Assessment of Native Stenotic Valve Disease 2016

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I Need Your Opinion…

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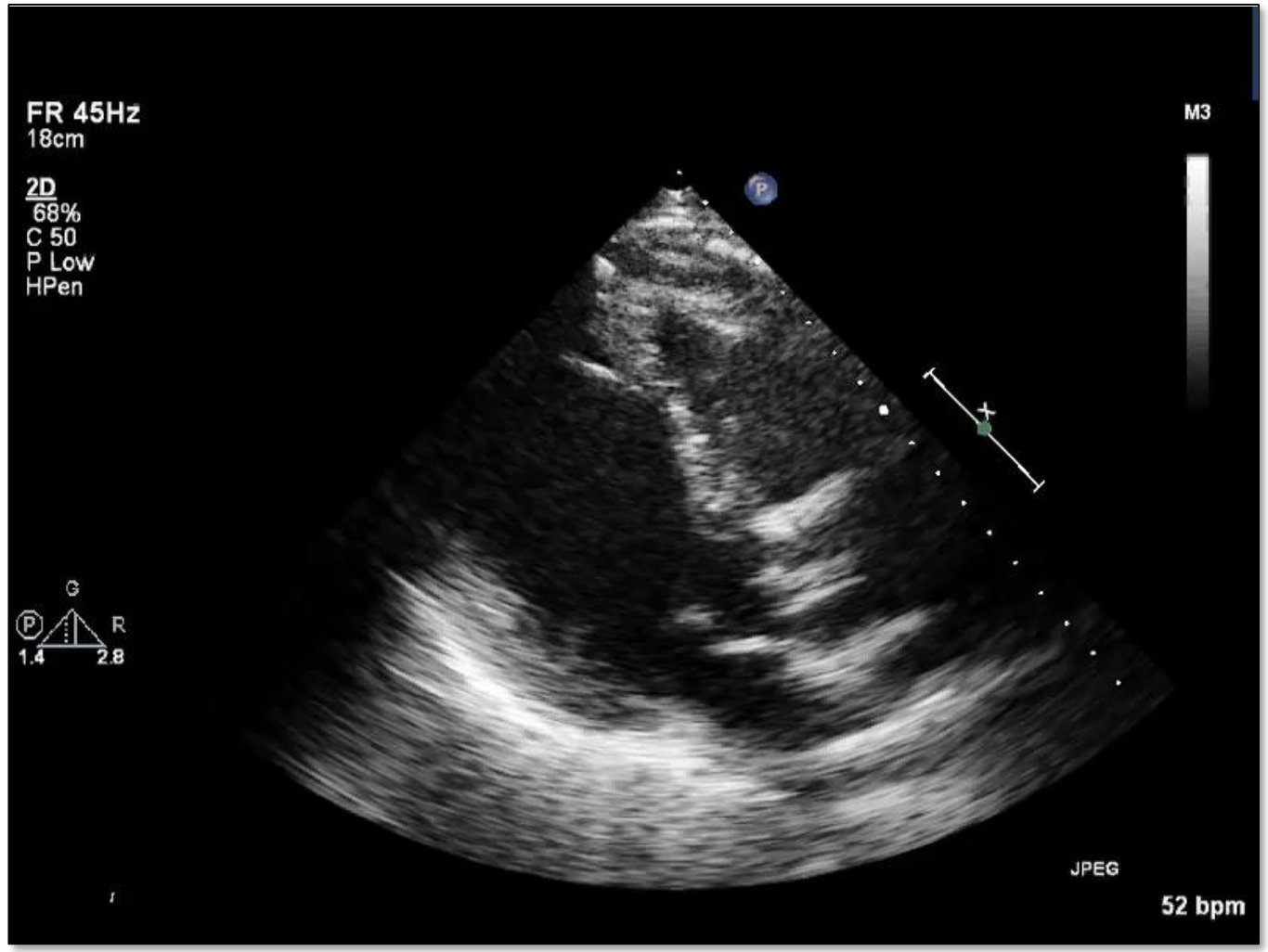
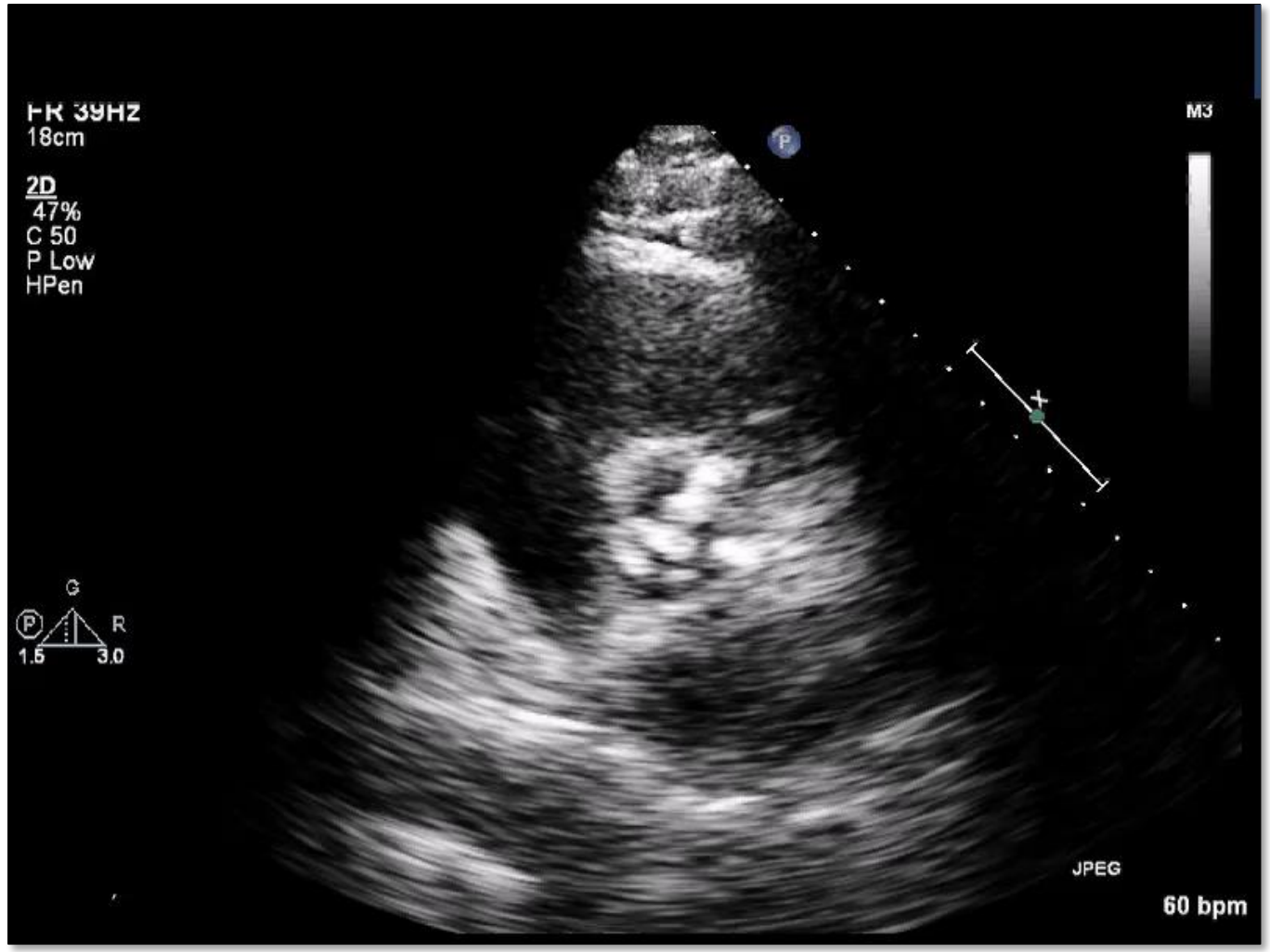
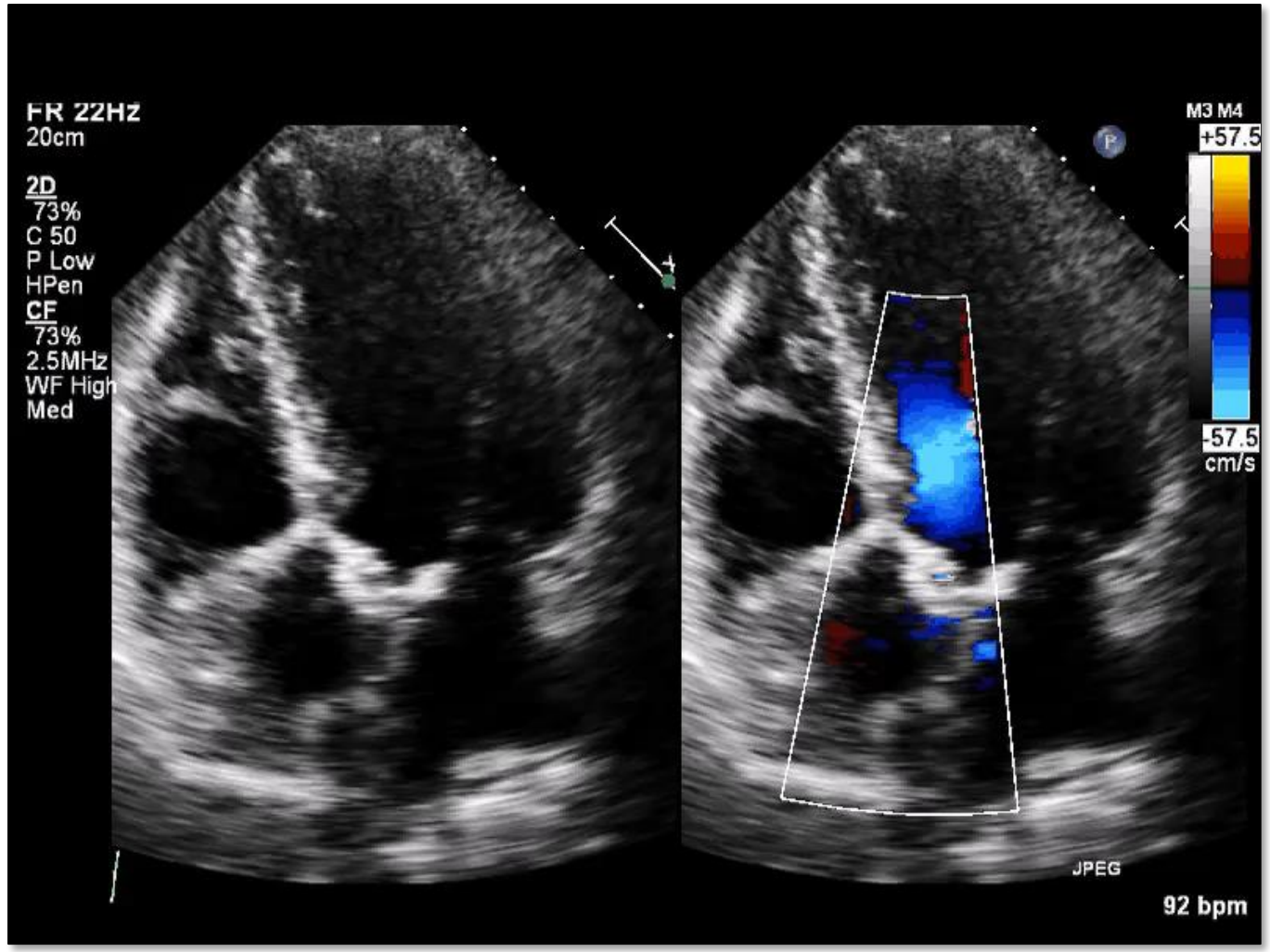
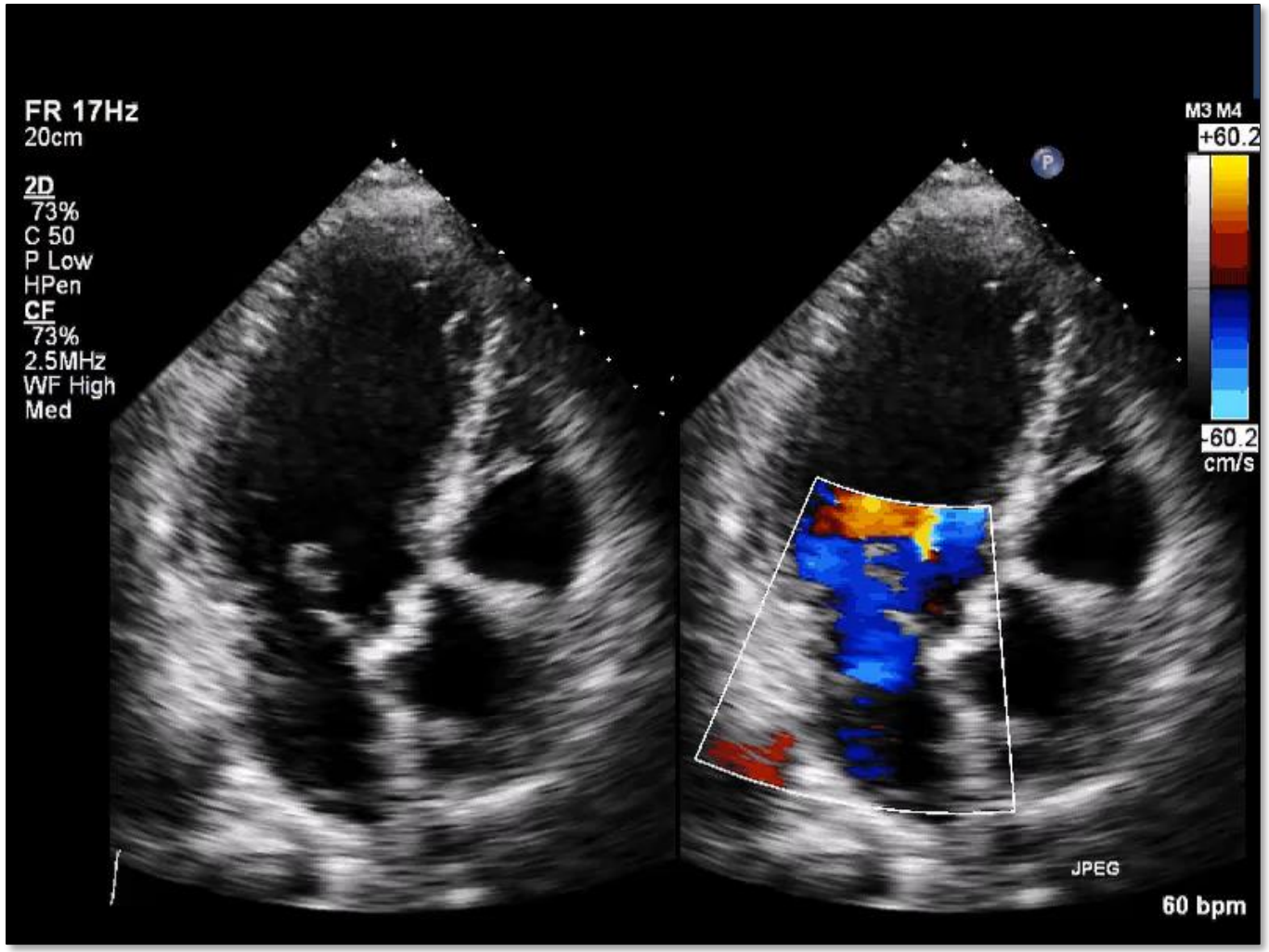
75 year old man

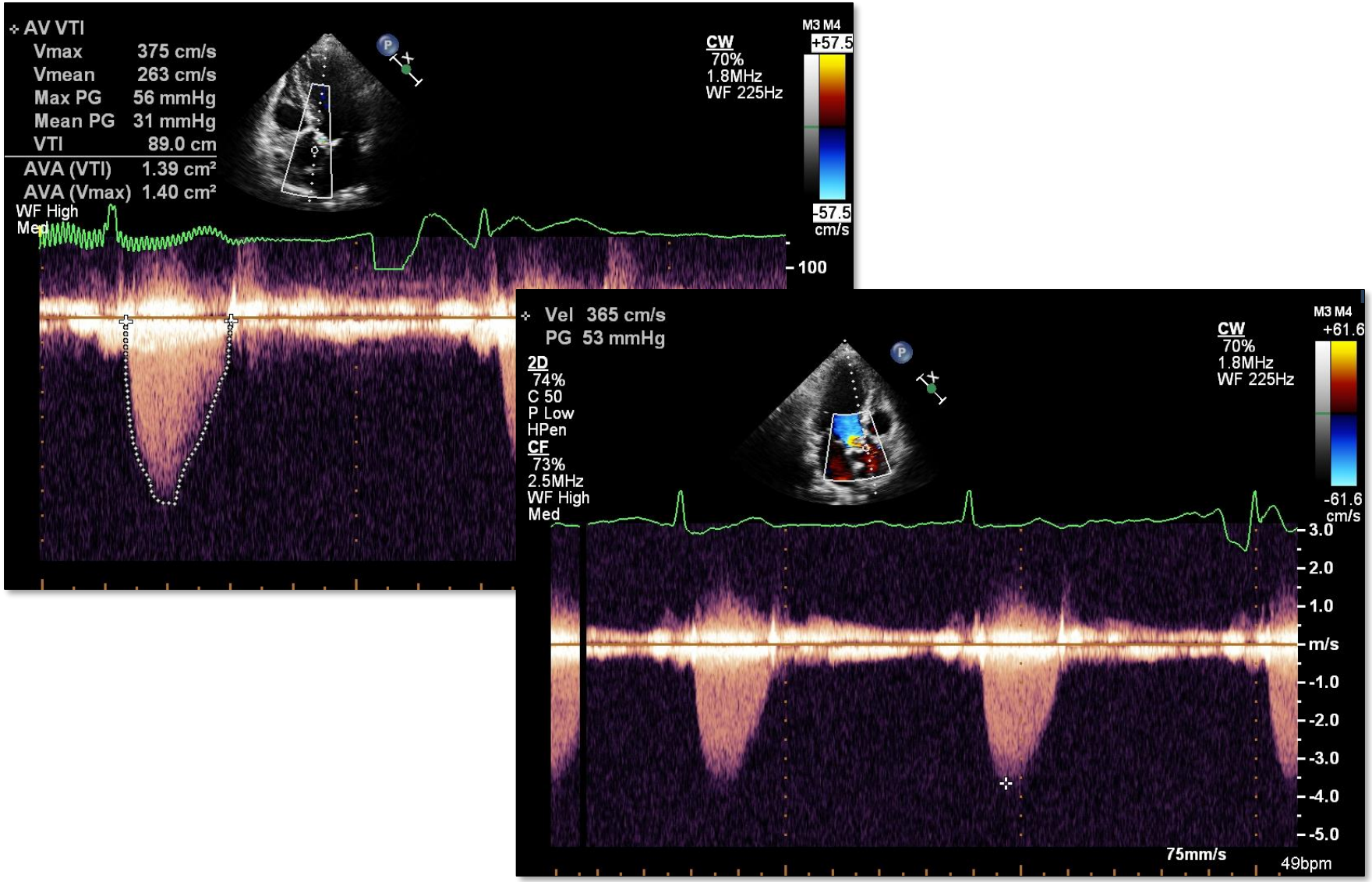
- Known aortic valve valve disease
- Heart murmur for 20 years
- He is asymptomatic
- Exercise testing last year showed excellent exercise tolerance (10 min Bruce protocol) with normal BP response
- Exam: Normal BP, diminished/delayed carotid pulses, 3/6 midsystolic outflow murmur radiating to carotids and to apex


FR 45Hz
18cm
2D
68%
C 50
P Low
HPen
M3
G
P
R
1.4
2.8
JPEG
52 bpm


FR 39HZ
18cm
2D
47%
C 50
P Low
HPen
M3
G
P
R
1.5
3.0
JPEG
60 bpm


FR 22Hz
20cm
2D
73%
C 50
P Low
HPen
CF
73%
2.5MHz
WF High
Med
M3 M4
+57.5
-57.5
cm/s
JPEG
92 bpm


FR 17Hz
20cm
2D
73%
C 50
P Low
HPen
CF
73%
2.5MHz
WF High
Med
M3 M4
+60.2
-60.2
cm/s
JPEG
60 bpm


AV VTI
Vmax 375 cm/s
Vmean 263 cm/s
Max PG 56 mmHg
Mean PG 31 mmHg
VTI 89.0 cm
AVA (VTI) 1.39 cm²
AVA (Vmax) 1.40 cm²
WF High
Med
CW
70%
1.8MHz
WF 225Hz
M3 M4
+57.5
-57.5
cm/s
100
Vel 365 cm/s
PG 53 mmHg
2D
74%
C 50
P Low
HPen
CF
73%
2.5MHz
WF High
Med
CW
70%
1.8MHz
WF 225Hz
M3 M4
+61.6
-61.6
cm/s
3.0
2.0
1.0
m/s
-1.0
-2.0
-3.0
-4.0
-5.0
75mm/s
49bpm

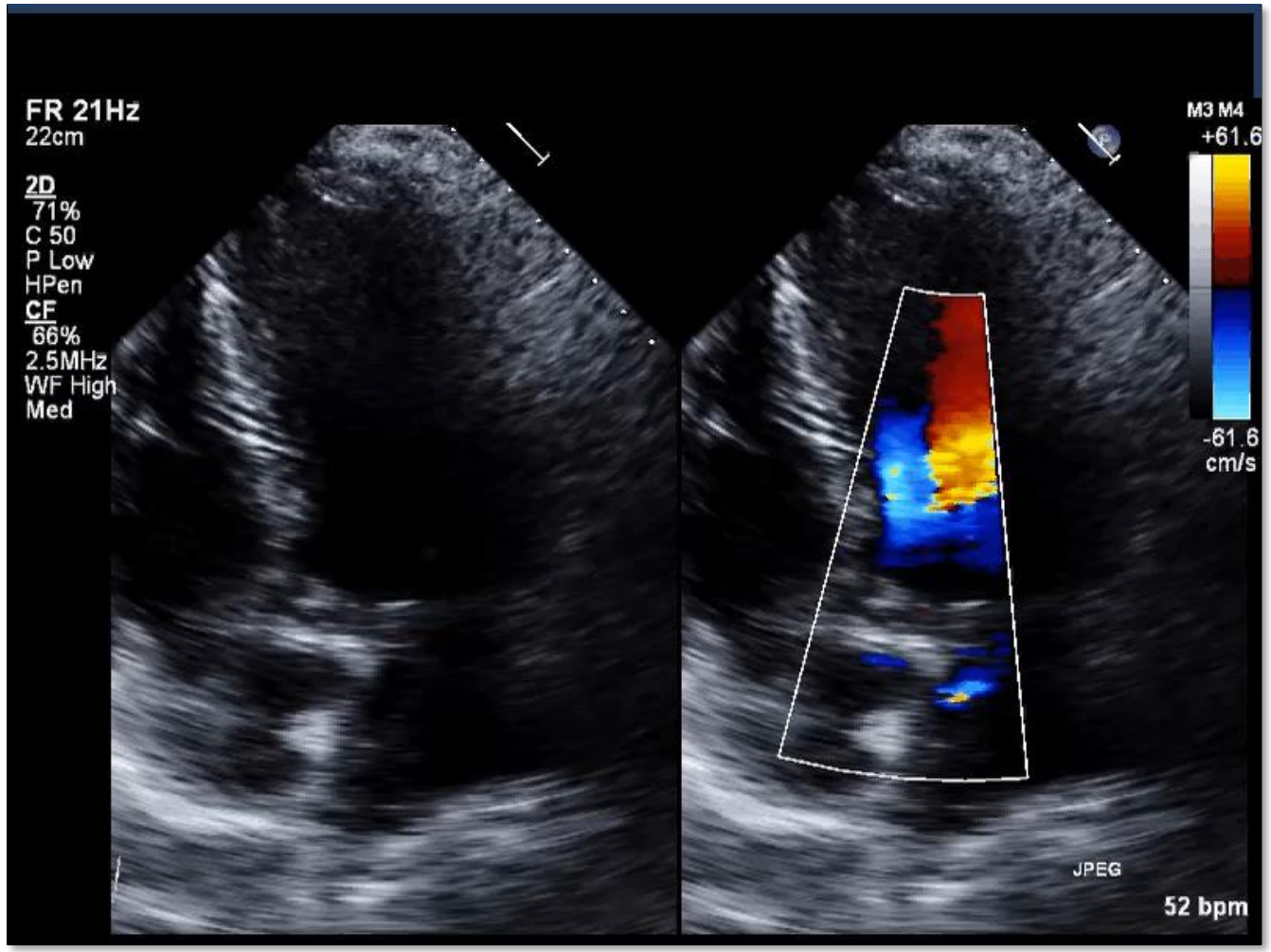
75 year old man with aortic stenosis

- Exercise test?
- Exercise echo
- Repeat echo in 6 months?
- Aortic valve replacement?

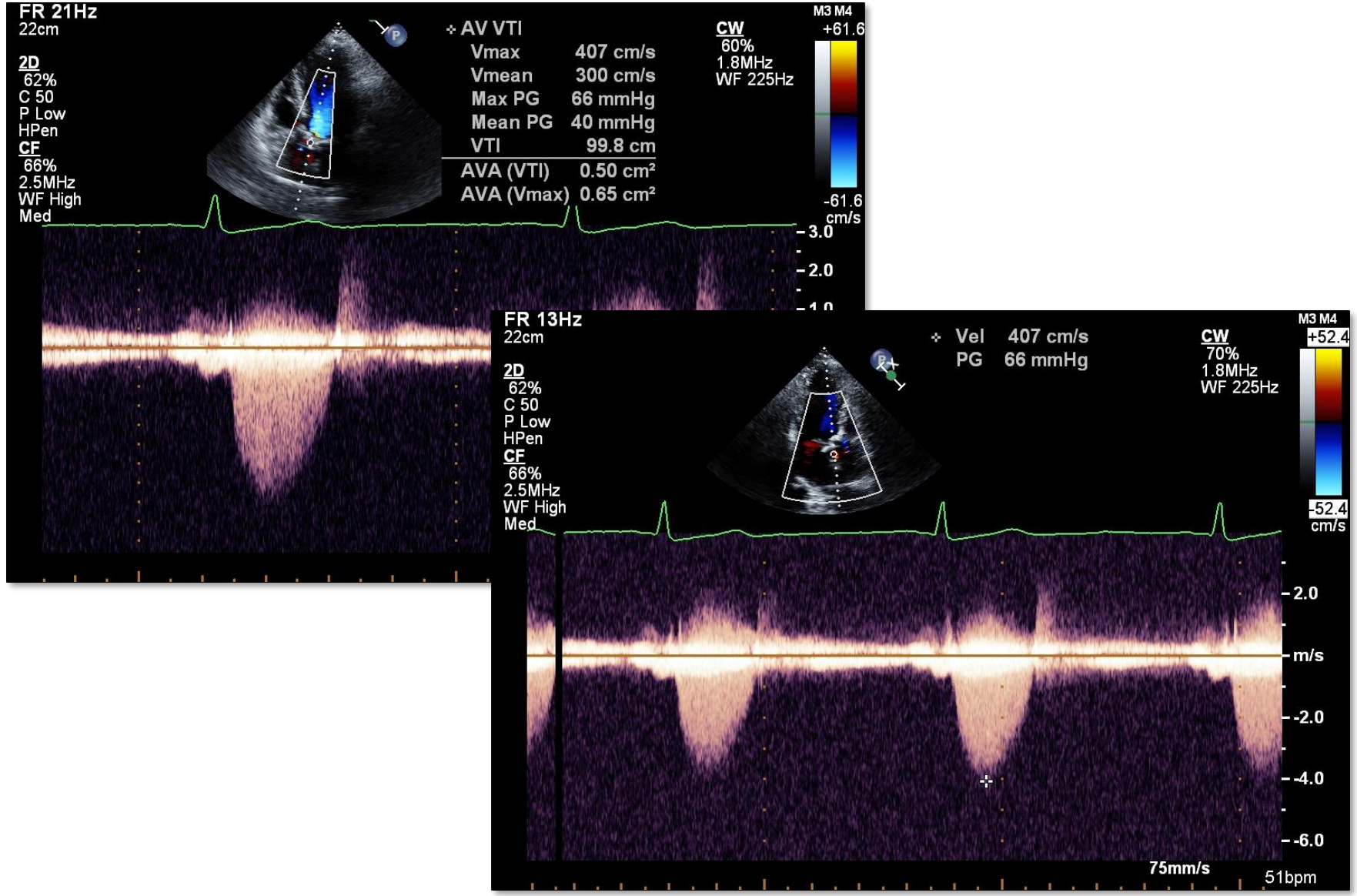
75 year old man with aortic stenosis

Treadmill exercise test:

- 9 min Bruce protocol, HR 136
- BP increases from 126/80 to 140/84

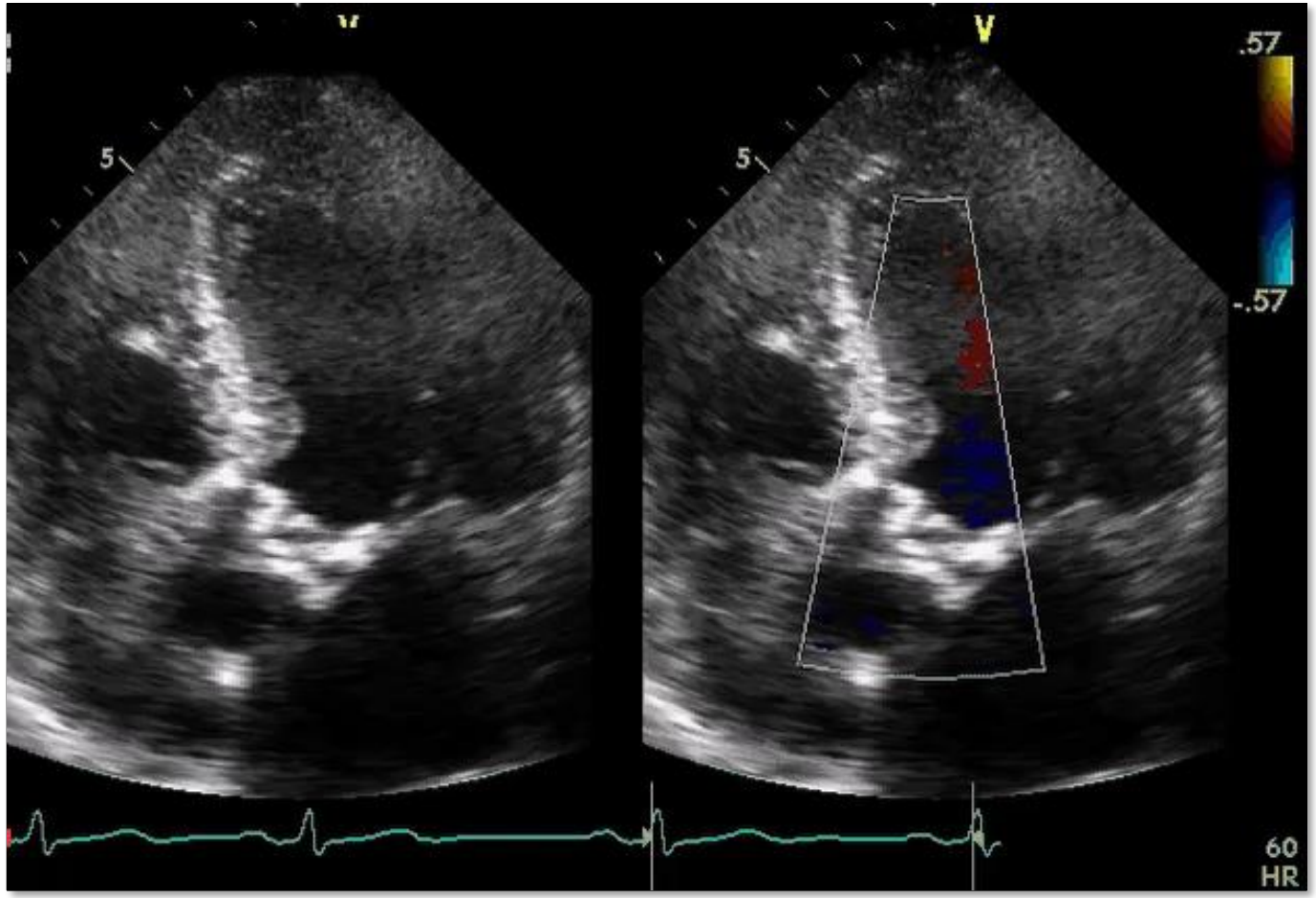

FR 21Hz
22cm
2D
71%
C 50
P Low
HPen
CF
66%
2.5MHz
WF High
Med
M3 M4
+61.6
-61.6
cm/s
JPEG
52 bpm

1 year later

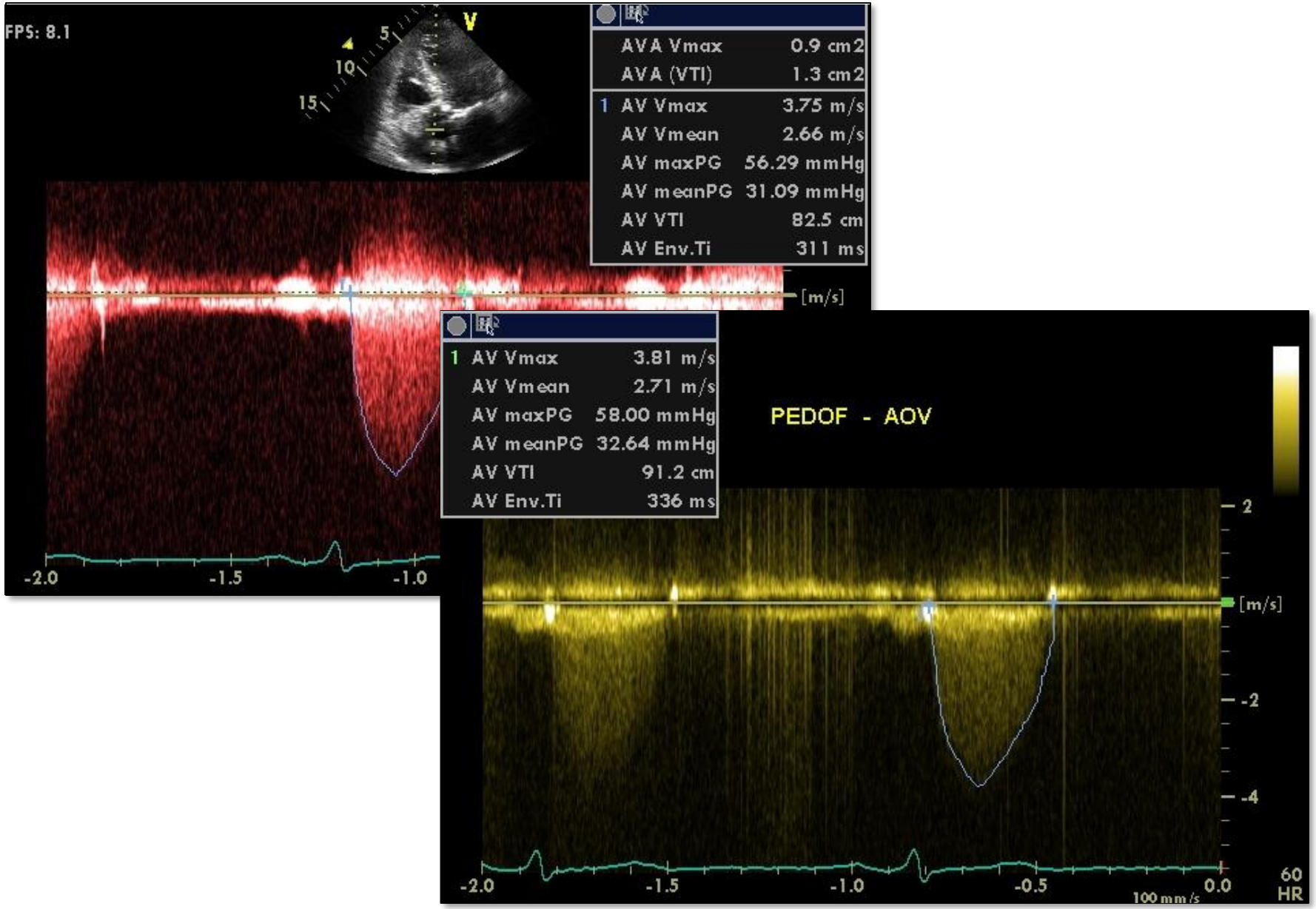

FR 21Hz
22cm
2D
62%
C 50
P Low
HPen
CF
66%
2.5MHz
WF High
Med
AV VTI
Vmax 407 cm/s
Vmean 300 cm/s
Max PG 66 mmHg
Mean PG 40 mmHg
VTI 99.8 cm
AVA (VTI) 0.50 cm²
AVA (Vmax) 0.65 cm²
CW
60%
1.8MHz
WF 225Hz
M3 M4
+61.6
-61.6
cm/s
3.0
2.0
FR 13Hz
22cm
2D
62%
C 50
P Low
HPen
CF
66%
2.5MHz
WF High
Med
Vel 407 cm/s
PG 66 mmHg
CW
70%
1.8MHz
WF 225Hz
M3 M4
+52.4
-52.4
cm/s
2.0
m/s
-2.0
-4.0
-6.0
75mm/s
51bpm

76 year old man with aortic stenosis

- Exercise test?
- Exercise echo
- Repeat echo in 6 months?
- Aortic valve replacement?

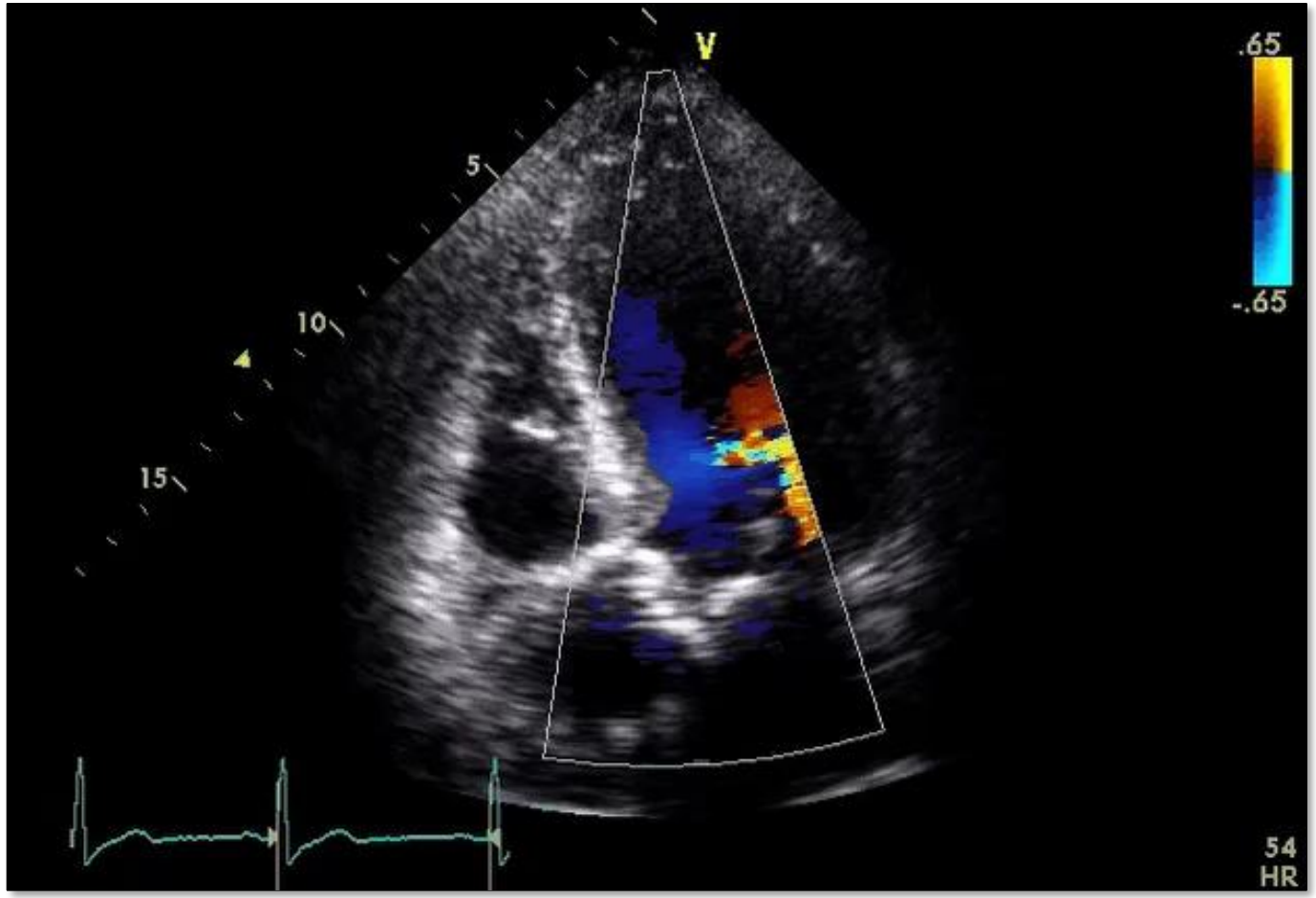


Another year later

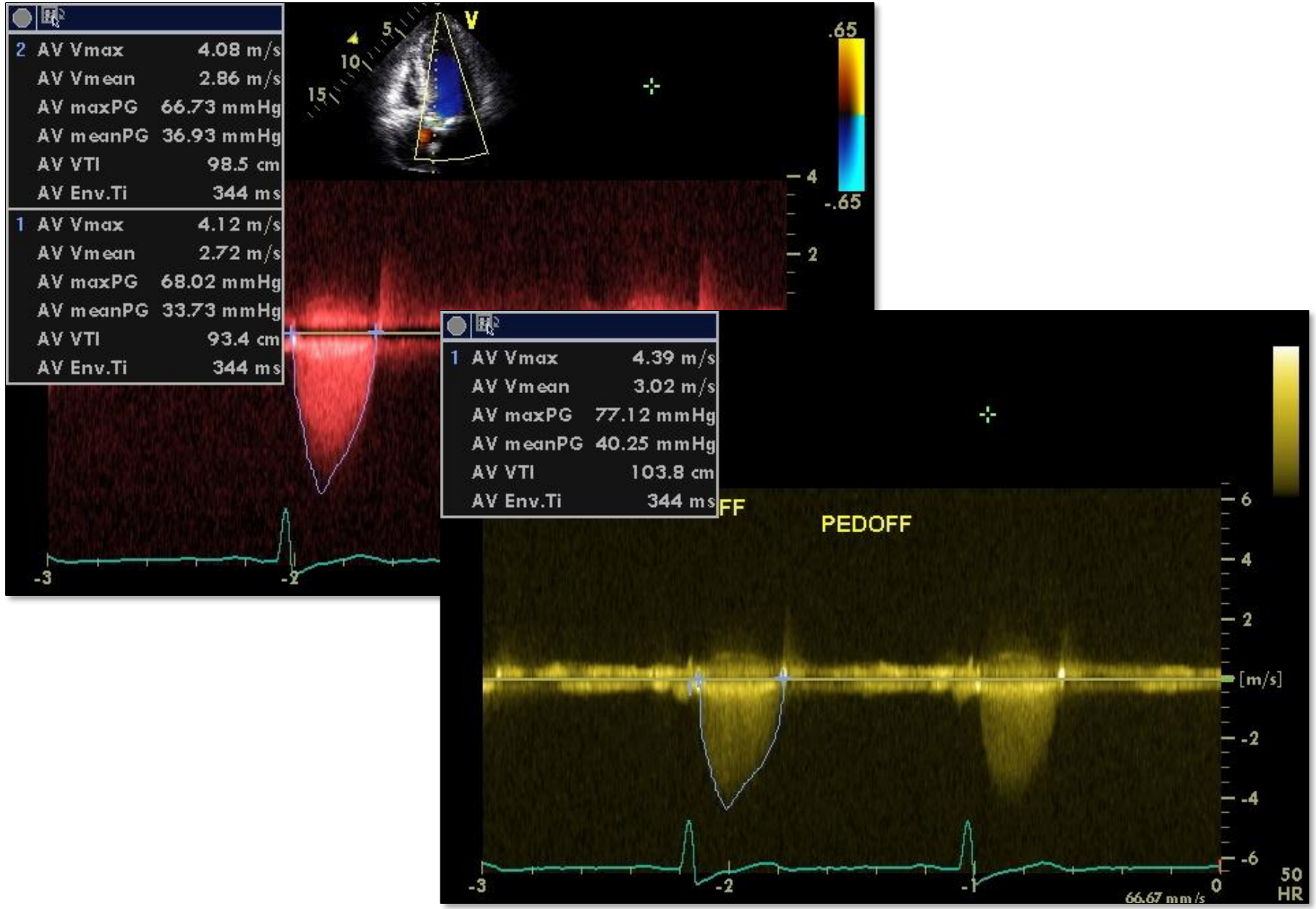

FPS: 8.1
AVA Vmax 0.9 cm2
AVA (VTI) 1.3 cm2
1 AV Vmax 3.75 m/s
AV Vmean 2.66 m/s
AV maxPG 56.29 mmHg
AV meanPG 31.09 mmHg
AV VTI 82.5 cm
AV Env.Ti 311 ms
[m/s]
-2.0
-1.5
-1.0
1 AV Vmax 3.81 m/s
AV Vmean 2.71 m/s
AV maxPG 58.00 mmHg
AV meanPG 32.64 mmHg
AV VTI 91.2 cm
AV Env.Ti 336 ms
PEDOF - AOV
2
[m/s]
-2
-4
-2.0
-1.5
-1.0
-0.5
0.0
100 mm/s
60
HR

77 year old man with aortic stenosis

- Exercise test?
- Exercise echo
- Repeat echo in 6 months?
- Aortic valve replacement?

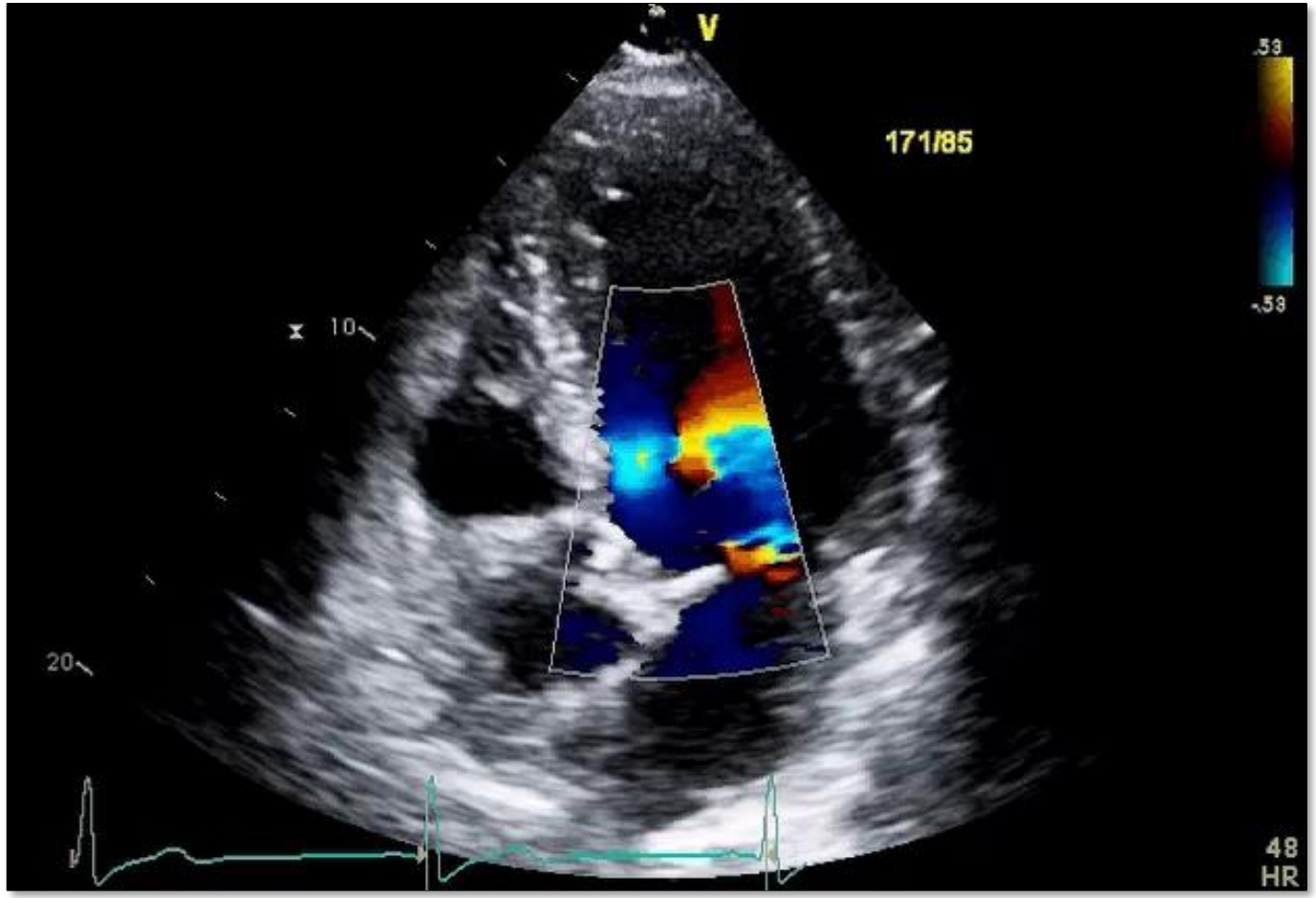


… And another year later

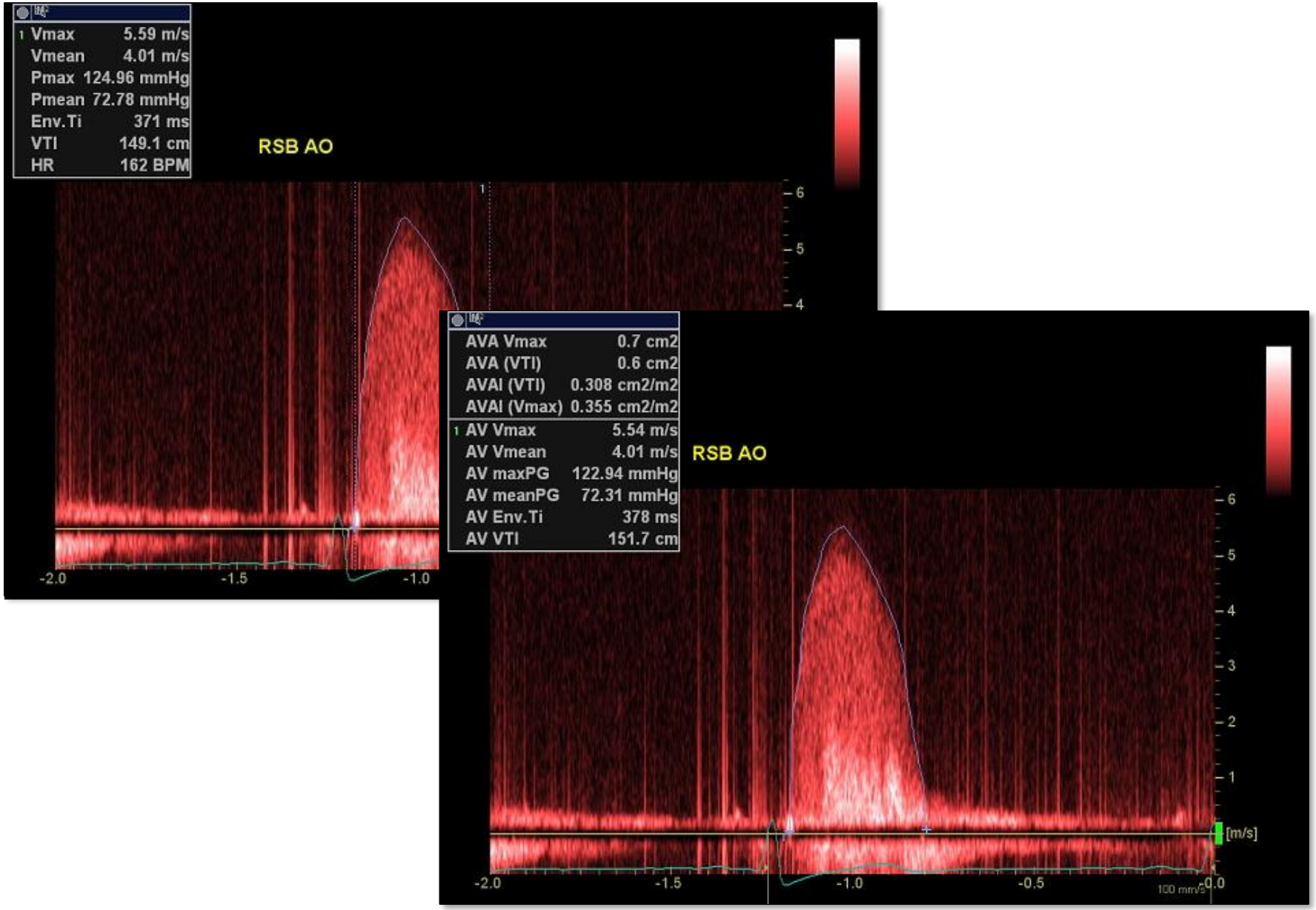

2 AV Vmax 4.08 m/s
AV Vmean 2.86 m/s
AV maxPG 66.73 mmHg
AV meanPG 36.93 mmHg
AV VTI 98.5 cm
AV Env.Ti 344 ms
1 AV Vmax 4.12 m/s
AV Vmean 2.72 m/s
AV maxPG 68.02 mmHg
AV meanPG 33.73 mmHg
AV VTI 93.4 cm
AV Env.Ti 344 ms
1 AV Vmax 4.39 m/s
AV Vmean 3.02 m/s
AV maxPG 77.12 mmHg
AV meanPG 40.25 mmHg
AV VTI 103.8 cm
AV Env.Ti 344 ms
PEDOFF
[m/s]
66.67 mm/s
50
HR

78 year old man with aortic stenosis

- Exercise test?
- Exercise echo
- Repeat echo in 6 months?
- Aortic valve replacement?

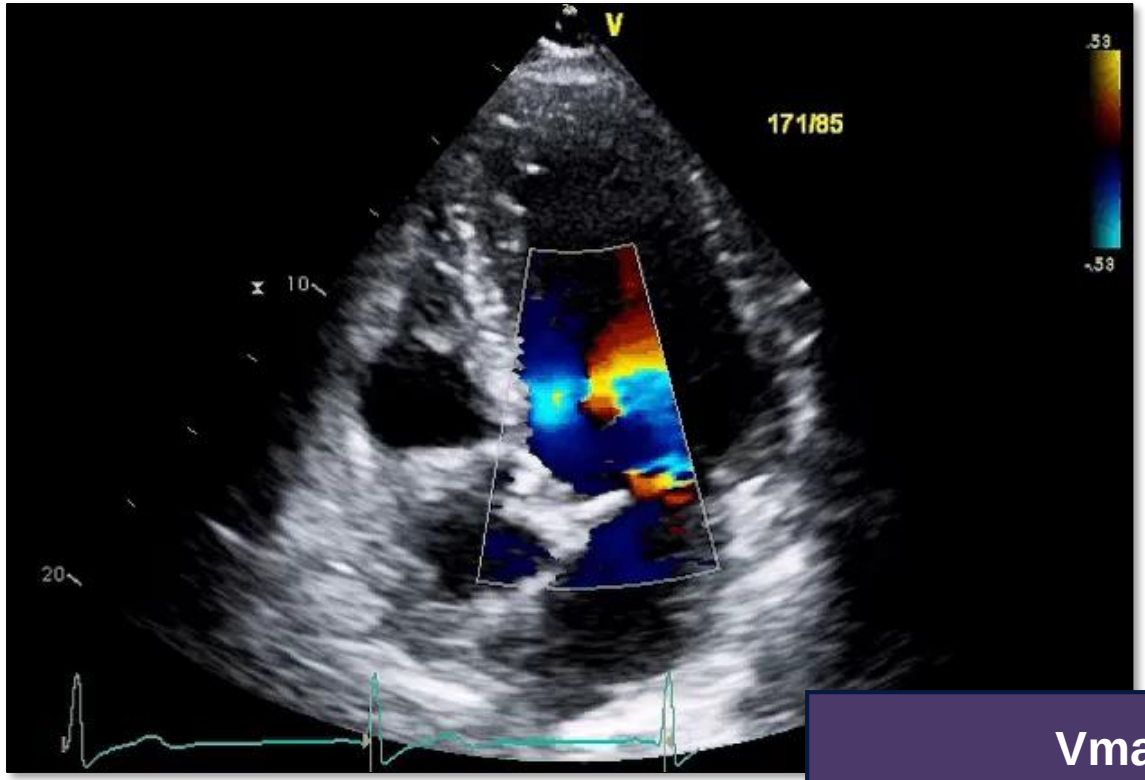


… And still another year later


Vmax 5.59 m/s
Vmean 4.01 m/s
Pmax 124.96 mmHg
Pmean 72.78 mmHg
Env.Ti 371 ms
VTI 149.1 cm
HR 162 BPM
RSB AO
6
5
4
-2.0
-1.5
-1.0
AVA Vmax 0.7 cm2
AVA (VTI) 0.6 cm2
AVAI (VTI) 0.308 cm2/m2
AVAI (Vmax) 0.355 cm2/m2
AV Vmax 5.54 m/s
AV Vmean 4.01 m/s
AV maxPG 122.94 mmHg
AV meanPG 72.31 mmHg
AV Env.Ti 378 ms
AV VTI 151.7 cm
RSB AO
6
5
4
3
2
1
[m/s]
-2.0
-1.5
-1.0
-0.5
0.0
100 mm/s

79 year old man with aortic stenosis

- Exercise test?
- Exercise echo
- Repeat echo in 6 months?
- Aortic valve replacement?



	Vmax	Mean Δ	AVA
2012	3.7	31	1.1
2013	4.1	40	0.9
2014	3.8	32	1.0
2015	4.4	40	0.8
2016	5.5	72	0.6

Asymptomatic Aortic Stenosis

Indications for valve replacement:

AMERICAN COLLEGE of CARDIOLOGY

American Heart Association.

- Very severe AS:
  Vmax ≥5 m/s

class IIa

Asymptomatic Aortic Stenosis

Indications for valve replacement:

AMERICAN COLLEGE of CARDIOLOGY

American Heart Association.

- Very severe AS:
  Vmax ≥5 m/s — **class IIa**
- Rapid progression and low surgical risk — **class IIb**

Asymptomatic Aortic Stenosis

Indications for valve replacement:

AMERICAN COLLEGE of CARDIOLOGY

American Heart Association.

- Very severe AS:
  Vmax ≥5 m/s — **class IIa**
- Rapid progression and low surgical risk — **class IIb**

EUROPEAN SOCIETY OF CARDIOLOGY®

EACTS

- Very severe AS:
  Vmax >5.5 m/s — **class IIa**

Asymptomatic Aortic Stenosis

Indications for valve replacement:

AMERICAN COLLEGE of CARDIOLOGY / American Heart Association

- Very severe AS: Vmax ≥5 m/s — **class IIa**
- Rapid progression and low surgical risk — **class IIb**

EUROPEAN SOCIETY OF CARDIOLOGY / EACTS

- Very severe AS: Vmax >5.5 m/s — **class IIa**
- Severe valve calcification and rate of progression ≥0.3 m/s / year — **class IIa**

Asymptomatic Aortic Stenosis

Indications for valve replacement:

AMERICAN COLLEGE of CARDIOLOGY

American Heart Association.

- Very severe AS: Vmax ≥5 m/s — **class IIa**
- Rapid progression and low surgical risk — **class IIb**

EUROPEAN SOCIETY OF CARDIOLOGY®

EACTS

- Very severe AS: Vmax >5.5 m/s — **class IIa**
- Severe valve calcification and rate of progression ≥0.3 m/s / year — **class IIa**
- Markedly elevated BNP
- Increase in gradient with exercise >20 mmHg
- Excessive LVH

— **class IIb**

ACC Latin America Conference 2016