MED439
KING SAUD UNIVERSITY

pediatric
439 Teamwork

Revised by The Academic Leader
Homoud Algadheb

Pediatric Dermatology

objectives:

- Essentials of Dermatology in Children:
- Anatomy and physiology of skin.
- Dermatological glossary, Common terms in Dermatology: Types of lesions.
- Approach to patients with skin diseases: History, examination & laboratory investigations.
- Neonatal skin disorders including inherited and congenital skin disorders in addition to simple innocent transient skin disorders of neonates.
- Common infantile skin disorders (eczema, seborrheic dermatitis and diaper rash).
- Skin lesions due to infectious agents.

Done by: Rayan Almasoud

Revised by: Saud Alrsheed

Team Leader: Saud Alrsheed

Special thanks to team 437 & Faisal alsaif

Notes

Important

Book

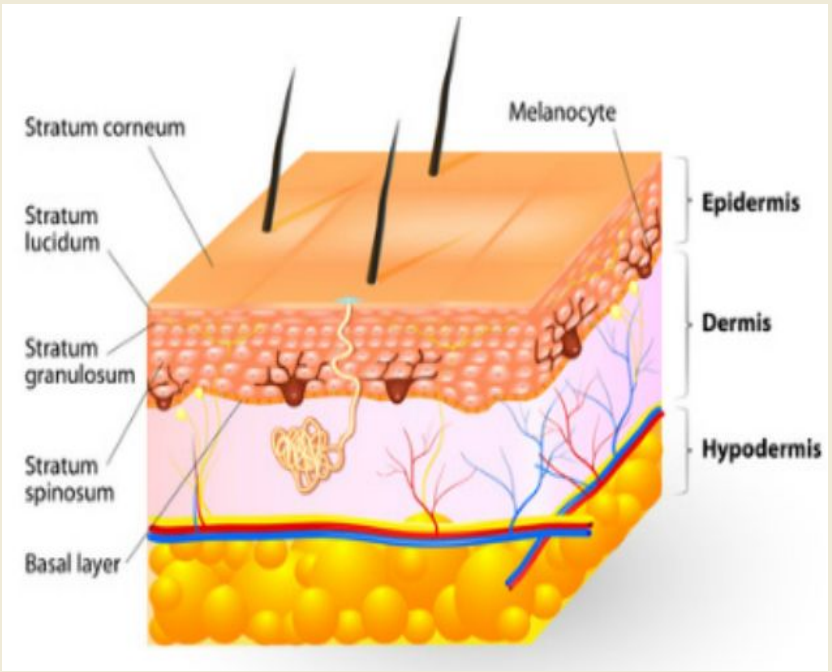
Primary skin lesions (arise de novo in the skin)

Lesion	*Description*	*Example*
Macule	A small flat area of altered colour or texture	Freckles, measles, rubella, roseola, café-au-lait macule of tuberous sclerosis
Patch	Larger flat area of altered colour or texture	Depigmented patch of vitiligo
Papule	A small raised lesion	Allergic, inflammatory papules of acne
Maculopapular	Combination of macules and papules	Measles, scarlet fever, parvovirus B19 (erythema infectiosum, fifth disease)
Plaque	A larger raised lesion	Scaly plaque of psoriasis
Nodule	A larger raised lesion with a deeper component (involvement of the dermis or subcutaneous fat)	Nodular lesion of erythema nodosum
Vesicle	A small clear blister	Varicella
Bulla	A large clear blister	Skin trauma, bullous impetigo
Wheal/weal	A transient raised lesion due to dermal oedema	Urticaria (hives)
Pustule	A pus-containing blister	Acute paronychia
Purpura	Bleeding into skin or mucosa. Small areas are petechiae, whereas large areas are ecchymoses. Do not blanch on pressure	Meningococcal septicaemia, Henoch–Schönlein purpura, immune thrombocytopenia, disseminated intravascular coagulation (DIC)

Secondary skin lesions (evolve from primary lesions or from scratching of primary lesions by the patient)

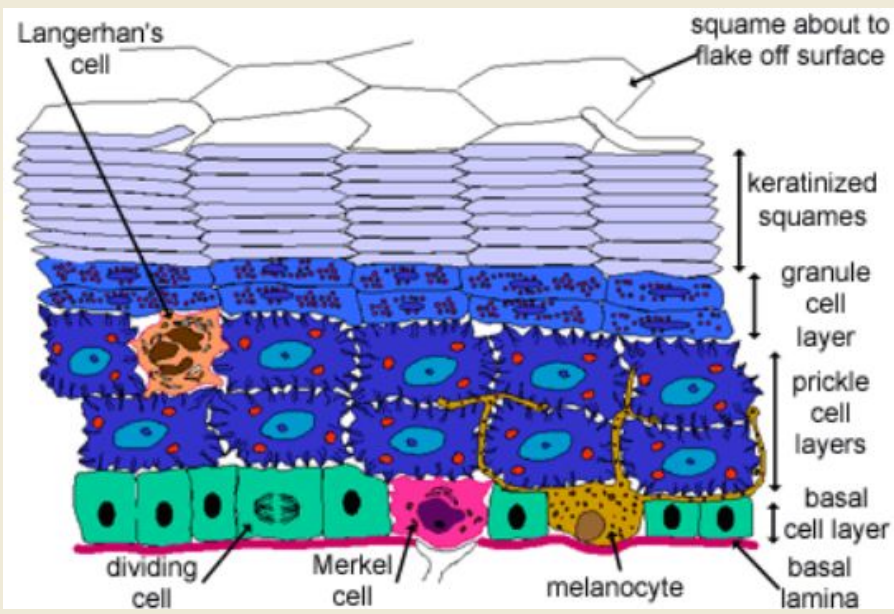
Excoriation	Scratch mark, loss of epidermis following trauma	Atopic dermatitis (from acute rubbing)
Lichenification	Roughening of skin with accentuation of skin markings	Atopic dermatitis (chronic rubbing)
Scales	Flakes of dead skin	Cradle cap in seborrhoeic dermatitis
Crust	Dry mass of exudates consisting of serum, dried blood, scales, and pus	Impetigo
Scar	Formation of new fibrous tissue postwound healing	Acne
Erosion	Loss of epidermis and dermis (heals with scarring)	Epidermolysis bullosa
Ulcer	Loss of epidermis and dermis (heals with scarring)	Ulcerating haemangioma

Anatomy:



The dermis has all the structures.

Skin lesions are common. Skin lesions are not the problem, they are manifestations of systemic disease, or complication of acute/chronic diseases e.g. RA, SLE, DM, infective endocarditis and malignancy.



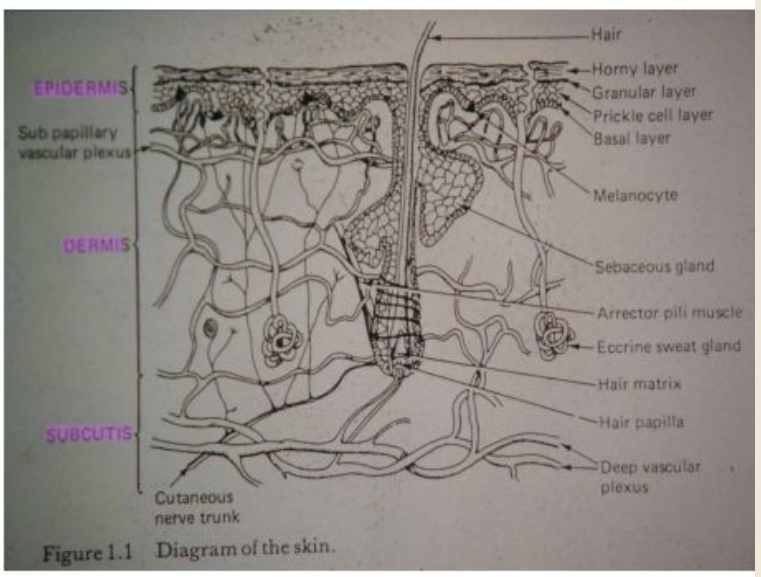


Figure 1.1 Diagram of the skin.

Physiology (Important Functional Properties of the skin):[1]

- Protects from external injury.
- Literally holds other organs together.
- Plays important role in fluid balance (mainly excretion but can also absorb fluid).
- Temperature control.
- An important organ of sensation.
- Absorb ultraviolet radiation.
- Metabolizes Vitamin D.
- Synthesizes epidermal lipids, which are an important protective barrier.
- Cosmetic function.

1) These are the functions of the skin. Everyday they discover a new function. It's not only protective and cosmetic. It's also metabolic; it plays a great role in metabolism…

Dermatological Glossary:[1]

• Erythema	• Edema
• Erosions	• Oozing
• Crusting	• Fissuring
• Lichenification	• Pigmentation
• Excoriation	• Xerosis
• Exfoliation	• Erythroderma

Approach to patients with skin disorders:

• **History:** You need history because sometimes lesions may look alike and you need to differentiate and, sometimes the lesion itself goes through stages. Also, sometimes the patients take medicine before they come to you (it could change the morphology of the lesion). You need to go through these points when taking history.

- Onset, progression, exacerbations and recurrences of the lesion. - Site of onset.
- Characters of original lesions & subsequent changes (including extension).
- Relation and exposure to: Sunlight, drugs and allergic contacts (metal, plants…).
- Itching / Pain.
- Fever / Prodromal symptoms.
- Medical history. - Family history.
- Racial.
- Family.
- Residence.
- Occupation.
- Leisure activities.
- Social factors.
- Past diseases.
- Drug history (History special).

1) There are words used for description in dermatology. These are the words that are repeated and you may hear…

- **Examination:** When you come to examination, the most important thing is exposing the patient as much as you can while still preserving the dignity of the patient. Preferably in a natural light if possible. The reason for the exposure is to know the extent of the disease, which is important in the diagnosis. Don't rely on what the patient has seen.

Skin diseases manifest on the skin in the form of changes that can be seen or felt. These are the signs of skin diseases. They are called skin lesions. These are divided into:

1. Primary skin lesions (Initial skin lesions):[1] It is the first lesion or a recently erupted fresh one that show on the skin as a sign of a developing disease (ex: macules in measles, papules, bullae and vesicles in varicella).

2. <u>Secondary skin lesions:</u>[2] It is a primary lesion that has:

- **Passed through a sequence of events that inherit to a given disease as a natural evolutionary process (ex. A vesicle that transforms into a pustule and the contents of it (pus) dries to form a crust.**

- **Has undergone changes due to trauma, scratching, infection or treatment (Ex. a vesicle scratched and it's roof is removed to reveal and erosion.**

In short, Primary lesions are de-novo lesions while secondary are either a sequence of the natural history of the disease or a modification of the primary lesion which can be either due to drug use or iatrogenic by itching.

- **Physical Examination:**

Full exposure in good light is essential: When you see the patient, there are 3 questions you ask. First, what type of lesion am I dealing with? Are they primary or secondary? Second, where are these lesions? And third, are there any characteristics in the lesion? Or any further description?

- **Nature of the lesion: Primary Lesions (Macules, papules, vesicles, pustules and wheals) or Secondary lesions (Scaling 'desquamation', crusting, scaring, ulceration, excoriation and pigmentation).** So, ask yourself what am I dealing with? Is it macular only or maculovesicular or maculopapular?

1) The primary are the lesions, which had occurred de novo and have the characteristics of the disease to start with.
2) The secondary are the ones that occur later either due to manipulation from the patient or treatment or part of the natural history of the disease. For example, Varicella starts, as a papule then becomes a vesicle and finally ulcerated and crusted.

- **Characteristics and configuration of the lesions:** Shape, size, color, dermatomal distribution, discoid appearance or umbillication. Are they oval? Circumscribed? Umbillicated? Do they have scales? Are they greasy or dry?

- **Distribution of the lesion:** Sometimes they are more in the trunk, sometimes they are more peripheral, sometimes they are more in the trunk and sometimes they don't. Also, they may involve the mucus membranes or the scalp. Sometimes they involve the palms or the soles.

• Possible differentials based on examination of the lesion:

1. Nature of the lesion: If you say macule, is it scaly macule or just simple macule?

- Macules: measles, neurofibromatosis 'café au let spots' , naevus flammues and vitiligo.
- Scaly macules: tinea corporis, pityriasis rosea, seborrheic dermatitis and pityriasis versicolor.

2. Distribution:

- Scalp: seborrheic dermatitis, psoriasis, tinea, alopecia and pediculosis.
- Face: acne, impetigo, infantile eczema, seborrheic dermatitis and lupus erythematosus.

• Laboratory Examinations and Investigations: After you examine, you may still need investigations to confirm the diagnosis...

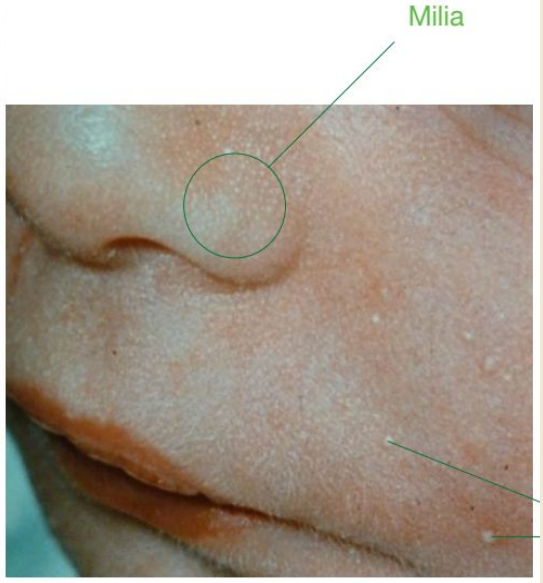
- Magnifying lens.
- Gram stain - KOH mount (fungi)
- Tzanck smear
- Woods light
- Patch test
- Dark field examination
- Biopsy - Immunofluorescence
- Blood chemistry

Dermatological test of choice is skin biopsy and it is done whenever we are in doubt. It is the gold standard.

We will start with the newborn. You will find these lesions in Page 150-151 in your book...

- **Milia:** The baby is born fine but he has these small pinpoint papules. Hyperpigmented or yellowish in color. Usually on nose and cheeks, not itchy and doesn't bother the baby.

• It's an epidermal inclusion cyst.
• Papules contain retained keratinized and sebaceous material.
• Unknown cause.
• Simple benign and asymptomatic.
• Resolves spontaneously within days.



Milia are pores blocked by debris, which create papules found on the nose and cheeks. They resolve within the first 4 weeks of life.

- **Milliria:** It's just a heat rash due to sensitization of the hair follicle. Don't worry about this it's not important. Focus on Milia.

Unfortunately, the Milliria photo was not in the slides provided. I had to add another. For your knowledge: -
-Milliria are blocked sweat ducts that create a red erythematous base with papules as secondary lesions. They are found most commonly on the forehead, neck and trunk. They settle within a few days with cooling and removal of occlusive clothing.

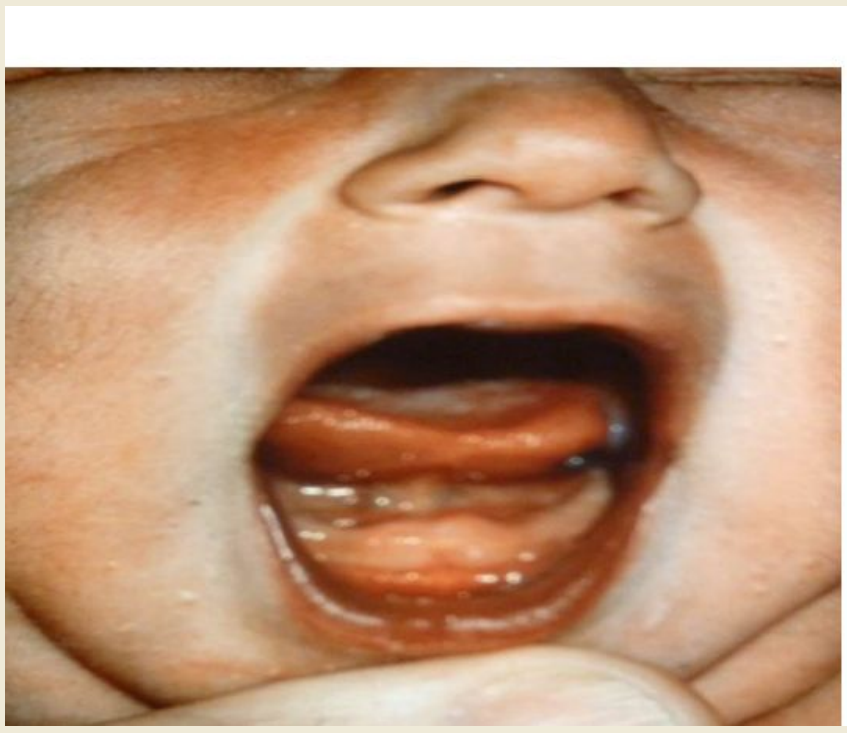
Due to preheation of baby, the baby sweats and hair follicles get irritated.
Uncover the baby.

- **Ebstein pearls:** Milia could be in the mucous membranes and when they are, they are called Ebstein pearls. Could be in the mouth or sometimes the genitalia. It does not cause any problem. (Asympatomatic) **It is an epidermal inclusion cyst. It affects mucous membrane , and most commonly in the mouth. When it ruptures, it involutes spontaneously.**

- **Ranula:** **It is a congenital mucous retention thin cyst, less commonly traumatic. It ruptures spontaneously and needs no surgical intervention.**

Sometimes in the floor of the mouth you find a cystic swelling, which is greenish bluish in color. It is similar to an aneurysm but in the salivary ducts. It is salivary duct ectasia. Assure the parents that it will rupture in a few days time.

However, there is another type of mucus retention cyst that can happen to anyone after oral trauma. A child may be running and falls on a hard object injuring one of the ducts. In this case, we may have to intervene surgically, but congenital is self-limiting.



Mucocele “mucus retention cyst” is floor of the tongue swelling, ruptures within few days, doesn’t cause any problem. Some children develop rapid (overnight) general rash mainly on trunk, sparing the palms, soles and mucus membrane. Which is not itchy and the child is well looking

- **Erythema Toxicum Neonatorum:** This is a baby who is born fine and in the 2nd or 3rd day of life his parents noticed that his body turned red. But, the baby is eating well, sleeping well, sucking well and he is not crying.

• It is a macular generalized patchy red rash. We call it a blotchy erythematous rash. (Sudden within hours)
• Benign and self-limiting.
• Ruptures and resolves spontaneously. Therefore, reassure the patient. (Slightly itchy, use emollient cream)
• Patient does not look sick and has no fever.
• Macules are the commonest presentation, but can also present with papules and vesicles. The erythematous eruption is there but in the middle of it, it can be macular or papulovesicular.
• It is a eosinophilic eruption. It's under the category: Eosinophilic eruptions of childhood.
• Scrape taken from the lesion will show eosinophil aggregate.

- **infantile gynaecomastia** The next picture (on the left) also shows infantile gynecomastia, which is physiological due to the maternal hormones crossing the placenta. It can also produce milk. It resolves spontaneously when the estrogen levels go down in the blood. Do not squeeze it or touch it because you might induce mastitis.

Have you heard of neonatal period? Sometimes girls are born with menses; they bleed from their vagina. The reason is withdrawal bleeding because they had high level of estrogen and progesterone in their body from the placenta. When the hormones go down after a few days of life, they come with vaginal bleeding. However, you have to make sure you are not dealing with something else. Hemorrhagic disease of the newborn may present with melena, bleeding per rectum or bleeding from the umbilicus. Hemorrhagic disease of the newborn = Vitamin K deficiency bleeding (VKDB)

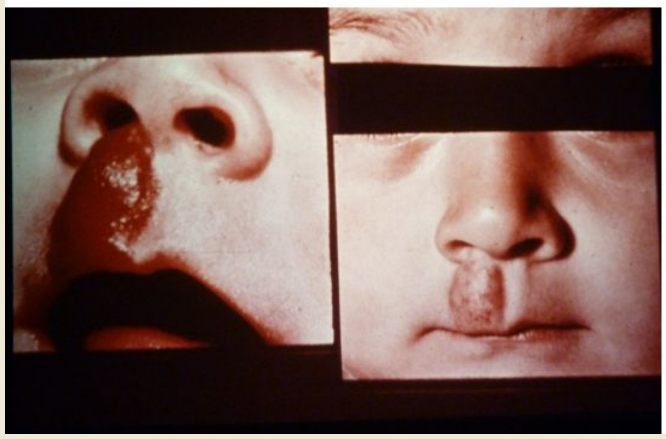
- **Salmon patch:** We also call it angel crest or stork bite. The best name for it is Nevus Simplex it's the pathological term for it.
  It is a congenital macular rash that appears on the back of the neck, glabella and the upper eyelid. It is an ectatic salmon like rash. They are ectatic capillaries in the epidermis. It's mostly in the upper eyelid or the glabella or in the nape of the neck. It disappears with time especially if above the clavicle or on the upper eyelid. It might also persist for years and then get covered by hair especially in the nape of the neck. Generally it is a simple lesion as the name implies.

This baby has two problems. He has congenital bilateral glaucoma. It's familial. He also has salmon patches of his eyelids.

- **Mongolian spots:** • It occurs anywhere, it could be in the face or hands and feet, but mostly in the lower back or buttocks.
  • It is a macular lesion and the baby is born with it. It is a bluish-greenish discoloration that is caused by the arrest of melanocytes in the dermis.
  • It is seen in Mongolian race, but it has nothing to do with Down syndrome.
  • Might disappear with time or it might be a permanent lesion, but it's harmless. Never turns malignant
  • Common in our society and dark-skinned people, but less common in Caucasians. In areas where it's not common, they may suspect child abuse.

Baby has mongolian spots and eczema.

- **Strawberry Hemangioma:** It's a type of malignancy (uncontrolled proliferation of blood vessels). They are raised lesions that look like strawberries. They have different classifications; some say raised or non-raised, some say involuted and non-involuted and some say capillary or cavernous. I don't care about that.



Cause is unknown
It could be anywhere in the body

If they present with stridor or respiratory distress and you look at their body and see strawberry hemangioma it means they may have hemangioma in their airway (laryngeal hemangioma)

Sometimes they are in the viscera e.g Liver and present with visceral bleeding

May lead to amblyopia

Usually they start as a small papule after birth and not noticed. It slowly enlarges to reach a maximum by second year of life. After that, starts to involute spontaneously. The center of the lesion involutes first, leaving a whitish knot. Do nothing unless in a sensitive area exposing to ulceration and infection or overlying a vital organ like the eye or the upper airway (obstructing the airway). Reassure no intervention needed. If it's bothersome we have modalities to treat (interferon, dapsone, plastic surgery, cryotherapy, local or systemic corticosteroids) or propranolol.

- **Not present at birth**, appears in the first month of life, more common in preterm infants.
- May be multiple.
- It increases in size until 3-15 months of age.
- Ulceration or hemorrhage may occur.
- Thrombocytopenia may occur with large lesions, when therapy with systemic steroids or interferon-a is required.

- **Capillary Hemangioma (Port-wine stain):** Also called Nevus Flammeus (looks like a flame). It is a non-raised discoloration of the skin that is present at birth. Usually hemangiomas are not congenital but this one is. It's normally dermatomal and takes the ophthalmic branch of the trigeminal nerve. If it involves the upper eyelid, it's more likely to cause problems to the eye. This hemangioma is different because it's associated with systemic anomalies. One of them is the eye, causing glaucoma and cataract.

This nevus Flammeus could be in the meninges (leptomeningioma), and presses on the brain causing atrophy. This is a syndrome called sturge-weber syndrome...

Look at the eye; it's larger than the other one. He's got glaucoma already.

It is due to vascular malformation of the capillaries in the dermis. If along the distribution of the trigeminal nerve, it may be associated with intracranial vascular anomalies (Sturge-weber syndrome) or severe lesions on the limbs with bony hypertrophy.
Disfiguring lesions can now be improved with laser therapy.

- **Sturge-Weber syndrome:** leptomeningioma with contra-lateral hemiplegia, mental retardation and capillary hemangioma.
It's a triad of 3 things: Hemangioma, leptomeningioma and contralateral paralysis or mental retardation or together.

This hemangioma can also cause another disease called Kabel Kanani syndrome. In addition to the hemangioma, the organs of the body on the same side of the hemangioma are larger than the other side.

- **Kabel Kanani syndrome** (Klippel-Trenaunay syndrome) he has hemi-hypertrophy on the side of the hemangioma.

There is asymmetry in the legs; one leg is larger and longer than the other.

And there is difference also color wise. There is hemihypertrophy.

- **Epidermolysis Bullosa:** Whenever the skin is touched it sloughs off. There is no specific treatment, you need to only prevent infection, and when infection occurs treat it.

The bonding tissue in the layers of epidermis is lost.

Usually our skin is kept tight and intact by connective tissue. All the layers of skin are connected. This is an inherited disease where this connection is lost. The baby suffers from sloughing of the skin. Even when he passes through the birth canal, he gets bullas and infections. There are many inheritance patterns; some are difficult some are milder, but all are lifelong diseases. Treatment is supportive.

- It's characterized by blistering of the skin and mucous membranes.
- Autosomal dominant variants are milder; autosomal recessive may be severe or fatal.
- Spontaneous sloughing occurs or after mild trauma.
- Complications include contractures of the limbs and ulcerations and erosions of mucous membranes. Esophageal stenosis may occur. Management is directed towards avoiding injury and treating secondary infections.
- Management is multidisciplinary.

- **Collodion baby (Icthyosis Congenita):** Colloid is a type of wax. **The skin is very tight the baby cannot move or breathe. It is a form of ichthyosis**(inherited disease). **The skin will get shed with time, but he will continue to have ichthyosis, requires supportive management.** Ichthyosis is a condition in which the skin is dry and scaly.

This is a baby who is born with respiratory distress and skin like plastic. It's an inherited form of Icthyosis. Babies are born sick and need supportive care until the skin dissolves or exfoliates. The baby will improve but he will have lifelong skin problems.

We support then in their first weeks of life with folate

- **Naevi:**
- **They are abnormal cells in abnormal locations.**
- **Black hairy nevus is AKA giant or trunk nevus. It might cover the whole trunk. The larger it is the more it is likely to convert into malignant melanoma (it increases the risk 10x normal).**
- Signs of malignancy: 1) Becoming larger 2) Change in color 3) itchy
- Risk factors for melanoma: 1) +ve FHx 2) Large number of naevi 3) Fair skin 4) Repeated exposure to sun.

This baby was born with a giant black hairy nevus. Also called a bathing trunk nevus. The problem with this is that it's disfiguring and has 10x malignant potential than normal. Unfortunately, treatment is multidisciplinary (plastics, derma…etc.).

Congenital pigmented naevi involving extensive areas of the skin (>9cm) are rare but disfiguring. They require prompt referral because they care 4-6% lifetime risk of malignant melanoma.

- **Infantile Eczema (Atopic Dermatitis):**

• It's not present at birth.

• It is an inflammatory immunological disorder. There is activation of the mast cells (increased IgE) causing the release of histamine that attacks the skin. Mast cells get sensitized and irritated and release histamine. Then, the histamine sensitizes the skin for itching.

They call it the itch rash cycle. Which one comes first? We believe that the itch comes first and the rash is created by the itch. So we stop this cycle by preventing the itching by giving antihistamines. Then, we treat the aftermath of the itching. Because if you don't stop the itching, whatever topical treatment you give will not succeed. So, we give antihistamine and a topical anti-inflammatory, because it has an inflammatory component. We also try to keep the skin wet with emollients, and we tell the parents that this is a lifelong disease. They may grow out of it.

• Unknown cause.

• It waxes and wanes (intermittent), it might stay for several years.

• Usually seen on the flexures.

• It causes itching, which will result in secondary lesions as: lichenification, ulceration and excoriation.

• It requires intermittent long-term treatment.

• Most common complication is by secondary bacterial infection (by staph or strept.) due to breakage of the skin barrier. It can also be complicated by eczema herpeticus in which herpes virus invades the abnormal skin.

Exclusive breastfeeding may delay the onset of asthma in predisposed children, but doesn't appear to have a significant impact on the prevalence of eczema during late childhood.

Box 25.3 Causes of exacerbation of eczema

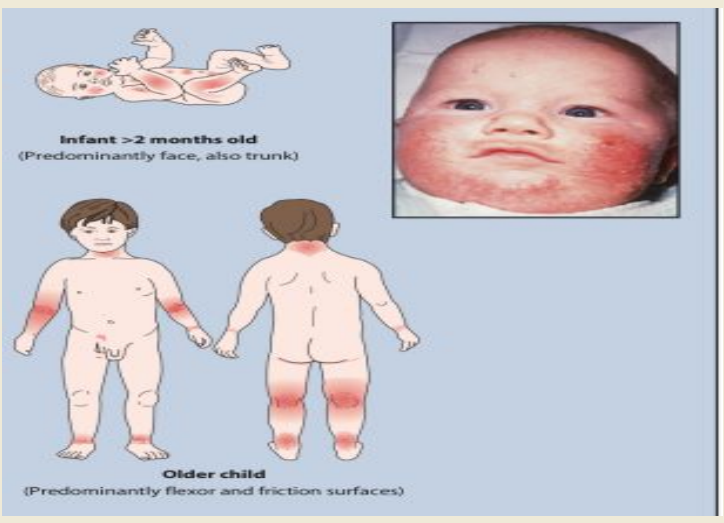
- Bacterial infection, e.g. *Staphylococcus*, *Streptococcus* spp.
- Viral infection, e.g. herpes simplex virus
- Ingestion of an allergen, e.g. egg
- Contact with an irritant or allergen
- Environment: heat, humidity
- Change or reduction in medication
- Psychological stress
- Unexplained

Regional lymphadenopathy is common and often marked by active eczema; it usually resolve when skin improves.

The baby is fine the first few months of life. Then, his skin becomes rough and itchy. You will also find oozing, crusting and fissuring. The hallmark is itching. **Most commonly found on the cheek, chin and flexor surfaces especially in the antecubital fossa.** Sometimes you'll find a **positive family history of atopy. i.e. eczema, asthma, allergic rhinitis**

The most common complication is secondary infection with staph aureus or with fungi.

Lichenification due to scratching.



There are vesicles.

Another infection that likes abnormal skin is Herpes Zoster. Varicella simplex loves abnormal skin. This is called Eczema Herpeticum.
We worry that it may disseminate in the body. So if the child is sick and febrile, we give systemic acyclovir.

- **Managing Atopic Dermatitis:**

- For ongoing care, use bland lubricant 2-3 times a day (less in warmer months). Mainstay
- Use lubricants after bathing or swimming (apply after patting skin dry).
- Use mild unscented soap preparation in areas where bacteria proliferate (waistband, under arms, around the neck and in groin).
- Use low to medium potency topical steroids in ointment-based vehicles.
- Use only as needed, only on areas that are affected, and no more that 1-2 times a day.
- Use antihistamines to control scratching (may be best at bedtime). Keep affected skin covered whenever possible to avoid irritation that might cause scratching.
- For acute flares (with no evidence of secondary infection), use cold tap water compresses 3-4 times a day, followed by bland lubricants.

In children over 2 years of age, short-term topical use of tacrolimus ointment or pimecrolimus cream may be indicated for eczema not controlled by topical corticosteroids and where there is a risk of important adverse effects from further topical steroid use.

A genetic deficiency of skin barriers function is important in the pathogenesis. Onset is usually in the first year of life. However, it is uncommon in the first 2 months of life unlike seborrheic dermatitis. Distribution tends to change with age. In infants, the face and scalp predominate, and the trunk may be involved. In older children, the skin flexures (cubital and popliteal fossae) and frictional areas, such as neck wrists and ankles are characteristically involved.

- **Seborrheic Dermatitis:**
- Scaly erythematous oily skin lesions. Has nothing to do with seborrheic glands.
- More common in extreme ages.
- Involves skin creases as the axilla, face and scalp (cradle scalp hallmark).
- More benign, more superficial and less itchy than atopic dermatitis.
- Might disappear and will not reappear until later in life (60-70) years.
- Treated by removing the scales, wash properly with shampoo, we might sometimes give mild steroids, salicylic acids or keratolytic drugs.

These babies are usually born with a problem. They have scaly oily macular lesions mainly on the skin creases. They may be on the trunk, but mainly in the inguinal area, armpits, axillae and neck. They are mildly itchy, but they are not dry or fissuring like eczema. These are superficial and scaly. It is associated with the risk of developing atopic eczema.

Secondary infections can happen but less than atopic dermatitis

You may see dandruff on the scalp. Cradle Scalp: A hallmark of seborrheic dermatitis. If the cradle cap is prominent, you have to get rid of it. We usually advise the parents to put warm olive oil and to clean the scalp with baby shampoo. If extreme you may give salicylic acid and keratolytic agents.

+ comb hair with narrow tooth comb

-Apply mild steroid

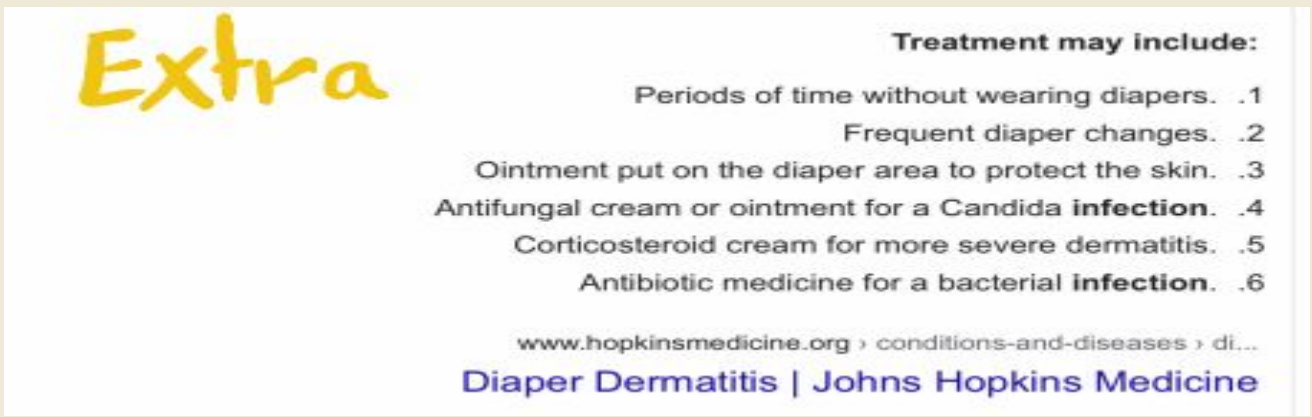
- **Differentiation Between Infantile Atopic From Seborrheic Dermatitis:**

	Atopic Dermatitis	Seborrhoeic Dermatitis
• Onset (age)	3 months	6 weeks
• Duration	Chronic	Approx. 6 wks.
• Itch	Yes	No
• Family history of atopy	Yes	No
• Distribution	Face & limb flexures	Scalp, face, axillae & diaper area

- **Contact Dermatitis:**
  - It's irritant dermatitis also known as diaper dermatitis.
  - It spares creases.
  - It's due to irritation from urine, stool and hot humid environment (as in the diaper). Stool and urine come into contact with skin in this humid environment, and this liberates gases. These gases sensitize the skin.
  - It might be complicated with fungal infection. In this case the creases will be involved and you might see vesicles. Whenever suspected look and the mouth for oral thrush.

Treatment:

- Advise parents to clean the baby as soon as they think the baby is wet
- Apply barrier cream (sudocrem)
- If it got inflamed you can use mild steroids

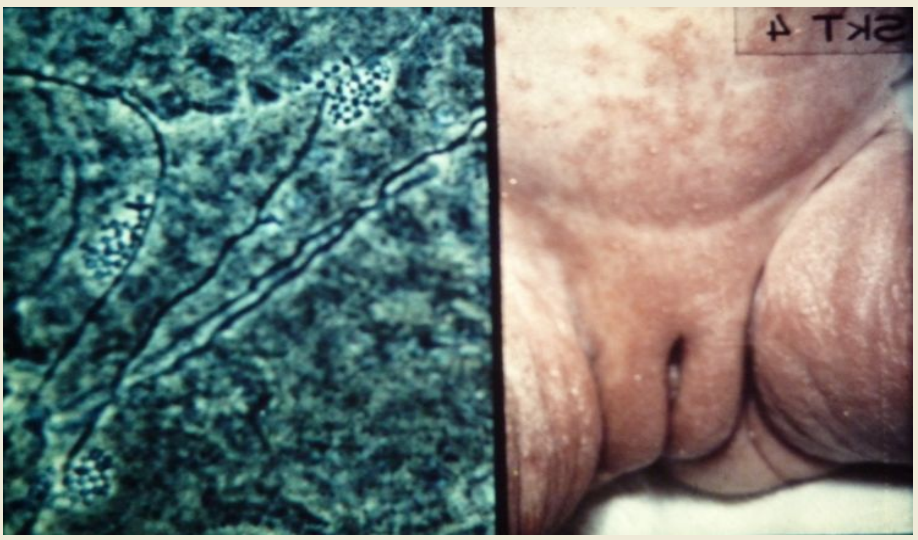


With time, bacteria and fungi come into the picture. They like hot wet environment plus the inflamed skin.



You see here it doesn't spare creases and went to the abdomen beyond diaper area (satellite)

- **Fungal Candidal Infection:**



Hyphae and spores Pustular candida dermatitis
Creases are involved

So, you may see satellite lesions or vesicles indicating a secondary candidal infection. It becomes candida dermatitis. If its pustular like this photo you are most likely dealing with candida.

For candidal treatment you can use Nystatin

- **Oral Thrush by Candida:**

Sometimes you look at the mouth of the baby and you'll find oral thrush. This baby also has facial palsy. It's most likely due to birth trauma probably forceps delivery.

Diaper rashes are either simple or complicated. We will not ask you about the complicated. Some diaper rashes may be associated systemic disease like Histiocytosis. Which is now known as Langerhans disease.

- **Differential Diagnosis of Diaper Dermatitis:** = Nappy rash

- More common:
  Irritant Contact Dermatitis
  Candidiasis
  Seborrheic Dermatitis
- - Less common:
  Allergic Dermatitis
  Impetigo
  Perianal Streptococcal Disease
  Atopic Dermatitis
  Psoriasis
  Acrodermatitis Enteropathica (Present with chronic diarrhea)
  Histiocytosis X (A form of malignancy)

Albinism:

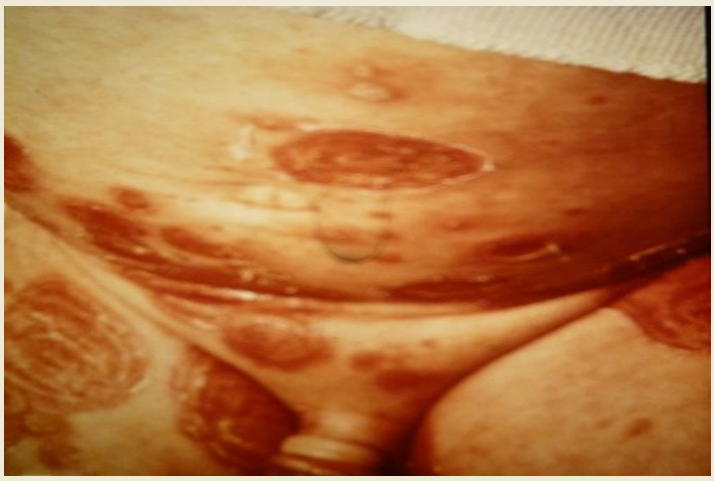
• This is due to a defect in biosynthesis and distribution of melanin.
• The albinism may be oculocutaneous, ocular, or partial, depending on the distribution of depigmentation in the skin and eye.
• The lack of pigment in the iris, retina, eyelids, and eyebrows results in failure to develop a fixation reflex. There is pendular nystagmus and photophobia, which causes constant frowning. Correction of refractive errors and tinted lenses may be helpful.
• The pale skin is prone to sunburn and skin cancer.

- **Impetigo Contagiosa:** Superficial skin infection

This child had a small lesion on the face. It started as a small papule and the child scratched and got it infected. Then, keeps scratching and spreads the infection. It's usually bacterial (staph or strept).

Tx: Topical mupirocin or systemic cloxacillin or floxacillin.

- **Bullous Impetigo:**
  Caused by staph and sometimes by strept, it involves the face and limbs. It causes honey-like crusted skin infection. The bullas might rupture causing severe pain. Treated by systemic antibiotics and other supportive measures.



- It's a localized, highly contagious staphylococcal and/or streptococcal infection.
- Most common in young children and infants.
- More common where there is preexisting skin disease like atopic eczema.
- Lesions are usually on the face, neck and hands. They begin as macules which may become vesicular/pustular or bullous. Rupture results in characteristic honey colored crusts.

- **Scalded Skin Syndrome (SSSS):**
  Scalded skin syndrome is an acute infection caused by exotoxin secreted from staph aureus. Whenever you touch the skin, it comes out (Nikolsky Sign). Antibiotics and supportive measures treat it. It responds to treatment unlike the inherited epidermolysis bullosa.

This baby is very sick. This is an acquired disease. They come febrile and when you touch them, the skin comes off. The skin easily separates. It's called Staphylococcal Scalded Skin Syndrome. Staph aureus is the cause. They need supportive treatment and IV antibiotics against staph.

It's caused by an exfoliative staphylococcal toxin, which causes separation of epidermal skin. Affects infants and young children. They may have a purulent crusting localized infection around the eyes, nose and mouth.

- **Molluscum Contagiosum:**

  It is caused by POX DNA virus. Human is the only reservoir. There will be thick wall vesicles with indurations and umbilication. It's asymptomatic and not itchy. May be single but usually multiple. It is a self-limiting disease, and usually disappears alone within a year but might need scraping. If multiple, it needs cryotherapy. Topical antibiotics may be used to treat secondary infection. It's contagious - Treatment by curettage is more than enough

This baby is a school child with papulovesicular eruption with a thick covering and this papule is Umbilicated.

- **Herpetic gingivostomatitis:**

• It's the most common form of primary HSV illness in children.
• Occurs from 10 months to 3 years of age.
• There are vesicular lesions on the lips, gums and anterior surfaces of the tongue and hard palate, which often progress to extensive, painful ulceration with bleeding.

It's an inflammation of the mucous membrane of the mouth with herpes simplex usually type-1. The child comes with high fever, pain and he cannot eat or drink. Treatment is usually supportive with hydration, liquid nutrition and we may give acyclovir.

- **Varicella Zoster:** VZ in children is not a sign of malignancy unlike adults

  Painful vesicular eruptions that involve a certain dermatomal area. It is caused by the activation of a dormant virus. In children, it is less painful than adults. The child is infective and might transmit the disease to other contacts therefore he must be isolated. If it is severe, give analgesics and acyclovir.

  The thing about this is that children not vaccinated against varicella, and they come into contact with someone infected with shingles, they may get chicken pox. This virus remains dormant in the posterior ganglia and then gets activated.

• Shingles is uncommon in children.
• It is caused by reactivation of latent varicella zoster virus (VZV), causing a vesicular eruption in a dermatomal distribution; most commonly in the thoracic region.
• Children unlike adults rarely suffer neuralgic pain.
• Recurrent multidermatomal shingles is strongly associated with underlying immunosuppression. It could also disseminate and cause severe disease.

- **Scabies:**

  It is caused by Sarcoptes scabiei (Mites). It causes severe itching and ulceration, positive family history of itching. Itching is the hallmark of the disease.

Hallmark is dirty itchiness
They don't find burrows in children as easy in adults

This child is very dirty and he has lesions all over his body and they are very itchy. Scabies can take any form but the hallmark is itchiness. It may run in the family; more than one family member is itchy. Sometimes we cannot find the characteristics in children so we treat empirically.

The mite burrows down the epidermis to stratum corneum.
Severe itching occurs 2-6 weeks after infestation, and it's worse in warm conditions and at night.
In older children, burrows, papules and vesicles involve the skin between the fingers and toes, axillae, flexor aspects of the wrists, belt line and around the nipples penis and buttocks. In infants and young children, the distribution often includes the palms, soles and trunk. Although burrows are pathognomonic, they may be hard to identify due to secondary infection from scratching.
It is a clinical diagnosis, but may be confirmed by microscopic examination of skin to find mite, eggs and feces.
Treatment: Treat the child and the entire family.
1)Anti-scabies (Permethrin cream 5%) 2) Shampoos.

This is the classical scabies lesion in adults.

- **Ringworm Infection:** Annular in shape

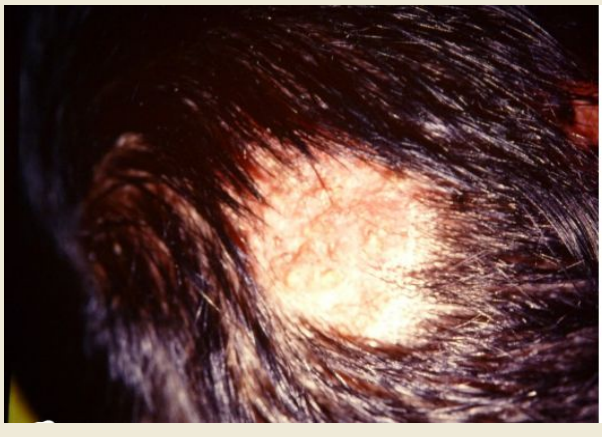
The skin lesion is rounded and superficial, has an active periphery and an inactive pale center. It can affect any part of the body: the trunk (tinea corporis), scalp (tinea capitis), and foot (tinea pedis). It is treated by topical antifungal if possible or systemic griseofulvin if multiple. Tinea cruris in the genitals

This child has a ring form lesions that are small papules in the periphery and an inactive pale normal center. This is a ringworm infection. It's fungal. It's common in school children. It sometimes comes from cats. We treat with an antifungal.

• Dermatophyte fungi invade dead keratinous structures such as the horny cell layer of skin, nails and hair. Severe inflammatory pustular ringworm patch is called a Kerion.
• Tinea capitis (scalp ringworm) sometimes acquired from dogs and cats, causes scaling and patchy alopecia with broken hairs. Wood's light may show bright greenish/yellow fluorescence of infected hairs with some fungal species.
• Rapid diagnosis may be made by microscopic examination of skin scrapings for fungal hyphae. Definitive diagnosis is by culture.
• Treat mild infection with topical antifungal. Treat more severe with systemic antifungals. Animal sources need to be treated too.

Sometimes the infection is in the scalp and causes alopecia. We have to differentiate between alopecia with and without infected skin…

- **Tinea Capitis:**

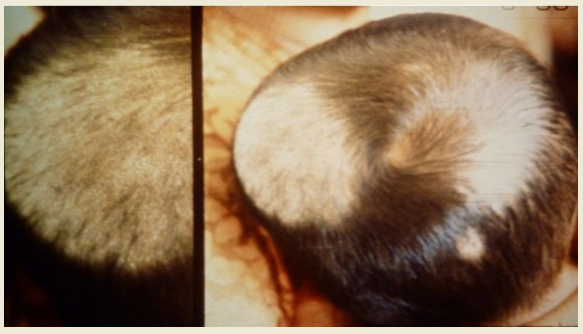


Sometimes there is an immunological over-reaction to the hyphae and it causes a lesion in the scalp called **Kerion** (Left Picture) . We treat this with systemic aggressive antifungals (Griseofulvin), systemic steroids and systemic antibiotics.

- **Alopecia:**

Alopecia is different. It is the absence of the hair from the skin in general. There are 3 types: universalis, totalis and areata. In areata, you'll find a clean scalp. That will differentiate it from Tinea where the scalp looks dirty.

Alopecia areata



Remnants of broken off hair are visible as 'exclamation mark' hairs may be seen at the edge of active patches of hair fall.
The more extensive the hair loss, the poorer the prognosis, but regrowth often occur with in 6-12m

- **Pediculosis:** قمل

  In pediculosis, the nits cannot be removed while dandruff can fall off without the hair coming out. It is common in school children. Whenever you see a child with itchy lesions on the scalp, think of pediculosis.
  Suboccipital lymphadenopathy is common.
  Once infestation is confirmed by finding live lice, dimeticone 4% lotion or an aqueous solution of malathion 0.5% is rubbed into the hair and scalp and left on overnight and the hair shampooed the following morning

- **Cutaneous Leishmaniasis:**

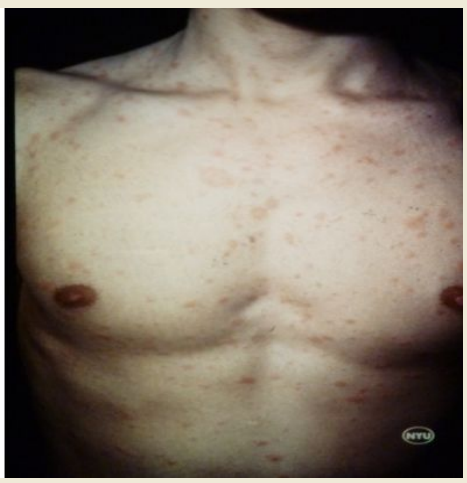
  It is caused by the parasite Leishmania Tropica or Donovani; the sand fly is the vector. It affects exposed skin. The lesion is not very itchy. It is a chronic disease treated by antimonial medications.
  In our country it is common in alkharj and alqassim. It has two types: Visceral and Cutaneous

This lesion is common in certain areas. It starts as a small itchy papule that enlarges and ulcerates. It's called Leishmania Tropica.

- **Pityriasis Rosea:**

It's a scaly hyper-pigmented lesion. It affects adolescent age group more common in boys. It is mildly itchy and is a self-limiting disease. If it was severely itchy, we give steroids.

Acute self-limiting condition that is thought to be of viral origin. It begins with a single round or oval scaly macule (herald patch 2-5cm in diameter), on the trunk, on the upper arm, neck or thigh. After a few days, numerous smaller pink dull macules develop on the trunk, upper arms and thighs. Rash resolves within 4-6 weeks.



Multiple hyperpigmented macules, mildly itchy, mainly on the trunk and upper chest

This is a superficial scaly hyperpigmentation on the skin of an adolescent. It is mildly itchy. It starts with a pig lesion called a Herald patch 2-3 days before the rest of the lesions. It's a self-limiting disease, but we can give mild steroids.

- **Psoriasis:**

Scaly patches that bleed upon removal (Auspitz's sign).

Guttate psoriasis: is milder form seen in children after throat infections; it causes guttate spots. Resolve within 3-4 months (risk for psoriasis recurrence in the next 3-5y)

- This familial disorder rarely presents before age of 2.
- The guttate pattern is common in children and often follows a streptococcal or viral sore throat or ear infection. Treatment is with bland ointments. Lesions usually resolve over 3-4 months.
- Coal tar is used for plaque psoriasis and for scalp lesions, which are less common.

This is a typical case. Rare

There is another type called guttate psoriasis, which is much milder and less chronic

Extra Picture

Erythema nodosum

Figure 25.19 Erythema nodosum. There are tender nodules over the legs. She also had fever and arthralgia.

Box 25.4 Causes of erythema nodosum

- Streptococcal infection
- Primary tuberculosis
- Inflammatory bowel disease
- Drug reaction
- Idiopathic

  (Sarcoidosis, a common association in adults, is rare in children)

Erythema multiforme

Figure 25.20 Erythema multiforme. There are target lesions with a central papule surrounded by an erythematous ring. Lesions may also be vesicular or bullous.

Box 25.5 Causes of erythema multiforme

- Herpes simplex infection
- *Mycoplasma pneumoniae* infection
- Other infections
- Drug reaction
- Idiopathic

Questions

1- William is a previously well 8-year-old boy who presents to the Emergency Department with a fever and arthralgia for 2 days, which is getting worse. On examination, he is noticed to have a painful, raised rash on his shins

Which of the following is the most likely cause?
Select one answer only.
A. Football injuries
B. Henoch–Schönlein purpura
C. Herpes simplex infection
D. Mycoplasma pneumoniae infection
E. Streptococcal infection

2- This 8-year-old boy presents to the Emergency Department. He is on co-trimoxazole (Septrin) as treatment for a urinary tract infection. He went on to develop severe ulceration of his mouth and corneal ulceration

What is the most likely diagnosis?
Select one answer only.
A. Kawasaki disease
B. Langerhans cell histiocytosis
C. Primary herpes simplex virus infection
D. Stevens–Johnson syndrome
E. Allergic keratoconjunctivitis

3- A 1-month-old male infant is brought to his family doctor. He has a rash confined to the perineum (Fig. 25.3). He has had diarrhoea for the last week.
What is the most likely cause for his rash?
Select one answer only.
A. Atopic eczema
B. Candida napkin rash
C. Chicken pox
D. Infantile seborrhoeic dermatitis
E. Irritant napkin rash

Questions

4- Many rashes in childhood are itchy and can cause a lot of discomfort for the child.
Which of the following rashes is least likely to be itchy?
Select one answer only.
A. Atopic eczema
B. Chicken pox
C. Infantile seborrhoeic dermatitis
D. Pityriasis rosea
E. Scabies

5- Joseph is a 4-year-old boy who is brought to the general paediatric clinic with this lesion in his hair.

What is the most likely diagnosis?
Select one answer only.
A. Alopecia areata
B. Cutis aplasia
C. Kerion
D. Langerhans cell histiocytosis
E. Psoriasis

Answers

1- **E.** Streptococcal infection
Correct. This boy has erythema nodosum and the
causes include streptococcal infection, primary tuberculosis, inflammatory bowel disease, drug reaction or idiopathic.

2- **D.** Stevens–Johnson syndrome
Correct. This boy has Stevens–Johnson syndrome, which is a severe bullous form of erythema multiforme. Its relative frequency in children treated with co-trimoxazole has led to this antibiotic rarely being used. It is still helpful for the treatment or prevention of Pneumocystis jirovecii (carinii) in children with
immunosuppression. The eye involvement may include conjunctivitis, corneal ulceration and uveitis, and ophthalmological assessment is required. It may also be caused by sensitivity to other drugs or infection, with morbidity and sometimes even mortality from infection, toxaemia or renal damage.

3- **B.** Candida napkin rash
Correct. In this condition the flexures are involved and there are satellite lesions (isolated erythematous lesions away from the main rash area).

4- **C.** Infantile seborrhoeic dermatitis
Correct. The causes of itchy rashes are: atopic eczema, chicken pox, urticaria, allergic reactions, contact dermatitis, insect bites, scabies, fungal infections and pityriasis rosea. All the conditions listed in the question are itchy other than seborrhoeic dermatitis.

5- **C.** Kerion
Correct. Kerions are caused by infection with tinea capitis (scalp ringworm). Topical treatment is usually tried first but oral antifungals may be required for very severe cases.