, there is no direct causal relationship between diet and the onset of acne.

Severity of Acne

- **Mild Acne**:
- Predominantly consists of **open and closed comedones** (blackheads and whiteheads), with few inflammatory lesions. These may include a **few papules** (small raised bumps) **and pustules** (pus-filled bumps), **but no nodules**.
- Mild acne can often be treated by pharmacists using over-the-counter (OTC) products, such as **topical retinoids, benzoyl peroxide, or salicylic acid**. **These products target the clogged follicles and reduce inflammation.**
- **Moderate Acne**:
- Moderate acne typically requires a stronger treatment approach, including prescription medications such as **oral antibiotics, or oral contraceptives** for female patients to regulate hormonal imbalances.
- **Severe Acne**:
- Severe acne often necessitates more aggressive treatments, such as **oral isotretinoin** (Accutane), which is highly effective but comes with significant side effects.

When to refer

1-**Moderate** or **severe** acne

2-**Failed** medications

3-Acne beginning or persisting **outside the normal age range** (teenage years and early 20s)

4-Suspected **drug-induced acne**

5-Suspected **occupational causes**

6-Suspected **rosacea**

Treatment timescale:

A patient with mild acne, which has not responded to treatment **within 8 weeks** should be referred.

Mild acne vulgaris

- These treatments are categorized into four main types:

1. **Keratolytics (Comedolytics)**:
   - These products help to **exfoliate the skin**, promote cell turnover, and prevent the clogging of pores (comedone formation).
   - **Examples**:

a) **Tretinoin**: A topical retinoid that increases cell turnover and helps prevent comedone formation.

b) **Benzoyl Peroxide**: works to exfoliate and clear the pores.

c) **Salicylic Acid**: helps to remove dead skin cells and unclog pores.

d) **Sulphur**: Known for its mild keratolytic and antibacterial effects, it can help reduce acne breakouts.

Mild acne vulgaris

- These treatments are categorized into four main types:

1. **Keratolytics (Comedolytics)**:
2. **Antimicrobials**:
   - These are used to reduce the overgrowth of bacteria (*Propionibacterium acnes*) in the skin, which contributes to acne formation.
   - **Examples**:
     - **Clindamycin**.
     - **Erythromycin**.

Mild acne vulgaris

3. **Anti-inflammatory Agents**:
   - These help to reduce the redness and swelling associated with acne.
   - **Example**:
     - **Nicotinamide**: The active form of niacin (**vitamin B3**), which has **anti-inflammatory** properties and can **reduce irritation and redness**.
4. **Abrasives**:
   - These products help with **physical exfoliation to remove dead skin cells and unclog pores**.
   - **Example**:
     - **Brasivol**: Contains fused synthetic **aluminum oxide** particles that provide mechanical exfoliation, helping to clear the skin.

Keratolytics: Benzoyl peroxide

- **Benzoyl peroxide** breakdown keratin and promote the shedding of the dead skin.
- **Benzoyl peroxide** is lipophilic and therefore penetrates the follicle well; once absorbed it releases oxygen, which **suppresses the bacteria**, and **reduces the production of irritant free fatty acids**.
- Side effects: Benzoyl peroxide is **mildly irritant** and may cause **redness**, **stinging** and **peeling**, **especially at the start of treatment**, but tolerance usually develops with continued use.
- Benzoyl peroxide is an oxidising agent and may **bleach clothing and bedclothes**.
- Gels have a greater potential for causing **drying of the skin and irritation**s.
- Benzoyl peroxide is available in the form of **creams**, **lotions**, **gels** and **washes**, and in concentrations of 2.5%, 5% and 10%.

Keratolytics: Tretinoin

- Tretinoin is mainly used in the topical treatment of acne vulgaris when comedones, papules, and pustules predominate.
- The skin should be **cleansed to remove excessive oiliness** and **dried before applying tretinoin** lightly, **once or twice daily** according to response and irritation; some patients may require less frequent applications.
- There may be **apparent exacerbations of the acne during early treatment** and a therapeutic response **may not be evident for 6 to 8 weeks**.
- Tretinoin is applied as a cream, gel, or alcoholic solution, usually containing 0.01 to 0.1%.

Keratolytics: Salicylic acid, Resorcinol & Sulphur

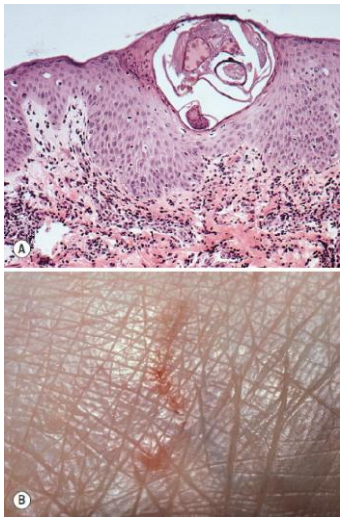
- **Salicylic acid** is used in concentrations of up to 2% for acne. Preparations are applied two or three times a day.
- **Resorcinol** is used in many over-the-counter acne treatments, as it has **keratolytic** and **antiseptic** properties. It helps in **exfoliating** the skin, preventing clogged pores, and reducing the appearance of acne lesions. It may produce hyperpigmentation in patients with dark skins and may darken light-coloured hair.
- **Sulphur** is claimed to possess **keratolytic** and **antiseptic** properties; it does, however, appear to hasten the **resolution of inflammatory pustular lesions**.

Practical points for managing acne:

1. **Diet**:
   - Despite common beliefs, **no evidence supports a link between diet and acne**. Foods like chocolate or fatty items are not proven to cause or worsen acne.
2. **Continuous Treatment**:
   - Acne is a **slowly responding condition**, and treatment may take up to **6 months** for maximum benefit.
   - **Keratolytics** (e.g., benzoyl peroxide) generally need **6–8 weeks** to start showing noticeable effects.
   - Patients should be encouraged to stick with their treatment plan, whether using OTC or prescription products, and understand that **acne is a chronic condition** requiring ongoing management to stay under control.
3. **Skin Hygiene**:
   - Acne is **not caused by poor hygiene**. Regular washing with soap and warm water or an antibacterial wash can help by removing excess oil and reducing bacteria on the skin, but **excessive washing is unnecessary**.
4. **Topical Hydrocortisone and Acne**:
   - **Topical hydrocortisone is contraindicated in acne** because it can worsen the condition. Steroids can amplify androgenic effects on sebaceous glands, increasing sebum production and aggravating acne.
5. **Make-Up**:
   - **Heavy, oily make-up** can exacerbate acne. If make-up is used, **water-based** products are preferred over oily ones, and they should be thoroughly removed at the end of the day to avoid clogging pores

Scabies

- Scabies can be defined as an intensely pruritic skin condition caused by the mite *Sarcoptes scabiei*.
- **The diagnostic burrows are small**, and scratching often makes them difficult to see.
- The mite is transmitted by direct physical contact (e.g., holding hands, hugging or sexual contact).
- Mating occurs on the skin surface, after which the female mite burrows into the stratum corneum to lay eggs.
- The faecal pellets left in the burrow cause a local hypersensitivity reaction and is assumed to cause the release of inflammatory mediators that trigger an allergic reaction provoking intense itching.



Clinical Features and Diagnosis of Scabies

- Severe pruritus, especially at night, is the hallmark symptom of scabies.
- The rash is usually made up of small red papules seen in the interdigital web spaces and sides of the fingers.
- A **definitive diagnosis** of scabies is **confirmed by extraction of the mite from its burrow** and **see it under the microscope**, although **in primary care this is rarely performed**.

When to refer

1. Babies and children.
2. Infected skin.
3. Treatment failure.
4. Severe and extensive symptoms.

Management of scabies:

- **Treatment Duration**:
  - **Two applications**, **spaced 7 days apart**, are recommended for effective management.
- **Application Coverage**:
  - UK guidelines suggest applying treatment **over the entire body**, paying special attention to the **scalp, neck, face, ears**, as well as hard-to-reach areas like **fingers, toes, soles, and under nails**.
  - For children or thumb-sucking infants, **socks** may be used to cover treated hands or feet.
- **Application of Lotion**:
  - Pour lotion into a bowl, and apply to **cool, dry skin** with a **clean, broad paint brush, cotton wool,** or a **sponge**.

Treatment Options

A. Permethrin 5% Cream

- **First-line treatment** and the most effective **scabicide**.
- Permethrin **interferes with sodium ion transport** in the parasite's nerve cell membranes, causing prolonged depolarization, **paralysis, and death**.
- **Application**: Apply to the **entire body** (including face, neck, scalp, and ears), then wash off after **8–12 hours**.
- **Special Instructions**: If hands are washed within 8 hours, reapply the cream to hands. Requires medical supervision for use in children under 2 years and elderly patients (70+).
- **Dosage**:
  - Adults: **30-60 grams** (1–2 tubes).
  - Children under 12:
    - **¼ tube** for ages 2 months to 5 years.
    - **½ tube** for ages 6 to 12 years.

Treatment Options

B. Benzyl Benzoate (25%)

- An older treatment now **less commonly used** due to lower efficacy and skin irritation risks.
- **Application**: Apply over the body, repeat the **next day without bathing**, and wash off after 24 hours. A third application may be required in some cases.
- **Precautions**: Can cause **skin irritation and burning**; if a severe reaction occurs, wash off with soap and water. Avoid eye contact as it's irritating.

C. Crotamiton (Eurax®)

- Has **antipruritic** (itch relief) and weak scabicidal effects. Recommended to control **residual itching** after using a more effective scabicide.
- **Application**: Apply **2-3 times daily** as needed.

Treatment Options

D. Malathion 0.5% Aqueous Solution

- Suitable for use **from 6 months of age** without a prescription.
- **Application**: Apply to the whole body and leave for **24 hours** before washing off. If hands are washed during the 24 hours, reapply to hands.
- **Side Effects**: May cause **mild skin irritation**.

Practical Advice for Patients

1. **Expected Itching:**
   - Patients should be informed that **itching may persist or worsen** in the days following treatment.
   - **Crotamiton cream or lotion** can help relieve itching, and
   - **Oral antihistamines** may be considered for severe itching.
2. **Timing of Application**:
   - Applying treatment **before bedtime** is recommended. This allows the medication to dry and minimizes washing it off too soon.
3. **Hand Washing**:
   - Since scabies often affects the hands, avoid washing them after applying treatment.
   - If hands are washed during the treatment period, **reapply the treatment** to the hands.

Practical Advice for Patients

4. **Application on Cool, Dry Skin**:
   - Apply the scabies treatment to **cool, dry skin** to ensure maximum effectiveness.
5. **Treating Household Members**:
   - All household members should be treated **on the same day**, even if they have no symptoms, as they may be infested without showing signs.
6. **Preventing Reinfestation**:
   - The scabies mite can only survive **about one day** away from a human host. **Wash all clothes and bedding at 50°C or higher** after treatment to eliminate any mites.

Treatment Options

- **Product Recommendations**
- **Permethrin Cream**:
  - This is the **first-choice treatment** for eradicating the scabies infection.
- **For Residual Itching**:
  - **Systemic antihistamines** can help manage persistent itching, and **calamine lotion or crotamiton cream or lotion** can be applied as needed to relieve discomfort.