

## Psoriasis and Other Erythematous Skin Diseases

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**With a morbidity rate of 2 - 3 %, psoriasis is one of the most common skin disorders in the Western world. It can be classified as one of the inflammatory, erythematous, hyperkeratotic skin diseases, which also include Reiter's dermatosis and the group of pityriasis dermatoses. Learn more about psoriasis and its forms, and about the other diseases mentioned above.**



Psoriasis

Definition



Picture: "Plaque psoriasis. In higher resolution, silvery white scales of exfoliated skin can be seen." by Eisfelder.  
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Psoriasis (**psoriasis vulgaris**) is a chronic-recurrent, relapsing skin disorder characterized by inflammation and hyperproliferation of skin cells of the epidermis. Patients present with patches of skin covered with silvery scales, which is why this disease is also called plaque psoriasis. This disease has many factors responsible for its manifestations including environmental, genetic and immunological.

## Epidemiology

Although psoriasis is spread over the entire globe, it is mostly fair-skinned people who are affected. The morbidity in Europe and North America is between 2 – 3 %; on the African and Asian continent, on the other hand, the disease is rarely found. For indigenous people, the disease is practically irrelevant.

## Pathogenesis

The cause of psoriasis has not yet been determined conclusively; however, there is a clear genetic disposition. The disease probability for a child whose parents both suffer from psoriasis is about 50 %. In identical twins, it is even higher with 66 %.

In addition, the disease is associated with various HLA antigens. A connection with other immunological factors, such as T-lymphocyte activity, is considered likely. Since endogenous antigens stimulate specific groups of T-cells, and this ultimately leads to an increased division rate of the keratinocytes through a more complex pathomechanism, psoriasis is also associated with autoimmune diseases.

On the basis of these defective immunological and autoimmune responses, a huge increase in certain metabolic processes and cell division rates occurs. While in healthy skin, an average 0.4 % of the cells of the basal cell layer continuously undergo cell division, the skin of a psoriasis patient shows a division rate of 2.5 %.

In addition, the time of cell division substantially increases. If a cell of said layer normally needs 20 days to divide, this time is reduced to 1.5 days in psoriatic skin. Also, the transit time of the cell from the basal cell layer to the secretion of lamellar bodies in the horny layer is significantly lower. While it takes 28 days in healthy skin, the cells of psoriatic skin pass through the individual skin layers within 3 – 4 days.

In addition to these causal factors, there are other trigger factors that play a crucial role in the etiology of psoriasis. For example, the cross-reactive relationship between previous streptococcal infections and the severity of psoriasis has been proven. The same applies

to staphylococcal skin. Another verified fact is the negative influence of various drugs such as beta-blockers, interferon or lithium have on psoriasis.

Other trigger factors are stress, alcohol and strong mechanical stimuli (**Koebner phenomenon**).

## Histology

Histologically, psoriasis typically manifests **acanthosis**, **hyperkeratosis**, and **parakeratosis**. The epidermis is enlarged, and the epidermal endplates are thinned. In the dermis, lymphocytic infiltration can be found. The cells of the prickle cell layer (**stratum spinosum**) are markedly enlarged due to the general increase in metabolic processes. At the same time, the accelerated processes result in an incomplete differentiation of the individual squamous epithelial layers of the epidermis. Thick, silvery scaling is the result.

## Clinical Presentation

### Main Symptoms

In general, the clinical picture of psoriasis is highly variable. Most common sites showing skin lesions are elbows, scalp, knees, lumbosacral region, natal cleft, and glans penis. The individual **psoriatic foci** usually do not itch, but at the same time, there are predilection sites such as the head and anal region that do tend to itch.

The typical lesion presents as a sharply defined, usually roundish, erythematous plaque with silvery scaling. Typical predilection sites are the extensor surfaces of the elbows and knees, the hairy areas of the head, the navel and the sacral region.

However, psoriatic lesions can appear on any part of the integumentary system. The size of the lesions varies widely, ranging from dot-like inflammations to confluent, plate-sized, scaly surfaces.

Also typical of psoriatic lesions are the following three phenomena that are present in each psoriatic lesion and thus may be diagnostically indicative:

#### 1. Candle phenomenon

The thick, silver-gray scales scraped off of the inflamed skin resemble the scrapings of candle wax.

#### 2. Phenomenon of the last epidermal layer

Below the thick scales, a cohesive, sheet-like membrane can be found, which corresponds to the deepest layer of the **epidermis**.

#### 3. Auspitz's sign (bloody dew)

If the last layer is removed, punctuate bleeding spots are revealed.



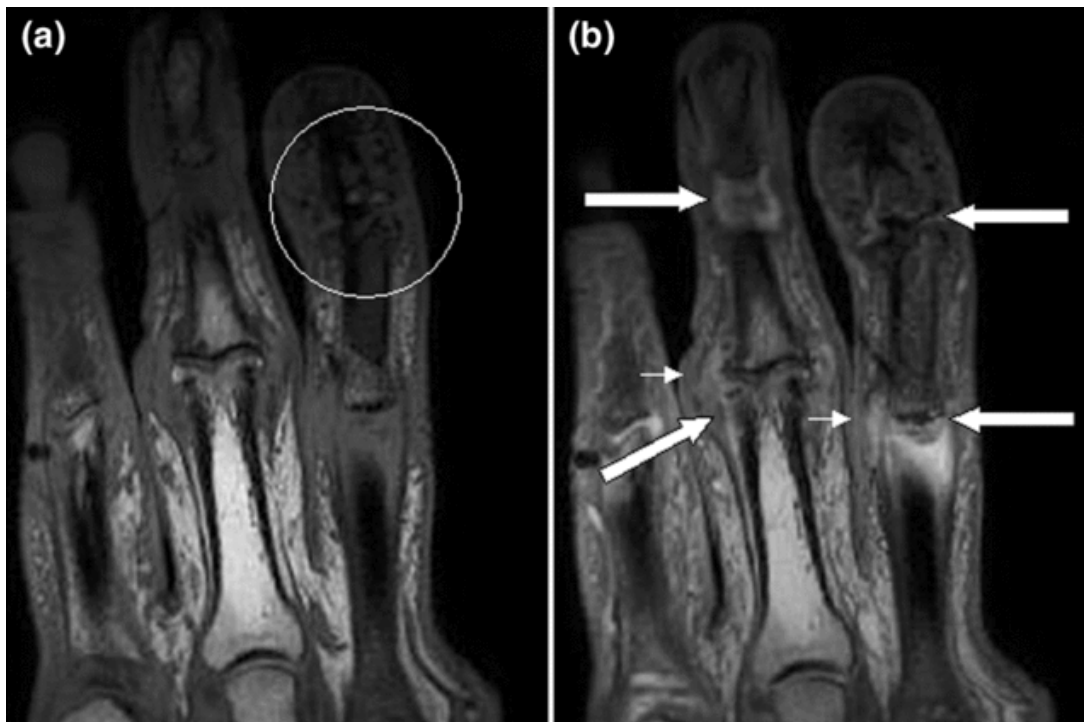
Picture: "Pitting of fingernails in psoriasis" by Goodbye. License: [CC BY-SA 3.0](https://creativecommons.org/licenses/by-sa/3.0/)

### Other symptoms

**Nails:** A rather common symptom (30 – 50 % of all cases) in psoriasis patients are changes on the nails. Typical signs are dotted or pitted nails, crumbling of the nails, a yellowish discoloration of the nail bed (oil drop) and distal onycholysis.

**Mucous membranes:** Less frequently than the nails, the mucous membranes are affected. Changes take the form of leukoplakia.

**Joints:** In some cases (about 5 – 8 %), immunological involvement of the joints (**arthritis psoriatica**) occurs. Through chronic inflammatory degenerations, the so-called **psoriatic arthritis** (or **psoriasis arthropathica**) develops. The central lesion in the joint is synovitis, which in turn causes cartilage destruction and bone erosion (Henz 1998, p. 178). Frequently affected are the large joints, but in the course of the inflammatory process, deviation of the fingers may occur as well.



**Picture:** "Magnetic resonance images of the fingers in psoriatic arthritis. Shown are T1-weighted (a) pre-contrast and (b) post-contrast coronal images. Enhancement of the synovial membrane at the third and fourth proximal interphalangeal (PIP) and distal interphalangeal (DIP) joints is seen, indicating active synovitis (inflammation of the synovial membrane; large arrows). There is joint space narrowing with bone proliferation at the third PIP joint and erosions are present at the fourth DIP joint (white circle). Extracapsular enhancement (small arrows) is seen medial to the third and fourth PIP joints, indicating probable enthesitis (inflammation of a tendon insertion)." By Fiona McQueen, Marissa Lassere and Mikkel Østergaard. License: [CC BY 2.0](https://creativecommons.org/licenses/by/2.0/)

### Pustular Psoriasis

Skin irritations are often caused by an infection or as a response to a drug. While this may not cause any further problems in an otherwise healthy person, it can result in the massive formation of pustules in a psoriasis patient. These pustules are primarily filled with neutrophilic granulocytes. The generalized form (**pustular psoriasis generalisata**) therefore leads to a greatly accelerated ESR and leukocytosis with a left shift.

## Diagnosis and Differential Diagnosis

There are no specific lab investigations for psoriasis. In the majority of cases, the clinical picture is enough for a safe diagnosis, a biopsy can be taken in uncertain cases. The histological picture corroborates the suspicion.

With regard to differential diagnosis, several investigations like :

- blood tests for rheumatoid factor
- ESR- it is normal in case of psoriasis except in pustular type where it is raised
- uric acid
- Fungal studies
- Dermatological biopsy
- Radiological studies of joints

### They are done to rule out other possibilities :

1. Scaly fungal infection or seborrheic dermatitis should be considered.
2. An acute exacerbation of neurodermatitis might also be confused with psoriasis.
3. Since psoriasis can affect joints in some cases, the differential diagnosis has to

take into account diseases of the rheumatic type.

## Therapy

The established treatment approaches only show a morbostatic effect, i.e., they are purely symptomatic. Except for rare cases of spontaneous healing, psoriasis turns out to be a protracted disorder that is difficult to treat.

### Local Therapy

- **Dithranol:** The most important drug for topical treatment is dithranol (anthralin). With proper dosage and correct exposure time, it results in a long-lasting remission of the lesions.
- **Vit D3:** Vitamin D analogs such as calcipotriol or tacalcitol are very effective in the treatment of psoriatic hyperproliferation.
- **Phototherapy:** UV light therapy in combination with oral medications that make the skin more photosensitive (PUVA therapy) is another option. Alternatively, a combination of UV light with irritating the skin with salt water can be considered (PUVA bath therapy).
- **Corticosteroids:** Treatments with corticosteroids should be cautious, short-term and only carried out in special cases (risks: rebound phenomenon, atrophy, the proliferation of vessels). Corticosteroids prove to be especially helpful in the treatment of unfavorably located, itchy places, such as the head and anal area.

### Systemic Therapy

- **Acitretin:** This is a retinoid and is usually used for pustular forms of psoriasis. Women of childbearing age and patients with liver damage are excluded from treatment with this medication.
- **Fumaric acid ester:** It is given in extensive cases of psoriasis vulgaris. Therapy should start with low dosages and increase slowly. Side effects occur mostly in the gastrointestinal area with symptoms such as nausea, vomiting, diarrhea. Due to the lymphocyte depression to be expected during this therapy, the medication has a significant immunosuppressive effect.
- **Cyclosporine:** This medication is used for all forms of psoriasis. Because renal functions might be diminished during this type of therapy, kidney function and blood pressure should be checked regularly (**drug monitoring**).

## Note

Psoriasis is based on defective immunological reactions (**autoimmune diseases**). Trigger factors include streptococcal infections, medications, stress, alcohol and mechanical stimuli.

The scaly, inflammatory lesions of psoriasis can be explained by an increased rate of mitosis of the basal layer (stratum basale), an accelerated cell division time and a reduced cell transit time.

### Typical of psoriatic lesions:

- Candle phenomenon
- The phenomenon of the last epidermal layer
- Auspitz's sign

### Major forms of psoriasis are:

- Plaque psoriasis (psoriasis vulgaris)
- Psoriatic arthritis (psoriasis arthropathica)
- Pustular psoriasis (psoriasis cum pustulatione)

Treatments are of local as well as systemic nature.

Psoriasis has two peak ages, first from 16 to 20 years, second from 57 to 60 years.

## Prognosis

Psoriasis has a tendency for remissions with phases of improvement. Symptoms get flared up mainly by stress and other infections.

## Dermatoses of the Pityriasis Group

Pityriasis stands for bran, which is why the term is used for the classification of dermatoses that are associated with scaling of the skin. The dermatoses of the pityriasis group include the **pityriasis rosea**, the **pityriasis lichenoides chronica** and the **pityriasis rubra pilaris**.

## Pityriasis Rosea

### Definition and Epidemiology

**Pityriasis rosea** is an acute inflammatory dermatosis with a time-limited progression. The usual onset age is between 10 and 40 years. It occurs most frequently in the autumn and winter months.

### Pathogenesis

Although the cause is not fully understood, it is now believed that the disease probably has infectious origins. It is probably a virus, but the pathogen has not yet been identified.

An allergic background is also discussed, in which mainly the allergy type IV (delayed type) is associated with pityriasis rosea.

### Histology

Histologically, edema in the **upper dermis** is typically present. Infiltrations of lymphocytes and a moderately widened epidermis are also apparent. The visibly noticeable scaling of the skin is histologically reflected in a parahyperkeratosis.

### Clinical Presentation

Typically, the pityriasis rosea starts with a single, sharply defined, oval plaque. This is also referred to as **primary plaque**, **primary medallion** or **herald patch**.

It is of a pale red color and has desquamation with marginal scales at its center. Main location is the torso.

So-called secondary outbreaks develop within the following two weeks. They exhibit the same clinical picture as the primary efflorescence lesions. However, they are smaller, making it possible for the clinician to diagnose the latter even weeks later. In general, the secondary outbreaks occur symmetrically on the torso and proximal extremities and usually extend into the main lines of the body. Head, neck and distal extremities are not

affected in the majority of the cases.

Flu-like symptoms may precede the skin manifestation but do not always occur. Itching is rarely a complaint. Cervically, it can sometimes lead to moderate lymphadenopathy.

After 4 – 6 weeks, pityriasis rosea usually dissipates.

### **Diagnosis and Differential Diagnosis**

Indicative for the diagnosis is the primary outbreak as well as the exanthematous distribution of secondary outbreaks (main voltage lines). A superficial **tinea corporis**, a macular syphilide, and an **exanthematous psoriasis guttata** should be considered as differential diagnoses.

### **Therapy**

Since the lesions regress on their own after at least six weeks, there is no need for treatment of pityriasis rosea. A rarely observed increased itching can be treated according to need with antihistamines such as cetirizine or Fenistil. A rehydrating therapy should be avoided as this worsens the disease.

## **Pityriasis Lichenoides Chronica**

### **Definition, Etiology and Epidemiology**

Pityriasis lichenoides chronica is a sub-acute to chronic inflammatory dermatosis for which **papular** or **squamous lesions** are characteristic. It occurs worldwide, most frequently in young adults. The etiology is unknown. An immune response due to infection and allergy is suspected.

### **Clinical Presentation**

Typical of the **pityriasis lichenoides chronica** is brownish-red papules and plaques that can reach the size of a penny and which flakes can be lifted off with a spatula. Accompanied by itching (often minor), complete healing occurs within weeks or months.

### **Diagnosis**

It is mainly the reddish-brown lesions, combined with the corresponding scaling, which is crucial to the diagnosis. Hardly any other symptoms are present. **Psoriasis**, **papulosis**, and **syphilis** should be considered as differential diagnoses.

### **Therapy**

**Pityriasis lichenoides chronica** usually heals itself after weeks or months. As an accompanying measure—or when complications arise—a carefully dosed UV-B phototherapy and corticosteroids may be used.

## **Pityriasis Rubra Pilaris**

### **Definition, Etiology and Epidemiology**

The **PRP** is one of the **papulosquamous dermatoses**. A typical peak age does not exist. Men and women are equally affected. The etiology is unknown. Two forms occur in adults, the **classic** and the **atypical PRP**.

### **Clinical Presentations**



The classic adult form (type I) is characterized by **follicular, erythematous, hyperkeratotic papules**. Common sites are the torso and extensor surfaces of the extremities. There may be extensive erythema with flaking, which can escalate up to erythroderma in scale. In its course, the **PRP** typically exhibits a cranio-caudal direction of development. Other symptoms include palmoplantar keratoses, thickened nails with distal splinter hemorrhages.

### Therapy

In 80 % of the cases, a spontaneous remission within 1 – 3 years is observed. Vitamin D3 analogs and retinoids are medications of choice.

## Reiter Dermatositis (Reiter's disease)

### Definition and Epidemiology

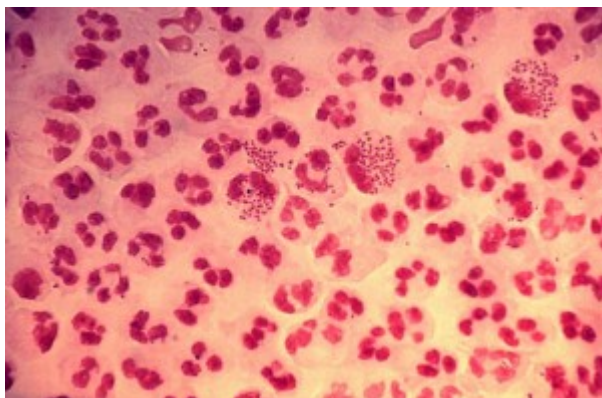
Reiter dermatosis is one of the main symptoms of **Reiter's disease**, which is characterized above all by the clinical triad urethritis, conjunctivitis, and arthritis. If dermatosis is also observed, this is called **Reiter's tetrad**.

**Balanitis circinata**, psoriasis-like lesions and **keratoderma blenorrhagicum** on the palms and soles characterize the cutaneous symptoms of this inflammatory, chronically relapsing disease.

### Pathogenesis

A genetic disposition (HLA-B27) is suspected. At the same time, an infectious and allergic background is assumed.

### Clinical Presentation and Diagnosis



Histopathology in an acute case of gonococcal urethritis using gram stain technique.

Main symptoms of **Reiter's disease** are:

- Urethritis (urogenital inflammation)
- Conjunctivitis (iritis)
- Arthritis (oligoarthritis)
- Reiter's dermatosis (balanitis, keratoderma)

Possible accompanying symptoms:

- Fever
- Systemic inflammatory signs
- Iliosacral arthritis
- Internal organ involvement (carditis, pleurisy, etc.)

### Symptoms of the skin

Dermatosis can be found in about 10 % of the cases of patients with **Reiter's disease**. The lesions are exudative. Since the exanthema may be pustular and confluent on the palms and soles of the feet, the so-called **keratoderma blenorrhagicum** develops. Since the hairy scalp and the nails may be affected as well, the lesions resemble those of psoriasis. Balanitis is found as both inflammatory and erosive efflorescence on the **glans penis**.

### Laboratory

If a diagnosis cannot be ensured with the mentioned **symptom triad**, various laboratory tests can be used as further indications:

- No rheumatoid factors, no antistreptolysin titer.
- Bacteriological serological indication of past infections; for example, of the bowel or the urogenital tract.
- Immunogenetically, frequently associated with HLA-B27.

## Therapy

Truly effective treatment of **Reiter's disease** does not exist. Locally, corticosteroids or vitamin D3 analogs can be used, if possible in combination with PUVA or PUVA bath therapy. Methotrexate has been proven to be rather effective. For severe pustular lesions, acitretin can be applied. Urethritis is treated with tetracyclines.

## Review Questions

The correct answers can be found below the references.

### 1. Which statement does not apply? The stratum germinativum of the skin...

- A. ...is well supplied with blood.
- B. ...allows regeneration.
- C. ...is a blastema.
- D. ...has a high mitotic index.
- E. ...shows differential cell division.

### 2. Which statement about the skin and subcutaneous tissue does not apply?

- A. The corium is composed of the papillary and reticular layer.
- B. In the tela subcutanea, strands of connective tissue divide the fat tissue.
- C. The horny layer of the epidermis is composed of cells with clearly visible nuclei.
- D. The basal layer of the epidermis contains pulp cells.
- E. The cells of the stratum spinosum of the epidermis contain tonofibrils (tonofilaments).

### 3. The basal layer of the skin...

1. ...is a blastema.
2. ...has a high mitotic index.

3. ...shows differential cell divisions.
  4. ...is callous.
  5. ...is well supplied with blood.
- A. Only 1, 2, and 3 are correct.
  - B. Only 1, 2, and 5 are correct.
  - C. Only 1, 3, and 5 are correct.
  - D. Only 2, 3, and 4 are correct.
  - E. Only 2, 4, and 5 are correct.

## References

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**Correct answers:** 1A, 2C, 3A

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Notes