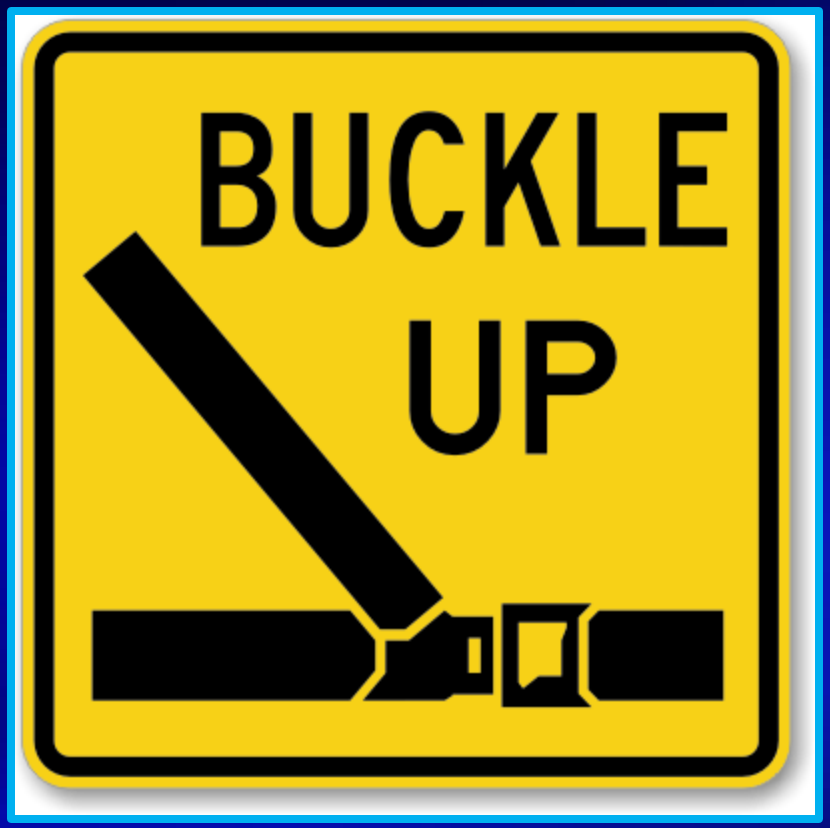
TOP 10 TAKEAWAYS…

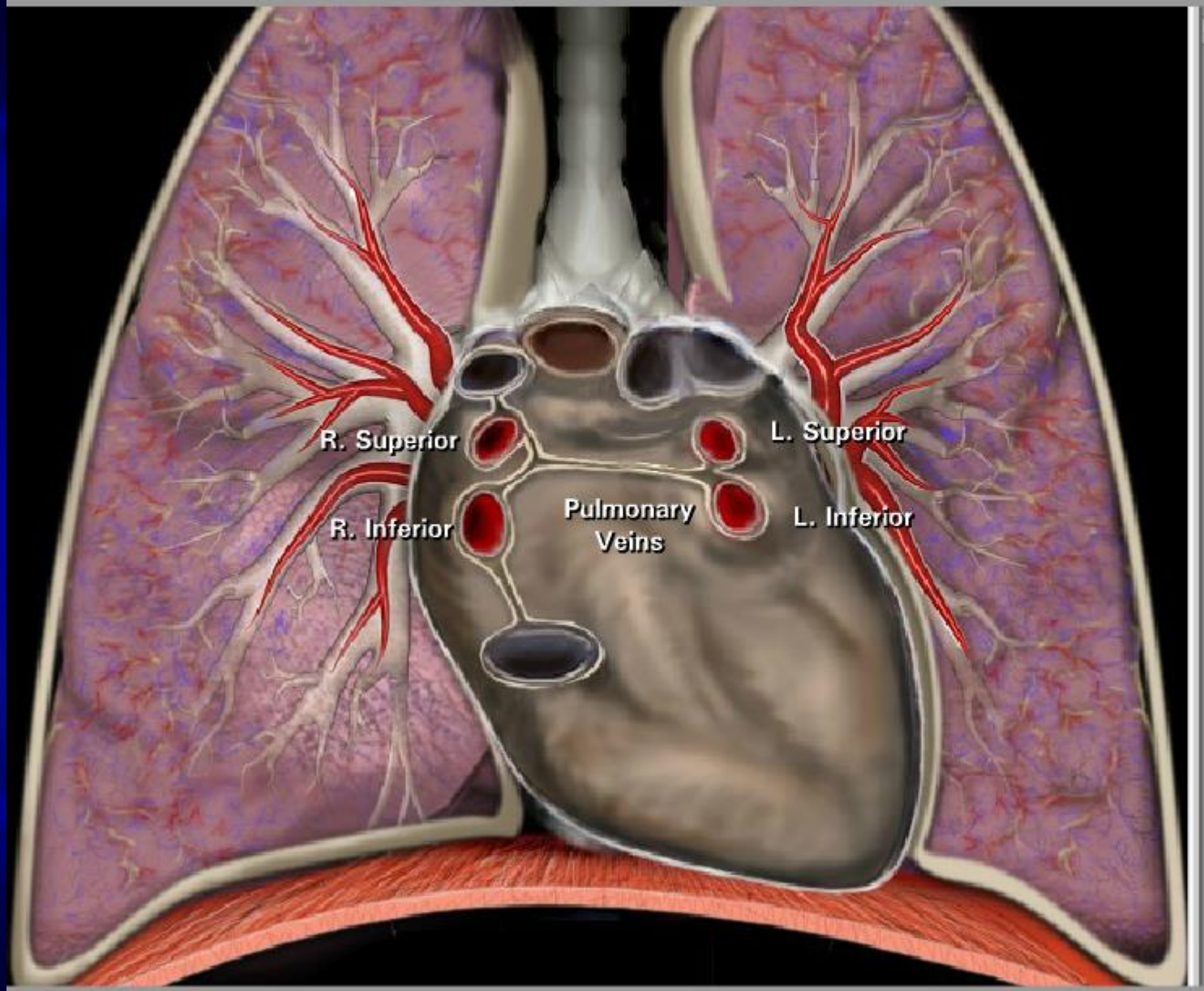


Jane A. Linderbaum MS, APRN, CNP, AACC
Assistant Professor of Medicine
Department of cardiovascular disease

No Disclosures
No off-label discussions

73% of survey respondents identified a need for improved knowledge of CV pathophysiology

#10 CARDIAC CIRCULATION, KNOW IT AND LOVE IT



- Pulmonary veins
- Left atrium
- Left ventricle
- Aorta
- Right Atrium
- Right ventricle
- Pulmonary arteries
- Ribs

Roll over image to resume animation.

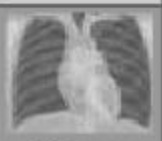
Left Heart

Right Heart

Entire Heart

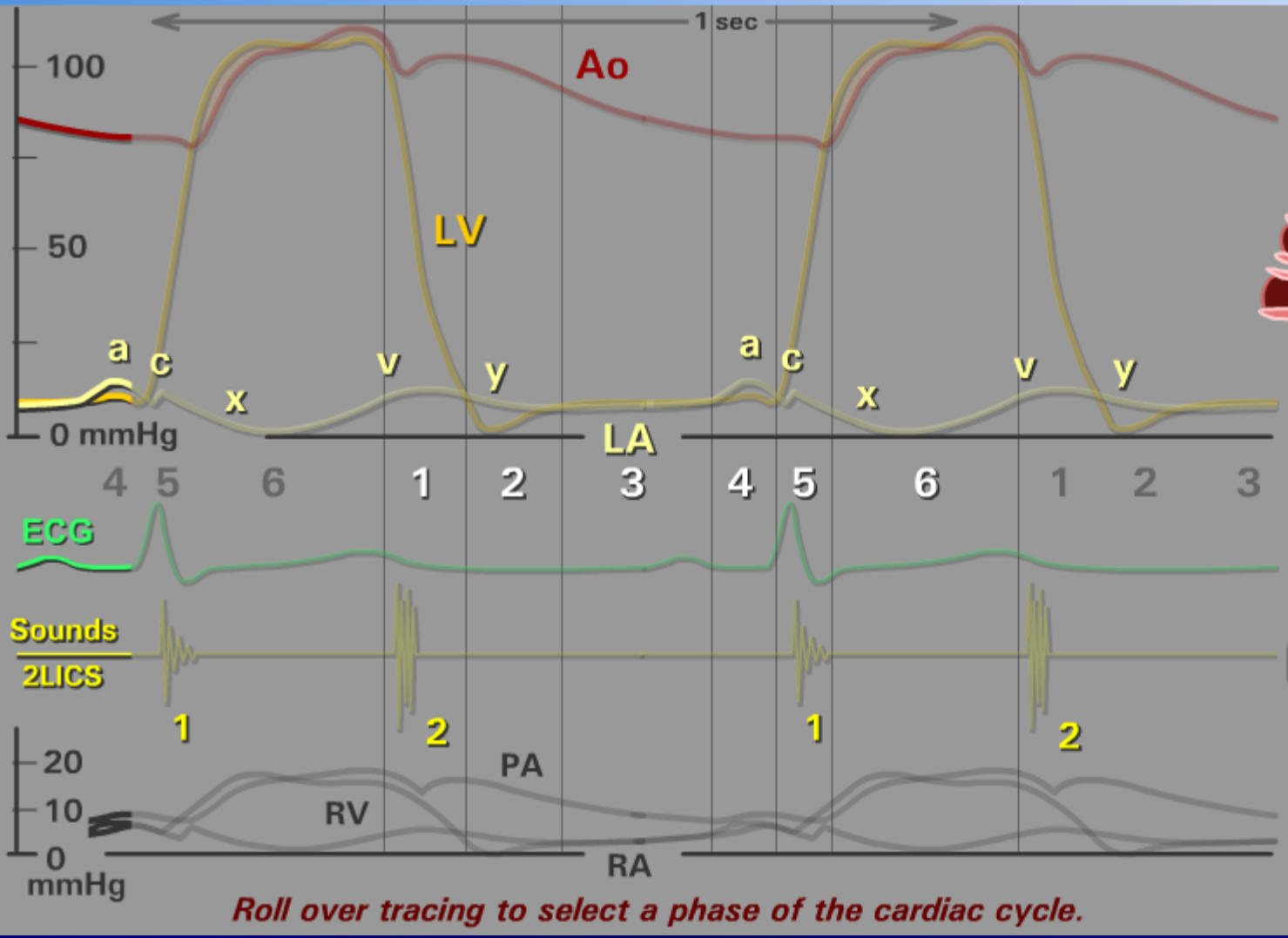
Active View

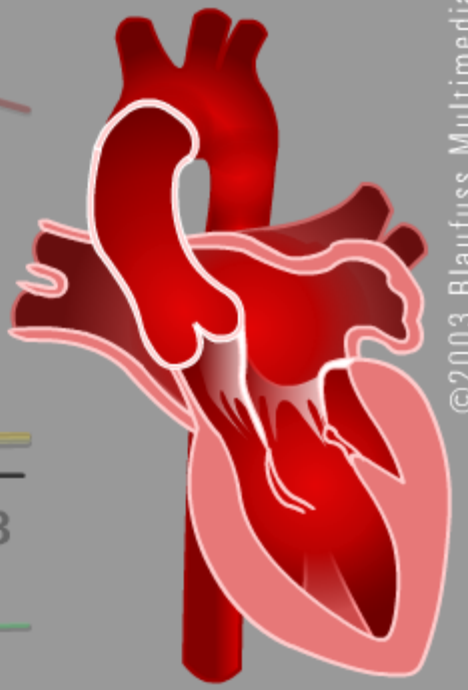
Cartoon



X-Ray

Phases of the Cardiac Cycle





Step

Roll over tracing to select a phase of the cardiac cycle.

The heart sounds

- S1

  Mitral (and tricuspid) valve closure

  Soft if poor EF, loud if good EF

- S2

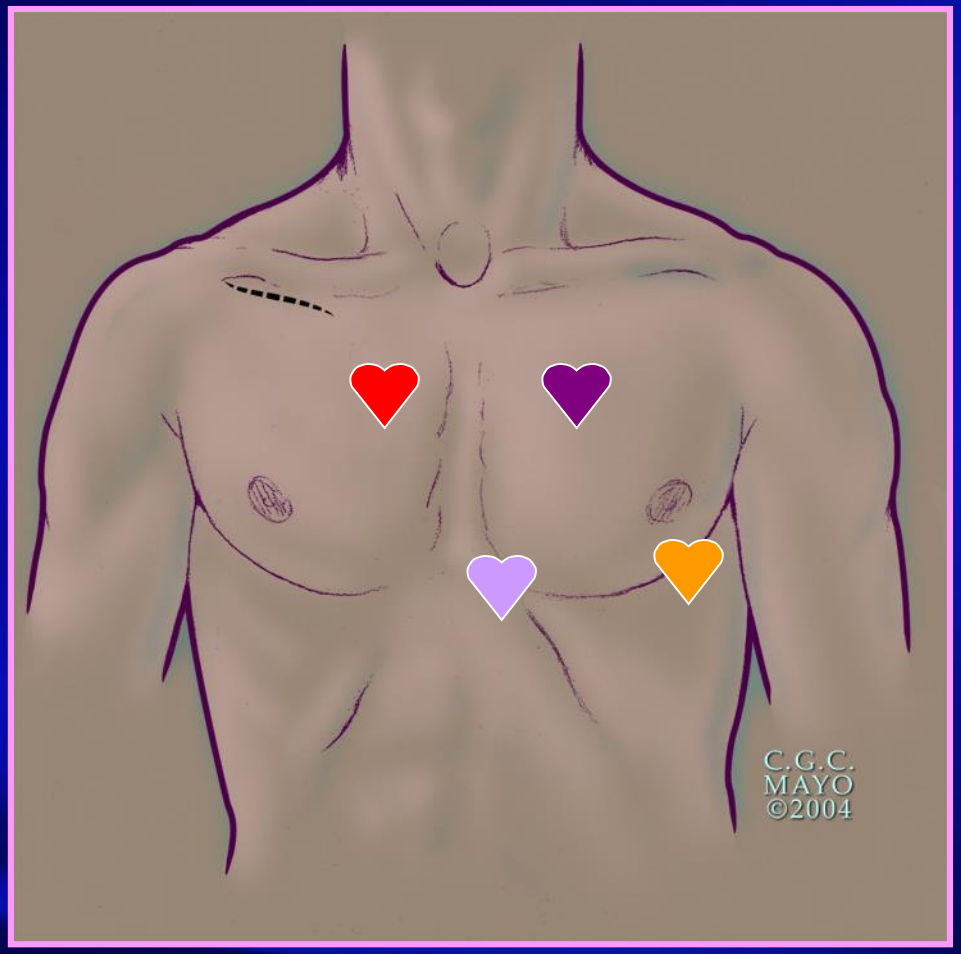
  Aortic and pulmonary valve closure

  Loud if ↑ aortic (pulm) pressure

- S3 – means "restrictive" filling
- S4 – means "abnormal" filling

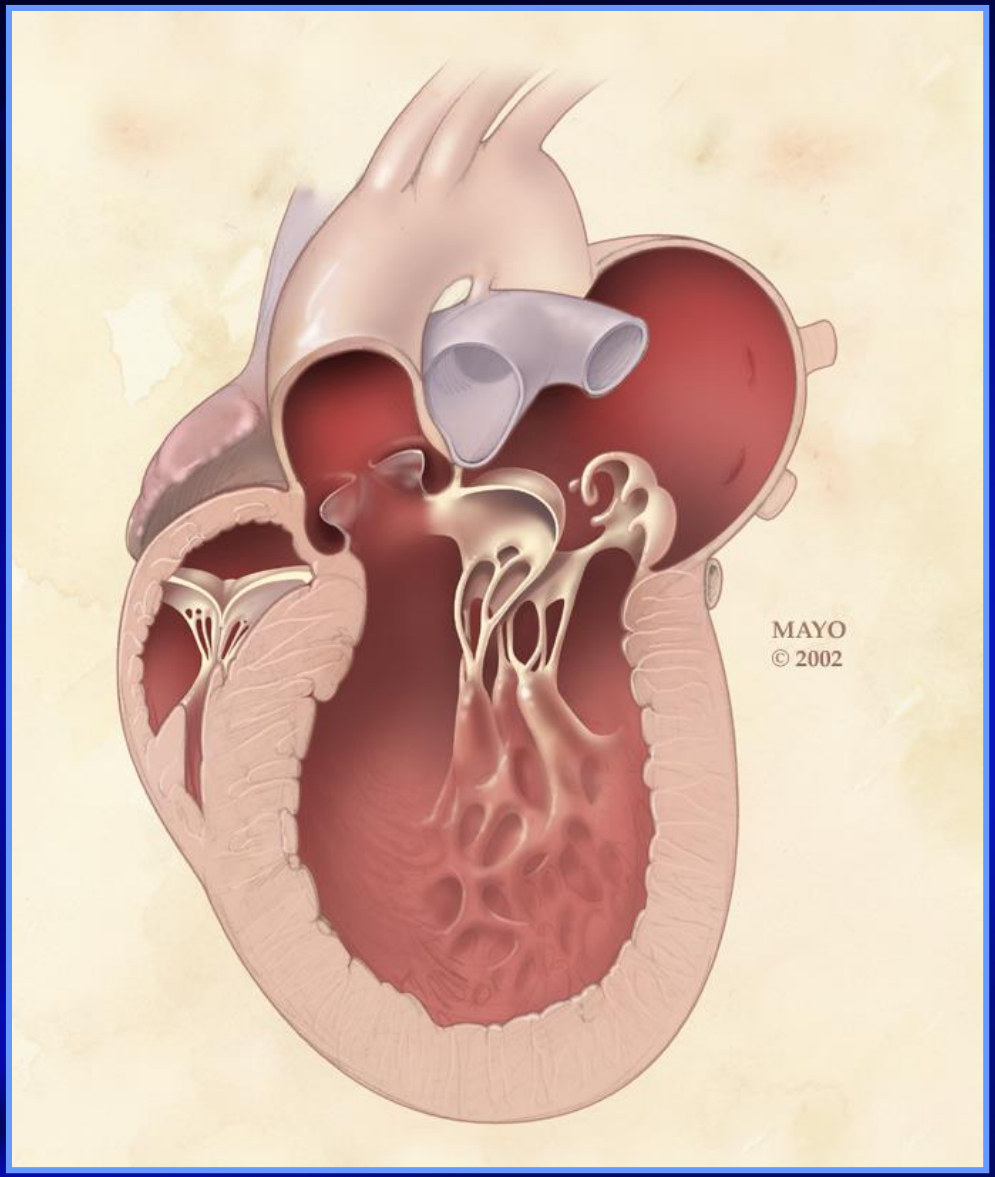
Listening Posts for Auscultation

- AV – 2nd RICS
- PV – 2nd LICS
- MV – 5-6th LICS @ the apex
- TV – 5-6th LICS parasternal



83% of survey respondents identified themselves as early career in clinic/hospital consult practices

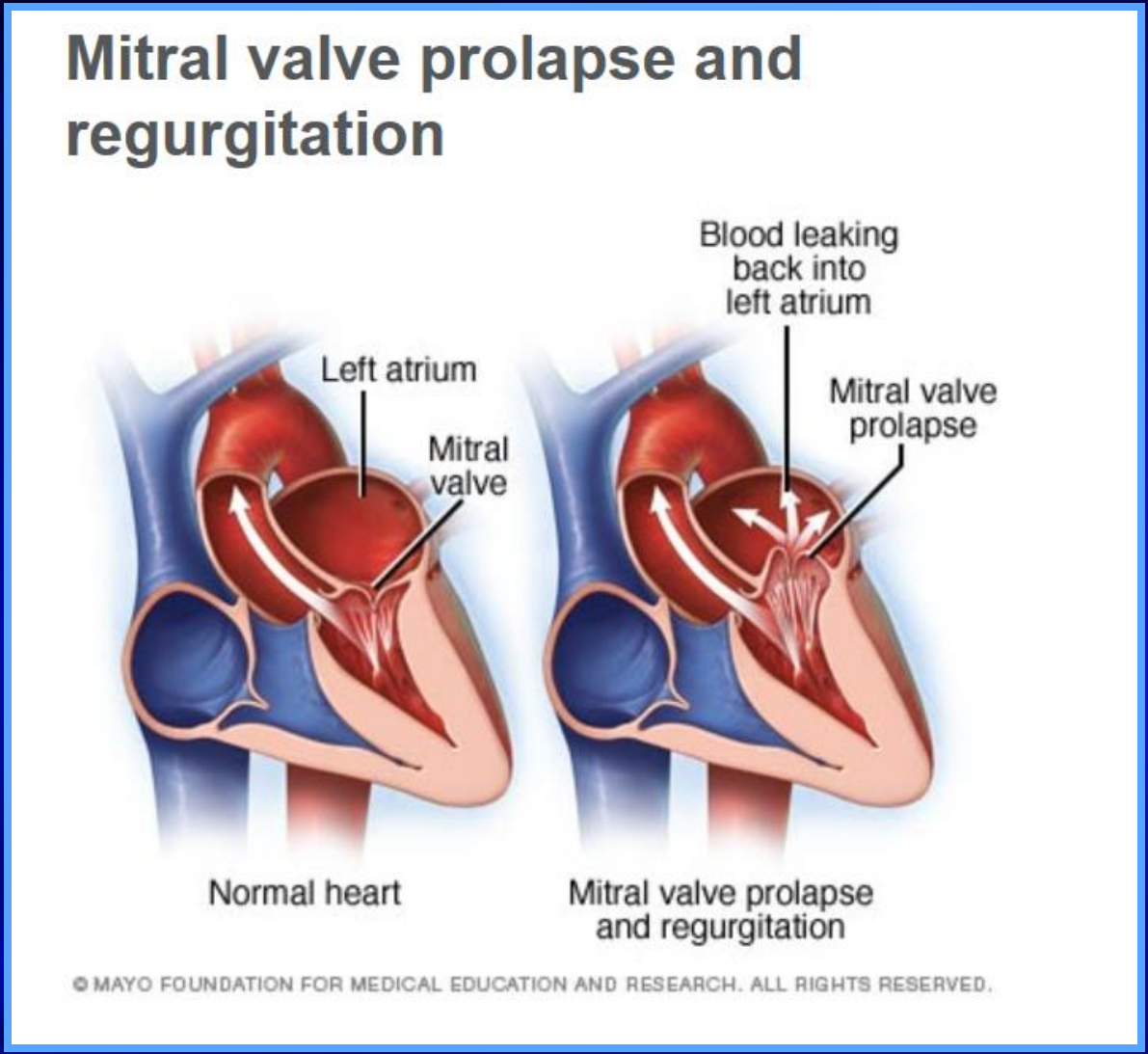
9 COMMON SYSTOLIC MURMURS YOU WILL DIAGNOSE AND MANAGE



MITRAL REGURGITATION

MR Treatment

- Treat underlying conditions
- Consider MV repair when possible at experienced center
- Consider MV replacement before ventricle dilates and/or function decreases

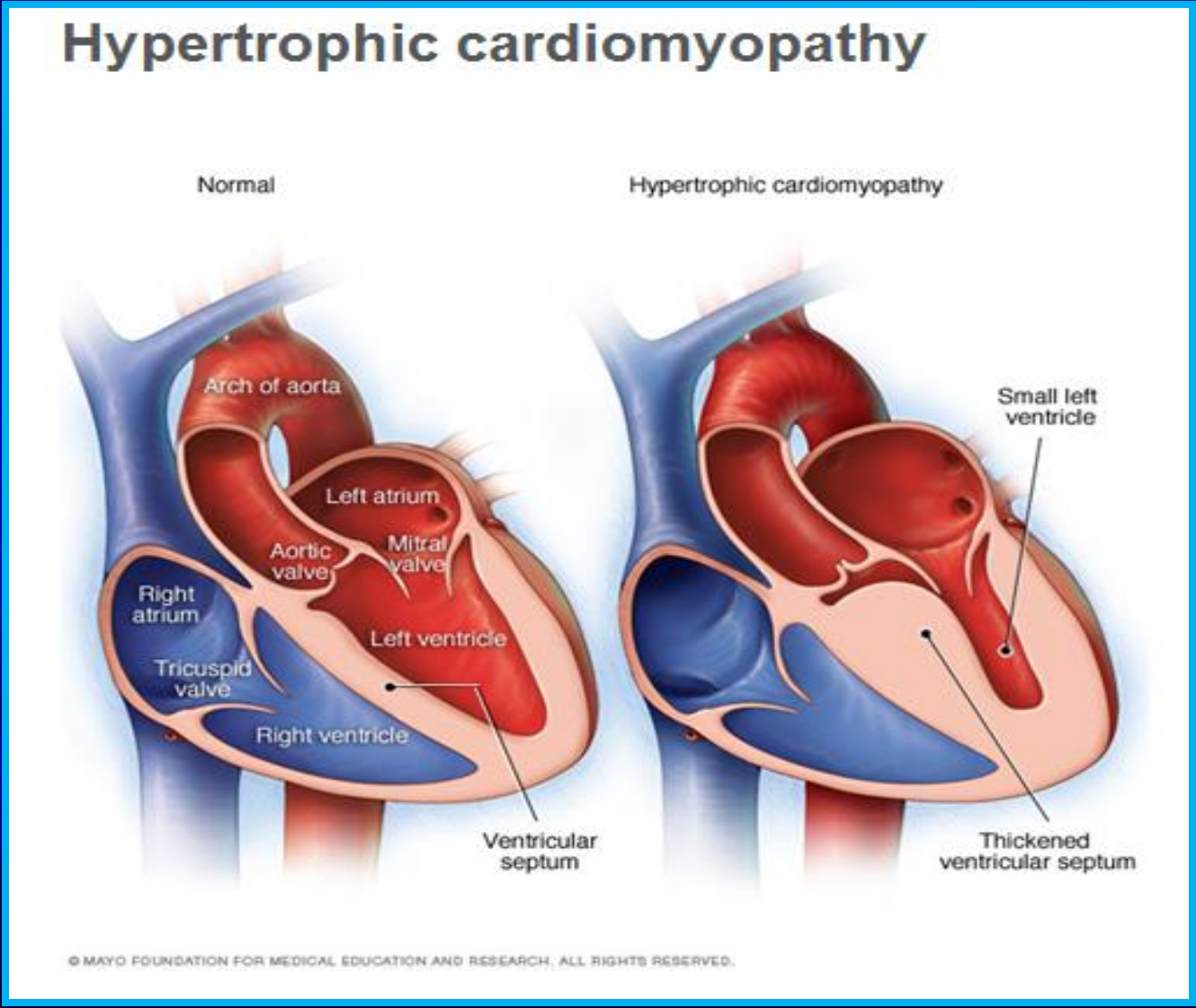


MITRAL VALVE PROLAPSE

Mitral Valve Prolapse Pearls

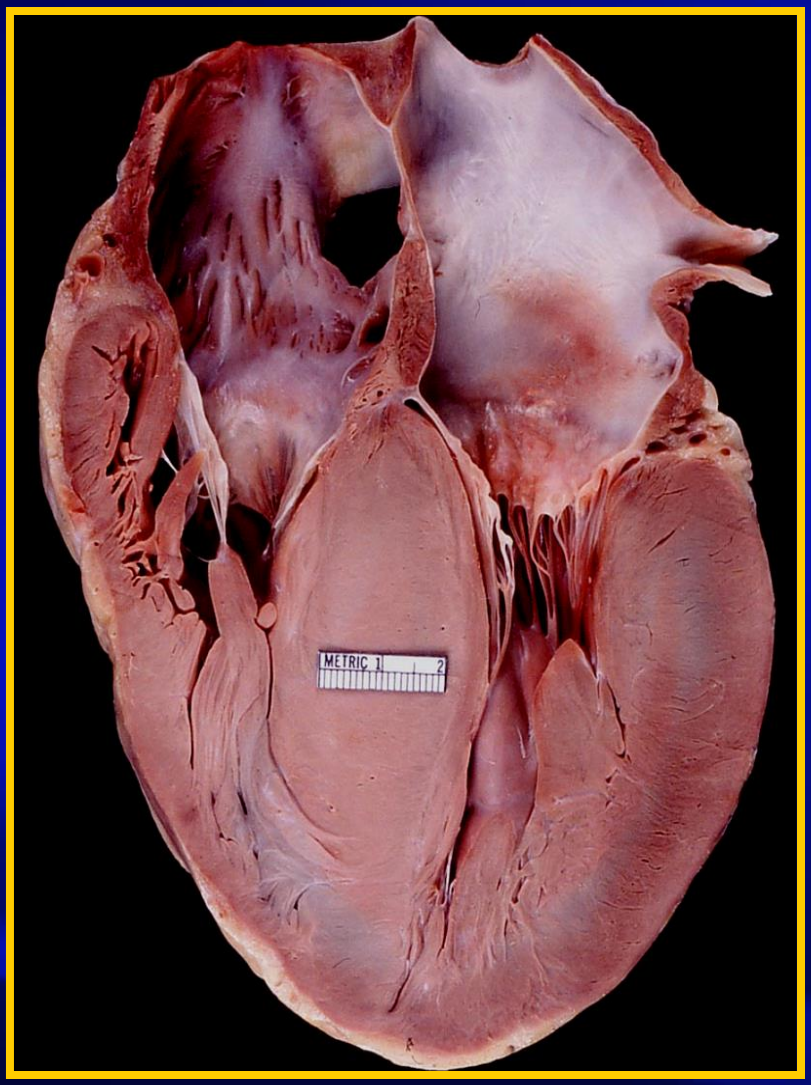
- **CHANGE** in Murmur (from click-murmur or isolated late sys murmur to holosystolic without audible click)
- Skeletal deformities in up to 50%
- Upright posture enhances auscultation of the mid-late systolic murmur
- May develop severe MR, **refer** for additional testing as patient may be candidate for mitral valve repair
- Murmur may **INCREASE** with Valsalva
- Typically do not require SBE prophylaxis

Hypertrophic Cardiomyopathy

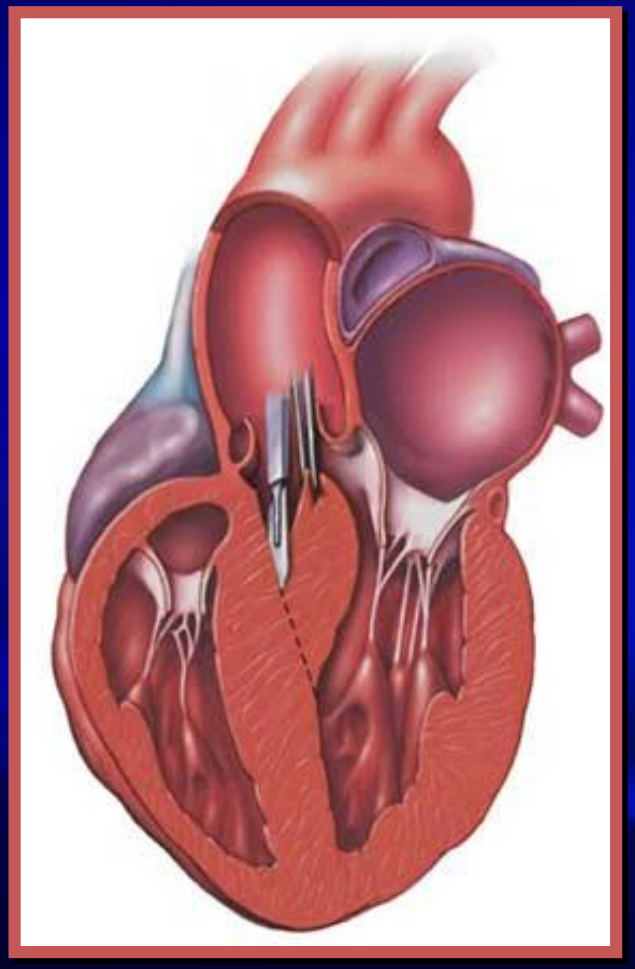


Hypertrophic Cardiomyopathy

- Vigorous LV apical impulse – sustained
- Systolic Murmur INCREASES with Valsalva
- S4 often present
- Dyspnea, angina, palpitation, syncope



Septal Reduction Therapy



Septal Myectomy

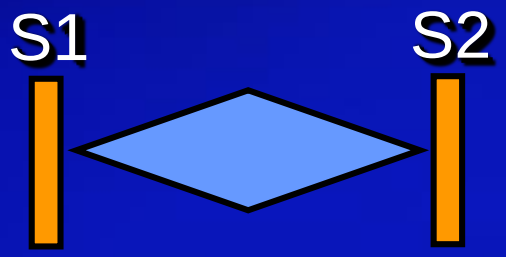
Summary for HCM

- Dynamic condition, load dependent
  - Dynamic auscultation
  - Provocative maneuvers
  - Valsalva-separate AS from HOCM
- Sx similar to AS
- "Triple ripple" Precordial exam
- "Bifid" Carotid
- Treat symptoms, prevent SCD

Innocent/Functional Murmur Defined by PE

Short duration, soft murmur

- ≤ grade 2 intensity
- Right sternal border
- Systolic ejection pattern
- No increase in intensity with Valsalva

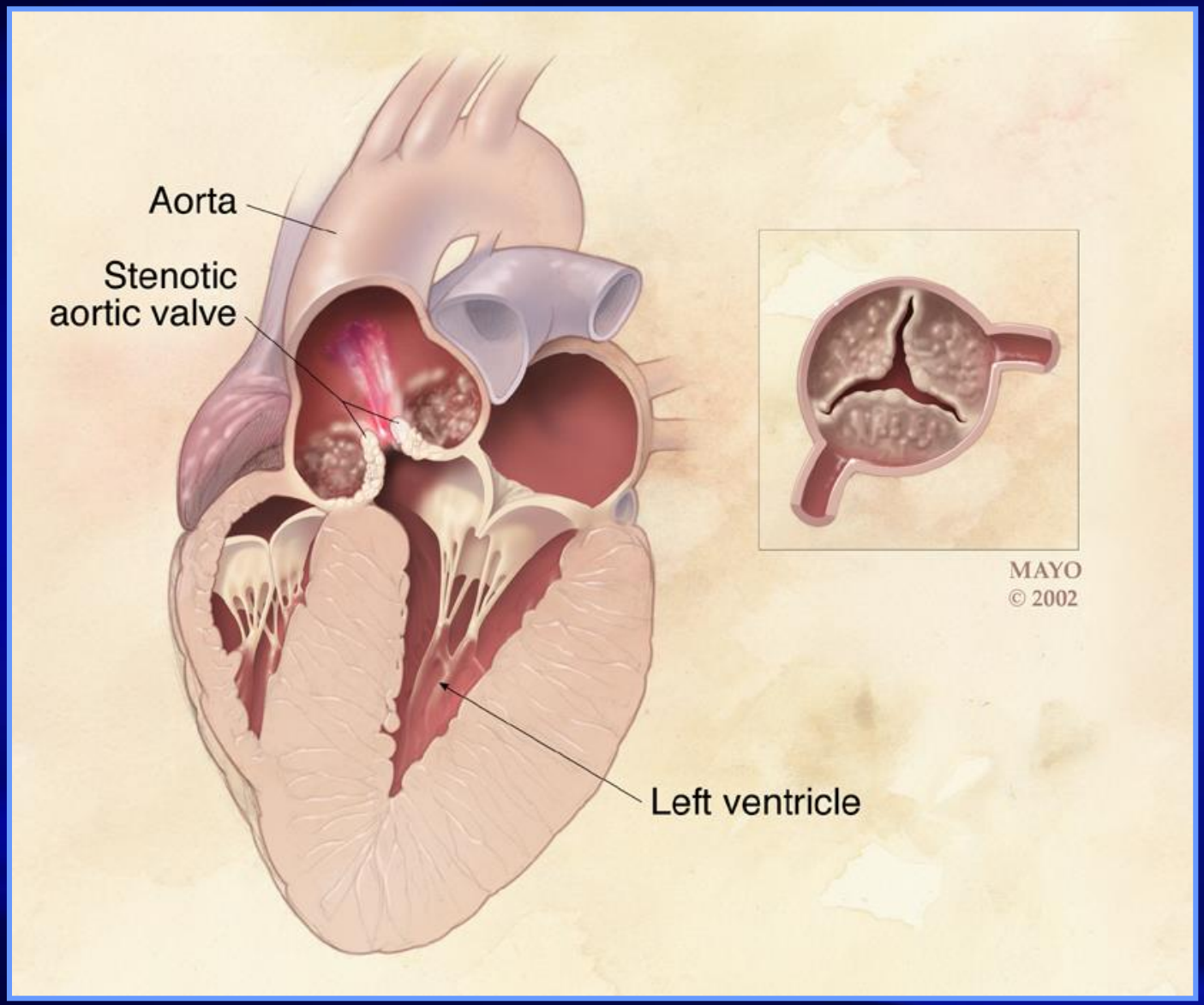


Normal S_2

No other abnormal sounds

No LV enlargement on exam or LVH (ECG)

Aortic Stenosis



Valvular Stenosis
Severity of Aortic Stenosis

	Peak velocity	Mean gradient	AVA
Progressive	< 4 m/s	< 40	> 1.0
Severe	≥ 4m/s	≥40	≤1.0
Very Severe	> 5m/s	> 60	

Valvular Stenosis
Indication for AVR

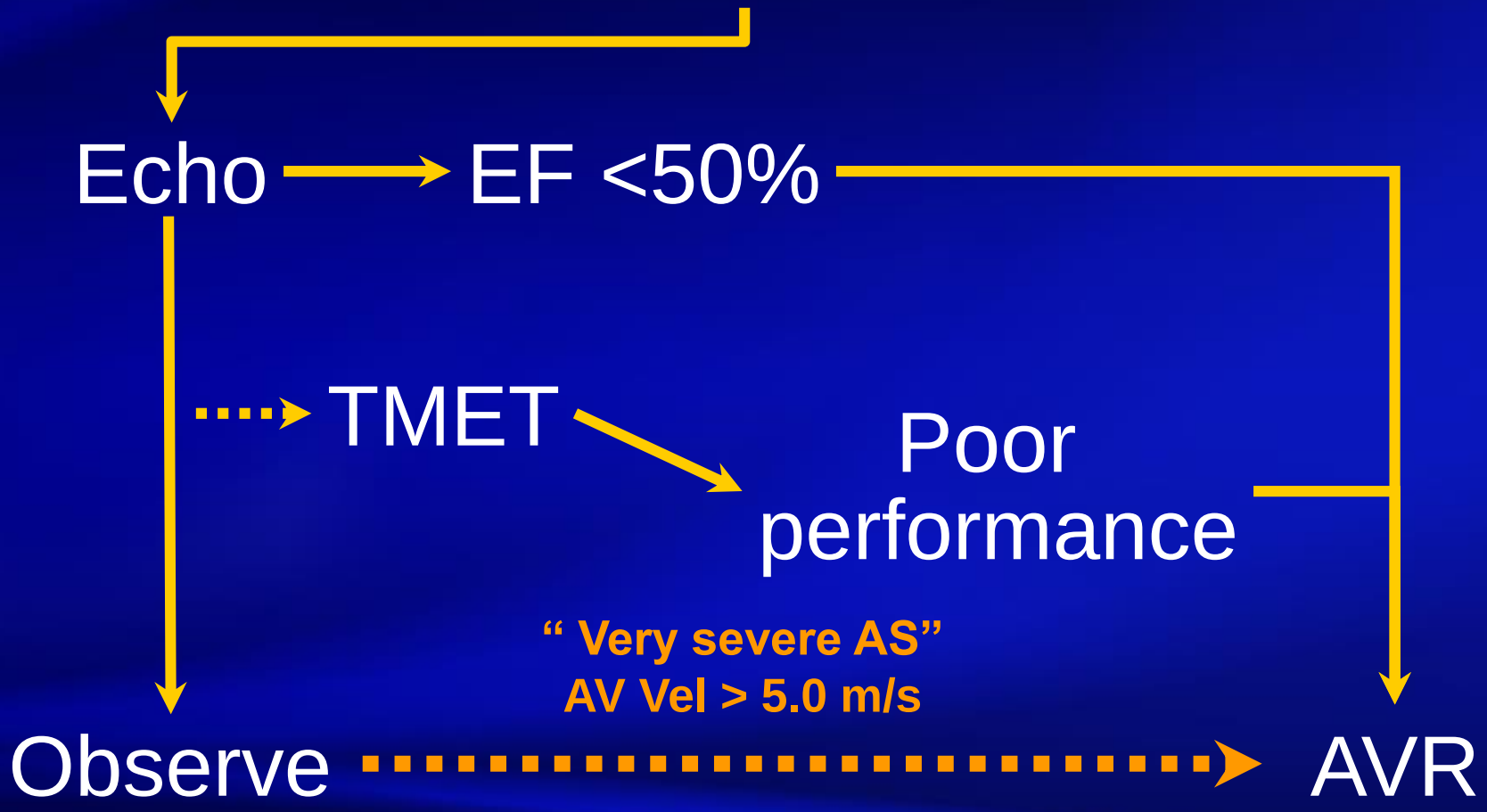
- Operate at onset of ***ANY*** symptoms
  - Irrespective of LV function 
  - Preop coronaries if indicated
- Other indications
  - Undergoing other cardiac surgery
    - Moderate and severe AS

Valvular Stenosis
Asymptomatic Severe AS

- Prevent sudden death with AVR
- Studies: Extremely low incidence of sudden death if truly asymptomatic
- “Most common cause of death in the asymptomatic pt is surgery…”

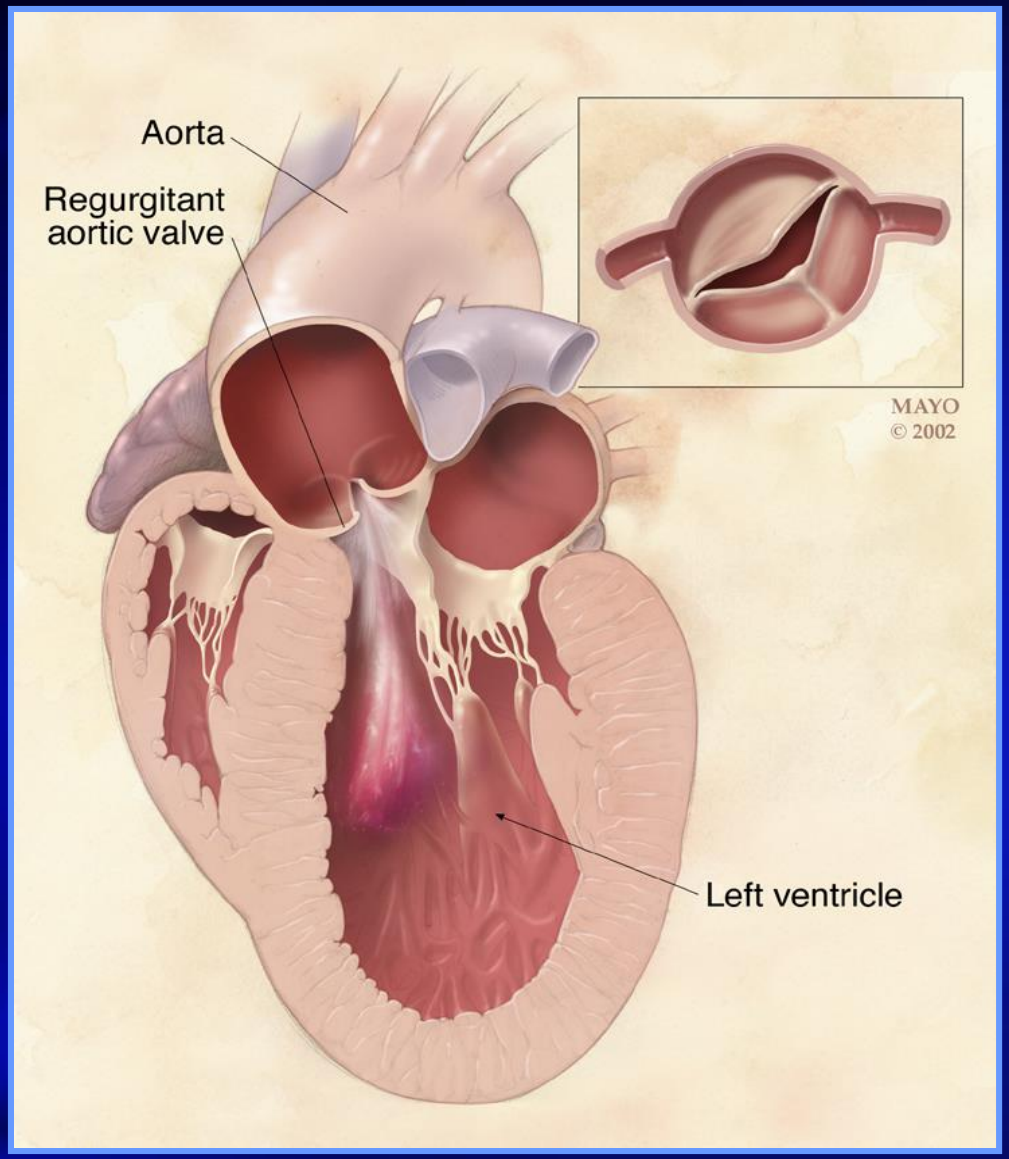
Valvular Stenosis

Asymptomatic Severe AS

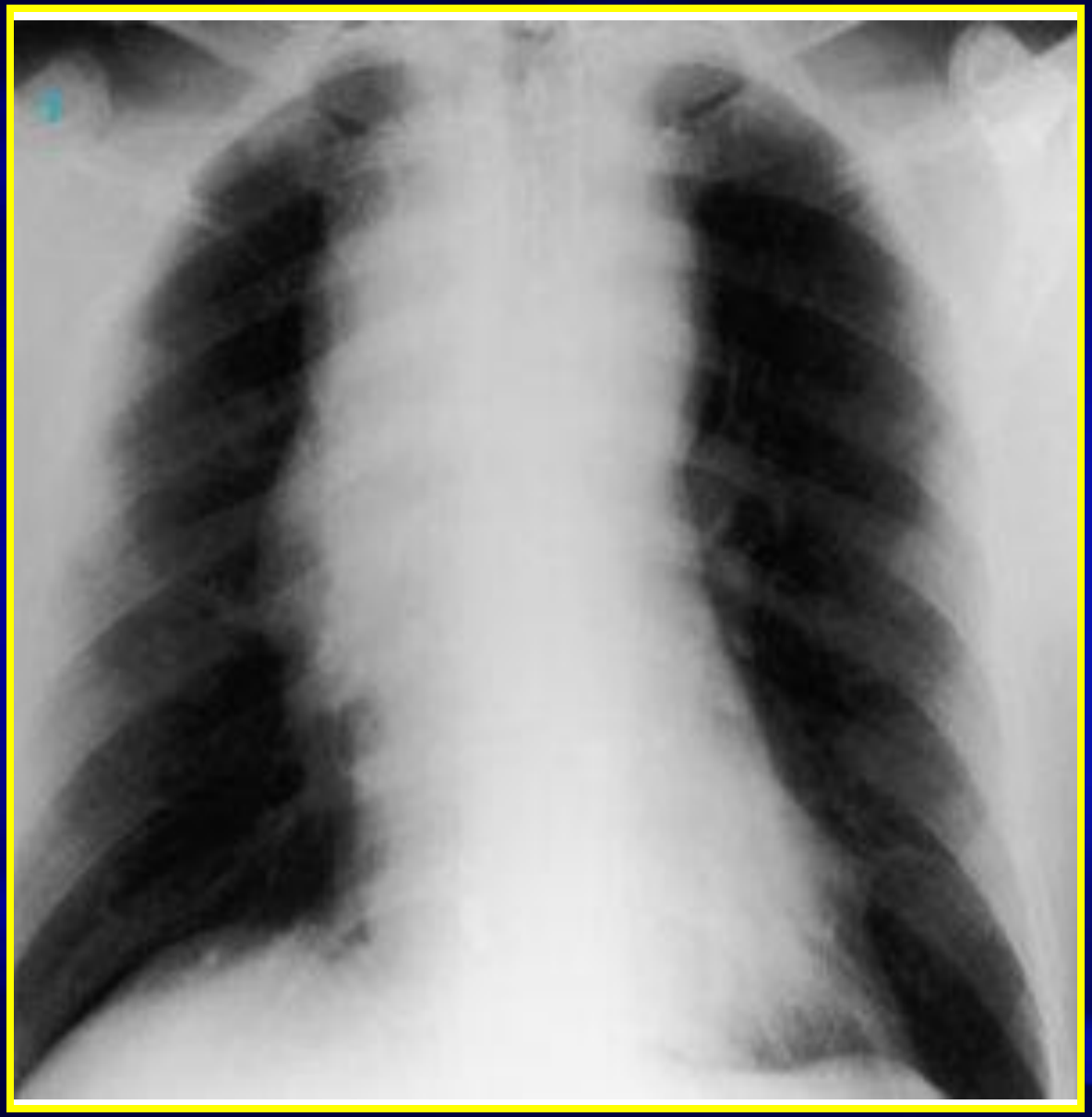


93% of survey respondents identified diagnosis and management skills as important for practice

8 DIASTOLIC MURMURS YOU WILL DIAGNOSE AND MANAGE



AORTIC REGURGITATION



Widened Mediastinum

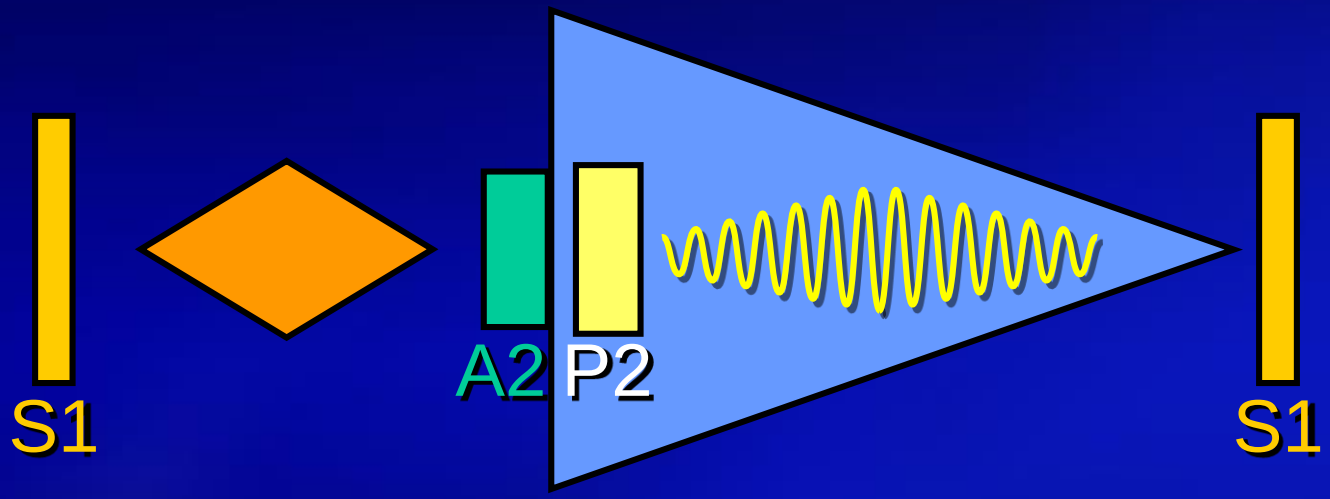
Aortic Regurgitation

Aortic valve does not close completely, blood backflows from aorta into the LV (congenital or acquired)

- Best heard at aortic area, or lower sternal edge
- Diastolic rumble
- S3 (S4)
- Short, rapid crescendo diastolic murmur
- Capillary pulsations in nailbeds

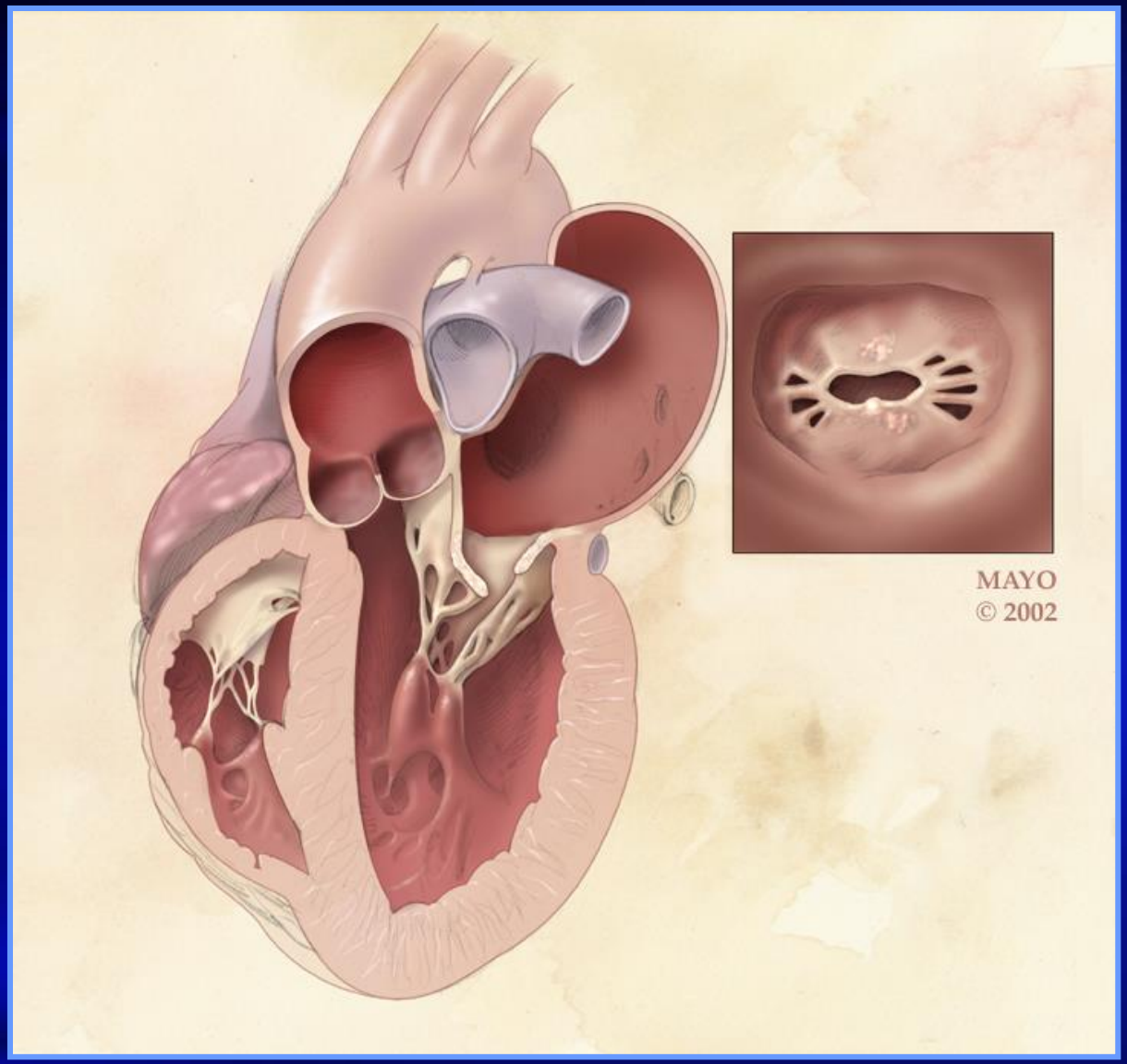
Aortic Regurgitation

Murmur



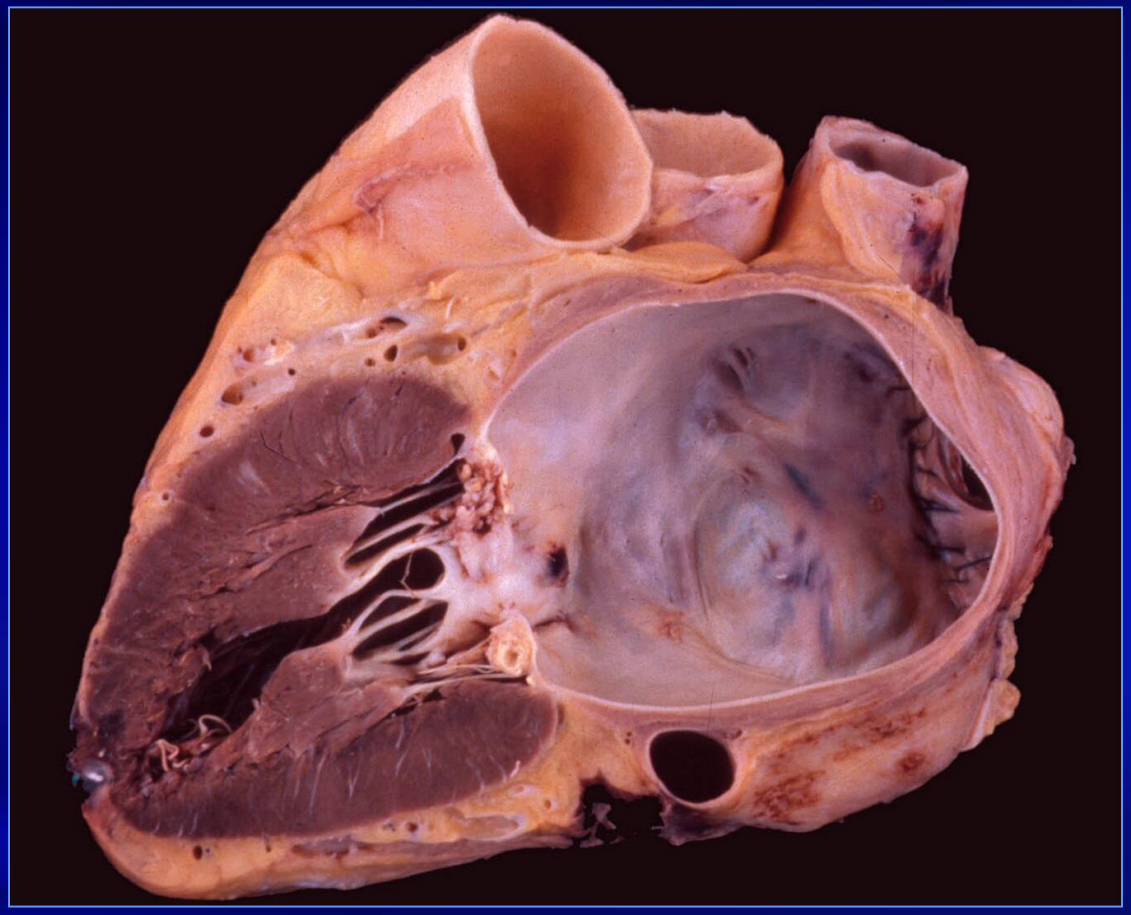
BP = ↑ PP

Austin flint murmur



MITRAL STENOSIS

Pathophysiology Secondary Effects Mitral Stenosis



Pressure overload: LA, RV, RA & pulmonary tree
LV protected

Courtesy of William Edwards, MD Mayo Clinic

Mitral Stenosis Pearls

- Low pitched diastolic murmur at apex
- Starts with OS, shorter S2 OS more severe MS
- No physiologic effect on the LV
- Overloaded LA, RV, PHTN
- AF common, assess for LA thrombus
- Doppler echo is gold standard tool
- PMBV reasonable for those with severe symptomatic MS and a pliable valve

Survey respondents are averaging 43 patients per week

7 TIPS/TRICKS AND MANEUVERS SO YOU ARE SUCCESSFUL WITH #8, 9, 10

Preload=LV, RV full (end diastolic **volume**)

Afterload=Resistance/**pressure** in the ventricles during ejection

Cardiac Systolic Murmur
Dynamic Auscultation Maneuvers

		MR	AS	HOCM
Amyl	⇓ afterload	⇓	⇑	⇑
Hand grip	⇑ afterload	⇑	⇓	⇓
Valsalva	⇓ preload	⇓	⇓	⇑
Squat	⇑ afterload and ⇑ preload	⇑	⇓	⇓
Stand	⇓ preload and ⇓ afterload	⇓	⇓	⇑
Post PVC	⇓ afterload; ⇑ contractility	⇔	⇑	⇑

Dynamic Auscultation

↑ HCM murmur with ↓ LV volume

- Valsalva maneuver
- Squat to Stand
- Amyl nitrate

		AS	HOCM
Amyl Nitrite	⇓ afterload & ⇓ preload	⇑	⇑
Valsalva	⇓ preload	⇓	⇑
Post PVC	⇓ afterload & ⇑ contractility	⇑	⇑

6 SBE COVERAGE OR NOT…

Antibiotic Prophylaxis

Recommended only for dental procedures that may result in bleeding (including cleaning), respiratory tract procedures only if there is an incision/biopsy of mucosa, and surgical procedures involving infected skin, structure or musculoskeletal tissue and in the presence of the following conditions:

- Prosthetic heart valves
- History of endocarditis
- Heart transplant with valvulopathy of the transplanted heart
- CHD that is uncorrected (or partially corrected) or has been corrected within the past 6 months

- **Antibiotic prophylaxis is not recommended for GI / GU procedures

Endocarditis Prophylaxis

If able to take oral medication

Treatment	Adults (≥18 years old)	Children*
Amoxicillin	2 g oral	50 mg/kg oral

*Children weighing >40 kg should receive adult dosages, maximum dosage should not exceed adult dosing.

No dosing adjustment necessary for renal or liver failure.

Allergic to penicillin or ampicillin and able to take oral medication

Treatment (choose one)	Adults (≥18 years old)	Children
Cephalexin†‡	2 g oral	50 mg/kg oral
Clindamycin	600 mg oral	20 mg/kg oral
Azithromycin	500 mg oral	15 mg/kg oral
Clarithromycin	500 mg oral	15 mg/kg oral

*Children weighing >40 kg should receive adult dosages, maximum dosage should not exceed adult dosing.

†Cephalosporins should NOT be used in an individual with a history of anaphylaxis, angioedema, or urticaria due to penicillins or other beta-lactam antibiotics.

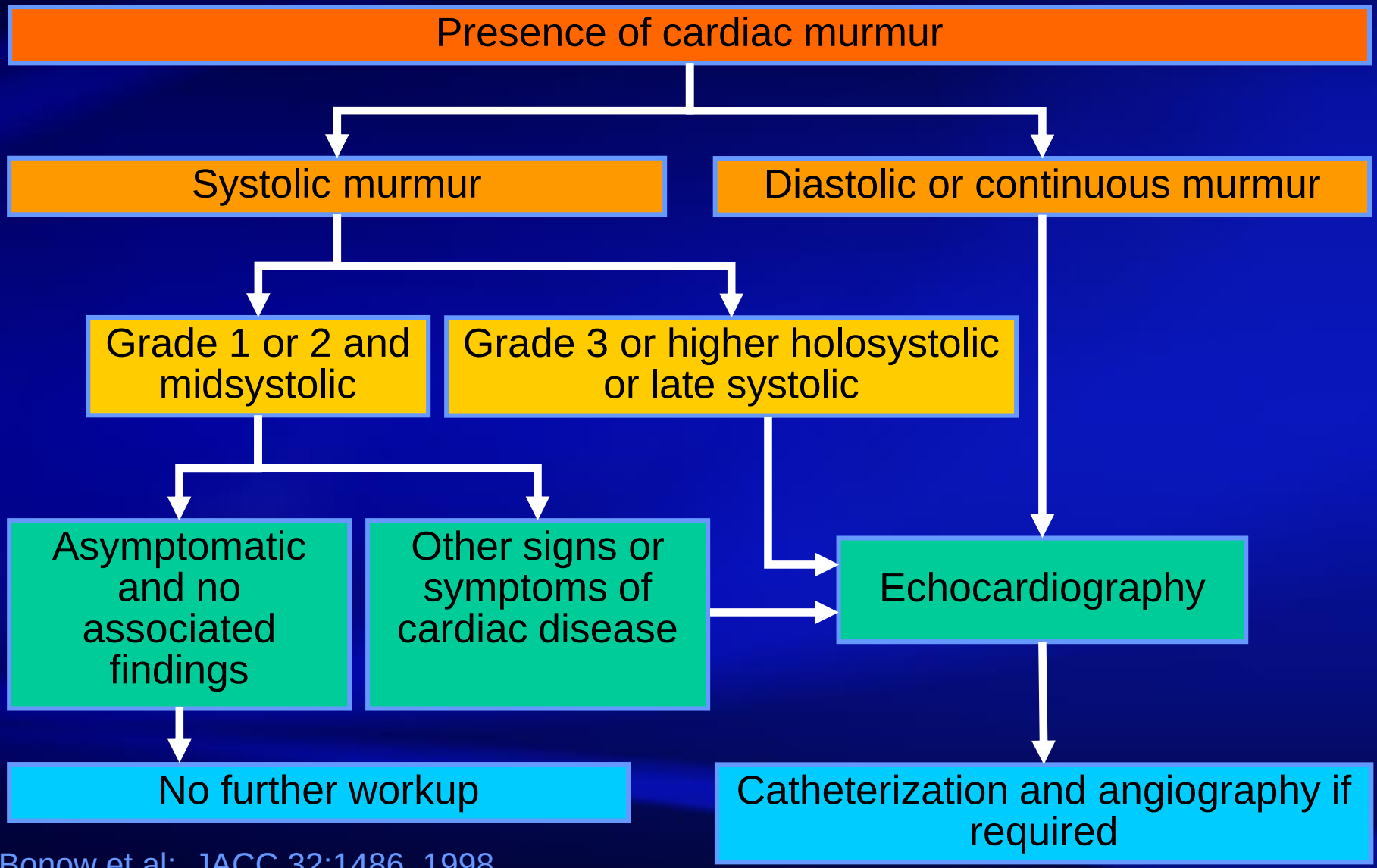
‡Or other first- or second-generation cephalosporin in equivalent adult dosage.

No dosing adjustment necessary for renal or liver failure.

Over 50% identify guidelines, appropriateness criteria important to practice

5 ECHO, NO ECHO

When to Get an Echo/When Not to



Bonow et al: JACC 32:1486, 1998

4 SCREEN / DON’T SCREEN

Bicuspid Aortic Valve – New Insights

Screen first degree relatives

Scan entire aorta (MRA or CT)

Aortic Dilatation
Bicuspid Aortic Valve

Aorta > 5.5 cm – operate for aortic dilation itself (> 5.0 cm if FH or rapid growth or low risk)

Aorta > 4.5 cm – replace aorta if AVR indicated

Other Screening

- Coronary artery disease
- Diabetes
- Hypertrophic cardiomyopathy
- Preventive screening (wt, bp, waist circumference, nutrition, nicotine, substances, supplements, home safety, fit testing)
- Other

3 WHAT CAN YOU DO FOR THE PRACTICE?

- Team models that work
- Patient, clinician satisfaction
- Financial outcomes
- Practice initiatives / incentives
- Quality improvement projects
- Standardization of management
- Cost effective care
- Comprehensive care
- Subspecialty standardization and individualized care
- Moderator
- Preceptor
- Educator
- Researcher
- Leader for improvement

2 KNOW YOUR PEEPS (NETWORK)

Cardiovascular Team Professionals

Membership
+ About Membership
- Become a Member
Cardiovascular Team Student Membership
Clinical Pharmacist
Physician Assistant
Cardiovascular Physician Practicing in the U.S./Canada
Academic Cardiologist or Scientist in the U.S./Canada
Cardiovascular Physician Practicing Outside the U.S./Canada
Professional in a Cardiovascular-Related Subspecialty
Cardiovascular Team Professionals
Nurse
Rehabilitation Specialist
Cardiovascular Technologist
Cardiovascular Veterinarian
Health IT Managers
Training Program Administrators
Geriatrician
Cardiovascular Administrator

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Just write "**Chapter Meeting Discount**" at the top of your application. Applications should be completed on-site or submitted within one business week of the meeting.

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+ Why Join: Your Membership Benefits

+ How to Apply: The Application Process

Atrial fibrillation, SVT, STEMI, NSTEMI, Cardiac Devices, Valvular heart disease, DAPT, Chol, Periop, Cholesterol, Obesity, CV Risk

1 ACC/AHA GUIDELINES – FOR MANAGEMENT EVIDENCE

AMERICAN COLLEGE of CARDIOLOGY

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Jane A. Linderbaum, MS, NP-C, AACC | Log Out

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Guidelines

2016 Focused Update on New Pharmacologic Therapy for Heart Failure | Key Points to Remember

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- [ ] **Expert Consensus Documents** +64
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- [ ] **Health Policy Statements** +17
- [ ] **Performance Measures** +15
- [ ] **Appropriate Use Criteria** +14
- [ ] **Methodology** +10
- [ ] **Data Standards** +8

Results **1-10** of **29** Alphabetical Release Date

Heart Failure Focused Update on Pharmacological Therapy

document type: **Guidelines**
clinical topic: Heart Failure and Cardiomyopathies, Acute Heart Failure
publish date: **May 20, 2016**

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Related Resources +

Dual Antiplatelet Therapy in Patients with Coronary Artery Disease Focused Update

document type: **Guidelines**
clinical topic: Acute Coronary Syndromes, Anticoagulation Management, Cardiac Surgery more +
publish date: **Mar 29, 2016**

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Related Resources +

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Guideline Clinical App

Guideline Clinical App
Frequently Asked Questions

The ACC's Guideline Clinical App is the mobile home of clinical guideline content and tools for clinicians caring for patients with cardiovascular disease. You can access guideline recommendations, "10 Points" summaries, and tools such as risk scores, calculators and algorithms. Customize your App by using the bookmark, note-taking, and shareable PDF features.

The App is available for free in the iTunes (iPhone, iPad) and Google Play (Galaxy, Nexus, other Android devices) app stores. Use the links below from your mobile device to download the App.

Download the App From iTunes **Download the App From Google Play**

The App currently offers content for the following guidelines:

- Atrial Fibrillation
- Cardiovascular Risk
- Coronary Artery Bypass Graft
- Cholesterol
- Device-Based Therapy
- Dual Antiplatelet Therapy Update
- Heart Failure
- Lifestyle
- Non–ST-Elevation Acute Coronary Syndromes
- Obesity
- Percutaneous Coronary Intervention
- Perioperative Management for Noncardiac Surgery
- Stable Ischemic Heart Disease
- ST-Elevated Myocardial Infarction
- Supraventricular Tachycardia
- Valvular Heart Disease

Learning Objectives

- Clinical Guidelines
- CV resources for busy clinicians
- Practice improvement opportunities
- Tips/Tricks for physical exam and differential diagnosis
- Collaboration and networking with CV colleagues
- ACC resources / support for CV Team members
- Unique opportunities for your practice at home

Top 10 Summary

- Identify CV pathophysiology and common conditions you will see in practice
- Facilitate evidenced based guideline directed treatment and surveillance
- Review the handouts/slides
- Check out the resources at ACC

Enjoy the meeting!

linderbaum.jane@mayo.edu
Phone 507-284-2129

Resources

- 2014 AHA/ACC Guideline for the Management of Patients With Valvular Heart Disease: Executive Summary: A Report of the American College of Cardiology/American Heart
- 2008 Focused update incorporated into the ACC/AHA 2006 guidelines for the management of patients with valvular heart disease
- O'Rourke, R.A.; Fuster, V.; Alexander, R. W.; Roberts, R.; King III, S. B.; Prystowsky, E.N.; Nash, I. S. (2005). 11th Edition Hurst's The Heart Manual of Cardiology. McGraw-Hill Medical Publishing Division.
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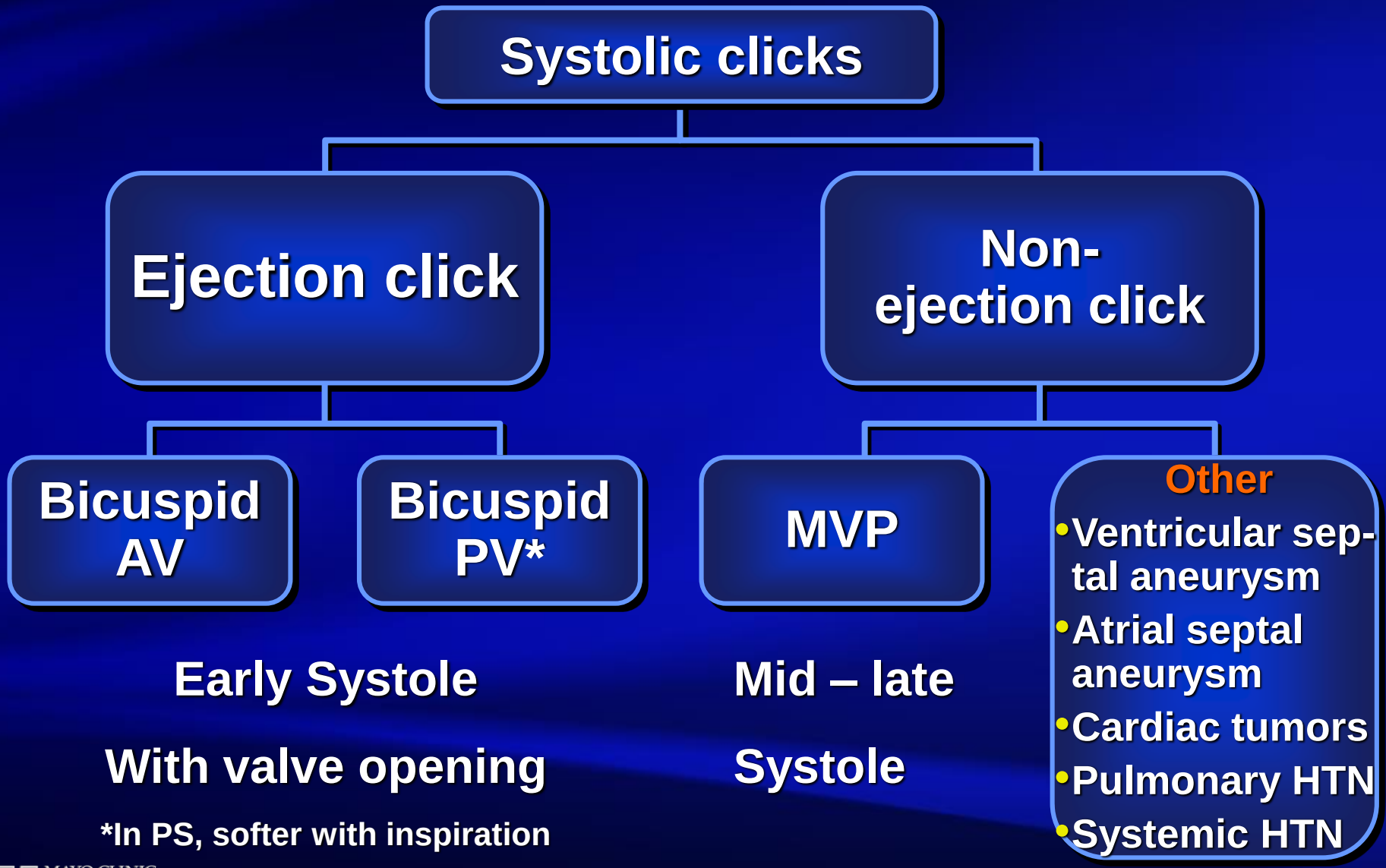
- Anderson, JL; Adams, CD; Antman, EA; et al. ACC/AHA 2007 Guidelines for the Management of Patients With Unstable Angina/Non ST-Elevation Myocardial Infarction: A Report of the American College of Cardiology/American Heart Association Task Force on Practice Guidelines (Writing Committee to Revise the 2002 Guidelines for the Management of Patients With Unstable Angina/Non ST-Elevation Myocardial Infarction). Circulation. 2007;116:e148-304.
- McGee: Am J Med 123: 913, 2010

Web Resources

- www.cardiosource.com
- www.blaufuss.org
- www.acc.org
- www.cvtoolbox.com
- askmayoexpert.com

Clicks


Systolic clicks
Ejection click
Non-ejection click
Bicuspid AV
Bicuspid PV*
MVP
Other
•Ventricular septal aneurysm
•Atrial septal aneurysm
•Cardiac tumors
•Pulmonary HTN
•Systemic HTN
Early Systole
With valve opening
Mid – late
Systole
*In PS, softer with inspiration

Valvular Stenosis