

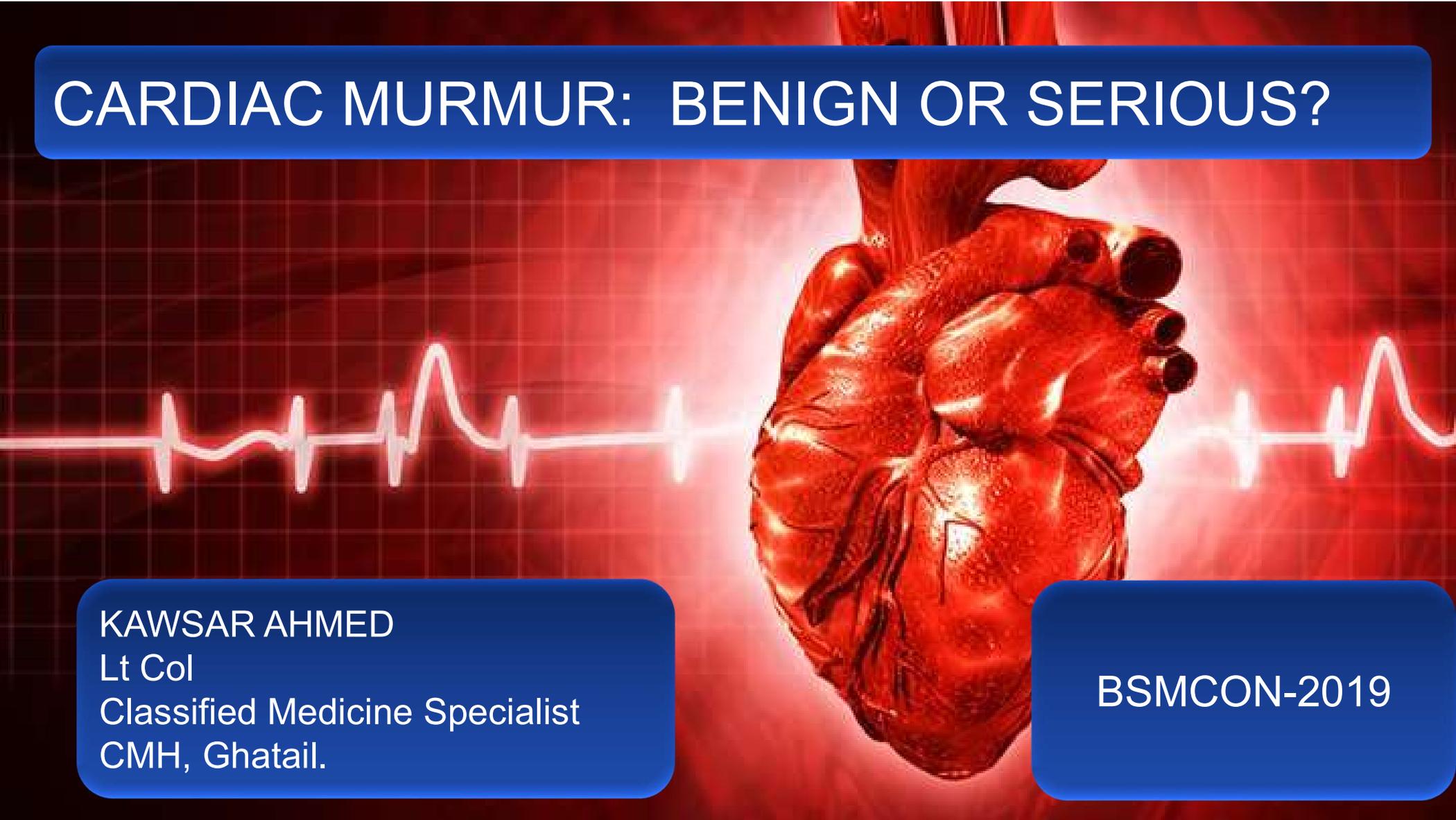


WELCOME

CARDIAC MURMUR: BENIGN OR SERIOUS?

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INTRODUCTION

Cardiac murmurs have remained a “hot topic” in cardiac evaluation since the invention of the stethoscope by Rene Laennec in the early 17th century.

In our clinical practice many of the times we come across the abnormal heart sound or murmur over the precordium. It may be the only sign of underlying serious cardiac diseases or may be a harmless innocent one.

INTRODUCTION

It is necessary to distinguish serious abnormal murmur from the innocent one as failure to evaluate a serious murmur can cause considerable morbidity and mortality.

On the other hand unnecessary evaluation of benign murmur may cause extra expenditure with unnecessary anxiety and harassment.

Basic Physiology



Murmurs are acoustic phenomenon produced by turbulent blood flow.



They can occur in wide variety of clinical settings.

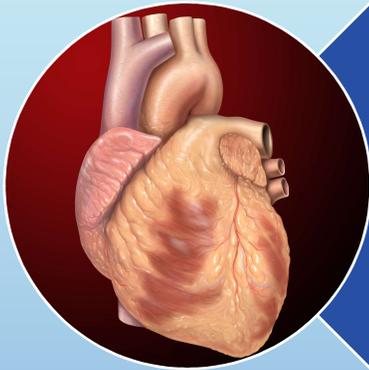


Murmur that occurs outside of the heart refers to bruit

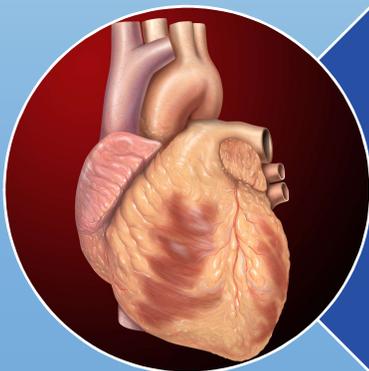


Murmur and bruit represents the same type of phenomenon

Basic Physiology



The chance that blood flow will be turbulent in any given situation and thus produce a murmur is dependant upon Reynolds number (Nr)



Turbulence are more likely when Raynolds number is higher

Reynolds Number (Nr)

The diagram shows the Reynolds Number equation $Re = \frac{\rho V D}{\mu}$ with red arrows pointing from descriptive labels to the variables in the equation. The labels are: 'Density of fluid' pointing to ρ , 'Velocity of fluid' pointing to V , 'Diameter of pipe' pointing to D , 'Dynamic Viscosity of fluid' pointing to μ , and 'Reynolds Number' pointing to the entire equation.

$$Re = \frac{\rho V D}{\mu}$$

Density of fluid

Velocity of fluid

Diameter of pipe

Dynamic Viscosity of fluid

Reynolds Number

Aetiology Of Murmur By Physiologic Mechanism

MECHANISM	Example
Decresed Blood Viscosity	Anaemia
Decreased Diameter of vessel, valve or orifice	Valvular stenosis, Coarctation of Aorta, VSD
Increased velocity of blood through normal Structures	Hyperdynamic states (Sepsis, Hyperthyroidism)
Regurgitation across an incompetent valve	Valvular regurgitation

Characteristics of Murmur

(??) **Systolic Murmur present in precordium**

Characteristics of Murmur



Timing



Location and Radiation



Shape



Pitch



Intensity



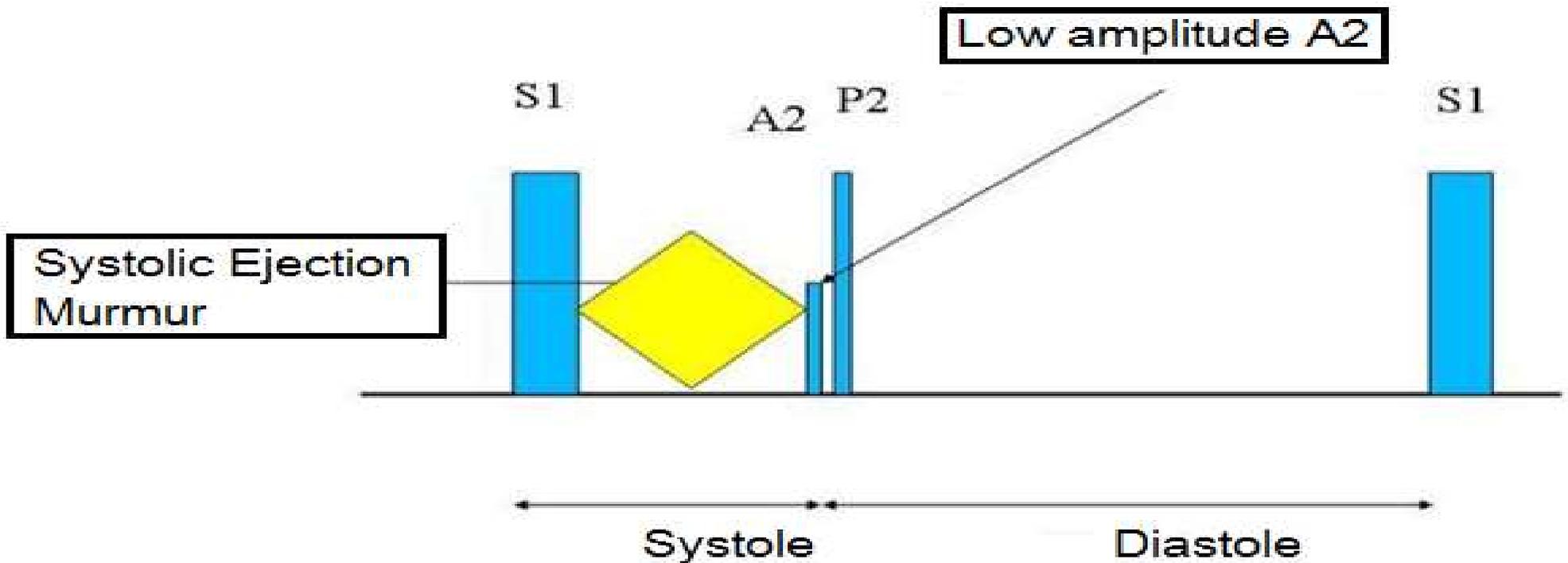
Quality



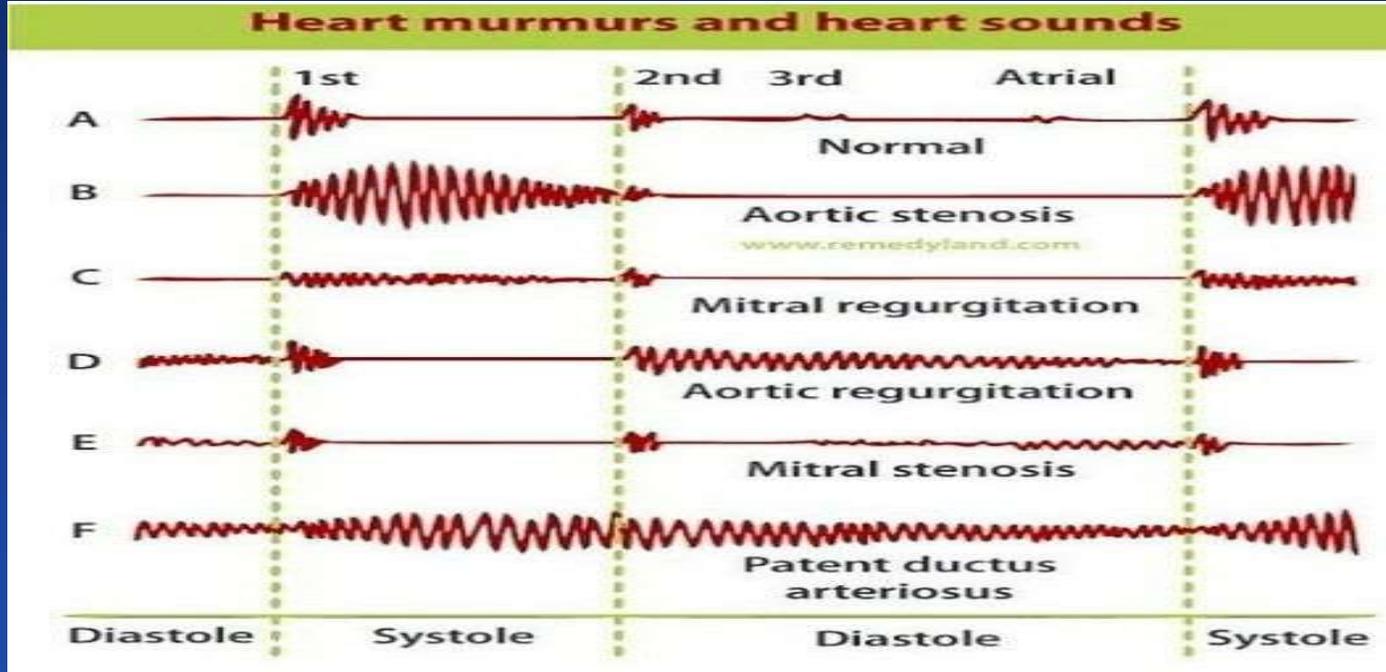
Response to Maneuvers

Description of a Murmur

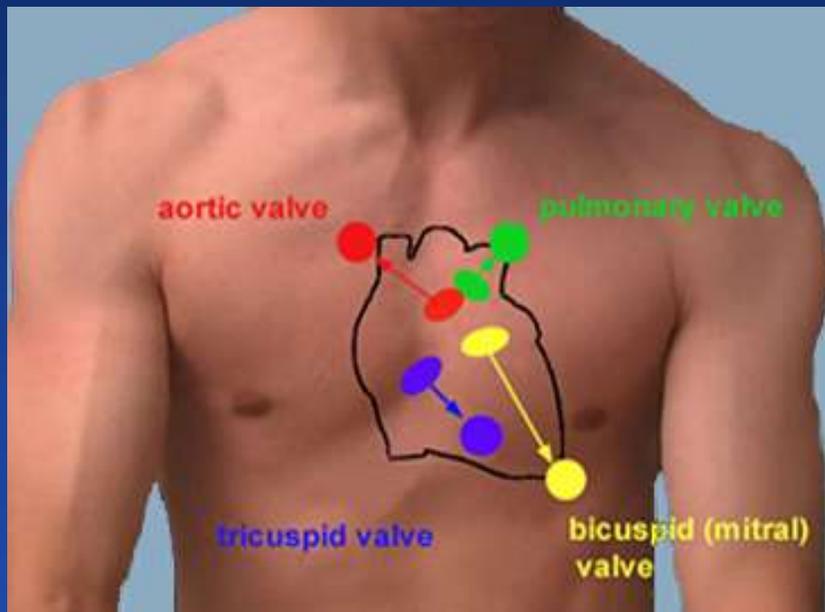
Heart Sounds (Aortic Stenosis)



Timing



Location and Radiation



RADIATION OF MURMURS

1 ESM of AS

at right 2nd ICS
radiates to carotids

2 EDM of AR

at right 2nd ICS
radiates to left 3rd ICS

3 PSM of TR

at left lower sternal border
radiates to left upper sternal border

3 MSM of HCM

at left lower sternal border
radiates to base of neck
but not the carotids

4 ESM of PS

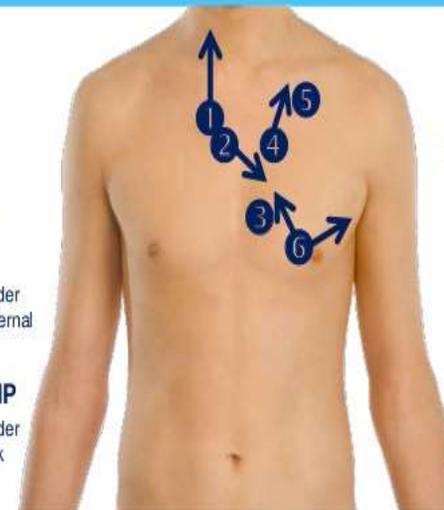
at left 2nd ICS
radiates to left clavicle

Murmur of PDA 5

at left infra-clavicular area
radiates to the back

PSM of MR 6

at left 5th ICS (apex)
radiates to the left axilla
and pericardium



Shape

Shape



Crescendo



Decrescendo



**Crescendo-
decrescendo**



Plateau



EMORY

Bickley, Lynn S, *Bate's Guide to Physical Examination and History Taking*. Lippincott Williams & Wilkins

Pitch

- It is the frequency of the murmur.
- Depends upon the velocity jet.

Intensity

Intensity refers to the loudness of the murmur, and is graded according to the Levine scale from 1 to 6

Quality

Quality refers to unusual characteristics of a murmur, such as blowing, harsh, rumbling or musical

Response to Maneuvers



Left lateral decubitus



With the patient sitting upright



With the patient leaning forward and exhaling

Benign cardiac murmur

Early
Systolic Or
Midsystolic

Not Louder
Than 1-2/6

Not
Diastolic

Do Not
Radiates

Do Not
Improve
With Any
Maneuver

Benign Cardiac Murmur

In children and young adults they are due to vibration across the pulmonary trunk, heard at lower left sternal border

Benign murmur in older patient is usually due to Aortic Valve sclerosis

Condition associated with hyperdynamic circulation also causes innocent functional murmur

Serious Cardiac Murmur

**Diastolic or
Holosystolic**

**Harsh in
character**

**Louder
(grade > 2/6)**

**Abnormal
splitting of
s2 and**

**Associated
with extra
sounds like
click**

Clinical Evaluation of a murmur

History regarding symptom and associated disease.

Physical examination considering aetiology and complications of the disease that produce this murmur.



PALPITATIONS

The sensation of an accelerated and irregular heartbeat



DYSPNEA

Shortness of breath during physical efforts



FATIGUE

Physical tiredness



DIZZINESS

Light-headedness



SYNCOPE

Fainting

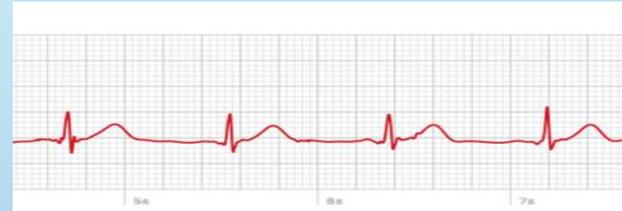


ANGINA

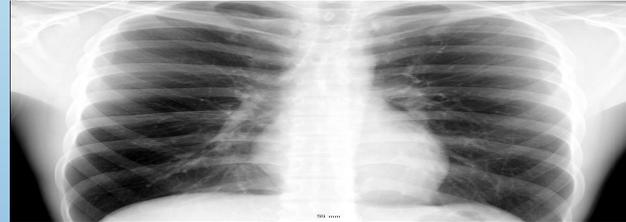
Retrosternal chest pain and discomfort

INVESTIGATION

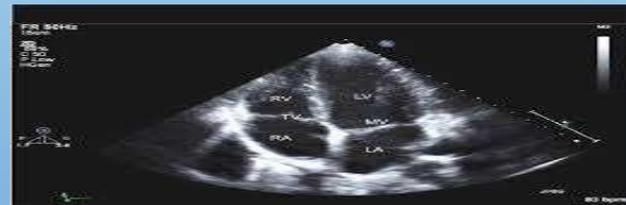
ECG



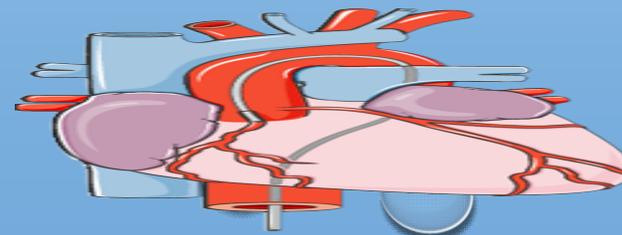
Chest X-Ray



Echocardiography.



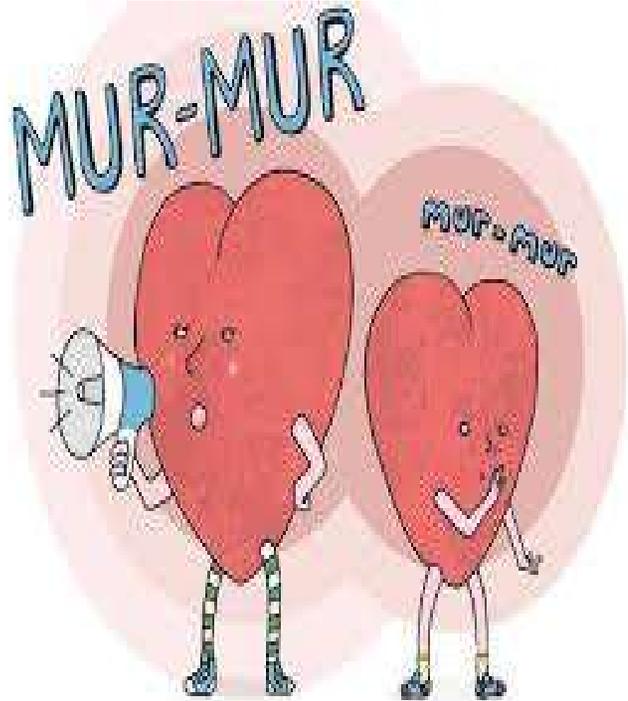
Cardiac
Catheterization



CONCLUSION

Innocent heart murmur remains a significant source of diagnostic uncertainty among primary care physicians and it is still one of the common reasons for a referral to an Internist or cardiologist

Despite being an “innocent finding”, it still remains a significant source of health care resource utilization and patients anxiety



THANK YOU