

# Difference Between Scarlet Fever and Rheumatic Fever

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## Key Difference - Scarlet Fever vs Rheumatic Fever

[Streptococci](#) are a group of gram-positive [bacteria](#) that cause many [infectious diseases](#) in humans. Scarlet fever and rheumatic fever are two disorders that were once extremely common conditions caused either directly or indirectly by the streptococcal infections. Scarlet fever occurs when an infectious agent produces erythrogenic toxins in a person who does not possess neutralizing antitoxin [antibodies](#). Rheumatic fever is an [inflammatory disease](#) caused by the infection of group A streptococci which commonly affects children and young adults. There is a multisystem involvement with clinically significant changes taking place in the CNS, joints, and heart. **Although rheumatic fever has a systemic impact, scarlet fever usually has more localized effects and clinical effects.** This is the **key difference** between scarlet fever and rheumatic fever.

## What is Scarlet Fever?

Scarlet fever occurs when an infectious agent produces erythrogenic toxins in a person who does not possess neutralizing antitoxin antibodies. Group A streptococci are the most common [pathogens](#) that cause scarlet fever. Usually, this occurs as episodic infections but occasionally there can be [epidemics](#) in residential places such as schools.

## Clinical Features

This frequently affects children usually 2-3 days after a pharyngeal streptococcal infection.

- Fever
- Chills and rigors
- A headache
- Vomiting
- Regional lymphadenopathy
- A rash that blanches on pressure appears on the second day of infection. It is generalized except in the face, palms, and After about five days, the rash disappears with subsequent desquamation of the skin.
- Face is flushed
- The tongue has a characteristic strawberry tongue appearance initially with a white coating which later disappears leaving a raw looking, bright red “raspberry tongue”.
- Scarlet fever can be complicated otitis media, peritonsillar and retropharyngeal abscesses.

## Diagnosis

Diagnosis is principally based on clinical features and is supported by culturing of throat swabs.



**Figure 01: Strawberry Tongue in Scarlet Fever**

## **Management**

Phenoxymethyl penicillin or parenteral benzylpenicillin are the antibiotics prescribed to counter the ongoing infection.

## **What is Rheumatic Fever?**

Rheumatic fever is an inflammatory disease caused by the infection of group A streptococci that commonly affects children and young adults. There is a multisystem involvement with clinically significant changes taking place in the CNS, joints, and heart.

Initially, there is a pharyngeal infection by group A streptococci and the presence of their antigens triggers an [autoimmune reaction](#) that gives rise to the set of clinical features which we identify as rheumatic fever. The bacterium directly infects none of the affected organs.

Modified Jones criteria for the diagnosis of rheumatic fever

## Evidence of antecedent Streptococcal Infection

### Major Criteria

- Carditis
- Polyarthritis
- Chorea
- Erythema marginatum
- Subcutaneous nodules

### Minor Criteria

- Fever
- [Arthritis](#)
- Previous history of rheumatic fever
- Raised ESR level
- [Leukocytosis](#)
- Prolonged PR interval on ECG

### Clinical Features

- Sudden occurrence of fever, joint pain, and malaise
- Appearance of heart murmurs
- Development of [pericardial effusion](#) and cardiomegaly
- Migratory polyarthritis affecting large joints such as knees, elbows, and ankles
- Chorea with speech disturbances
- Transient pink rash with slightly raised edges
- Occasionally there can be subcutaneous nodules which feel like hard bumps just underneath the skin

### Investigations

- Culturing of throat swabs
- Measurement of antistreptolysin O level that is elevated in rheumatic fever
- Measurement of ESR and CRP levels that are also increased
- Cardiac changes associated with carditis can be identified using ECG and echocardiogram

### Management

- The residual streptococcal infection has to be treated with oral phenoxymethyl penicillin. This antibiotic should be given even when the culture results do not confirm the presence of group A streptococci.
- Arthritis can be treated with NSAIDS
- Any streptococcal infection that develops in the future should be treated

## What are the Similarities Between Scarlet Fever and Rheumatic Fever?

- Streptococci can cause both disease conditions.
- In both scarlet fever and rheumatic fever, the clinical manifestations appear few days after a preceding streptococcal pharyngeal infection.
- Both diseases commonly affect children

## What is the Difference Between Scarlet Fever and Rheumatic Fever?

| Scarlet Fever vs Rheumatic Fever  |   |
|---|---|
| Scarlet fever occurs when an infectious agent produces erythrogenic toxins in a person who does not possess neutralizing antitoxin antibodies. Group A streptococci are the most common pathogens that cause scarlet fever. | Rheumatic fever is an inflammatory disease caused by the infection of group A streptococci which commonly affects children and young adults. There is a multisystem involvement with clinically significant changes taking place in the CNS, joints, and heart.   |
| Diagnosis   |   |
| Diagnosis of scarlet fever is principally based on clinical features and is supported by culturing of throat swabs.   | <p>Investigations done for the diagnosis of rheumatic fever are,</p> <ul style="list-style-type: none"> <li>• Culturing of throat swabs</li> <li>• Measurement of antistreptolysin O level which is elevated in rheumatic fever</li> <li>• Measurement of ESR and CRP levels which are also increased</li> <li>• Cardiac changes associated with carditis can be identified using ECG and echocardiogram</li> </ul> |
| Treatment   |   |
| Phenoxymethylpenicillin or parenteral benzylpenicillin are the antibiotics prescribed to counter the ongoing infection.   | <ul style="list-style-type: none"> <li>• The residual streptococcal infection has to be treated with oral phenoxymethylpenicillin. This antibiotic should be given even when the culture results do not confirm the presence of group A streptococci.</li> <li>• Arthritis can be treated with NSAIDS</li> <li>• Any streptococcal infection that</li> </ul>  |

|  | develops in the future should be treated immediately.  |
|--|--|
| Clinical Features  |  |
| <p>Following clinical features can be seen in scarlet fever,</p> <ul style="list-style-type: none"> <li>· Fever</li> <li>· Chills and rigors</li> <li>· Headache</li> <li>· Vomiting</li> <li>· Regional lymphadenopathy</li> <li>· A rash that blanches on pressure appears on the second day of infection. It is generalized except in the face, palms, and soles. After about five days, the rash disappears with subsequent desquamation of the skin.</li> <li>· Face is flushed</li> <li>· The tongue has a characteristic strawberry tongue appearance initially with a white coating which later disappears leaving a raw looking, bright red “raspberry tongue”.</li> <li>· Scarlet fever can be complicated otitis media, peritonsillar and retropharyngeal abscesses.</li> </ul> | <p>Clinical features of rheumatic fever are,</p> <ul style="list-style-type: none"> <li>· Sudden occurrence of fever, joint pain, and malaise</li> <li>· Appearance of heart murmurs</li> <li>· Development of pericardial effusion and cardiomegaly</li> <li>· Migratory polyarthritis affecting large joints such as knees, elbows, and ankles</li> <li>· Chorea with speech disturbances</li> <li>· Transient pink rash with slightly raised edges</li> <li>· Occasionally there can be subcutaneous nodules which feel like hard bumps just underneath the skin</li> </ul> |
| Symptoms   |  |
| Usually, there are no systemic manifestations  | There are multi-system manifestations  |

## Summary - Scarlet Fever vs Rheumatic Fever

Scarlet fever occurs when an infectious agent produces erythrogenic toxins in a person who does not possess neutralizing antitoxin antibodies. Group A streptococci are the most common pathogens that cause scarlet fever. On the other hand, rheumatic fever is

an inflammatory disease caused by the infection of group A streptococci that commonly affects children and young adults. There is a multisystem involvement with clinically significant changes taking place in the CNS, joints, and heart. Unlike rheumatic fever scarlet fever does not have any systemic effects. This is the difference between scarlet fever and rheumatic fever.

**Reference:**

1.Kumar, Parveen J., and Michael L. Clark. Kumar & Clark clinical medicine. Edinburgh: W.B. Saunders, 2009.

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