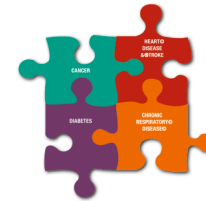
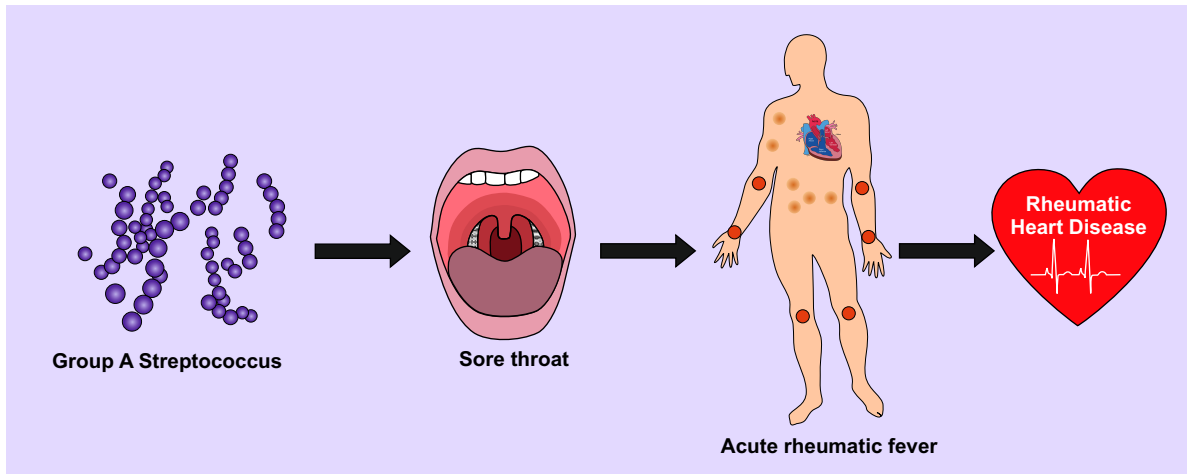


Strep sore throat and rheumatic heart disease (RHD)

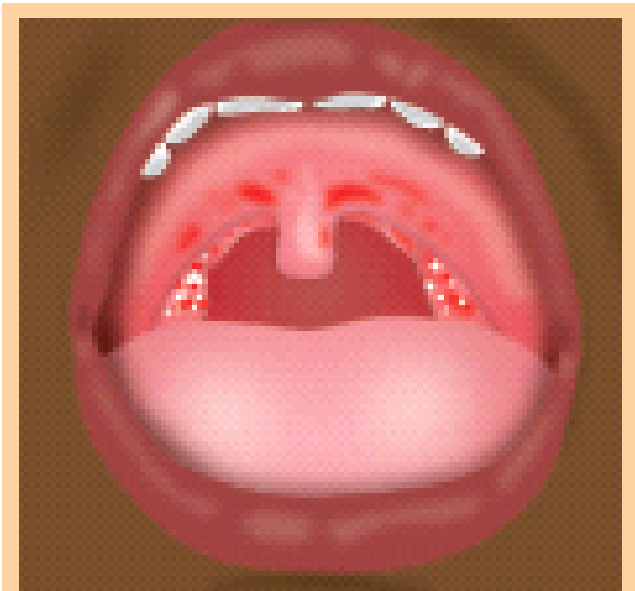


Developed by

WHO Collaborating Centre for Capacity Building and Research in Community-based Noncommunicable Disease Prevention and Control

Centre for Community Medicine, All India Institute of Medical Sciences (AIIMS), New Delhi, India

Strep sore throat



Sore throat

Prominent symptoms



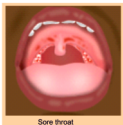
Red, swollen, inflamed joints, Pink or red skin rash

Strep sore throat

- It is a sickness caused by a germ called 'Streptococcus' generally known as "STREP"
- It is one of the common causes of sore throats and skin sores in children between 5-14 years of age.
- In some children throat and skin sores can cause sickness in other parts of the body - joints, heart, skin and brain

What is Acute Rheumatic Fever

- It is a sickness caused by a germ called 'Streptococcus' generally known as "STREP"
- It is one of the common causes of sore throats and skin sores in children between 5-14 years of age.
- In some children throat and skin sores can cause sickness in other parts of the body - joints, heart, skin and brain



Sore throat



Rheumatic fever symptoms

Red, swollen, inflamed joints, Pink or red skin rash

FOR PATIENTS

FOR HEALTH CARE PROVIDER

From sore throat to heart disease



What causes rheumatic heart disease?

- Rheumatic heart disease is caused by rheumatic fever, an inflammatory disease. that can affect many tissues, especially in the heart, joints, skin, or brain. Group A streptococcal infections of the throat, if not inadequately treated, can lead to acute rheumatic fever which can cause rheumatic heart disease (RHD) and acute glomerulonephritis.
- Rheumatic heart disease almost always affects left-sided heart valves. The most common manifestation in the early stages is regurgitation of a left-sided (mitral) valve, which allows blood to leak back from the lower chamber (ventricle) to the upper chamber (atrium).



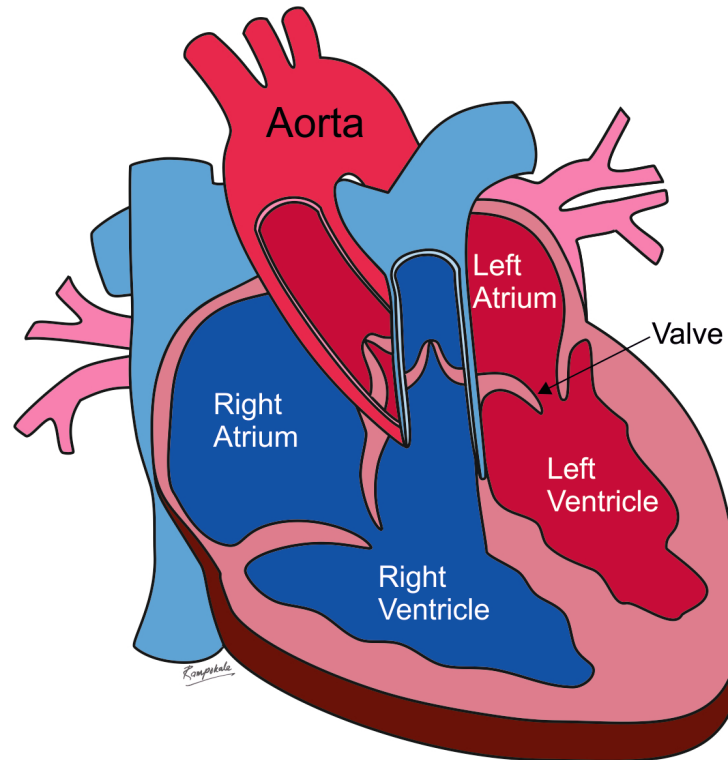
What causes Rheumatic heart disease?



FOR PATIENTS

FOR HEALTH CARE PROVIDER

How does our heart function?



Heart valves all work to keep the blood flowing forward. They open up to let the blood move ahead, then they close quickly to keep the blood from flowing backward.

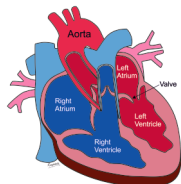
How does our heart function?

A normal heart has four chambers, two atria and two ventricles

- Right part of heart has deoxygenated blood and left part has oxygenated blood so there is complete separation of oxygenated and deoxygenated blood in human's body.
- Right atrium is separated from the right ventricle by **tricuspid** valve, while left atrium is separated by left ventricle by bicuspid valve or also known as **mitral** valve



How does our heart function?



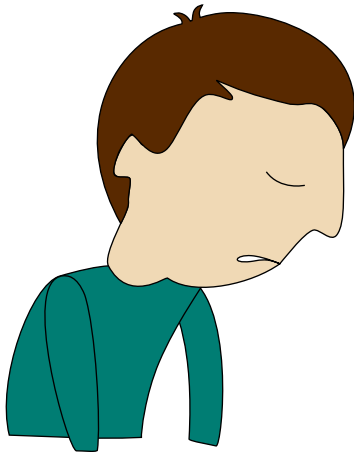
Heart valves all work to keep the blood flowing forward. They open up to let the blood move ahead, then they close quickly to keep the blood from flowing backward.

FOR PATIENTS

FOR HEALTH CARE PROVIDER

A patient with damaged heart valves may suffer from

- Breathlessness with exertion or when lying down flat
- Waking at night feeling breathless
- Cough, Chest pain
- Palpitation
- Tiredness
- Leg swelling



Tiredness



Chest Pain



Knee pain

What are the signs and symptoms of RHD?

Symptoms

- Breathlessness upon exertion, orthopnoea or breathing problems when lying down
- Syncope or fainting and edema or swelling of the body
- Paroxysmal nocturnal dyspnea or need to wake up from sleep for sitting or walking, with the hope of comfort
- Damaged heart valves leading to stroke.

Signs

- Precordial pulsations
- Heart murmurs, both systolic and diastolic
- Diastolic murmur of mitral stenosis exaggerated by activity

Stagnation of blood in enlarged chambers can result in clot formation, which can then break off and obstruct blood flow to different parts of the body, resulting for example, in a stroke. Very often, the diagnosis is made late in the course of the disease, through complications such as these or signs of heart failure.

What are the signs and symptoms of Rheumatic Heart Disease?

- Palpitation
- Breathlessness with exertion or when lying down flat
- Waking at night feeling breathless
- Tiredness
- Cough, Chest pain
- Leg swelling



Tiredness



Chest Pain



Knee pain

FOR PARENTS

Source:

Prevention of Acute Rheumatic Fever and Rheumatic Heart Disease. Mariana Mirabel, Kumar Narayanan, Xavier Jouven and Eloi Marijon. Circulation. 2014;130:e35-e37, originally published July 28, 2014. <http://circ.ahajournals.org/content/130/5/e35.full>

FOR HEALTH CARE PROVIDER

Pregnant woman with damaged heart valves (RHD)

A pregnant woman with RHD is at high risk for complications during her pregnancy

RHD causes stress on the heart can lead to **breathlessness and excessive fatigue** and even heart failure

Babies of RHD mothers are also at risk



FOR PATIENTS

Why does RHD get worse in pregnancy?

- There is a 30-50% increased cardiac workload in normal pregnancy, therefore '**hyperdynamic circulation**'; major extra cardiac work needed
- Diagnosis may not occur until the time of pregnancy. The added stress on the heart can result in symptomatic RHD where previously there were no symptoms.
- During labour - further major increase in cardiac work
- If heart capacity is reduced due to RHD, then breathlessness and heart failure can occur
- If she's **receiving anticoagulation therapy** during pregnancy, careful assessment is required.

Signs and symptoms

- dyspnea and fatigue
- cough
- diastolic murmur
- signs of heart failure indicates severe disease
- irregular rhythm suggests atrial fibrillation.

RHD in pregnancy

A pregnant woman with RHD is at high risk for complications during her pregnancy
RHD causes stress on the heart can lead to **breathlessness and excessive fatigue**
and even heart failure

Babies of RHD mothers are also at risk
Complications during pregnancy
and labour caused by damage to the
heart valves, or the anticoagulation medication
that may be required by the mother

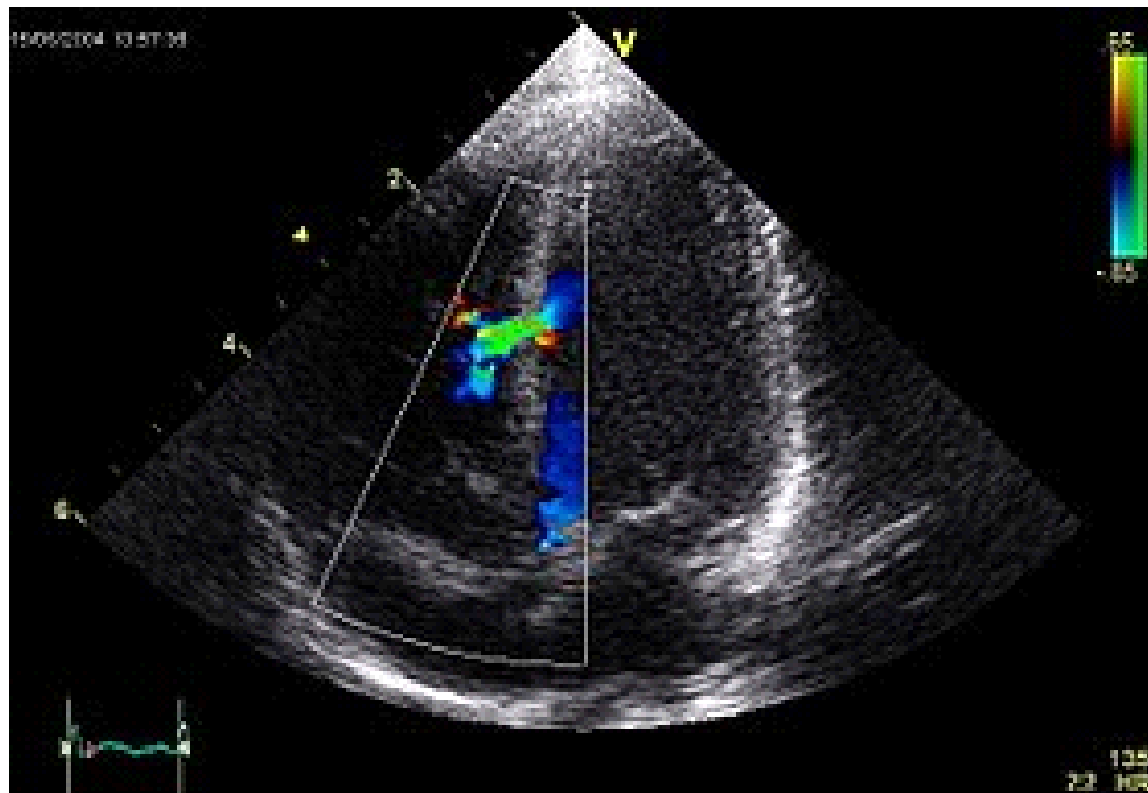


FOR PATIENTS

FOR HEALTH CARE PROVIDER

Diagnosing damaged heart valves

By echocardiography (ultrasound of the heart)




FOR PATIENTS

How is RHD diagnosed?

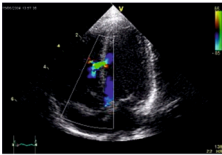
Echocardiography is the primary diagnostic tool for patients with suspected and confirmed RHD as it delineates the distribution and severity of valvular involvement and excludes alternate pathology. Left-sided cardiac involvement is most commonly seen; it involves the mitral valve almost 100% of the time and involves the aortic valve in 20–30% of cases.

Listening to the heart with the stethoscope is not accurate



How is RHD diagnosed?

RHD is diagnosed by echocardiography (ultrasound of the heart)



Listening to the heart with the stethoscope is not accurate

FOR PATIENTS

FOR HEALTH CARE PROVIDER

Prevent strep sore throat = prevent heart valve damage



Improved living conditions

Healthy housing

Good hygiene



How can RF/RHD be prevented?

Preventive measures can be categorized as under:

- Prevention of risk factors such as poor living conditions, overcrowding, etc. (termed as primordial prevention).
- Improved living conditions reduce likelihood of epidemics of streptococcal infections.
- Detection of streptococcal pharyngitis among children followed by adequate treatment with appropriate antibiotics (termed as primary prevention).

How can RF/RHD be prevented?



RF/RHD can be prevented by Improved living conditions

Healthy housing

Good hygiene

FOR PATIENTS

FOR HEALTH CARE PROVIDER

Prevent future attacks of strep sore throat



- Timely diagnosis
- Use of penicillin

Benzathine benzyl penicillin, single injection once in three weeks till the age of 21 years



FOR PATIENTS

How can you prevent future attacks of RF/RHD

- Secondary Prophylaxis is a more suitable option for preventing RHD
- A single injection of intramuscular benzathine benzylpenicillin (BPG), a long-acting repository form of the antibiotic, is the most effective treatment in eradicating group A streptococci, probably due to its long duration of action.

Benzathine benzyl penicillin, single injection once in three weeks till the age of 25 years

- For each injection of BPG, a test dose of 0.1 cc is given intradermal first and the patient is made to wait for half an hour.

Mode of administration	Penicillin
Intramuscular	Benzathine benzyl penicillin, single injection once in three weeks ^a <ul style="list-style-type: none"> ○ for children <30 kg: 600 000 units ○ for children ≥30 kg and adults: 1 200 00 units
Oral	Phenoxy methyl penicillin 250 mg twice daily

How can you prevent future attacks of RF/RHD



Timely diagnosis of an initial Rheumatic fever episode and subsequent use of penicillin is the best method of preventing RHD.

Benzathine benzyl penicillin, single injection once in three weeks till the age of 21 years

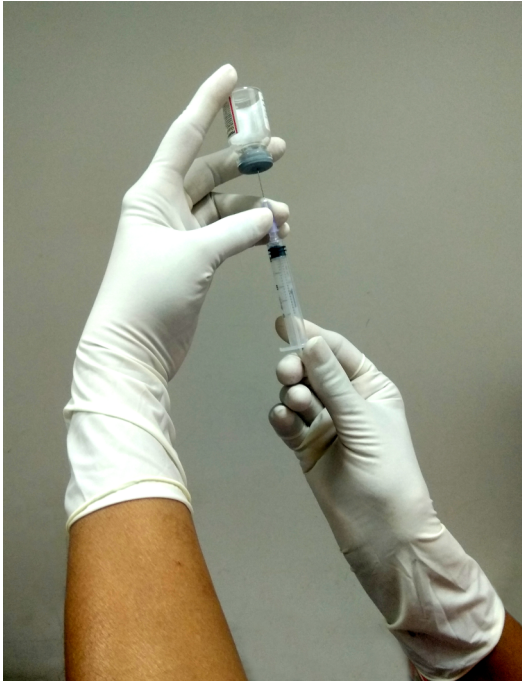


FOR PATIENTS

Source : WHO Technical Series Report on rheumatic fever and rheumatic heart disease. Geneva: WHO, 2004 <https://www.abc.net.au/news/2017-05-20/east-timor-penicillin-program-stopping-preventable-deaths/8526828>.

FOR HEALTH CARE PROVIDER

How long will penicillin injections be necessary?



A child will need to have injections every 21 days for at **least 10 years**, or until they are **25 years old**, whichever is longer.

In some cases, particularly if a child has heart valve damage, they may need to continue penicillin injections for longer.

How long will penicillin injections be necessary?

A child will need to have injections every 21 days for at **least 10 years**, or until they are **25 years old**, whichever is longer.

In some cases, particularly if a child has heart valve damage, they may need to continue penicillin injections for longer.

If a patient does not receive the monthly treatment he/ she will have more episodes of acute rheumatic fever and go on to develop more severe RHD and end up with heart failure and possibly even death

How long will penicillin injections be necessary?



A child will need to have injections every 21 days for at **least 10 years**, or until they are **25 years old**, whichever is longer.

In some cases, particularly if a child has heart valve damage, they may need to continue penicillin injections for longer.

Source :

WHO Technical Series Report on rheumatic fever and rheumatic heart disease. Geneva: WHO, 2004 <https://www.abc.net.au/news/2017-05-20/east-timor-penicillin-program-stopping-preventable-deaths/8526828>.

FOR PATIENTS

FOR HEALTH CARE PROVIDER

Does strep sore throat always lead to damaged heart valves?



No, damage is more likely if

- Heart is affected
- If infection occurs at young age and occurs repeatedly
- However it is difficult to predict accurately who will develop damaged heart valves, therefore prevention with penicillin is a must

Does Acute rheumatic fever always lead to RHD?

No, RHD is more likely if

- Heart is affected in ARF
- ARF occurs at young age
- Symptoms of RF, and specifically inflammation, if persistent for weeks, months, or longer, causing long-term problems may lead to RHD
- Repeated occurrences of RF and a significantly higher risk of heart damage, which can become permanent.
- However one cannot predict accurately who will develop RHD, therefore secondary prophylaxis with long term penicillin is must

Does Acute rheumatic fever always lead to RHD?



- No, RHD is more likely if
- Heart is affected in rheumatic fever
 - If RF occurs at young age
 - If RF occurs repeatedly
 - However you cannot predict accurately who will develop RHD, prevention with penicillin injections is a must

FOR PATIENTS

FOR HEALTH CARE PROVIDER



**World Health
Organization**

Regional Office for South-East Asia