



# **Rheumatic Heart Disease Prevention Module For Health Personnel**

# Pre – Training Test

Chose the best ansewer

**1.The type of sore throat that leads to acute rheumatic fever is:**

- a. Viral
- b. Bacterial

**2. How do we diagnose bacterial pharyngitis:**

- a. High leucocyte count
- b. Take throat culture
- c. Sore throat with no runny nose or cough

### **3. The best treatment for bacterial pharyngitis is:**

- a. Intravenous penicillin
- b. Oral penicillin for 5 days
- c. One injection of benzathine penicillin

### **4. Primary prevention of rheumatic heart disease is:**

- a. Use of 3 weekly benzathine penicillin
- b. Accurate diagnosis and treatment of bacterial pharyngitis.

## **5. Rheumatic fever causes:**

- a. Perminant joint disease
- b. Perminant heart disease

## **6. After an episode of acute rheumatic fever: the patient needs:**

- a. Benzyle penicillin every day
- b. Benzathine penicillin every 3 weeks

## **7. When we inject benzathine penicillin:**

- a. We need to have adrenaline injection ready
- b. We need to do skin test using dilute benzathine penicillin

# Introduction

# RHD

Rheumatic heart disease (RHD) is the most important cause of heart disease in children and young adults in low and middle income countries

# RHD

- Affects 35 million people around the world with high rates in Africa
- Most patients in Africa present with severe heart lesions needing surgery which is not affordable
- Surgical operation costs about 4000 USD

Global Burden of Disease 2015 study. Institute for Health Metrics and Evaluation. <http://www.healthdata.org/>



**RHD can easily  
be prevented**



**RHD is difficult  
to treat**





# **Rheumatic Heart Disease**

RHD passes through 3 stages:

Can be  
treated

# Bacterial Pharyngitis

Can be  
treated if  
discovered  
early

## Acute Rheumatic Fever

Difficult  
to treat

## Rheumatic Heart Disease

# Rheumatic Heart Disease

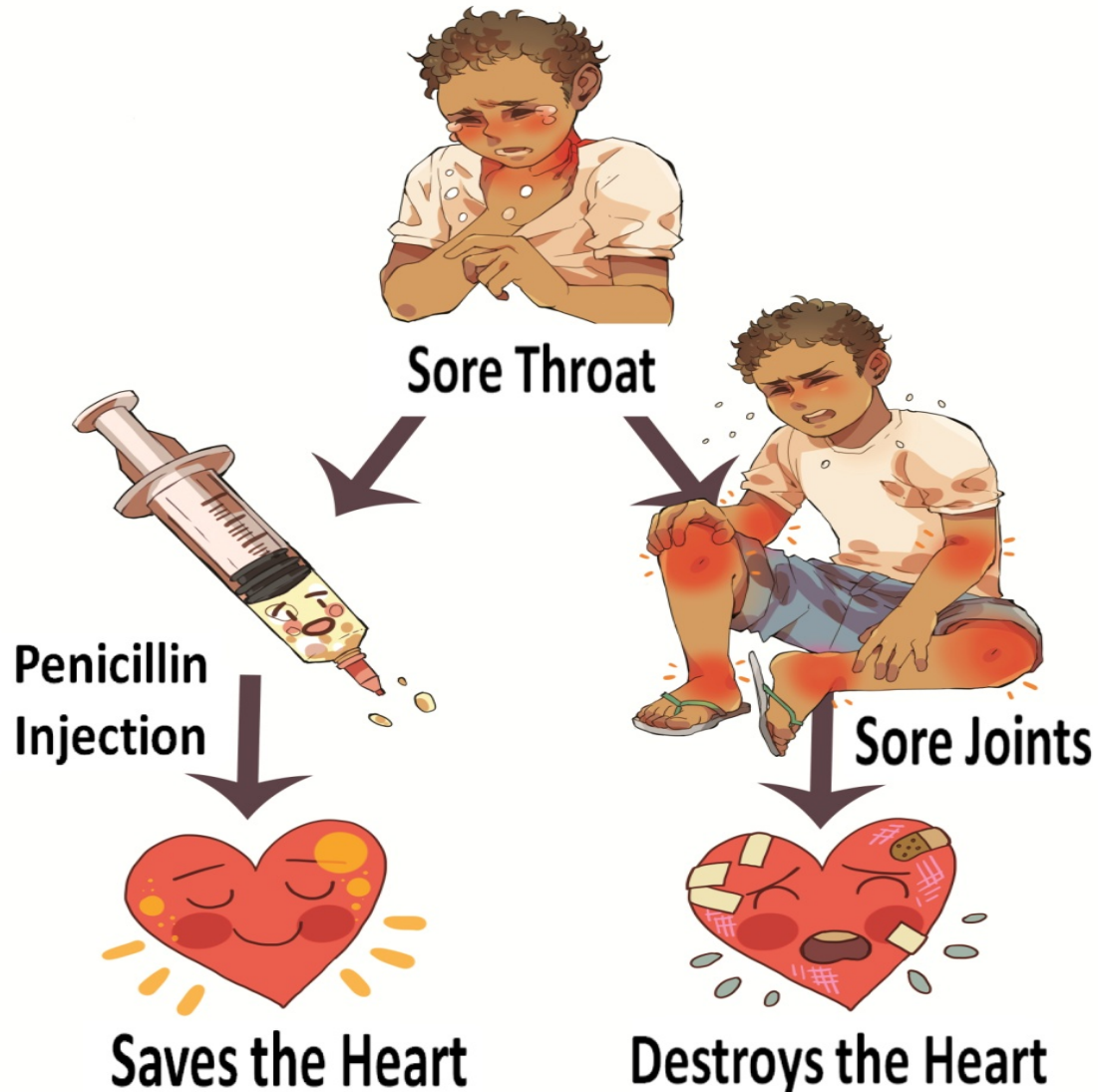
- Leads to permanent damage to heart valves , heart failure, cerebro vascular accidents and death.
- Surgery is costly and is only palliative as the disease continues after operations.
- Post surgery, the patient still needs expensive treatment and follow up.

**Valve Surgery Doesn't Cure the  
Patient**

# Summary

- RHD is the most important cause of heart disease in the young
- It can be prevented but difficult to treat
- It passes through 3 stages: bacterial pharyngitis, acute rheumatic fever then RHD
- When fully established cannot be cured

# Questions?



# Strep Pharyngitis

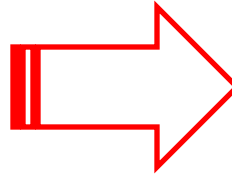


# Sore Throat

- Mostly viral
- Bacterial (about 30%) pharyngitis is caused by Group A streptococcus (GAS)
- Diagnosis of Bacterial Pharynges is by finding **Sore throat with absent cough and runny nose in patients 3 to 18 years**

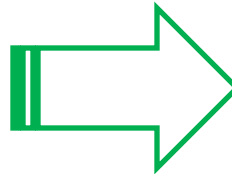


- Pharyngeal Membrane
- Cervical lymph nodes
- Fever  $>38$
- Absent runny nose and cough



**Bacterial  
Pharyngitis**

- Runny nose
- Cough
- Hoarseness



**Viral  
Pharyngitis**

# How do I recognize bacterial pharyngitis?

- 3- 18 year old patient
- Complaining of sore throat
- No cough or runny nose
- May have enlarge tonsils, tonsillar membrane or lymph node on the neck



# Important

- Bacterial pharyngitis includes tonsillitis and pharyngitis so tonsils may not be involved
- Removal of tonsils may not protect

# How do I treat Bacterial Pharyngitis?

**One injection of benzathine penicillin  
(Preferred)**

**OR**

**10 day course of oral penicillin**



# Dose of Benzatine Penicillin for Strep Pharyngitis

- For patients weighing 30 or more = 1,2 million International units
- Less than 30 kg = 600 000 IU

One injection IM

(See section on how to administer BPG)

# **Primary Prevention**

Accurate diagnosis and  
treatment of bacterial  
pharyngitis

# Strep Pharyngitis



## Acute Rheumatic Fever



## RHD

# Summary

1. Strep throat leads to acute rheumatic fever and rheumatic heart disease
2. Strep throat includes tonsils and throat
3. We recognize strep throat in those 3-18 years with sore throat and no runny nose or cough
4. We treat strep throat with one injection of benzathine penicillin
5. Primary prevention is quick identification and treatment of strep throat.



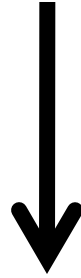
# Questions??



# Rheumatic Fever



# Strep Pharyngitis



## Acute Rheumatic Fever

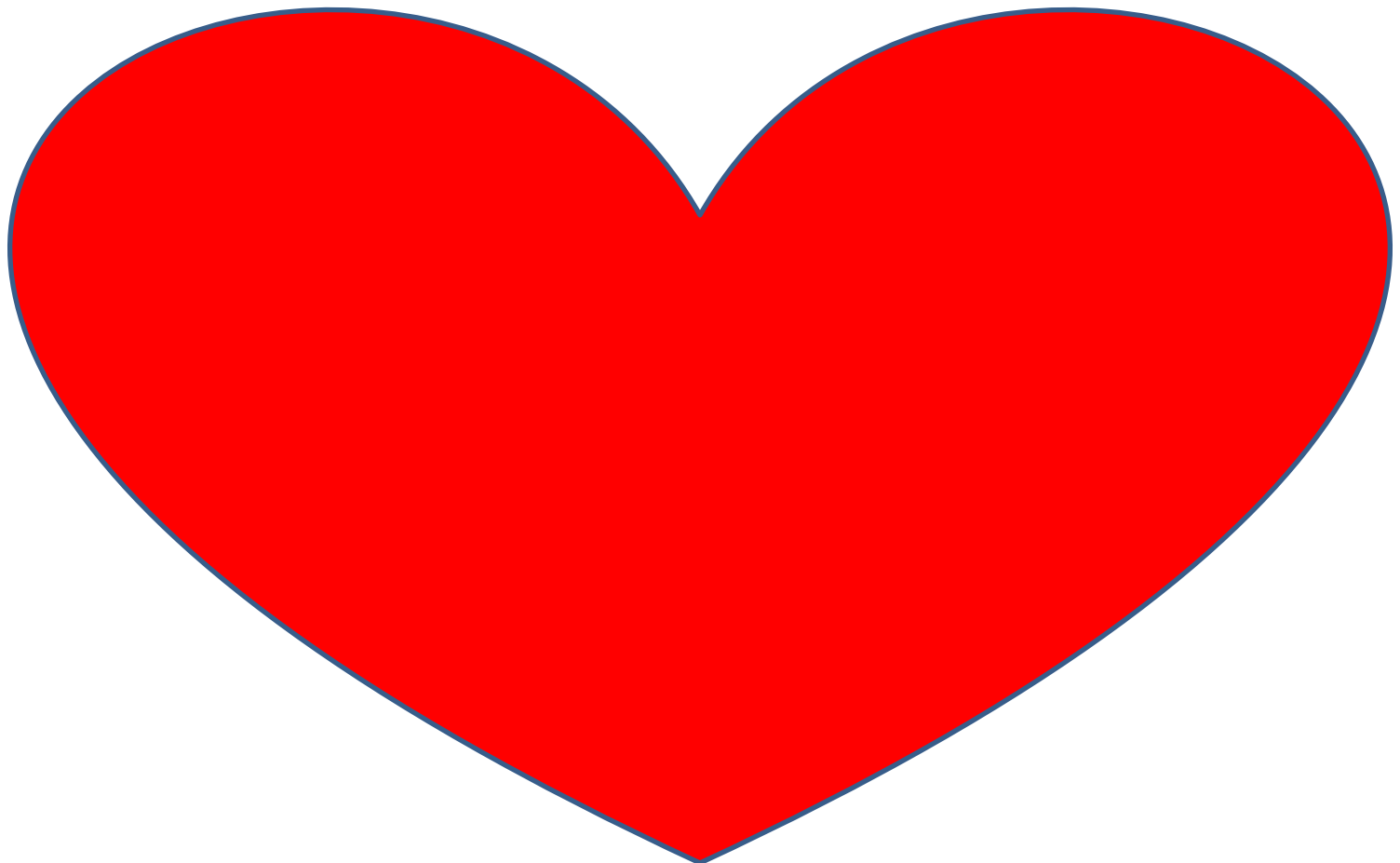


## RHD

# **What is Acute Rheumatic Fever (ARF)?**

- It's a reaction to strep infection that occurs few weeks after.
- Affects the Heart, joints and brain.

**The heart is the only organ that  
suffers permanent damage**



# Rheumatic Carditis

- The patients will feel:
  - ❖ Fast heart beat (palpitations)
  - ❖ Difficult and fast breathing especially when mobilizing
  - ❖ Body swelling
- Heart damage is identified by ultrasound (Echo): the mitral and aortic valves will be affected.

# Rheumatic Joint Affection

- Severe pain in large joints with inability to move
- Jumps from one joint to the other
- Improves , even with no treatment within 3-4 days
- No permanent damage

# **Rheumatic Brain Affection (Chorea)**

- Purposeless movements
- Difficult to keep balance, too emotional
- Poor hand writing
- Can be easily treated, no permanent damage



# Treatment of ARF

1. Refer the patient to the doctor
2. Doctor will do investigations and start 3 weekly penicillin injections
3. This regular penicillin is called:  
Secondary Prevention

# **IMPORTANT**

**You need to instruct the patient  
not to miss 3 weekly penicillin  
injection**

**ARF will recur if penicillin is  
missed**

# Secondary Prevention is:

**Use of 3 weekly penicillin injection**



# Summary

- ARF is caused by strep throat
- It affects the heart, the joints and the brain , the heart damage is permanent.
- Heart valve affection causes palpitations, difficulty in breathing and edema
- Patients with any sign of ARF should be referred to the doctor immediately
- The patient should use 3 weekly Benzathine penicillin regularly

# Questions?



# **Safe Administration of Benzathine Penicillin**

# **Benzathine Penicillin G (BPG)**

- It is the most important medicine for treatment and prevention of RHD
- Its cheap and effective.
- Serious BPG allergy is very rare
- We need to know more about how to administer BPG

# Problems of BPG can be solved

Problem	Solution
The drug is “heavy”	Use appropriate amount of diluents at room temp
The drug can block the needle	Use a large bore needle
The drug is painful	Dilute the powder in lidocaine 2% and inject slowly
Patients fear allergy	Serious allergy is very rare-reassure patients
Health workers fear allergy	Training of health workers on allergy management help them to be confident



# Important

- Skin testing using diluted BPG has **NO ROLE** in prediction of allergic patients
- Don't perform this Skin testing
- Go by the 5 Steps Protocol

Aiden Long (Associate Professor of Immunology, Harvard Medical School, USA)  
.Do we need to do skin testing with dilute BPG?. PASCAR RHD Committee Meeting,  
Cairo, 2017

# Five Steps for BPG Administration

Step1

- Ask about BPG allergy

Step2

- Prepare the items

Step3

- Prepare the injection

Step4

- Prepare the patient and give injection

Step 5

- Observe for 15 minutes

# Step 1: Ask about the H/O Allergy

Patient gave history of Severe allergy (collapse or needed emergency medicine)

- DON'T GIVE BPG
- Give Erythromycin

No H/O allergy

Give BPG by 5 step protocol)

## **Step 2: Prepare the following**

1. One 10 ml syringe
2. One 5 ml syringe (Lure Lock)
3. One BPG ampoule 1.2 million units
4. One vial of local anesthetic lidocaine (Lignocaine) 2% (or water for injection)
5. One adrenaline vial 1:1000
6. One antihistamine vial

Adrenaline  
1:1000

Lidocaine  
2%

Lure Lock 5  
ml Syringe

BPG 1,2  
Million

10 ml  
syringe

Antihistamine



# Step 3: Prepare the injection:

- Draw appropriate amount of local anesthetic as diluent for the BPG powder (make sure it's not cold)
- Inject the diluent into the BPG vial



Mix gently till dissolved



Draw in a 5 ml syringe





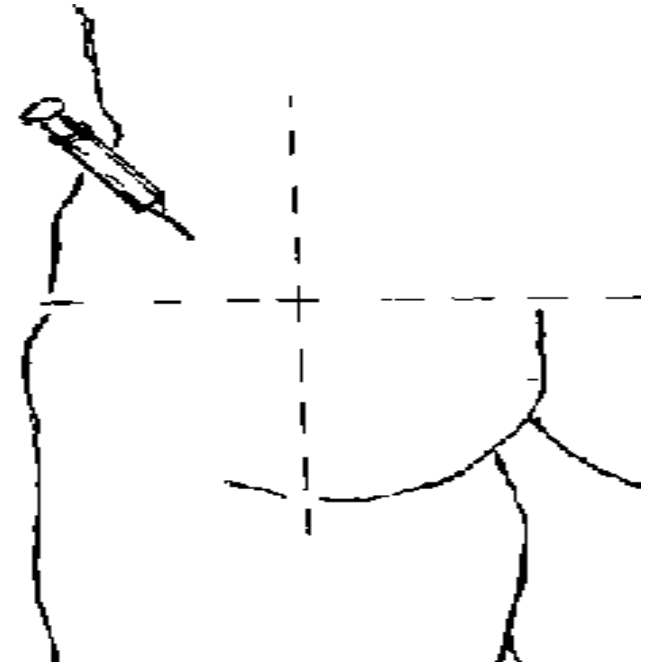
Change the  
small needle  
with the large  
bore needle  
of the 10ml  
syringe





# Step 4: Prepare the patient and give the injection:

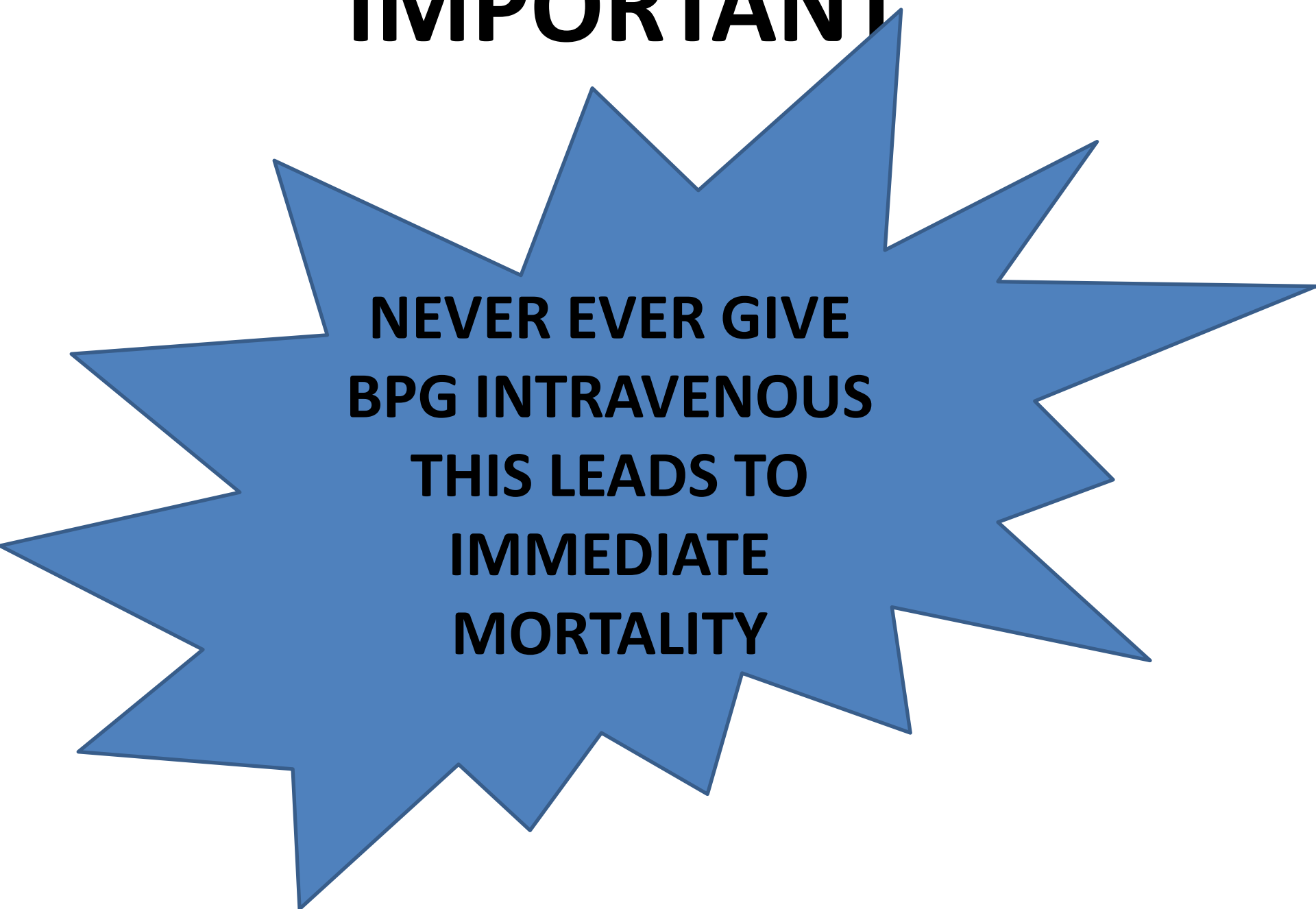
- Ask the patient to lie on the abdomen
- Mark the site of the injection (Figure)
- To minimize pain: press with your thumb over the site for 10 seconds
- Aspirate first to avoid veins then give slowly



## **Dose:**

- For patients weighing 30 kg or more: 1.2 million units
- For patients less than 30 kg: 600 000 units

# **IMPORTANT**

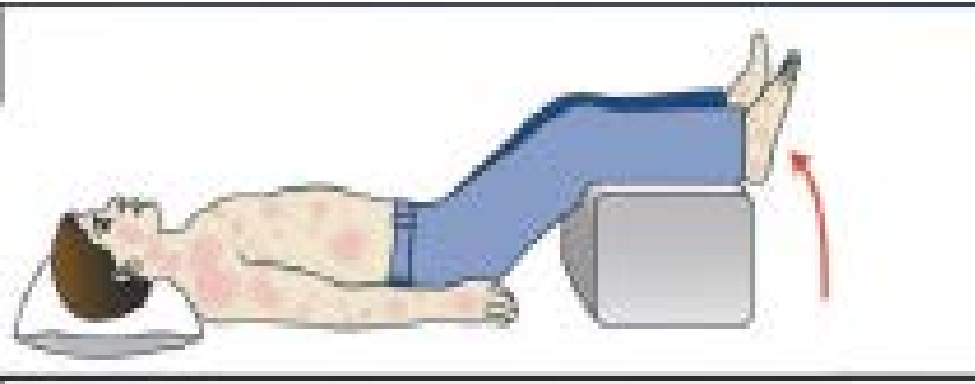


**NEVER EVER GIVE  
BPG INTRAVENOUS  
THIS LEADS TO  
IMMEDIATE  
MORTALITY**

# Step 5: Observe and treat reaction

- Observe for 15 minutes
- If an allergic reaction develops:
  - Local Reaction :Itching, hives:
    - Antihistamine injection
    - Call the doctor

# Collapse, feeling dizzy?



1. Put the patient on the floor with legs up
2. Give adrenaline
3. Call for help and start CPR if needed.

Age	Adrenalin Dose
Less than 7 years	0.3 ml
7 Years or more	0.5 ml

# Summary

- BPG is the main drug for treatment and prevention of RHD
- Serious BPG allergy is very rare
- We can safely administer BPG if we follow the 5 step protocol

# Penicillin Protects the Heart



# Can you beat RHD?

**Sur**veillance

**I**ntegration

**C**ollaboration

**A**dvocacy

**A**wareness

Trai**N**ing

**SUR I CAAN**

*SURE YOU CAN*



Sudan Heart Society

<http://www.sudanheartsociety.org>

Working Group on Rheumatic Heart Disease