AHA'S MODERATE AORTIC STENOSIS VIRTUAL GRAND ROUNDS SERIES: SESSION #2

Identifying the Right Patient: Echo, Risk, and Readiness

May 06, 2026

Meeting Reminders

Please Note:

- This webinar is being recorded.
- All participants will be muted upon entry.
- Recordings of today's sessions will be enduring resources in a few weeks on www.heart.org/ModerateAS

Questions?

- We encourage an open, conversational discussion, so please engage and share your thoughts!
- Q&A is scheduled at the end of the session.
- Submit your questions in the chat anytime—they will be addressed during the designated Q&A.

If you are having issue with audio, please call in using the appropriate number below.

Dial by your location:

+1 (301) 715-8592	(Washington DC)
+1 (312) 626-6799	(Chicago)
+1 (646) 876-9923	(New York)
+1 (253) 215-8782	(Tacoma)
+1 (346) 248-7799	(Houston)
+1 (669) 900-6833	(San Jose)

Meeting ID: 86747122854
Passcode: 858496

Welcome & Introductions

Inara Valliani, MPH
Program Implementation Manager, Clinical Studies
American Heart Association

Thank you to

Kardigan, Inc.

for being a supporter of the

American Heart Association's

Heart Valve Initiative

Today's Speakers

Anita M. Kelsey, MD, MBA

Duke University Health System

Professor of Medicine/Cardiology

Vice Chief, Faculty Affairs and Operations

Medical Director, Duke Cardiac Ultrasound Certificate Program

Alexandria (Lexi) Vincent, ACS, RDCS, RCCS

Structural Heart Program, Stanford Health Care

Lead Cardiac Sonographer

Fellow of the American Society of Echocardiography

Disclosures

American Heart Association Statement

- The recommendations and opinions presented by our guest speakers may not represent the official position of the American Heart Association. The materials are for educational purposes only, and do not constitute an endorsement or instruction by the Heart Association. The American Heart Association does not endorse any product or device.

Anita M. Kelsey, MD, MBA

- Research: Site PI, KATALYST-AV Trial (NCT 07001800)

Alexandria Vincent, ACS, RDCS, RCCS

- Consulting / Advisory: Edwards Lifesciences, Egnite Health, and Bristol Myers Squibb

Agenda:

1. Echocardiograms & Clinical Implications of Moderate AS
2. Integrating Echo Reports & EMR-Driven Clinical Workflows
3. Key Hemodynamic Principles in AS Evaluation
4. Resolving Discordance Using Advanced Imaging
5. Case-Based Discussions: Monitoring Moderate AS & Understanding Discordance
6. Q&A and Closing Remarks

American Heart Association®

ECHOCARDIOGRAMS & CLINICAL IMPLICATIONS OF MODERATE AORTIC STENOSIS

Alexandria (Lexi) Vincent, ACS, RCDS, RCCS

Structural Heart Program, Stanford Health Care System

Lead Cardiac Sonographer

Fellow of the American Society of Echocardiography

OUTLINE

Describe moderate AS **disease progression**, **clinical implications**, and **comorbidities**.

Explore a **step-wise approach** to evaluating echo reports and discordant AS findings.

WHY FOCUS ON MODERATE AS?

Moderate AS remains under-recognized and undertreated.

- Moderate AS is traditionally managed using a **"watch and wait"** approach
- However, many **moderate AS patients experience significant morbidity** before progressing to severe AS

Progression risk varies widely across patients.

- Growing evidence demonstrates the **presence of heart failure symptoms** in patients with a "moderate AS" classification

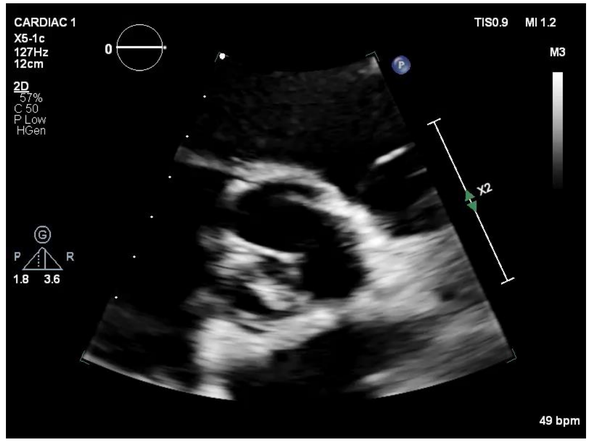
Emerging clinical trials (e.g., KATALYST-AV, PROGRESS) present opportunities for earlier intervention.

DEFINING MODERATE AS

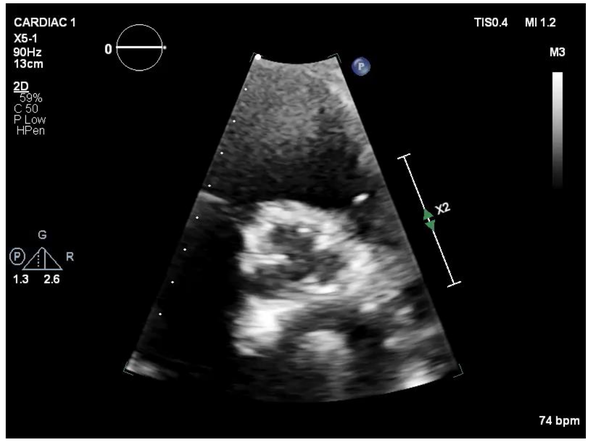
Valve Area, AVA (cm^2)	1.01 cm^2 – 1.50 cm^2
Mean Pressure Gradient (mmHg)	20 mmHg – 39 mmHg
Peak Velocity (m/s)	2.5 m/s – 3.9 m/s

PARASTERNAL SHORT AXIS VIEW (SAX) OF AORTIC VALVE

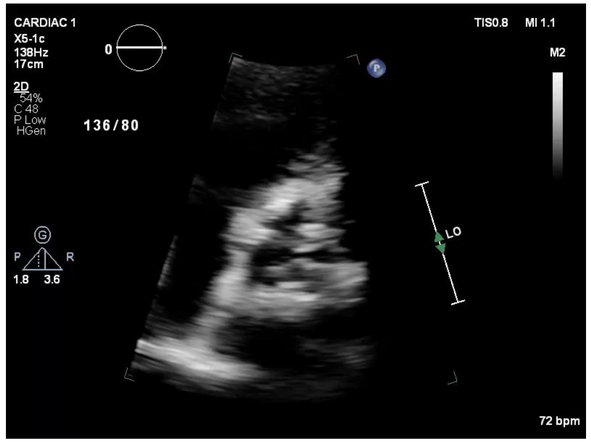
Normal AoV



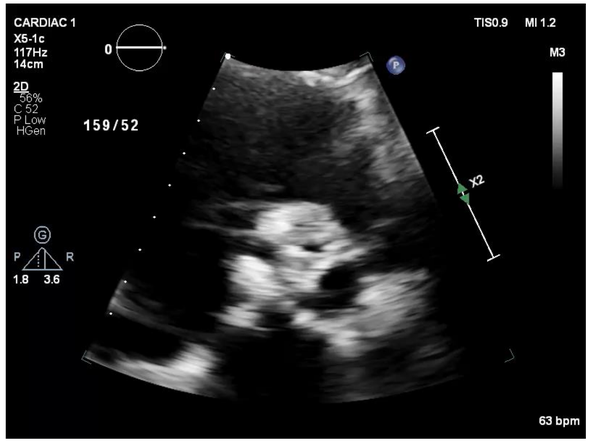
Mild AS



Moderate AS



Severe AS



WHAT CONSTITUTES A GOOD ECHO?

Measurement Accuracy

Flow State Assessment

Doppler Angle

Sonographer Variability

Patient Positioning/Acoustic Window

ECHO MEASUREMENTS FOR AS

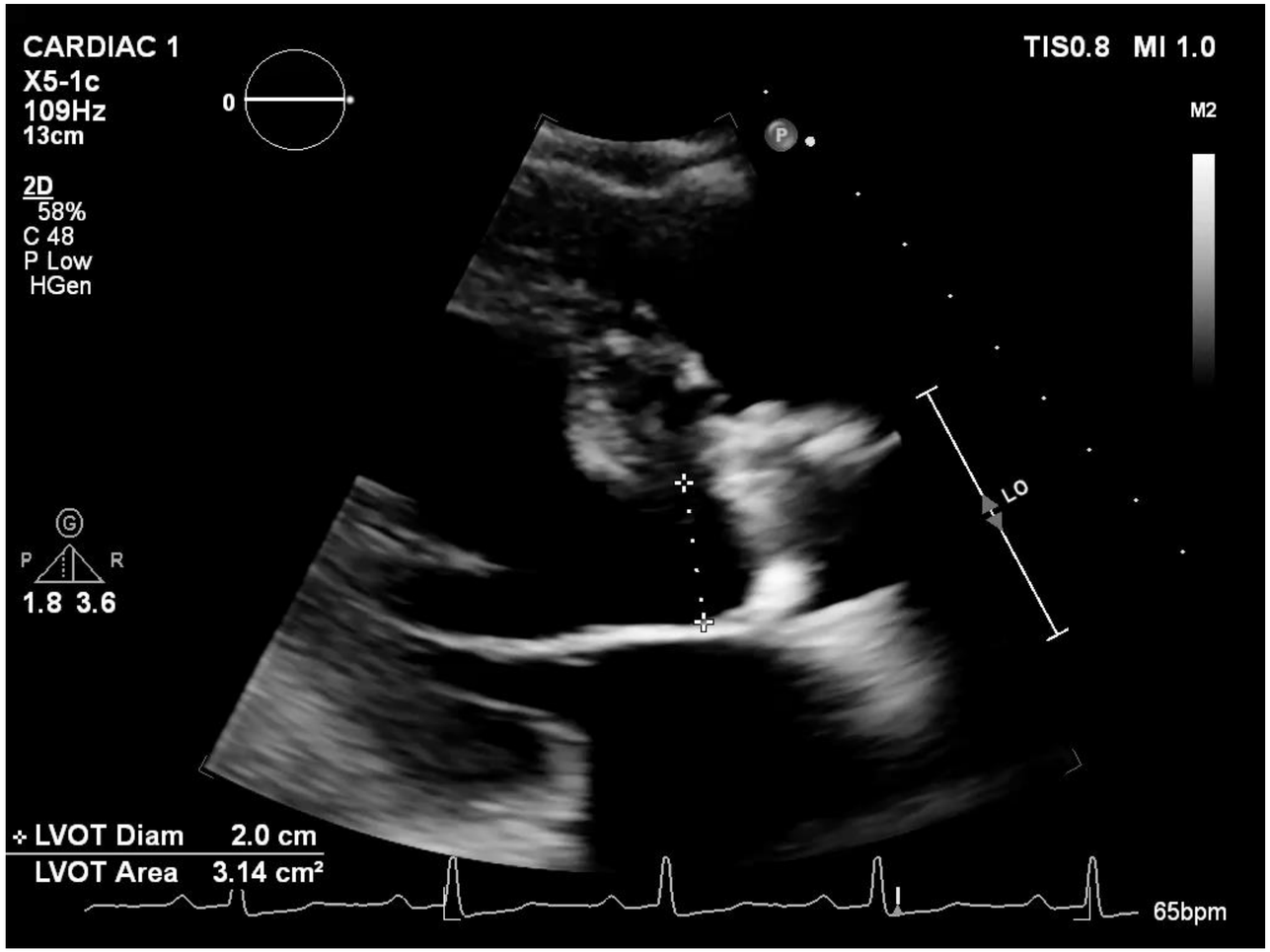
Left Ventricular Outflow Tract (LVOT) Diameter

LV V1 Pulsed Wave Doppler

AoV Continuous Doppler

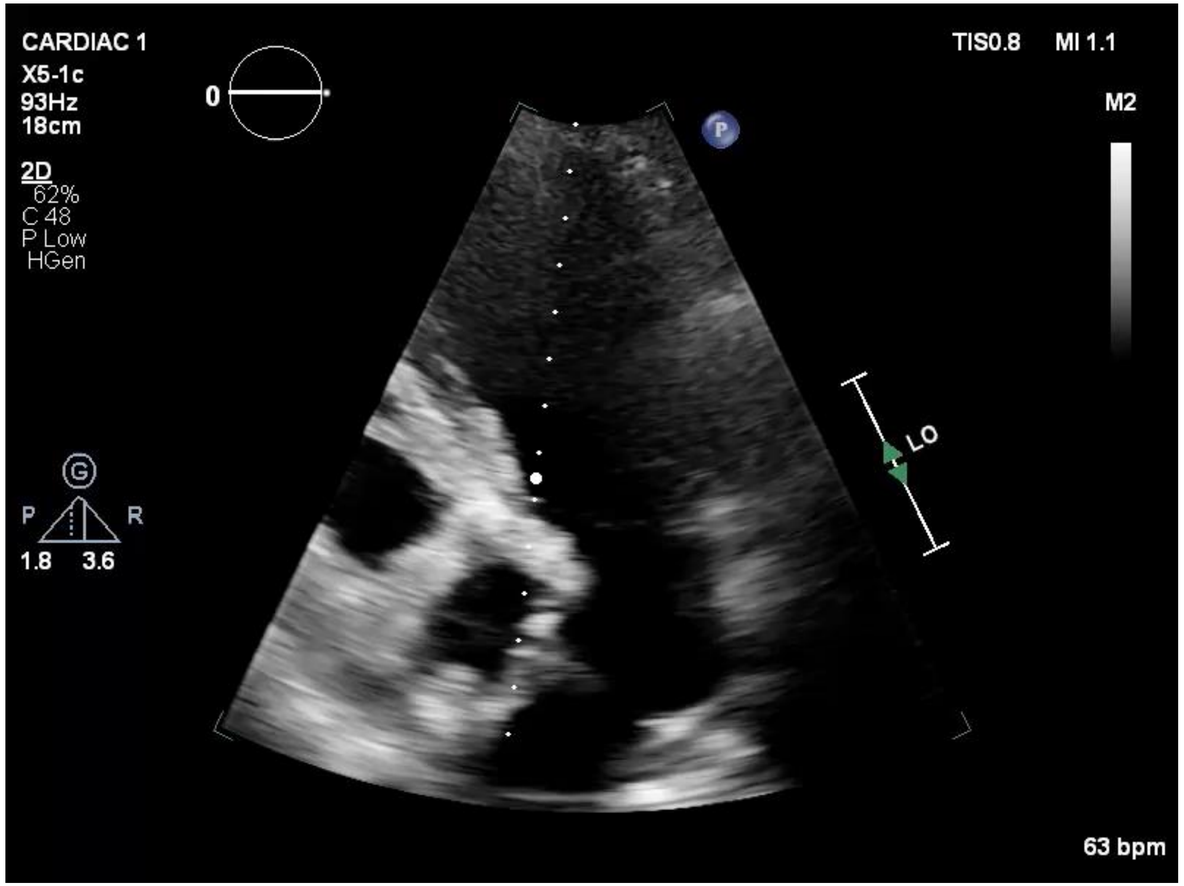
Continuity Equation: $AVA = \frac{CSA_{LVOT} \; x \; VTI_{LVOT}}{VTI_{AV}}$

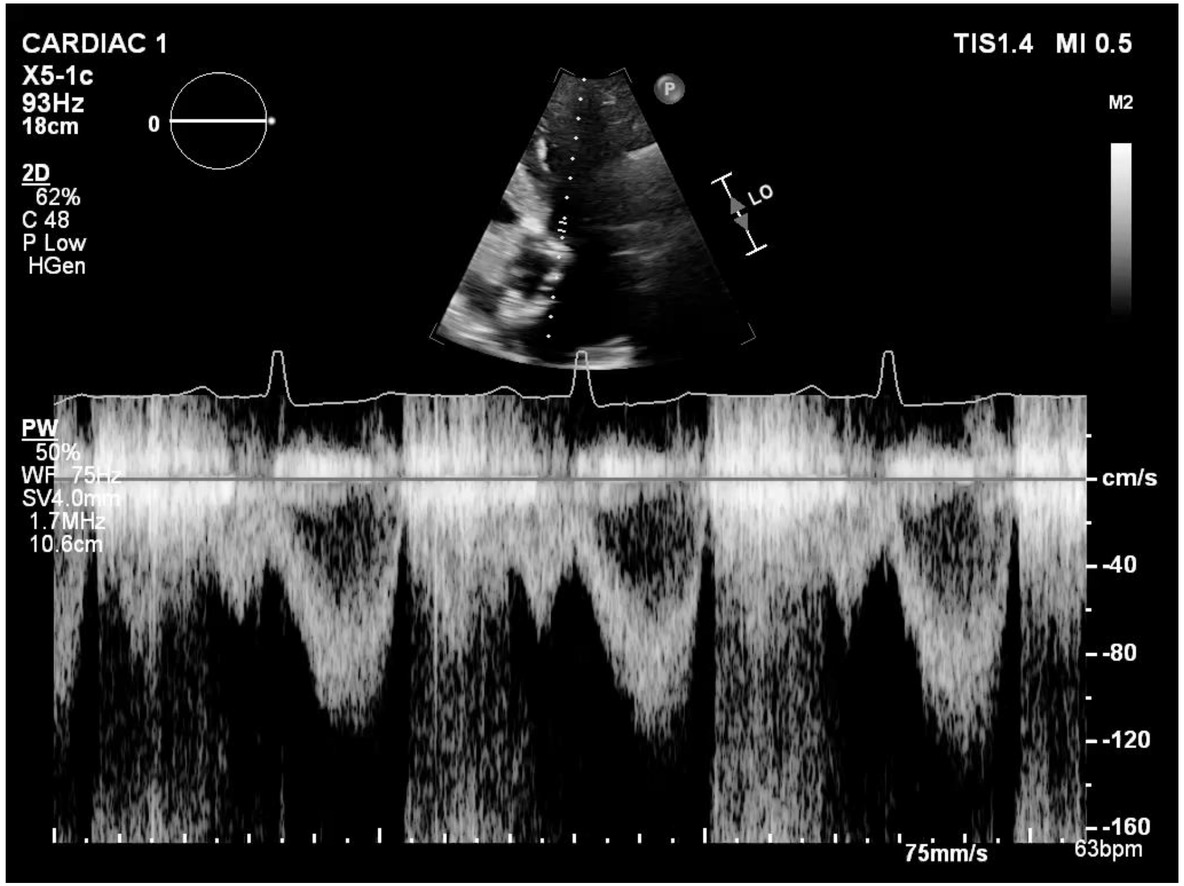
LVOT DIAMETER MEASUREMENT



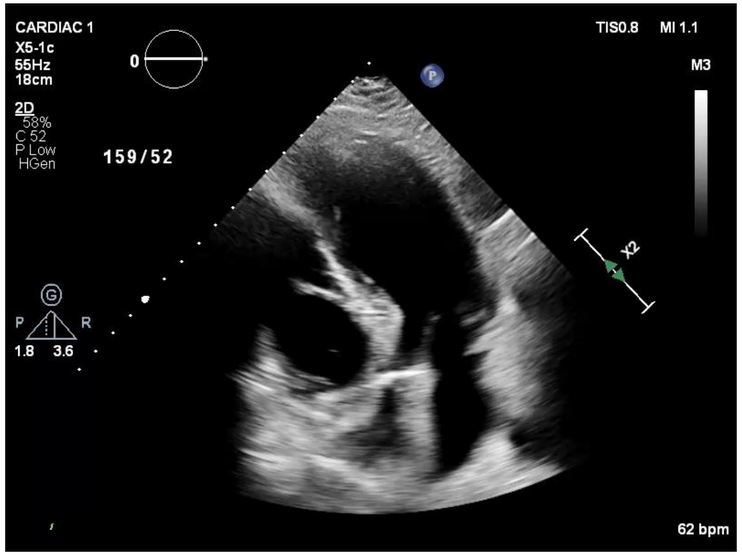
- PLAX Zoom on AoV
- Measure in mid-systole

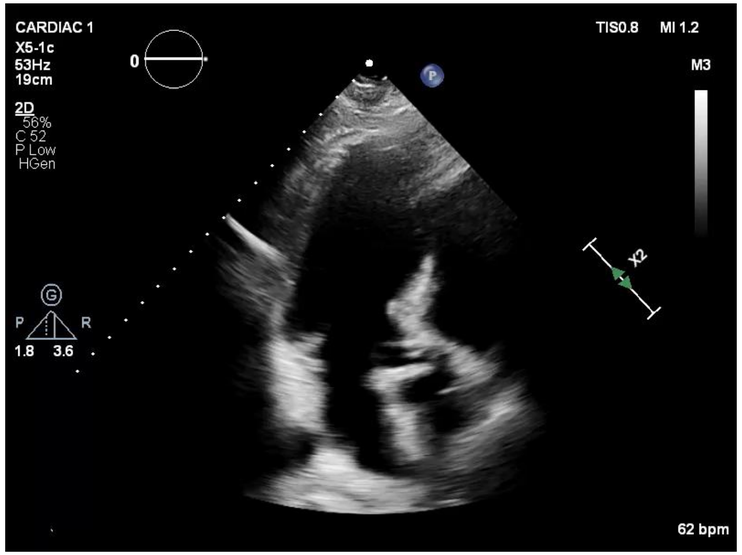
LV V1 PULSED WAVE DOPPLER

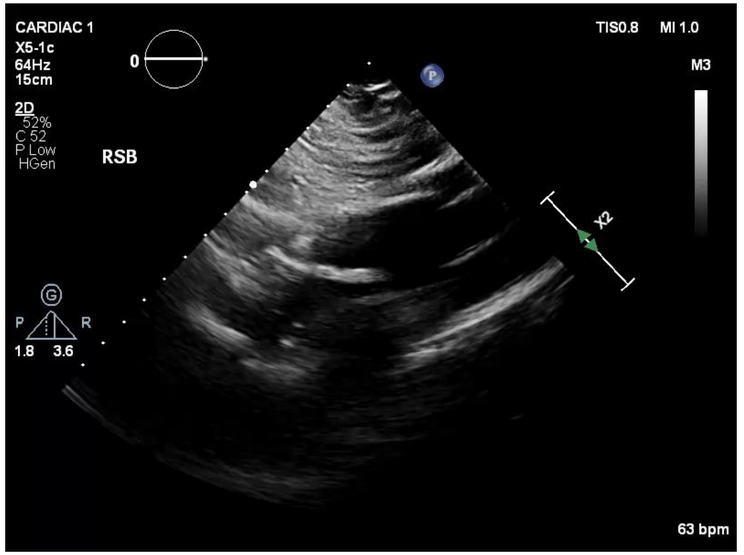




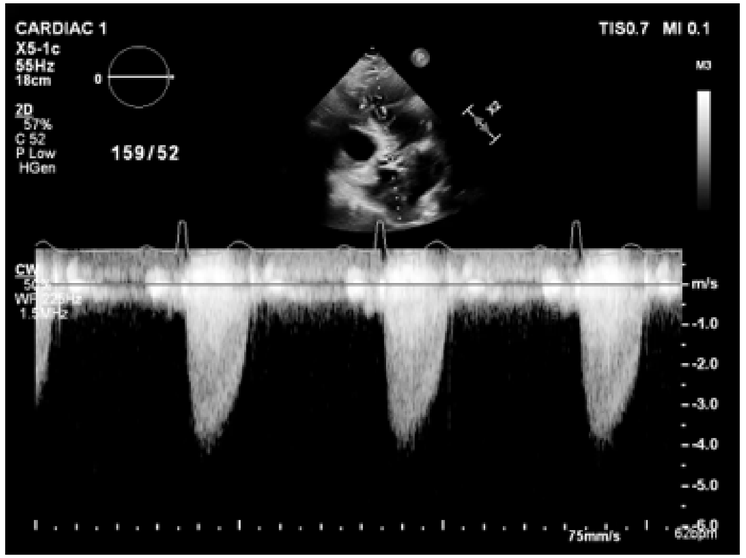
CONTINUOUS WAVE DOPPLER



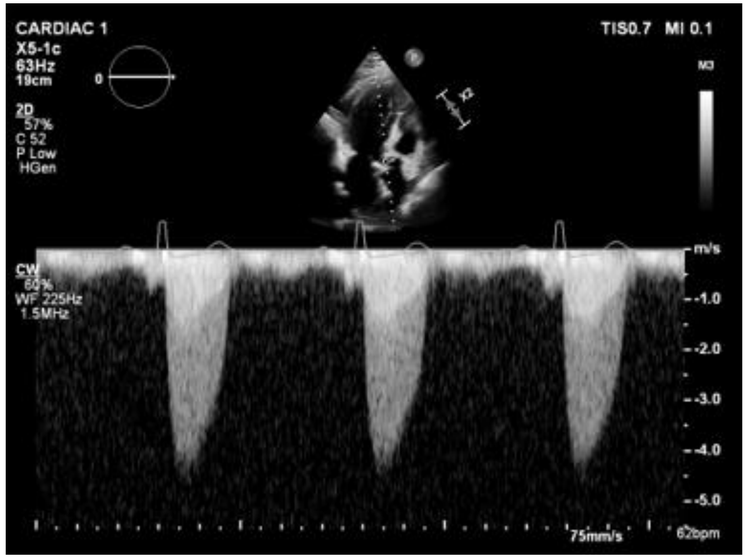




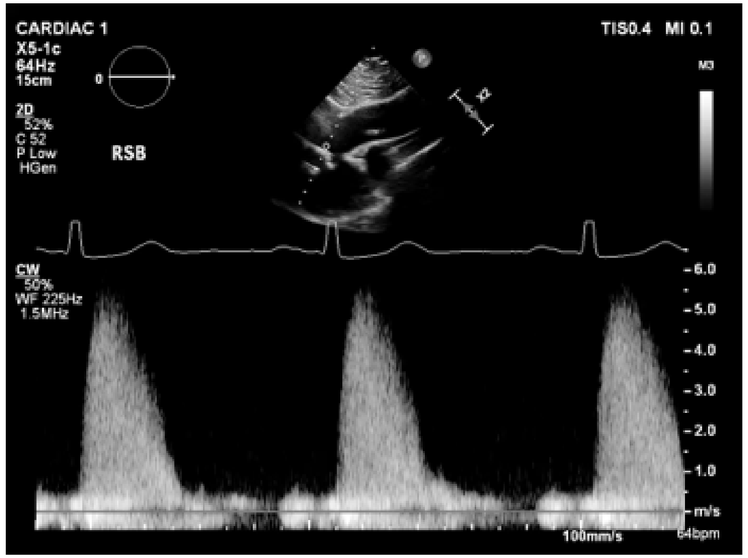
Mean of 45 mmHg



Mean of 50 mmHg



Mean of 70 mmHg

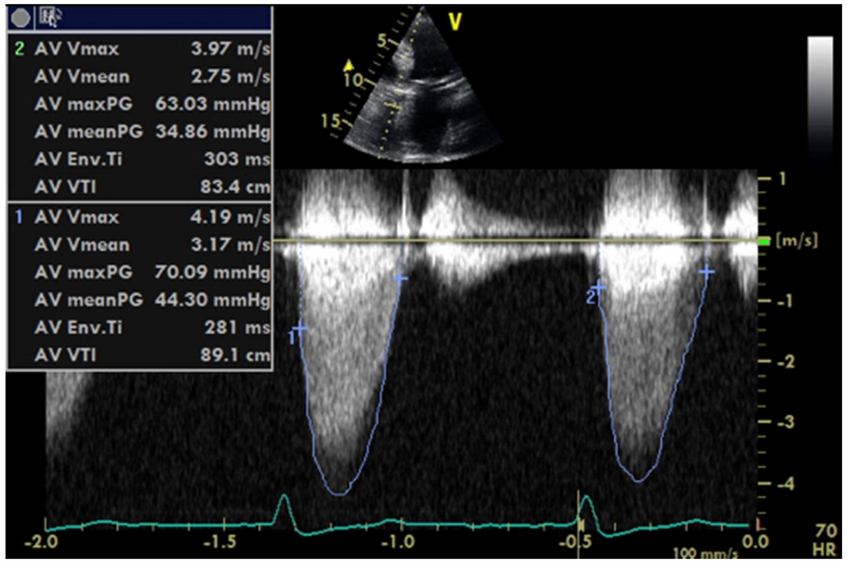


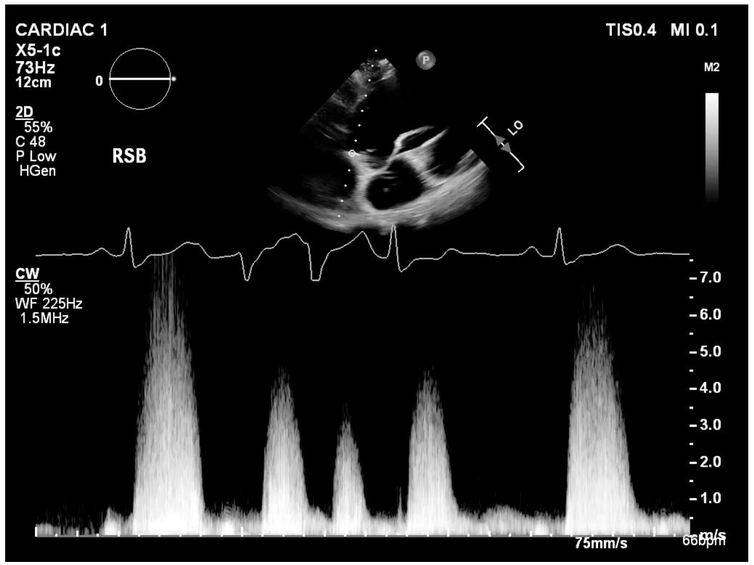
OTHER CONSIDERATIONS:

Post-PVC

Ectopy/AFib

Good Tracing





Chong A, Senior R, Wahi S Contemporary Imaging of Aortic Stenosis Heart, Lung and Circulation, 2019; 28, 1310-1319

ECHO REPORT

American Heart Association®
Target: Aortic Stenosis™

Stanford HEALTH CARE
STANFORD MEDICINE

Stanford Echocardiography
Room H3128, Unit B36, 300 Pasteur Drive, Stanford, CA 94305 || Room J280, Unit J2, 500 Pasteur Drive, Stanford, CA 94305
Phone: 650-723-7406 Fax: 650-725-3899

IAC INTERSOCIETAL ACCREDITATION COMMISSION — ACCREDITED FACILITY — CELEBRATING 25 YEARS OF QUALITY PATIENT CARE — ECHOCARDIOGRAPHY

Transthoracic Echocardiography Report

KEY REPORTING METRICS

1. AVA
2. Mean Pressure Gradient
3. Peak Velocity
4. Qualitative AS Severity Categorization
5. LVEF

INTERPRETATION SUMMARY

1. Moderate AS with a mean aortic gradient of 30 mmHg (apical) and a calculated AVA of 1.1 cm^2. Peak aortic velocity of 3.7 m/s. Normal LV size and systolic function. Calculated LVEF of 65% by MOD.
2. Normal RV size with normal systolic function. Mild MR/TR. Estimated RVSP of 27 mmHg (RAP 3 mmHg).
3. Compared to the prior TTE of 10/8/2025, mild RVE is noted.

ECHO REPORT

Sex Specific Reference Range

Ao root diam: 3.5 cm	(<4.0 cm)	**LVIDd**: 4.4 cm	(4.2-5.8 cm)	**LVIDs**: 2.9 cm (2.5-4.0 cm)	
IVSd: 1.3 cm (0.6-1.0 cm)		**LVPWd**: 1.2 cm	(0.6-1.0 cm)	**RA volume index**: 39.5 ml/m^2	(11-39 ml/m^2)

MMode/2D Measurements & Calculations

LVIDd index: 2.1

asc Aorta Diam: 3.7 cm

FS: 34.3 %

LVOT diam: 2.0 cm

RVDd minor: 4.1 cm

EDV(MOD-sp4): 123.8 ml

ESV(MOD-sp4): 43.2 ml

EF(MOD-sp4): 65.1 %

LAV(MOD-bp): 90.1 ml

LAV(MOD-bp) index: 41.9 ml/m^2

RA volume: 84.8 ml

Doppler Measurements & Calculations

MV A dur: 0.10 sec

MV E max vel: 67.1 cm/sec

MV A max vel: 50.8 cm/sec

MV E/A: 1.3

MV dec time: 0.24 sec

LV IVRT: 0.08 sec

Lat Peak E' Vel: 12.4 cm/sec

Med Peak E' Vel: 7.6 cm/sec

E/e' Lat: 5.4

E/e' Med: 8.8

E/e' Ave: 7.1

LV V1 max: 120.5 cm/sec

LV V1 max PG at rest: 5.8 mmHg

LV V1 VTI: 25.2 cm

SV(LVOT): 79.6 ml

SVI(LVOT): 37.1 ml/m^2

Ao V2 max: 364.5 cm/sec

Ao max PG: 53.1 mmHg

Ao mean PG: 29.9 mmHg

Ao V2 mean: 260.5 cm/sec

Ao V2 VTI: 74.3 cm

AVA(I,D): 1.1 cm^2

DI (VTI): 0.34

TR max vel: 245.3 cm/sec

TR max PG: 24.1 mmHg

RAP systole: 3.0 mmHg

RVSP(TR): 27.1 mmHg

Pulm Sys Vel: 49.3 cm/sec

Pulm Dias Vel: 46.5 cm/sec

Pulm A Revs Vel: 25.6 cm/sec

Pulm A Revs Dur: 0.13 sec

Pulm S/D: 1.1

Measurements from QLAB

LV GLS Endo Peak Avg (AS): -17.9 %

QLAB Heart Model

EF (HM)_phl: 63.0 %

DISCORDANT AS: THE COMMON PROBLEM

- **Recognizing Discordance:**
  - AVA ≤1.5 cm^2 ***BUT*** gradients <20 mmHg
  - Gradients suggest moderate aortic stenosis ***BUT*** AVA borderline severe

Discordance between clinical presentation and imaging is a signal - not noise!

STEPWISE EVALUATION OF DISCORDANT AS

1

Step 1: Confirm Measurement Accuracy

- LVOT Diameter
- Doppler Alignment

2

Step 2: Assess Flow

- SVI < 35 mL/m^2 = low flow
- LVEF < 50% = low flow

3

Step 3: Additional Testing

- CT for Aortic Valve Calcium Scoring
- Stress Echo

4

Step 4: Clinical Context

- Symptoms
- HF Status

Recommendations on the Echocardiographic Assessment of Aortic Valve Stenosis: A Focused Update from the European Association of Cardiovascular Imaging and the American Society of Echocardiography. Baumgartner et al. Journal of the American Society of Echocardiography Volume 30 Number 4

Integrating Echo Reports & EMR-Driven Clinical Workflows

WHY AI? CLINICAL PROBLEM & UNMET NEED

- **Heterogenous** progression rates
- Symptom **under-recognition**
- **Discordant** echo measurements
- LV dysfunction & remodeling may **begin before severe AS**
- **Missed timing** for referral/intervention
- High-risk patients are **hidden** within “moderate” category

“Moderate AS is not a uniform disease state”

WHY ECHO ALONE IS NOT ENOUGH

- Measurement **variability**
- Discordant **AVA vs Gradient**
- **Low-flow** states
- LVEF may remain **preserved** while myocardial dysfunction **progresses**

"Valve severity does not equal patient risk"

BRIDGING THE GAP BETWEEN ECHO & EMR DATA

- Over-reliance on AVA alone
- Missing **discordant AS**
- Ignoring **flow state**
- Echo interpretation in isolation
- Follow up intervals based on broad guideline buckets
- **EMR contains symptoms, BNP, renal function, frailty** - but not often integrated into risk assessment

DATA AVAILABLE IN MODERATE AS

Echocardiographic Data

- Peak Velocity
- Mean Gradient
- AVA
- Dimensionless Index
- Stroke Volume Index
- LVEF

EMR/Clinical Data

- Age, Sex
- Symptoms (DOE, angina, syncope)
- NT-proBNP
- Renal Function
- Comorbidities (CAD, AF, HTN, CKD, Diabetes)
- HF admissions
- Medications (GDMT, diuretics)

ECHO DATABASE QUERY & USE OF AI

Algorithmic Review

Severe AS Index *

89%

AHA Guidelines

Potential Severe AS

2020 ACC/AHA Guidelines

AVA	JV	MPG	LVEF	DI	SVI
0.91 cm^2	4.01 m/s	35.1 mmHg	57.0%	0.22	42.4

Moderate AS

AV Findings

The aortic valve is tricuspid. There is some (unable to grade) aortic regurgitation. There is moderate aortic stenosis. The transaortic valve mean pressure gradient is 35.1 mmHg. The transaortic valve maximum velocity is 401.3 cm/sec. The aortic valve area is 0.91 cm 2. The DI is 0.22 . The stroke volume index, SVI(LVOT), is 42.4 ml/m 2.

Algorithmic Review

Severe AS Index *

89%

AHA Guidelines

Potential Severe AS

2020 ACC/AHA Guidelines

AVA	JV	MPG	LVEF	DI	SVI
0.8 cm^2	3.95 m/s	35.6 mmHg	65.0%	0.25	31.7

Moderate to Severe AS

AV Findings

The aortic valve is tricuspid. The aortic valve leaflets are moderately thickened and/or calcified. There is mild aortic regurgitation. There is moderate-severe aortic stenosis. The transaortic valve mean pressure gradient is 35.6 mmHg. The aortic valve area is 0.80 cm 2.

Algorithmic Review

Severe AS Index *

89%

AHA Guidelines

Potential Severe AS

2020 ACC/AHA Guidelines

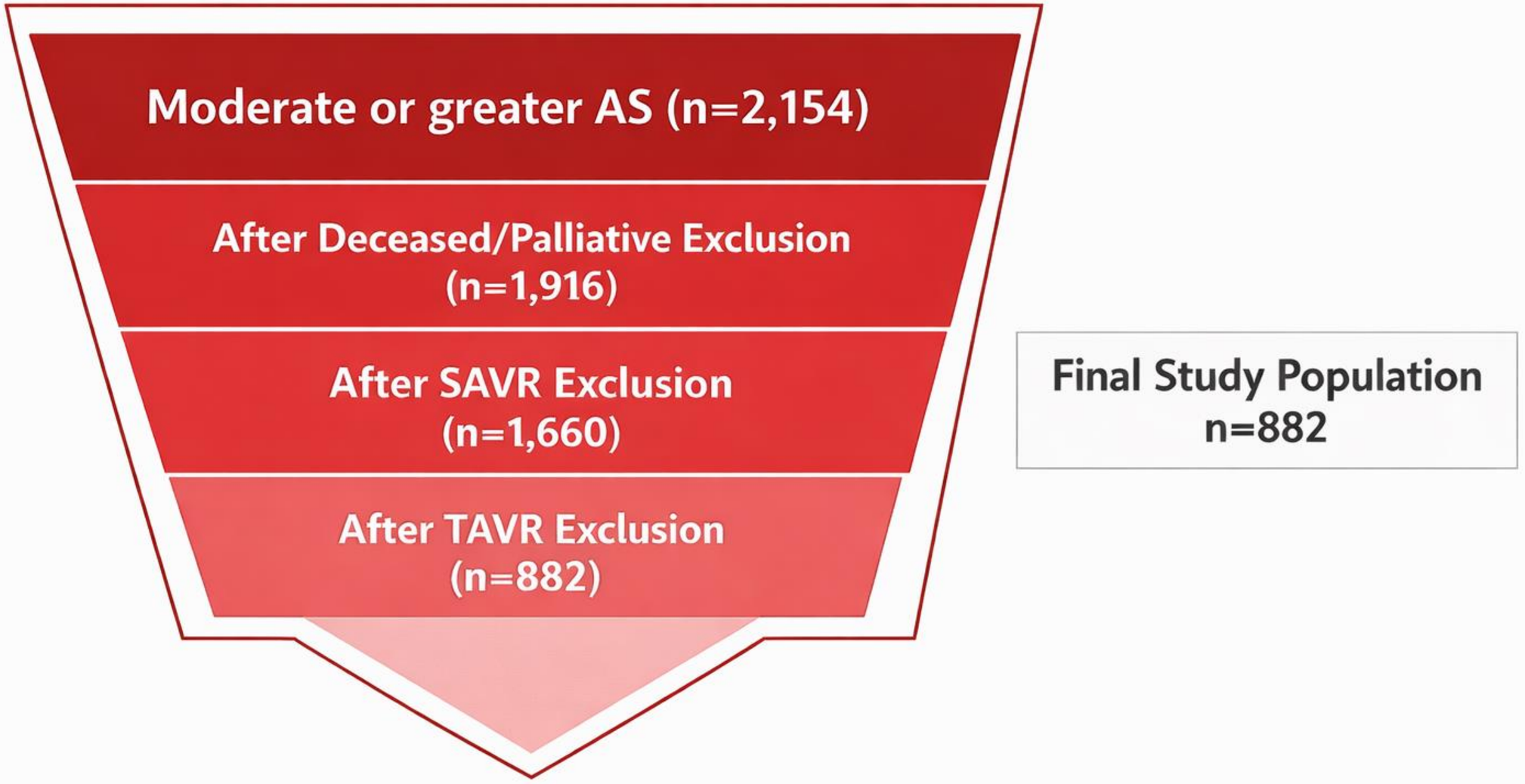
AVA	JV	MPG	LVEF	DI	SVI
0.88 cm^2	3.96 m/s	35 mmHg	53.0%	0.28	47.6

Moderate AS

AV Findings

The aortic valve is not well visualized. The aortic valve leaflets are moderately thickened and/or calcified. There is trace aortic regurgitation. There is moderate aortic stenosis. The transaortic valve mean pressure gradient is 35.0 mmHg. The transaortic valve maximum velocity is 395.7 cm/sec. The aortic valve area is 0.88 cm 2. The DI is 0.28 .

PATIENT COHORT SELECTION FROM EMR DATABASE



NEXT STEPS

1

Filter by Managing Provider

2

Direct Our Outreach To Primary Cardiology Groups

3

Shift Focus To Primary Care Physician Group

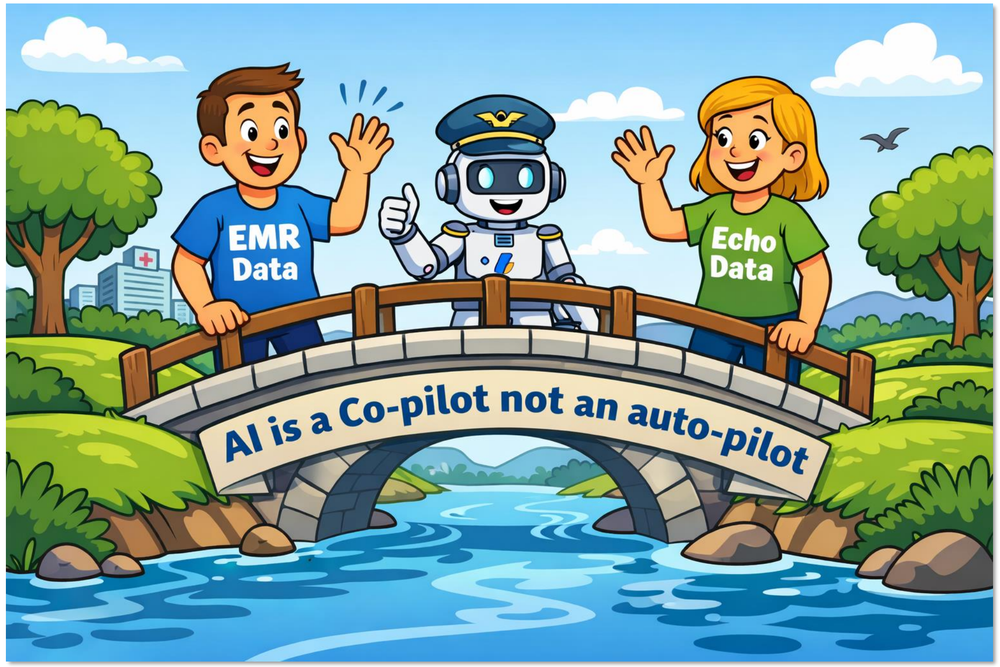
4

Include Recommendations In Echo Report For Referral To Our Valve Clinic

Under discussion: Include recommendations in Echo Report to patient?

KEY TAKEAWAYS

- AI is a **"Co-Pilot"** not **"Auto-Pilot"**
- Moderate AS requires **integrated interpretation**
- Discordant findings are common → **use structured framework**



Key Hemodynamic Principles in Aortic Stenosis Evaluation

Dr. Anita M. Kelsey, MD, MBA

Duke University Health System

Professor of Medicine/Cardiology

Vice Chief, Faculty Affairs and Operations

Medical Director, Duke Cardiac Ultrasound Certificate Program

OUTLINE

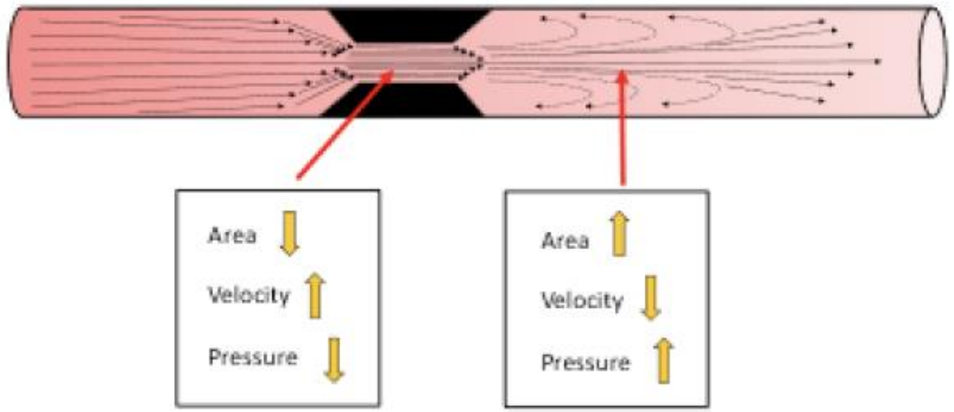
Explain the **hemodynamics and physics** that affect echocardiographic assessments of aortic stenosis.

Describe the **value of additional imaging** in assessments of **discordant echocardiographic findings**.

Principles of flow

BERNOULLI'S PRINCIPLE

- Based on the law of "Conservation of Energy" that energy cannot be created or destroyed – just transformed
- When blood is traveling through a stenosis (a narrowing in the vessel):
  - **Velocity (kinetic energy)** ***increases*** ★
  - **Pressure** ***decreases*** ★

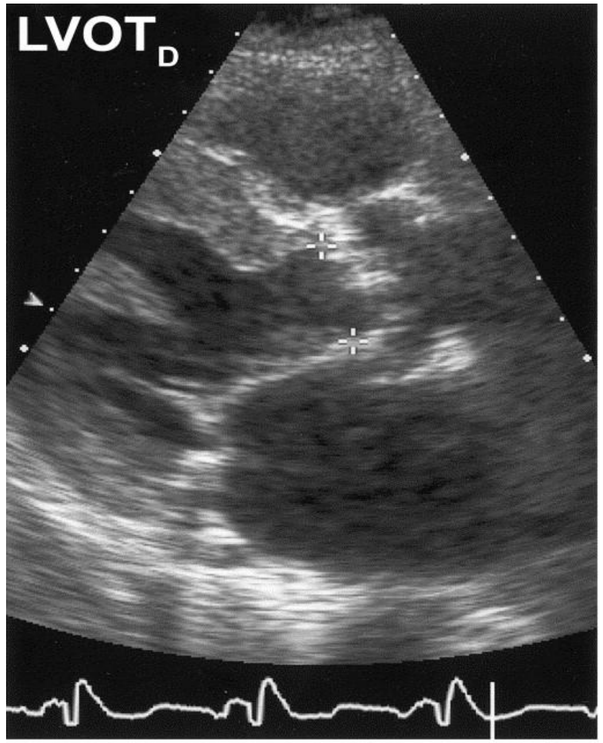


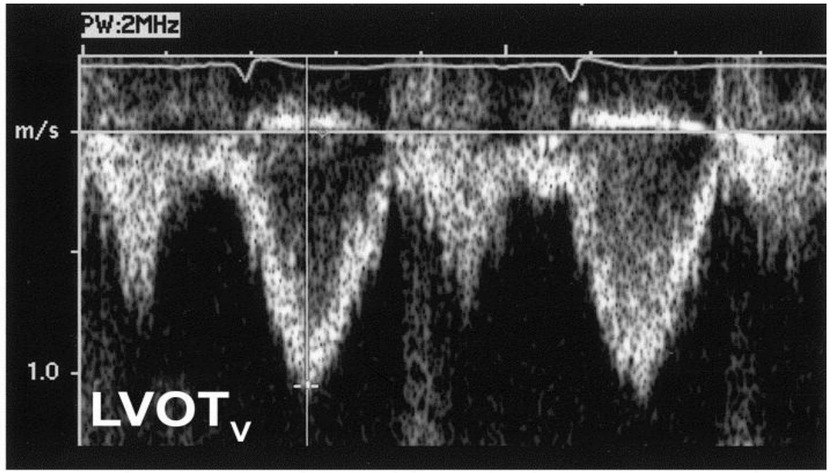
FLOW THROUGH THE HEART

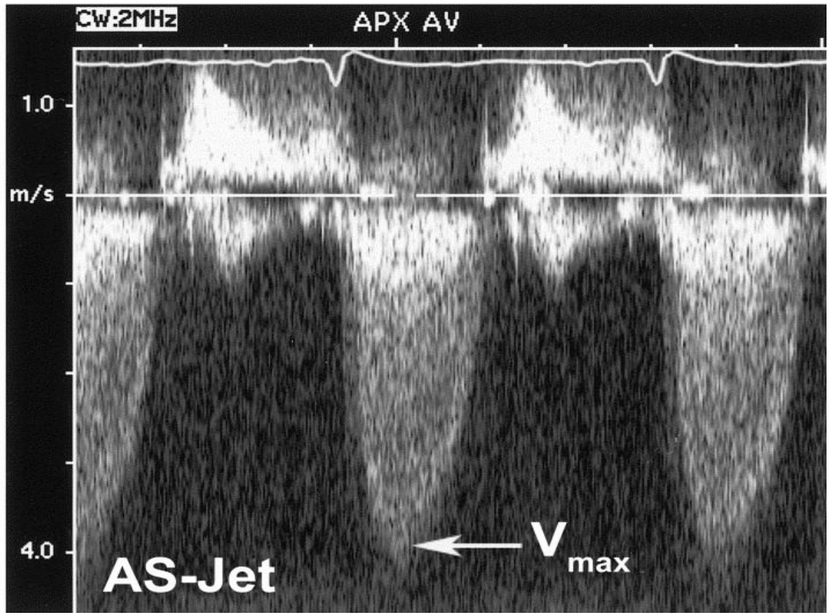
Large area has *low velocity*

Small area has *high velocity*

ECHOCARDIOGRAPHY



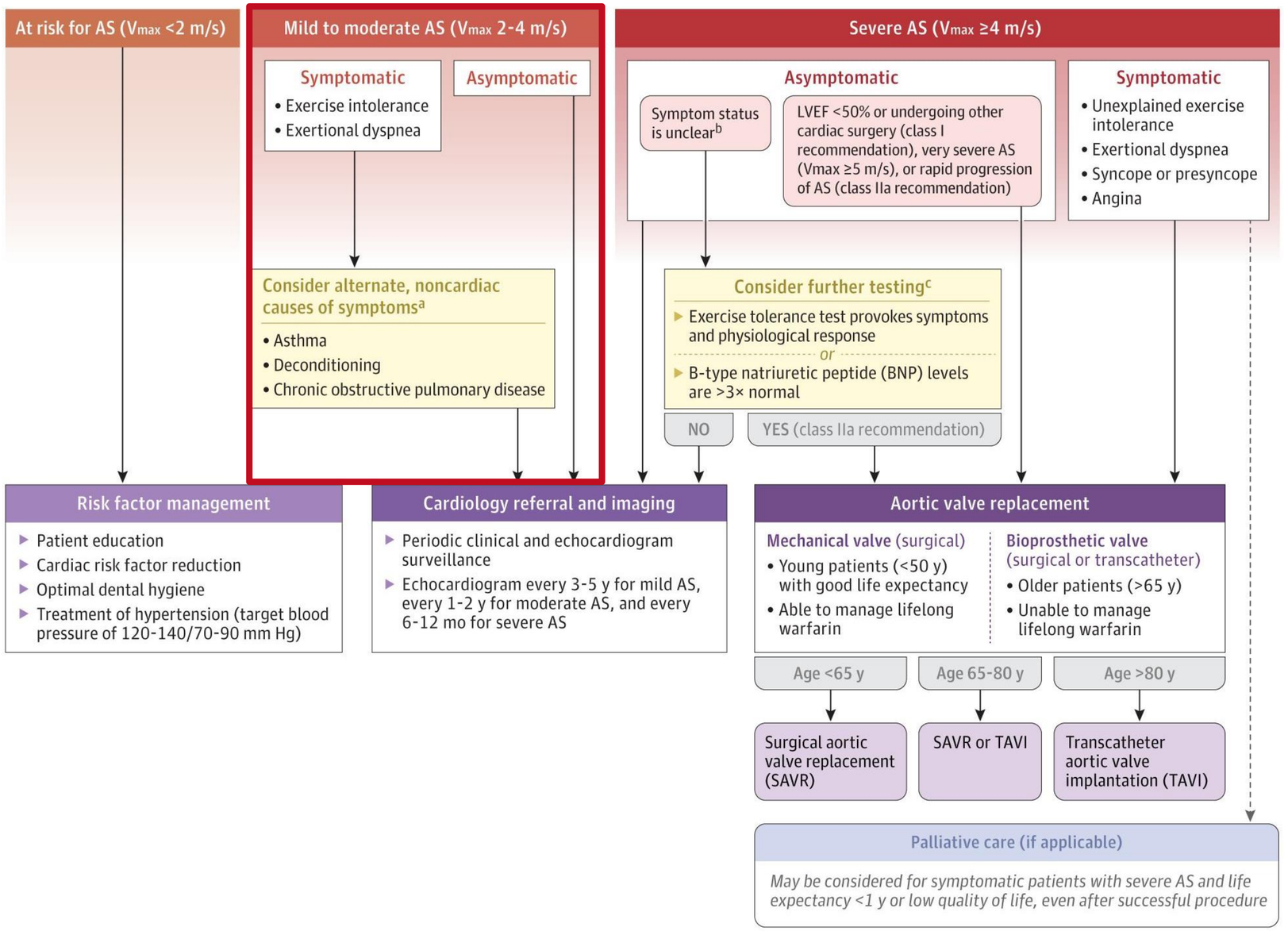




$$AVA = \frac{(CSA_{LVOT} \times VTI_{LVOT})}{VTI_{AS}}$$

2020 ACC/AHA Valvular Heart Disease Guideline, J of ACC. Vol. 77,4 (2021).

MANAGEMENT OF PATIENT WITH AS



Otto 2024 Dec 17;332(23):2014-2026.

SEVERITY OF AS

Table 3 Recommendations for classification of AS severity

	Aortic sclerosis	Mild	Moderate	Severe
Aortic jet velocity (m/s)	≤2.5 m/s	2.6–2.9	3.0–4.0	>4.0
Mean gradient (mmHg)	—	<20 (<30[a])	20–40[b] (30–50[a])	>40[b] (>50[a])
AVA (cm^2)	—	>1.5	1.0–1.5	<1.0
Indexed AVA (cm^2/m^2)		>0.85	0.60–0.85	<0.6
Velocity ratio		>0.50	0.25–0.50	<0.25

[a]ESC Guidelines.
[b]AHA/ACC Guidelines.

Baumgartner, et al., Echocardiographic Assessment of Valve Stenosis: EAE/ASE Recommendations for Clinical Practice
Journal of the American Society of Echocardiography, 22, 1-232009

PITFALLS IN ECHOCARDIOGRAPHIC ASSESSMENT

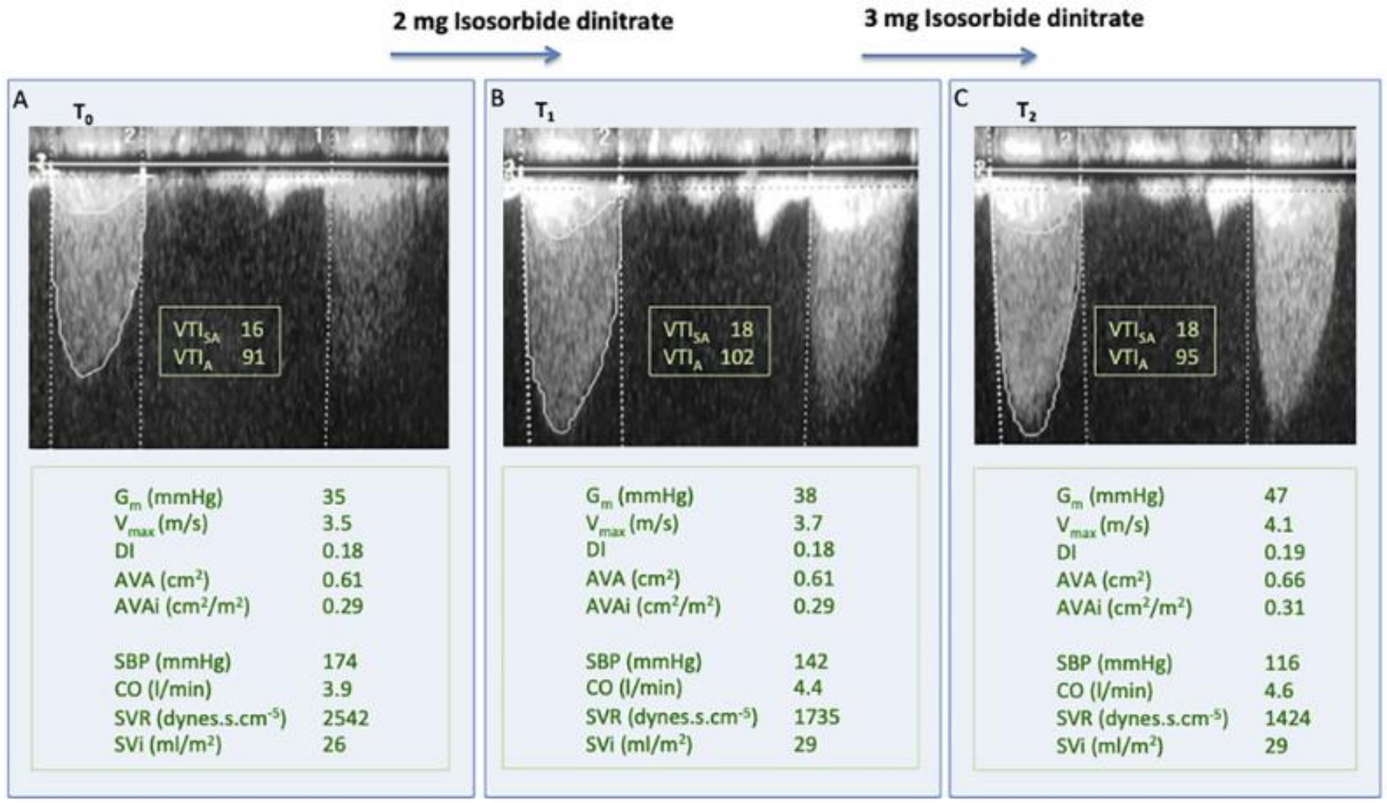
Afterload

Changes in flow

Concomitant disease

Physics of ultrasound

AFTERLOAD

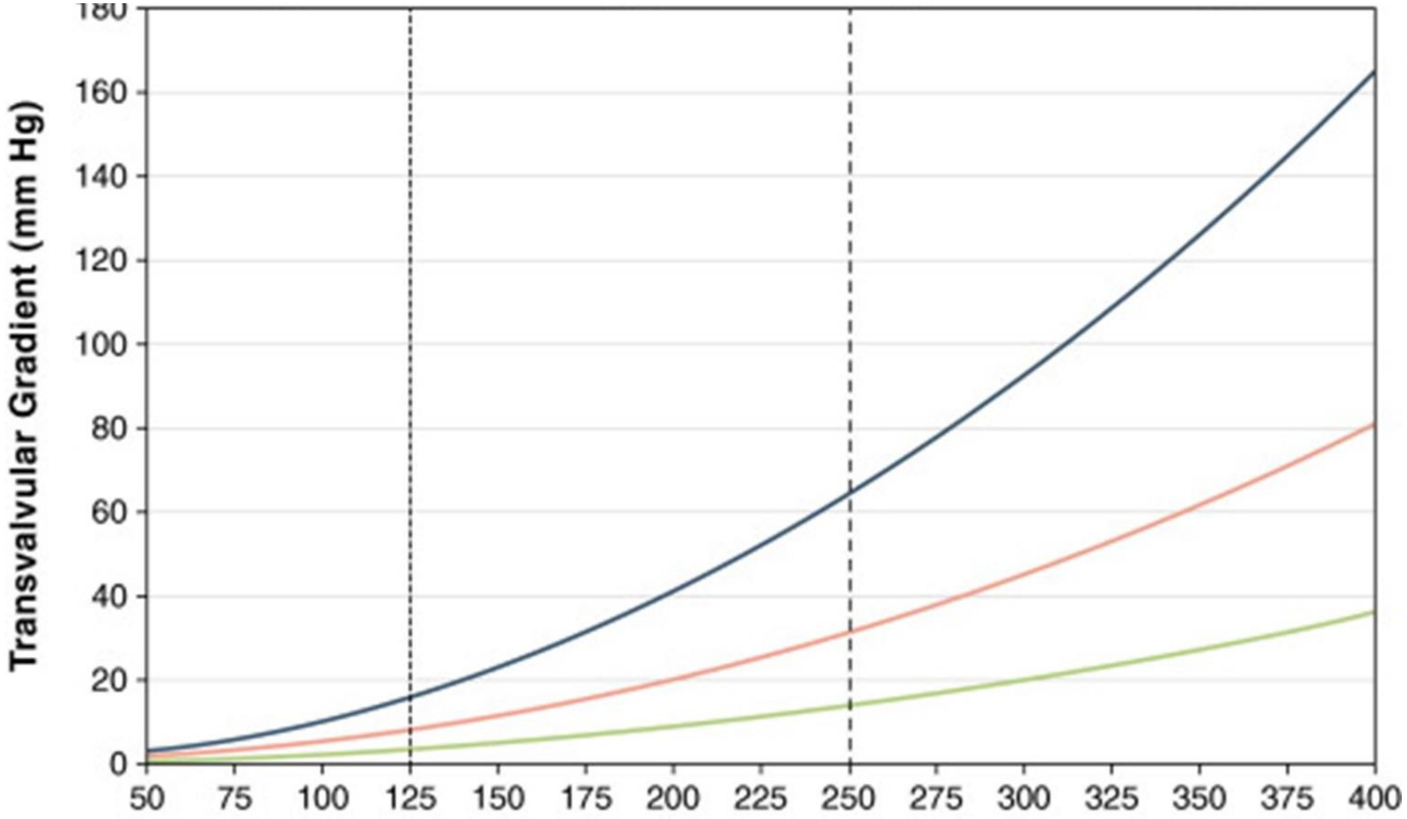


	A	B	C
G_m (mmHg)	35	38	47
V_{max} (m/s)	3.5	3.7	4.1
DI	0.18	0.18	0.19
AVA (cm^2)	0.61	0.61	0.66
AVAi (cm^2/m^2)	0.29	0.29	0.31
SBP (mmHg)	174	142	116
CO (l/min)	3.9	4.4	4.6
SVR (dynes.s.cm^{-5})	2542	1735	1424
SVi (ml/m^2)	26	29	29

- Elevated BP results in **underestimate** of AS severity
- Must keep **systolic BP <140 mmHg** during imaging

Hayek et al., Impact of Arterial Blood Pressure on Ultrasound Hemodynamic Assessment of Aortic Valve Stenosis Severity. Journal of the American Society of Echocardiography, 2020; 33, 1324-1333

FLOW RATES



Low Flow States

- Reduced LVEF
- Small hypertrophied LV
- Mitral regurgitation

High Flow States

- Anemia
- Fever
- Hyperthyroidism
- Anxiety
- Pain
- Significant aortic regurgitation
- Arteriovenous fistulas

Tandon, A, J Am Coll Cardiol Img. 2013 Feb, 6 (2) 184–195
Tandon, A Imaging of Low-Gradient Severe Aortic Stenosis. J Am Coll Cardiol Img. 2013 Feb, 6 (2) 184–195.

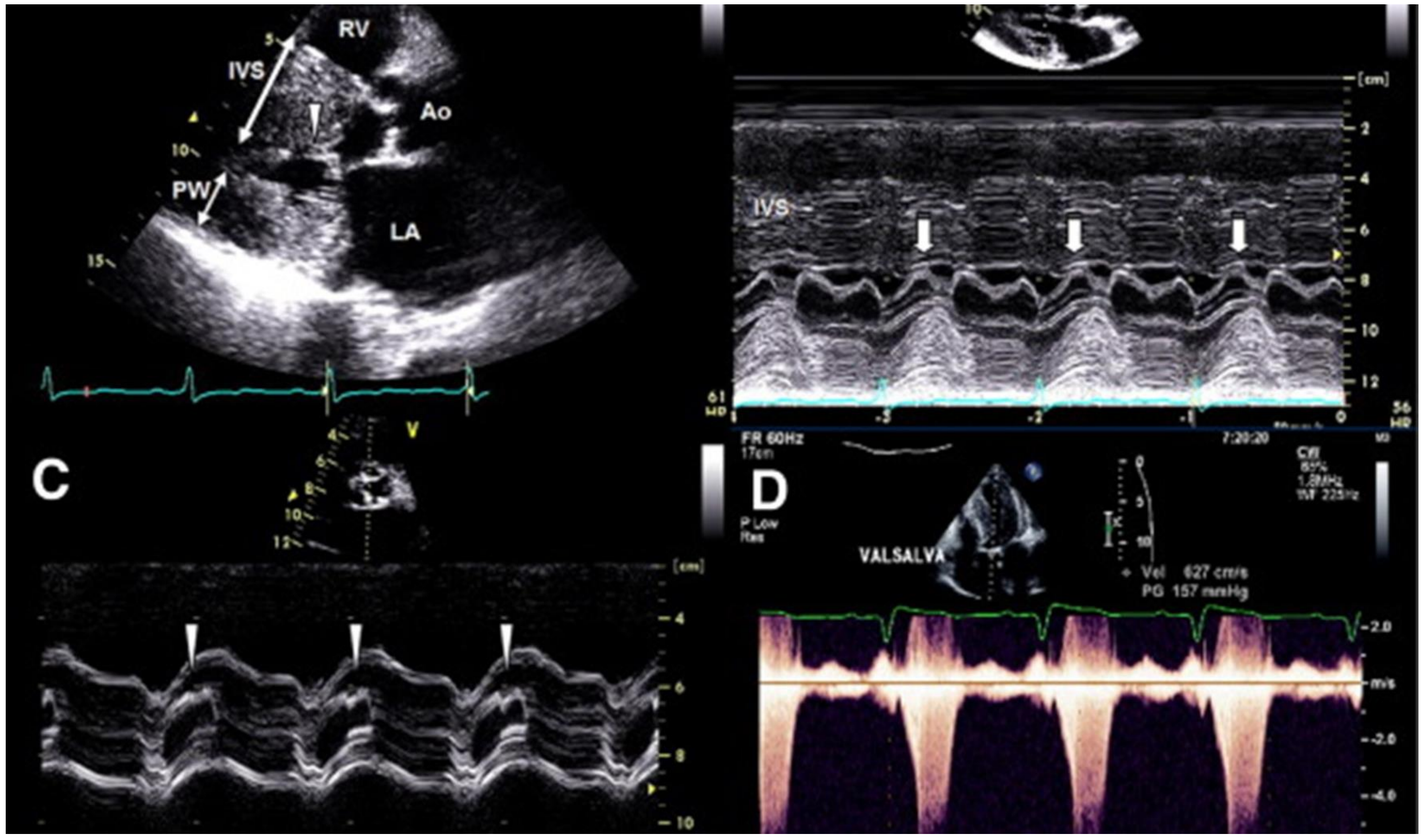
ECHO REPORTS: CUTOFF VALUES

Low Flow State: Stroke Volume Indexed <35 ml/beat/m^2

High Flow State: Can Sort Out With the AVA!

- Gradients are **high** and AVA **is not** < 1.0 cm^2

CONCOMITANT DISEASE

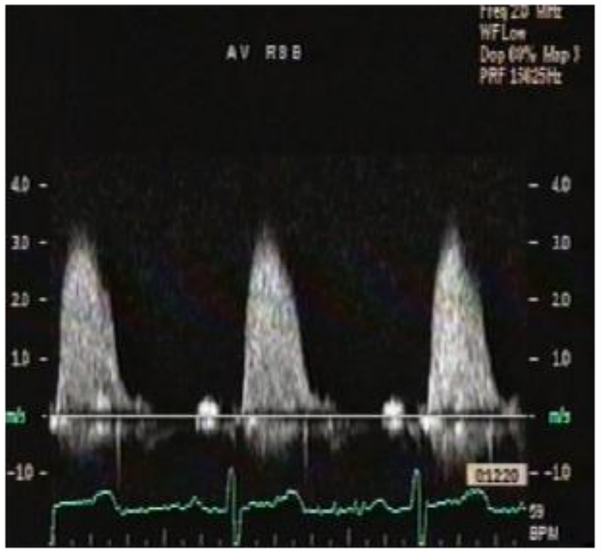


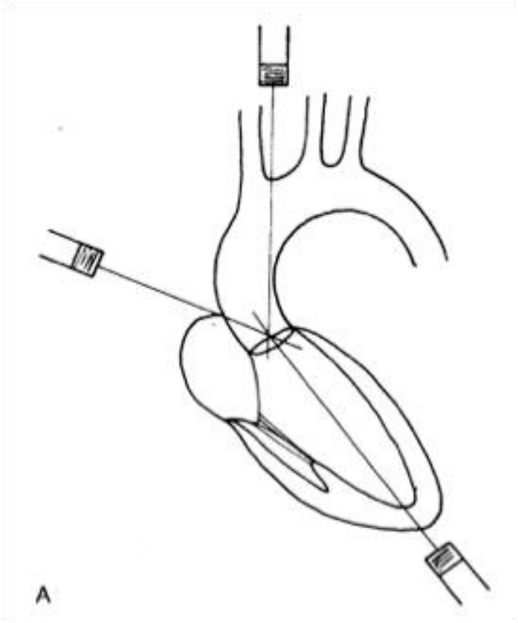
Hypertrophic Obstructive Cardiomyopathy:

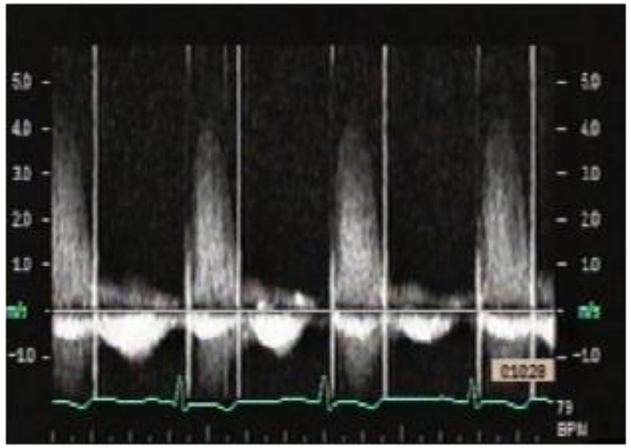
Creates a sub-valvular obstruction, resulting in ***overestimation of AS severity***

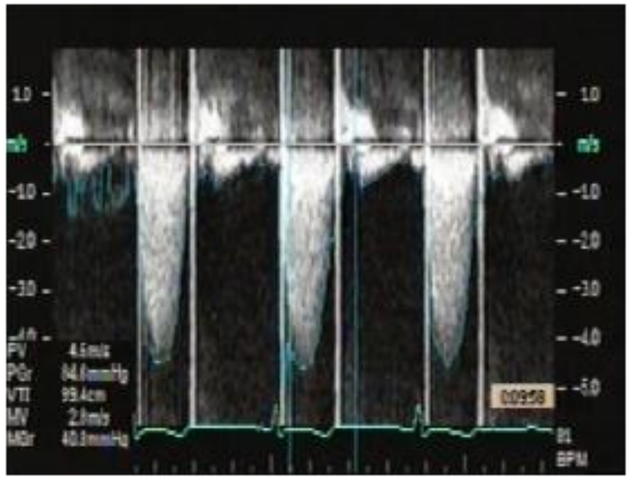
AORTIC VELOCITY

MUST BE PARALLEL



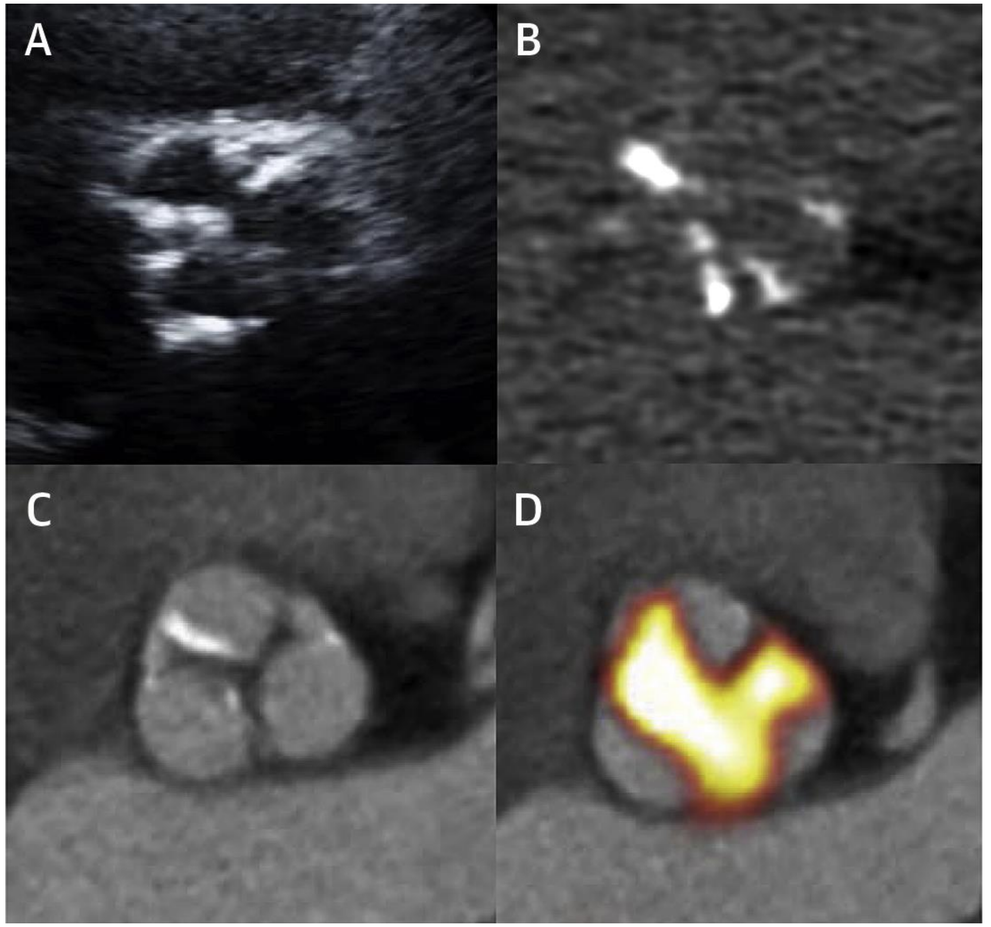






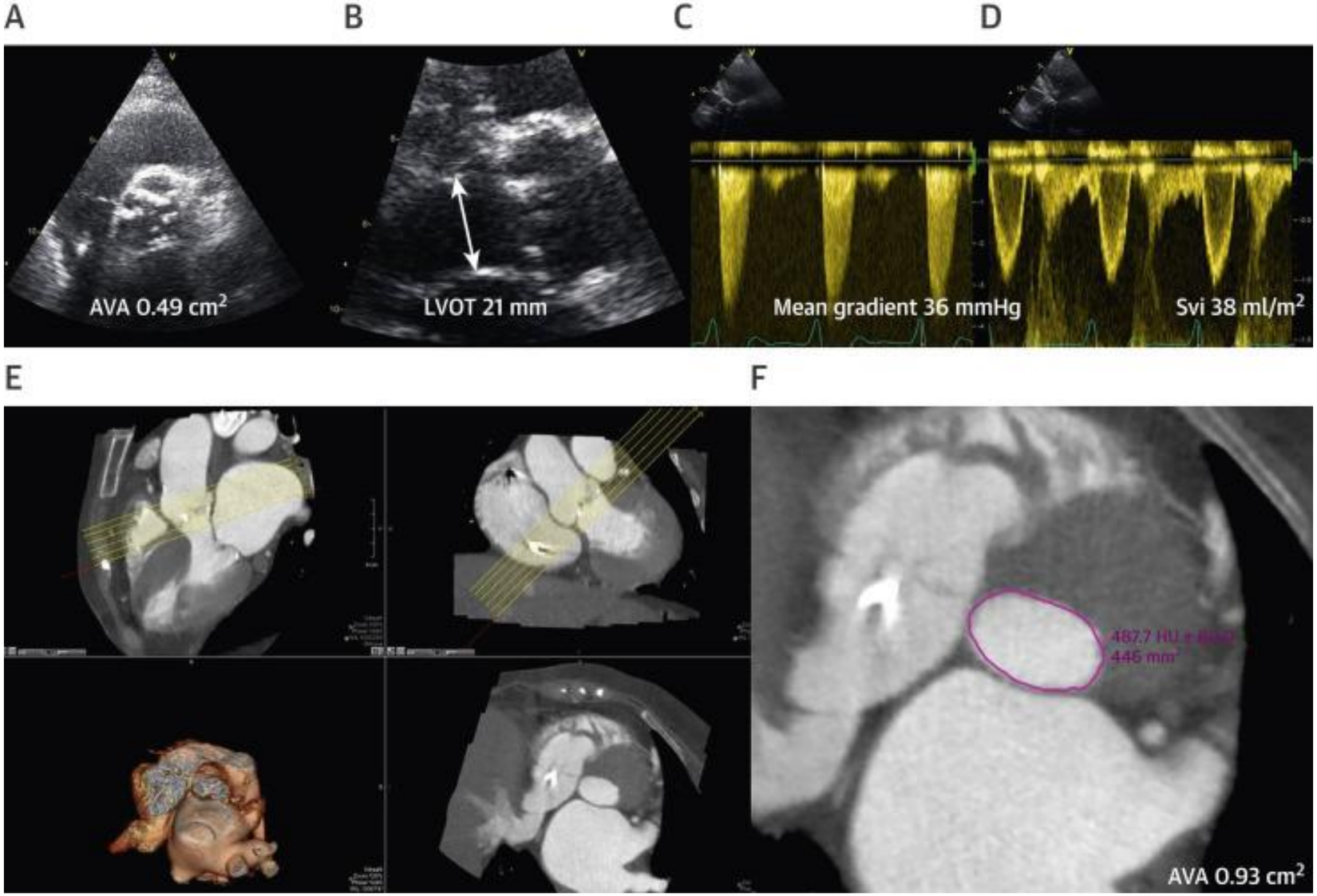
When to Use Other Modalities

COMPARISON OF IMAGING MODALITIES FOR CALCIFIC AS



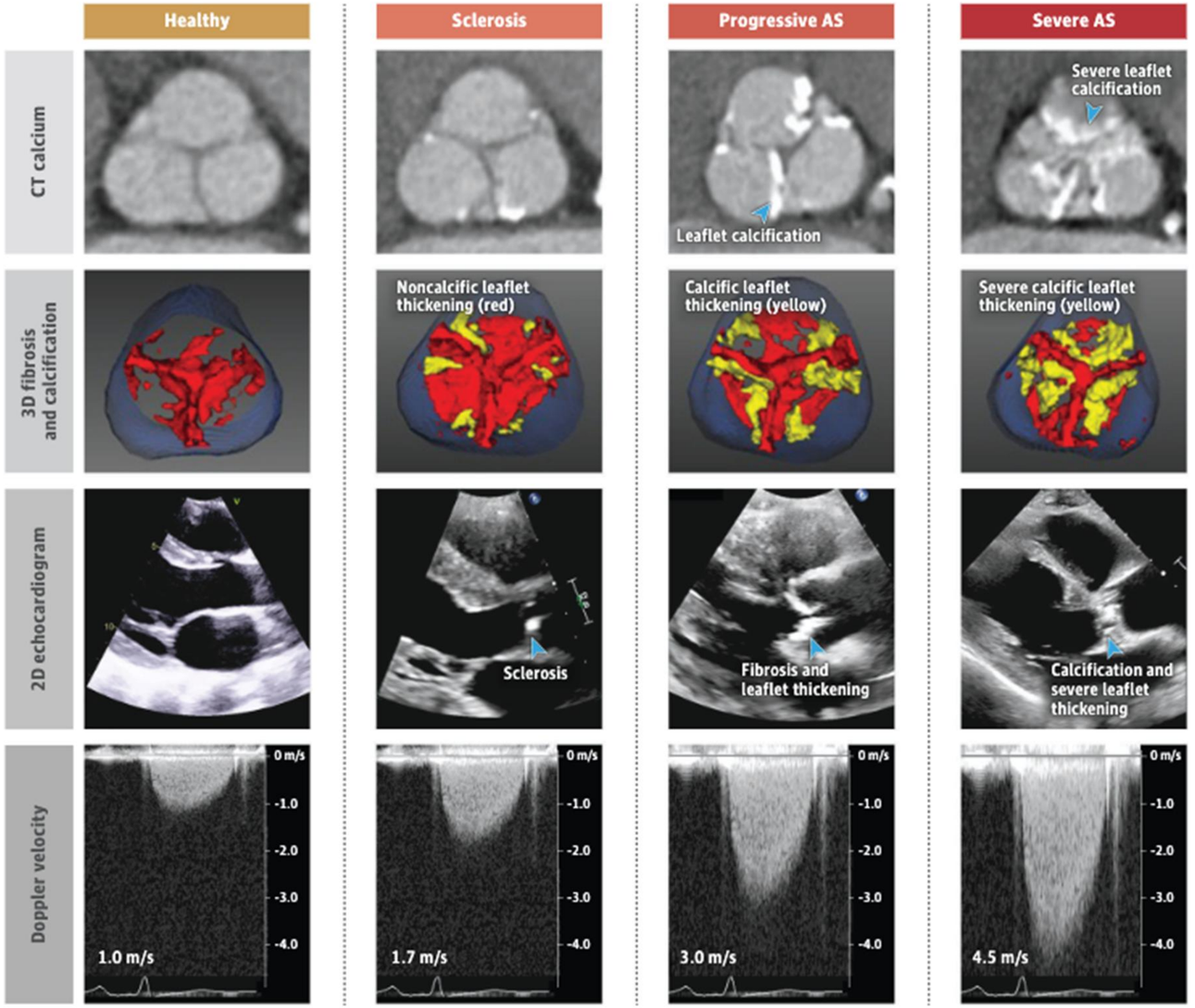
Pawade 2015 *JACC*. 2015 Aug, 66 (5) 561–577.

LVOT



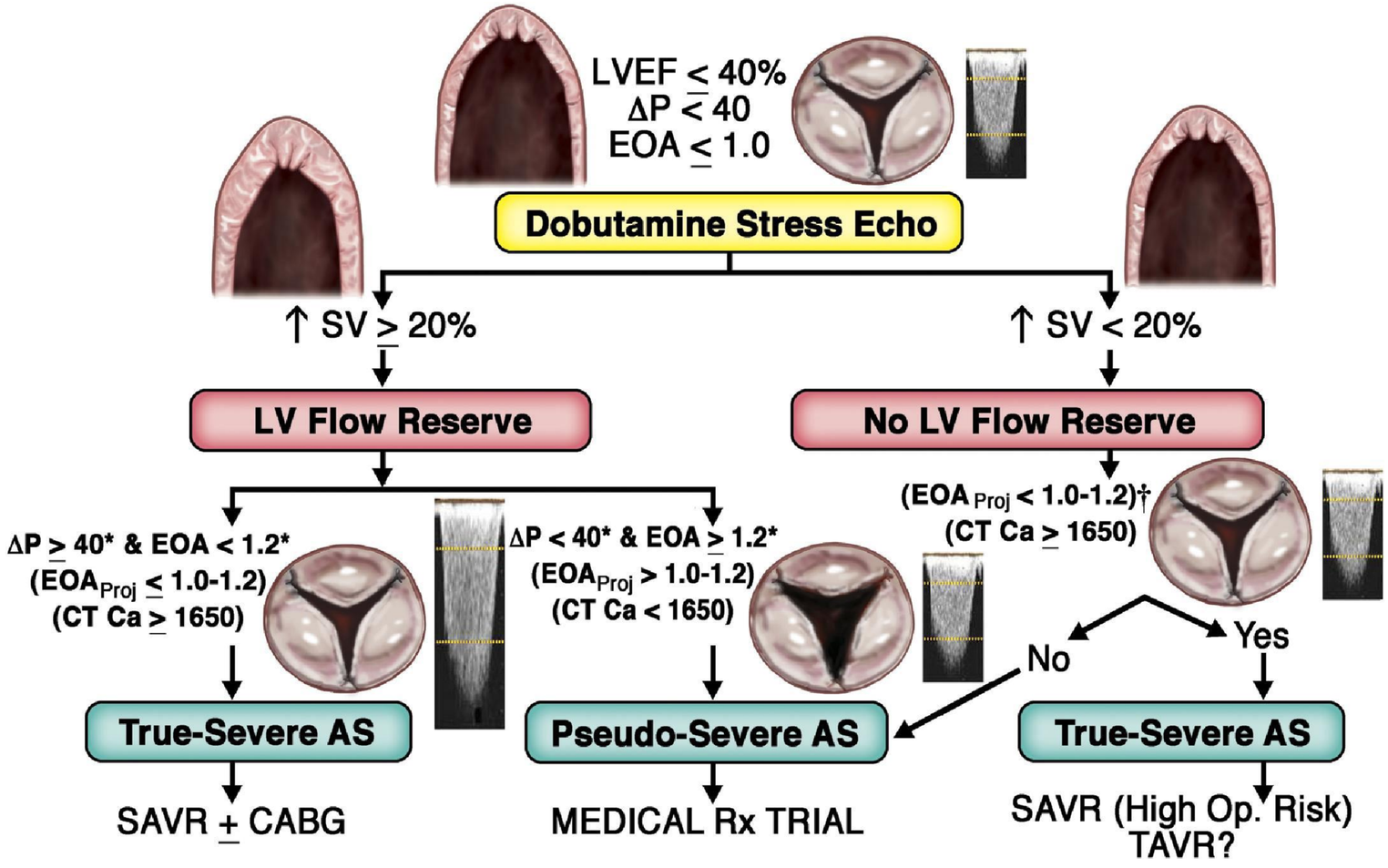
Delgado, V, Clavel, M, Hahn, R. et al. How Do We Reconcile Echocardiography, Computed Tomography, and Hybrid Imaging in Assessing Discordant Grading of Aortic Stenosis Severity?. *J Am Coll Cardiol Img*. 2019 Feb, 12 (2) 267–282.

PROGRESSION OF AORTIC STENOSIS



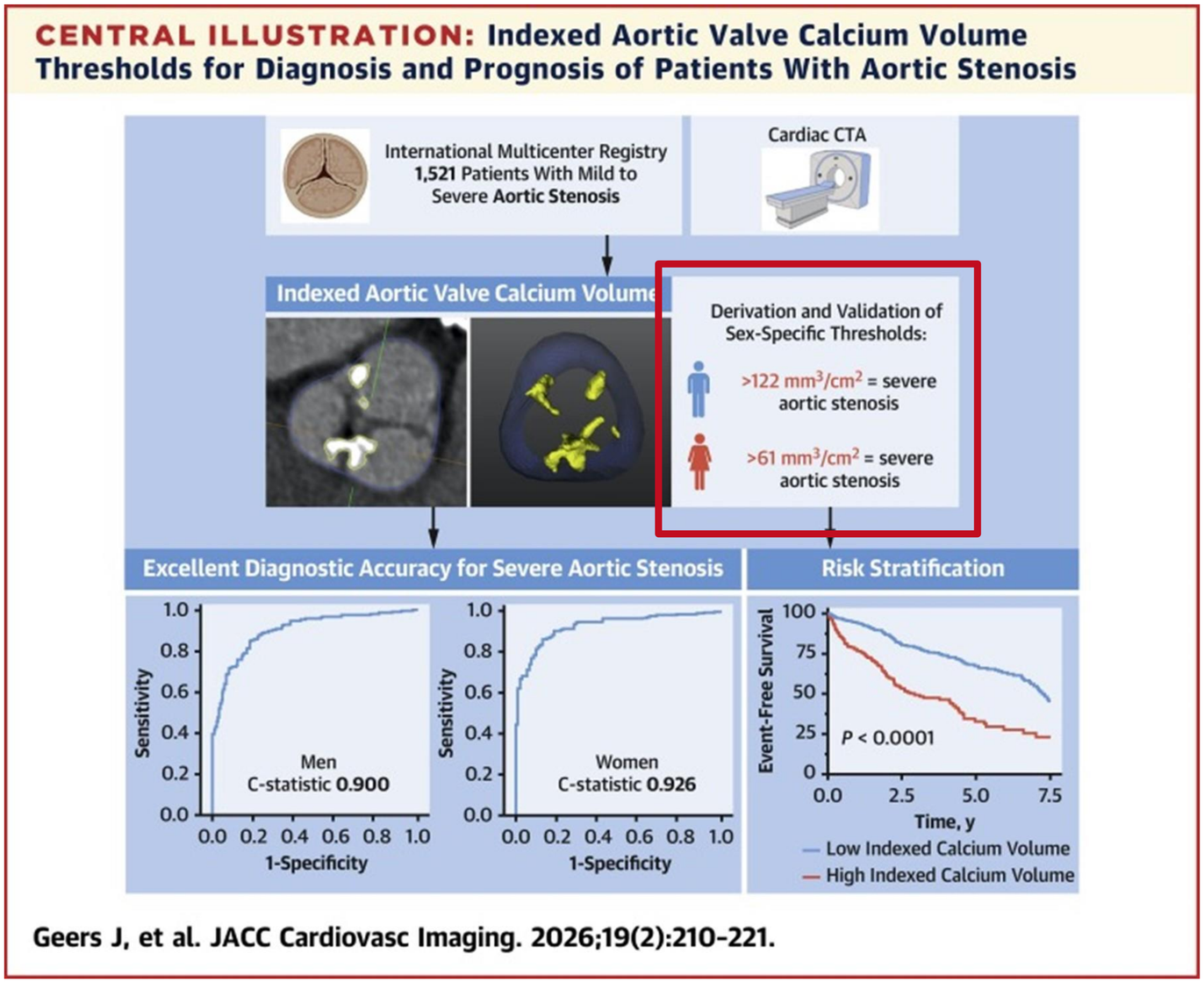
Otto 2024 Dec 17;332(23):2014-2026.

DOBUTAMINE STRESS ECHOCARDIOGRAPHY: GRADIENT AS



Pibarot et al. JACC. 2012 Nov, 60 (19) 1845-1853.

CT IMAGING



Geers J, et al. JACC Cardiovasc Imaging. 2026;19(2):210-221.

KATALYST-AV

A Two-Part Phase 2b/3, Randomized, Double-Blinded Placebo Controlled Study Checking the Efficacy and Safety of Ataciguat to Slow the Progression of Valvular Dysfunction in Participants with Moderate Calcific Aortic Valve Stenosis

- **What is the effect of ataciguat on slowing the progression of AVC?**
- **How does the change in AVC correlate with echocardiographic measures (e.g., diastolic function)?**
- **How do these changes relate to symptoms and cardiopulmonary function?**
- **What is the direct effect of ataciguat on cardiopulmonary function?**

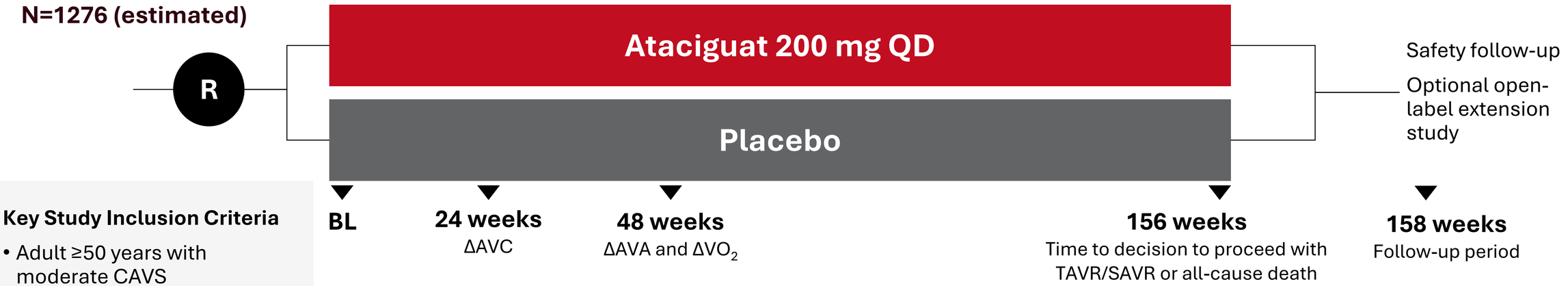
https://clinicaltrials.gov/study/NCT07001800

KATALYST-AV

Phase 2b/3 KATALYST-AV Clinical Trial (Currently Recruiting)[1]

A phase 2b/3, randomized, double-blind, placebo-controlled trial investigating the efficacy of ataciguat in slowing the progression of valvular dysfunction in adults with moderate CAVS (NCT07001800)

Design and Inclusion Criteria



Key Study Inclusion Criteria

- Adult ≥50 years with moderate CAVS
- AVA of ≥1.0 cm^2 to ≤1.50 cm^2
- AVC 600-1200 AU (women) or 600-2000 AU (men)
- LVEF ≥ 45% at screening
- No contraindication to completing CPET (Part A sub-study, Part B)

	Part A (n=132)	Part B (n=1144)
Primary endpoint(s)	• Change in AVC at Week 24	• Change in AVA at week 48 • Change in pVO_2 at week 48
Secondary endpoints	• Change in eVO_2 at week 48 (ATA vs PBO) • Change in AVC and VO_2 correlation at week 48 • Change in VO_2 at week 48 • Change in LVMI at week 48 • Change in KCCQ-23 at week 48	• Change in AVC at week 48 • TTD to proceed with TAVR/SAVR or all-cause death • Percent with progression to AVA <1.0 cm^2 at week 48
CPET Sub-study (n~50)	• Change in pVO_2 at week 48 (ATA vs PBO) • Borg RPF at peak exertion	N/A

*Safety, tolerability, and pharmacokinetics will also be evaluated.

1. Protocol ATA-301, Version 3.0. December 12, 2025.

American Heart Association®

Case-Based Discussion: Monitoring Moderate AS & Understanding Discordance

Anita M. Kelsey, MD, MBA

Duke University Health System

Professor of Medicine/Cardiology

Lexi Vincent, ACS, RDCS, RCCS

Structural Heart Program, Stanford Health Care

Lead Cardiac Sonographer

Patient Case #1

WHAT ABOUT THIS PATIENT:

An 81-year-old female with a history of **HTN**, **HLD**, **GERD**, **Gout**, and **Hiatal Hernia**.

Cardiac History:

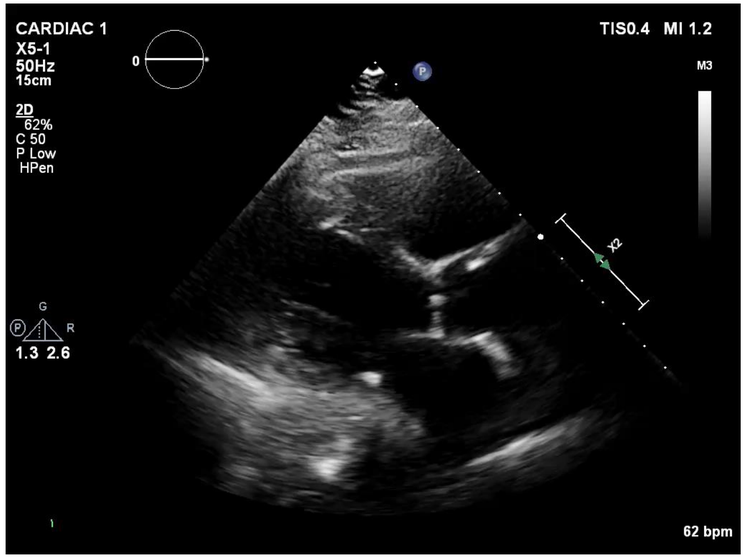
- Dyspnea on Exertion (DOE) ongoing for 2 years
- Endorses occasional bendopnea, dyspnea when carrying heavy objects, and dyspnea with one flight of stairs

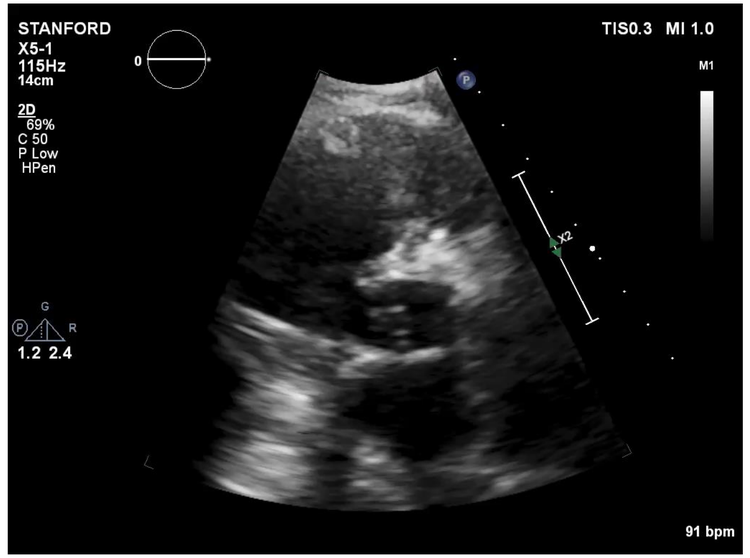
Symptoms:

- General fatigue
- Occasional dizziness with quick position changes
- Patient is admittedly more sedentary over the last year

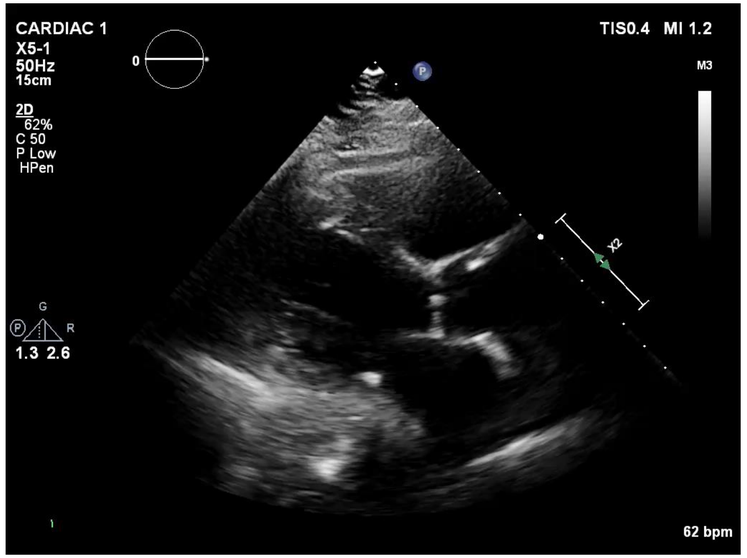
ECHO: 2017 & 2021

2017



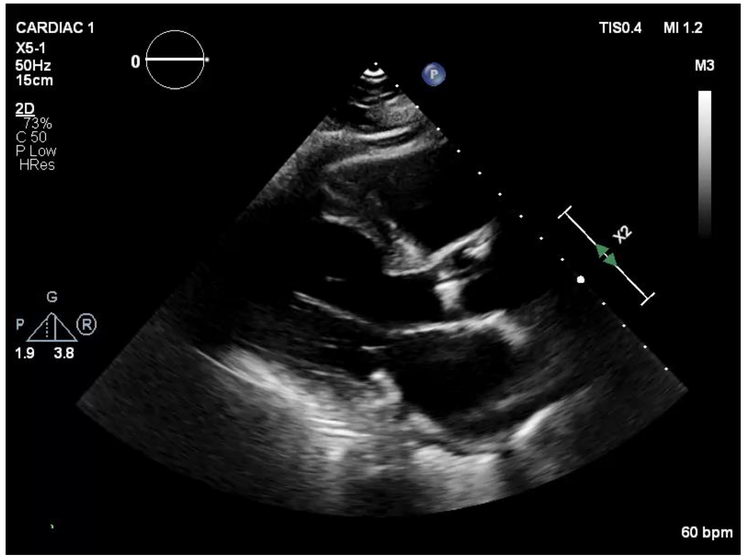


2021

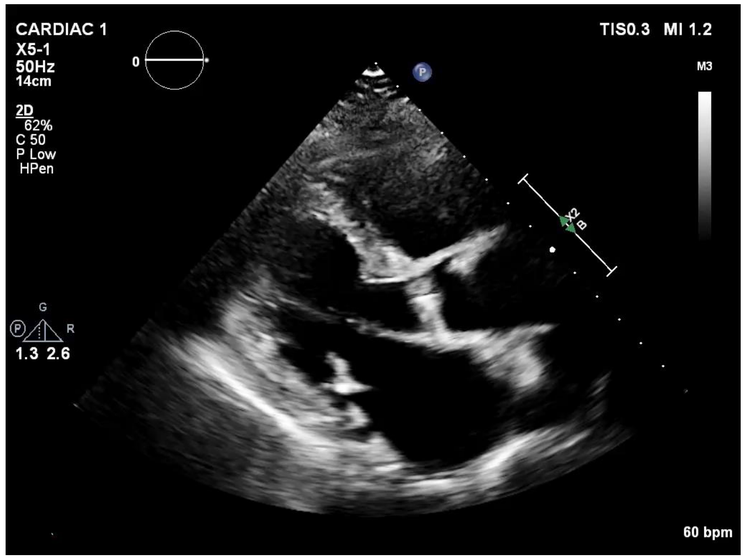


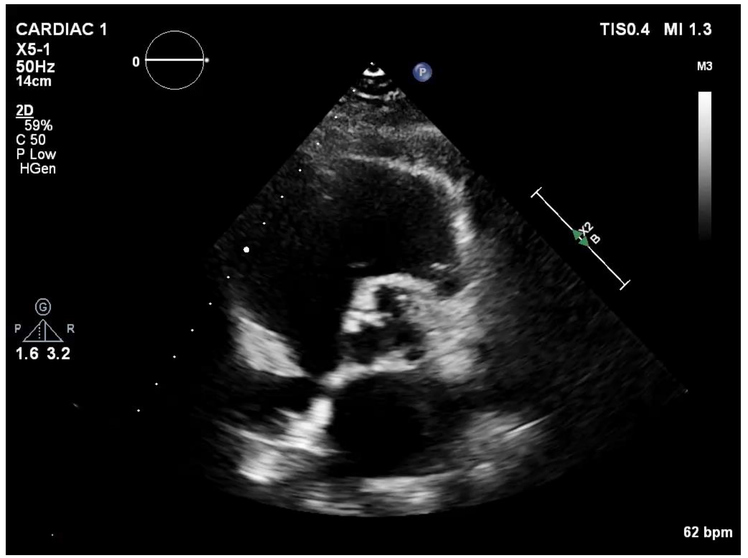
ECHO: 2022 & 2023

2022



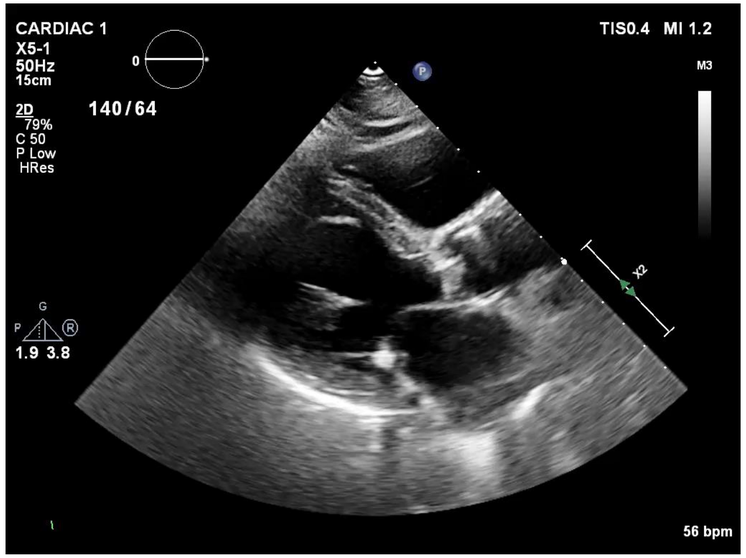
2023

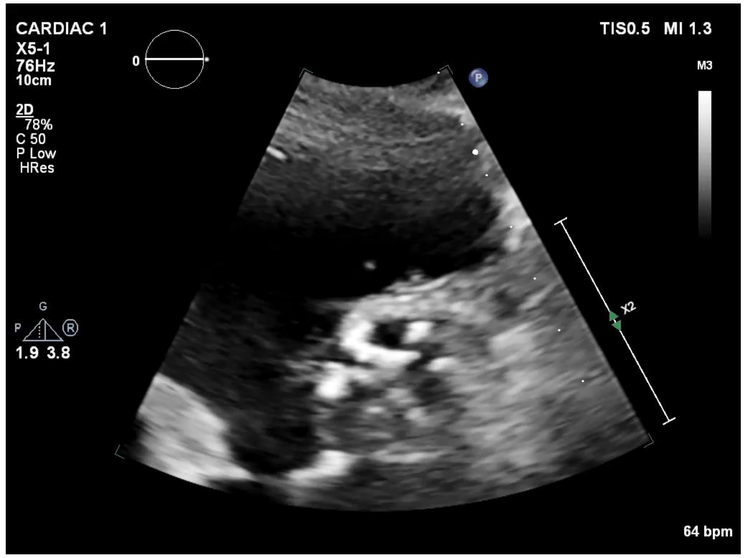




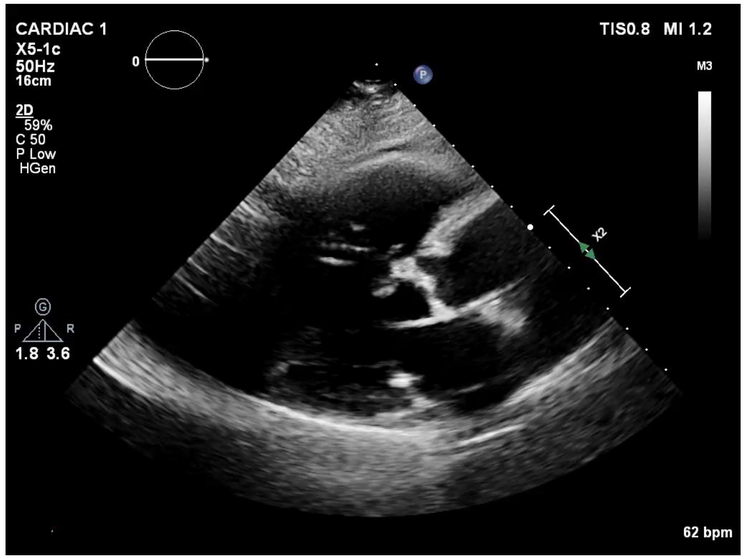
ECHO: AUGUST 2024 & OCTOBER 2024

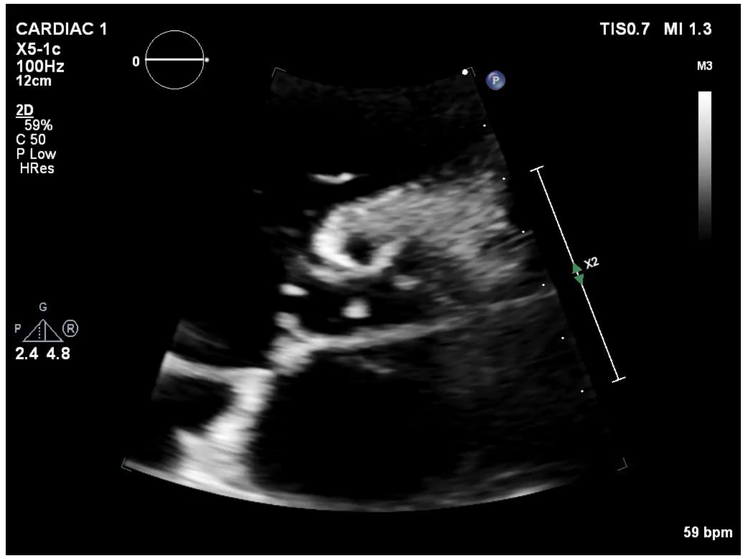
AUG 2024





OCT 2024





ECHOCARDIOGRAPHIC PROGRESSION

2021	TTE: Mean of 22 mmHg, AVA 1.3 cm^2. Peak velocity of 3.1 m/s	***Moderate AS***
2022	TTE: Mean of 28 mmHg, AVA 1.1 cm^2. Peak velocity of 3.4 m/s	***Moderate AS***
2023	**TTE: Mean of 29 mmHg, AVA 1.0 cm^2. Peak velocity of 3.7 m/s**	***Borderline Moderate to Severe AS***
Jan. 2024	*Pt enrolls in PROGRESS Trial for moderate AS and is randomized to clinical surveillance*	
Aug. 2024	TTE: Mean of 35 mmHg, AVA 0.8 cm^2. Peak velocity of 3.8 m/s	***Borderline Moderate to Severe AS***
Oct. 2024	TTE: Mean of 41 mmHg, AVA 0.5 cm^2. Peak velocity of 4.1 m/s	***Severe AS***
Dec. 2024	Patient crossed over to TAVR	***Severe AS***

SYMPTOM PROGRESSION

2021

Progressive DOE x 2 years

Referred for TAVR eval.

TTE showed moderate AS

2022

Ongoing fatigue & reduced exercise tolerance

2023

Pt struggling to increase physical activity

DOE on hills/stairs & lightheadedness

Jan. 2024

Patient enrolls in PROGRESS Clinical Trial and is randomized to clinical surveillance arm

Aug. 2024

Visit with THV clinic, AS progressed “Mod/Severe”

Oct. 2024

Increased SOB & Fatigue

Dec. 2024

TAVR

KEY TAKEAWAYS

Moderate AS can be **clinically significant before** it appears severe on echocardiography

Symptoms **should not be dismissed** when echo parameters suggest only “moderate” disease

Opportunities for Moderate AS Research Trials shift care from **reactive to proactive**

Early recognition of patient “readiness” requires integrating **symptoms, progression, and physiology** – not just valve gradients

Patient Case #2

WHAT ABOUT THIS PATIENT:

April 2021: A 76-year-old man with **hypertension**, dyslipidemia, asthma, h/o DVT, benign prosthetic hypertrophy and **osteoarthritis** (status post back surgery (1995)) seen by primary care doctor for dyspnea.

Family History:

- Mother died at 86 of MI
- Son at 54 with degenerative bone disease
- Daughter 53 with hypertension, diabetes

Social History:

- Married for 52 years
- Never smoker
- Socially drinks
- Denies illicit drug use

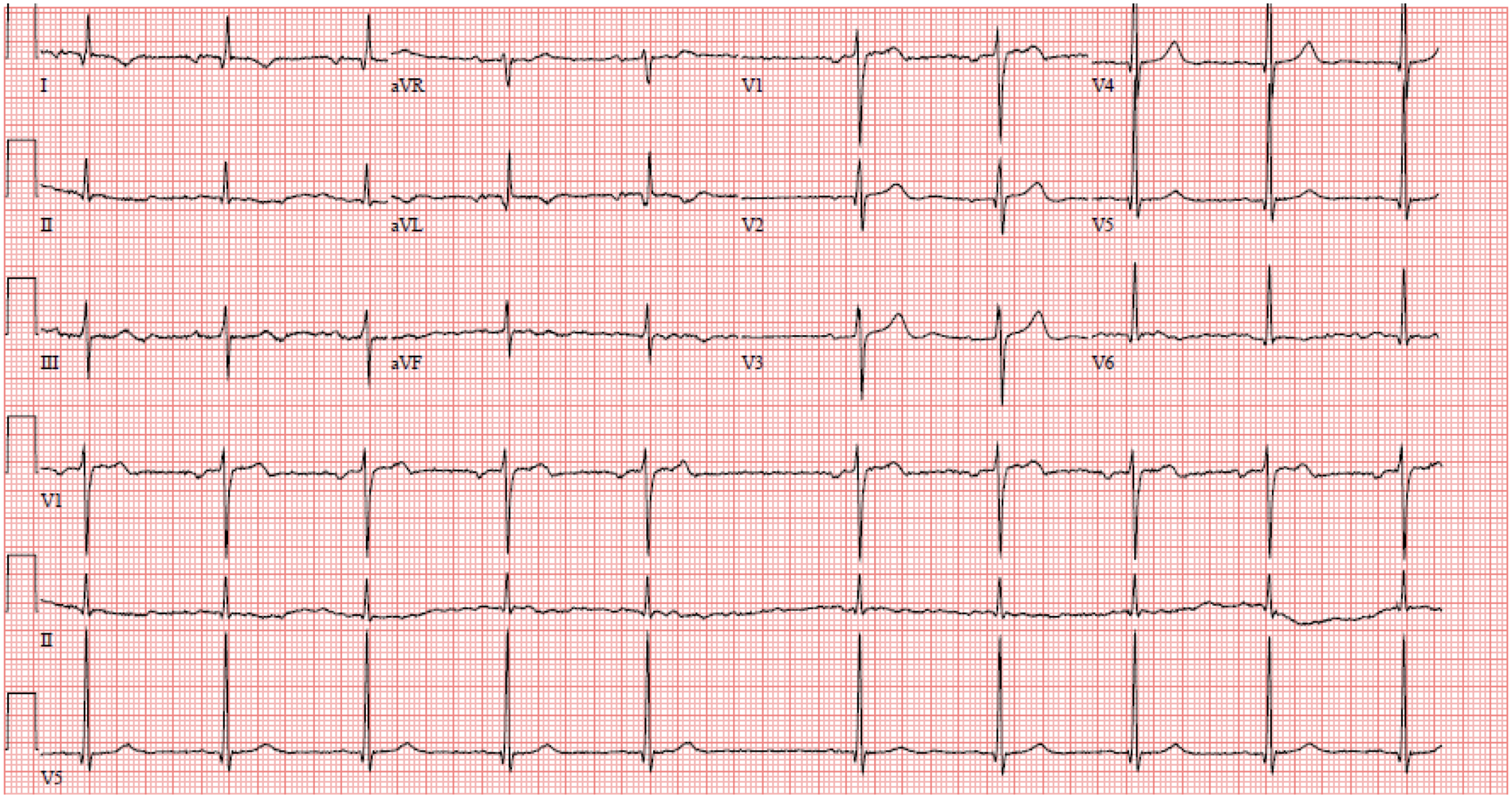
Medications:

- Albuterol 90 mcg/actuation inhaler
- Apixaban 2.5 mg tablet BID
- Atorvastatin 20 mg QD
- Carvedilol 12.5 mg QD
- Tamsulosin 0.4 mg QD
- Multivitamin

WHAT ABOUT THIS PATIENT: VITALS

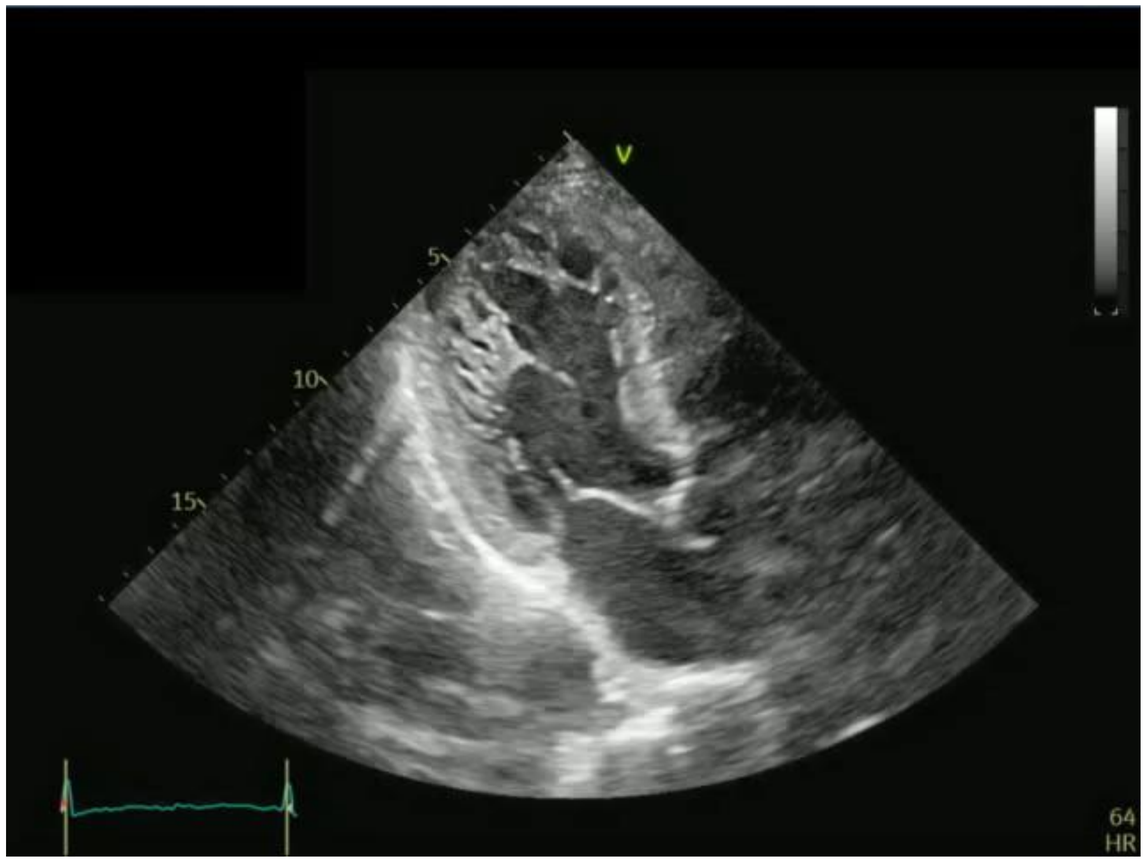
- **Vitals:**
  - BP: 128/70 mmHg
  - HR: 77 BPM
  - Resp: 18
  - HT: 5’3’’ (1.6m)
  - WT: 159 lb (72.1 kg)
  - SpO2: 92%
  - BMI: 28.17 kg/m^2
- **HEENT:** EOMI, anicteric, OP clear, MMM
- **Neck:** No JVD, no LAD
- **Heart:** RRR, nl S1, S2, 2/6 SEM
- **Lungs:** CTAB, no retractions
- **Abd:** Soft, NT, ND, NABS, no HSM
- **Ext:** No clubbing, cyanosis, or edema
- **Skin:** Warm, dry, and well perfused
- **Neuro:** Grossly non focal

IMAGING: EKG

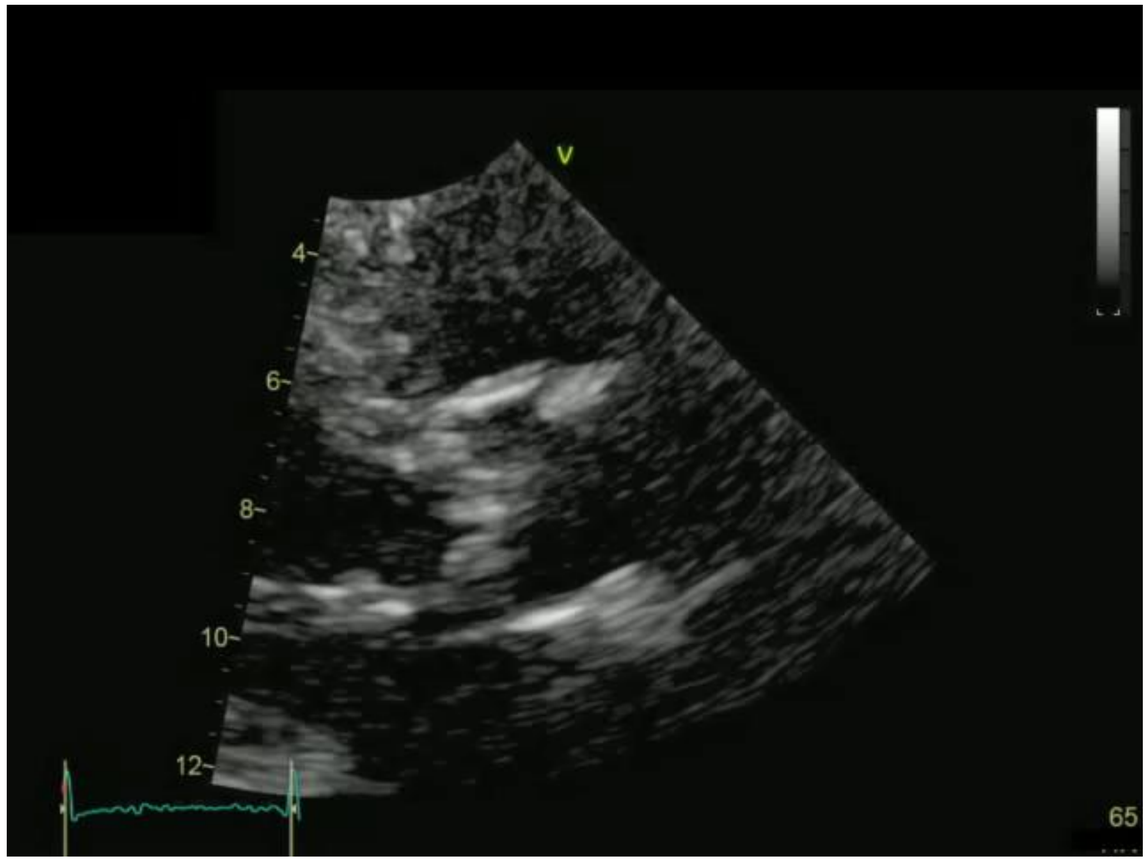


IMAGING: ECHO

Parasternal Long Axis View

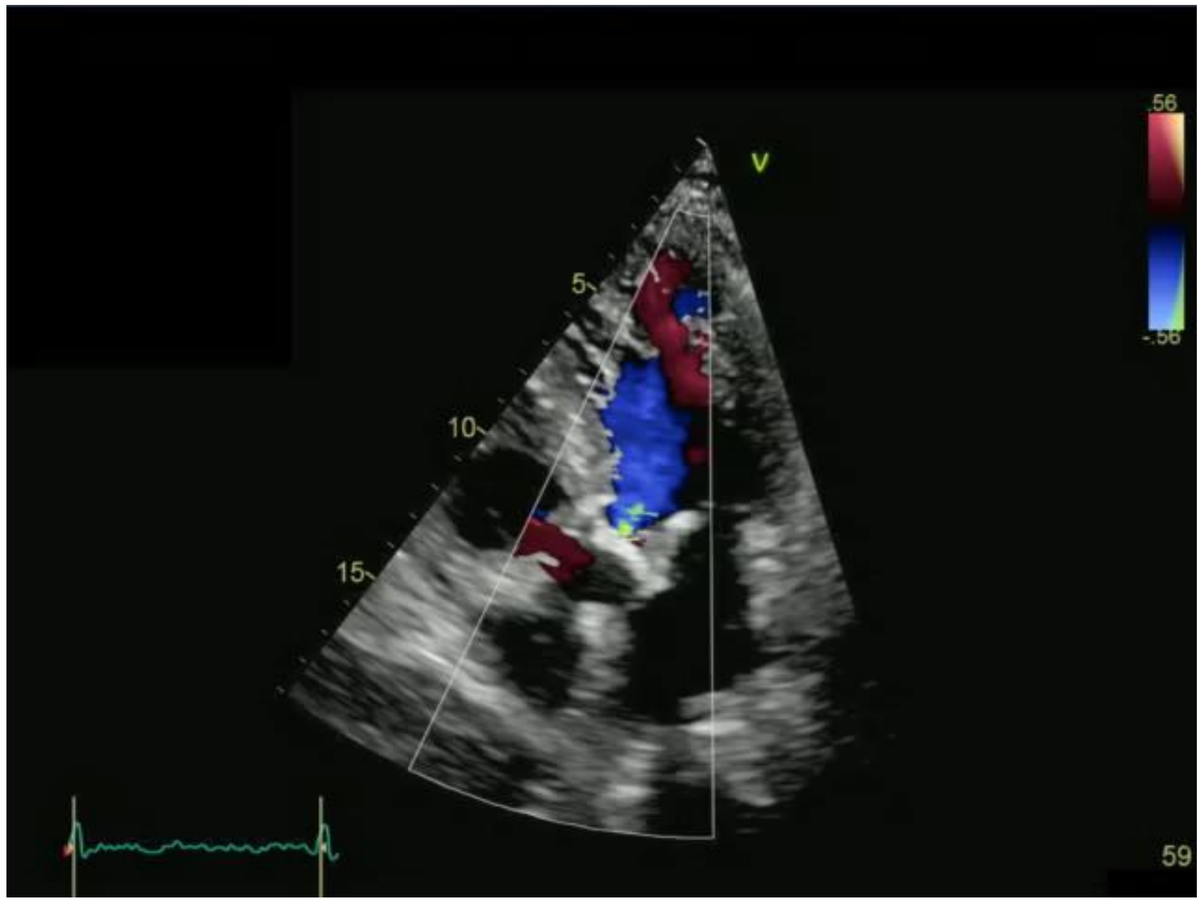


Parasternal Long Axis View Zoomed

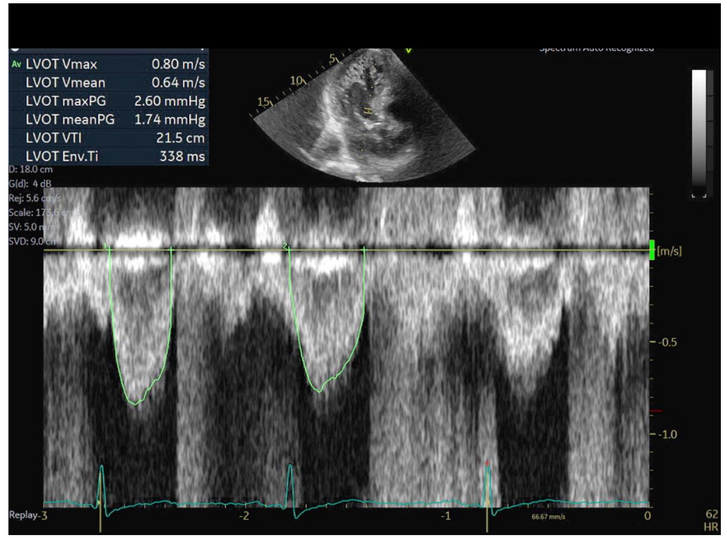


IMAGING: ECHO

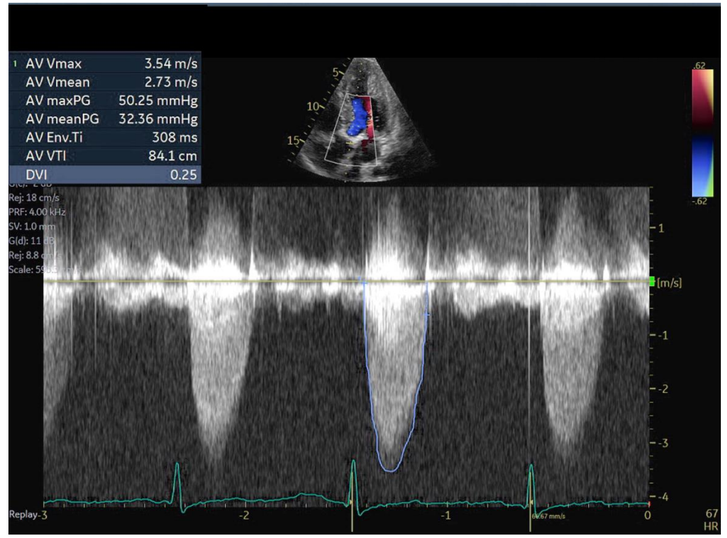
Apical 5 Chamber View With Color Doppler



LVOT Doppler



Aortic Valve Doppler



WHAT ABOUT THIS PATIENT: ECHO FINDINGS

Left Ventricular:

- Normal left ventricular size.
- LV systolic function is normal.
- LV ejection fraction is approximately 50%.
- Moderate left ventricular hypertrophy.
- Abnormal LV diastolic function (Grade I).
- Mildly dilated left atrium in size.

Right Ventricular:

- Normal right ventricular size.
- Normal RV systolic function.

Aortic Valve:

- Aortic valve appears trileaflet, partially mobile.
- Mild aortic regurgitation
- The calculated aortic valve area is 1.5 cm^2 (index 0.9 cm^2/m^2) when LVOT is measures at 2.0 cm (Vmax 3.5 m/s; mean gradient 32 mmHg).
- Normal right atrial pressure
- Mildly dilated sinus of Valsalva; sinus of Valsalva measures 40 mm (index 22 mm/m^2).

CASE SUMMARY:

Overview:

A 76-year-old man with **hypertension**, dyslipidemia, asthma, h/o DVT, benign prosthetic hypertrophy and **osteoarthritis** (status post back surgery (1995)) seen by primary care doctor for dyspnea.

ECHO Findings:

- Normal LVEF
- AVA 1.5 cm^2
- MG 32 mmHg
- Vmax 3.5 m/s
- AVAi 0.9 cm^2/m^2

Clinical Insights:

- Symptomatic at high work level
- Normotensive
- Narrow complex NSR on EKG
- Negative stress nuclear for myocardial ischemia

How would you classify this patient?

A. Mild Aortic Stenosis

B. Moderate, Asymptomatic Aortic Stenosis

C. Moderate, Symptomatic Aortic Stenosis

D. Severe Aortic Stenosis

Would this patient trigger…?

A. Referral to the Heart Team for education about aortic stenosis and what to expect in near future

B. Close surveillance by Primary Cardiologist with recommendation to repeat echo in 1 year

C. Consideration for research / clinical trial

D. No need to refer this patient since he is asymptomatic from cardiac standpoint

→

WHAT ABOUT THIS PATIENT:

April 2026: The same 81-year-old man with **hypertension**, dyslipidemia, asthma, h/o DVT, and **osteoarthritis** (status post back surgery (1995)) returns with increased symptoms of dyspnea with mild exertion

Family History:

- Mother died at 86 of MI
- Son at 54 with degenerative bone disease
- Daughter 53 with hypertension, diabetes

Social History:

- Married for 57 years
- Never smoker
- Socially drinks
- Denies illicit drug use

Medications:

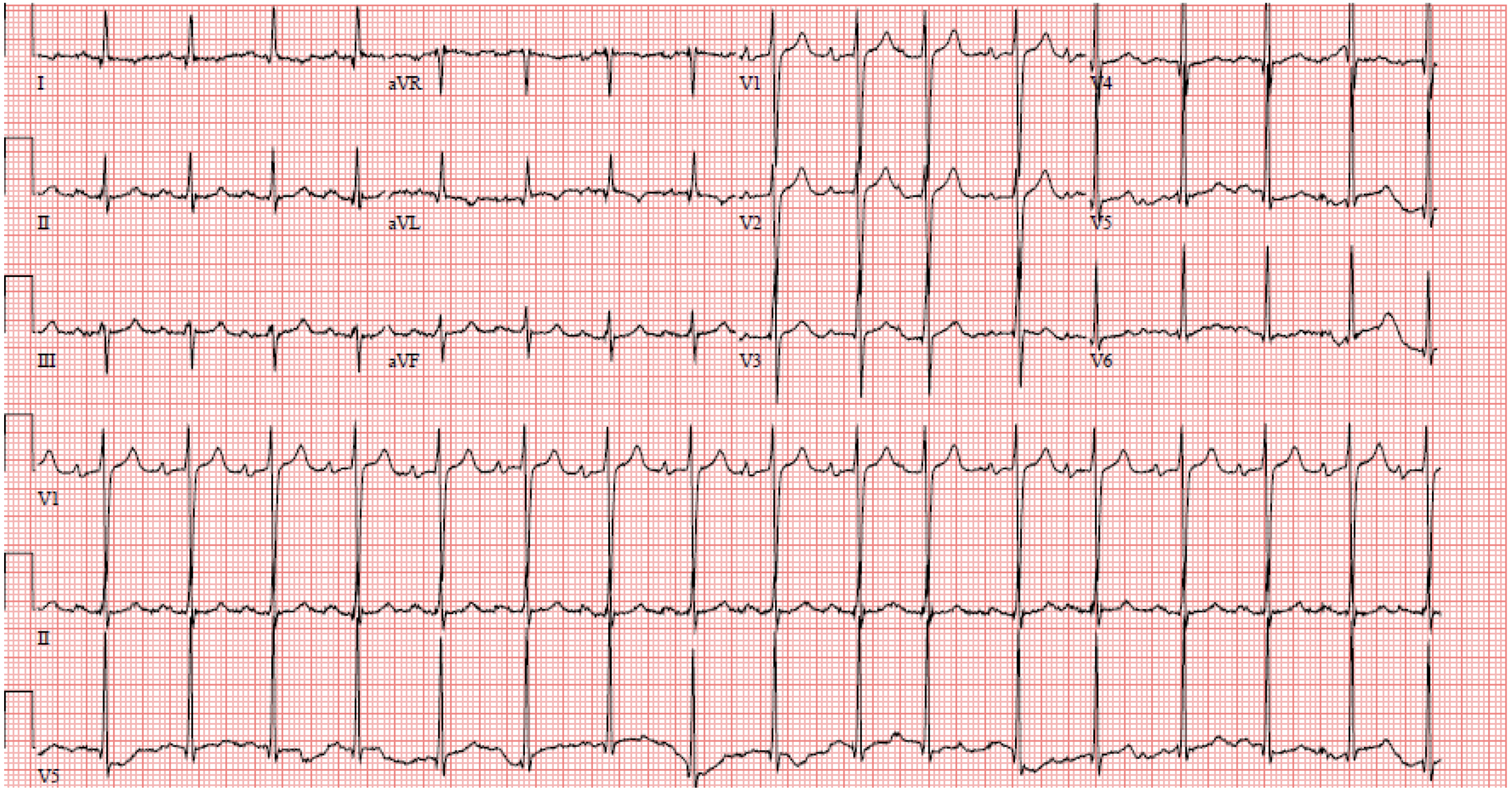
- Albuterol 90 mcg/actuation inhaler
- Apixaban 2.5 mg tablet BID
- Atorvastatin 20 mg QD
- Carvedilol 12.5 mg QD
- Tamsulosin 0.4 mg QD
- Multivitamin

WHAT ABOUT THIS PATIENT: VITALS

- **Vitals:**
  - BP: 160/90 mmHg
  - HR: 101 BPM
  - Resp: 18
  - HT: 5’3’’ (1.6m)
  - WT: 175 lb (72.1 kg)
  - SpO2: 92%
  - BMI: 29 kg/m^2

- **HEENT:** EOMI, anicteric, OP clear, MMM
- **Neck:** No JVD. No LAD
- **Heart:** RRR, nl S1, diminished S2, 2/6 SEM
- **Lungs:** CTAB, no retractions
- **Abd:** Soft, NT, ND, NABS, no HSM
- **Ext:** No clubbing, cyanosis, 1+ leg edema
- **Skin:** Warm, dry, and well perfused
- **Neuro:** Grossly non focal

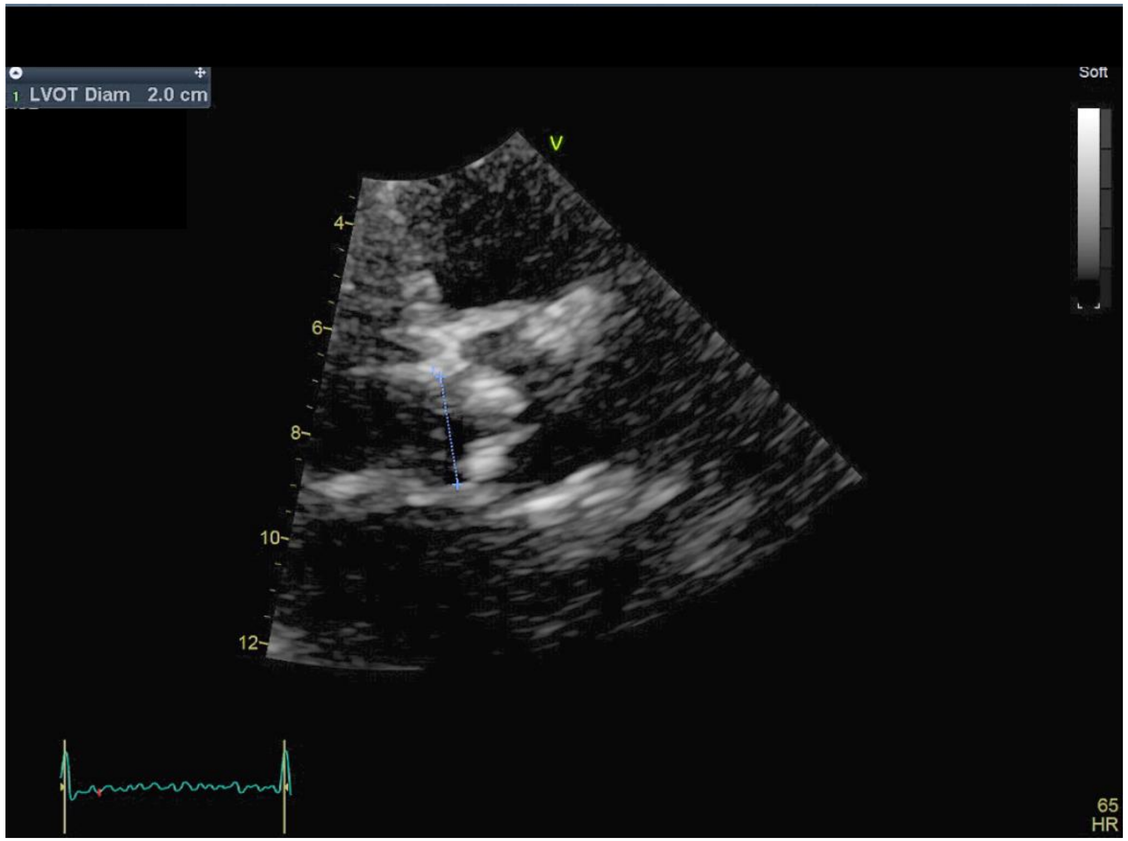
IMAGING: EKG



IMAGING: ECHO

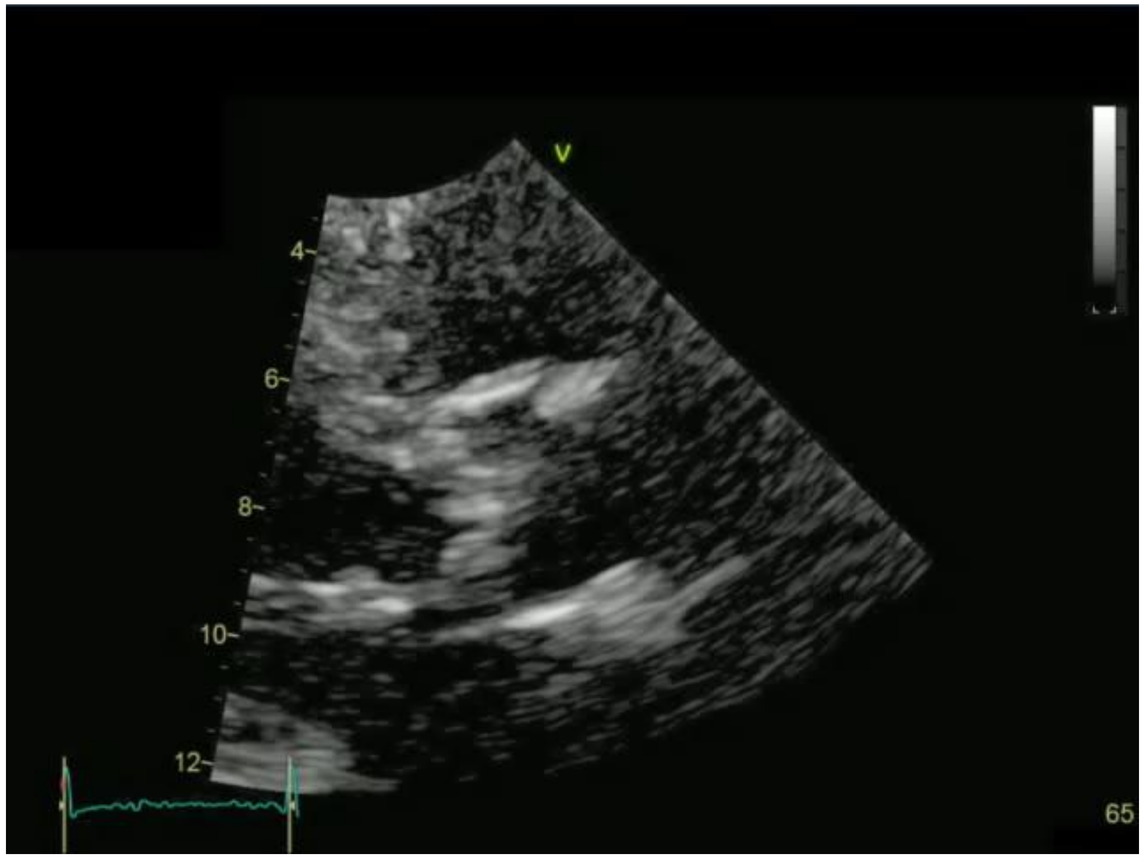
Parasternal Long Axis View

Parasternal Long Axis View
Zoomed and Measured

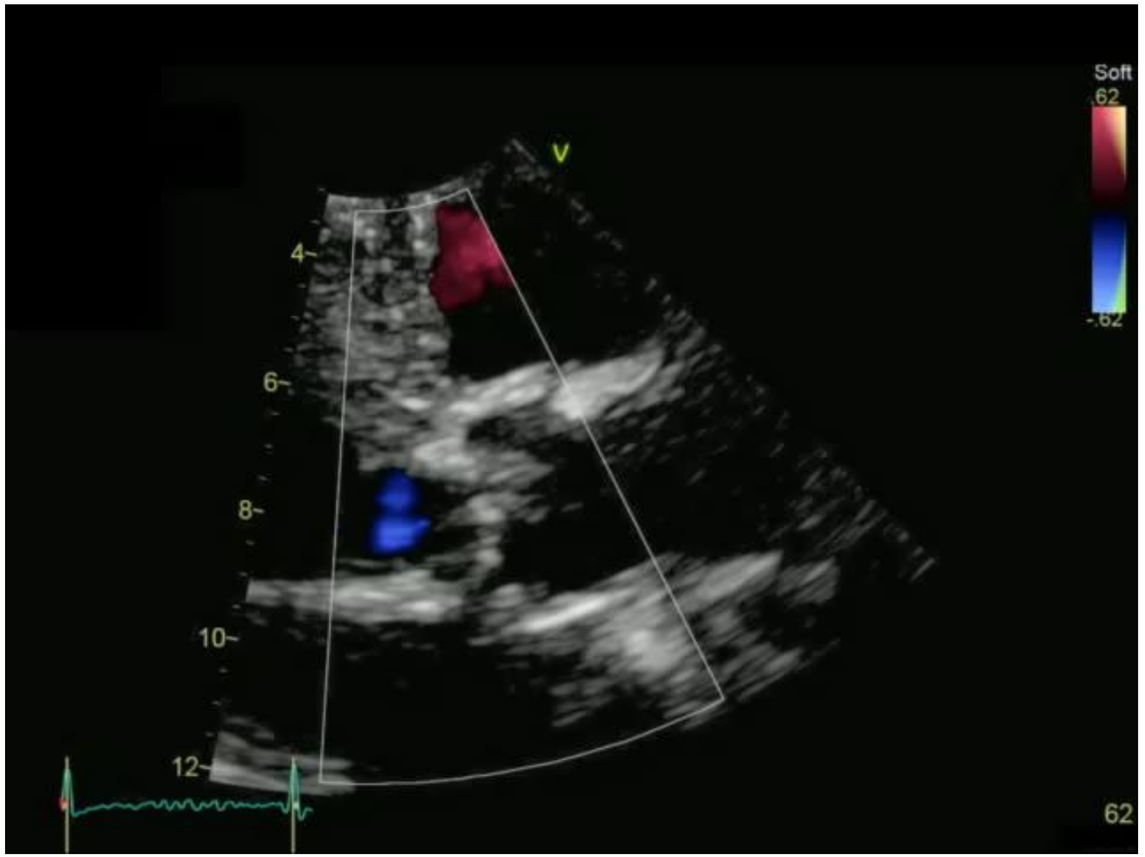


IMAGING: ECHO

Parasternal Long Axis View Zoomed

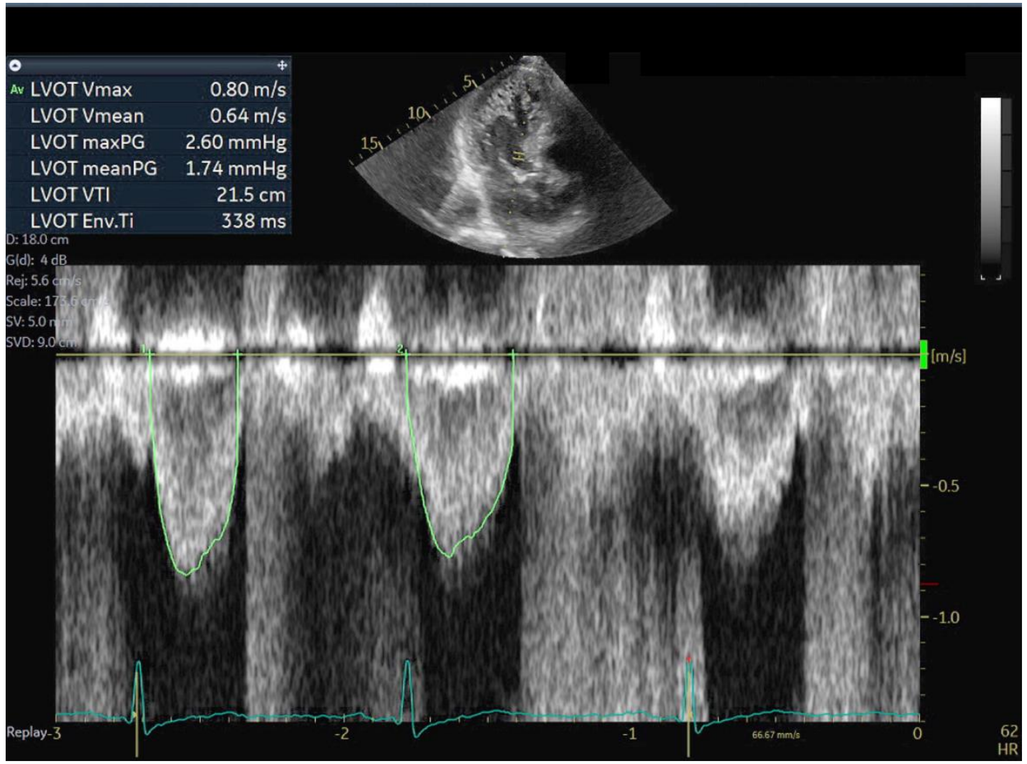


Parasternal Long Axis View Zoomed with Color Doppler

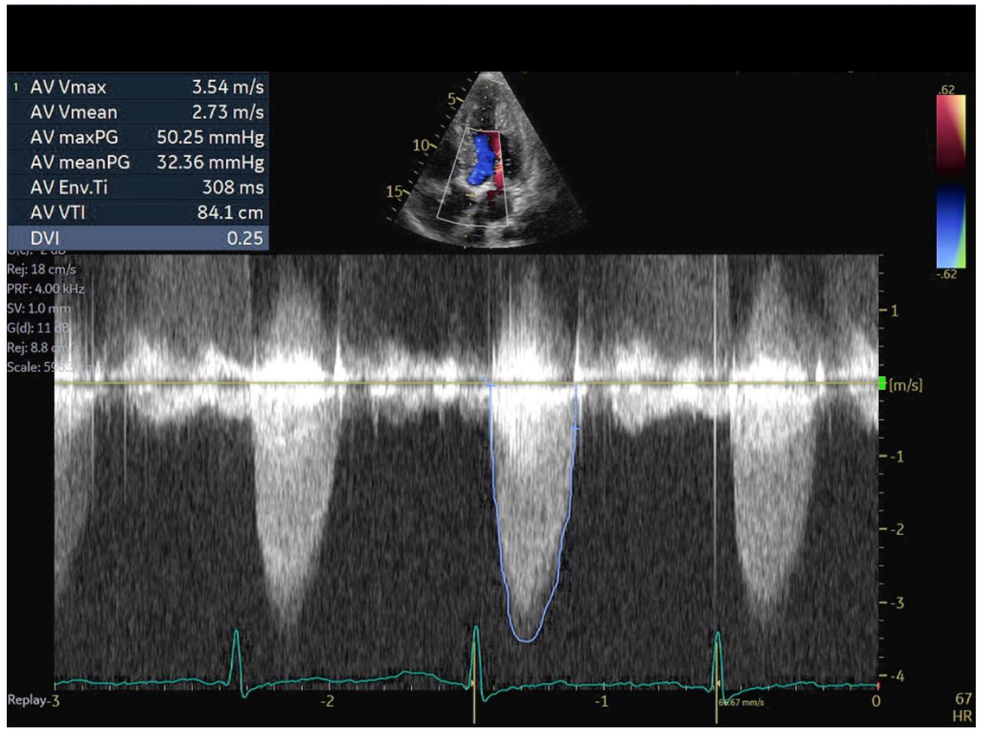


IMAGING: ECHO

LVOT Doppler



Aortic Velocity



WHAT ABOUT THIS PATIENT: ECHO FINDINGS

Left Ventricular:

- Normal left ventricular size.
- LV systolic function is normal.
- LV ejection fraction is approximately 50%.
- Moderate left ventricular hypertrophy.
- Abnormal LV diastolic function (Grade I).
- Mildly dilated left atrium in size.

Right Ventricular:

- Normal right ventricular size.
- Normal RV systolic function.

Aortic Valve:

- Aortic valve appears calcific, thickened and relatively immobile.
- Mild aortic regurgitation
- The calculated aortic valve area is 0.9 cm^2 (index 0.7 cm^2/m^2) when LVOT is measured at 2.1 cm (Vmax 3.5 m/s; mean gradient 32 mmHg).
- Normal right atrial pressure
- Mildly dilated sinus of Valsalva; sinus of Valsalva measures 41 mm (index 23 mm/m).
- Compared to prior study on 04/16/2024, AVA in severe range and gradients relatively unchanged

CASE SUMMARY:

Overview:

April 2026: 81-year-old man with **hypertension**, dyslipidemia, asthma, h/o DVT, and **osteoarthritis** (status post back surgery (1995)) returns increased symptoms of dyspnea with mild exertion

ECHO Findings:

- Normal LVEF
- AVA 0.9 cm^2
- MG 32 mm Hg
- Vmax 3.5 m/s
- AVAi 0.7 cm^2/m^2
- Compared to echo from the previous year, the AVA has progressed from 1.5 cm^2

Clinical Insights:

- More symptomatic than 5 years ago
- Hypertensive
- Narrow complex tachycardia on EKG
- Normal LVEF

What would this patient trigger?

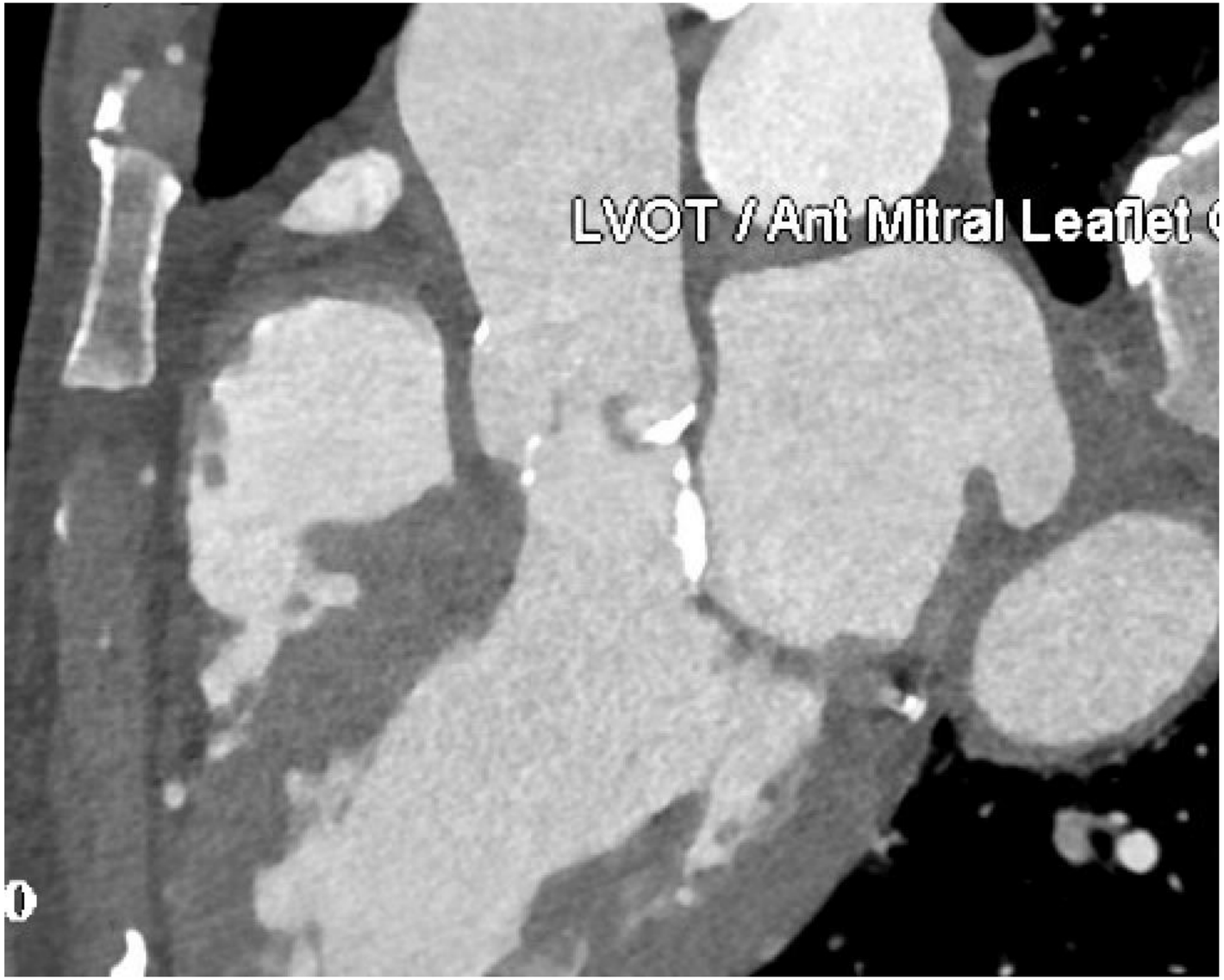
A. TAVR evaluation

B. Dobutamine stress echocardiography

C. CTA with AV calcium scoring

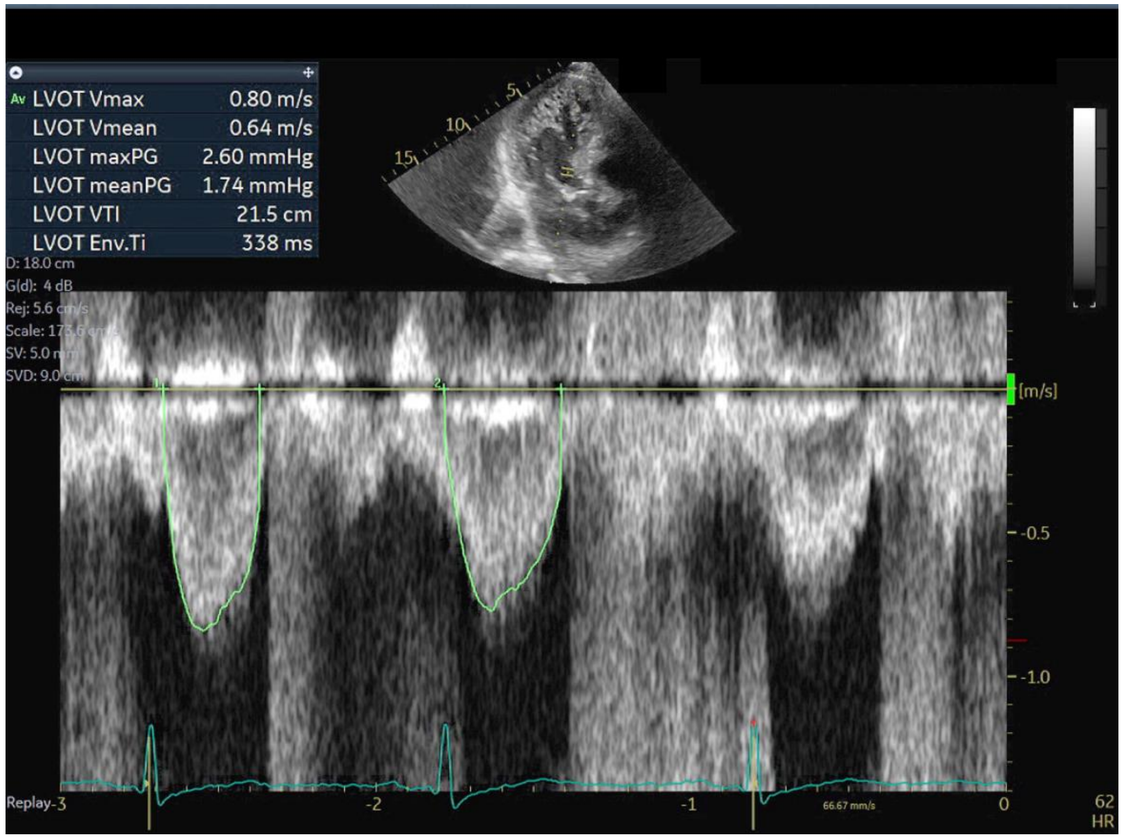
IMAGING: CT

AV CALCIUM 2200 AU

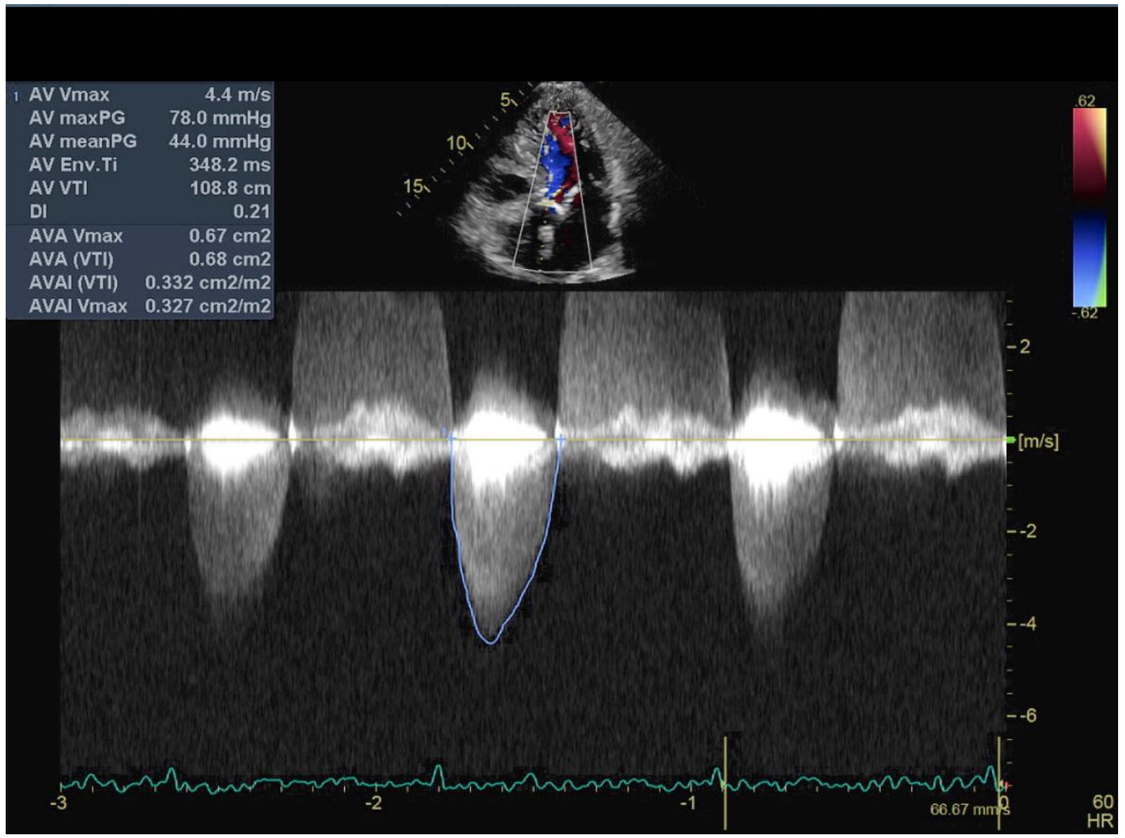


IMAGING: ECHO

LVOT Doppler



Aortic Velocity



KEY TAKEAWAYS

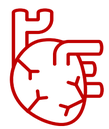
- **Echocardiographic assessment of aortic stenosis is complex –**
  - Relies on **good echocardiographic imaging** taken in context of clinical scenario.

- Discordant findings require **integrated interpretation**.

- Enrollment in ongoing studies will help answer the question of whether **earlier intervention in moderate AS *may make a difference!***

Q & A

INTERESTED IN LEARNING MORE?



Join our upcoming Moderate AS Virtual Grand Rounds Sessions!

COMING SOON:

- **Session #3:** Research Readiness & Trial Infrastructure in Medical Therapy Paradigm – ***July 2026***
- **Session #4:** Engaging the Patient Voice & Driving Trial Participation – ***October 2026***

Sessions will encourage cross-disciplinary dialogue and discuss opportunities available across the moderate AS care pathway.

Scan to visit http://www.heart.org/ModerateAS for a recording of today's session, additional resources, and information on future Virtual Grand Round sessions!

American Heart Association®

Thank you for joining us today!

Recordings of today's sessions will be enduring resources in a few weeks on www.heart.org/ModerateAS

Connect with Us! Scan to email ClinicalStudies@heart.org