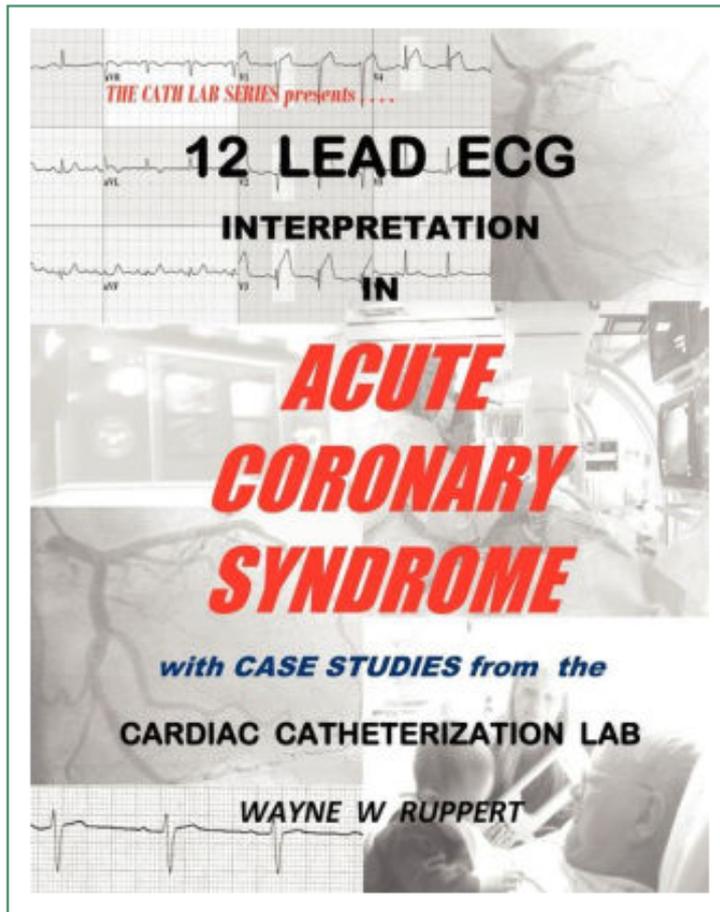


# A Brief Overview of Heart Sounds - an excerpt from the textbook:



## 12 Lead Ecg Interpretation In Acute Coronary Syndrome With Case Studies From The Cardiac Catheterization Lab

by Wayne W Ruppert

★★★★★ 4.7 (3)

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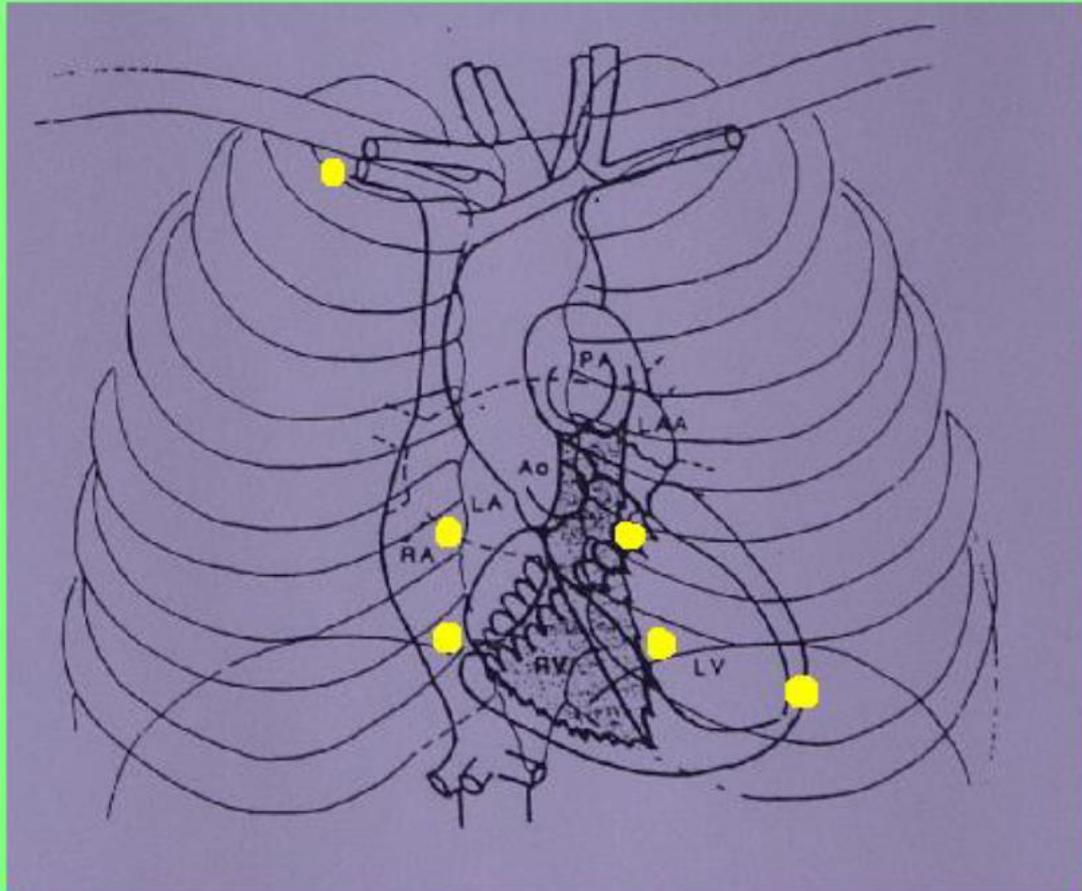
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# HEART SOUNDS ASSESSMENT



# HEART SOUNDS ASSESSMENT



**VERY**

# BASIC HEART SOUNDS ASSESSMENT

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- ❑ **Normal Heart Sounds**
- ❑ **Murmurs**
  - systolic
  - diastolic
- ❑ **Friction Rubs**



SCOTT DAVIDSON, RN auscultating heart sounds at St. Joseph's Hospital Heart Institute Tampa, FL

# HEART SOUNDS ASSESSMENT

HEART SOUNDS ARE GENERATED BY THE SOUND OF THE HEART VALVES CLOSING.

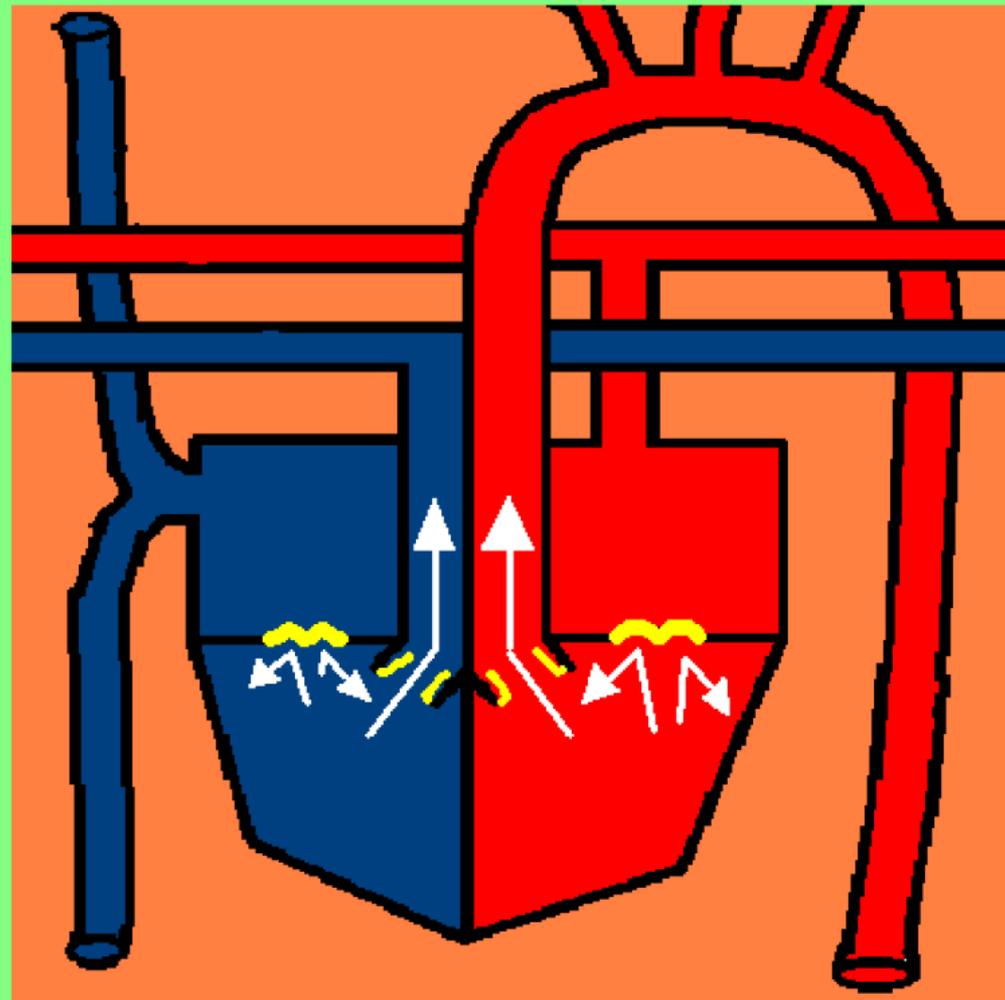
THERE ARE TWO NORMAL HEART SOUNDS,  
KNOWN AS: S-1 and S-2

WE OFTEN DESCRIBE THESE HEART SOUNDS  
AS "LUB - DUP"

# HEART SOUNDS ASSESSMENT

**S-1  
BEGINNING  
OF  
SYSTOLE.**

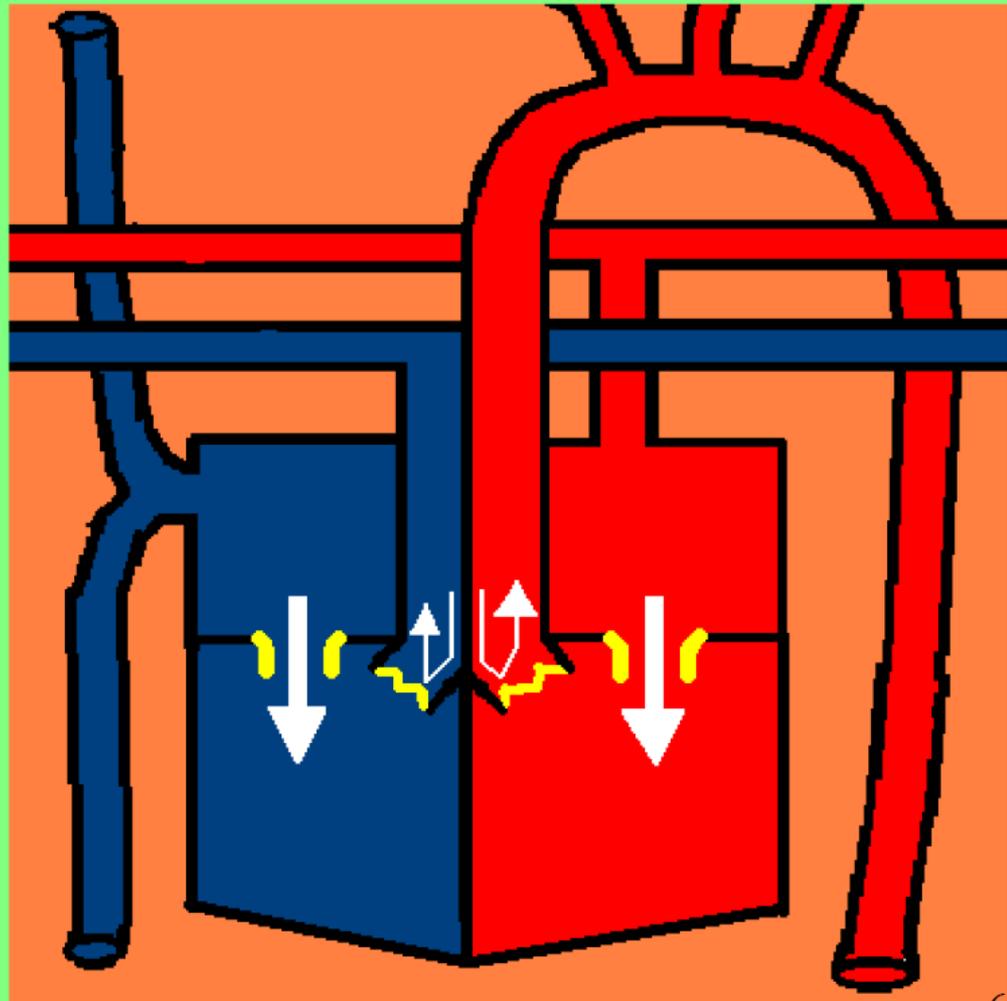
**SOUND OF  
THE  
MITRAL  
AND  
TRICUSPID  
VALVES  
CLOSING.**



# HEART SOUNDS ASSESSMENT

S-2 OCCURS  
AT THE END  
OF SYSTOLE  
(THE BEGINNING  
OF DIASTOLE).

IT IS THE  
SOUND OF THE  
AORTIC AND  
PULMONARY  
VALVES  
CLOSING.



**MURMUR = "SWOOSH"  
SOUND CAUSED BY THE  
SOUND OF TURBULENCE.**

**S-1 MURMUR SOUNDS LIKE:**

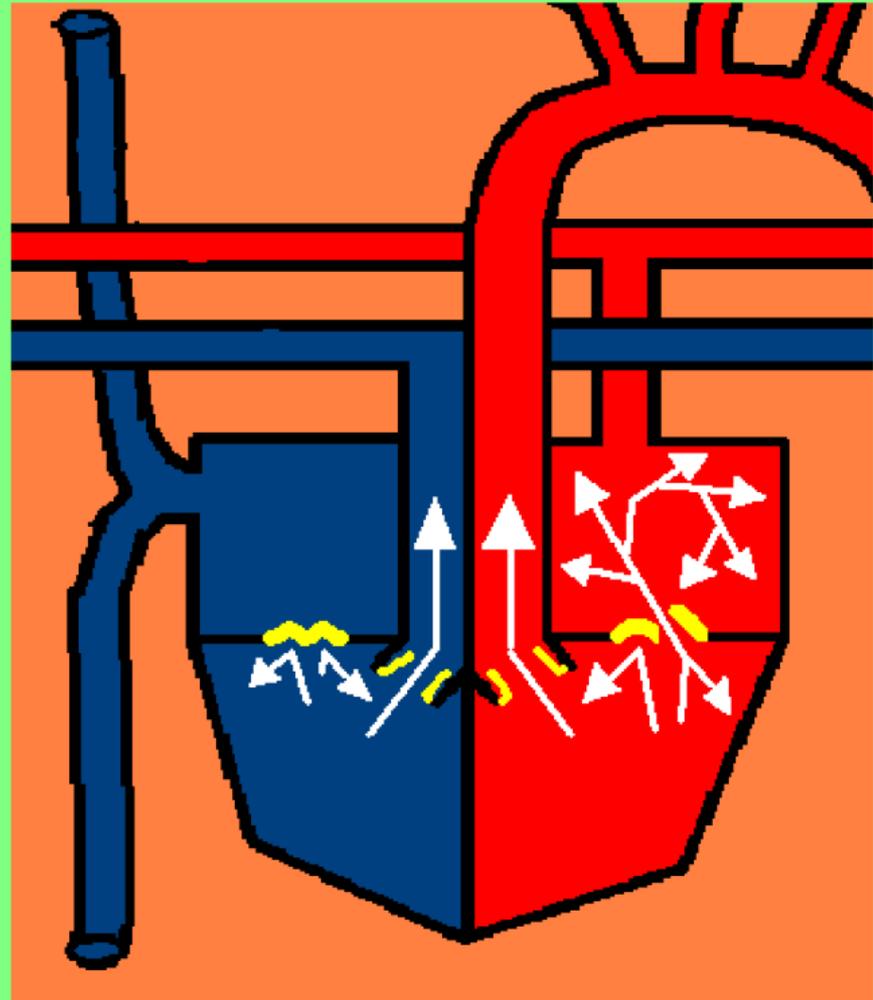
**"SWOOSH-DUB . . . . SWOOSH-  
DUB . . . . SWOOSH-DUB . . . .  
SWOOSH-DUB . . . ."**



# CAUSE OF SYSTOLIC (S 1) MURMUR

---

- ❑ **DAMAGE TO MITRAL and/or TRICUSPID VALVE(S)**
- ❑ **CAUSES REGURGITATION**



❑ **MOST SYSTOLIC MURMURS  
CAUSED BY MITRAL VALVE  
FAILURE.**



**ACUTE MITRAL VALVE  
REGURGITATION IS A  
POTENTIALLY LETHAL  
COMPLICATION OF  
ACUTE / RECENT  
EXTENSIVE TRANSMURAL MI**

**ACUTE MITRAL VALVE RUPTURE USUALLY OCCURS 7-10 DAYS POST  
EXTENSIVE MI (e.g.: INFERIOR POSTERIOR LATERAL MI).**

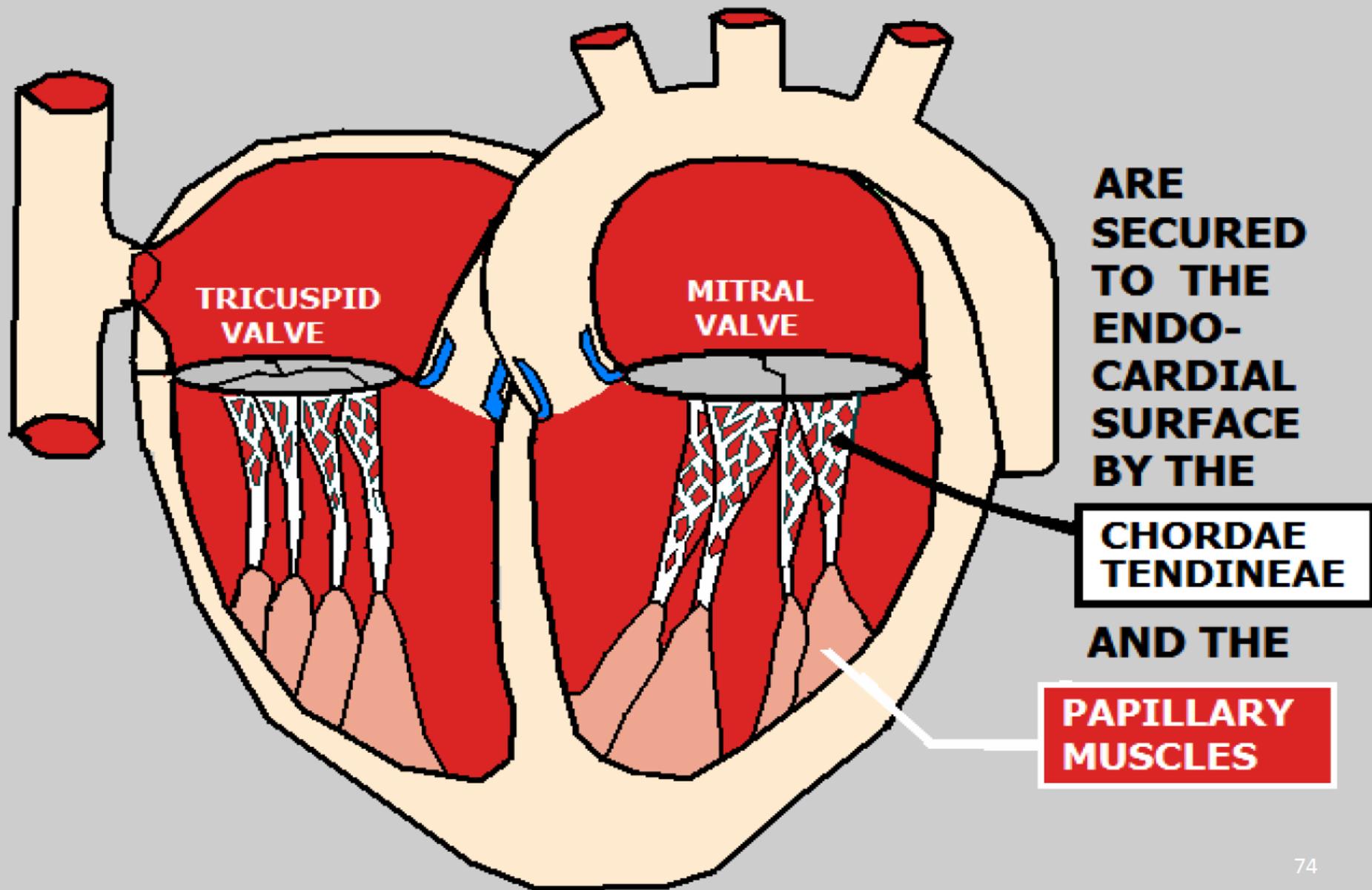
**ACUTE Mitral Valve  
REGURGITATION can be caused by  
EXTENSIVE “Multi-Site” Myocardial  
Infarction and Necrosis – which  
results in PAPILLARY MUSCLE  
NECROSIS and PAPILLARY  
MUSCLE TEAR.**

**Papillary muscles are attached to  
“multiple surfaces” . . . . .**

# **A Common Cause of ACUTE MITRAL REGURGITATION is:**

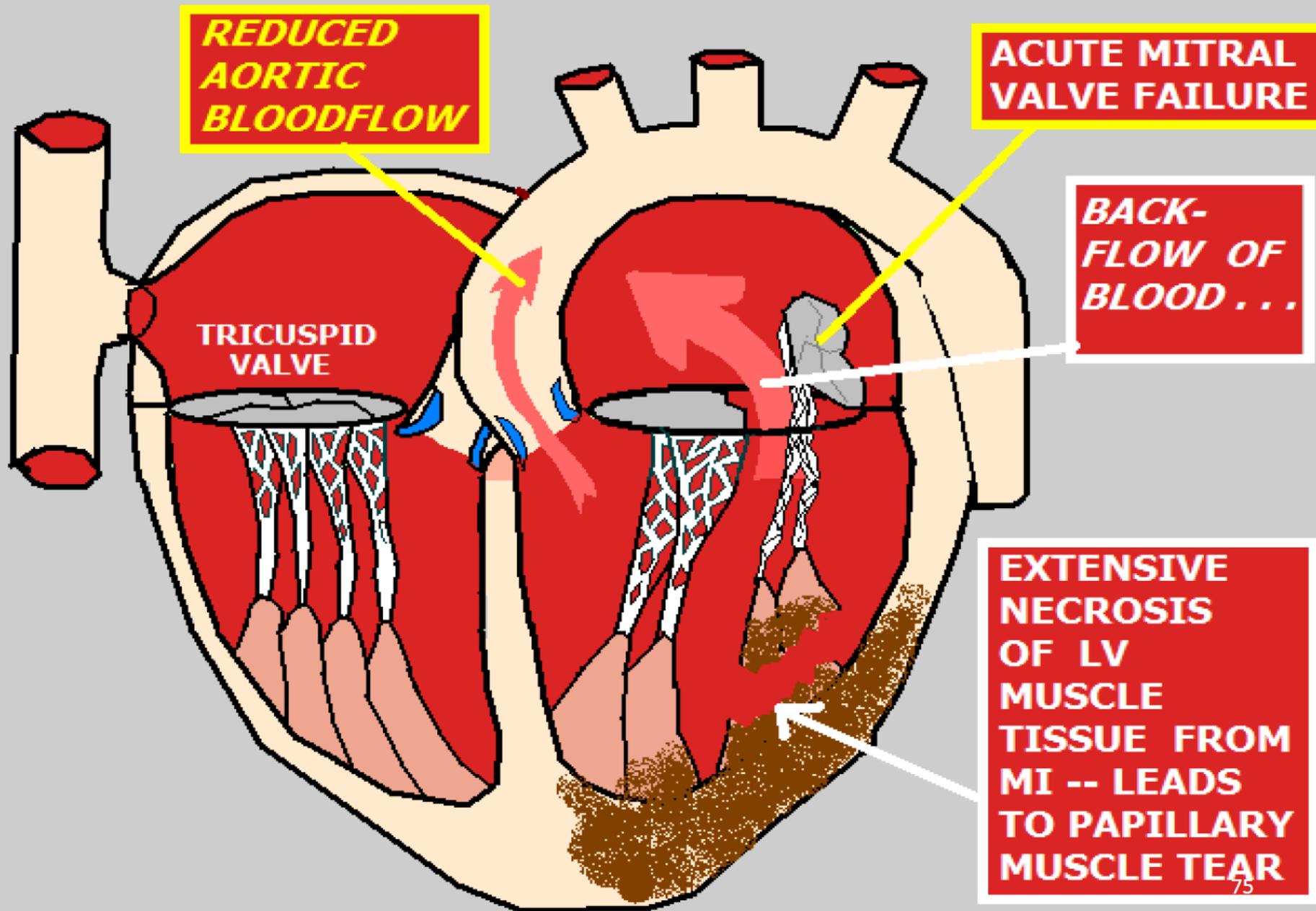
**“Patients who are 7-10 days POST-EXTENSIVE MI,” in cases where the “zone of infarction” is large (e.g. “inferior-posterior-lateral”) and there was a delay in PCI resulting in large zone of necrosis.**

# ATRIO-VENTRICULAR VALVES



# ACUTE MITRAL REGURGITATION

DURING VENTRICULAR SYSTOLE



# Symptoms of Acute Mitral Regurgitation

- SHOCK
- PROFOUND HYPOTENSION
- PINK, FROTHY SPUTUM
- PULMONARY EDEMA
- SYSTOLIC (S1) MURMUR

*“SWOOSH – DUB.....SWOOSH – DUB.....SWOOSH – DUB...”*

# BASIC HEART SOUNDS ASSESSMENT

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**MURMUR = "SWOOSH"  
SOUND CAUSED BY THE  
SOUND OF TURBULENCE.**



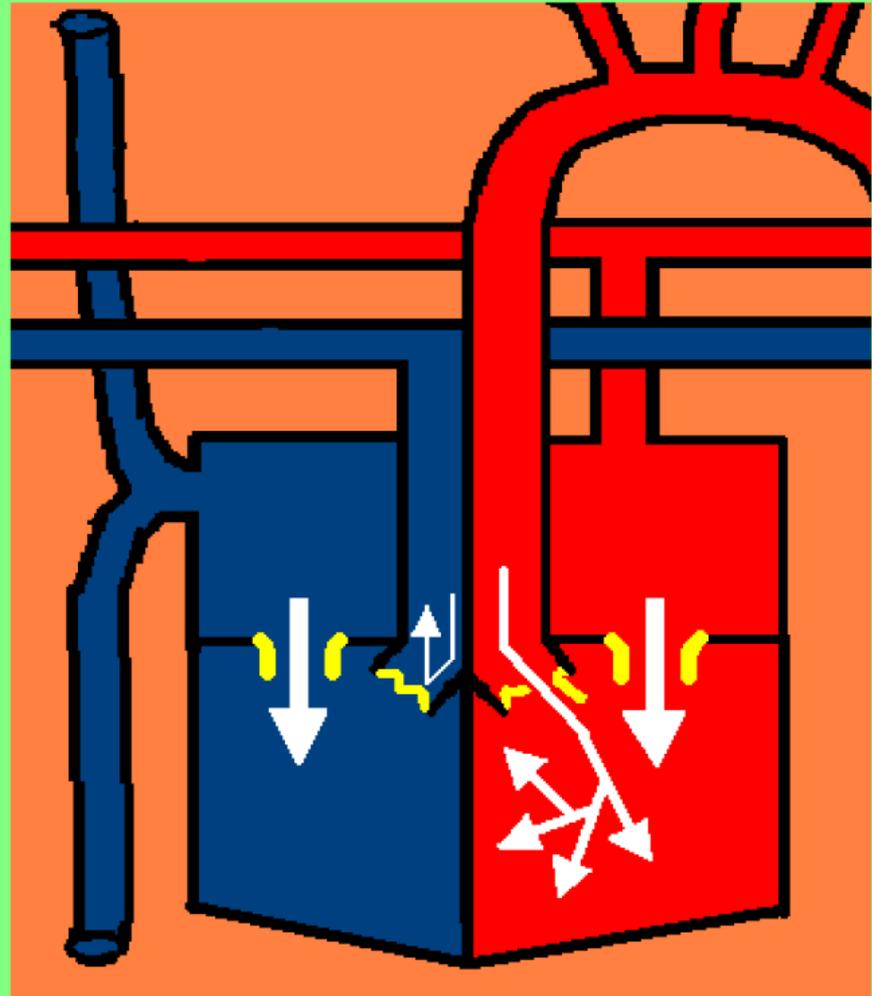
**S-2 MURMUR SOUNDS LIKE:**

**"LUB-SWOOSH . . . . LUB-SWOOSH  
. . . .LUB-SWOOSH . . . . LUB-  
SWOOSH . . . ."**

# CAUSE OF DIASTOLIC ( $S_2$ ) MURMUR

---

- ❑ **DAMAGE TO AORTIC and/or PULMONIC VALVE(S)**
- ❑ **CAUSES REGURGITATION**



Chronic **Valvular REGURGITATION**

(Leaky Valve) leads to elevated heart chamber pressures and DILITATION.

Chronic **Valvular STENOSIS** (“Creaky” Valve) leads to Cardiac Muscle STRAIN and HYPERTROPHY.

BOTH conditions, if untreated, eventually leads to **HEART FAILURE.**

# Heart Sounds: S<sub>3</sub>

- S<sub>3</sub> sounds like: “kenTUCky . . . kenTUCky”
- Caused by: increased atrial pressure.
- S<sub>3</sub> is associated with: **Heart Failure, Dilated Cardiomyopathy.**

# Heart Sounds: S<sub>4</sub>

- S<sub>4</sub> sounds like: “TENnessee. . . TENnessee”
- Caused by: stiffened left ventricle.
- S<sub>4</sub> is associated with: **Hypertension, Aortic Stenosis, Ischemic or Hypertrophic Cardiomyopathy.**

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[Heart Sound Simulator](#)