Cardiac Murmur : Benign or Serious?

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They laid their lives on 14th December, 1971

INTRODUCTION

WHAT IS MURMUR?

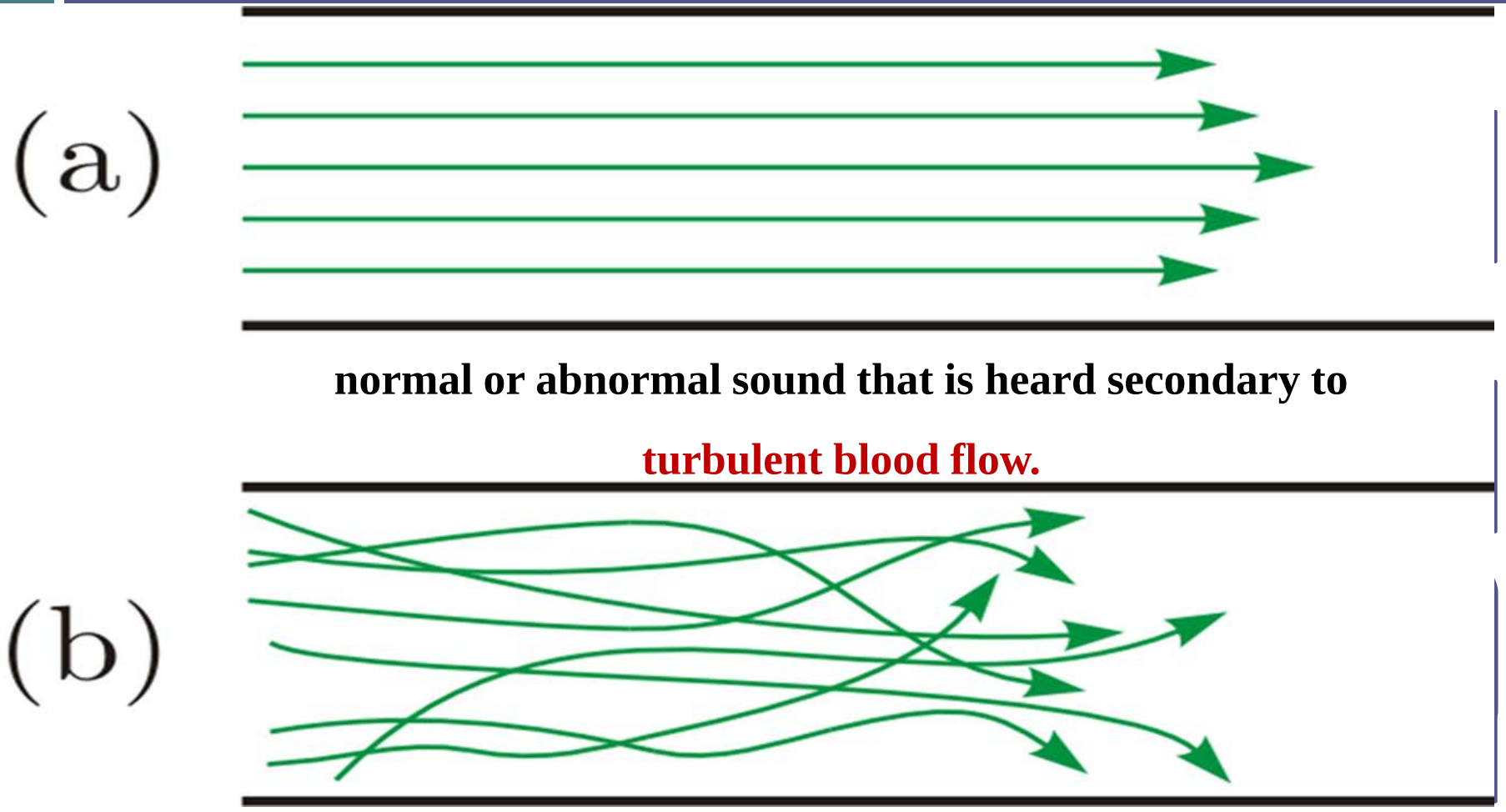
Heart murmurs are actually a sound that is created when there is something else going on

MURMUR

- **A cardiac murmur** is defined as a relatively prolonged series of **auditory vibrations** of varying intensity (loudness), frequency (pitch), quality, configuration and duration.

Turbulence is the prime factor responsible for most Murmurs

PATHOPHYSIOLOGY OF MURMUR BENIGN OR SERIOUS



normal or abnormal sound that is heard secondary to

turbulent blood flow.

CHARACTER OF A MURMUR

- Intensity (Grade)
- Frequency (Pitch)
- Timing
- Shape
- Location
- Radiation

INTENSITY OF A MURMUR

The intensity of a murmur is primarily determined by

- **Quantity and velocity** of blood flow at the site of its origin.
- **Transmission** characteristic of the tissues between the blood flow and stethoscope.
- **Site** of auscultation or recording.
- **Distance** of transmission.

INTENSITY OF A MURMUR

Intensity ↓ in the presence of

- **Obesity**

- **Emphysema**

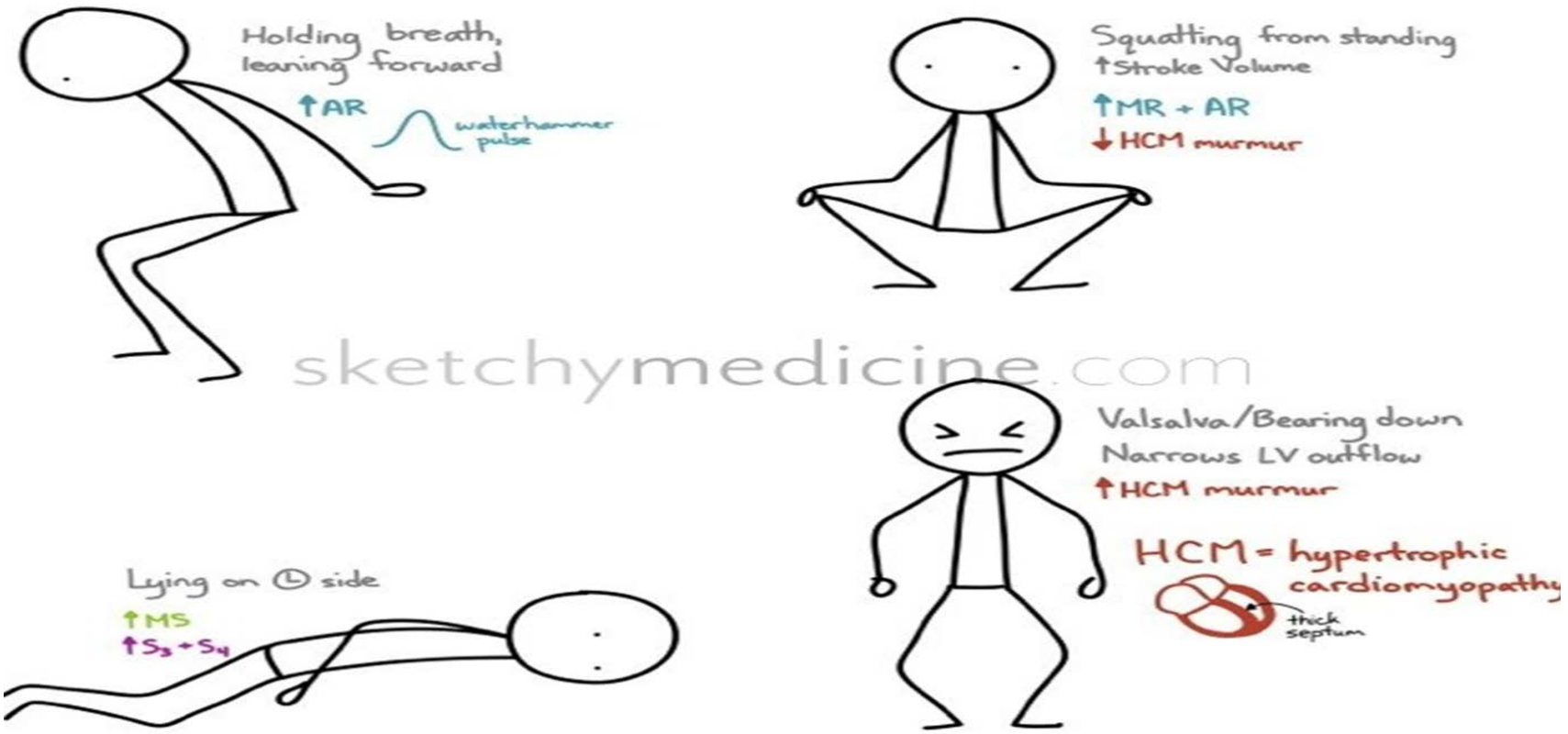
- **Pericardial effusion**

INTENSITY OF A MURMUR

- In general, Murmurs are usually **louder** in **thin** individuals

INTENSITY OF A MURMUR

- **Intensity** of the mid systolic mumur changes in response to **different maneuvers** which is also useful **diagnostically**

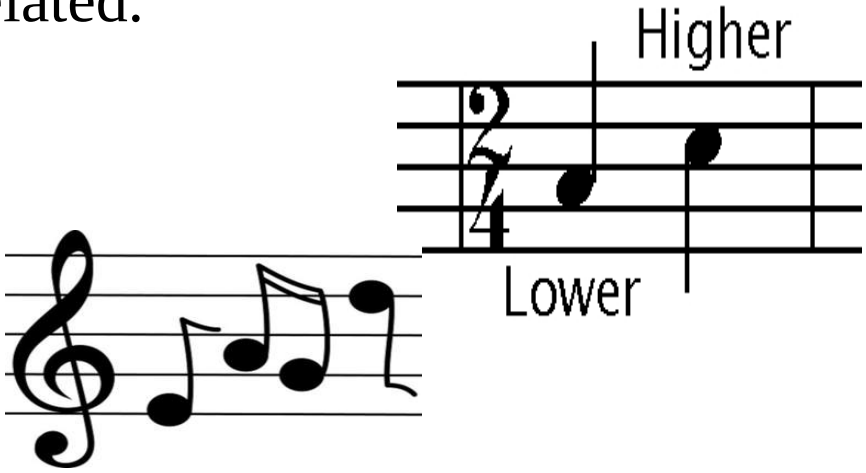


INTENSITY OF MURMUR: CLASSIFICATION

Grade I	• is the faintest murmur that can be heard (with difficulty)
Grade II	• is also a faint murmur but can be identified immediately
Grade III	• is moderately loud
Grade IV	• is loud and is associated with a palpable thrill
Grade V	• is very loud but cannot be heard without the stethoscope
Grade VI	• is the loudest and can be heard without a stethoscope

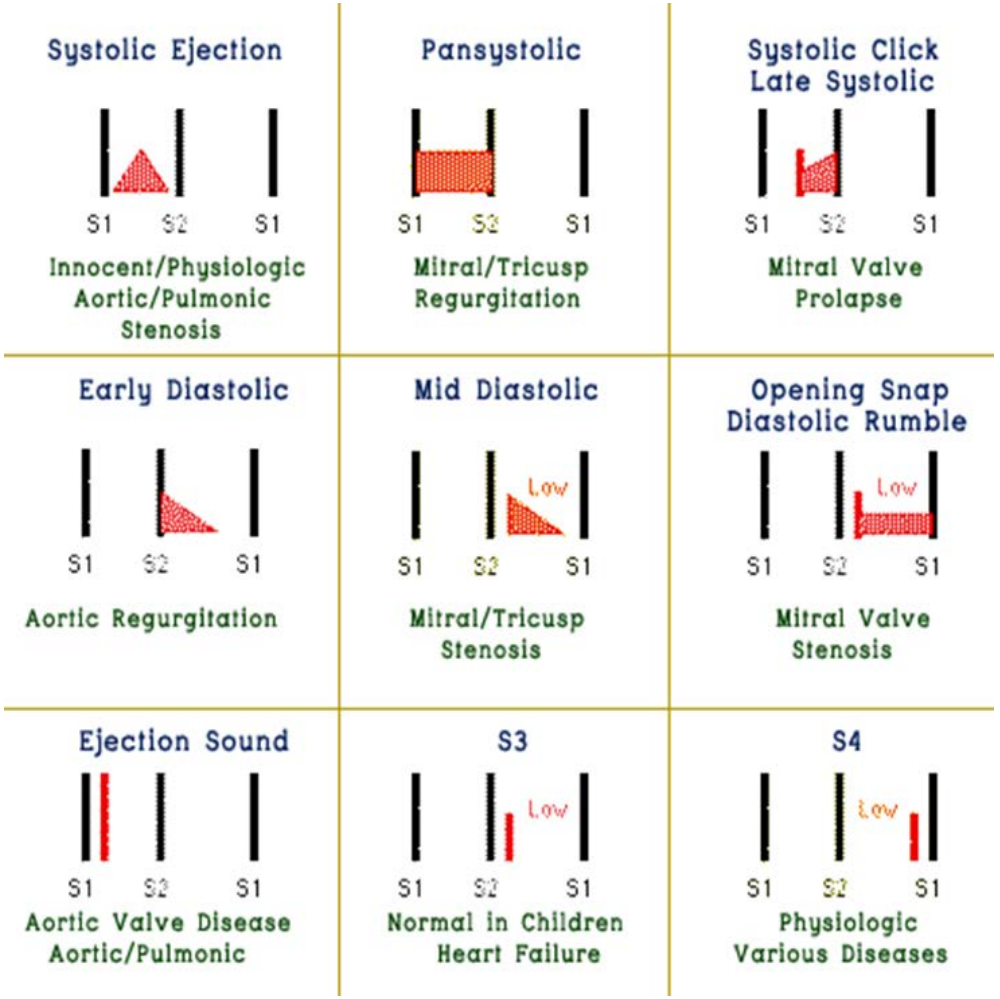
PITCH

- The frequency of the murmur determines the pitch, which may be **high or low.**
- The quality can be described as **harsh, rumbling, scratchy, grunting, blowing, squeaky, and musical.**
- Quality and pitch are closely related.



CONFIGURATION

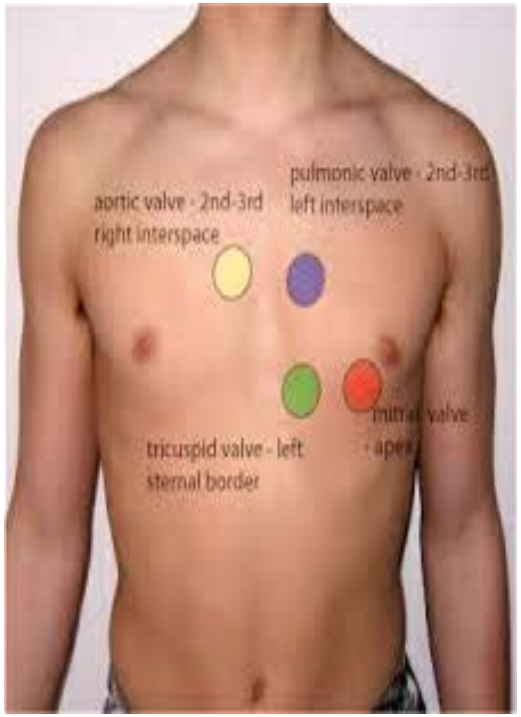
- The time course of murmur intensity corresponds to the **"shape"** of a diagram of murmur intensity over time, as in a phonocardiogram.



LOCATION

The location and radiation of a murmur are determined by

- Site of origin
- Intensity
- Direction blood flow
- Physical characteristics of the chest.



TIMING

- The **duration of a murmur** is assessed by determining **the length of systole or diastole** that the murmur occupies.
- The murmur can be **long** (eg, it occupies most of systole or diastole) or **brief.**

TYPES OF MURMUR

Systolic murmur

- **Ejection systolic murmur**
  - -Aortic stenosis
  - -Pulmonary stenosis
  - -HOCM
  - -Atrial septal defect
- **Pan systolic murmur**
  - -Mitral regurgitation
  - -Tricuspid regurgitation
  - -VSD
- **Late systolic murmur**
  - - Mitral valve prolapse

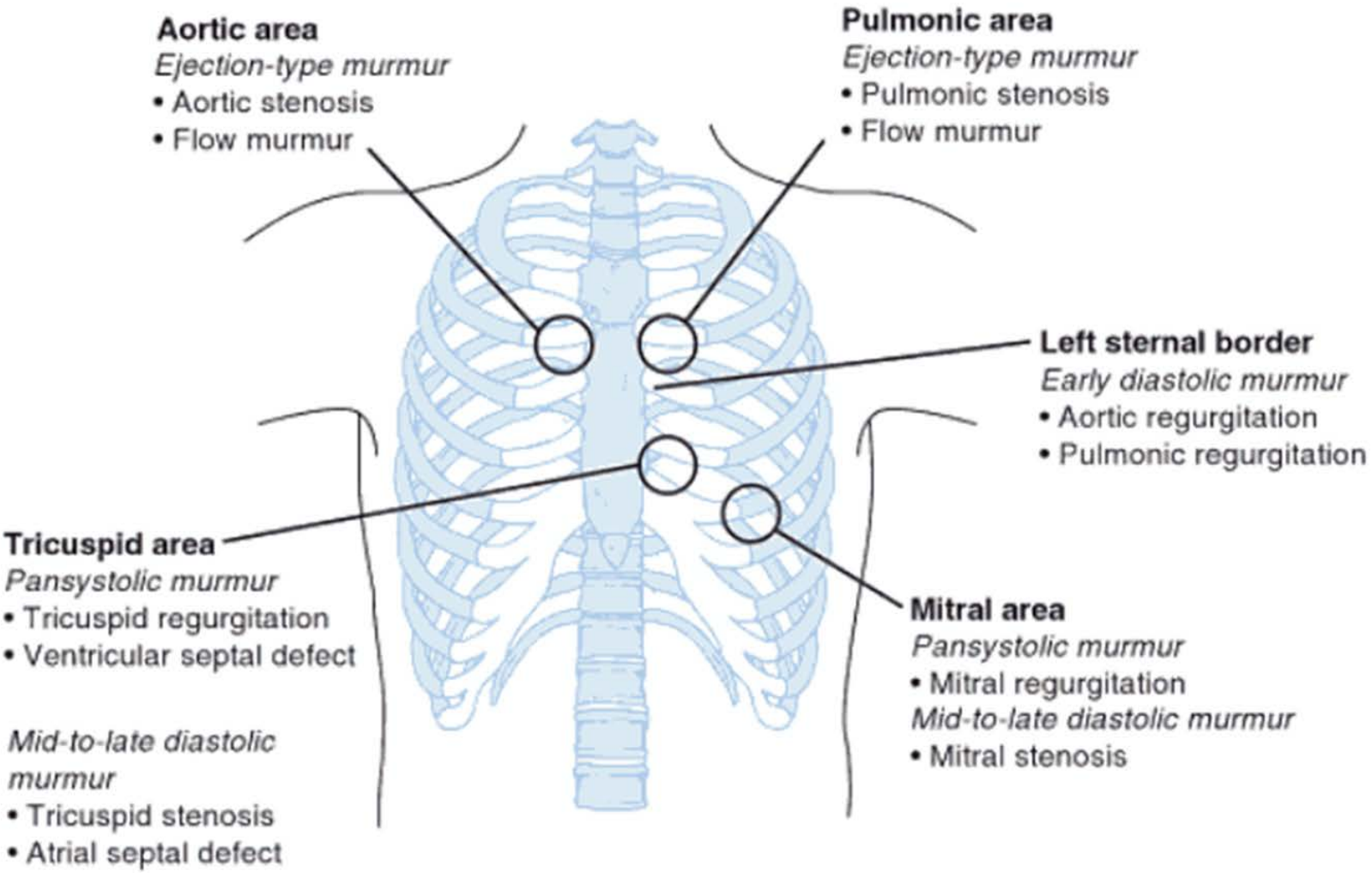
Diastolic murmur

- **Early diastolic murmur**
  - -Aortic regurgitation
  - -Pulmonary regurgitation
- **Mid diastolic/Late diastolic murmur**
  - -Mitral stenosis
  - -Tricuspid stenosis
  - -Austin flint murmur

Continuous murmur

- **Patent ductus arteriosus**

TYPES OF MURMUR



TYPES OF MURMUR

- Benign Murmur

- Serious Murmur

BENIGN MURMUR

- The most common cause of mid systolic murmurs are **benign (innocent) flow murmurs**.
- Systolic murmur is present in up to **60 percent** of patients, with **90 percent** being associated with a **normal echocardiogram.**

BENIGN MURMUR

Results from flow in the normal LV or RV outflow tract and always end well before semilunar valve closure

Occurs without the evidence of physiologic or structural abnormalities in CVS

When peak velocity in early systole exceeds the murmur threshold.

BENIGN MURMUR

Always systolic ejection murmur

Grade is less then III

Intensity vary considerably from examination to examination, with body position, level of physical activity.

No radiation to carotid arteries or axillae

No associated thrill

BENIGN MURMUR

Children : **30% - 50%** of all children(3-8 years of age)

- **Cause** : Originates from **flow in the LV outflow tract.**
- **Type** : Vibratory (still) **systolic murmur**
- **Quality** : Groaning, croaking, buzzing or twanging.
- **Location**: **Left** sternal border at **3rd 4th ICS**
- **Supraclavicular arterial murmur or bruit is common finding which tend to be louder on right above the clavicles. Often heard bilaterally.**

BENIGN MURMUR

Adolescents, Young Adults:

- **Cause** : Flow in the **normal RV outflow tract**
- **Type** **:** Innocent **pulmonic systolic** murmurs
- **Quality** : Low to medium in pitch with **blowing** quality
- **Location** : **2nd left** ICS (Pulmonic area)
- **Radiation**: Along **left** sternal border.

BENIGN MURMUR

Adult: (>50 years)

- **Cause** : Flow in the **LV outflow tract**
- **Type** : Innocent **systolic** murmurs
- **Quality** : **Higher frequency with musical quality**
- **Location** : **Loudest at apex.**
- Associated with tortuous dilated sclerotic root, in setting of systolic hypertension.
- Mild sclerosis of the aortic valve can be present

FUNCTIONAL SYSTOLIC EJECTION MURMUR

Produced by high cardiac output states

Flow related

Associated with altered physiologic state

Excluded from the category of innocent murmurs

FUNCTIONAL SYSTOLIC EJECTION MURMUR

- **Intensity: Often grade III,occasionally grade IV**
- **Type : Mid systolic murmur**
- **Location : Pulmonic**

(Pulmonic mid systolic murmur is present in over 80 percent of normal pregnant women)

FUNCTIONAL SYSTOLIC EJECTION MURMUR

Pure Aortic regurgitation

An ejection mid-systolic murmur may result from **markedly increased flow** across the aortic valve

Not considered evidence for aortic stenosis in the absence of other findings.

Atrial septal defect with left to right shunting

An ejection mid-systolic murmur resulting from **increased flow** across the pulmonic valve

Not indicate associated pulmonic stenosis.

BENIGN Vs SERIOUS MURMURS

- Physiologic murmurs need to be distinguished from the **serious** mid systolic murmur in patients with fixed or dynamic outflow tract obstruction.

BENIGN Vs SERIOUS MURMURS

- The "**innocence**" of systolic murmur should **not** depend upon the duration or intensity of the murmur, but on the **absence** of other abnormal findings.
- Even a short grade I-II/VI ejection mid-systolic murmur **may not** be **innocent** if there are coexisting findings such as an abnormal S2.

BENIGN Vs SERIOUS MURMURS

BENIGN MURMURS

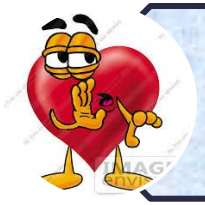
- Systolic
- Soft or vibratory
- Grade I-II / VI
- Normal S1, S2
- No extra sounds
- Louder supine

SERIOUS MURMURS

- Diastolic/ Systolic
- May be Harsh
- Grade> III / VI
- Abnormal split S2
- Extra sounds ‘click’
- Louder with standing

WHEN TO SUSPECT SERIOUS MURMUR ?

Patients with **cardiac symptoms and any cardiac murmur.**



Asymptomatic patients with a **diastolic murmur**.

Grade 3 or greater systolic murmur.

Systolic murmur in association with other abnormal exam findings, such as **a systolic click or reduced carotid upstroke.**

SUMMARY

- Majority of heart murmurs are **mid systolic** and **soft.**
- When such murmurs occur in an asymptomatic child or young adult without other evidence of heart disease on clinical examination it is usually benign and **echocardiography is NOT required**.

SUMMARY

Conversely echocardiographic examination is indicated:

- Patients with **loud systolic murmurs**, specially when they are holosystolic or late systolic murmur,
- Patient with **diastolic** or **continuous** murmur and
- Patients with **unexplained** physical findings on cardiac examination.

SUMMARY

- So **identification** of murmur whether **benign** or **serious** is very important because optimal management of heart should be initiated before the patient having symptoms.

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