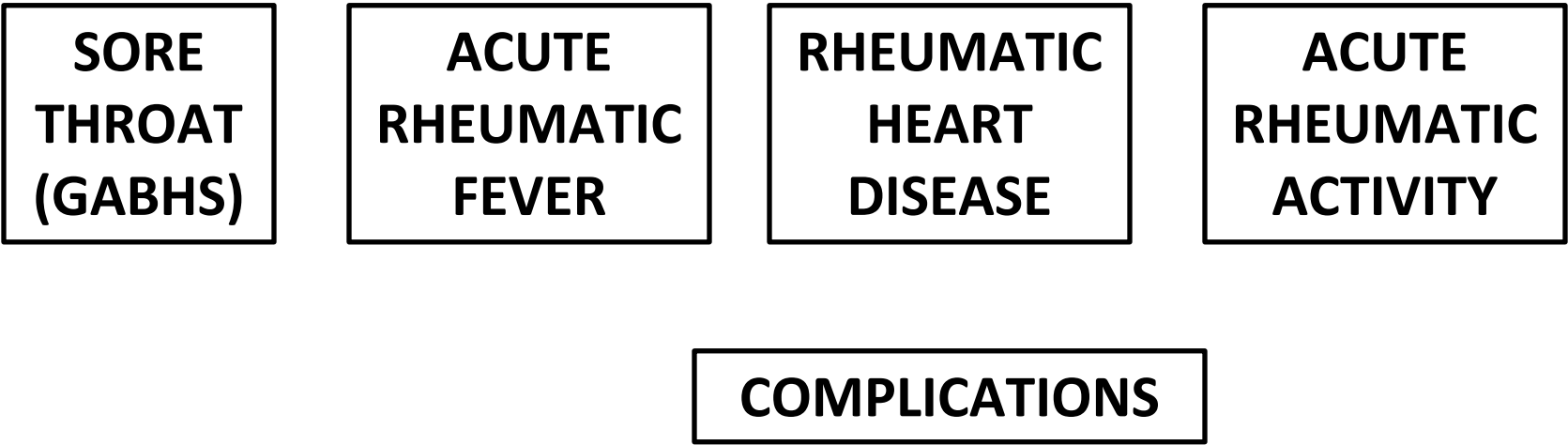


Rheumatic Heart Disease

Pathology

- Fibrinous necrosis: exudative (bread and butter appearance)
- Proliferative (Aschoff nodules/Antishkow/caterpillar cells) – McCallum patch
- Healing and fibrosis (milk spots)

Series of Events



PREVALENCE

	5-15 YRS	>15 YRS
RF	0.75/1000 (Mishra)	0.4/1000 (Verma)
RHD	4.5/1000 (Lalchandani)	4.5/1000 (Lalchandani)

	5-15 YRS	All age
Low risk pop	<2/1 lac	<1/1000
High risk pop	>2/1 lac	>1/1000

GABHS Sore Throat

SORE
THROAT
(GABHS)

MODIFIED CENTOR CRITERIA

1. AGE 5-15 YRS
2. HIGH GRADE FEVER
3. ANT CERVICAL LN
4. TONSILLAR EXUDATE
5. COUGH ABSENT

0-1 +: NO AB*

2-3 +: THROAT SWAB
RAPID AG DET
AB IF POSITIVE

4-5 +: AB

SORE THROAT to ARF: 3% (epidemic) 0.3% (endemic)

Once RF after sore throat, 50% chance of RF recurrence after another sore throat

THROAT SWAB: YIELD 5-10%

*AMOXICILLIN/ AZITHROMYCIN



Table 7. Revised Jones Criteria

A. For all patient populations with evidence of preceding GAS infection

Diagnosis: initial ARF

2 Major manifestations or 1 major plus 2 minor manifestations

Diagnosis: recurrent ARF

2 Major or 1 major and 2 minor or 3 minor

B. Major criteria

Low-risk populations*

Moderate- and high-risk populations

Carditis†

Carditis

- Clinical and/or subclinical

- Clinical and/or subclinical

Arthritis

Arthritis

- Polyarthriti s only

- Monoarthritis or polyarthriti s

- Polyarthralgia‡

Chorea

Chorea

Erythema marginatum

Erythema marginatum

Subcutaneous nodules

Subcutaneous nodules

C. Minor criteria

Low-risk populations*

Moderate- and high-risk populations

Polyarthralgia

Monoarthralgia

Fever (≥38.5°C)

Fever (≥38°C)

ESR ≥60 mm in the first hour and/or CRP ≥3.0 mg/dL§

ESR ≥30 mm/h and/or CRP ≥3.0 mg/dL§

Prolonged PR interval, after accounting for age variability (unless carditis is a major criterion)

Prolonged PR interval, after accounting for age variability (unless carditis is a major criterion)

ARF: Modified Jones Criteria

MAJOR

PANCARDITIS

MIGRATORY

ARTHRITIS

CHOREA

SC NODULES

ERYTHEMA

MARGINATUM

MINOR

HIGH FEVER

ARTHRALGIA

ESR>30

CRP>3

PROLONGED PR

GAS INFECTION

RAPID AG TEST

THROAT SWAB

ASO

ANTI-DNAase

H/O ARF IN RHD

BLAND & JONES 30%

PADMAVATI 30%

PAUL WOOD 60%

SB ROY 60%

Jones criteria exempted

MS

Chorea

INDIAN VS WESTERN

Table 18.1: Percentage of different manifestations in rheumatic fever in India

Manifestations	Padmavati*, 1962, New Delhi	Sanyal et al**, 1973, New Delhi	Sharma et al***, 1999, New Delhi	Routray****, 2003, Cuttack
Arthritis	–	56.6	61.8	44.2
Arthralgia	60.1	–	13.6	43.1
Carditis	30.9	33.3	81.2	76.6
Chorea	8.8	20	9.4	5.2
Subcutaneous nodules	1.5	1.9	20.4	11.1
Erythema marginatum	–	1.9	1.0	0

*Padmavati S Circulation Vol XXV, April, 1062, 703-10. ** Sanyal KS Circulation, Vol XLIX, Jan, 1974.***Sharma M et al, Ind HJ (Abstract), 1990, ****Routray et al, Ind HJ, 2003;55(2):1952-7.

	WESTERN (BLAND & JONES)	INDIAN (PADMAVATI, SANYAL)	COMMENTS
CARDITIS	2/3	1/3	LESS IN INDIANS
ARTHRITIS	1/3	2/3	ARTHALGIA > ARTHRITIS
CHOREA	50%	10%	UNCOMMON
SCN	5%	1%	UNCOMMON
EM	5%	www.FirstRanker.com	RARE

PANCARDITIS

ENDOCARDITIS

Regurgitations
MC-MR

PSM

Careycoumb
EDM (AR)

Long PR/ AF

MYOCARDITIS

Cardiomegaly
S3
Parchment carditis

Vs viral carditis:
No murmer
Symp improves

PERICARDITIS

Rub
Effusion
Rare w/o
endocarditis

VALVULAR INV IN ARF

VALVE	INVOLVEMENT
MITRAL	75%
MITRAL + AORTIC	20%
AORTIC	3%
TRICUSPID	2%
PULMONARY	-

FATE OF MR/ PSM

1/3 DISAPPEARS

1/3 SAME

1/3 PROGRESSES

VALVULAR LOAD

SVC 5	PV 10
RA 5	LA 10
RV 25/0-5	LV 120/0-10
PA 25/10	AO 120/80

TCV 20 mmHg	MV 110 mmHg
PV 5 mmHg	AV 70 mmHg

TCVA 8-10cm2	MVA 4-6cm2
PVA 2-4cm2	AVA 2-4cm2

TCVA 2 mmHg/ cm2	MVA 40 mmHg/cm2
PVA 1 mmHg/ cm2	AVA 25 mmHg/cm2

Carditis

- Acute: Dyspnea at rest
 - Subacute: DOE
 - Insidious: no symps, murmer+
 - Subclinical: no symp, no murmer, echo+
-
- In jones criteria: No role of Murmer

SEVERITY OF CARDITIS

Severity	CI/F
Mild	NYHA 2-3
Mod	NYHA 3-4 NO CARDIOMEGALY
Severe	NYHA 3-4 CARDIOMEGALY PERICARDIAL EFFUSION SC NODULES JACCOUDS ARTHOPATHY
Fulminant	NYHA 3-4 CARDIOMEGALY LV FUNCTION DEPRESSED

Table 3 Echocardiographic criteria for the diagnosis of subclinical carditis³¹

Pathological mitral regurgitation (meets all four criteria)	Pathological aortic regurgitation (meets all four criteria)
Seen in at least two views Jet length ≥2 cm in at least one view Peak velocity >3 m/s Pansystolic jet in at least one envelope	Seen in at least two views Jet length ≥1 cm in at least one view Peak velocity >3 m/s Pandiastolic jet in at least one envelope

SUB CLINICAL CARDITIS

VIJAYA'S ECHO SCORE		
SL.NO	ECHO FEATURE	SCORE
1.	MV & AV THICKNESS ≥ 4 mm	2
2.	MV REGURGITATION & AV/TVR	2
3.	MITRAL VALVE PROLAPSE	2
4.	RHEUMATIC NODULES	2
5.	PANCARDITIS	2
6.	CHORDAL TEAR	2
7.	REDUCED MOBILITY OF VALVES	2
8.	↑ ECHOGENICITY OF SUBMITRAL STRUCTURES	2
	TOTAL SCORE	16
ECHO SCORE ≥ 6 IS DIAGNOSTIC OF RHEUMATIC CARDITIS		

CONSEQUENCE OF CARDITIS

SANYAL ET AL

ARF

CARDITIS (60%)

NO CARDITIS (40%)

**2/3
RHD
(40%)**

**1/10
RHD
(4%)**

Which murmur disappears?

- No CHF/ cardiomegaly
- Low grade PSM
- Single valve
- Early penicillin
- First attack
- Male

Which ARF will lead to RHD?

- CARDIOMEGALY / CHF
 - >GR2 EDM
- OVERCROWDING
- MALNUTRITION
- NO PEN PROPHX
- RECURRENT ATTACK

HOW MANY DIES?

BLAND & JONES

10% IN 10 YRS

20% IN 20 YRS

TOTAL

30% (1/3) IN 3 YRS

CHF

CARDIOMEGALY

50% DIES

Arthralgia/ arthritis!

Fever and joint pain

1 week after sore throat

Migratory

Stereotypic

Large joints

No small joints

NOT INVOLVED: TMJ, STERNOCLAV JOINT, ATLANTOAXIAL JOINT

Back rarely involved

Severely painful/ tender/ swollen/ red/ hot

L/O function

Symp > signs

Each joint Lasts for 1 week

Dramatic response to salicylates

Total episode resolves in 4 week

No residual deformity



Arthralgia/ arthritis!DD

VS PSRA

1. Short incubation period
2. Affects small joint
3. No response to salicylates
4. Often renal involvement
5. No carditis

TO RX PENICILLIN PROPHYLAXIS FOR 1 YEAR

VS JIA

1. MP rash incl face
2. Back inv
3. Small joints inv
4. LN
5. LFT deranged

Jaccoud's Arthropathy



Signifies ARA

Non-erosive

Can involve lower limbs

Subcutaneous nodules

Extensor surface
Elbow forearm
Knee joints knee
Severe carditis/ active carditis
Painless
Freely mobile
Not attached to tendon
Good response to salicylate



DD
Rheumatoid nodules/JIA
-Larger
-Painful
-Attached to tendons

Osler's node
Painful
Pulp of fingers
Smaller

Janeway lesion
Macular
Palm soles
blanching

Erythema marginatum

In crops
Painless
Axilla/ thighs+
Never on face
Annular
Evanescent
Itchy
Rare to find in indians
Carditis+
No response to salicylates



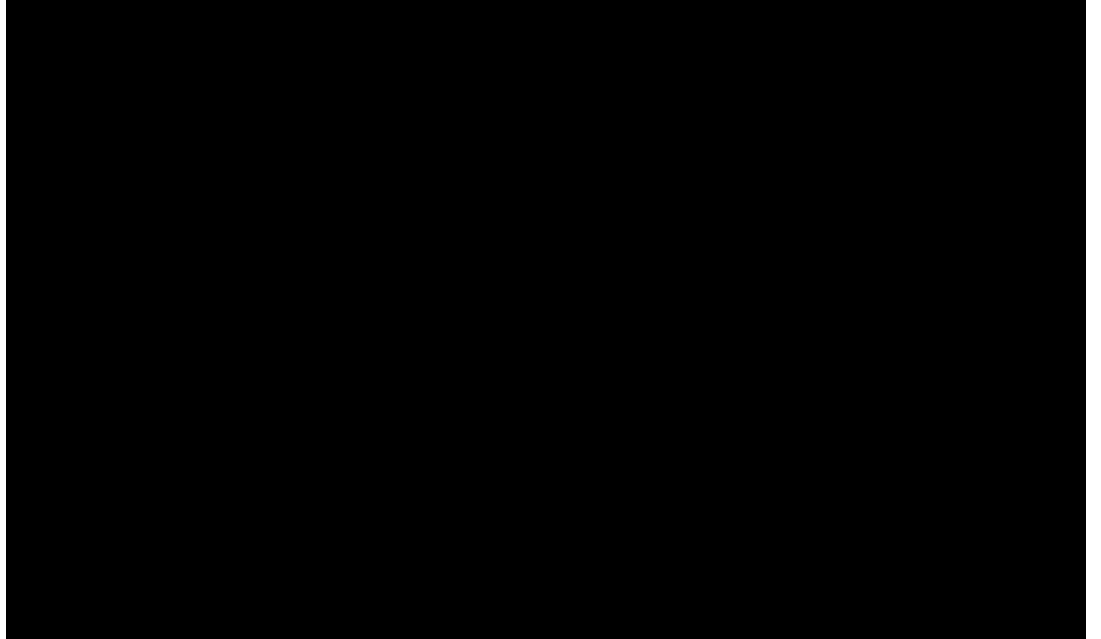
DD
Scarlet fever
Scalding

Sydenhams Chorea

Late manifestation
Never with arthritis
Carditis+
More in females
Rare in postpubertal boys
Resolves in 6m in 75% cases

Jerky speech
Pronator sign
Jack in the box
Worms in the tongue
Milkmaids grip
Spoon-like configuration
Pendular knee jerk

OCD
Poor school performance
Things fall from hands
No sensory or motor inv



Sydenhams Chorea/ DD

PANDAS

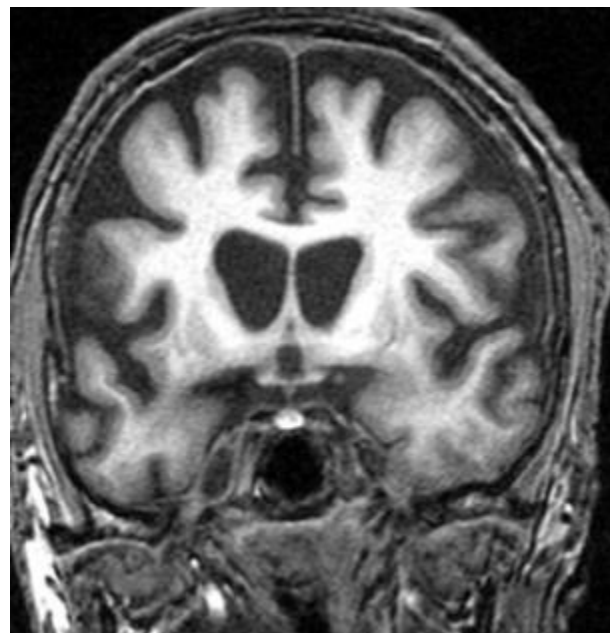
Early after sore throat
OCD
Tics
Epilepsy
TO RX PENICILLIN
TX IVIG/PLEX

WILSONS

Liver inv
No carditis
Hereditary

HUNTINGTONS

Anticipation
Psychiatric prob
~~Genetic/Imaging~~



Antibodies

ASO > 240 TU in adults, >330 in children

ASO rises after 1 week peaks after 3 weeks

Anti DNAase B >120 TU in adults, >240 in children

Anti DNAase B rises after 2 weeks peaks after 6 weeks

Sensitivity

ASO only 65%

Anti DNAase B 85%

Together 95%

ESR>30, >50 in CHF (ESR falsely high in 50% pts of CHF)

CRP>3

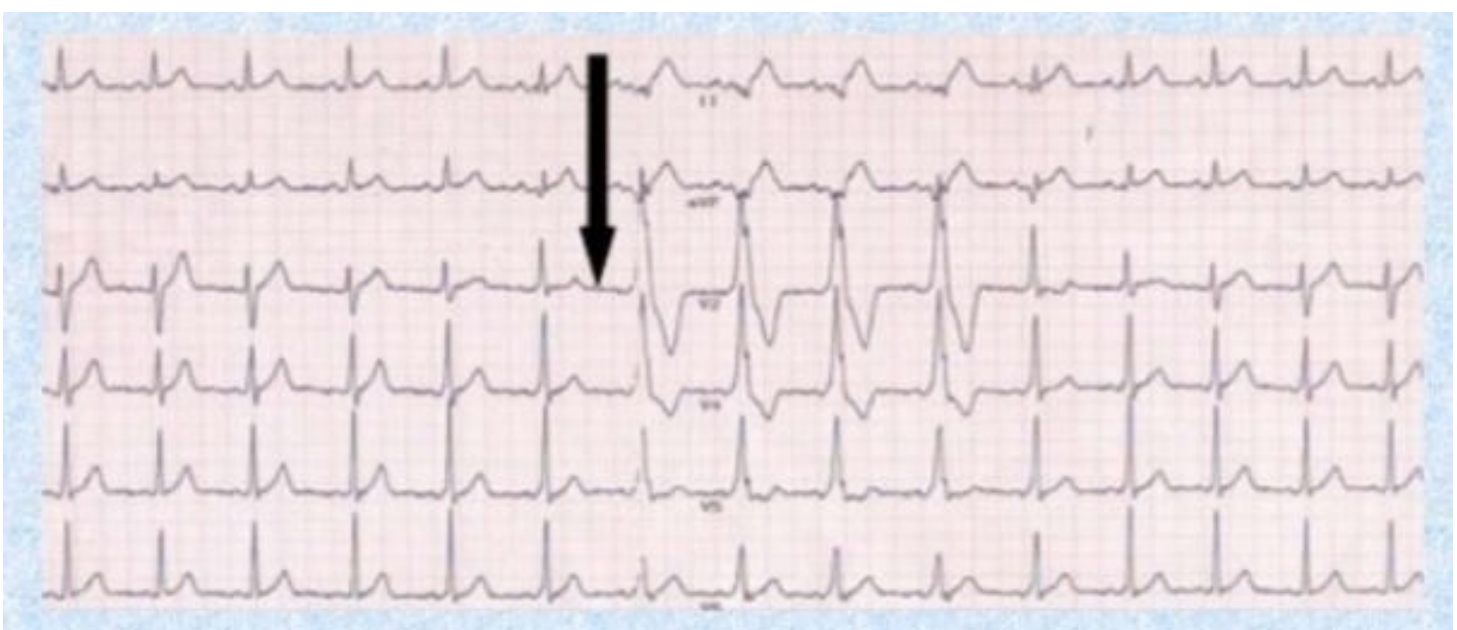
Throat swab can not differentiate b/w active inf/ carrier

Multiple samples required

Yield 10%

Rapid antigen test also can not differentiate b/w active inf/ carrier

ECG features of active carditis



Heart blocks

PR prolongation despite
tachy

Relative brady

VPCs

Small voltage

DD

Dengue

Diphtheria

Progression of RHD

- Bland & Jones >20 yrs
- In india 5-10 yrs
- CMC Vellore 3months
- Depends on:
 - Host factors (no penicillin prophx)
 - Environmental factors (overcrowding, malnutrition)
 - Agent factors (Virulent strain, eg. Outbreak in Utah 1987)

RHD

Manjunath et al:

Mitral 60%

1/3 MS

1/3 MR

1/3 MS+MR

Mitral + aortic 25%

Aortic only 10%

Tricuspid only 10% (TR>>>TS)

Pulm valve only not reported from India

MVD 1/3

Complications of RHD

- PVH
- PAH
- LV dysfunction
- CHF
- AF
- Embolic stroke
- IE

Sudden worsening of symptoms

- Carditis/ ARA
- AF
- LV dysfunc
- Preg (carditis gravidarum)
- Vol overload
- Bact inf
- Thyrotoxicosis
- IE
- Thrombus

Recurrences

SB Roy

1. Musical murmur
2. Rub
3. Cardiomegaly
4. CHF
5. Sleeping tachycardia

Also

1. SC nodules
2. Prolonged PR despite tachy
3. Heart blocks
4. VPCs w/o digoxin
5. Pericardial effusion

Bland & Jones

- 1/5 in 5 yrs
1/10 in 5-10 yrs
1/20 in 10-15 yrs
1/40 in 15-20 yrs

Sanyal

Carditis in 1st attack 30%

Vaishnab

Carditis in all attacks 90%

RHD in Young

- <5 yrs: 5% (Chockalingum)
- <12 yrs: 10% (Vaishnab) – Pediatric MS
- <20 yrs: 20% (SB Roy) – Juvenile MS
- <40 YRS: 40%

Juvenile MS (SB Roy)

- Predominant MS
- Low ca
- Less AF
- Severe PAH
- Small aorta
- Cuspal: symp > signs
- Good result to BMV

ARF: Management

- Bed rest 4-6 weeks
- Good nutrition
- Benz Pen (<27 kgs) 6lac IU (>27 kgs) 12lac IU deep IM in buttock, small needle
- OR oral Pen V 250 TDSX5d (children) 500TDSX5d (adult)
- OR Erythromycin 250 QDSx10d (20mg/kg/d upto 1 gram in 3-4 divided doses)
- OR azithromycin 500 in day and 250 ODX4d (12.5 mg/kg/d x 5d)
- Arthritis: ASA 100mg/kg/day in 3-4 divided doses
- Carditis: ASA 100mg/kg/day in 3-4 divided doses
- Salicylism: Resp alk (hyperventilation) – paradoxical aciduria – met acidosis
- CHF: prednisolone 1mg/kg/d in two divided doses
- Review after 1 weeks, 2 weeks and 4 weeks and FU with echo/ clin

**NO PROPHYLAXIS FOR
ASYMP CARRIERS/ CONTACTS**

Rebound/ Recurrence?

- On treatment:

Initial recovery. But later worsening = relapse

- Treatment completed

Symptoms reappeared after completion of tx

<6wks = rebound

>8wks = recurrence

Secondary prophylaxis

Category of Patient	Duration of Prophylaxis
RF without carditis	For 5 years after the last attack or 21 years of age (whichever is longer)
RF with carditis but no residual valvular disease	For 10 years after the last attack, or 21 years of age (whichever is longer)
RF with persistent valvular disease, evident clinically or on echocardiography	For 10 years after the last attack, or 40 years of age (whichever is longer). Sometimes lifelong prophylaxis.

Secondary prophylaxis

STOPS SORE THROAT, PREVENTS RECURRENCES OF ARF AND AIDS IN REGRESSION OF RHD*

Antibiotic	Administration	Dose
Benzathine penicillin	Single IM injection every 21 days	1.2 MU > 27 kg 600 000 U < 27 kg
Penicillin V	BD PO daily	250 mg bd
Erythromycin ethylsuccinate	BD po daily	Use same dose as above.

Oral penicillin has been shown to be less effective than Penicillin IMI*

Penicillin

- **Recurrences**
 - w/o pen: 10%
 - With oral pen: 3%
 - With IM pen: 0.5%
- **Complications**
 - allergy: 3%
 - Anaphylaxis: 0.5%
 - Death: 0.05%
- **Why 3wks?**
 - Incubation period: 9 days
 - Achieves t1/2: 19 days
 - Dose: 4 weekly
 - For developing countries: 3 wkly
 - (Pen level drops after 20 days, Taiwan)

Infective endocarditis prophylaxis

Prosthetic cardiac valve

Previous infective endocarditis

Congenital heart disease (CHD)*

Unrepaired cyanotic CHD, including palliative shunts and conduits

Completely repaired congenital heart defect with prosthetic material or device, whether placed by surgery or by catheter intervention, during the first 6 months after the procedure†

Repaired CHD with residual defects at the site of or adjacent to the site of a prosthetic patch or prosthetic device (which inhibit endothelialization)

Cardiac valvulopathy in cardiac transplantation recipients

Q1: Commonest cutaneous manifestation in ARF?

1. SC Nodules
2. Erythema Marginatum
3. Osler's Node
4. Janeway Lesion

Q2: what is the most common cause of Jaccoud's arthropathy in India?

1. SLE
2. ARF
3. RA
4. TB

Q3: MS/MR patient had recurrence at 45 yrs. 2' prophyx how long?

1. None
2. 1 yrs
3. 5 yrs
4. 10 yrs

Q4: McCallum patch commonest in?

- Ventr side of LV
- Atrial side of LA
- Ventr side of AML
- Atrial side of PML

Q4: In RHD least involved mitral scallops is?

1. A2
2. A3
3. P2
4. P3

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