

2017 ASE Echo Florida, Orlando, FL

# Stress Echo Cases

Sunday, October 8, 2016 | 3:10 – 3:30 PM | 20 min

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NYU  
SCHOOL OF  
MEDICINE



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**Associate Professor of Medicine**  
**New York University Langone Medical Center**

# Disclosures

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Medtronic & Philips  
Speakers' Bureaus

# Stress Case #1

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## CASE PRESENTATION

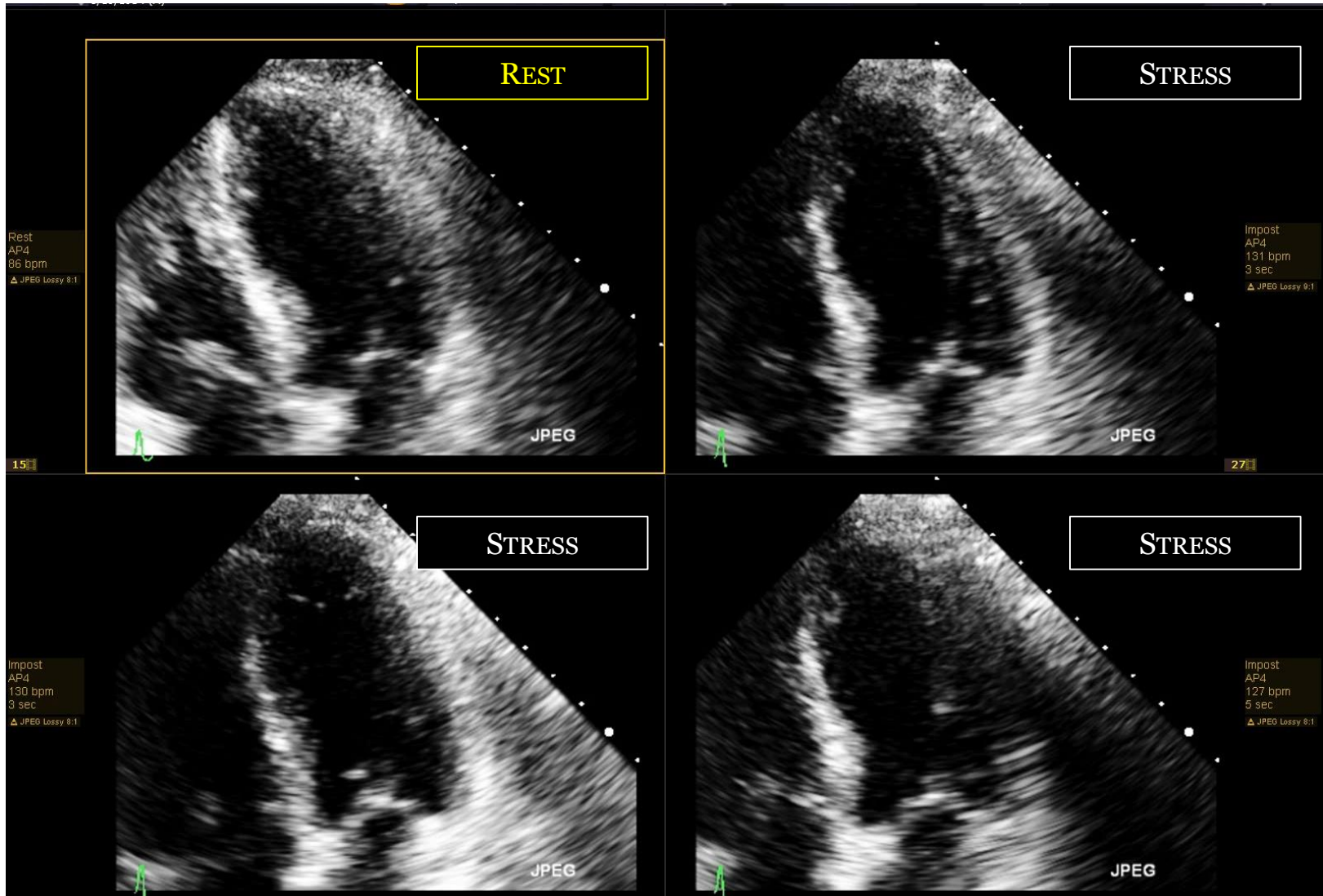
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82-year-old man with history of hypertension,  
presents with **exertional chest pain.**

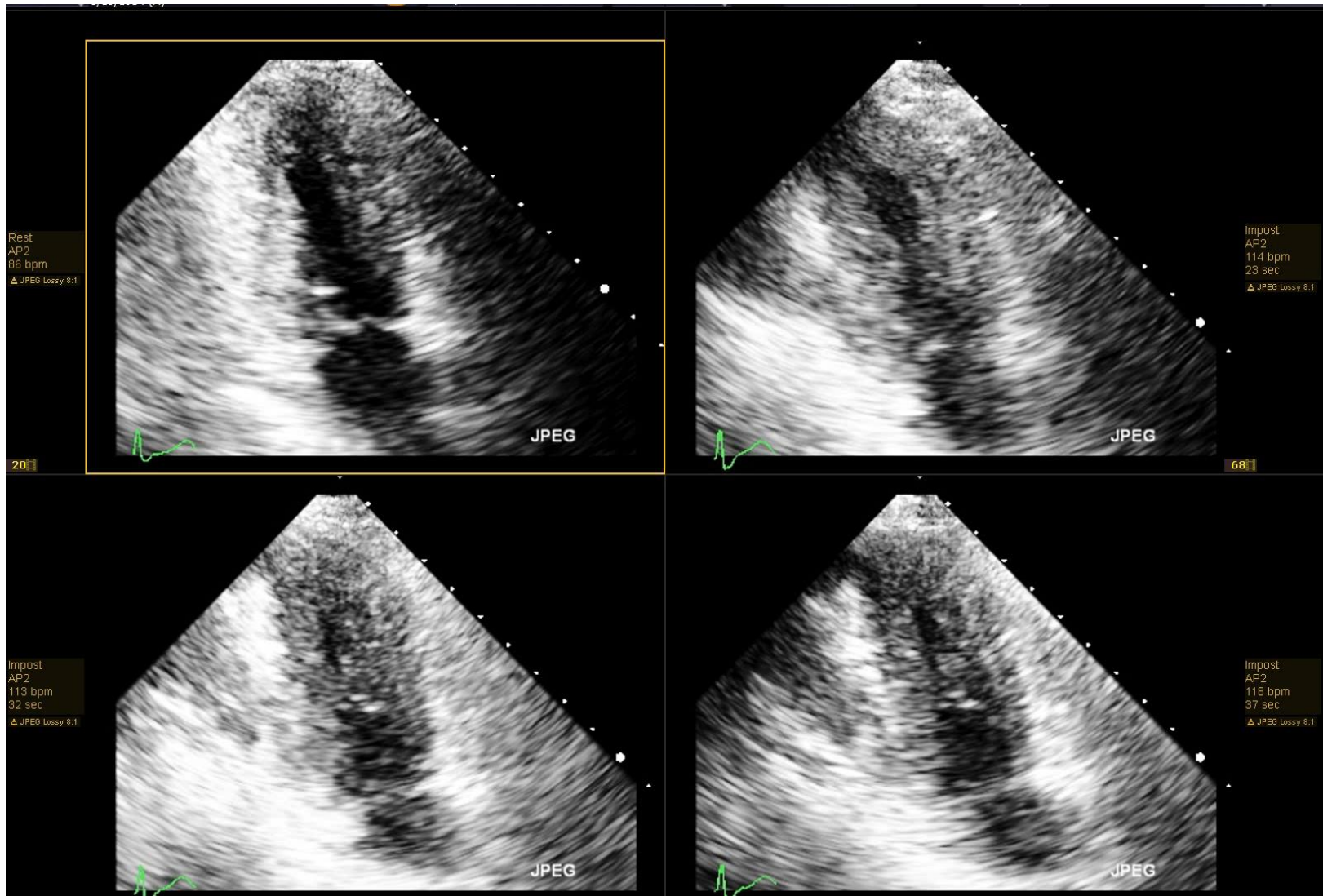
\*\*\*

Referred for **exercise** stress echo

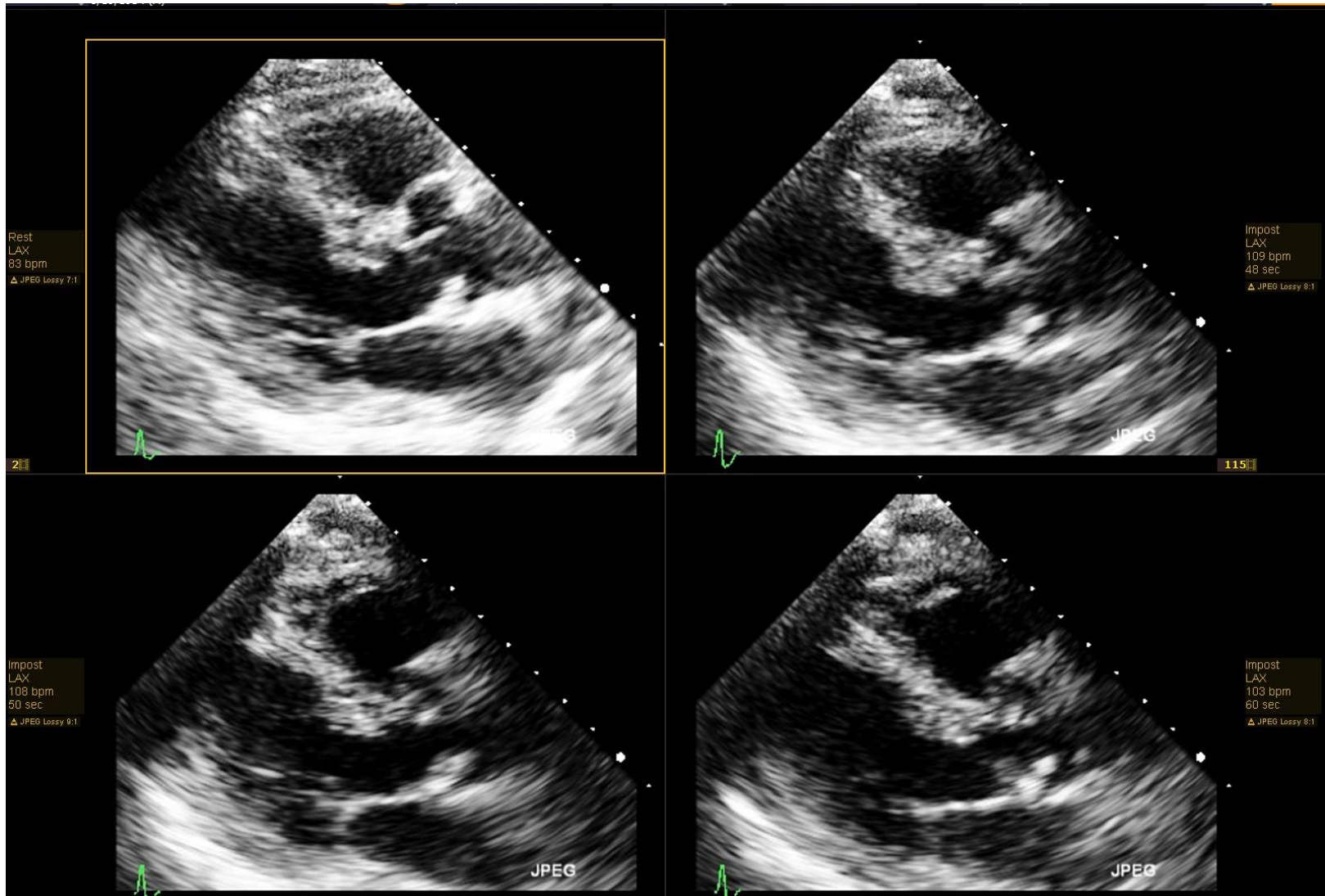
# EXERCISE STRESS ECHO | A4C VIEW



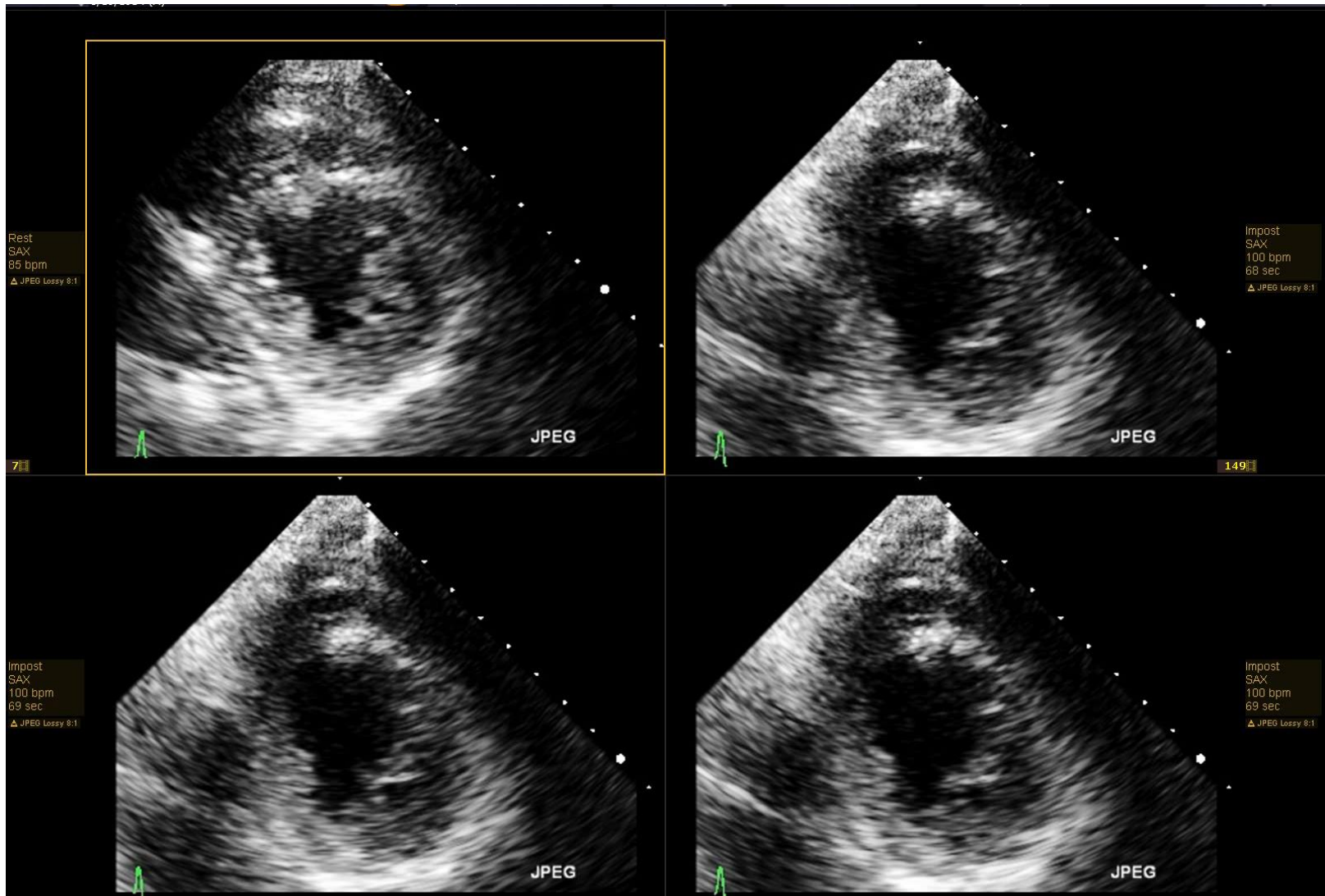
# EXERCISE STRESS ECHO | A2C VIEW



# EXERCISE STRESS ECHO | PLAX VIEW



# EXERCISE STRESS ECHO | PSAX VIEW



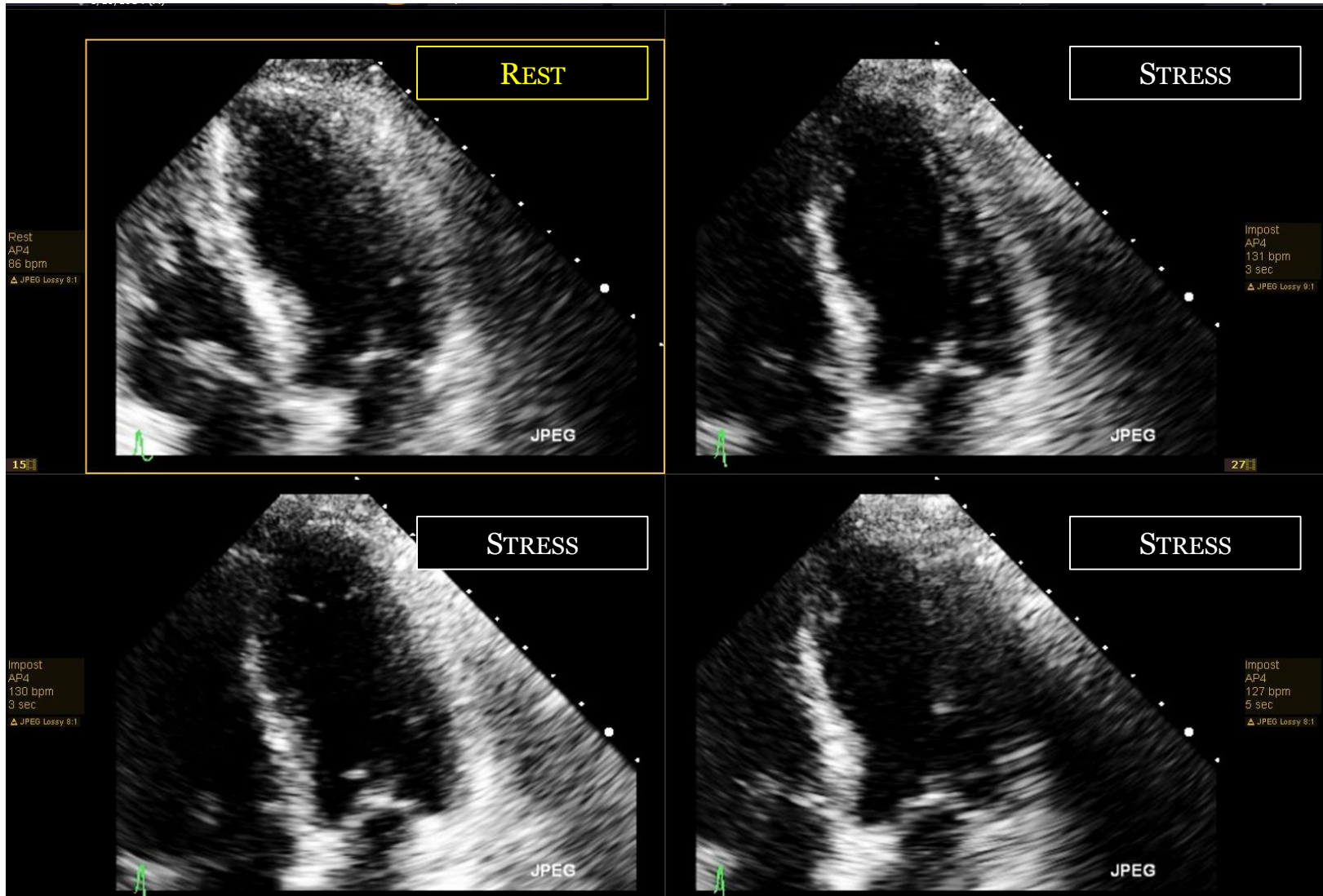


## **CONCLUSION**

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Normal stress echocardiogram

# EXERCISE STRESS ECHO | A4C VIEW



# STRESS ECHO | LV CONTRACTILITY DATA

Stress Echo Findings
Stress Echo Comments

Echo images obtained within 60-90 secs

HR at Stress Imaging

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	LVEF
Rest LVEF	60 %
Stress LVEF	75 %

	LVH
LVH Degree	<input type="text"/>
LVH Location	<input type="text"/>

Change in LV cavity size

smaller

same

dilated

NOTE: Provide both LVH degree and location for sentence to appear in report.

	REGIONAL FINDINGS
Ischemic Regions	<input type="text"/>
Viable Regions	<input type="text"/>
Prior Infarct Regions	<input type="text"/>

**STRESS ECHO CONCLUSION**

Nondiagnostic

Negative

Equivocal

Suggestive of regional ischemia

Suggestive of diffuse ischemia

Positive

Miscellaneous Comments

No EKG/echo correlates of symptoms

No echo correlates of EKG changes

Peak stress global hyperkinesis

Cannot r/o isch at higher HR

Nonischemic cardiomyopathy

# TEACHING POINTS

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## NORMAL STRESS ECHOCARDIOGRAM

- Global increase in LV and RV contractility with exercise
- Decrease in LV cavity size
- Maintenance of triangular LV shape

## TECHNICAL POINTS

- View hierarchy  
A4C > A2C > PLAX > PSAX

# Stress Case #2

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## CASE PRESENTATION

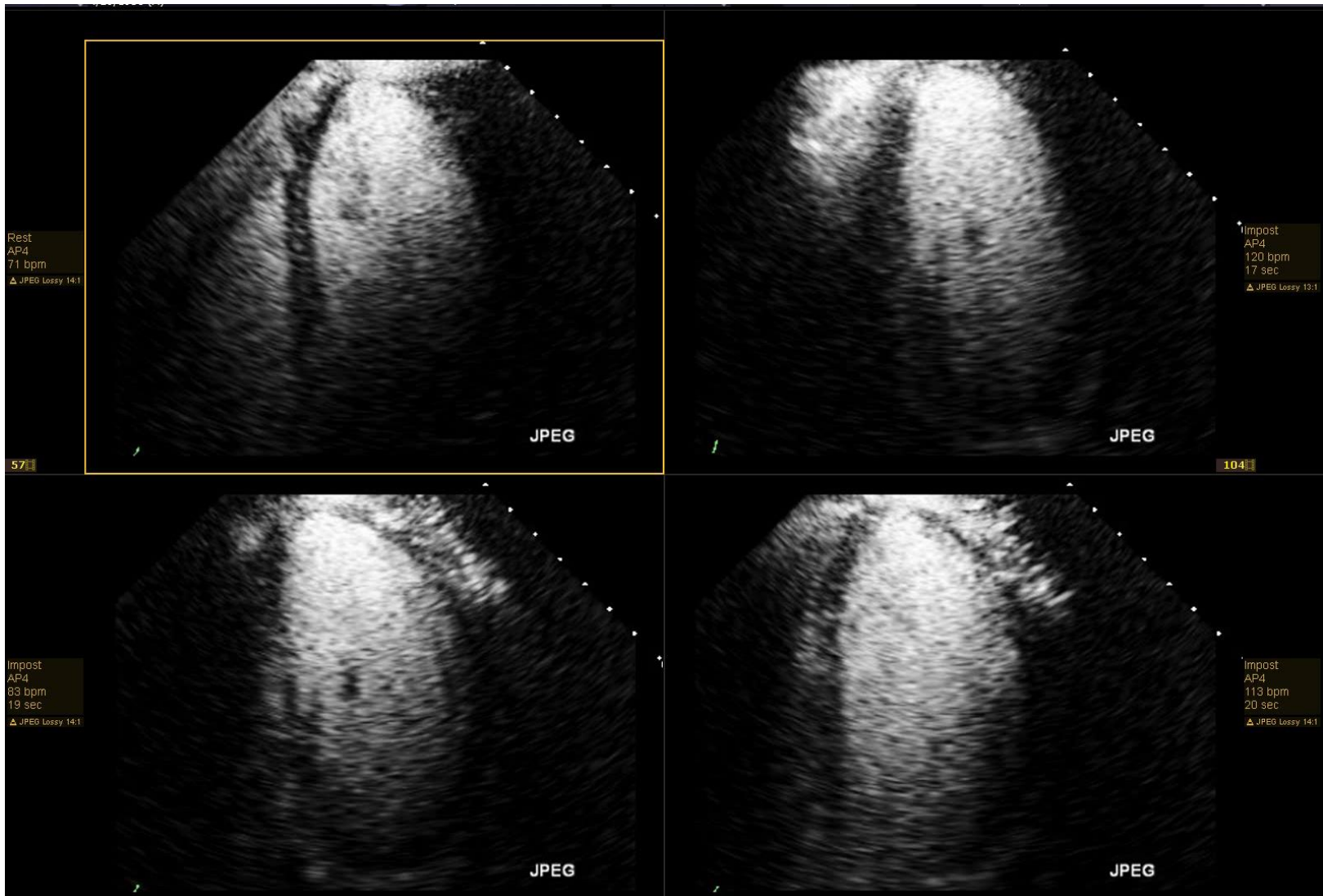
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60 y/o male with hypertension, diabetes mellitus and obesity presents with **exertional dyspnea**.

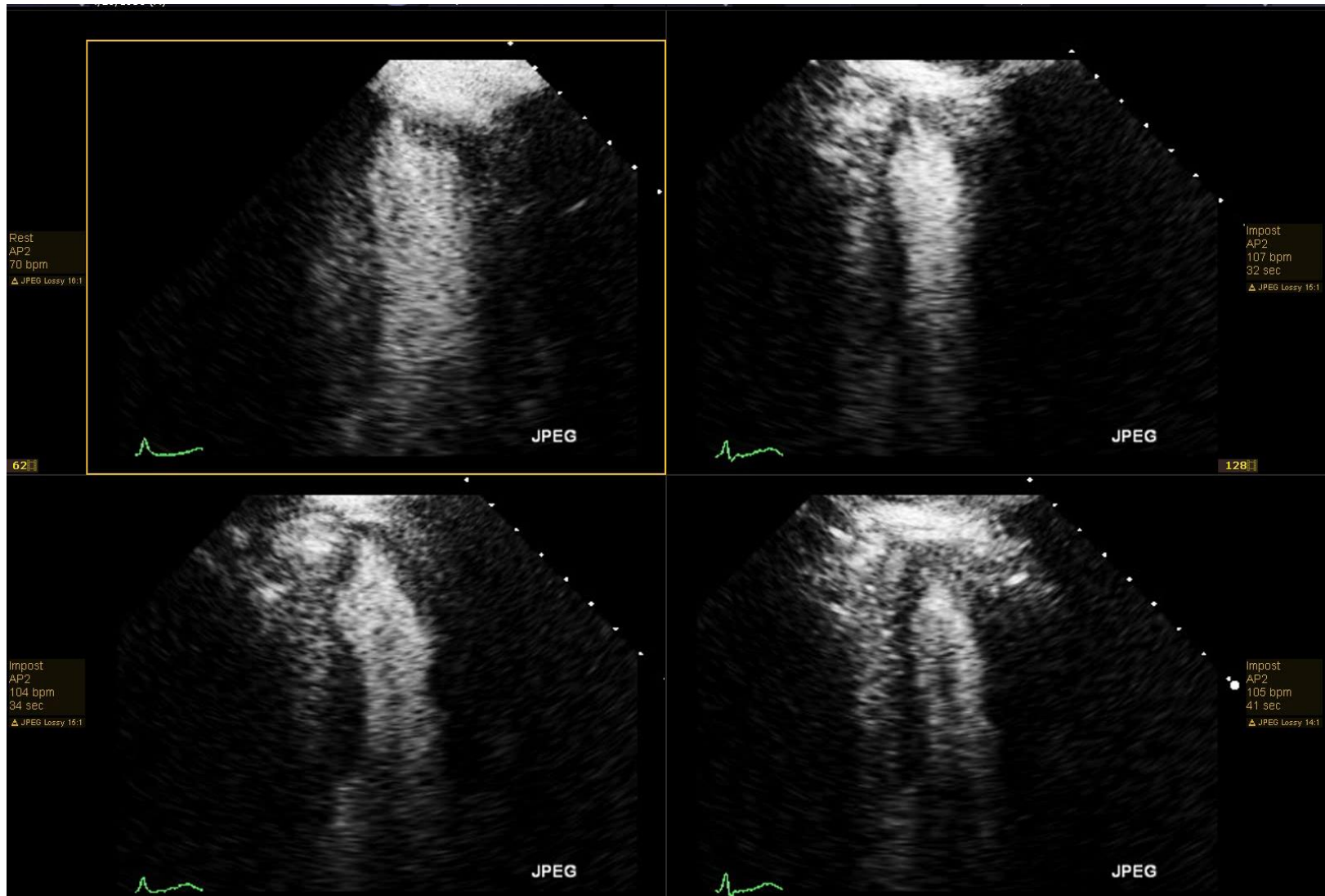
\*\*\*

Referred for **exercise** stress echo

# EXERCISE STRESS ECHO | A4C VIEW

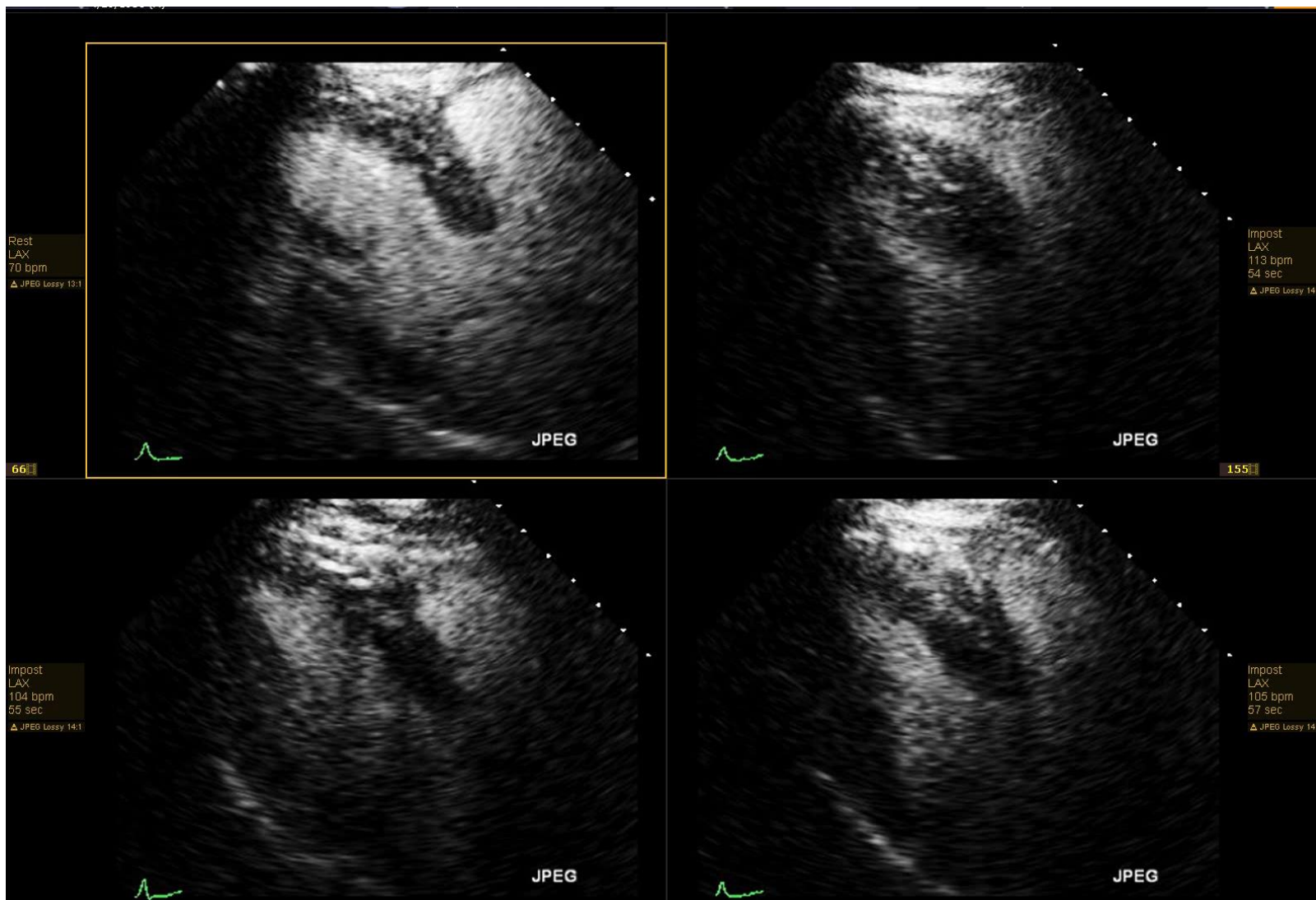


# EXERCISE STRESS ECHO | A2C VIEW

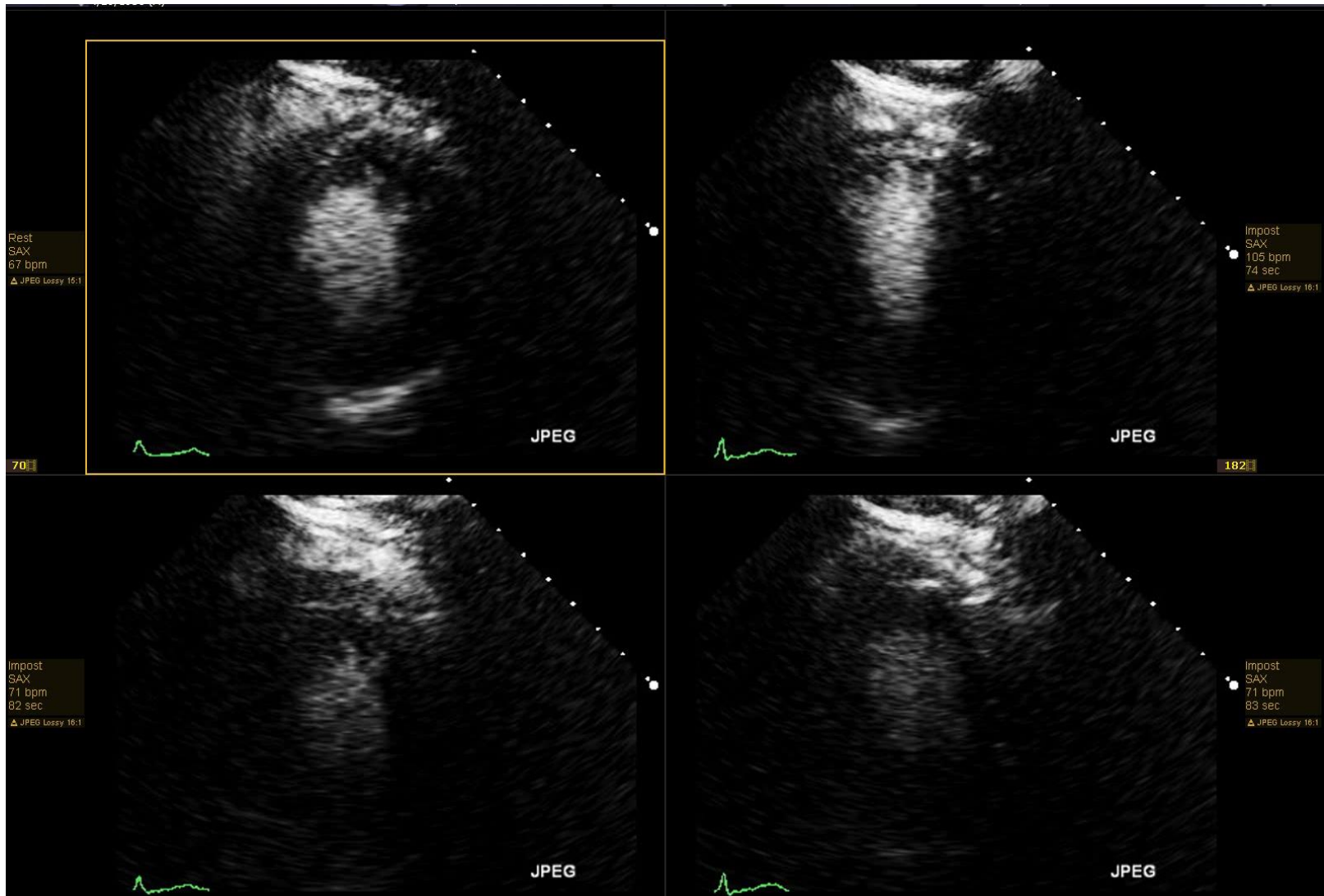




# EXERCISE STRESS ECHO | PLAX VIEW



# EXERCISE STRESS ECHO | PSAX VIEW

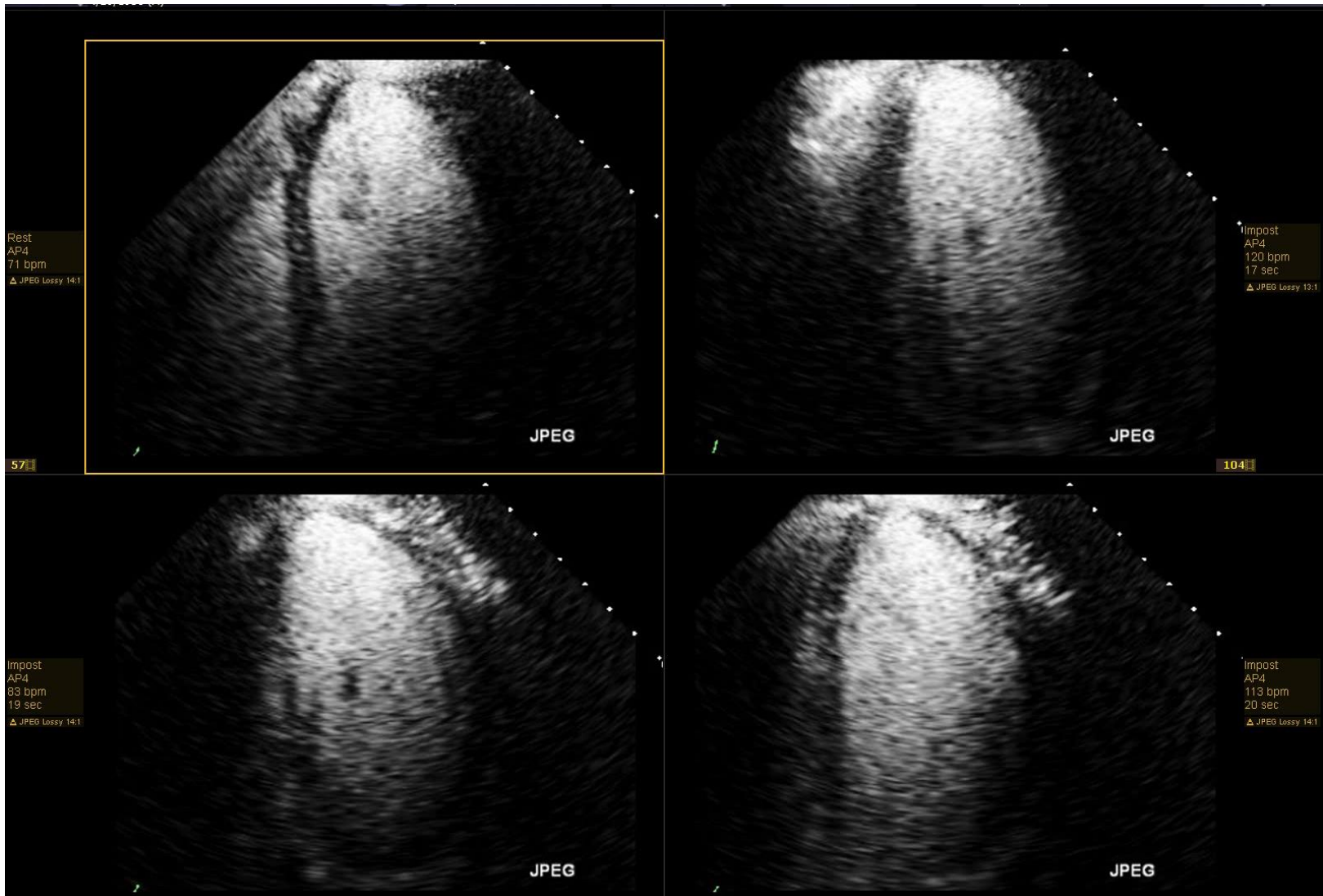


## **CONCLUSION**

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Normal contrast stress echocardiogram

# EXERCISE STRESS ECHO | A4C VIEW



# TEACHING POINTS

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## NORMAL STRESS ECHOCARDIOGRAM

- Global increase in LV and RV contractility with exercise
- Decrease in LV cavity size
- Maintenance of triangular LV shape

## TECHNICAL POINTS

- View hierarchy  
A4C > A2C > PLAX > PSAX

# Stress Case #3

22

## CASE PRESENTATION

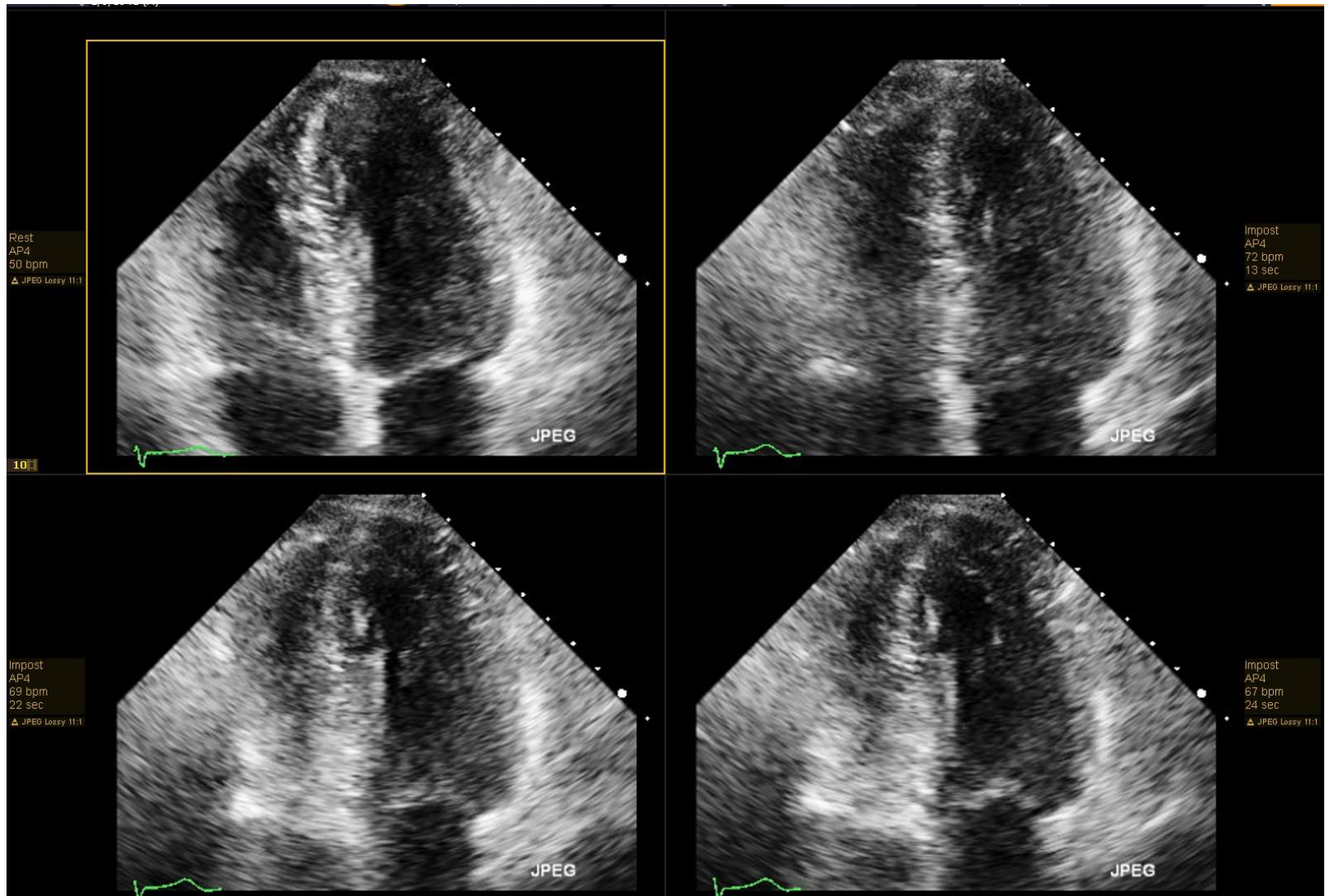
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75-year-old man with CAD, s/p CABG with subsequent RCA stent.  
Presents with **exertional dyspnea**

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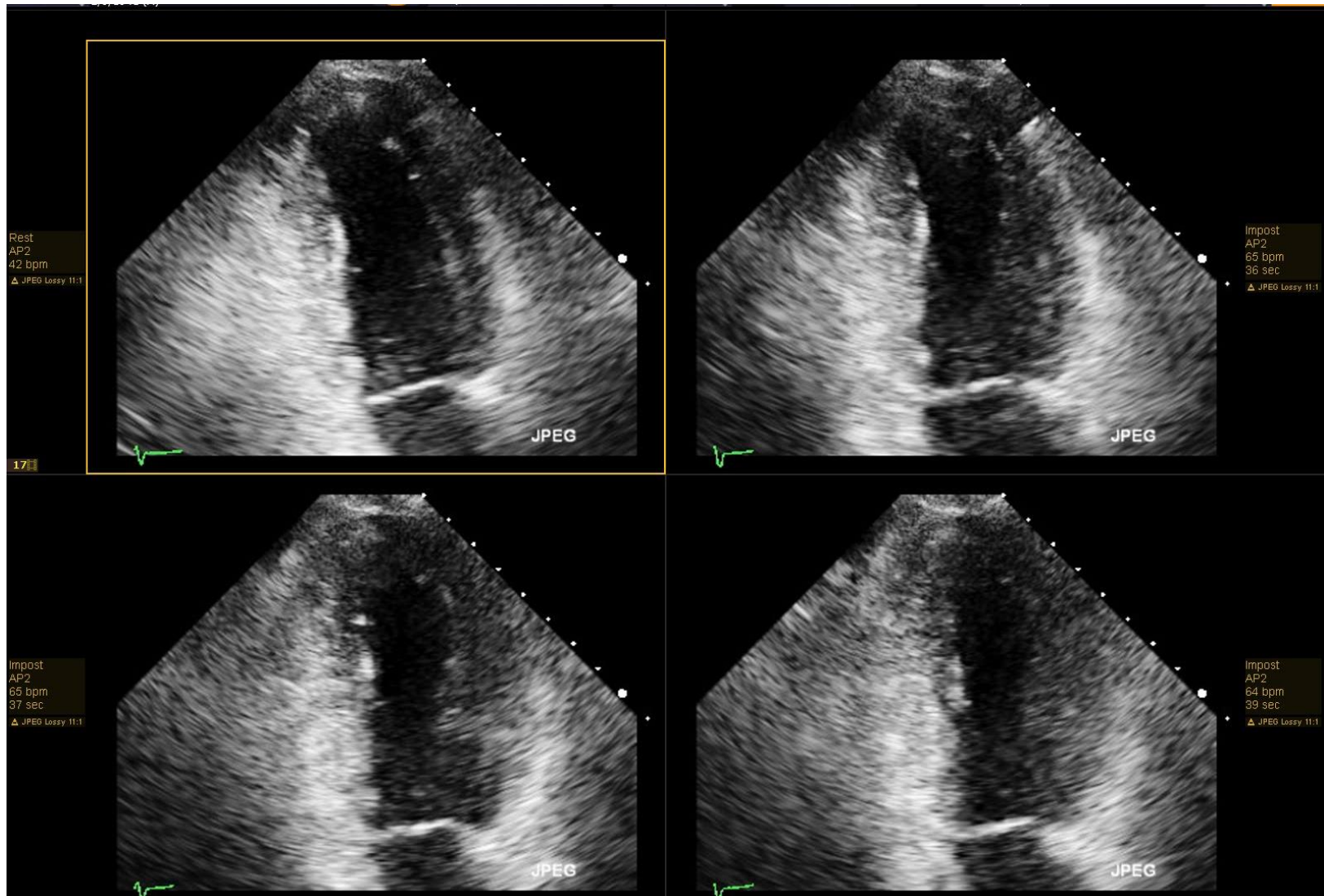
Referred for **exercise** stress echo

# EXERCISE STRESS ECHO | A4C VIEW





# EXERCISE STRESS ECHO | A2C VIEW



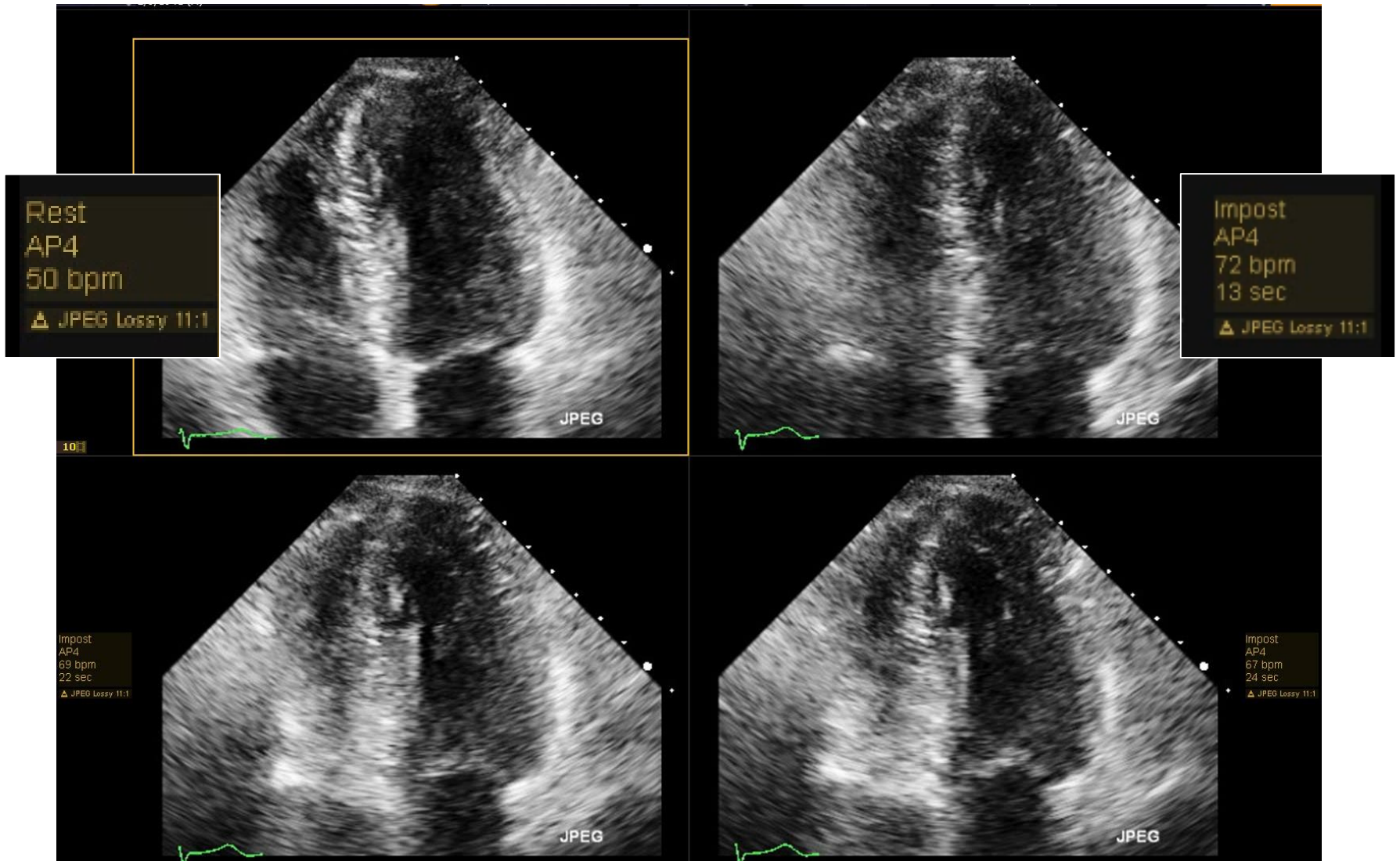
## CONCLUSION

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No stress-induced LV wall motion abnormalities.

But... Is this a normal stress echocardiogram?

# EXERCISE STRESS ECHO | A4C VIEW



## TEACHING POINTS

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- Absence of stress-induced LV wall motion abnormalities does NOT exclude occlusive coronary artery disease.
- Always comment on workload at which stress images were obtained.

# STRESS ECHO | WORKLOAD DATA

Select Protocol ▾

-BRUCE PROTOCOL--

Minutes  Seconds

	Achieved	Expected	% Expected
Stage	3		
Minutes	7.2		113 %
METS	8.3		125 %
VO2	23.6		

Transcribe to Report

Symptoms & Functional Capacity

Reason test stopped

Stress Symptoms

For exercise protocols:

Functional capacity

Oxygen Saturation

REST SatO2:

STRESS SatO2:

HR & BP Findings

	HR	SBP	DBP	Work DP
Rest	53	142	68	
Stress	91	162	70	14742
Expec				
% Exp	63 %			

**GOOD WORKLOAD**  
DPP ≥ 20,000

**GOOD WORKLOAD**  
Peak HR ≥ 85% max

**DPP = DOUBLE PRESSURE PRODUCT**  
**PEAK SBP X PEAK HR**

# Stress Case #4

30

## CASE PRESENTATION

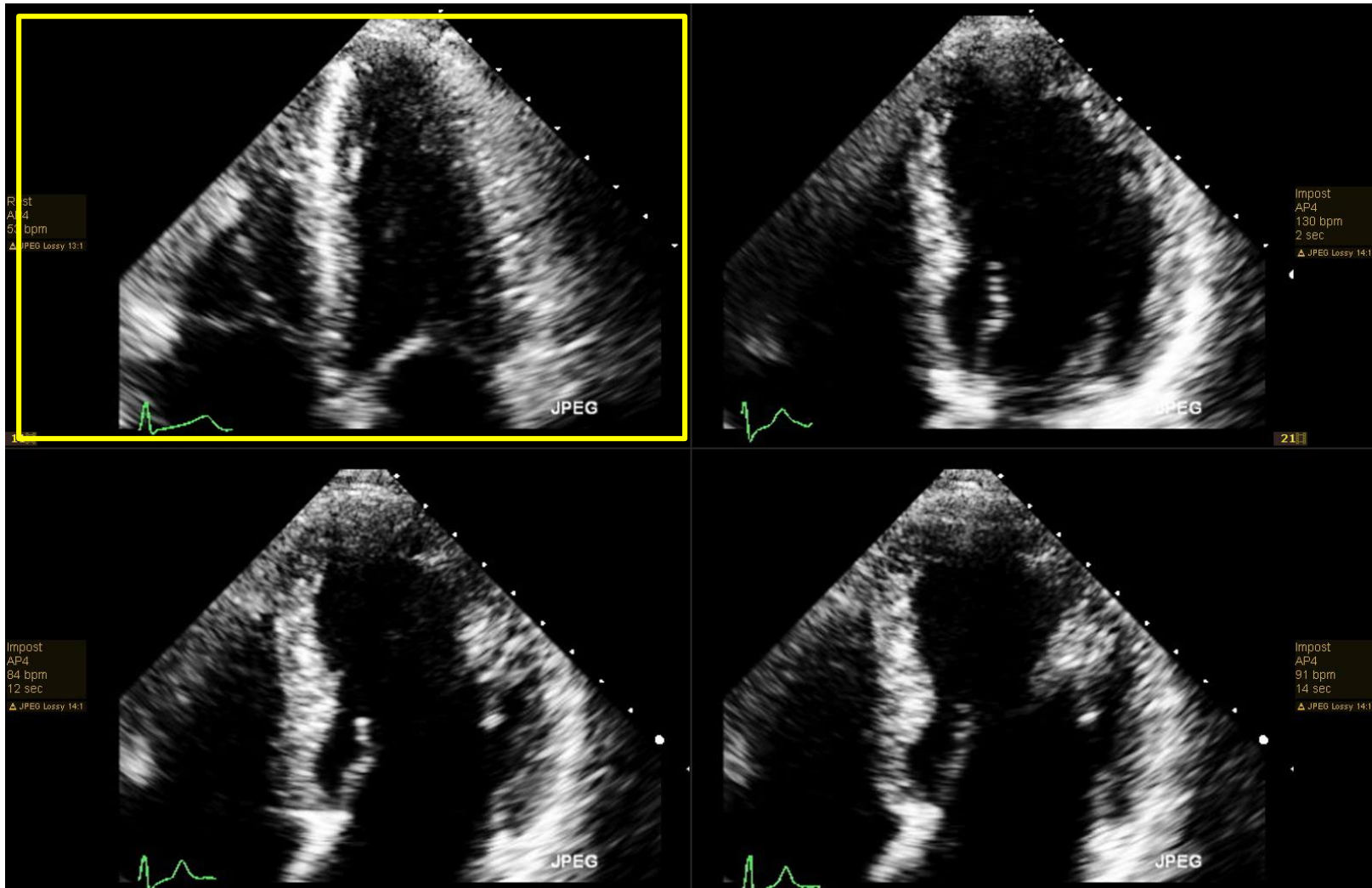
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50-year-old man, previously healthy, referred for evaluation of **syncope** following an episode of rapid heart beat.

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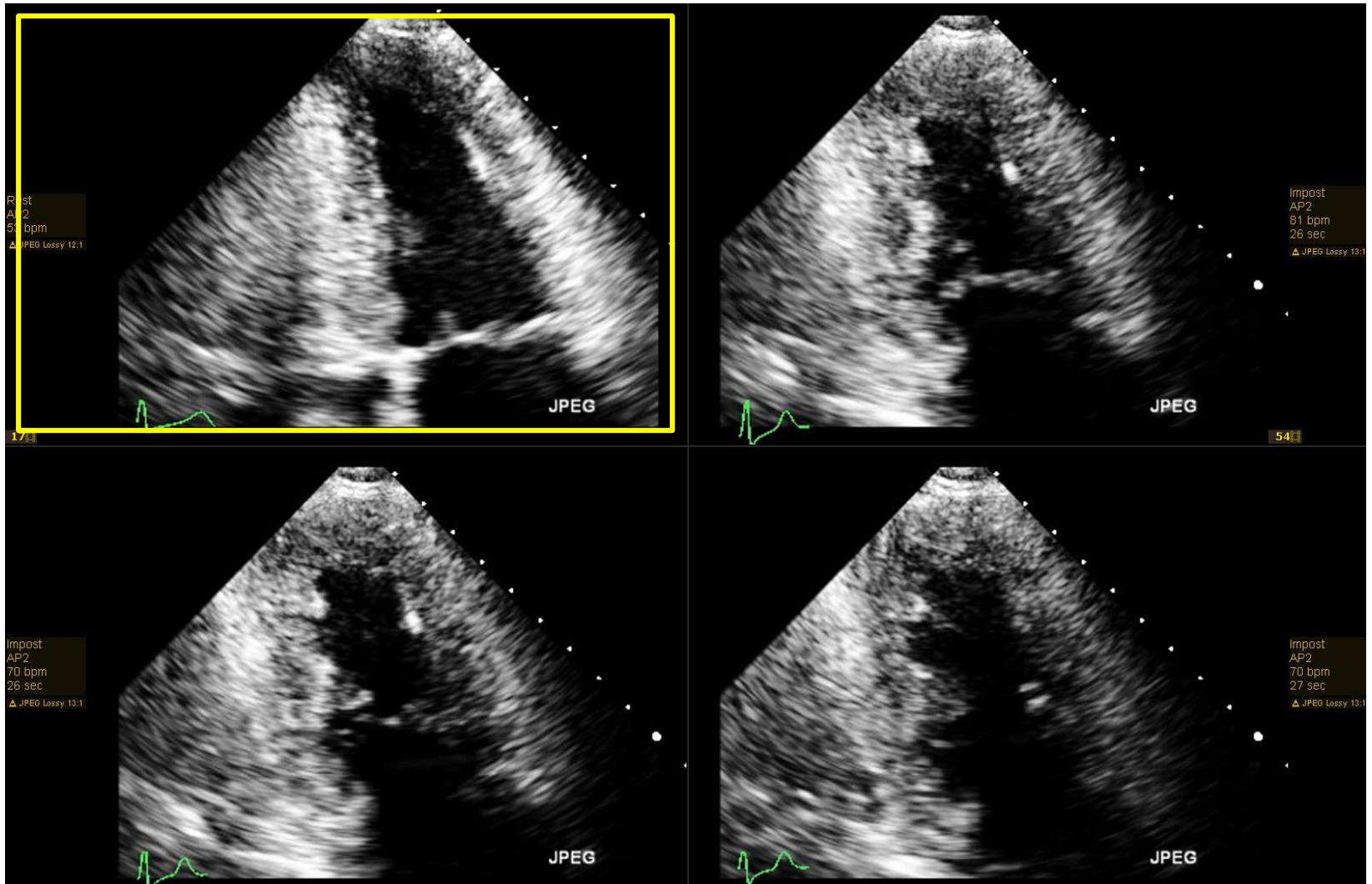
Referred for **exercise** stress echo

# EXERCISE STRESS ECHO | A4C VIEW

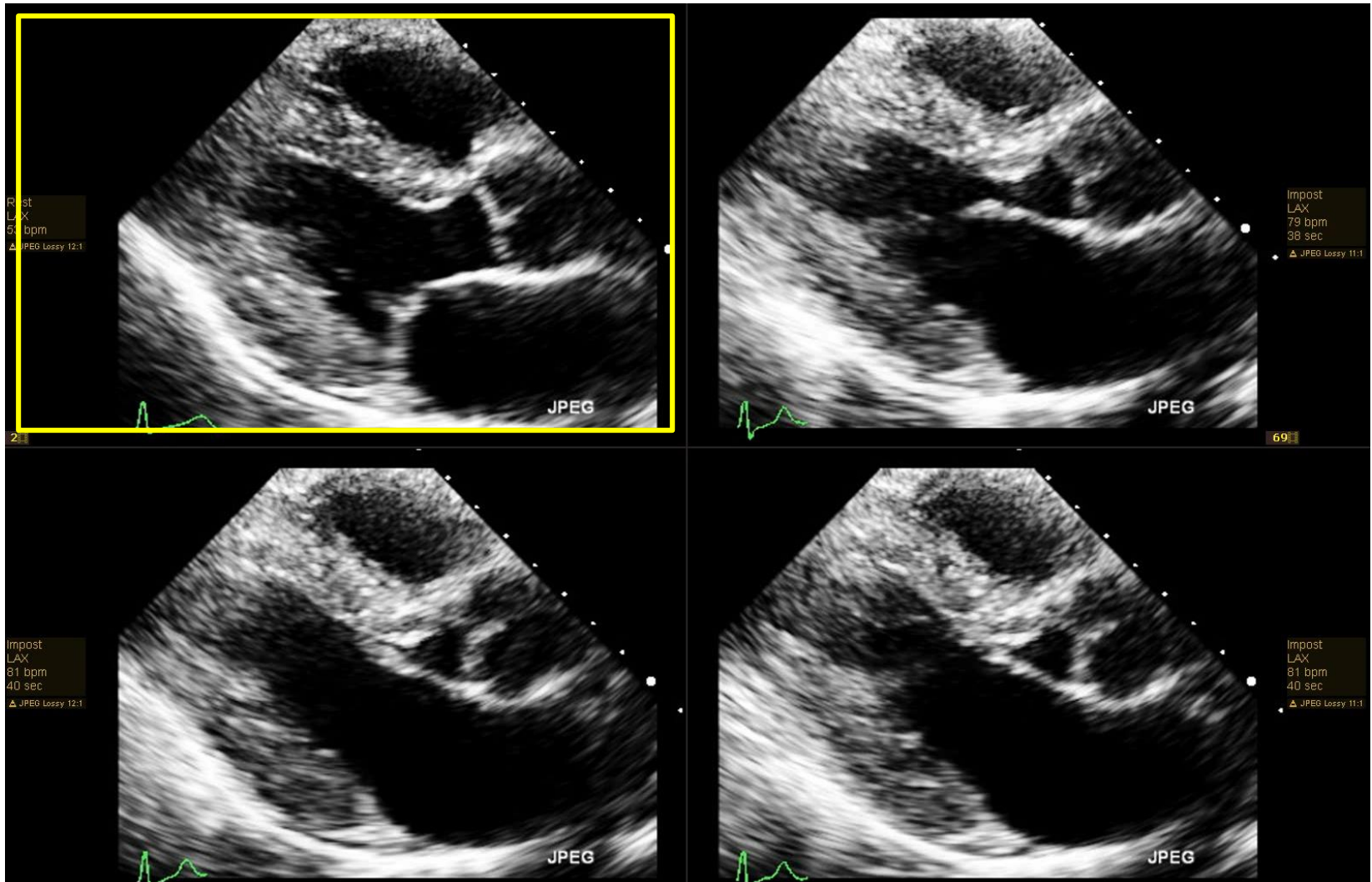




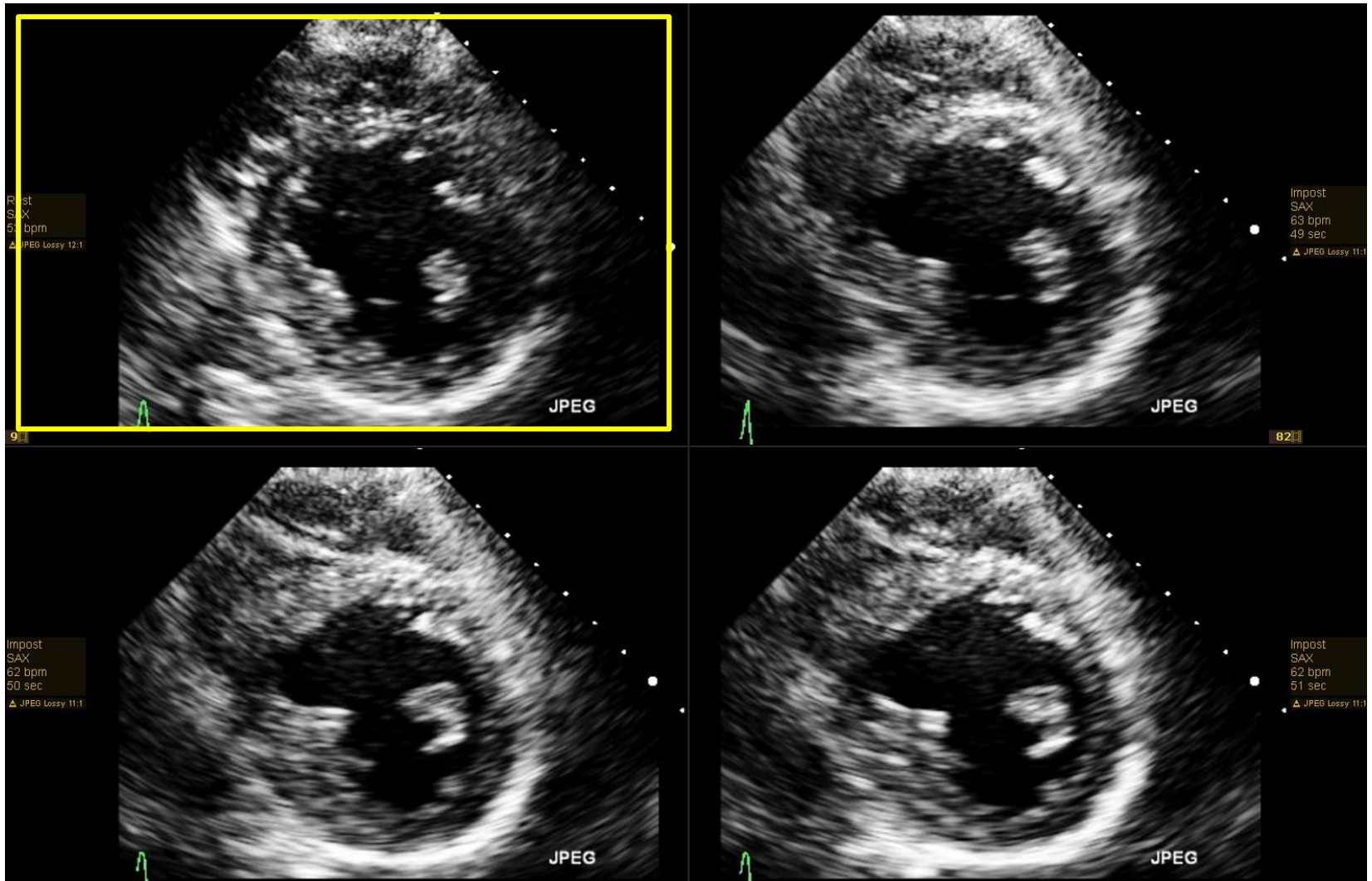
# EXERCISE STRESS ECHO | A2C VIEW



# EXERCISE STRESS ECHO | PLAX VIEW



# EXERCISE STRESS ECHO | PSAX VIEW



# EXERCISE STRESS ECHO | WALL SCORING

## Wall Scoring

0 Unable to Score

1 Normal

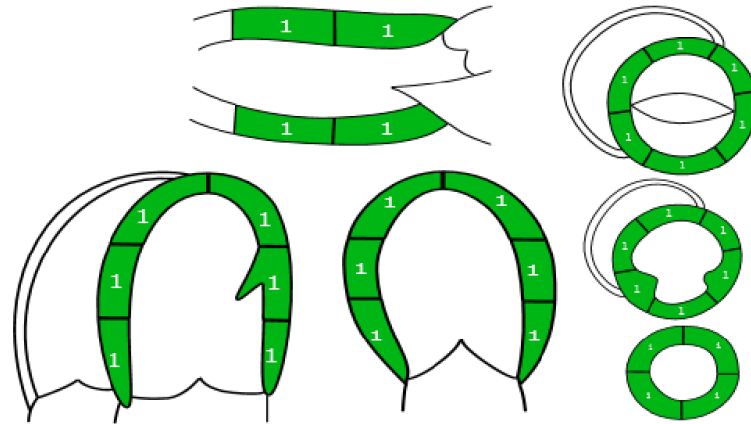
2 Hypokinetic

3 Akinetic

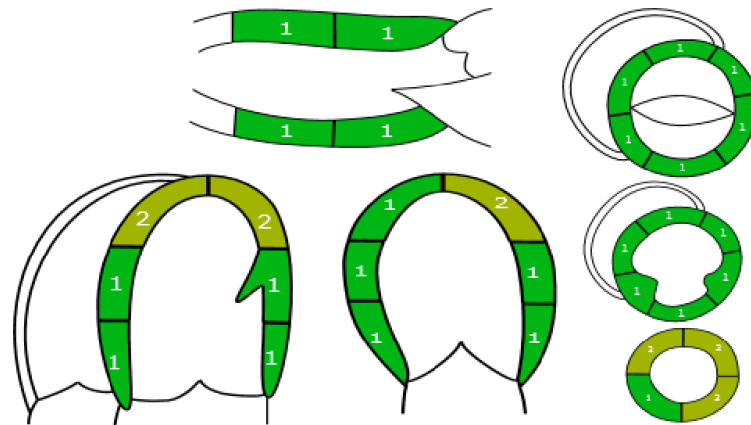
4 Dyskinetic

5 Aneurysmal

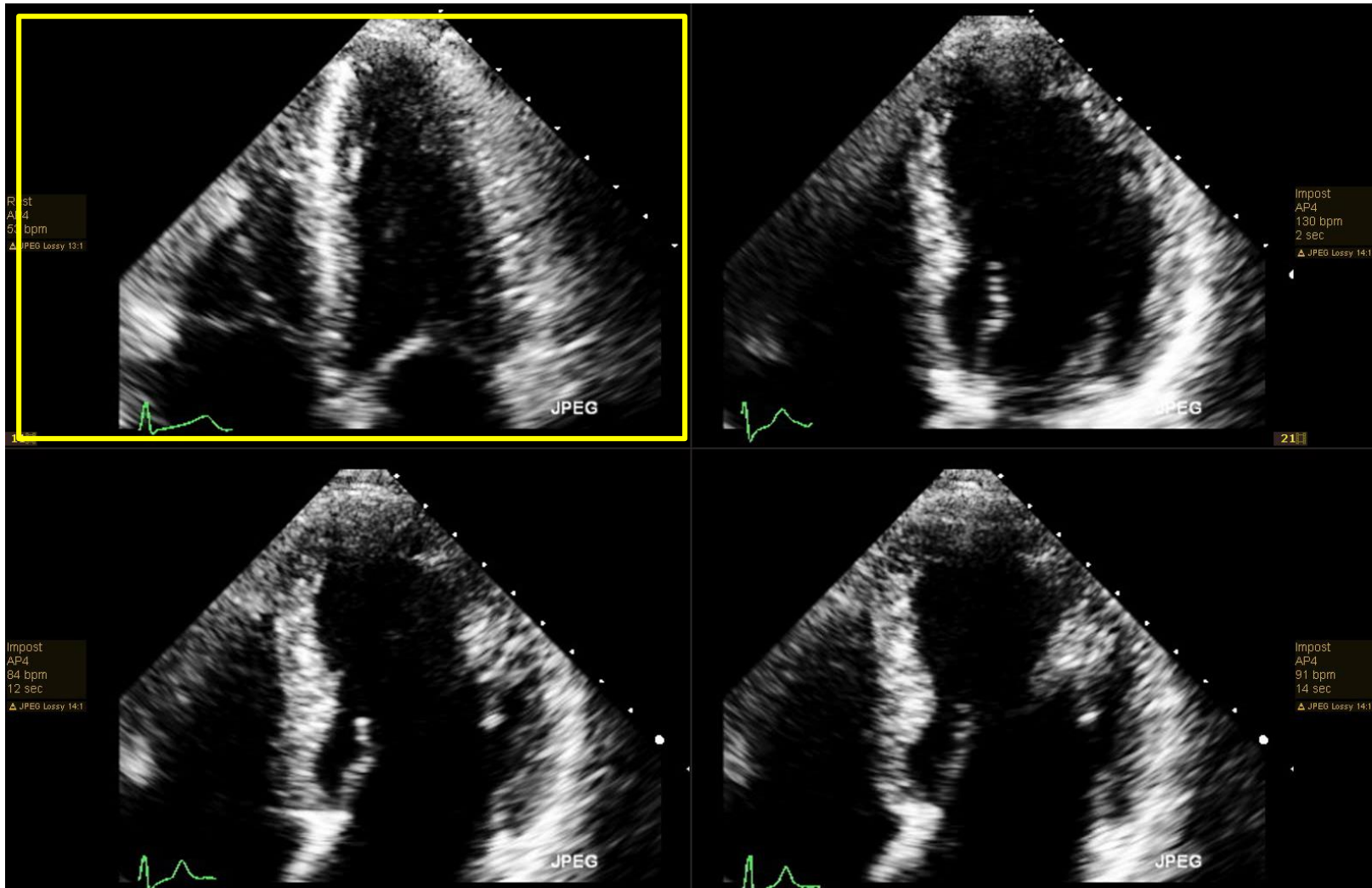
Rest All segments are normal.



Impost The apical lateral wall, apical septum, and apical anterior wall are hypokinetic. All remaining scored segments are normal.



# EXERCISE STRESS ECHO | A4C VIEW



# EXERCISE STRESS ECHO | EKG AT PEAK STRESS



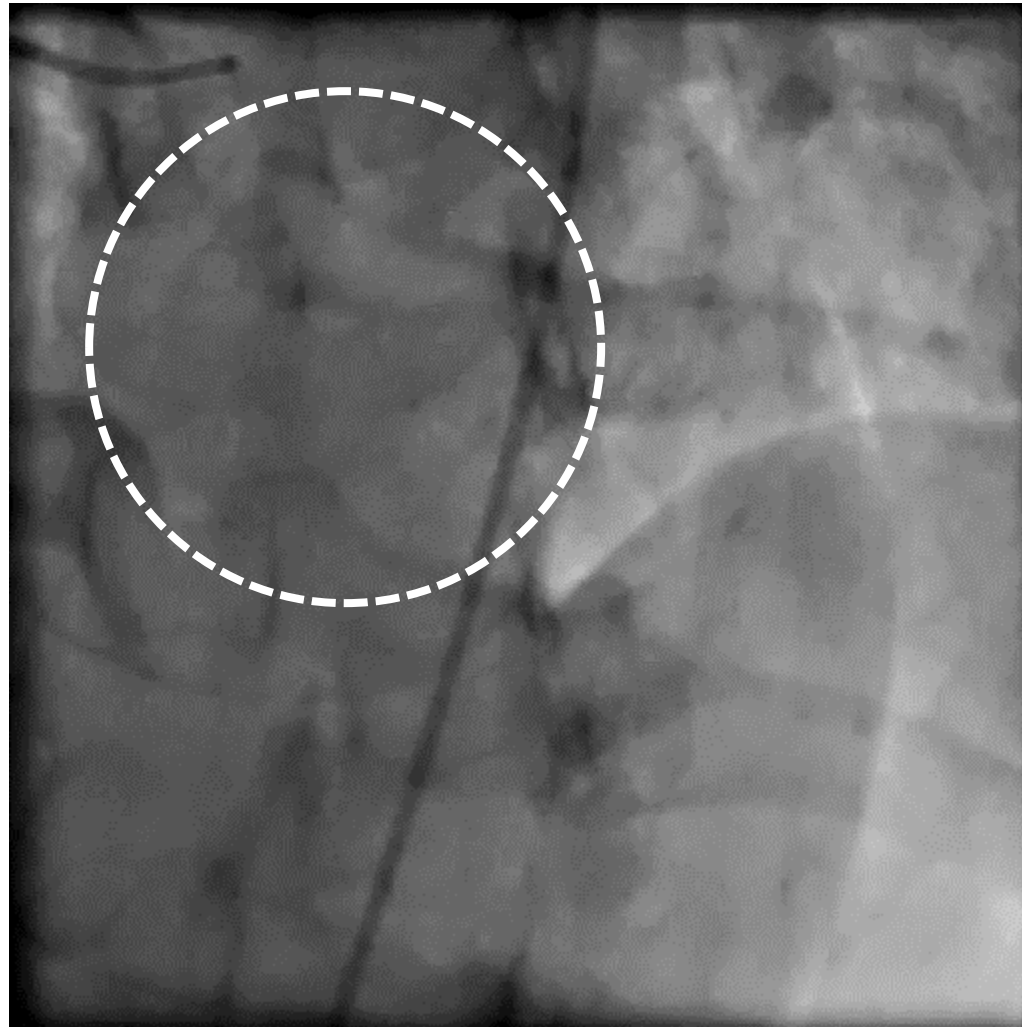
## CONCLUSION

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Stress echo **positive** for LAD ischemia.

# CORONARY ANGIOGRAPHY | LAD STENOSIS | LAO VIEW

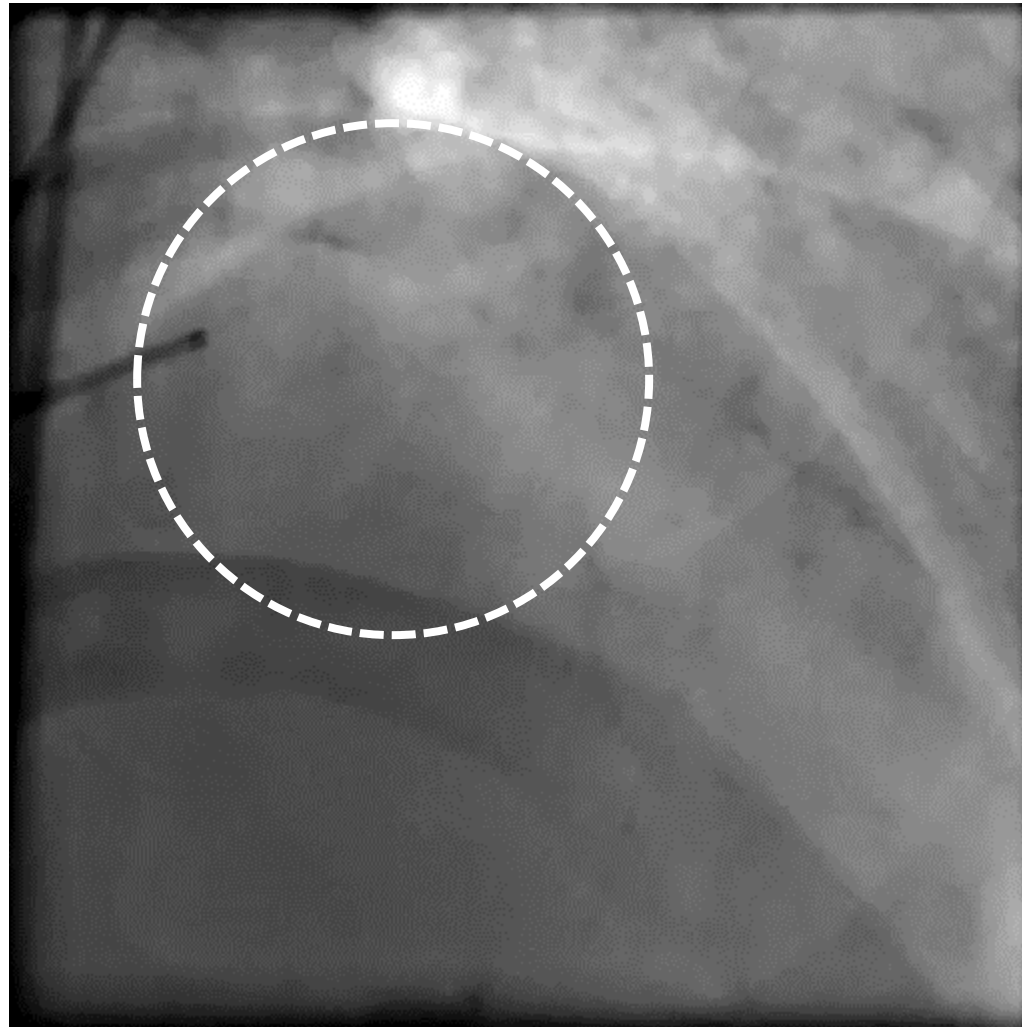
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# CORONARY ANGIOGRAPHY | LAD STENOSIS | RAO VIEW

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# Stress Case #5

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## CASE PRESENTATION

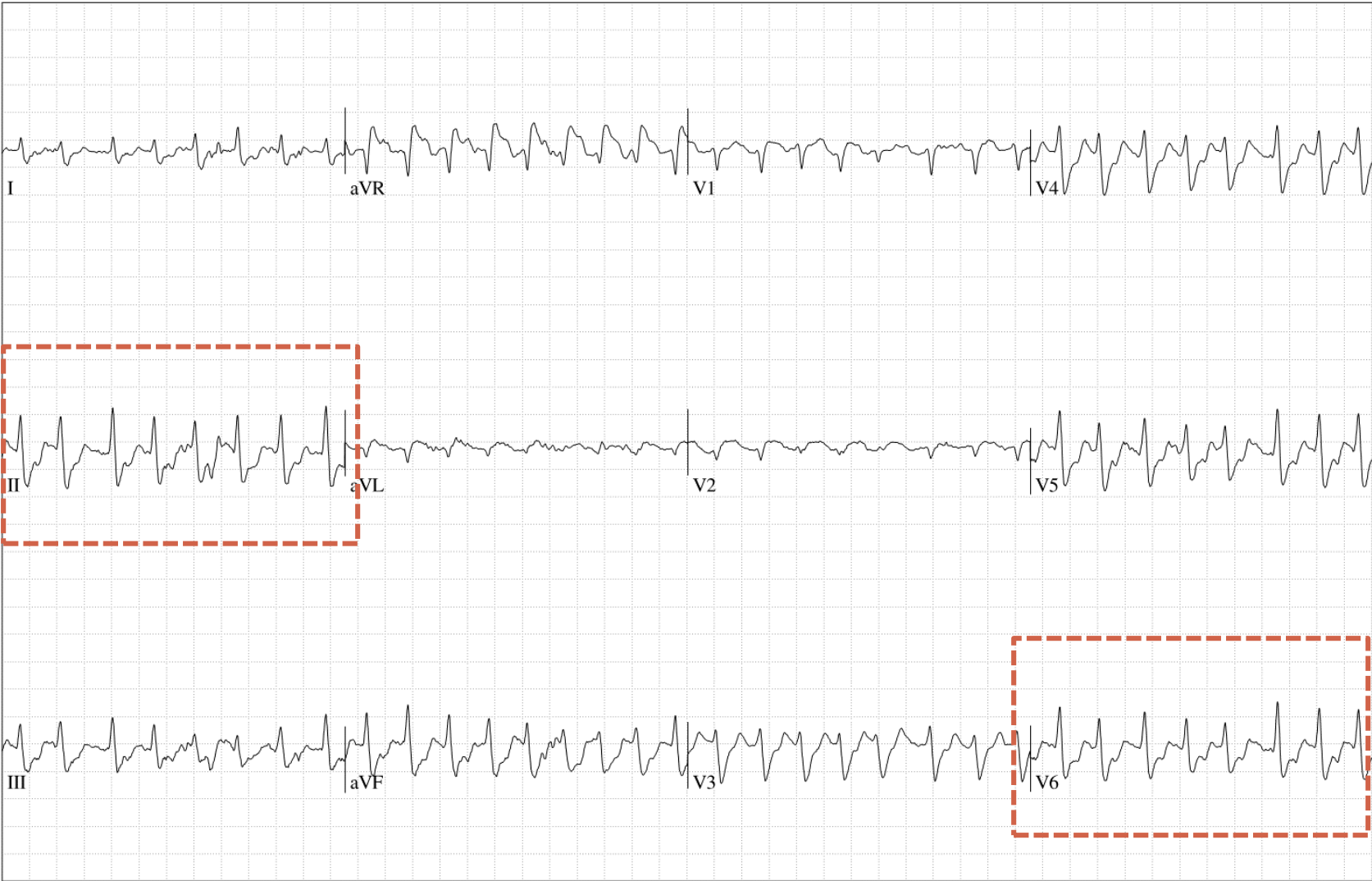
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69-year-old man with CAD, s/p PCI to LAD  
with recent recurrence of **exertional chest pain**.

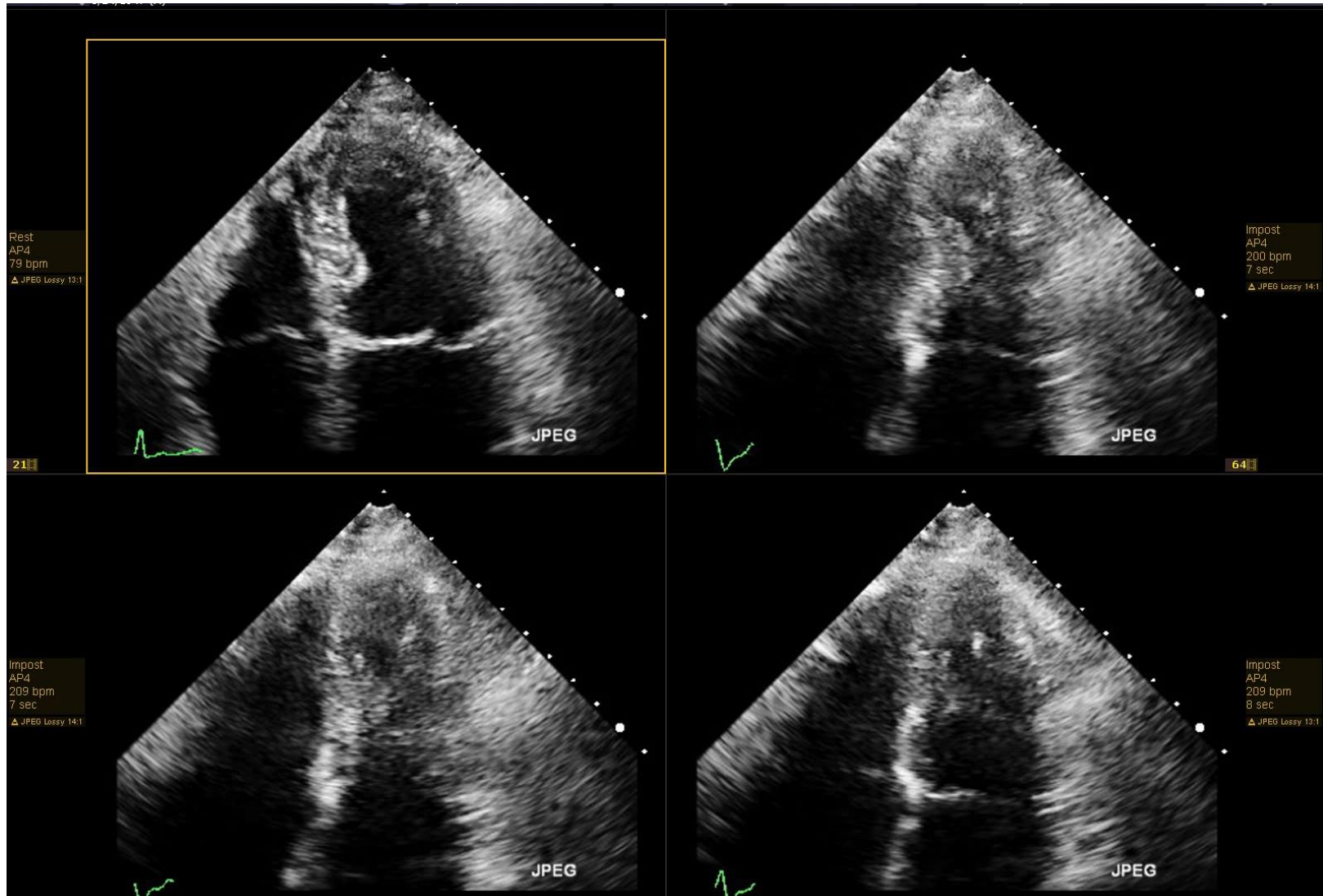
\*\*\*

Referred for **exercise** stress echo

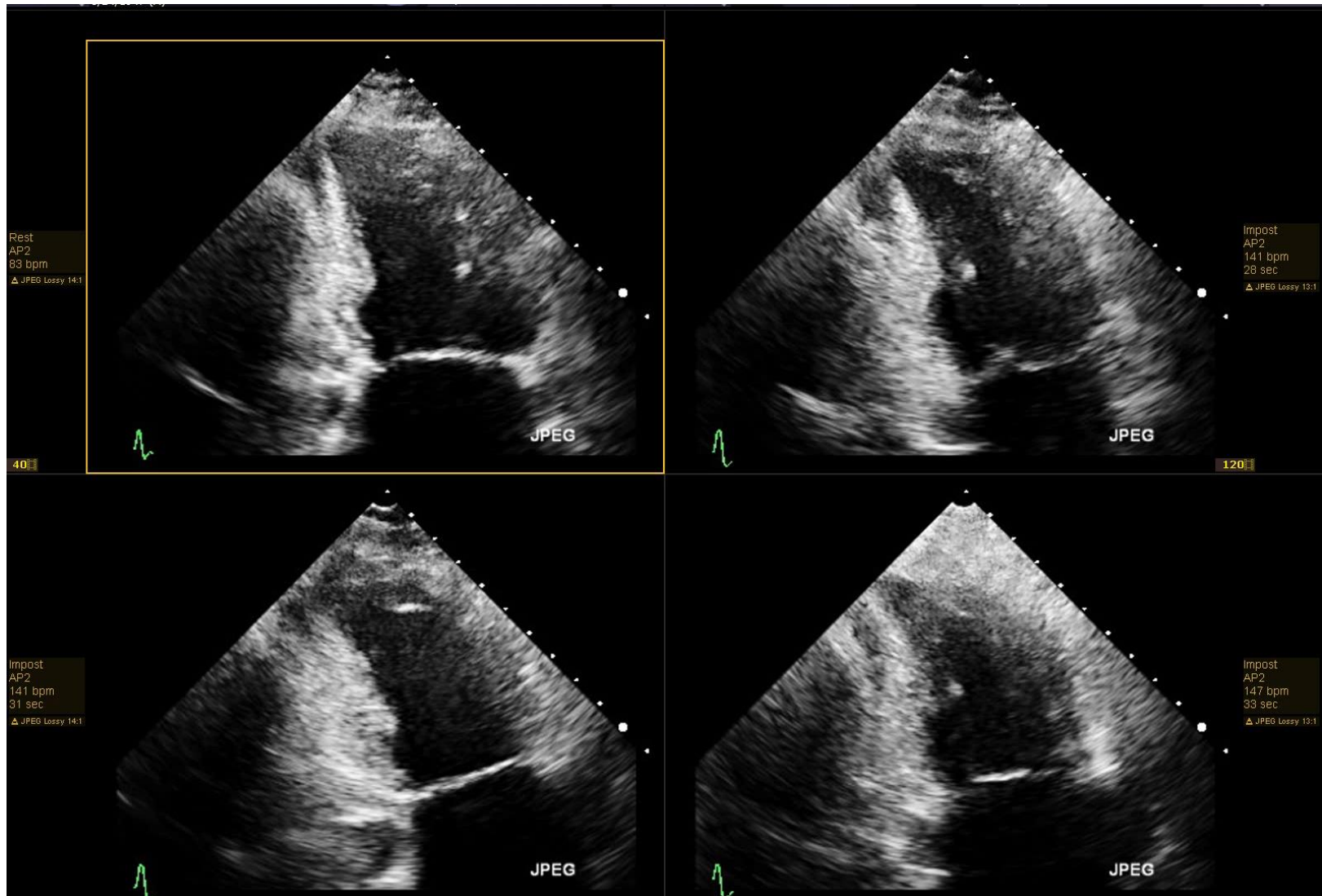
# EXERCISE STRESS ECHO | EKG AT PEAK STRESS



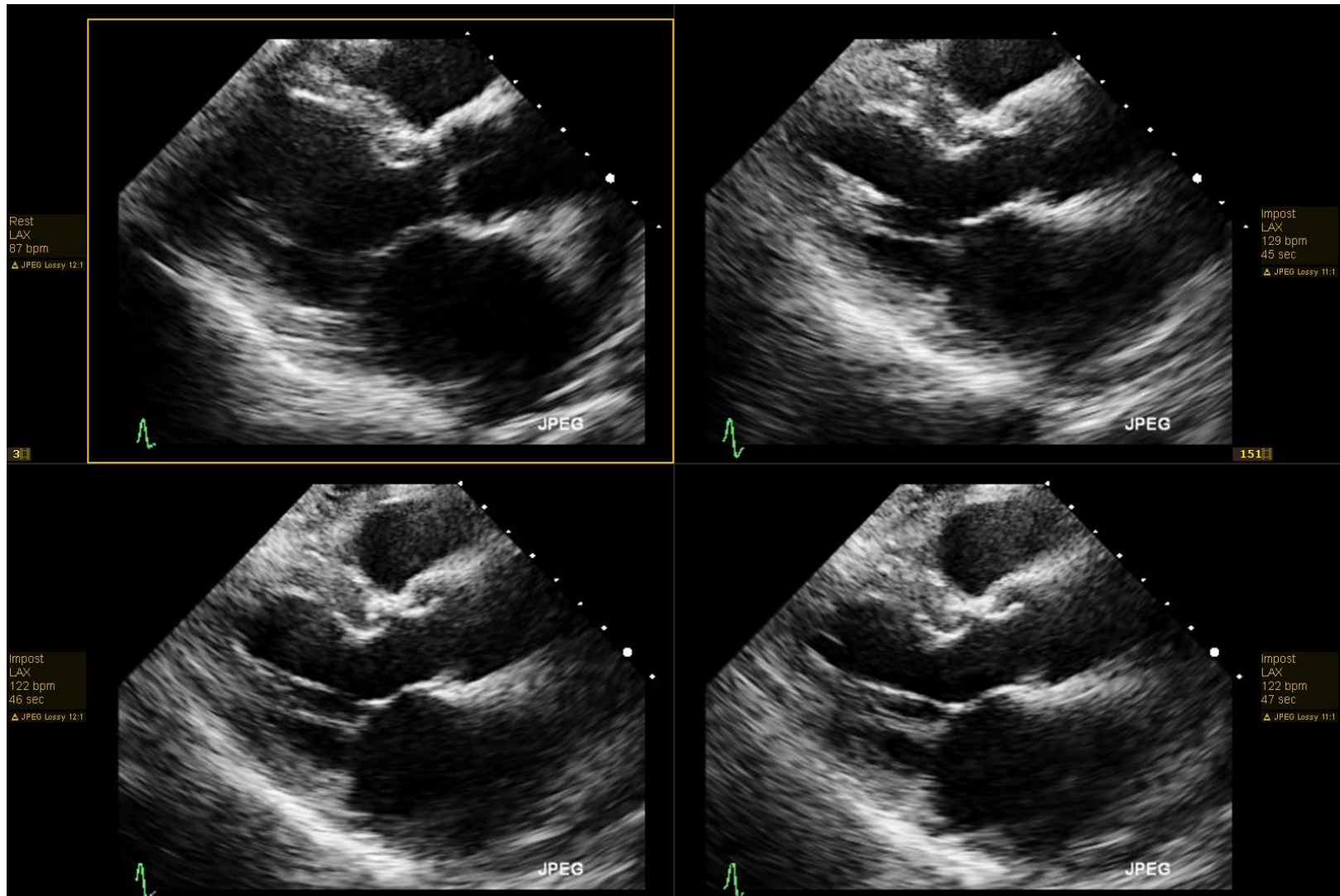
# EXERCISE STRESS ECHO | A4C VIEW



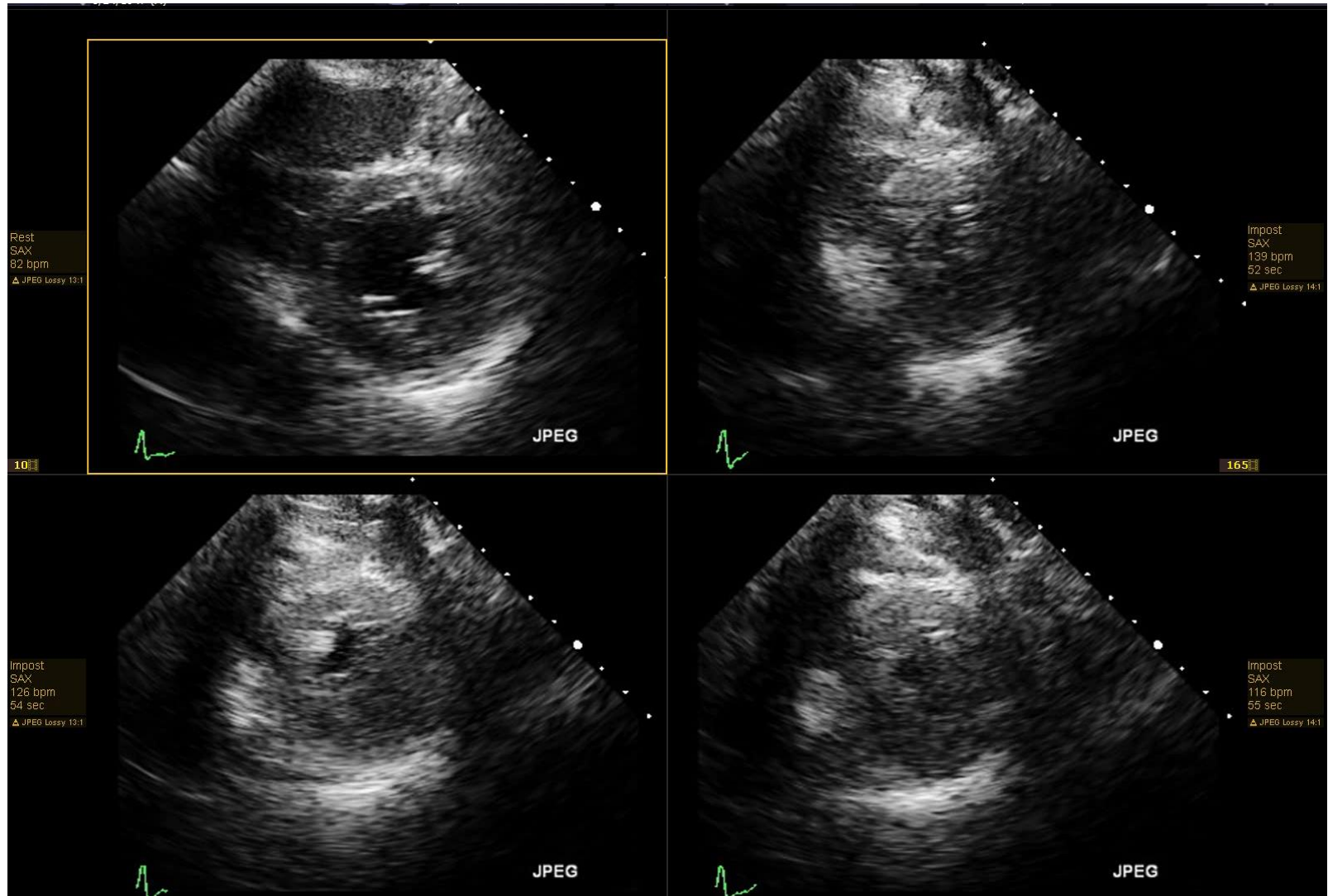
# EXERCISE STRESS ECHO | A2C VIEW



# EXERCISE STRESS ECHO | PLAX VIEW



# EXERCISE STRESS ECHO | PSAX VIEW





## QUESTION

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**Is this a positive stress echo?**

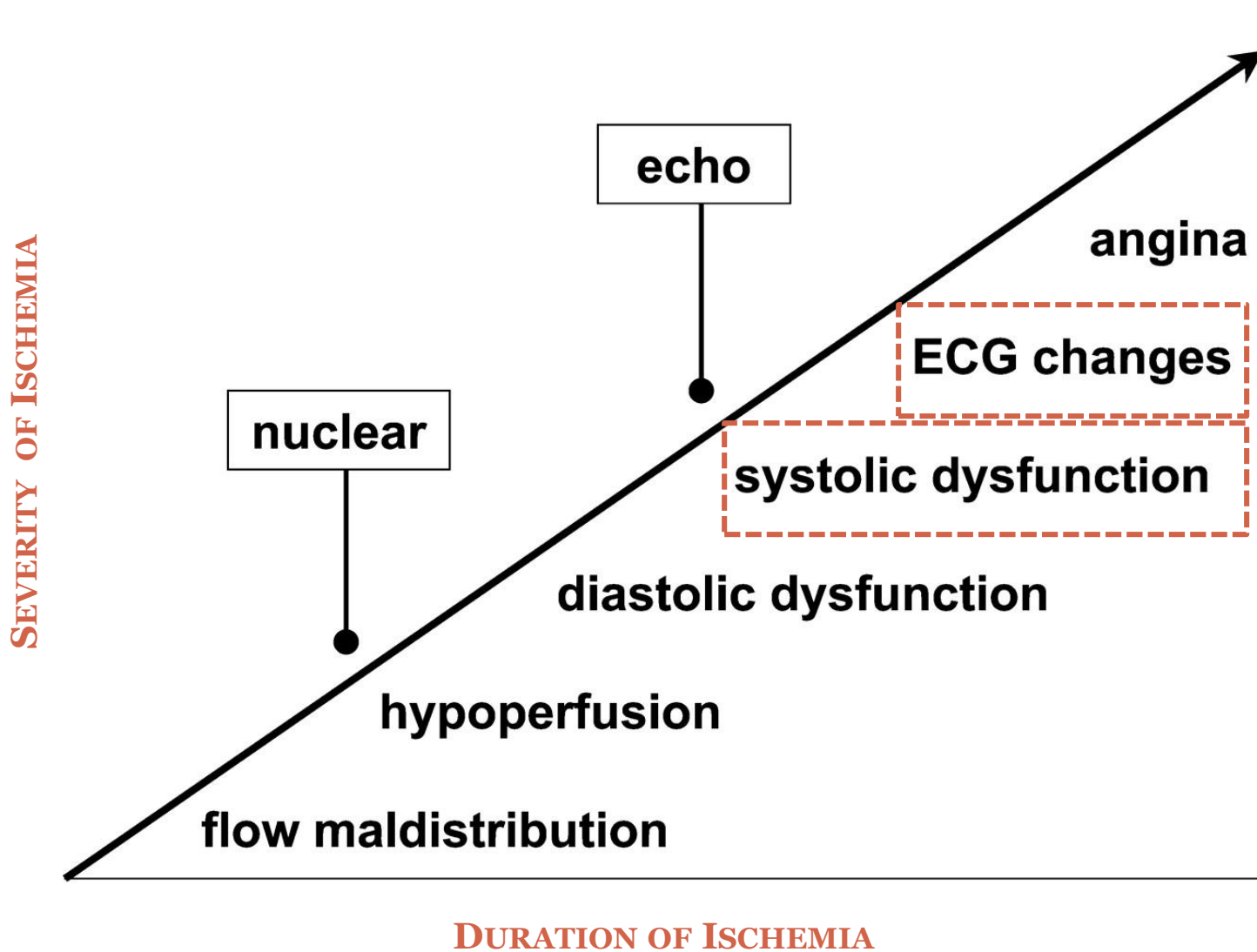
Positive EKG + Negative LV wall motion abnormalities

## TEACHING POINTS

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- Absence of stress-induced LV wall motion abnormalities typically implies a **negative stress echo** irrespective of stress-induced EKG changes.

# ISCHEMIC CASCADE



# Stress Case #6

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## CASE PRESENTATION

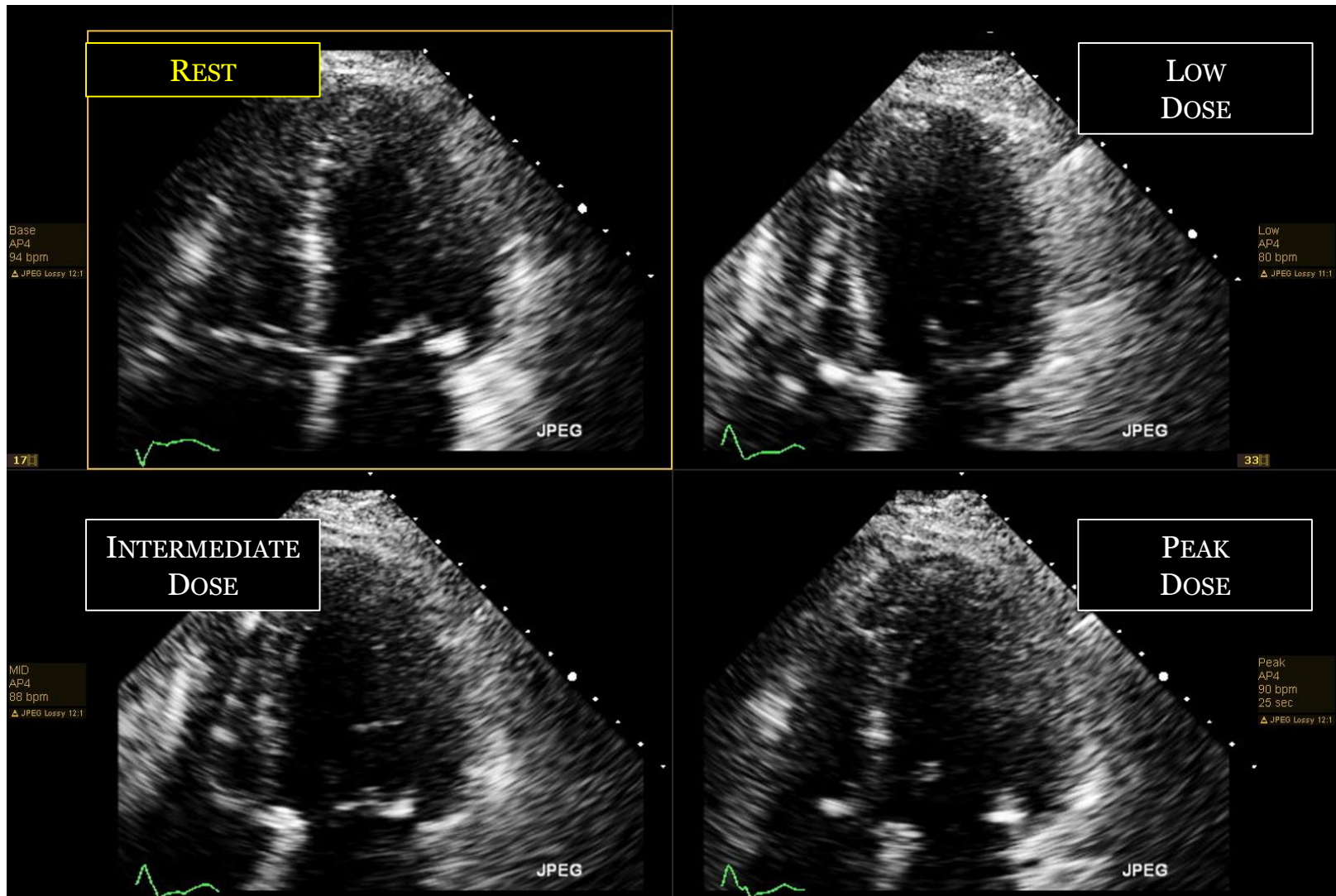
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82-year-old woman with CAD, s/p multiple coronary stents  
presents with **heart failure**.

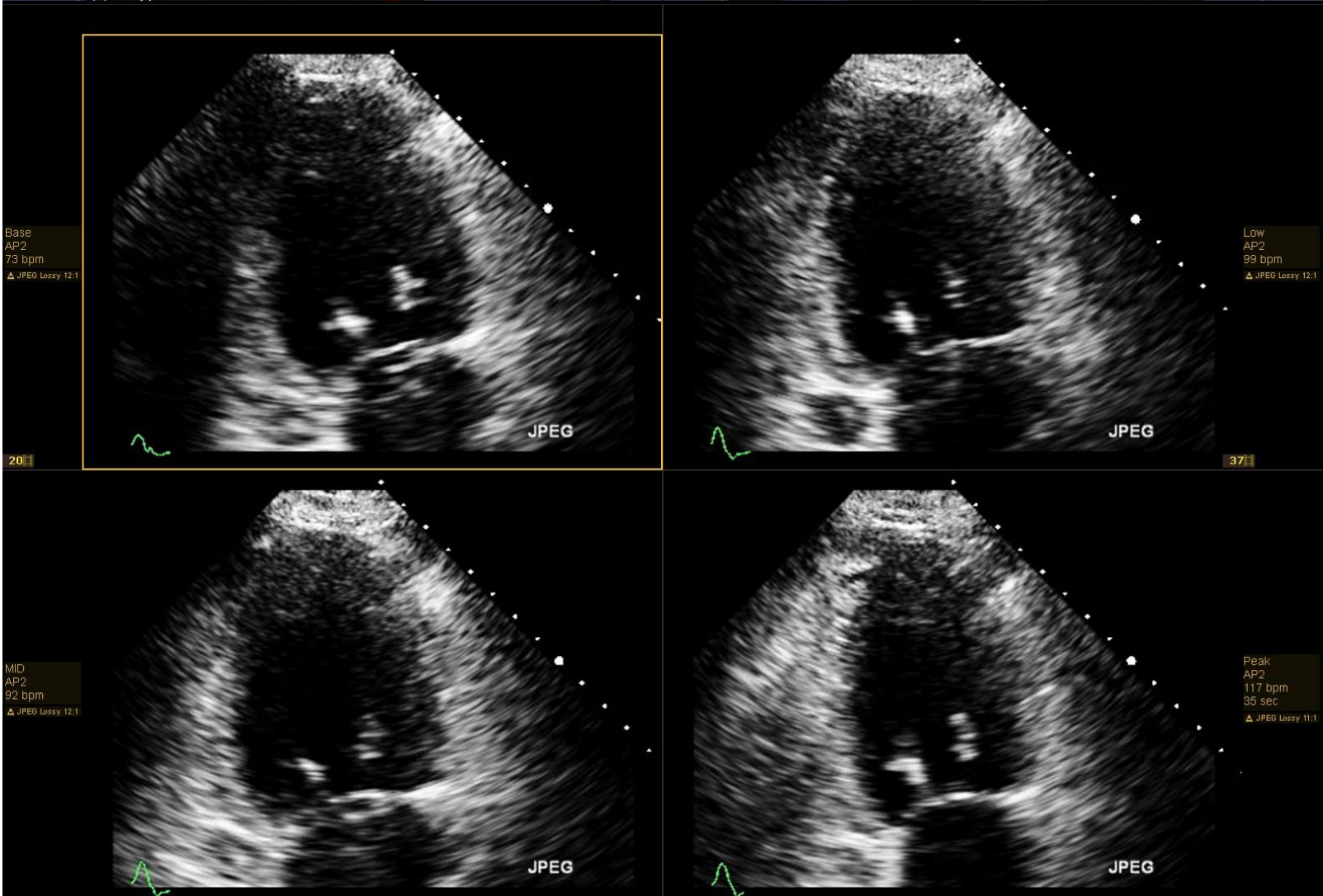
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Referred for **dobutamine** stress echo;  
cannot exercise due to severe hip pain.

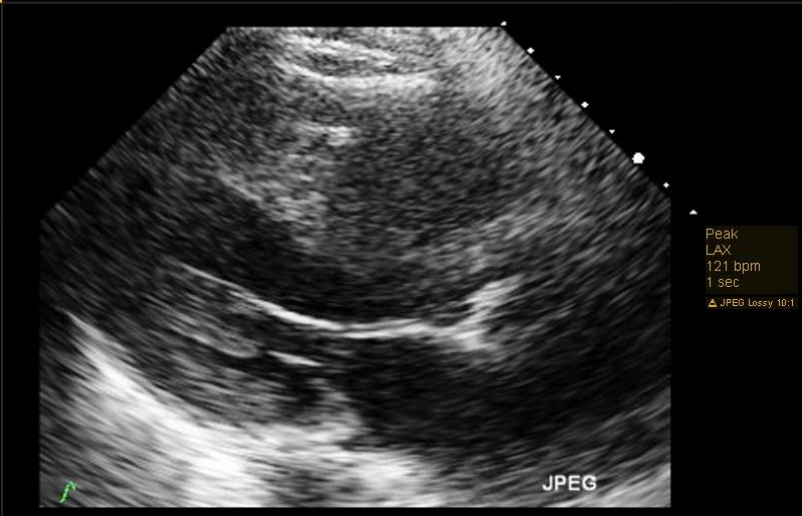
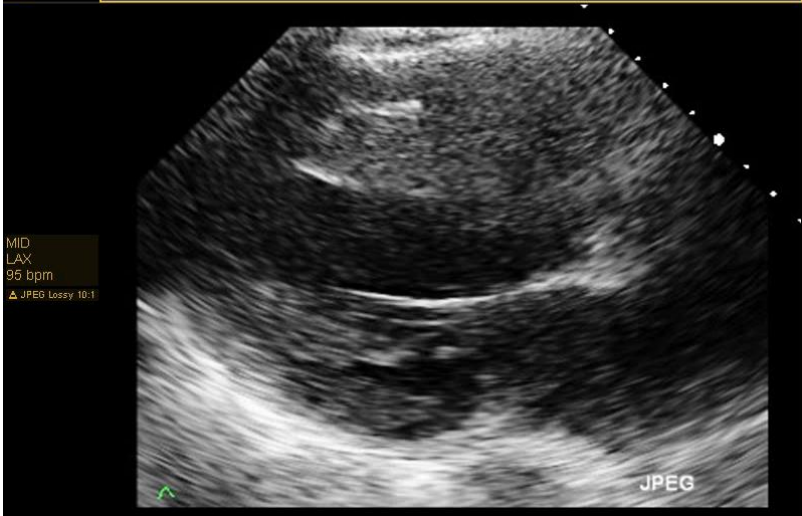
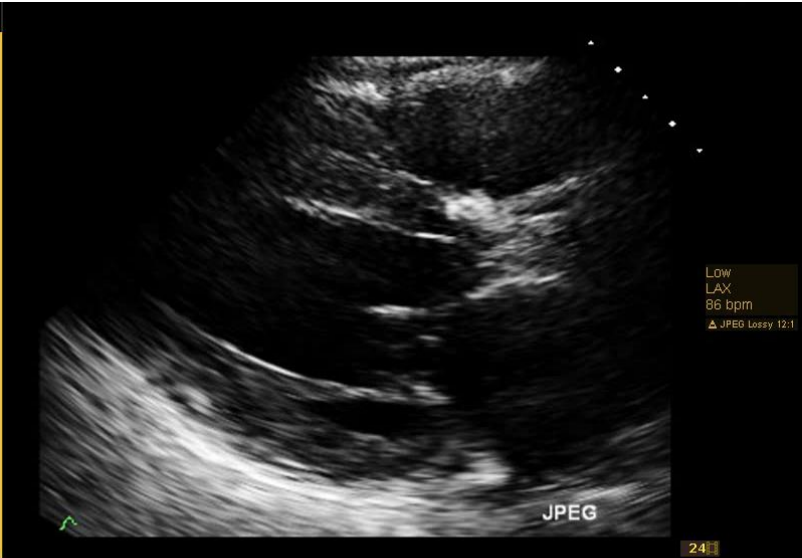
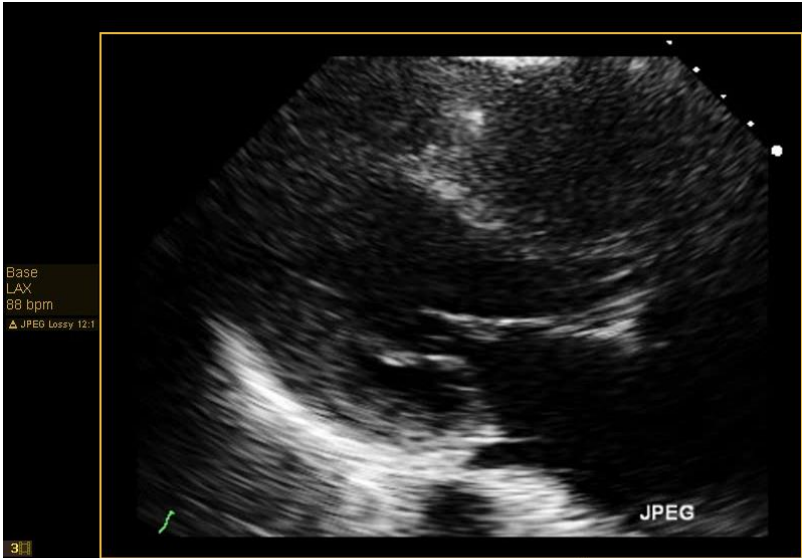
# DOBUTAMINE STRESS ECHO | A4C VIEW



# DOBUTAMINE STRESS ECHO | A2C VIEW

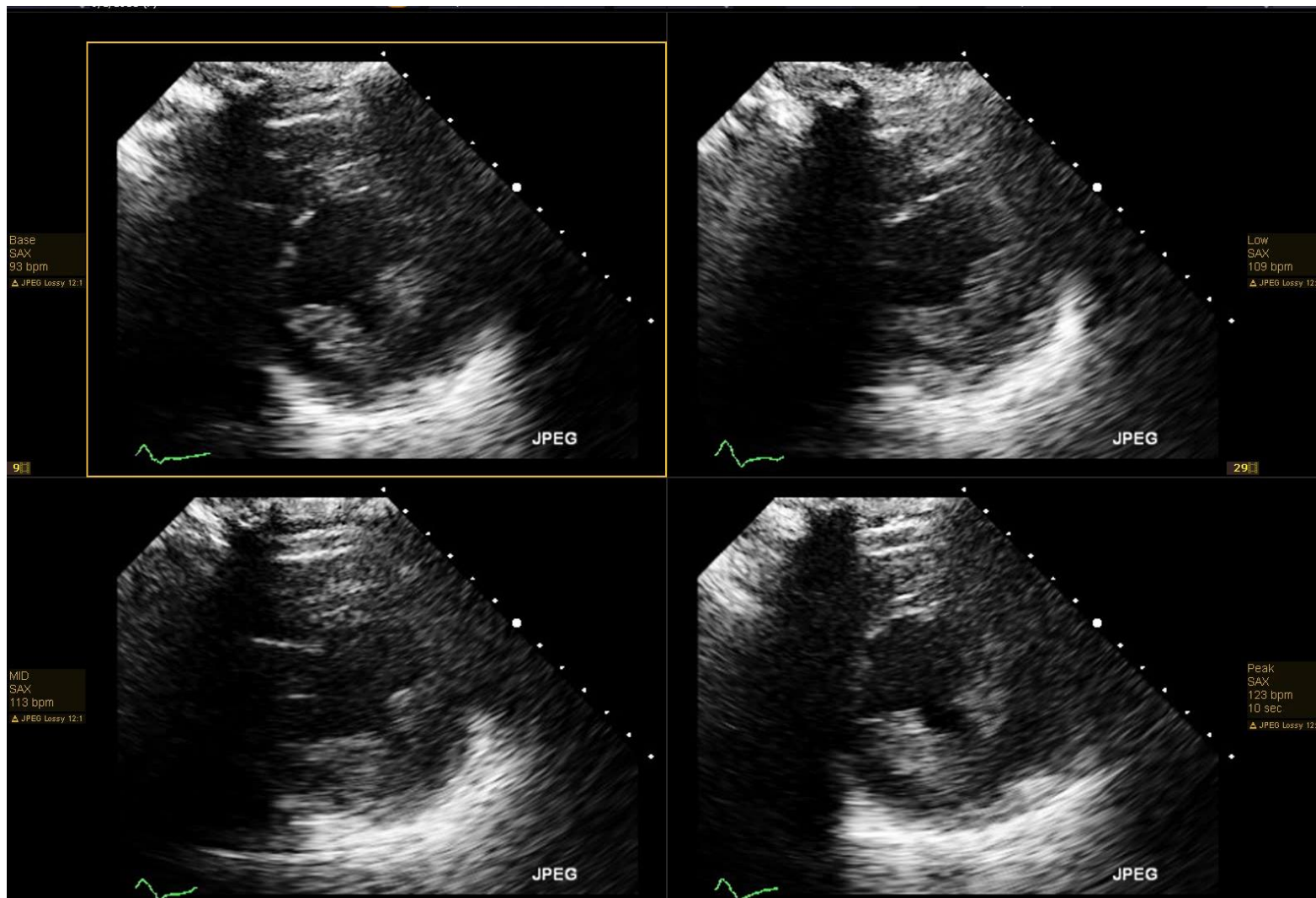


# DOBUTAMINE STRESS ECHO | PLAX VIEW





# DOBUTAMINE STRESS ECHO | PSAX VIEW



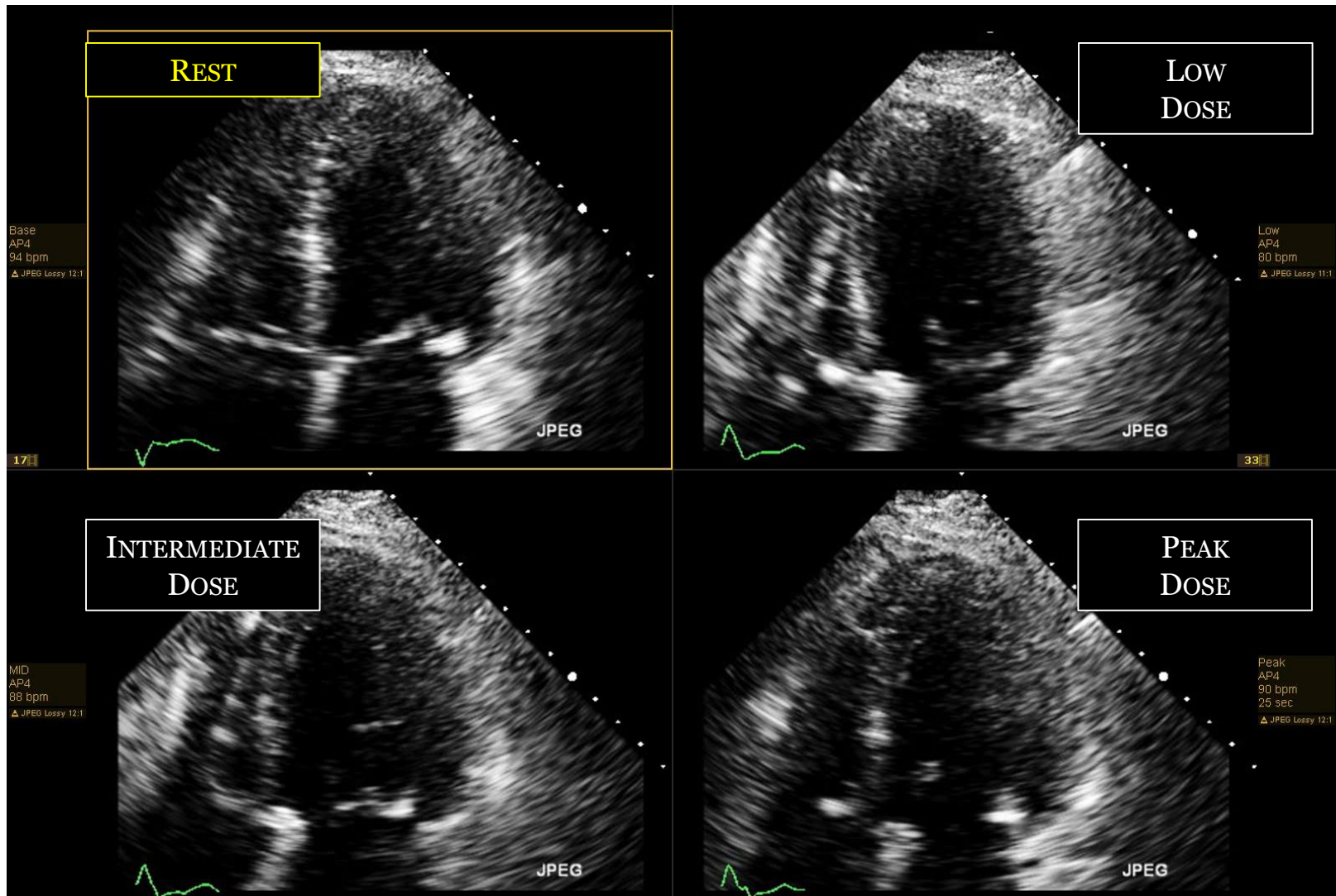
## QUESTION

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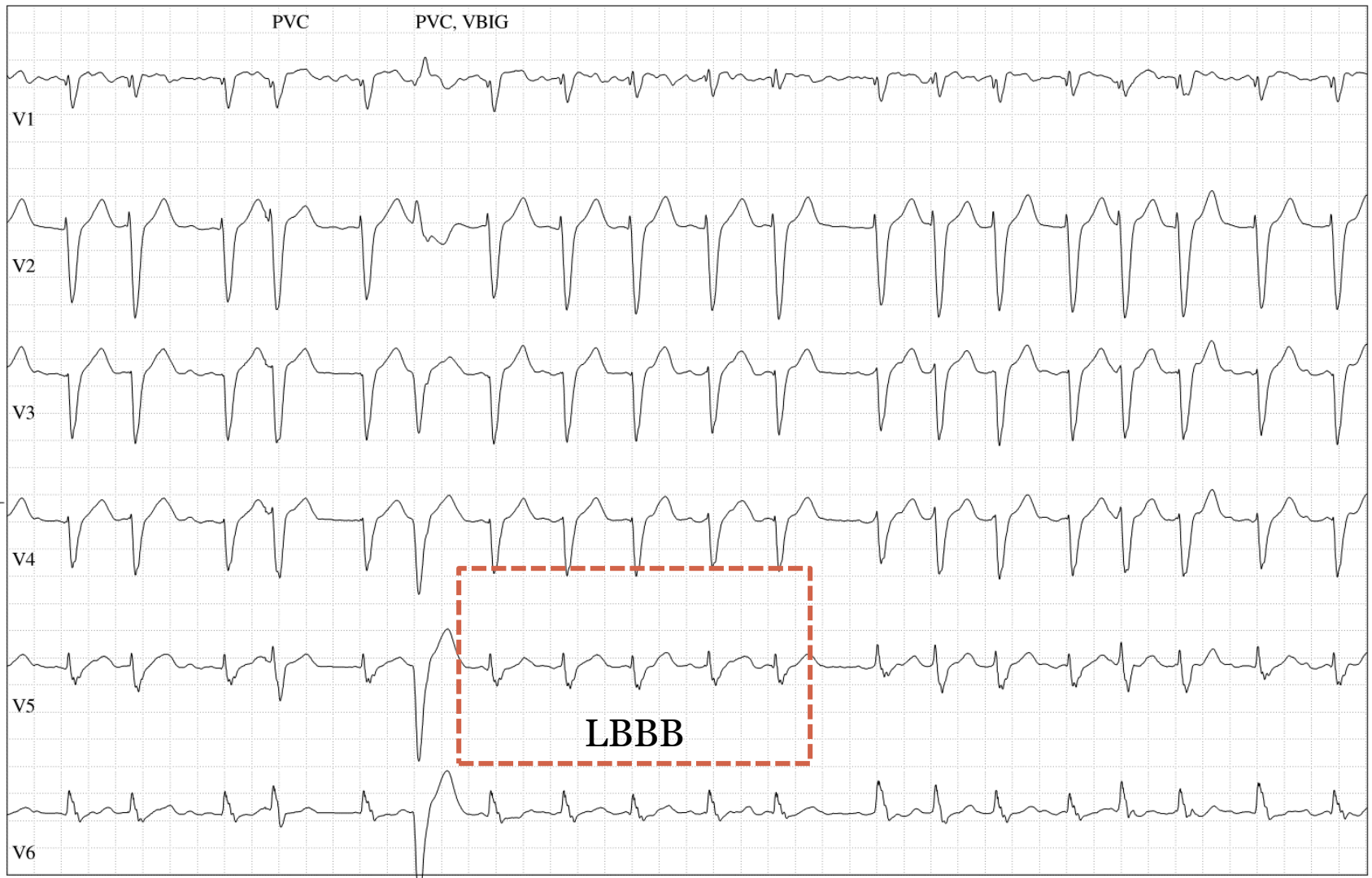
There are stress-induced LV wall motion abnormalities in the LAD territory.

**Is this a positive stress echo?**

# DOBUTAMINE STRESS ECHO | A4C VIEW



# DOBUTAMINE STRESS ECHO | EKG AT PEAK STRESS



## TEACHING POINTS

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- **LBBB** may lead to LV wall motion abnormalities that **mimic LAD ischemia**
- If possible, patients with baseline LBBB should undergo a form of stress testing that does **NOT** rely on heart rate increase.
- Baseline **LBBB** >>> order **vasodilator stress test** (vasodilator nuclear in the United States; vasodilator echo in Europe).

# Thank you

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**New York University Medical Center**