Cutaneous infections that manifest in maculopapular rashes (2)

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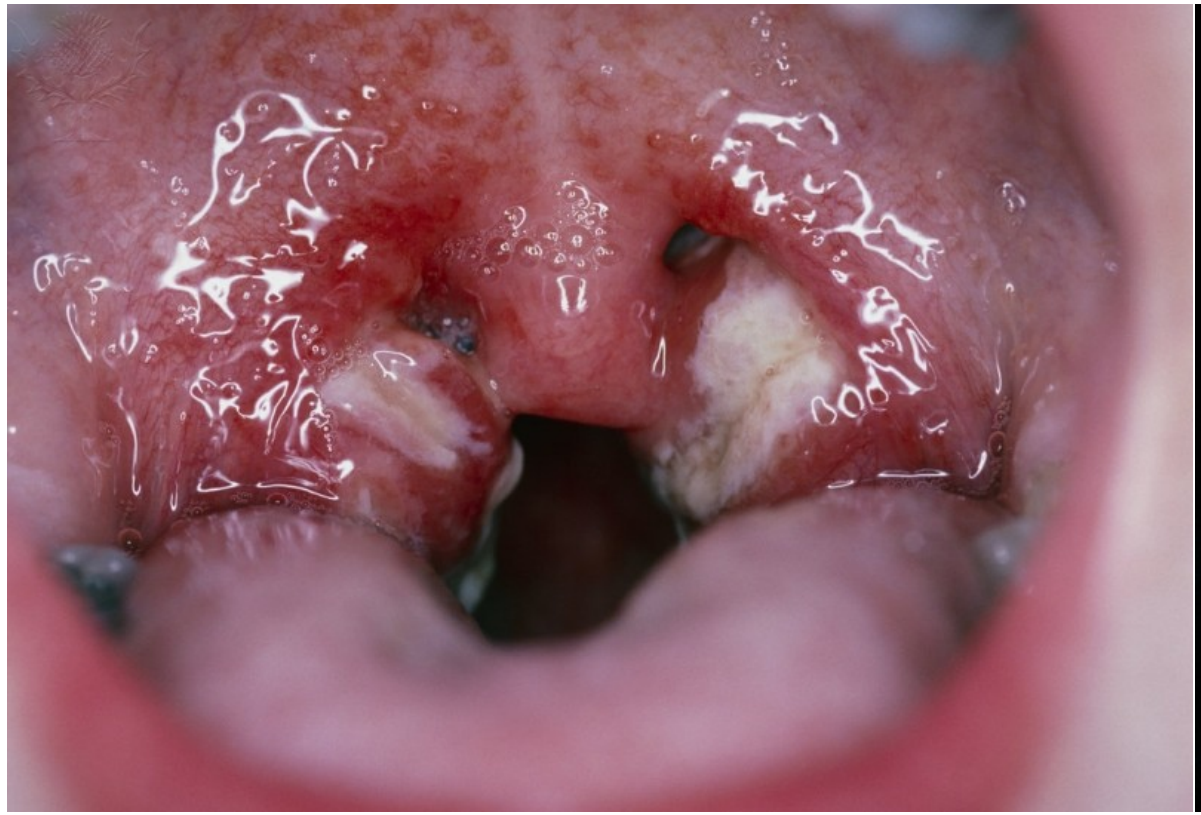
Infectious Mononucleosis

- Infectious mononucleosis can cause a rash in a certain subset of patients.
- Epstein-Barr virus (EBV) causes this disease.
- **Petechiae on the hard and soft palates can be seen in 25–60% of patients**.
- **A maculopapular rash is widely scattered, and erythematous, and occurs in 10–15% of patients**.
- The rash is more common in young children.

Infectious Mononucleosis



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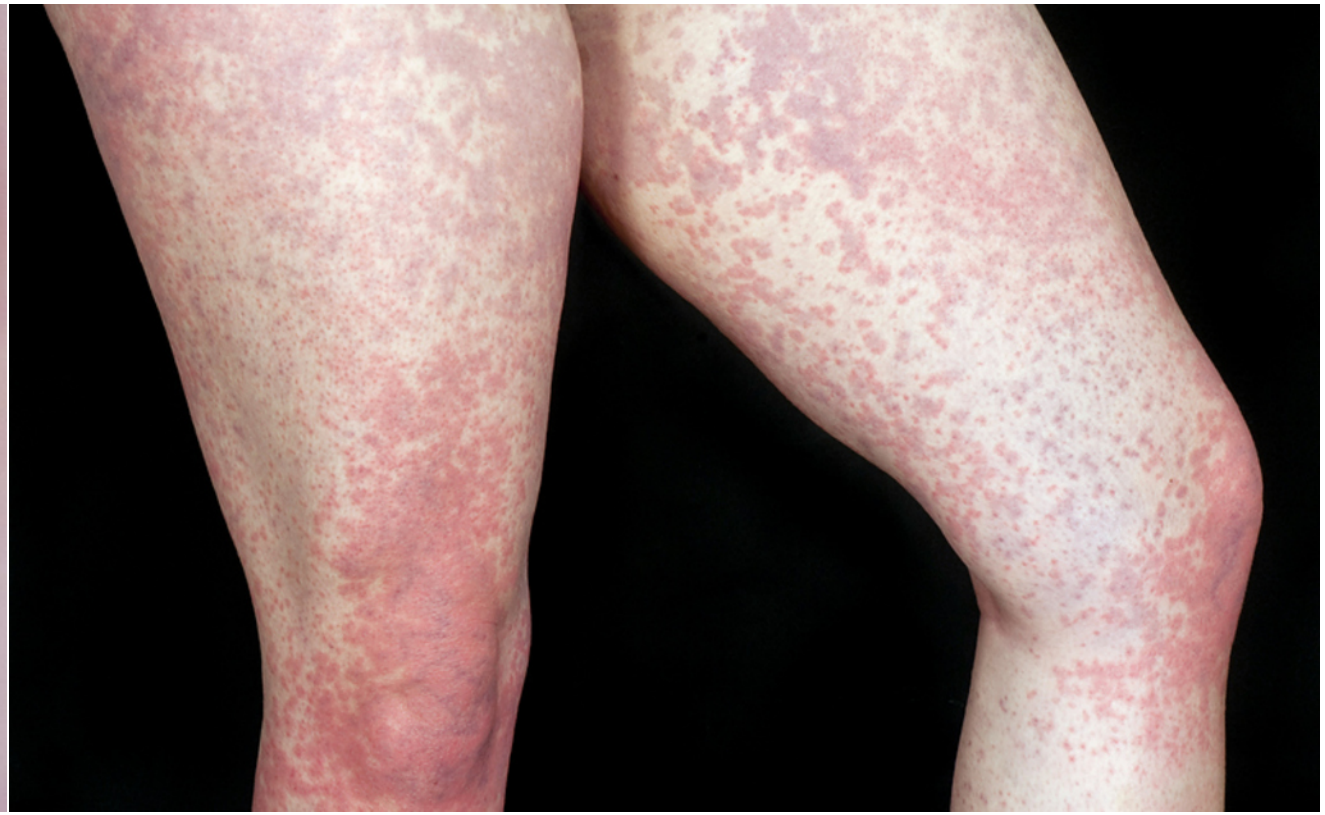

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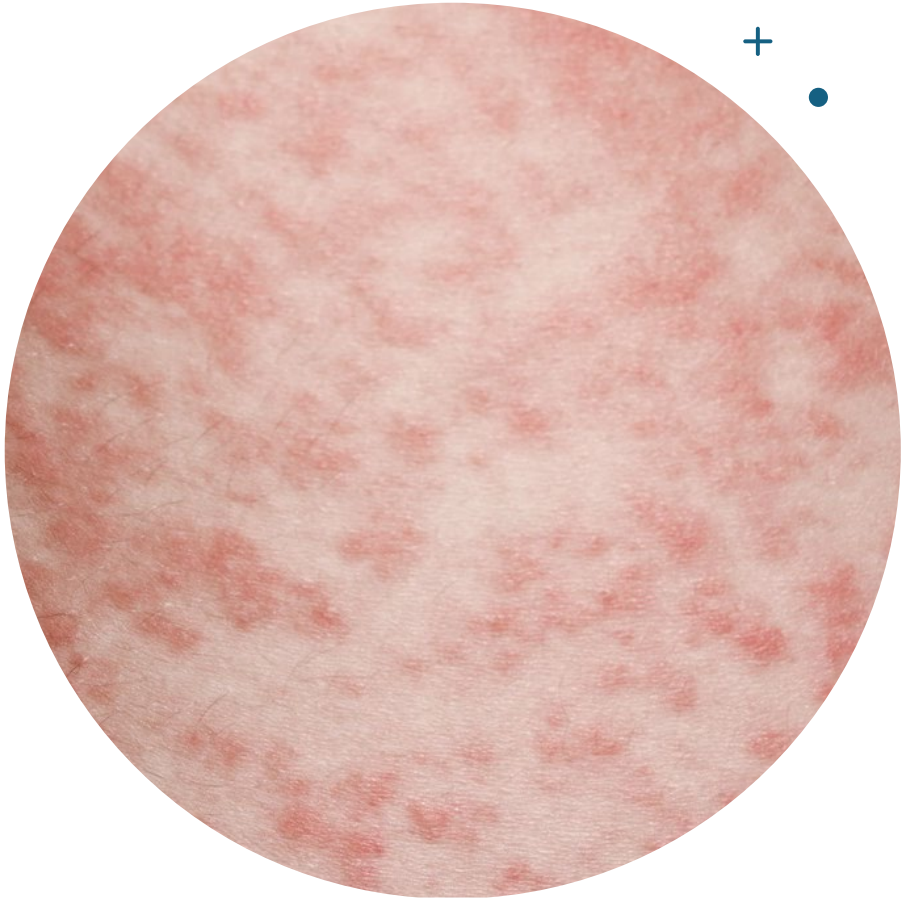
Infectious Mononucleosis

- Infectious mononucleosis can be misdiagnosed as a streptococcal pharyngitis, with subsequent treatment with amoxicillin or ampicillin.
- About 80% of patients with EBV mononucleosis treated with amoxicillin or ampicillin develop **a widely scattered maculopapular rash**.
- To avoid treating infectious mononucleosis with antimicrobial agent, *Streptococcus pyogenes* pharyngitis should be ruled out.



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Infectious Mononucleosis – Epidemiology

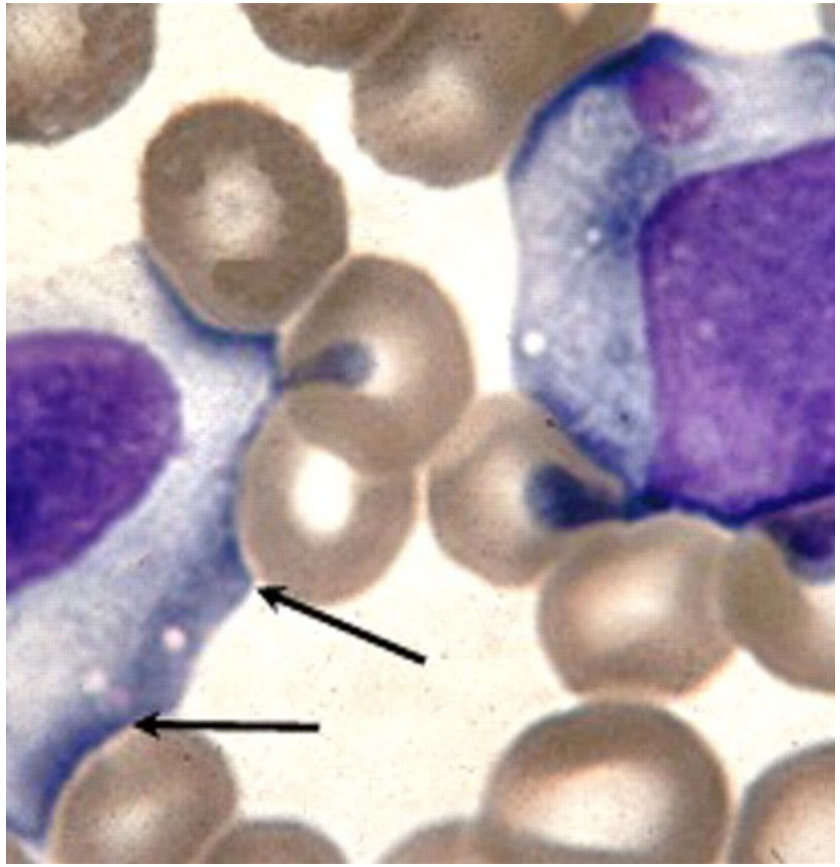
- EBV is found worldwide and is common.
- Most people are seropositive for EBV by age 25.
- EBV is transmitted via saliva, sexual contact, organ transplantation, or blood transfusions from infected or convalescent persons.

Infectious Mononucleosis – Pathogenesis

- EBV infects the B cells in the oropharyngeal epithelium, then the B cells spread the infection throughout the reticuloendothelial system.
- The virus is usually present in immune complexes responsible for the arthralgia and rash that occurs during the acute phase of the disease.

Infectious Mononucleosis – Diagnosis

- In CBC with differential, leukocytosis with lymphocytosis and **atypical lymphocytes**.
- Serologic findings for EBV includes positive heterophile antibody tests (Monospot and Paul-Bunnell tests) and EBV-specific serology (VCA IgM, EA IgG, EBNA IgG).



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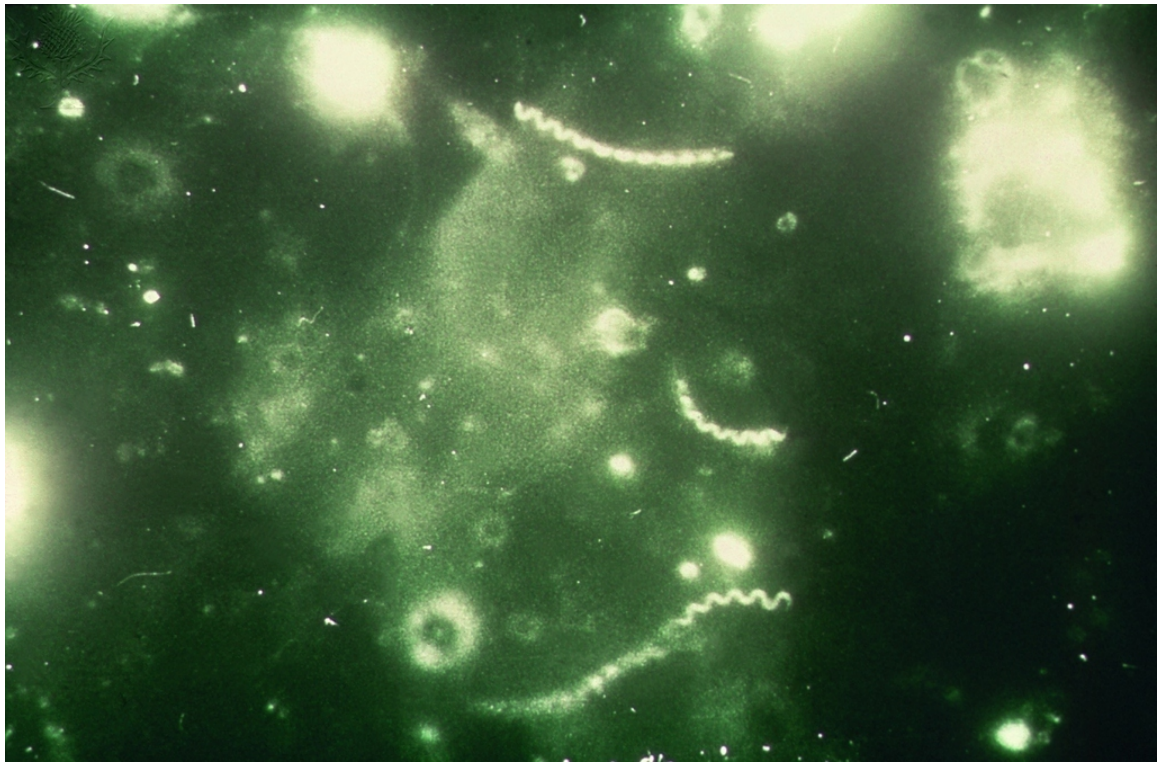
Secondary Syphilis

- Syphilis manifests in three stages: primary, secondary, and tertiary.
- The stage with the most prominent skin lesions is **secondary syphilis** with **many maculopapular lesions** that cover most of the body.
- Syphilis is caused by *Treponema pallidum*.
- *T. pallidum* is visualized through **darkfield microscopy**.



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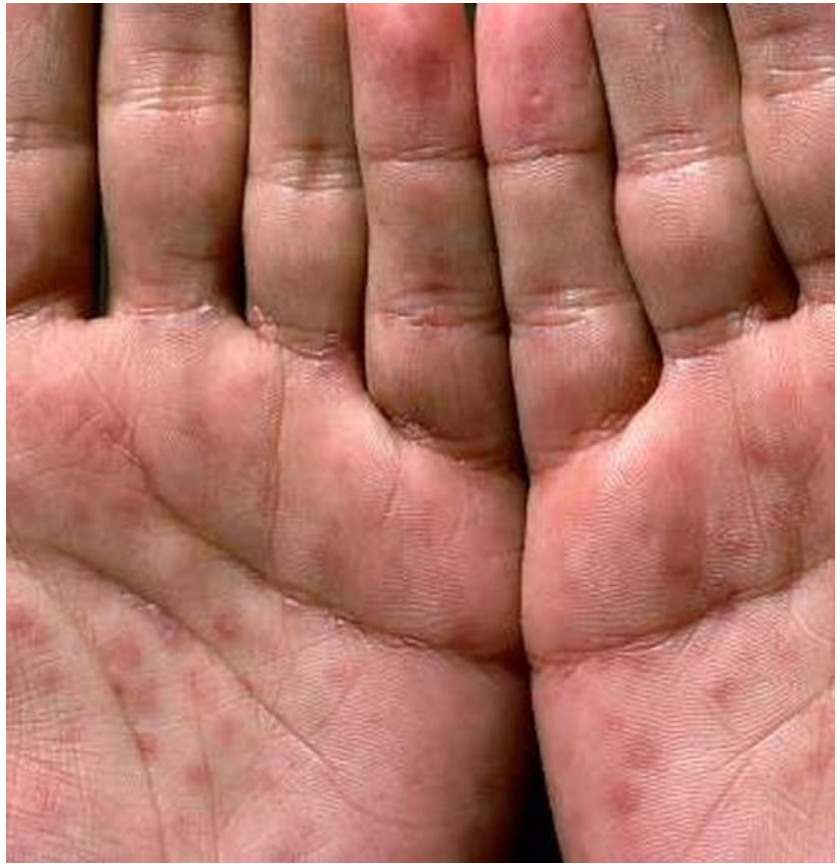
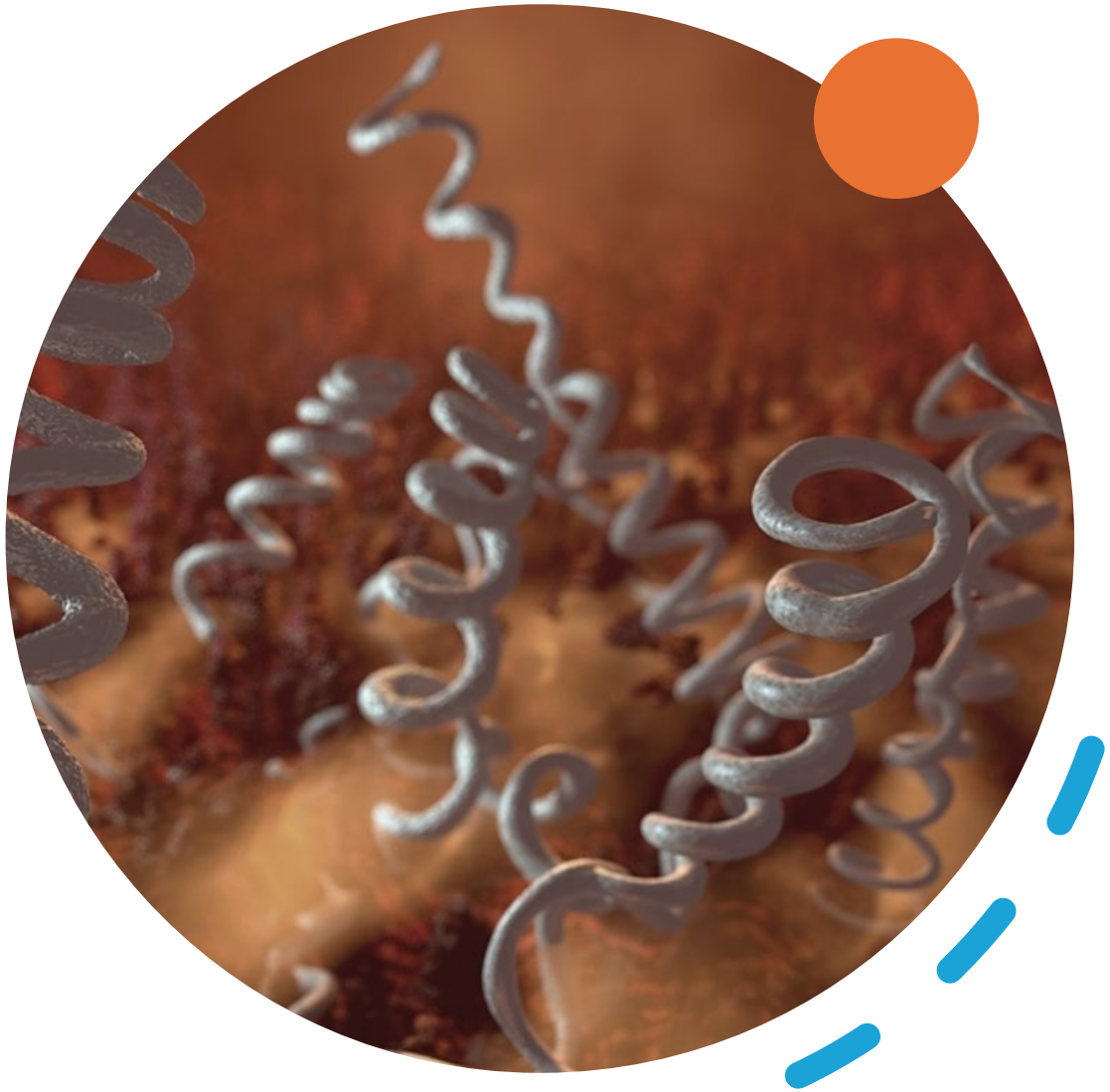
Secondary Syphilis – Clinical Manifestations

- In neonatal syphilis, the lesions can be vesicular, bullous, or maculopapular.
- Unlike the childhood exanthems and infectious mononucleosis, lesions in secondary syphilis can be seen **on the palms and soles**.
- The lesions regress without treatment, but relapses of the rash can occur in 20% of untreated patients.



Syphilis – Epidemiology/Pathogenesis

- An inflammatory reaction occurs causing a **hard chancre** (**raised edematous ulcer**). Histologic examination of the chancre demonstrates endarteritis and periarteritis and infiltration of the ulcer with macrophages and PMNs.



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Epidemiology/Pathogenesis

- Syphilis is an STI, with the highest incidence in sexually active men and women aged 20–45 years.
- Following contact with a break in the skin, *T pallidum* penetrates and enters the blood with spread to almost every organ, including **the skin**.
- The immune response causes the mucocutaneous lesions with maculopapular lesions on the skin.
- **All these lesions contain viable *T. pallidum* and are highly infectious.**

Secondary Syphilis Diagnosis

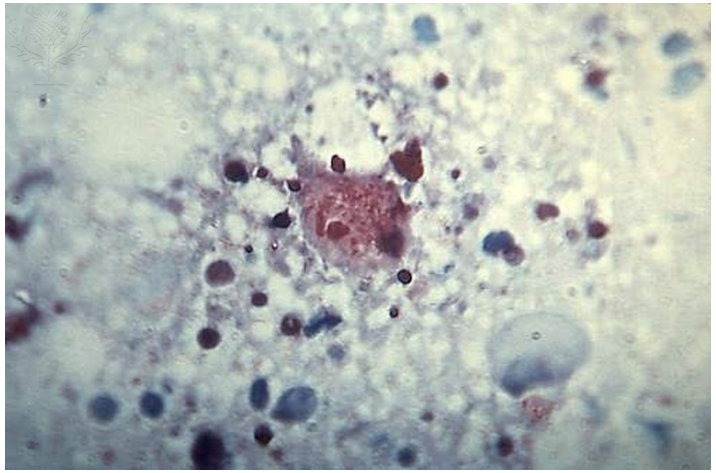
- The diagnosis of secondary syphilis involves a complete history, physical exam, serologic tests, and darkfield microscopy of fluids from lesions. Two different serologic tests are used: screening tests and confirmatory tests.
- The **screening test** is a non-treponemal test that detects the presence of antibodies reactive with cardiolipin. The non-treponemal serologic tests include the venereal diseases research laboratory (VDRL) and rapid plasma reagin (RPR) tests. False-positive results can occur; therefore, a confirmatory test is required following a positive result.
- **Confirmatory** or treponemal tests include the *T pallidum* immobilization (TPI), fluorescent treponemal antibody absorption (FTA-ABS), and micro-hemagglutination assay for *T pallidum* (MHA-TP).

Secondary Syphilis Treatment and Prevention

- **Benzathine penicillin** is the antibiotic of choice for treatment of primary and secondary syphilis.
- Preventive measures identifying and treating their sexual contacts and avoiding sexual contact with other syphilitic patients.

Rocky Mountain spotted fever (RMSF)

- Rocky Mountain spotted fever (RMSF) is **the most common rickettsial tick-borne infection in the United States**.
- RMSF is caused by *Rickettsia rickettsii* which is an obligate intracellular bacterium transmitted via a **tick bite**.



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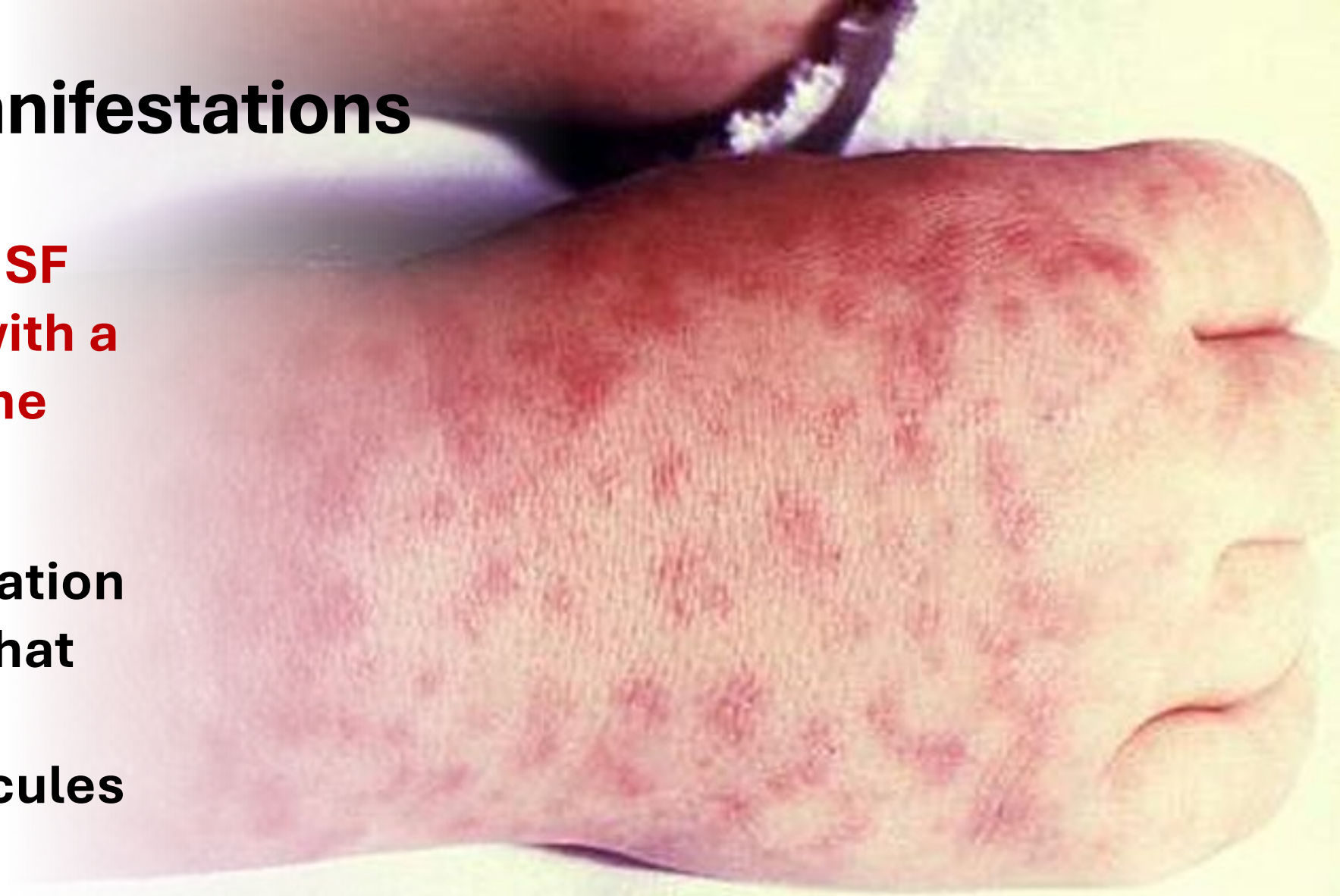
RMSF – Skin Manifestations

- **The majority of RMSF patients present with a rash 3 days after the bite.**
- **A unique manifestation of this disease is that the rash begins as erythematous macules on the wrists and ankles.**



Toxic shock syndrome (TSS)

- Toxic shock syndrome (TSS) is an uncommon but severe systemic life-threatening disease that follows exposure to a bacterial superantigen produced by certain strains of *S. aureus* and *S. pyogenes*.
- **The most common cause of TSS is *S. pyogenes* strains producing either superantigen SPE A or C**.
- *S. aureus* also causes TSS. Staphylococcal TSS can occur during menstruation or following a localized staphylococcal infection (non-menstrual TSS). Staphylococcal TSS is caused by the superantigen exotoxin TSS toxin-1 (TSST-1) or enterotoxins.

Toxic shock syndrome – Clinical Manifestations

- Streptococcal TSS is defined as any group A streptococcal infection associated with the early onset of shock and organ failure. **A diffuse scarlatina-like erythema is seen in only about 10% of patients with streptococcal TSS.**
- Staphylococcal TSS is an acute-onset illness characterized by fever, hypotension, and **rash** and can lead to multi-organ failure and shock. **The rash appears later in the disease and has a sunburn-like appearance**. Desquamation frequently is seen in patients who survive. The desquamation is especially prominent on the palms and soles.

Toxic shock syndrome – Epidemiology

- People of any age can be affected, and many do not have any predisposing conditions. In some cases, viral infections such as chickenpox and influenza have provided a portal for infection.
- The mortality rate of streptococcal TSS is 30–70%. Streptococcal TSS occurs after an invasive infection (e.g., bacteremia, pneumonia).
- Infection begins at a site of minor local trauma. Many cases have developed within 24–72 hours of minor non-penetrating trauma.

Toxic shock syndrome – Epidemiology

- Non-menstrual staphylococcal TSS commonly follows superinfection of an upper respiratory tract after viral infection. Other staphylococcal infections can cause non-menstrual TSS (e.g., infected surgical wounds, abscesses, infected burns, and deep and superficial soft tissue infections).
- Menstrual staphylococcal TSS is defined as occurring during menstruation or within the 2 days preceding its onset or the 2 days following its cessation. This form of TSS is associated with tampon use.
- The mortality rate is about 5% for both menstrual and non-menstrual TSS.

Toxic shock syndrome – Diagnosis

- Streptococcal TSS can be difficult to diagnose
- A set of clinical and laboratory criteria can aid in determining the diagnosis.
- Because of the difficulty in diagnosing TSS, the Centers for Disease Control and Prevention has developed a case definition of characteristic clinical criteria (Criteria for toxic shock syndrome and STSS).

Toxic shock syndrome – Treatment and Prevention

- Treatment includes aggressive fluid replacement and IV treatment with antibiotics (e.g., oxacillin or nafcillin).
- In non-menstrual TSS, removing the localized staphylococcal infection is essential.
- Treatment of streptococcal TSS includes identification of the site of infection and surgical debridement, aggressive fluid replacement, and intravenous antibiotics.
- Frequent handwashing and measures to prevent spread of these superantigen-producing bacteria can be helpful.

Thanks for listening!