# ACC Latin America Conference 2017

## MEXICO CITY

JUNE 22 – 24, 2017

## GLOBAL EXPERTS, LOCAL LEARNING

# VALVULAR HEART DISEASE

## Stenotic Valvular Lessions 2017

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## Aortic Stenosis

### Proper evaluation & Prognosis


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**No disclosure.**

# Stages of Progression of VHD

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| Stage | Definition | Description |
|---|---|---|
| **A** | **At risk** | **Patients with risk factors for the development of VHD** |
| B | Progressive | Patients with progressive VHD (mild-to-moderate severity and asymptomatic) |
| C | Asymptomatic severe | Asymptomatic patients who have reached the criteria for severe VHD<br>C1: Asymptomatic patients with severe VHD in whom the left or right ventricle remains compensated<br>C2: Asymptomatic patients who have severe VHD, with decompensation of the left or right ventricle |
| D | **Symptomatic** severe | Patients who have developed symptoms as a result of VHD |

2017 AHA/ACC Focused Update of the 2014 AHA/ACC Guideline for the Management of Patients With Valvular Heart Disease: A Report of the American College of Cardiology/American Heart Association Task Force on Clinical Practice Guidelines. http://circ.ahajournals.org/lookup/suppl/doi:10.1161/CIR.0000000000000503/-/DC1.

# Stage of Valvular Aortic Stenosis

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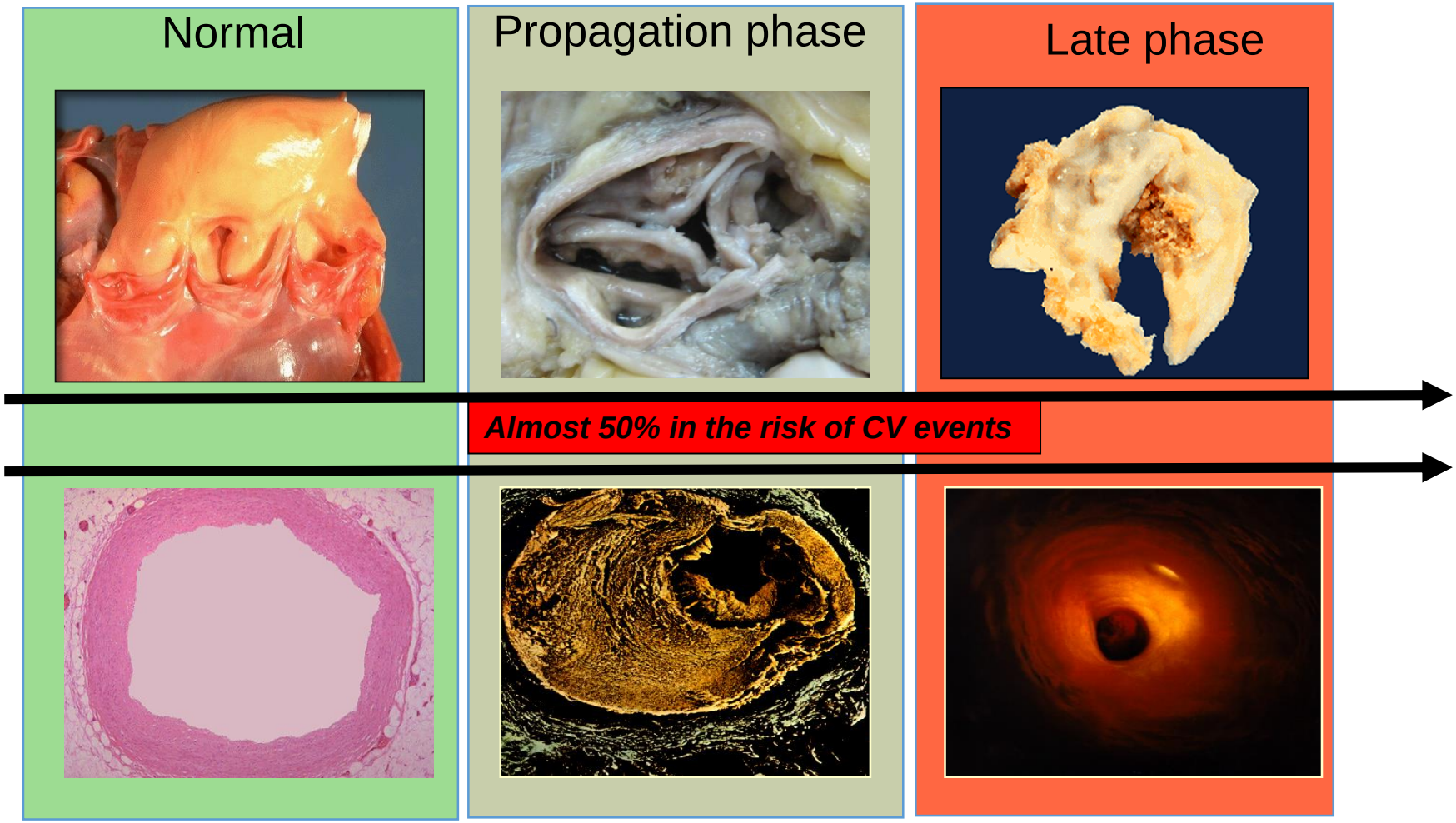
| Stage | Definition | Valve Anatomy | Valve Hemodynamics | Hemodynamic Consequences | Symptoms |
|---|---|---|---|---|---|
| **A** | **At risk of AS** | • Bicuspid aortic valve (or other congenital valve anomaly)<br>• Aortic valve sclerosis | • Aortic $V_{max}$ <2 m/s | • None | • None |
| **B** | **Progressive AS** | • Mild-to-moderate leaflet calcification of a bicuspid or trileaflet valve with some reduction in systolic motion or<br>• Rheumatic valve changes with commissural fusion | • Mild AS: Aortic $V_{max}$ 2.0–2.9 m/s or mean ΔP <20 mm Hg<br>• Moderate AS: Aortic $V_{max}$ 3.0–3.9 m/s or mean ΔP 20–39 mm Hg | • Early LV diastolic dysfunction may be present<br>• Normal LVEF | • None |

2017 AHA/ACC Focused Update of the 2014 AHA/ACC Guideline for the Management of Patients With Valvular Heart Disease: A Report of the American College of Cardiology/American Heart Association Task Force on Clinical Practice Guidelines. http://circ.ahajournals.org/lookup/suppl/doi:10.1161/CIR.0000000000000503/-/DC1.

# Evaluation of spectrum of VHD





# Stage of Valvular Aortic Stenosis

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| Stage | Definition | Valve Anatomy | Valve Hemodynamics | Hemodynamic Consequences | Symptoms |
|---|---|---|---|---|---|
| **C - Asymptomatic severe AS** | | | | | |
| **C1** | **Asymptomatic severe AS** | • Severe leaflet calcification or congenital stenosis with severely reduced leaflet opening | • Aortic $V_{max}$ ≥4 m/s or mean ΔP ≥40 mm Hg<br>• AVA typically is ≤1 $cm^2$ (or AVAi ≤0.6 $cm^2/m^2$)<br>• Very severe AS is an aortic $V_{max}$ ≥5 m/s, or mean ΔP ≥60 mm Hg | • LV diastolic dysfunction<br>• Mild LV hypertrophy<br>• Normal LVEF | • None–**exercise testing** is reasonable to confirm symptom status |
| **C2** | **Asymptomatic severe AS with LV dysfunction** | • Severe leaflet calcification or congenital stenosis with severely reduced leaflet opening | • Aortic $V_{max}$ ≥4 m/s or mean ΔP ≥40 mm Hg<br>• AVA typically is ≤1 $cm^2$ (or AVAi ≤0.6 $cm^2/m^2$) | • LVEF <50% | • None |

# Should we wait for AS?

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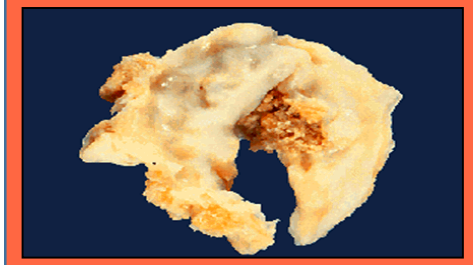
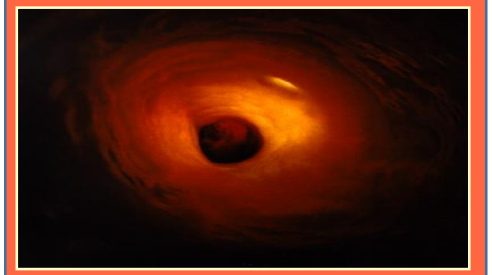
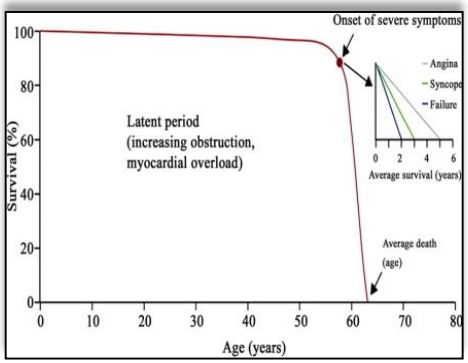
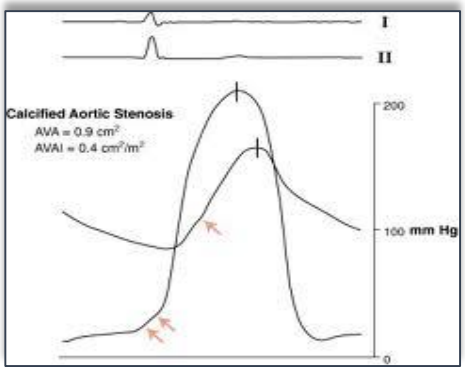
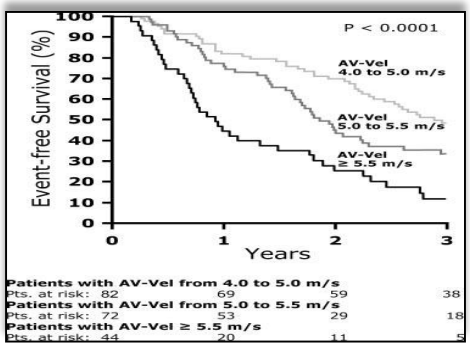
## Late phase

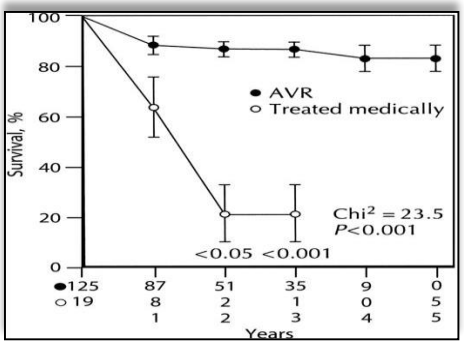







2014 AHA/ACC Guideline for the Management of Patients With Valvular Heart Disease. A report of the American College of Cardiology / American Heart Association Task Force on Practice Guidelines.

# Stage of Valvular Aortic Stenosis



| Stage | Definition | Valve Anatomy | Valve Hemodynamics | Hemodynamic Consequences | Symptoms |
|---|---|---|---|---|---|
| **D - Symptomatic severe AS** | | | | | |
| **D1** | **Symptomatic severe high-gradient AS** | • Severe leaflet calcification or congenital stenosis with severely reduced leaflet opening | • Aortic $V_{max}$ ≥4 m/s, or mean ΔP ≥40 mm Hg<br>• AVA typically is ≤1 $cm^2$ (or AVAi ≤0.6 $cm^2/m^2$), but may be larger with mixed AS/AR | • LV diastolic dysfunction<br>• LV hypertrophy<br>• Pulmonary hypertension may be present | • Exertional dyspnea or decreased exercise tolerance<br>• Exertional angina<br>• Exertional syncope or presyncope |
| **D2** | **Symptomatic severe low-flow/low-gradient AS with reduced LVEF** | • Severe leaflet calcification with severely reduced leaflet motion | • AVA ≤1 $cm^2$ with resting aortic $V_{max}$ <4 m/s or mean ΔP <40 mm Hg<br>• Dobutamine stress echo shows AVA ≤1 $cm^2$ with $V_{max}$ ≥4 m/s at any flow rate | • LV diastolic dysfunction<br>• LV hypertrophy<br>• LVEF <50% | • HF,<br>• Angina,<br>• Syncope or presyncope |

# Stage of Valvular Aortic Stenosis

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| Stage | Definition | Valve Anatomy | Valve Hemodynamics | Hemodynamic Consequences | Symptoms |
|---|---|---|---|---|---|
| **D - Symptomatic severe AS** | | | | | |
| **D3** | **Symptomatic severe low-gradient AS with normal LVEF or paradoxical low-flow severe AS** | • Severe leaflet calcification with severely reduced leaflet motion | • AVA ≤1 $cm^2$ with aortic $V_{max}$ <4 m/s, or mean ΔP <40 mm Hg<br>• Indexed AVA ≤0.6 $cm^2/m^2$ and<br>• Stroke volume index <35 $mL/m^2$<br>• Measured when the patient is normotensive (systolic BP <140 mm Hg) | • Increased LV relative wall thickness<br>• Small LV chamber with low-stroke volume.<br>• Restrictive diastolic filling<br>• LVEF ≥50% | • HF,<br>• Angina,<br>• Syncope or presyncope |

# AS, Diagnosis & Follow up

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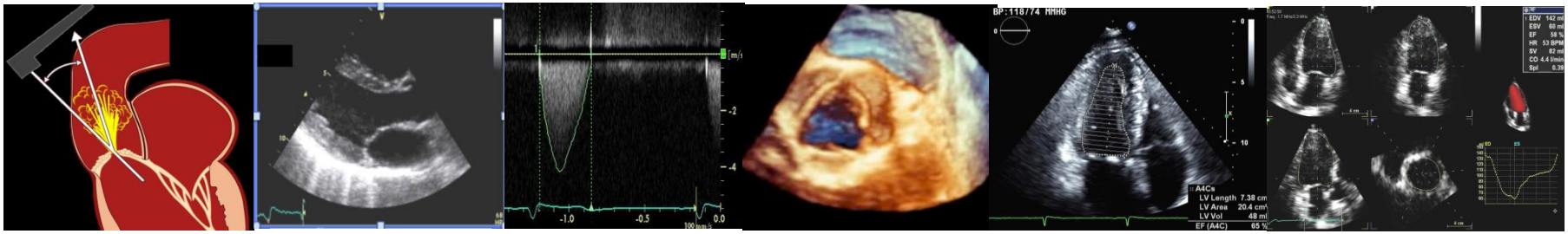
## Mainstay of diagnosis & follow up

**ECHOCARDIOGRAPHIC EVALUATION OF AORTIC STENOSIS DOPPLER, 2D AND 3D**

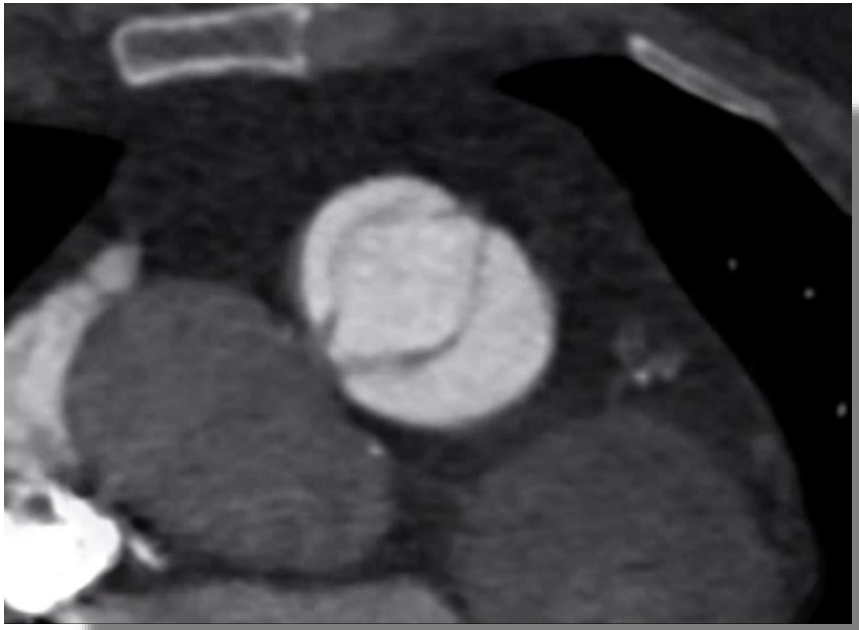
- Valve Morphology
- Vmax, Valve Area and Gradient
- Ventricular Size & Function, RVSP Doppler 3D Vmax

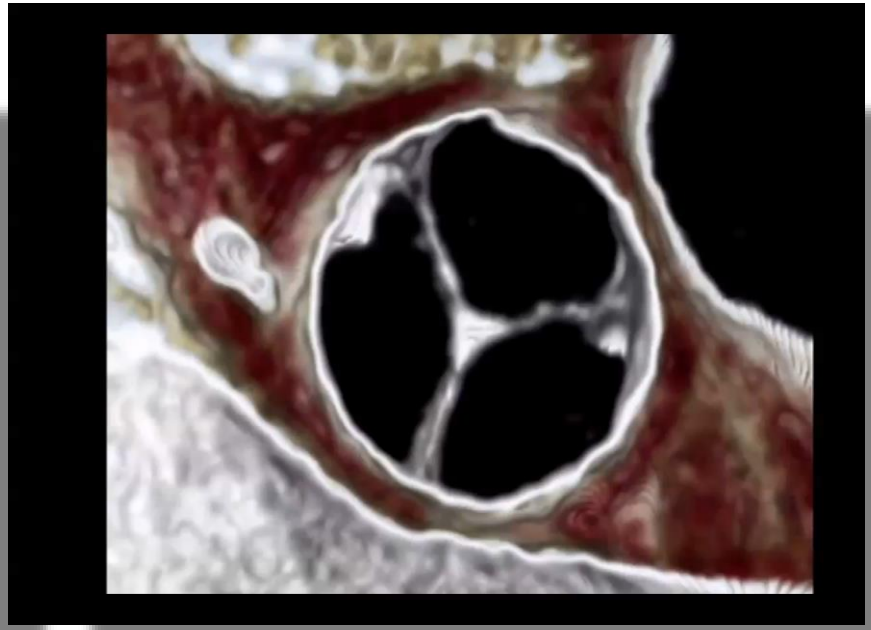


# AS, Diagnosis & Follow up



CT – Evaluation of Aortic Valve Movement





Krauss T, JSCCT 2014;170-171.

# AS, Diagnosis & Follow up

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| Recommendations | COR | LOE |
|---|---|---|
| **TTE** is indicated in **patients with signs or symptoms** of AS or a bicuspid aortic valve for accurate diagnosis of the **cause of AS**, hemodynamic severity, LV size and systolic function, and for determining prognosis and timing of valve intervention | I | B |
| **Low-dose dobutamine stress testing** using echocardiographic or invasive hemodynamic measurements is reasonable in patients with stage D2 AS with all of the following*:*<br>a. Calcified aortic valve with reduced systolic opening;<br>b. LVEF less than 50%;<br>c. Calculated valve area 1.0 $cm^2$ or less; and<br>d. Aortic velocity less than 4.0 m per second or mean pressure gradient less than 40 mm Hg | IIa | B |

# AS, Diagnosis & Follow up



| Recommendations | COR | LOE |
|---|---|---|
| **Exercise testing** is reasonable to assess physiological changes with exercise and to **confirm the absence of symptoms in asymptomatic patients with a calcified aortic valve and an aortic velocity 4.0 m per second or greater or mean pressure gradient 40 mm Hg or higher (stage C)** | IIa | B |
| Exercise testing **should not be performed in symptomatic** patients with AS when the aortic velocity is 4.0 m per second or greater or mean pressure gradient is 40 mm Hg or higher (stage D) | III: Harm | B |

# AS, Diagnosis & Follow up

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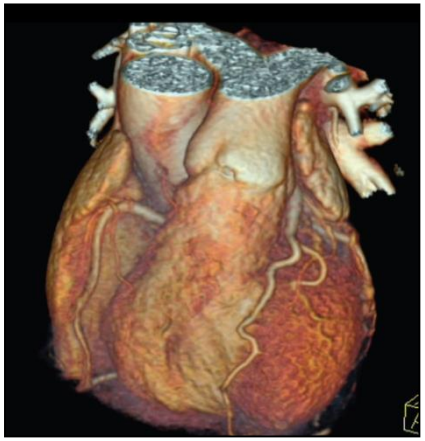
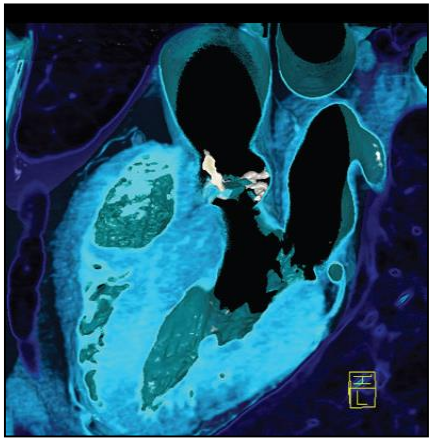
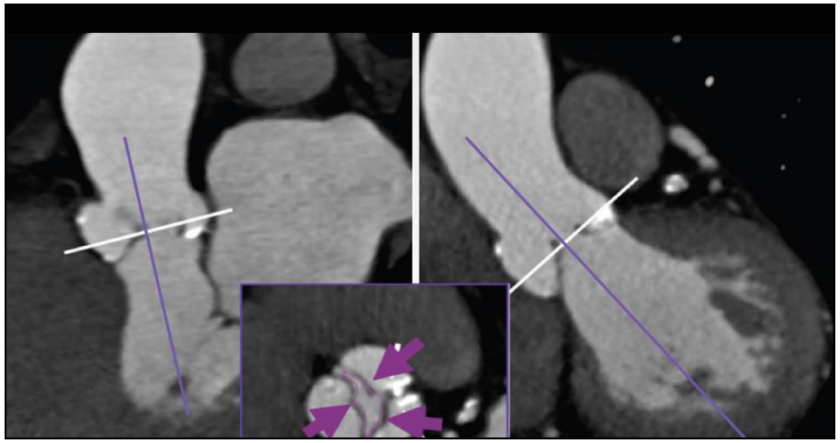
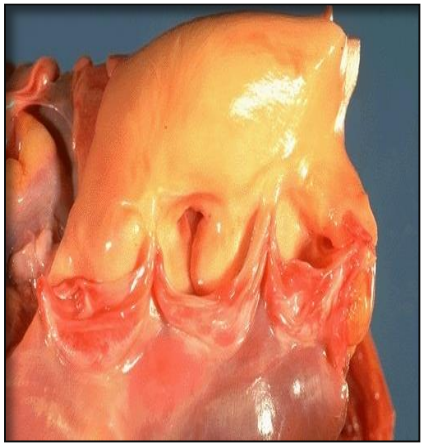
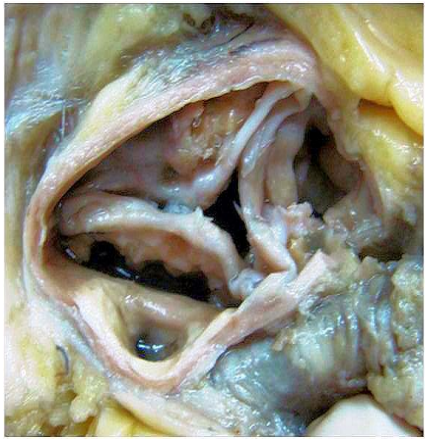

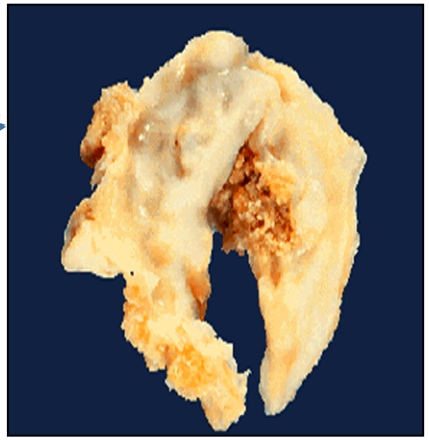

# The Heart Valve Team & CofE

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| Recommendations | COR | LOE |
|---|---|---|
| Patients with severe VHD should be evaluated by a ***multidisciplinary Heart Valve Team when intervention is considered*** | I | C |
| Consultation with or referral to a Heart Valve Center of Excellence is reasonable when discussing treatment options for 1) asymptomatic patients with severe VHD, 2) patients who may benefit from valve repair versus valve replacement, or 3) patients with multiple comorbidities for whom valve intervention is considered | IIa | C |

# Evaluation of Coronary Anatomy



| Recommendations | COR | LOE |
|---|---|---|
| Coronary angiography is indicated before valve intervention in patients with symptoms of angina, objective evidence of ischemia, decreased LV systolic function, history of CAD, or coronary risk factors (including men age >40 years and postmenopausal women) | I | C |
| Coronary angiography should be performed as part of the evaluation of patients with chronic severe secondary MR | I | C |

# CONCLUSIONS

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- ***Integral evaluation;*** *almost 50% in the risk of CV event*s.
- ***ECHO*****:** Mainstay of diagnosis of patients with AS.
- ***Low-dose dobutamine stress testing*** in patients with stage D2
- ***Exercise testing*** is reasonable to confirm the absence of symptoms in asymptomatic AS patients in stage C**.**
- ***Invasive assessment (CATH*****)** of AS is reserved to cases when the non-invasive studies are inconclusive.
- The use of ***multi-modality imaging*** to help assess the severity of AS or to evaluate peri-operative or peri-TAVR
- Patients with severe AS should be evaluated by a ***multidisciplinary Heart Valve Team*** when intervention is considered

# Aortic Stenosis

## Proper evaluation & Prognosis

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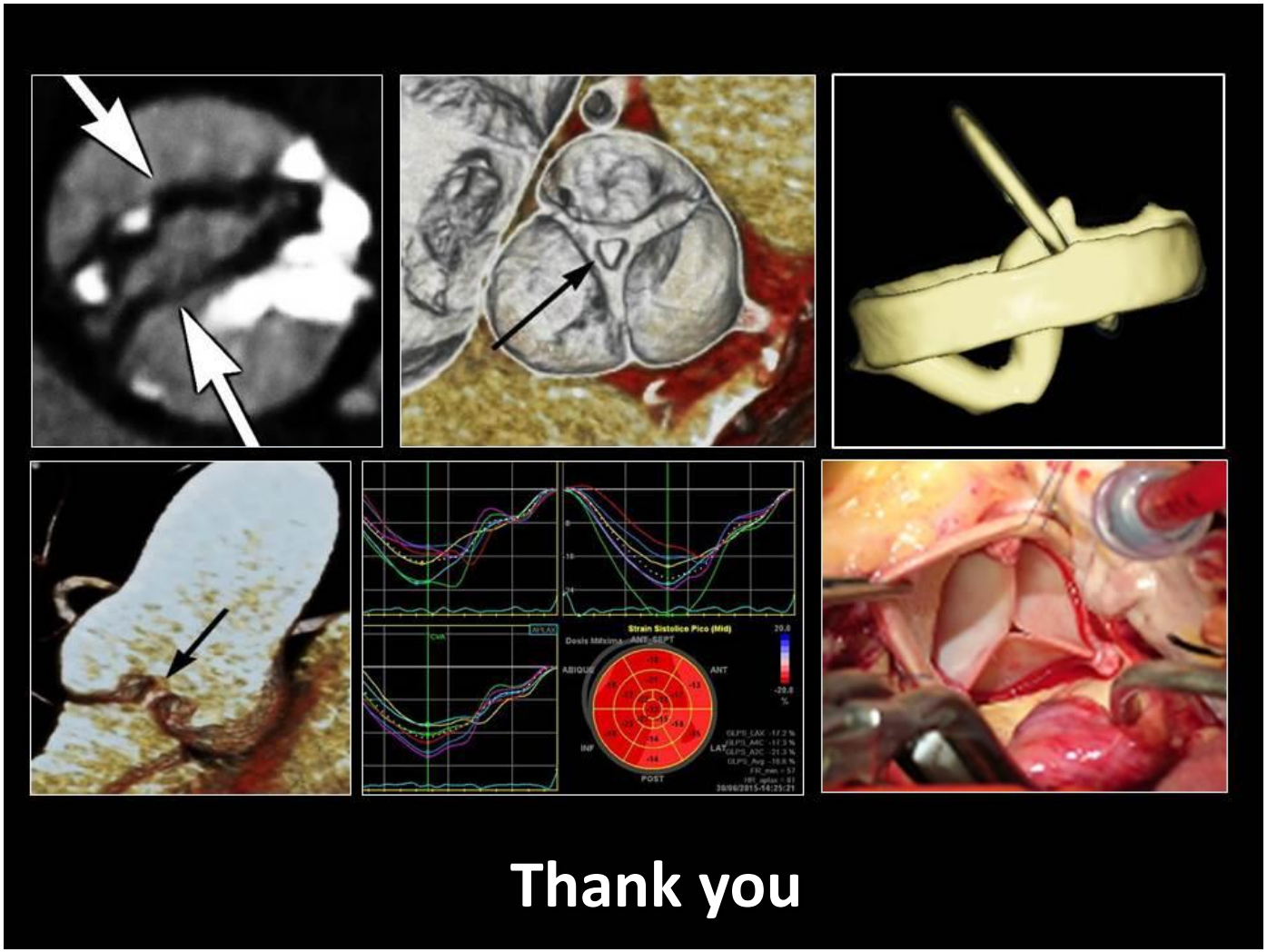


**Thank you**