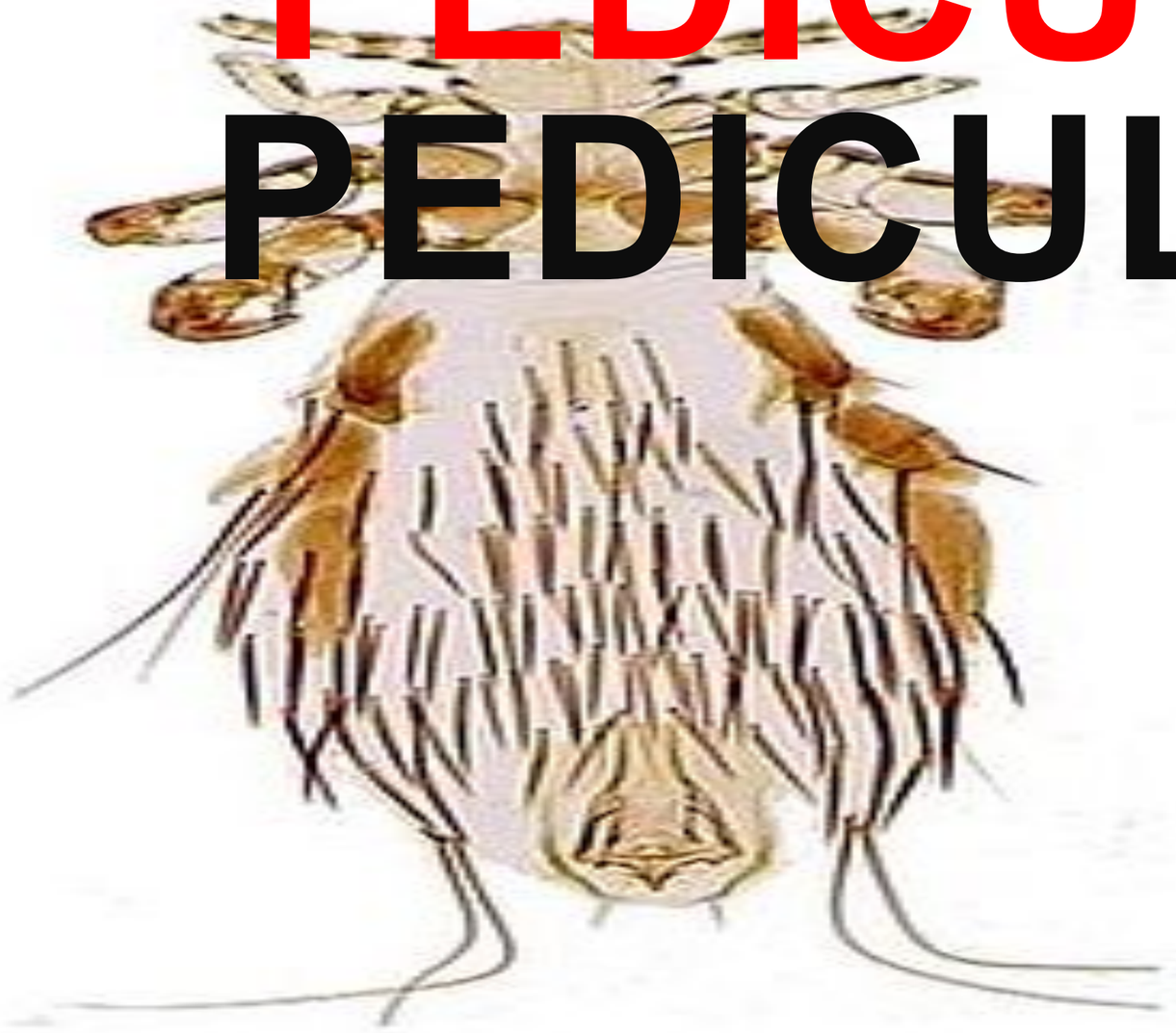
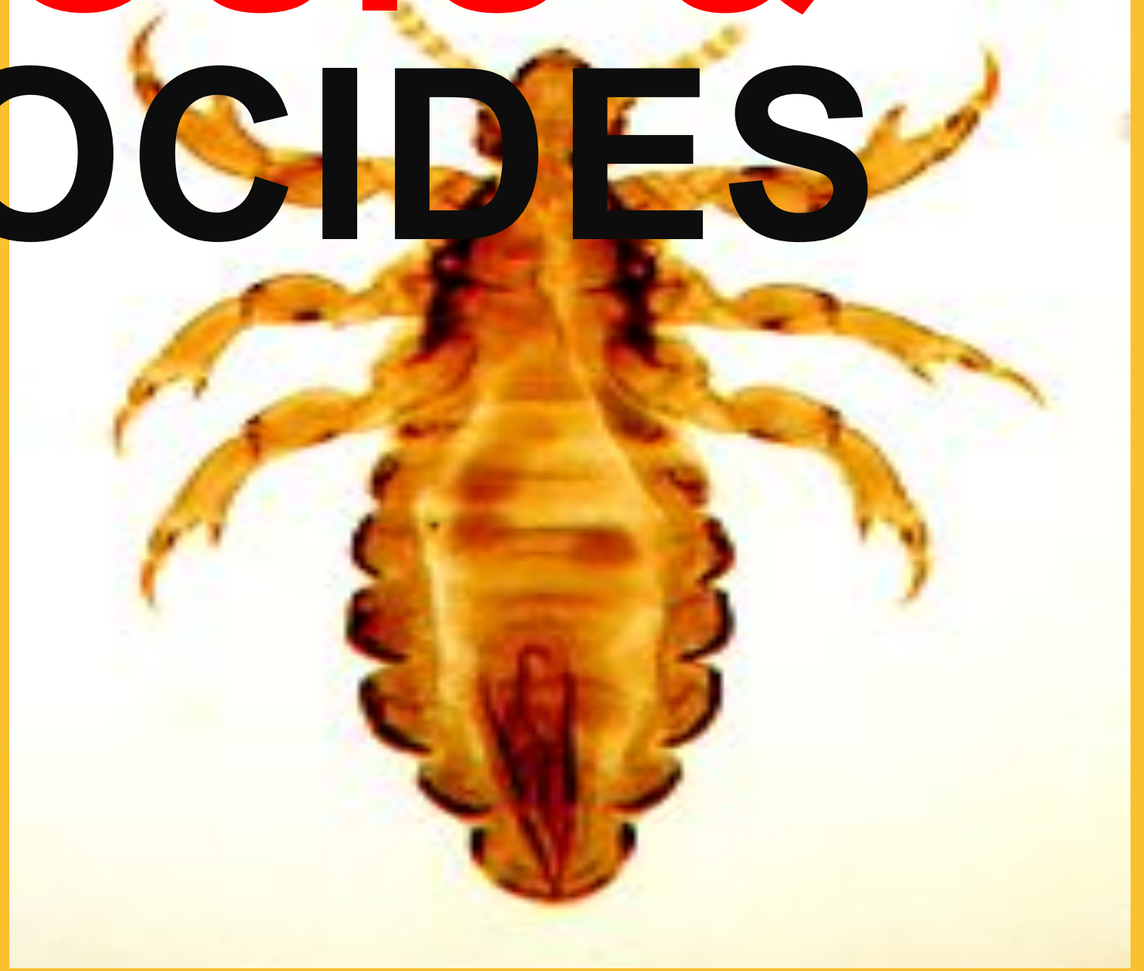
PEDICULOSIS &
PEDICULOCIDES



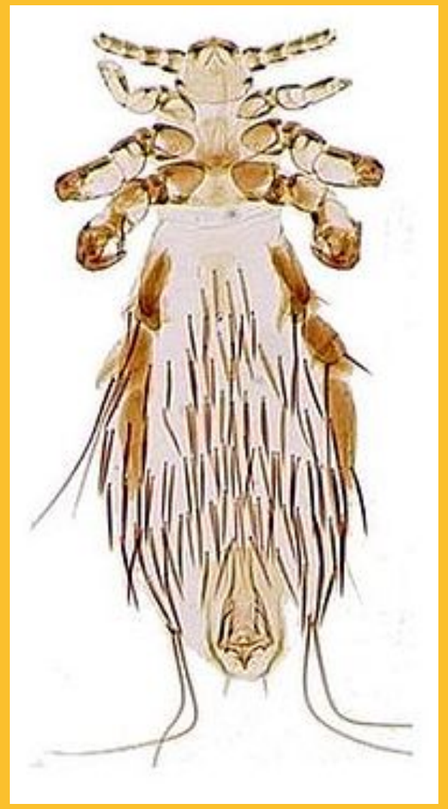


PEDICULOSIS AND PEDICULOCIDES

A. **Introduction;** Pediculosis is a skin infestation produced by blood-sucking lice. Lice are small, flat, wingless insects with stubby antennae and three pairs of legs that end in sharp, curved claws. Three **types of lice infest humans.**

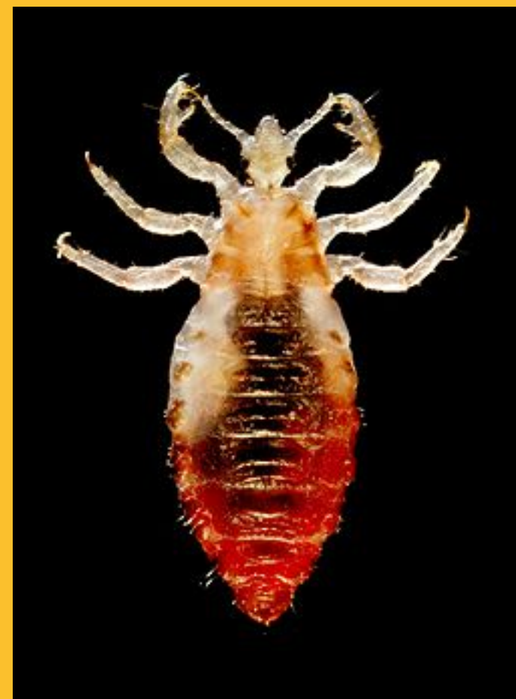
1. Pediculus humunus capitis (i.e., the head louse)
2. Pediculus humunus corporis (i.e., the body louse)

Louse



Male head louse, adult

Body louse



B. **Life cycles;** The lice that infest humans pass through similar life cycles.
   1. **Location;** All lice need human warmth to survive.
      a. **Head** and **pubic lice** spend their entire cycle on the skin of human host
      b. **Body lice** live in clothing, coming to the skin surface only to feed
   2. **Development**
      a. Each type of louse develops from **eggs (nits)** that incubate for about 1 week
      b. In about 3 weeks, the **nymphs** mature; then the females start to lay eggs.
      c. Each type of louse survives about 1 month as a **mature adult.** During this time, the female head louse can produce 3-6 eggs a day

2. **Egg deposit**
    a. **Body lice** deposit their eggs on fibers of clothing, particularly in the seams. These lice can survive without food up to 10 days, and the eggs remain viable for about 1 month. Daily clothing changes and boiling or ironing infested clothing can eradicate **body lice.**
    b. **Head** and **pubic lice** deposit their eggs on hair strands. Adult head lice can survive on inanimate objects for about 20hrs; head lice nits may survive up to 10 days off the body.

C. **Incidence.** The incidence of lice infestations increases each year.

1. For example more than 10 million cases of head lice occur each year in the UK
2. The bulk of these cases occur in students during school days
3. In outbreaks of head lice, 70% of cases occur in children younger than 12 years
4. Infestations tend to be common in girls, presumably because of their greater tendency to share grooming items
5. Unlike the other two forms of lice, **body lice** are associated with improper hygiene and are often present in homeless people.

D. Medical problems

1. Both adult and nymph lice are blood sucking; they feed on humans by piercing the skin and introducing a small amount of saliva (which contains an **anticoagulant**) into the feeding area. All lice types feed on blood for about 30-45min every 3-6hrs.
    a. The attachment of lice to the body causes an **erythematous papule**, which may **itch.**
    b. The female louse produces a sticky **cement-like secretion** that holds the eggs in place on the hair shaft so securely that ordinary shampooing does not remove it.

2. Neither head nor crab lice transmit infections, but body lice transmit **typhus, relapsing fever** and **trench fever.**
3. Lice and humans have a true **parasitic relationship;** lice depend on the human host for shelter, food, and reproductive success. Once hatched, nymphs must have access to the human host within the first 12- to 24-hr period, if they are to survive.

E. Methods of transmission

1. **Head lice** are most commonly **spread by head-to-head contact** with an infested person through hats, caps, scarves, pillowcases, communal combs and brushes, or clothing that is hung close together.
2. **Pubic lice** are **transmitted primarily through sexual contact,** but also through shared undergarments, towels, or toilet seats.
    a. The lice affect teens and young adults most often through sexual contact
    b. Lice frequently coexist with other sexually transmitted diseases
    c. Scratching in the genital areas may transmit pubic lice to other hairy regions, such as the eyelashes, eyebrows, sideburns and mustaches

F. **Signs and symptoms**

1. **Head lice**
   a. Most patients have fewer than 10 lice
   b. The most common sign is **head scratching**
   c. **Skin redness around the nape of the neck** and above the ears is usually seen.
   d. The lice can be identified by direct examination using wooden applicator sticks or a comb to part the hair, then looking at the hair through a magnifying glass.
   e. The lice appear as tiny brownish grey spots that are often difficult to see. The shiny, **whitish silver eggs,** which appear almost as grains of sugar, are more likely to be seen than the lice. The nits may be **confused with dandruff or hair spray droplets.**

2. **Pubic lice.** The primary symptom is scratching in the genital area
3. **Body lice.** The most common symptoms are bites and itching, which are commonly seen as vertical excoriations on the trunk area

G. Treatment

1. There are **three steps** in the treatment of **head and body lice.**
   a. Treat the lice and nits with a pediculicide agent
   b. Control the symptoms of itching to prevent secondary infection
   c. Clean the environment of potential lice and nits

2. Itching. Pharmacists should advise patients that even after the causative organism and its nits have been killed, itching may persist for several days. This aspect is very important because patients may decide to use the pediculicide excessively, thinking that they have been ineffective when the itching continues. **Excessive use of pediculicides may result in excessive drying, which can cause further itching**

3. **Home remedies**. Because of the social stigma attached to lice infestation, some individuals may resort to harmful home remedies. Examples of such uncomfortable, ineffective, and potentially dangerous approaches that should not be used include
    a. Shaving the head and pubic area
    b. Applying heat to the infested area with a hair dryer
    c. Soaking the head in hot water for several minutes

4. **Over the counter (OTC) pediculicide products** are considered first-line treatments and include
    a. **Pyrethrins 0.17-0.33% with piperonyl butoxide 2-4%.** This product is safe and effective for the treatment of head and pubic lice. The combination of ingredients is an example of **pharmacological synergism Pyrethrins** kill by **disrupting ion-transport mechanisms at the nerve membranes.** These natural insecticides are derived from a mixture of substances obtained from the flowers of the **chrysanthemum** plant.
    b. Because not all eggs may be killed (it takes about 4 days for the nervous system of the louse to develop) with a single application of this agent or removed with a nit comb, it may be necessary to reapply the Pyrethrin product within 7-10days of the first application (because the usual hatching time of the eggs is 7-10days).

2. **Piperonyl butoxide** enhances the pediculicide effect of pyrethrins by **suppressing the oxidative degradation mechanisms of lice.** Therefore , the length of time that the Pyrethrins contact the lice is increased.
3. **Side effects** from either agent are **uncommon.**
    a. **Contact dermatitis** is the most frequently reported side effect
    b. **Allergic reactions.** Because pyrethrins are derived from a plant, they may produce hay fever and asthma attacks in susceptible individuals.

4. **Directions for use (shampoo)**
   a. apply the product, undiluted, to the dry hair until it is entirely wet
   b. Allow the product to remain on the head for 10 min
   c. Rinse thoroughly with warm water
   d. Dry the area, preferably with a disposable cloth
   e. Comb hair in previously infested area with a fine-toothed comb to remove dead lice and eggs
   f. Do not exceed two applications within 24hrs. It may be necessary to reapply the shampoo in 7-10 days

5. **Permethrin** is a pyrethroid (i.e., a synthetic version of a pyrethrin). It is indicated for the treatment of head lice only.
    a. **Mechanism of action.** Permethrin has **similar mechanism of action as Pyrethrins**.
    b. **Application.** Permethrin comes in the form of a 1% **creme rinse** and should be applied like a conversional hair conditioner after the hair has been shampooed(use a shampoo with no conditioner), rinsed, and towel dried. The hair should be thoroughly saturated with undiluted permethrin (25-30ml), which should **remain on the hair for 10min, then rinsed.**

5. **Permethrin**
    c. **Effectiveness;** A single application is generally effective in killing lice. Because the agent is retained on the hair shaft, the product provides continuing activity for up to 14 days. This residual effect persists regardless of normal shampooing.
        i. Even with the residual activity, there still may be need for retreatment in 7-10 days
        ii. **Comb hair** in the previously infested area **with a fine-toothed comb** to remove dead lice and eggs
        iii. There is, at least theoretically, the speculation that because low-level residual amounts of this agent are retained on the hair, it may be possible that when suboptimal levels are present, some lice may survive and give rise to strains that are resistant

6. **OTC pediculicide treatment failure.** Treatment failure with the use of the preceding agents has been reported. Speculations as to the cause of this treatment failure include failure to follow product instructions, noncompliance with nit removal, and head-lice drug resistance. Studies support the theory that there are now “super lice” that have survived exposure to Pyrethrins and Permethrin
7. **Prescription products** are included here to put into perspective how the OTC agents fit into therapy.
    a. **Malathion** is an organophosphate cholinesterase inhibitor that has been widely used as a lawn and garden insecticide. Resistance has also become an issue with this agent.
        i. **Mechanism of action;** Sulfur atoms in the malathion bind with sulfur groups on the hair, giving a residual protective effect against re-infestation.

ii. **Application;** Malathion is prepared as a lotion in 78% alcohol; therefore, caution should be used near an open flame or a hair dryer. The product should be sprinkled on dry hair and left for 8-12 hr before rinsing. A fine-toothed comb should be used to remove the dead lice and eggs.

iii. No systemic **adverse effects** have been reported with topical use of this medication.

a) The alcoholic vehicle may produce stinging and possible flammability.

b) Although this agent may be effective, its unpleasant odor, the required time of 8-12hrs on scalp, represent the main drawbacks

8. **Lindane,** or γ-benzene hexachloride has fallen into disfavor because of the potential for toxicity and the fact that its efficacy is less than the other agents available . Resistance to this agent is widespread
    a. It has **neurotoxicity potential** because of percutaneous absorption; therefore, its use should be avoided in **infants, pregnant** and **nursing women,** and anyone with **neurological disorder.**
    b. Severe **CNS toxicity** has occurred in infants, with seizures and deaths reported, particularly when the lotion is used or when the agent is ingested. Toxicity has been minimal when the shampoo is used properly to treat head lice

9. **Adjunctive therapy**
    a. **Nit removal**
        i. The pediculicide products mentioned vary in their ability to kill the lice nits. To ensure successful therapy, after pediculicide application, the nits should be removed with a **fine-toothed comb.** A sturdy **metal comb** is recommended. Some schools have a “**no nit” policy-** that is, a child’s hair or scalp must be free of nits before he/she is allowed to return to classroom.
        ii. Although various substances have been used in an effort to dislodge the nits from the hair shafts, most, if not all, have been unsuccessful. A mixture of 50% vinegar and 50% water has been recommended, but its effectiveness has been questioned.

b. **Treatment of other household members.** Once a lice infestation has been identified in one member of the household, all other members should be examined carefully. Everyone who is infested should be treated at the same time

c. **Adjunctive methods for controlling lice infestations**

i. **Washable material items** such as linens, towels, hats, and clothing should be machine-washed in hot water and dried in a hot dryer to destroy lice and nits

ii. **Nonwashable material goods** should be dry-cleaned or sealed in a plastic bag for 2weeks

iii. **Personal items** (e.g., comb, brushes) should be soaked in hot water(54^0c) for atleast 15min.

iv. **Furniture and household items** (e.g., carpets, chairs, couches, pillows) should be vacuumed thoroughly. OTC spray products that contain pyrethrins are no more effective than vacuuming in items of removing the risk of reinfestation.

d. Pediculicides should not be used around the eyes. For **eyelash pubic lice infestations,** Petrolatum applied five times a day asphyxiates lice, or gentle removal with baby shampoo may be helpful.

H. **Head lice myths** are numerous. The following **facts** may reassure and inform patients and parents of patients.

1. No significant difference in incidence of pediculosis occurs among the various socioeconomic classes or races.
2. Hygiene and hair length are not contributing factors to head or pubic lice
3. Head lice do not fly or jump from person to person

4. Head lice do not carry other diseases
5. Head lice cannot be contracted from animals, and pets are not susceptible to *Pediculus* humanus *capitis*
6. The head does not have to be shaved to get rid of lice
7. Washing hair with “brown” soap is not effective
8. Head lice are unrelated to ticks
9. Hair does not fall out as a consequence of infestation
10. Head lice infestations can occur at any time of the year

SCABIES

INTEMED

SCABIES

Background

Scabies is a pruritic skin condition caused by the mite *sarcoptes scabiei.* It is easily missed or misdiagnosed as dermatitis. The diagnostic burrows are small and difficult to locate because they are often obscured by effects of scratching.

Prevalence and epidemiology

Scabies is not gender or age specific. Infants to the elderly can acquire the infestation, although it is more common in the elderly. Outbreaks in care homes are common and can affect staff as well as patients.

AETIOLOGY

The mite is transmitted by direct physical contact (e.g. holding hands, hugging or sexual contact).

The female mite burrows into the stratum corneum to lay eggs. The faecal pellets she leaves in the burrow cause a local hypersensitivity reaction and is assumed to cause the release of the inflammatory mediators that trigger an allergic reaction invoking intense itching.

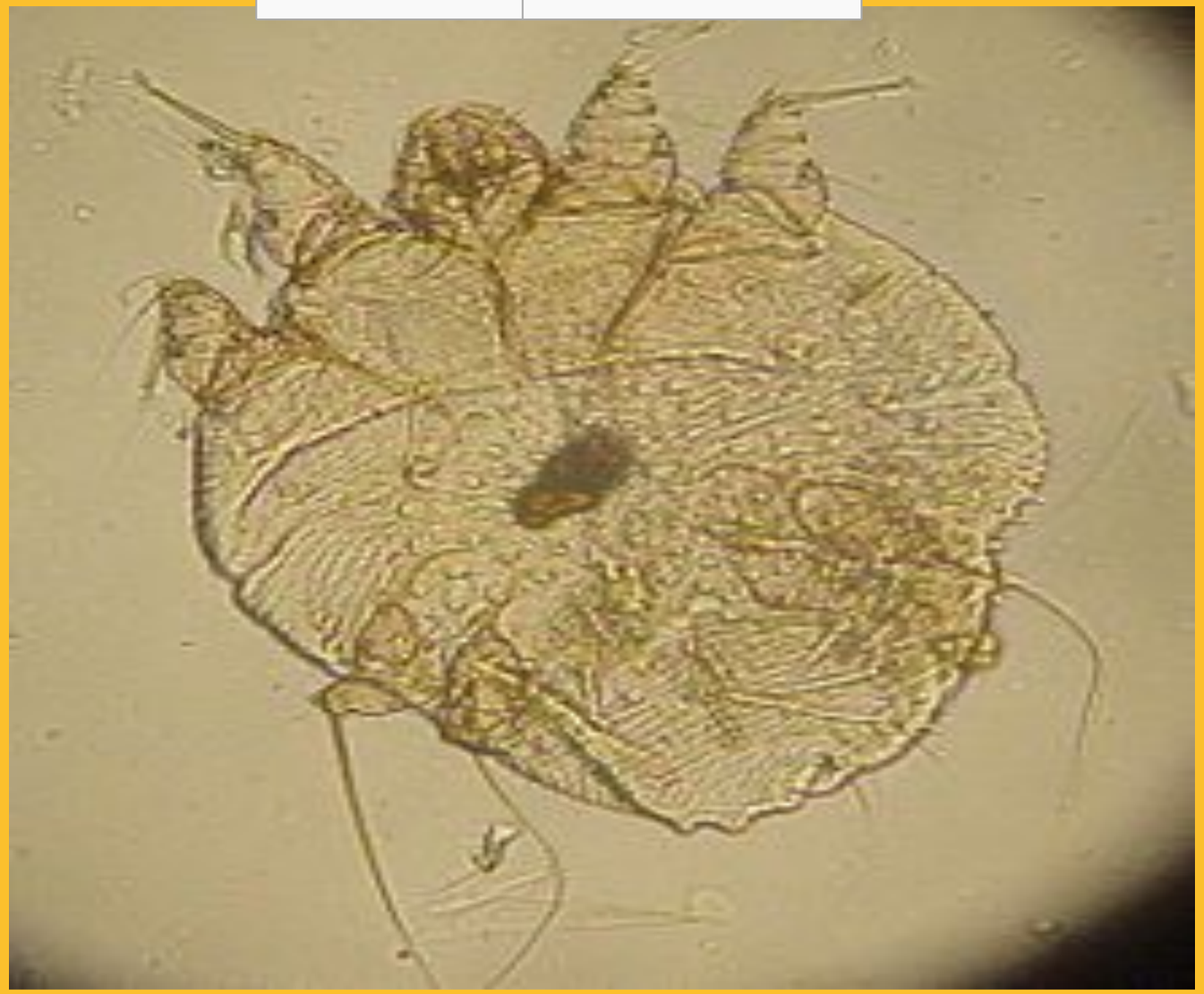
However, the above response can take up to 6 weeks to develop. During this asymptomatic period, the mite can be passed on to others unknowingly.

The eggs hatch and mature in 14days, after which the cycle can begin again.

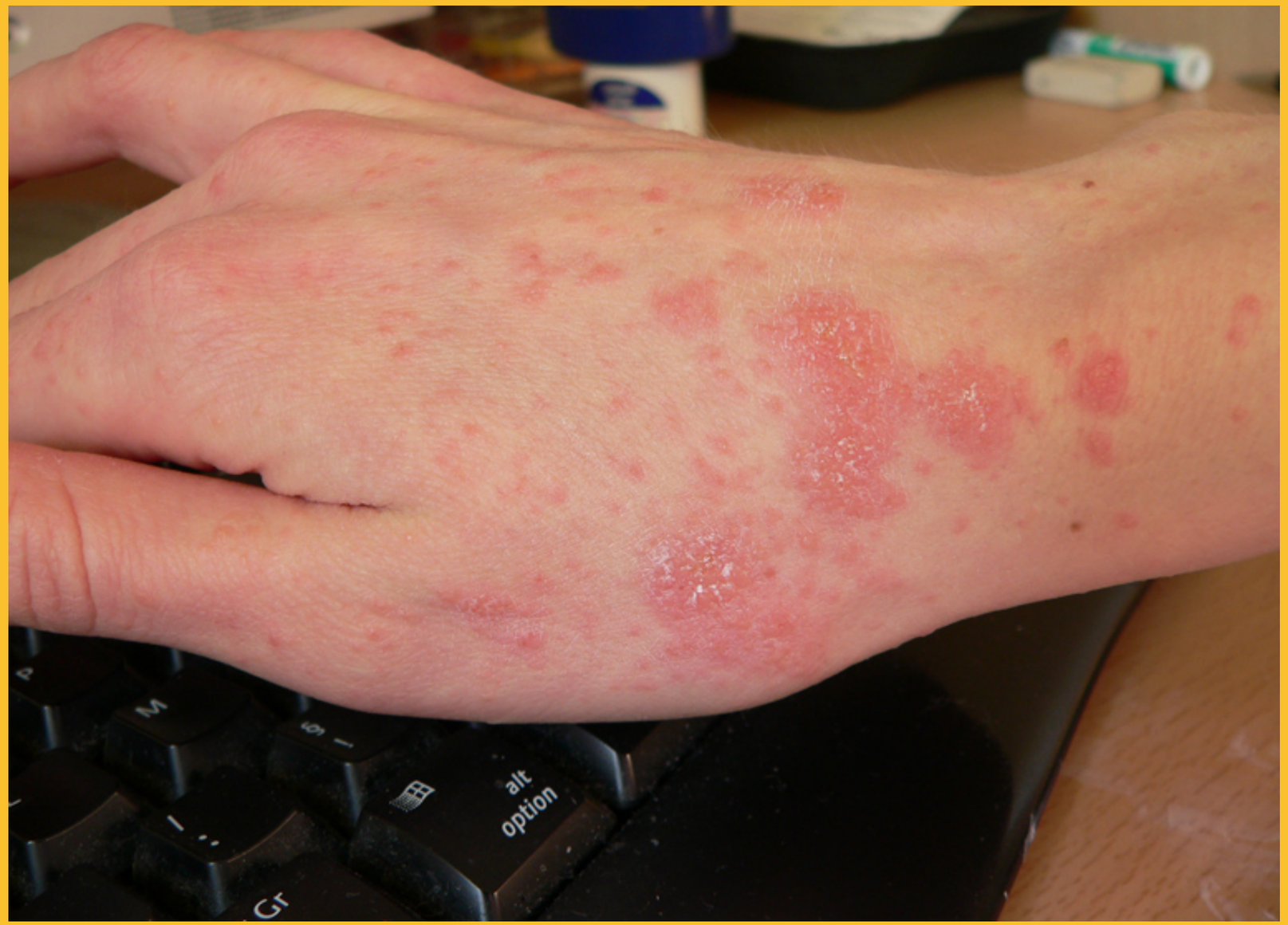
ARRIVING AT A DIFFERENTIAL DIAGNOSIS

The diagnosis of scabies is confirmed by extraction of the mite from its burrow, although in primary care this is rarely performed and a differential diagnosis is made on clinical appearance, patient history and symptoms reported by close friends.

Species	*S. scabiei*



Scabies of the hand



SPECIFIC QUESTIONS TO ASK THE PATIENT: SCABIES

Question	Relevance
Visible signs of the mite	Burrows, which are up to 1cm long and blue-grey in colour, might be visible although in practice this characteristic is often not present.
Location of rash	Scabies classically affects the finger webs, the sides of the fingers and wrists. Hand involvement is rare in dermatitis herpetiformis
History of presenting complaint	If contact dermatitis is suspected then questioning should reveal the past history of similar skin lesions Often people with scabies will be care

CLINICAL FEATURES OF SCABIES

Severe pruritus is the hallmark symptom of scabies, although this is diffuse and not localised. It can be worse at night and after bathing

Besides classic location of lesions, in men the penile and scrotal skin and in women beneath the breasts and nipples can be affected.

Infants who are not walking might have marked sole involvement

CONDITIONS TO ELIMINATE

Allergic contact dermatitis

This condition presents as an area of inflamed, itchy skin with either **papules** or **vesicles** being present.

However, enquiry into the patient's history should reveal a past history of similar lesions in allergic contact dermatitis.

Dermatitis herpetiformis

A chronic condition characterised by intense itchy clusters of papules and vesicles.

It also exhibits urticarial-type lesions

Dermatitis herpetiformis cont’

It commonly involves the elbows, knees and sacral region

The lesions usually exhibit a symmetrical distribution and hand involvement is rare

Therefore, differences in distribution of the lesions should allow it to be differentiated from scabies

Trigger points indicative of referral: Scabies

Severe and extensive symptoms

Suspected dermatitis herpetiformis

EVIDENCE BASE FOR OVER-THE-COUNTER MEDICATION

- The efficacy and safety of scabicidal agents is difficult to determine.
- Benzyl benzoate, Crotamiton, Permethrin and Malathion have all been used.
- Permethrine has cure rates of approximately 90%. It has been shown to be superior to crotamiton and as effective as gamma-benzene hexachloride (which has been withdrawn from many markets because of adverse effects).
- Case reports suggest **malathion** is effective in curing scabies, with a cure rate of over 80%.

- **Benzyl benzoate** has been used to treat scabies for many years. It has been shown to provide cure rates of approximately 50%.

- Up to 25% of patients experience side-effects such as burning, irritation, and itching on application of Benzyl benzoate.

- Therefore, the use of Benzyl benzoate has declined over time and it should now no longer be recommended as a first-line treatment.

- On current evidence, Permethrin (Lyclear Dermal Cream) is the medicine of choice because it has the highest cure rate,

PERMETHRIN (LYCLEAR DERMAL CREAM)

- Permethrin is suitable for use by adults and children over 2months.
- General guidance for application of Lyclear is that adults and children over 12years old should use up to a full tube as a single application.
- For children under 12: 2months to 1 year should use up to ⅛ of a tube; children aged between 1 and 5, up to ¼ of and those aged between 6 and 12years should use ½ a tube.

HINTS AND TIPS: SCABIES

Itching after treatment and the treatment antihistamines	Pruritus can persist for several weeks after patient might benefit from Crotamiton or
Lyclear less than of the	If necessary, a second application can be given-not 7days after initial application - if there are no signs original lesions healing or if new lesions are present
Who to treat?	All close personal contacts

LYCLEAR DERMAL CREAM

- Lyclear Dermal Cream should be applied to the whole body, excluding the head, of all patients over the age of 2.

- However, children between 2 months and 2 years should have the cream applied to the palms, soles, face, neck, scalp and ears. Care must be taken to avoid the vicinity of the mouth and eyes.

- The whole body should be washed thoroughly 8-12 hours after treatment

BENZYL BENZOATE (E.G. ASCABIOL)

- Benzyl benzoate can be used by adults and children. It is applied to the whole body except the head and face.
- If the application is thorough, one treatment should suffice but the possibility of failure is lessened if a second application is made within 5 days of the first.
- Alternatively, Benzyl benzoate can be applied to the whole body, on three occasions, at 12-hourly intervals.
- When used in older children, Benzyl benzoate should be diluted with an equal quantity of water and three parts of water for babies.

BENZYL BENZOATE (E.G. ASCABIOL)

- It appears to be safe in pregnancy, although the manufacturers of Ascabiol recommend that it be avoided wherever practicable.
- The major drawback with benzyl benzoate is its side-effect profile. It causes skin irritation and transient burning sensation. This is usually mild but can occasionally be severe in sensitive individuals.
- In the event of a severe skin reaction the preparation should be washed off using soap and warm water.
- Ascabiol is also irritating to the eyes which should be protected if it is applied to the scalp.

CROTAMITON (EURAX)

- Eurax should be rubbed into the entire body surface, apart from the face and scalp, once a day for between 3 and 5 consecutive days for adults and children over the age of 3.

- It can cause irritation on application. Treatment of scabies with Eurax is now no longer advocated although it is still used to control itch after scabies eradication

MALATHION (DERBAC M AND QUELLADA M LIQUID)

- The liquid can be used on adults and children over 6 months old. The liquid should be applied to the entire skin surface below the head for all patients aged over 2.

- For children younger than 2 years old a thin film of liquid should be applied to the scalp, face and ears.

- The liquid has to be left on for 24 h. if hands, or any other parts of the body must be washed during this period, the treatment must be reapplied to those areas immediately.

PRACTICAL PRESCRIBING: SUMMARY OF MEDICINES FOR SCABIES

Medicines	Use in children	Likely side-effects	Drug interaction	Pregnancy
Permethrin	> 2 months	burning, stinging	None	OK
Benzyl benzoate	No lower age limit sated	Burning, irritation	None	OK
Crotamiton	> 3 years	Skin irritation reported	None	Manufacturer advises avoidance but no teratogenic reports could be found
Malathion Quellada M	> 6 months	Skin irritation but rare	None	OK