

Cardiovascular Disease in India



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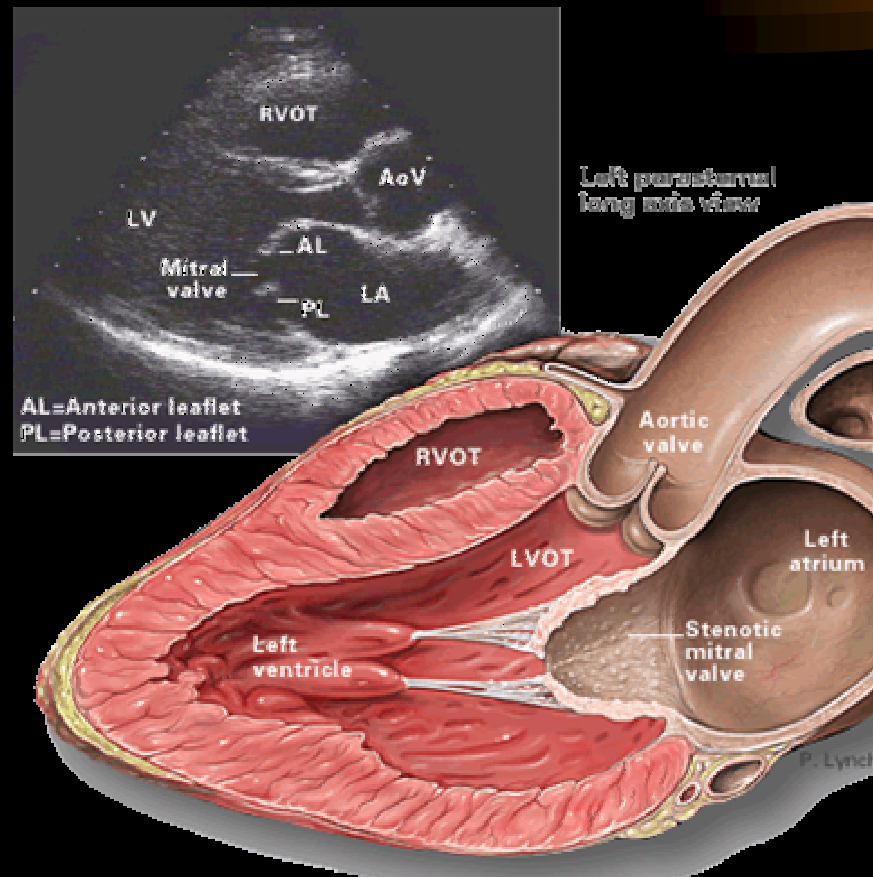


Areas

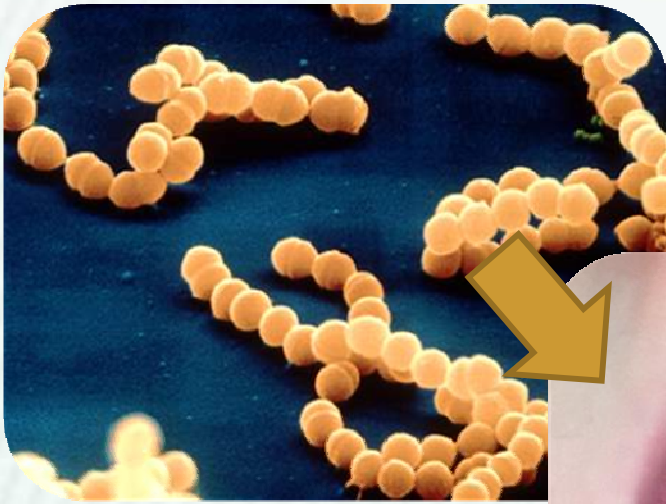
1. Rheumatic Heart Disease

2. Atherosclerotic Coronary Artery Disease

Rheumatic Heart Disease

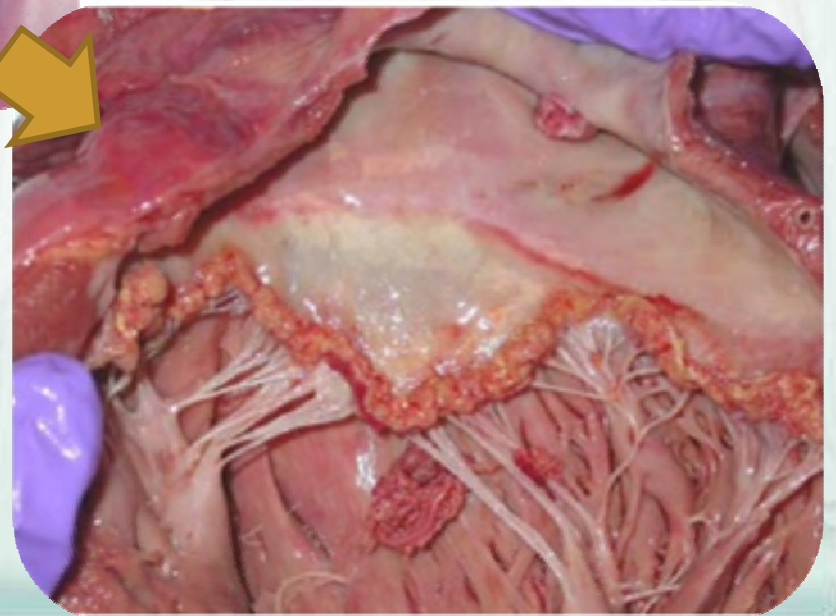


Rheumatic Heart Disease



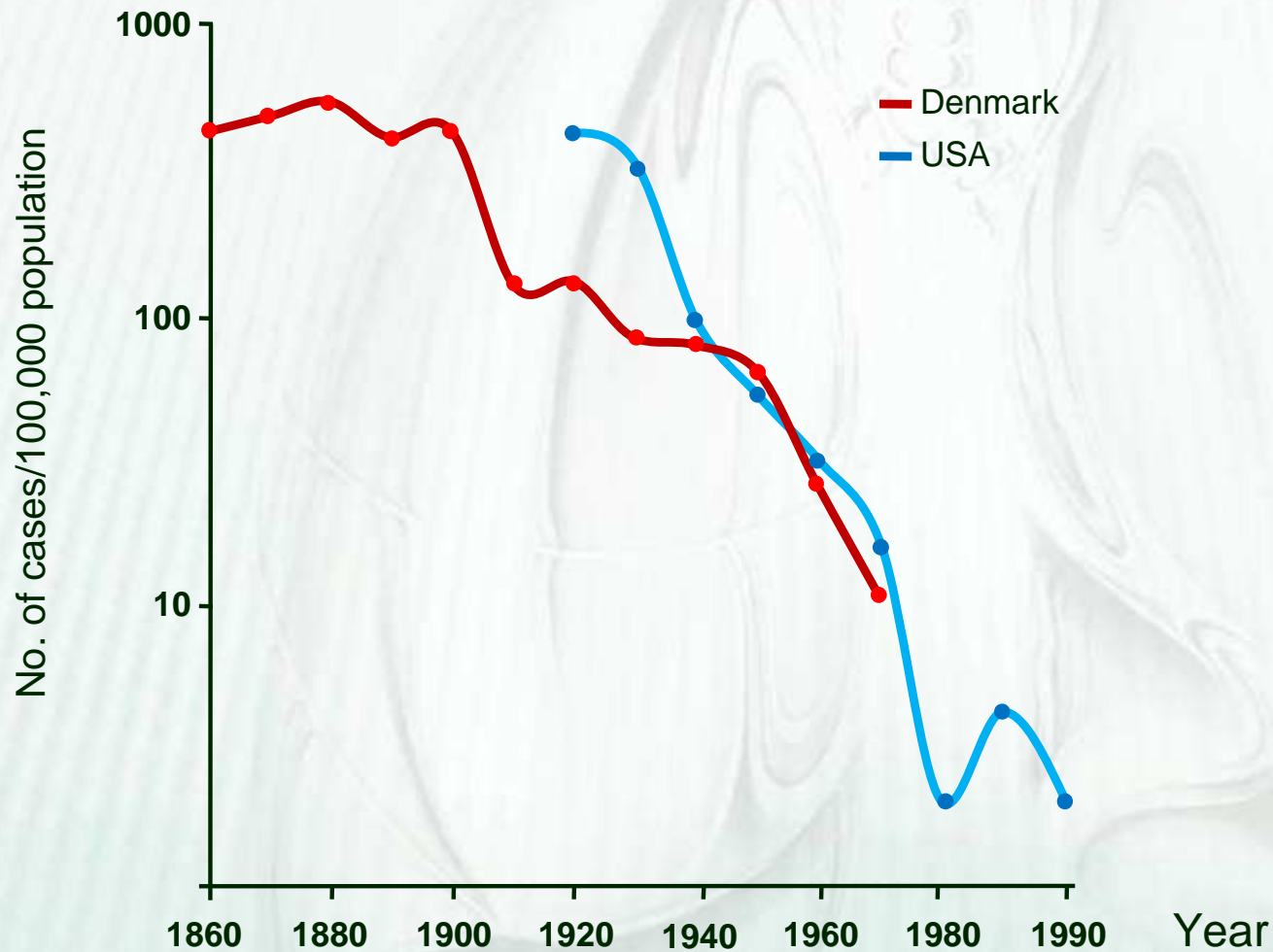
Throat infection

RHD



Declined in the Developed world...

SECULAR TRENDS IN THE INCIDENCE OF RHEUMATIC FEVER
IN TWO INDUSTRIALIZED NATIONS



RHD Prevalence and RF Incidence in India – 4 decades of Community studies

Year	RHD Children (/1000)	RF Incidence (/1000)
1970s and beyond (Clinical)	4 - 8	1.6
1980-90 (Clinical)	2.6	0.55
1990-2000 (Echocardiography)	1.5	
2000 onwards (Echocardiography)	0.12- 0.68	

Burden of Rheumatic Heart Disease in India:

(Lowest Estimate Based on the 2001 Census)

RHD

Prevalence rate – 0.21 % (5 - 40 yrs)

Number of patients – 2.81 million

Average age of Death 24.4 Yrs.

Valve surgeries in India – 1999 – 6607

- 2009 - 15,000

Anil Grover et.al IHJ, 2002;54:(1) 104-107

Rajesh kumar et.al IHJ 2002 ;54 (1) 54-58

Balloon mitral valvotomy

Inoue balloon - standard (Toray Inc. USA)

- Triple lumen
- Costly

Alternatives – **Accura** double lumen balloon*** (Still costly)

- **Cribier's** metallic valvulotome*** (Technical Difficulties)
(Cost effective)

* *Harikrishnan et.al. CCVInterventions 2006; 67: 453-459.*

** *Harikrishnan et.al. J. Invasive Cardiology 2006 :18; 54– 58.*

*** *Krishna Kumar, Harikrishnan et.al CSI KC Abstract 2009 Novemb*

RHD – Knowledge gap.

Progression from Rheumatic fever to established RHD.

** Fibrosis and scarring are the key factors in the progression of RHD / re-stenosis.

Basic and Clinical research – very limited in India.

SCTIMST - PVRI – UK – Collaborative research

– Influence of inflammation in re-stenosis

- Juvenile Mitral stenosis – (< 20 Years)

Avenues of research

1. **Basic Research**

To find out the mechanisms leading to progression to RHD / Re-stenosis.

- ? Inflammation
- ? Subclinical streptococcal infection

2. **Therapeutic** - Drugs to prevent fibrosis.(ACE Inhibitors and statins)

- a. Animal models for testing
- b. Clinical studies

3. **Rheumatic Fever Vaccines**

Rheumatic drug Prophylaxis

The best way to prevent progression from RF to RHD - Penicillin prophylaxis

Injectable penicillin Vs Oral Penicillin

Injectable Penicillin - Most effective,
Not used – fear of anaphylaxis.

Oral penicillin – Two times daily dosage
- Compliance problems / Financial

Compliance – 20%

Rheumatic drug Prophylaxis

Poor Compliance

To tide over this problem.

Penicillin drug depot

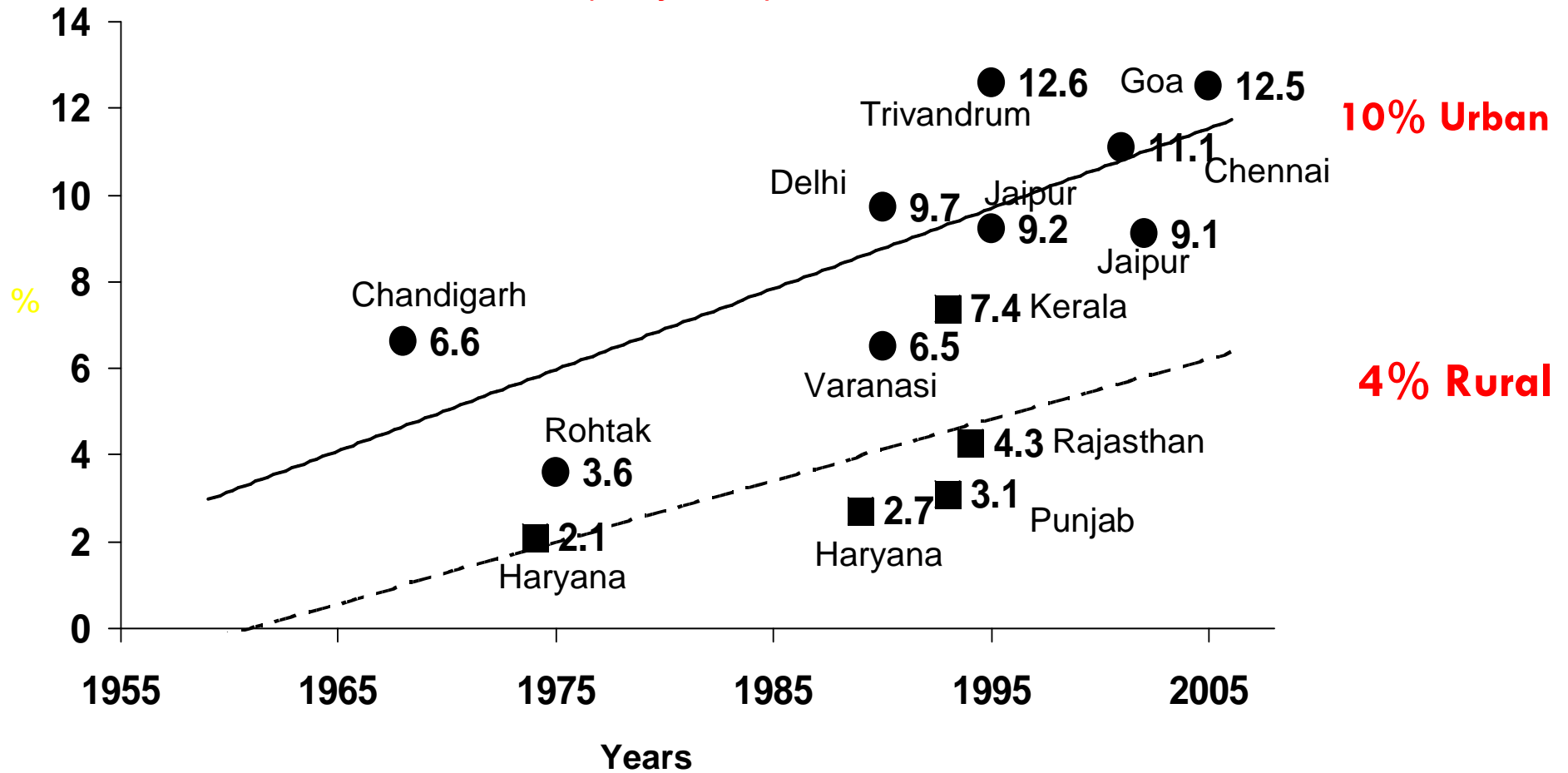
eg . Drug Implant – releasing for 5 years



Atherosclerotic Coronary Artery Disease.

CAD PREVALENCE STUDIES IN INDIA

Urban – 4 fold rise (40 years)
Rural - 2 fold rise (30 years)



CAD is disease of the poor

Treatment and outcomes of acute coronary syndromes in India (CREATE): a prospective analysis of registry data



*Denis Xavier, Prem Pais, P J Devereaux, Changchun Xie, D Prabhakaran, K Srinath Reddy, Rajeev Gupta, Prashant Joshi, Prafulla Kerkar, S Thanikachalam, K K Haridas, T M Jaison, Sudhir Naik, A K Maity, Salim Yusuf; on behalf of the CREATE registry investigators**

72% of patients were from Poor or low-middle income groups.

Less likely to get evidence based treatments.

Greater 30 day mortality compared to the rich

CAD in India – Facts and Projections

- Major health problem – Epidemic of CAD
- Strikes early in Indians (one decade), 50% occurs in Young and middle aged adults.
- Conventional risks – **Cholesterol**, Smoking, Diabetes, HTN.
- **Key --- Prevention.**
- **Control the risk factors and screening those at risk**

¹Reddy KS Lancet 2005;366:1745

²Reddy KS JACC 2007 1370-2

³Indrayan A. NCMH, Govt of India, 2004

Cholesterol (Dyslipidemia) management

- No major centers (Lipid Clinics) in the country

SCTIMST – Small set-up

No major facilities to evaluate and treat all sorts of dyslipidemia

- Netherlands –

Good Infrastructure and Network

(Dutch Lipid Clinic Network – 46 lipid clinics)

Screening (Cascade Screening - 1994) and early diagnostics

Harikrishnan, Rajeev et.al Niacin in Low HDL IHJ 2009

Harikrishnan et.al Are we attaining lipid targets with Statins – KMJ 2008.

Kroon AA Circulation LAARS Study 1996 May 15;93(10):1826-35.

University Hospital, Nijmegen.

Joep C. Defesche, Atherosclerosis. 2009 Sep;206(1):223-7.

Academic Medical Center, University of Amsterdam.

Lipid Apheresis

- Many patients with familial hypercholesterolemia, Very high cholesterol levels.
- Lipid apheresis – treatment of choice.
 - Apheresis – Regress atherosclerosis
 - No facility in India.

Comprehensive Lipid Clinic

- Establishment of a comprehensive lipid reference clinic – cater all dyslipidemias
- Support from Netherlands

Areas of Collaboration.

- ❖ Develop screening tests for Indians – Eg. Lipochip – Screening tests to identify high risk – Positive family history.
- ❖ Provide expertise to treat dyslipidemias
- ❖ Lipid apheresis unit – First one in the country.
- ❖ Research

CAD in the young

- India – CAD in the young – Major problem.
- Only way to prevent – Identify the high risk individuals
- **Screening**
 - ❖ For risk factors (DM, Hypertension)
 - ❖ Genetic Susceptibility eg. Gene polymorphisms
 - ❖ SCTIMST – DSTK – Thrombotic risk factors in CAD - 2010.

CAD in the young

Netherlands –

Screening program already on..

Avenues to collaborate ...

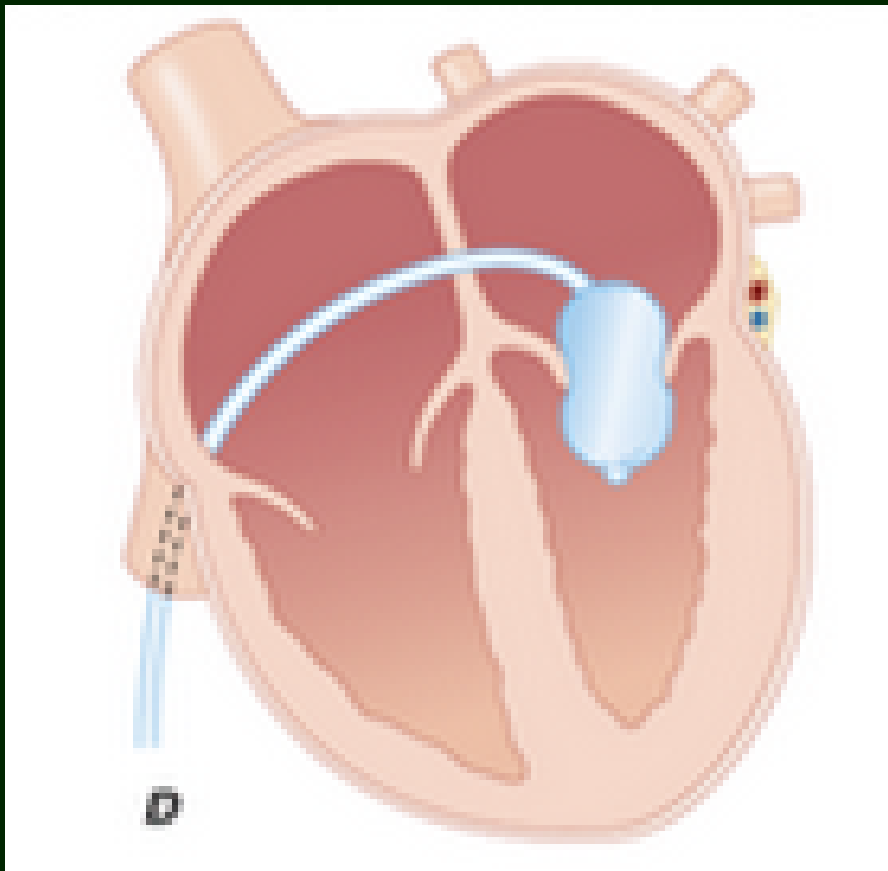
- Develops screening program incorporating the mutations linked to CAD, specific to Indians
- Share the expertise in screening methods
- Develop a cost-effective model for screening and primary prevention.

Economic impact of CAD - India

- Major macroeconomic impact – 1.5% of GDP loss
- Micro-economic impact
 - Health Insurance < 7%
 - 82% spend their own,
 - Poor state support.

WHO. The World Health Report
Harikrishnan, Prabhakaran et.al. 2009

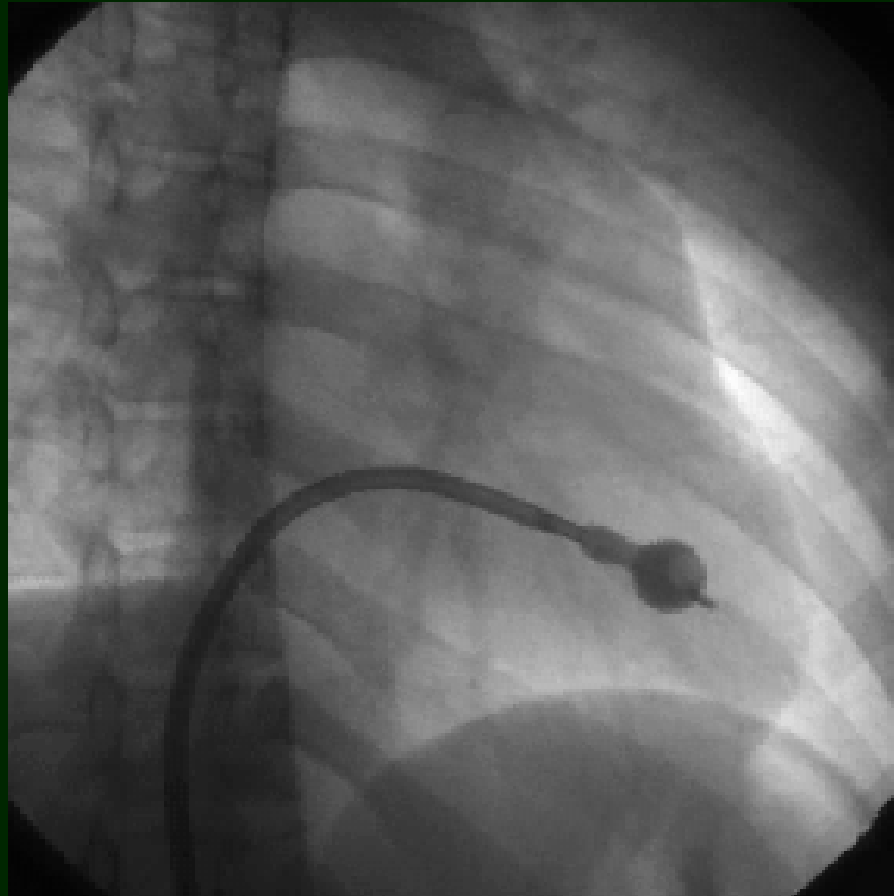
Balloon Mitral Valvotomy



Surgical Valve replacement



Balloon Mitral Valvotomy – Inoue Balloon



Current areas of research

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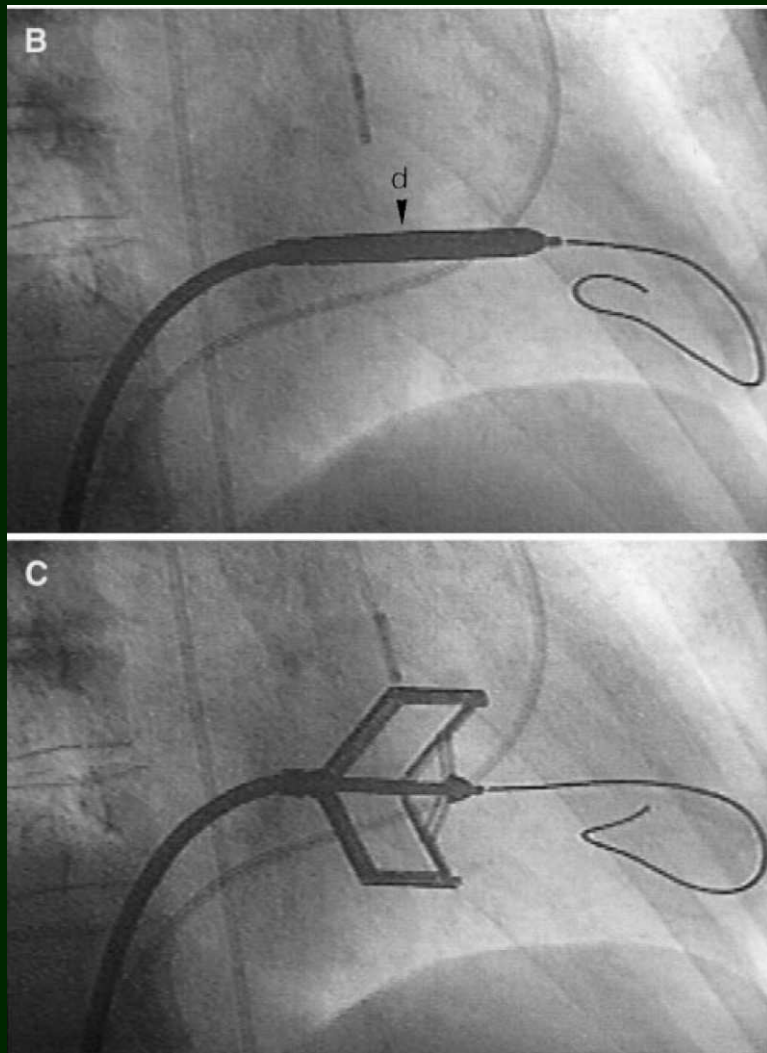
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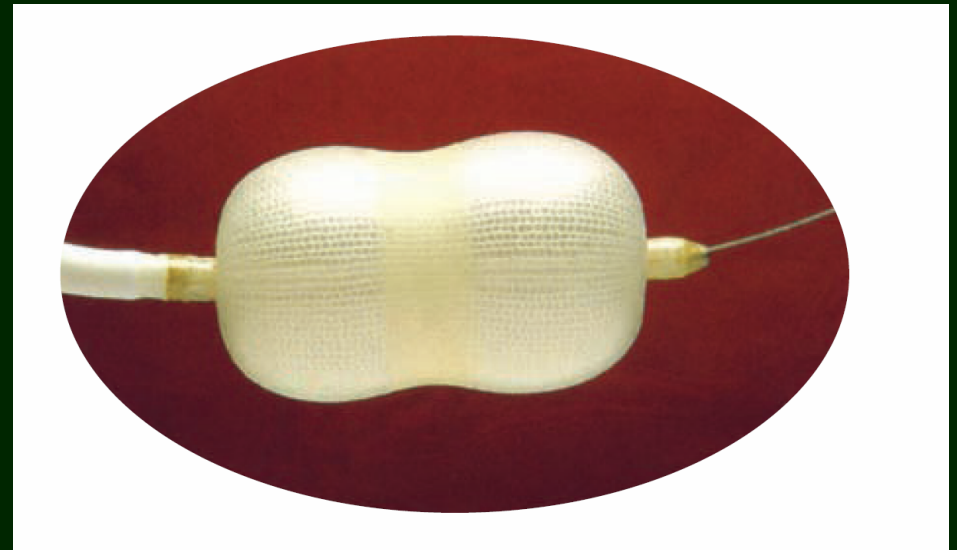
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Cribier device



Accura Balloon



Area of future research and development

Development of a new balloon valvotomy device

- Efficient and effective

1. Metallic / Plastic – Resterilizable /
Or Cheap - thrown away after single use.
 2. Should provide graded dilatations.
 3. Should orient towards the commissures to reduce valve tear
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1. Progression from Rheumatic fever to established RHD.

To understand the pathobiology, to develop clinical targets.

2. Rheumatic drug prophylaxis



THANK YOU