Systolic Ejection Murmurs: Not all Created Equal

(No Disclosures)

Nicole Minniefield, MD

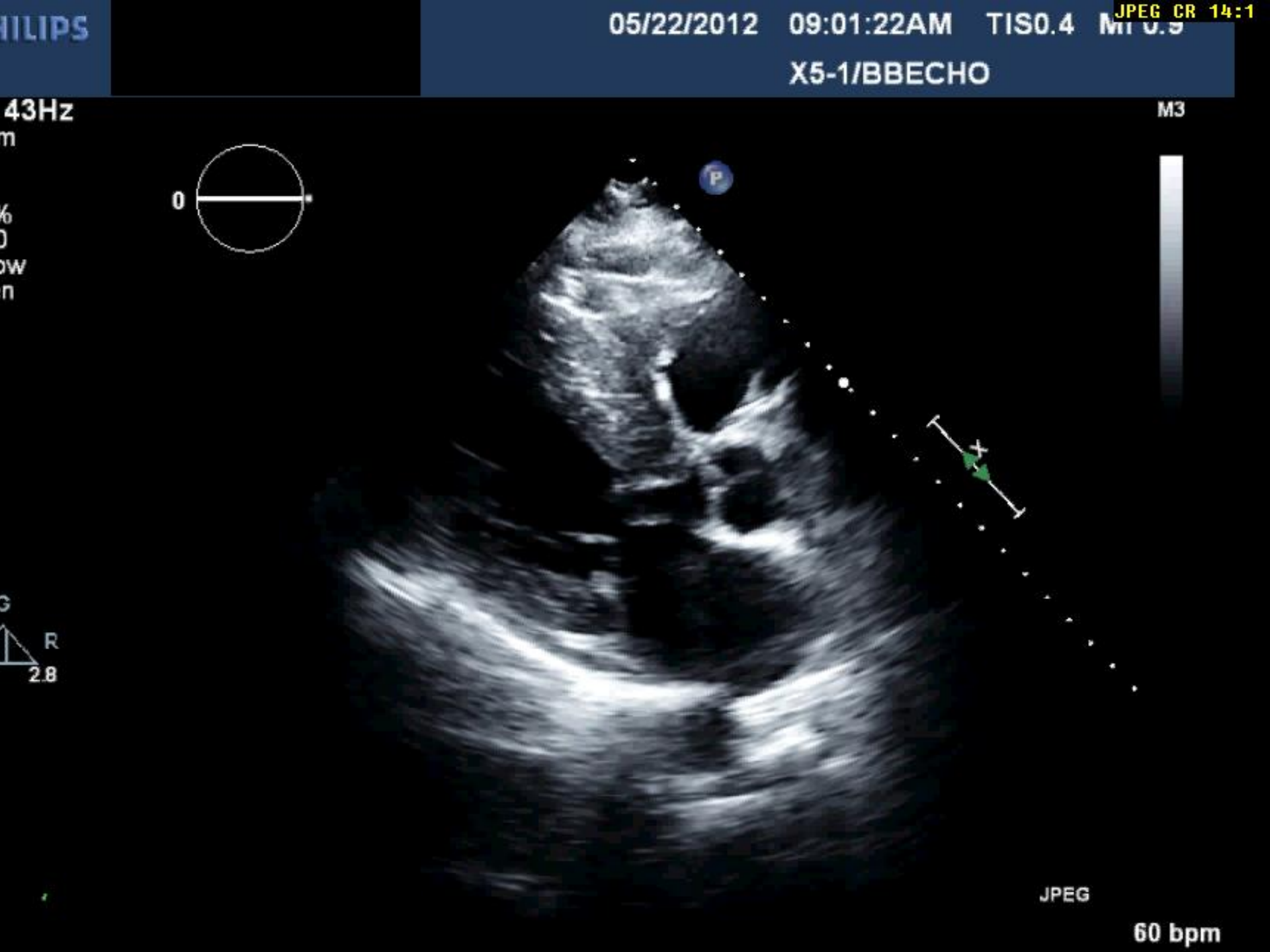
Staff Physician, Division of Cardiology, VA North Texas Healthcare System

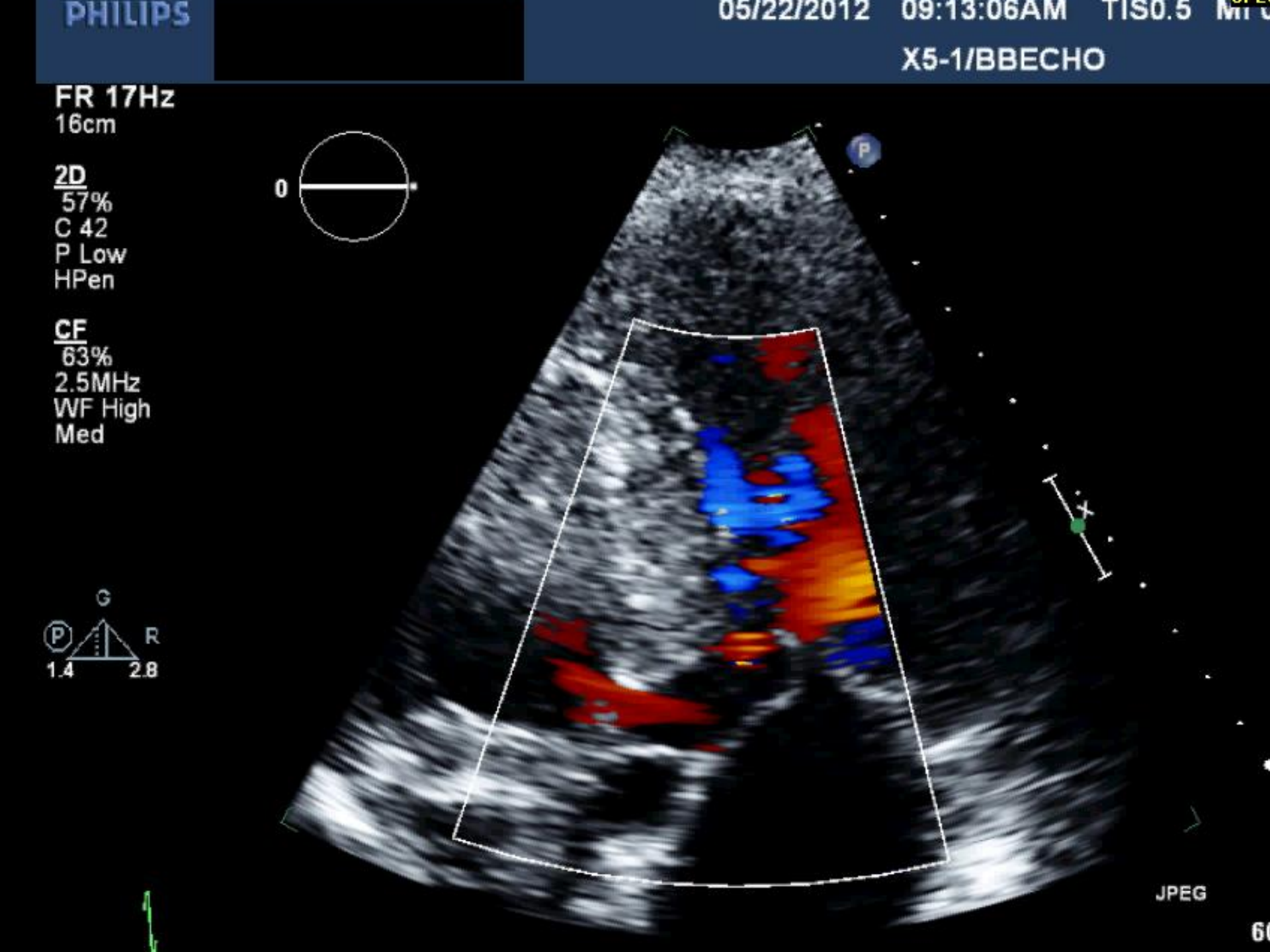
Assistant Prof. in Medicine, UT Southwestern Med. Ctr.

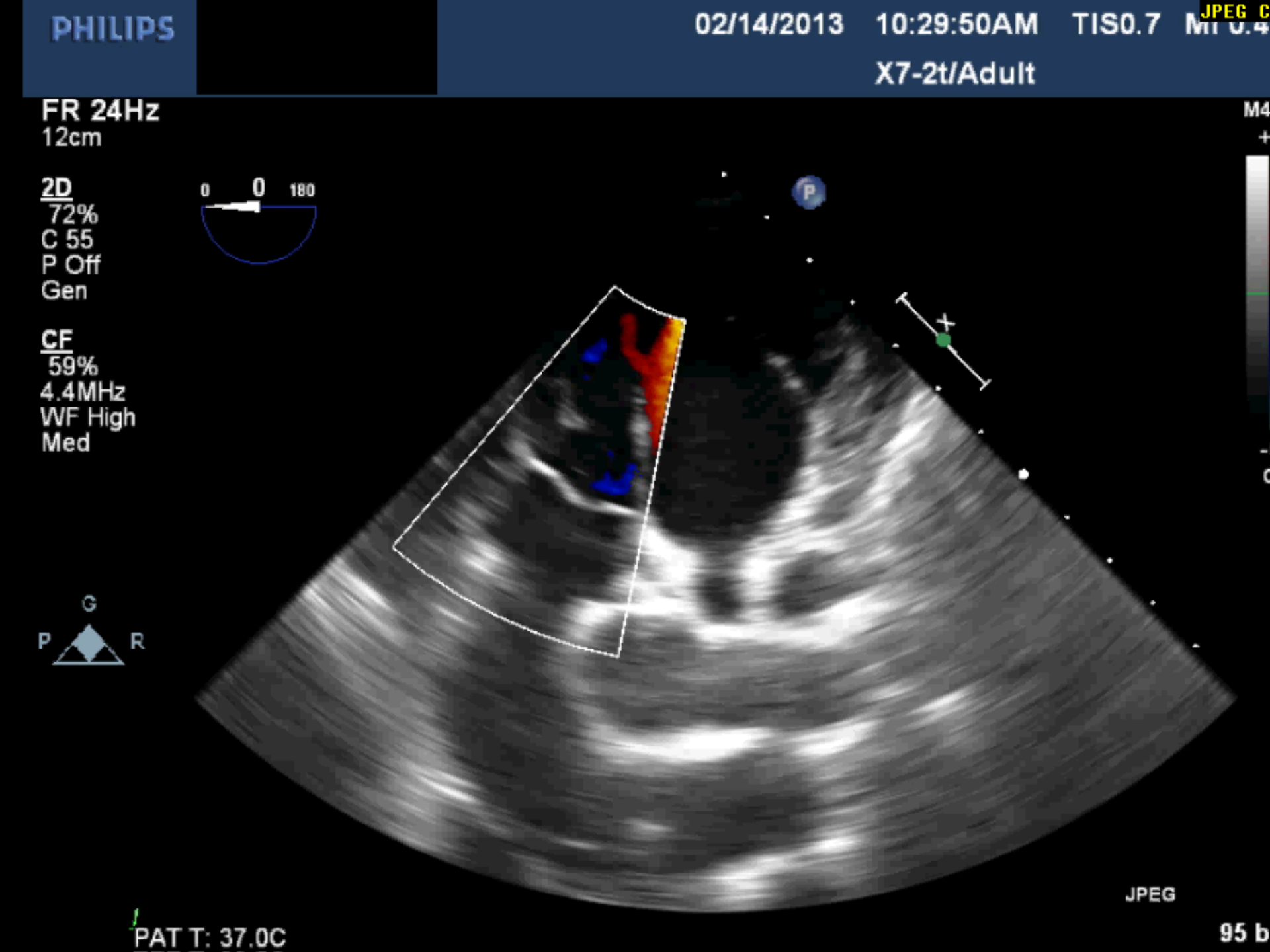
Dallas CARDIOVASCULAR INNOVATIONS 2013

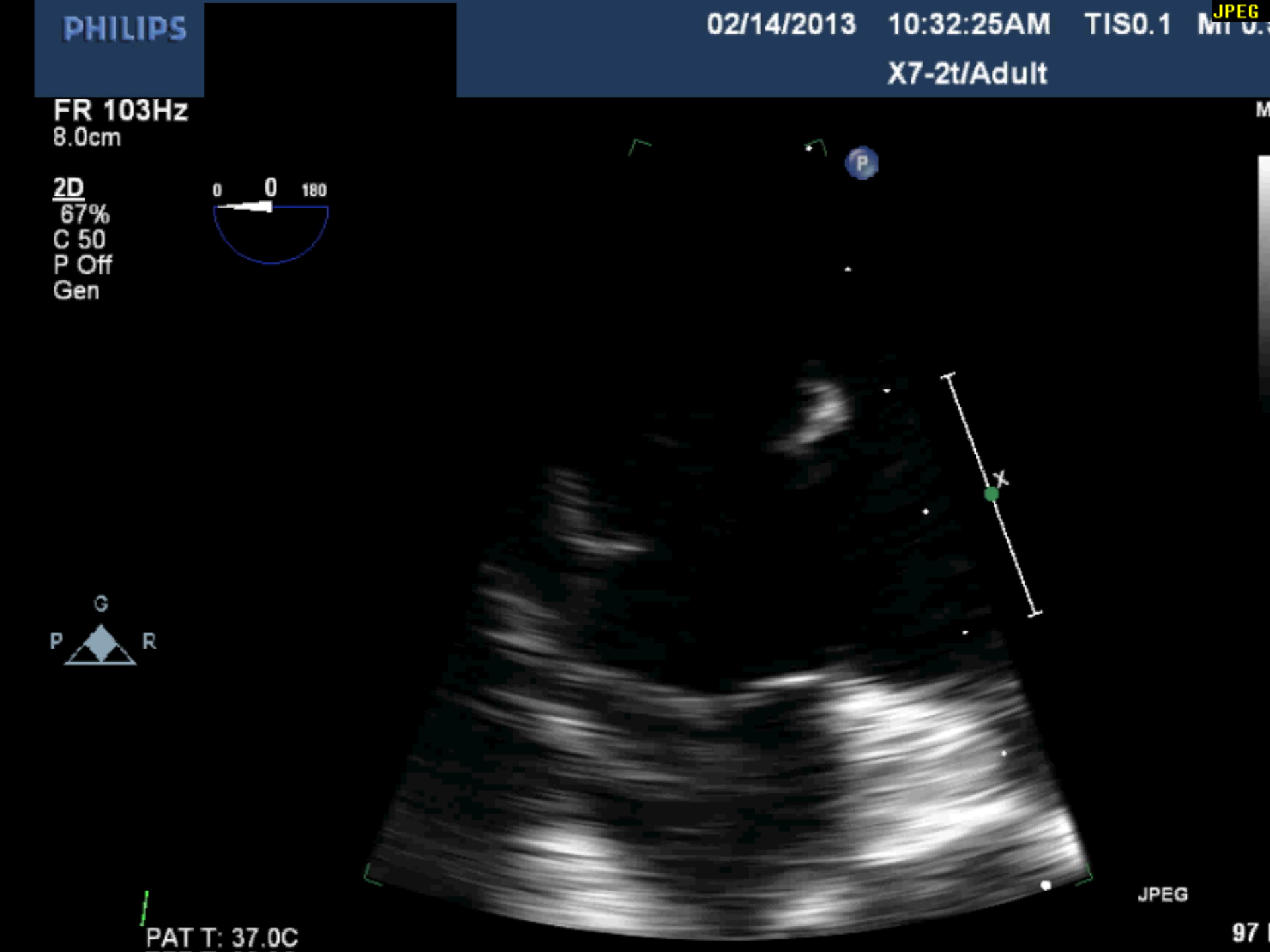
Case Presentation

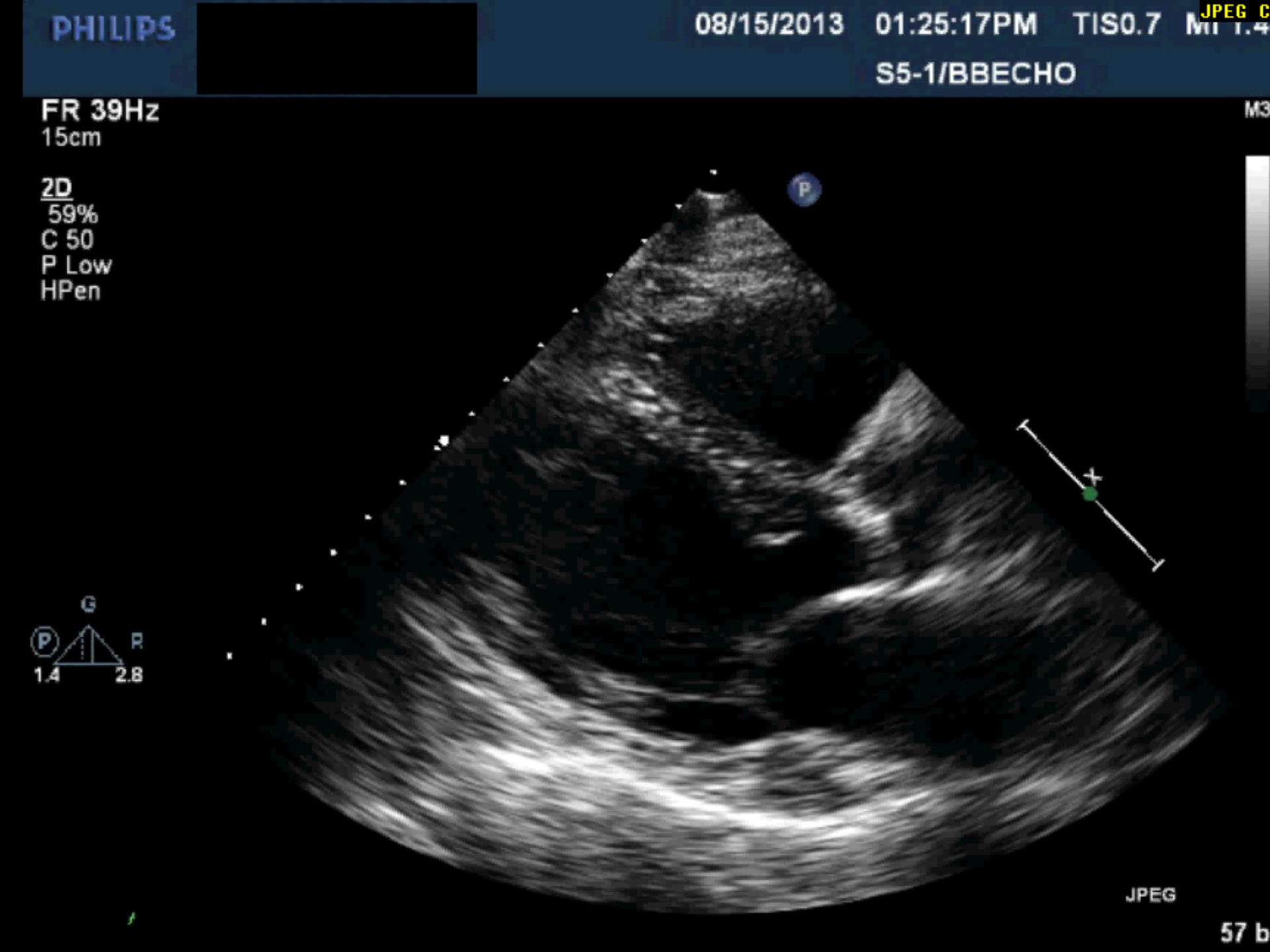
- 57 year old male with diabetes mellitus found to have 3/6 systolic ejection murmur during a preoperative evaluation. An echo was requested…

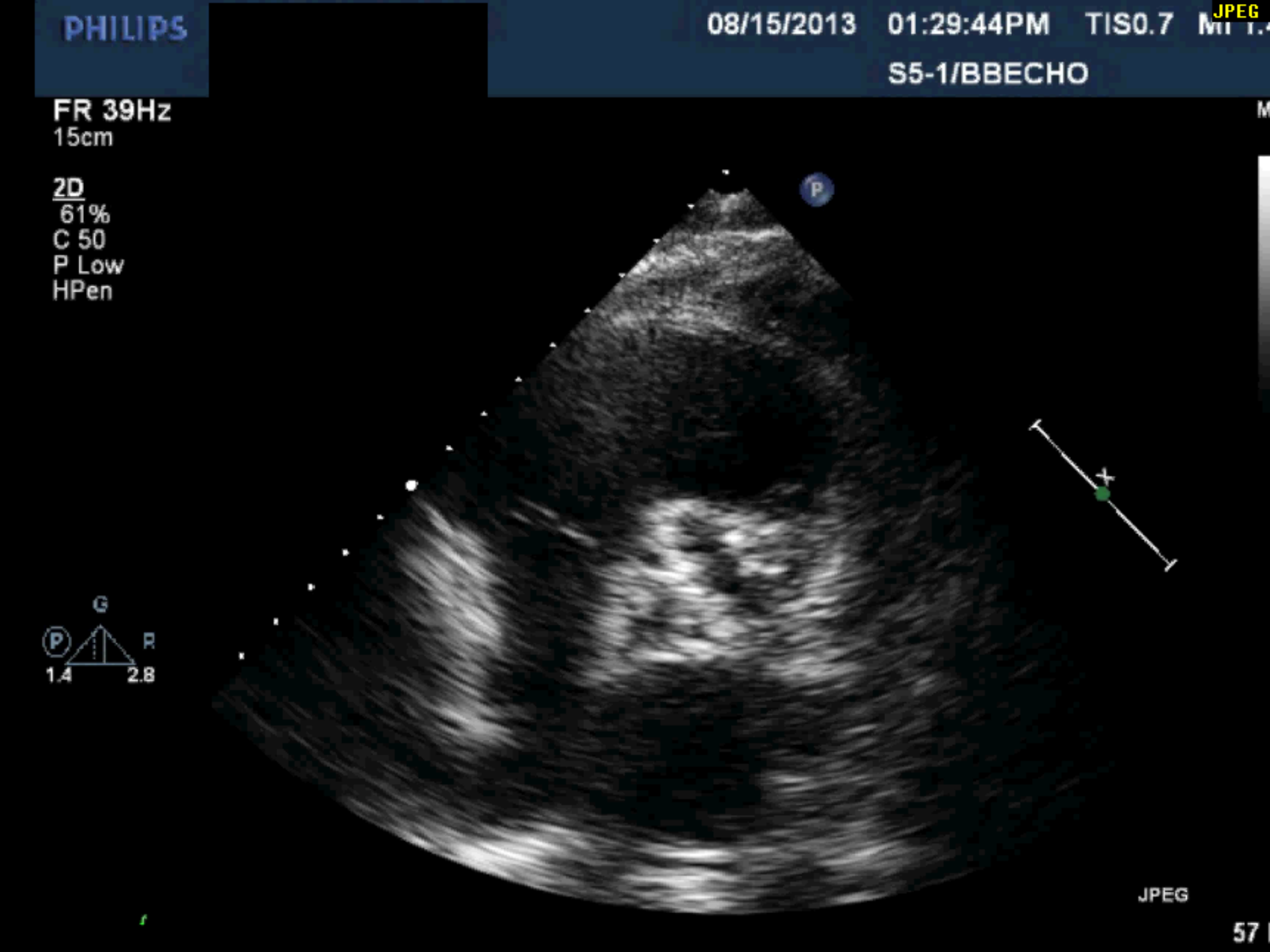

ILIPS
05/22/2012 09:01:22AM TIS0.4
X5-1/BBECHO
JPEG CR 14:1
43Hz
M3
0
P
R
2.8
JPEG
60 bpm

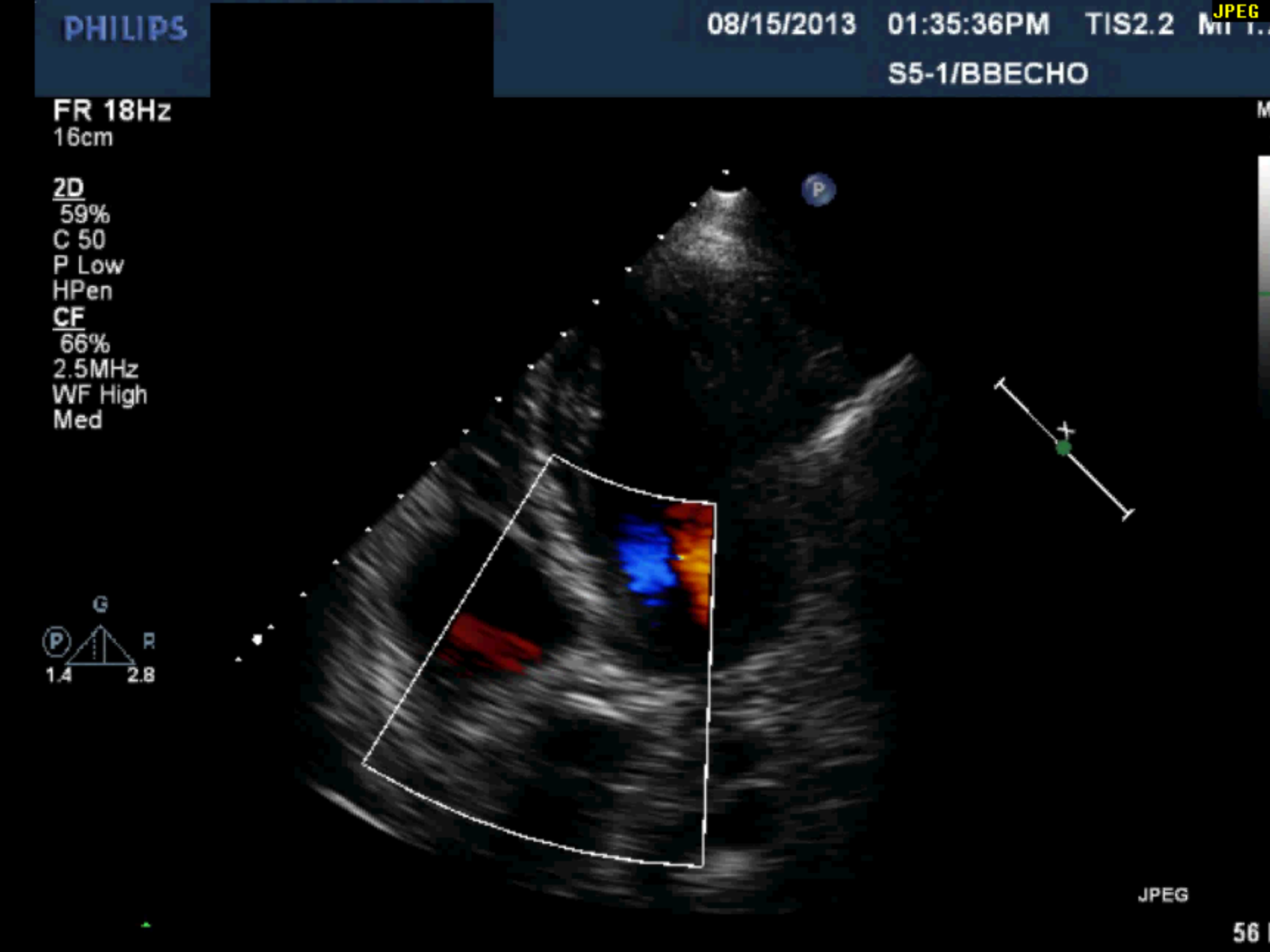

PHILIPS
05/22/2012 09:13:06AM TIS0.5
X5-1/BBECHO
FR 17Hz
16cm
2D
57%
C 42
P Low
HPen
CF
63%
2.5MHz
WF High
Med
G
P
R
1.4
2.8
JPEG


PHILIPS
02/14/2013 10:29:50AM TIS0.7
X7-2t/Adult
FR 24Hz
12cm
2D
72%
C 55
P Off
Gen
CF
59%
4.4MHz
WF High
Med
0 0 180
G
P R
JPEG
PAT T: 37.0C


PHILIPS
02/14/2013 10:32:25AM TIS0.1
X7-2t/Adult
JPEG
FR 103Hz
8.0cm
2D
67%
C 50
P Off
Gen
0 0 180
G
P R
JPEG
PAT T: 37.0C
97


PHILIPS
08/15/2013 01:25:17PM TIS0.7
S5-1/BBECHO
FR 39Hz
15cm
2D
59%
C 50
P Low
HPen
1.4
2.8
JPEG

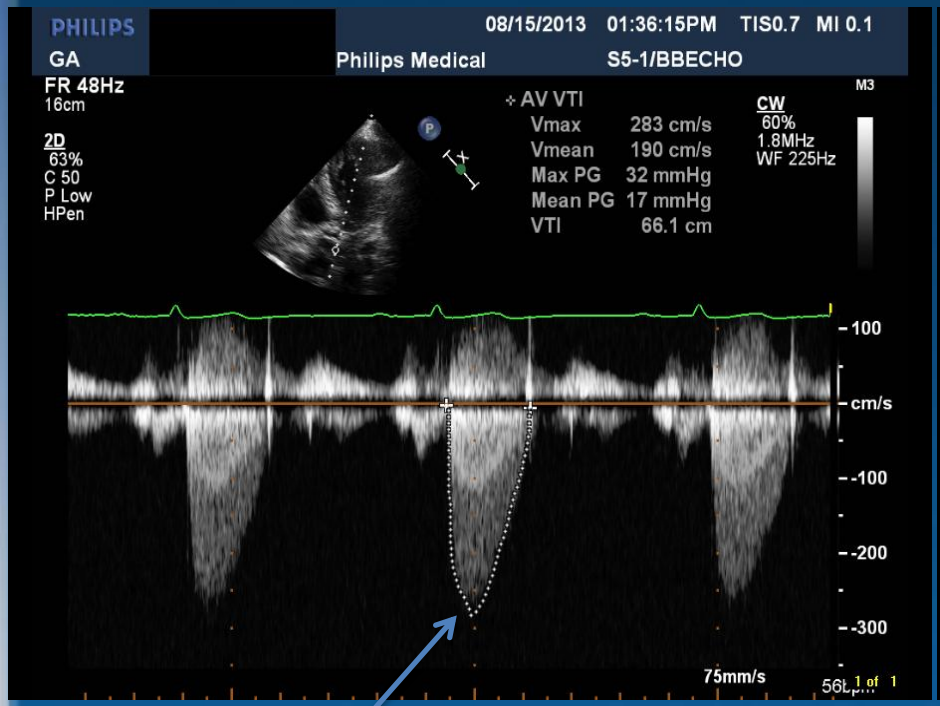

PHILIPS
08/15/2013 01:29:44PM TIS0.7
S5-1/BBECHO
JPEG
FR 39Hz
15cm
2D
61%
C 50
P Low
HPen
G
P
R
1.4
2.8
JPEG
57


PHILIPS
08/15/2013 01:35:36PM TIS2.2
S5-1/BBECHO
JPEG
FR 18Hz
16cm
2D
59%
C 50
P Low
HPen
CF
66%
2.5MHz
WF High
Med
G
P
R
1.4
2.8
JPEG
56

Dallas CARDIOVASCULAR INNOVATIONS 2013

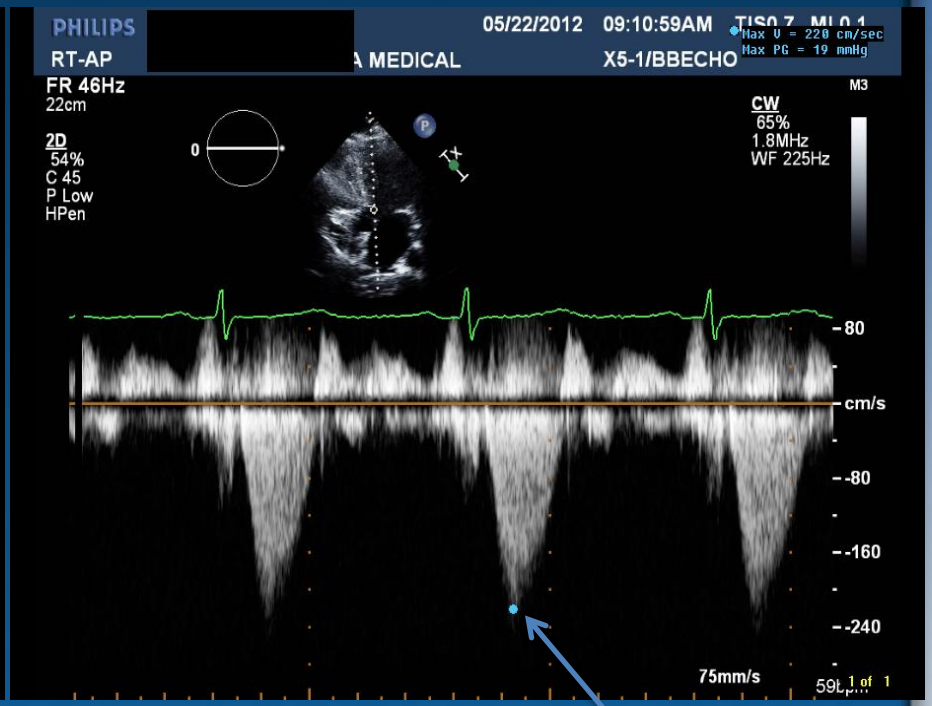
Doppler differences: AS vs HCM

Aortic Stenosis



Peak velocity 2.8 m/sec

Hypertrophic Cardiomyopathy

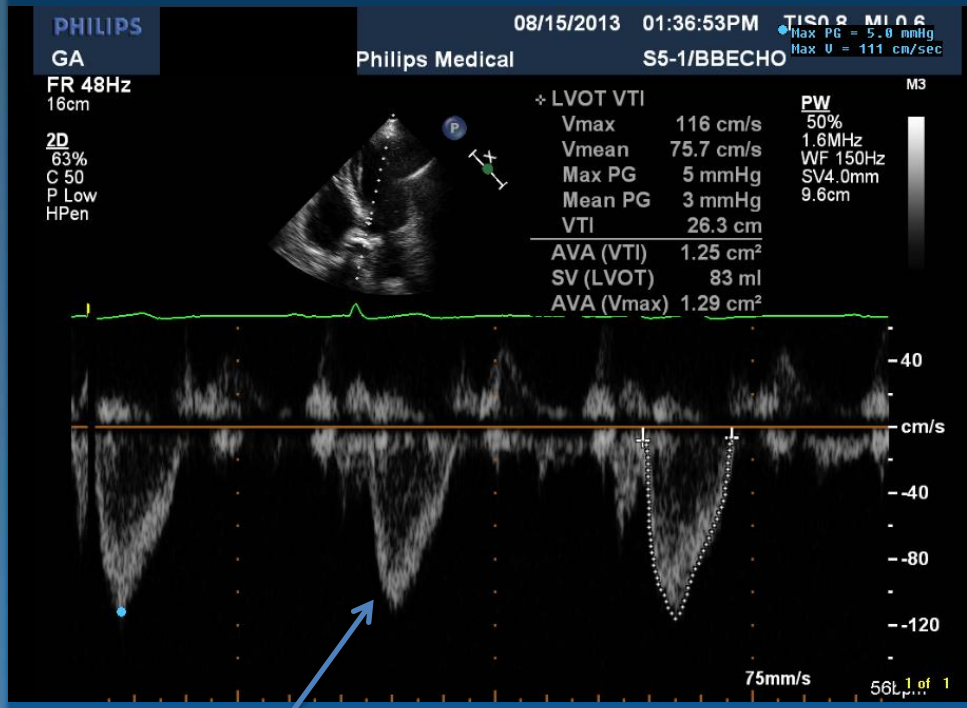


Peak velocity 2.4 m/sec

Dallas CARDIOVASCULAR INNOVATIONS 2013

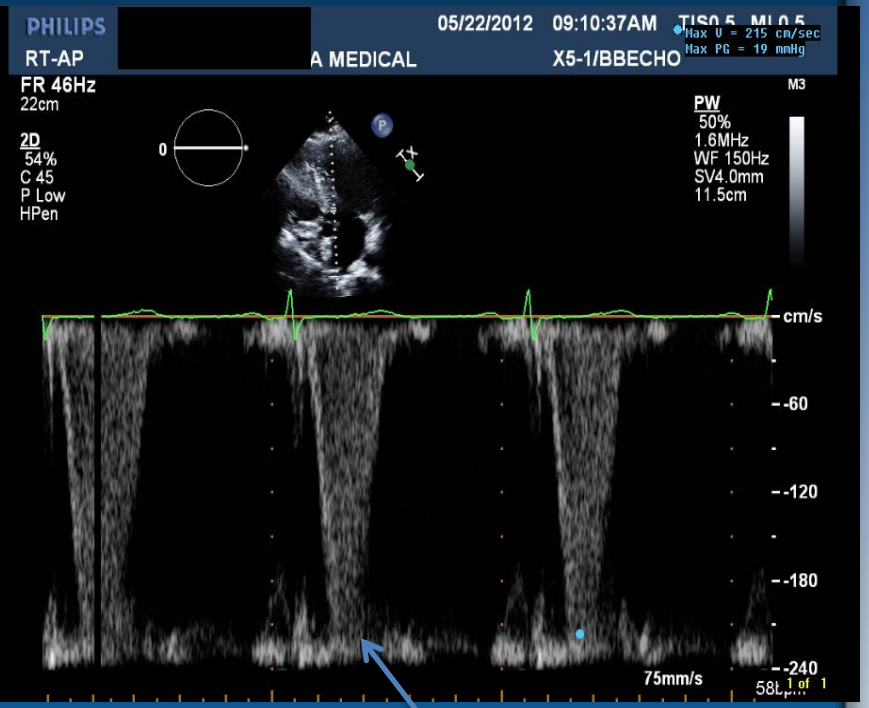
Doppler differences: AS vs HCM

Aortic Stenosis



Peak Gradient 5 mmHg

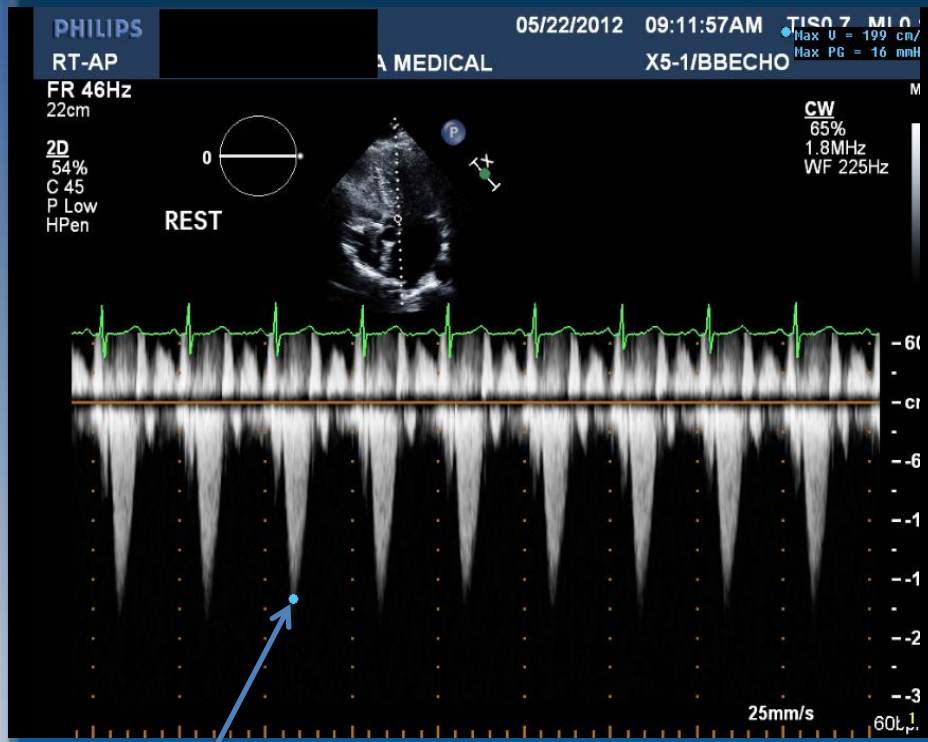
Hypertrophic Cardiomyopathy

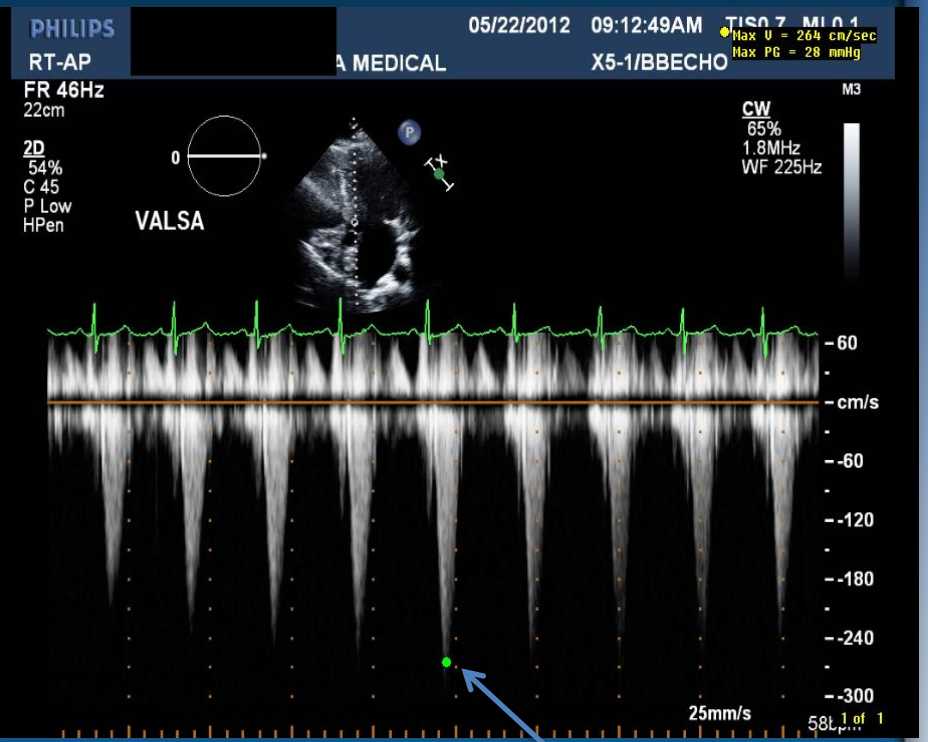


Peak Gradient 20 mmHg

Dallas CARDIOVASCULAR INNOVATIONS 2013

HCM: Dynamic Obstruction





Resting gradient: 16 mmHg

Gradient w/ Valsalva: 30 mmHg

Dallas CARDIOVASCULAR INNOVATIONS 2013

HCM Defined

- Definition
  - A disease state characterized by unexplained LV hypertrophy associated with non-dilated ventricular chambers in the absence of another cardiac or systemic disease that itself would be capable of producing the magnitude of hypertrophy evident in a given patient…
- Differential diagnosis
  - Athlete's heart
  - Hypertensive heart disease
  - Infiltrative disease

Dallas CARDIOVASCULAR INNOVATIONS 2013

HCM Variants

- Asymmetric septal hypertrophy
  - Obstruction (resting or dynamic)
    - SAM
    - Mitral regurgitation
  - Non-obstruction
- Concentric hypertrophy
  - Mid cavitary obstruction
- Apical hypertrophy

- 1/3 resting obstruction
  - Peak gradient >= 30 mmHg
- 1/3 labile inducible gradient
  - <30 mmHg at rest
  - >=30 with physiologic provocation
- 1/3 non-obstructive form

Dallas CARDIOVASCULAR INNOVATIONS 2013

HCM: Diagnosis

- Clinical diagnosis made conventionally with 2-D Echocardiography
  - Presence of hypertrophy >= 15 mm in adults
  - Non-dilated ventricular chamber
- Increasing utility of cardiac MRI
  - Class I if echo is inconclusive
  - Class IIa define apical hypertrophy
  - Class IIb stratification of SCD risk, rule out other systemic conditions

Dallas CARDIOVASCULAR INNOVATIONS 2013

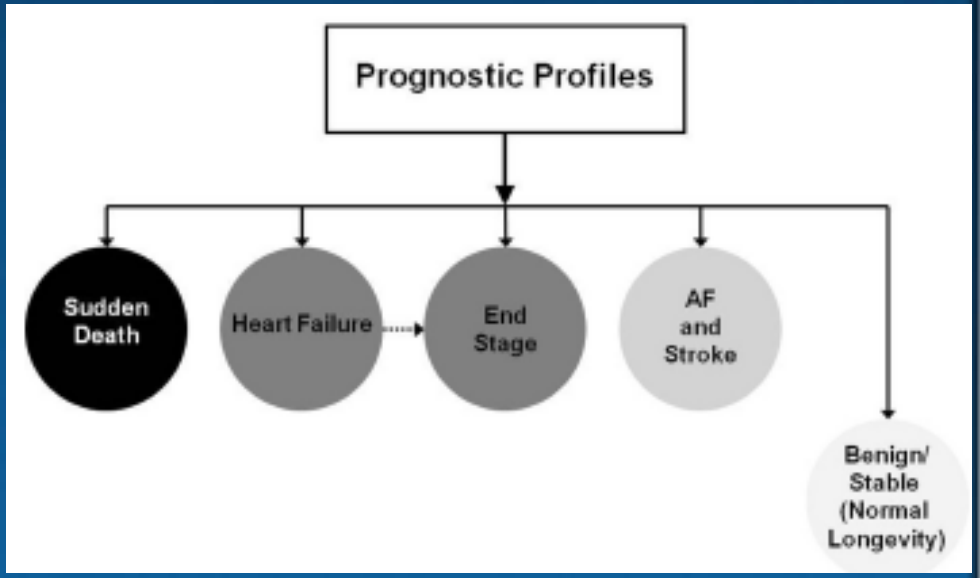
HCM: Diagnosis

- Genetic testing
  - Definitive diagnosis determine genetic status
  - Identification of affected relatives in families known to have HCM

Dallas CARDIOVASCULAR INNOVATIONS 2013

HCM: Clinical Course

- Asymptomatic
- Sudden Cardiac Death
  - Young asymptomatic (age <35)
  - Competitive athletes
- Heart Failure
- Atrial Fibrillation

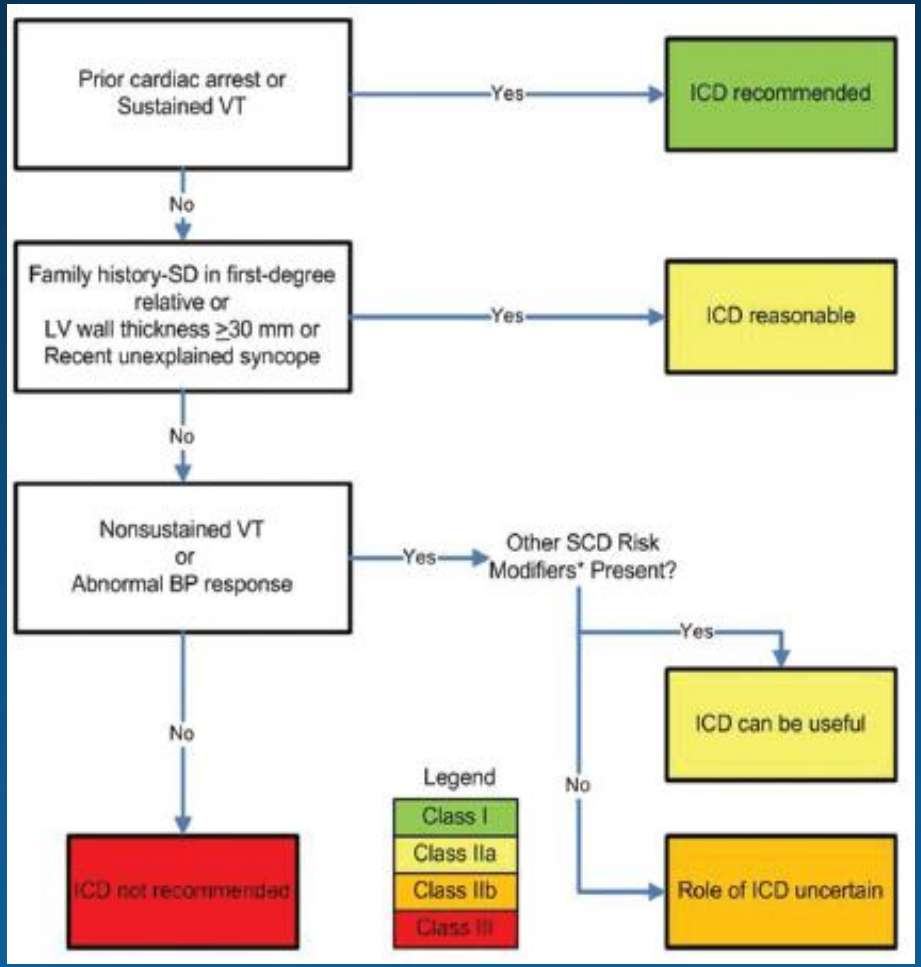


HCM Guidelines Circulation. 2011;124:e783-e831

Dallas CARDIOVASCULAR INNOVATIONS 2013

HCM Management

- Medical Therapy
- Medically Refractory population
  - Surgical Myectomy (preferred)
  - ETOH Septal Ablation (prohibitive surgical risk)
  - DDD pacing (age >65, prohibitive surgical and percutaneous ablation risk)
- ICD



HCM Guidelines Circulation. 2011;124:e783-e831