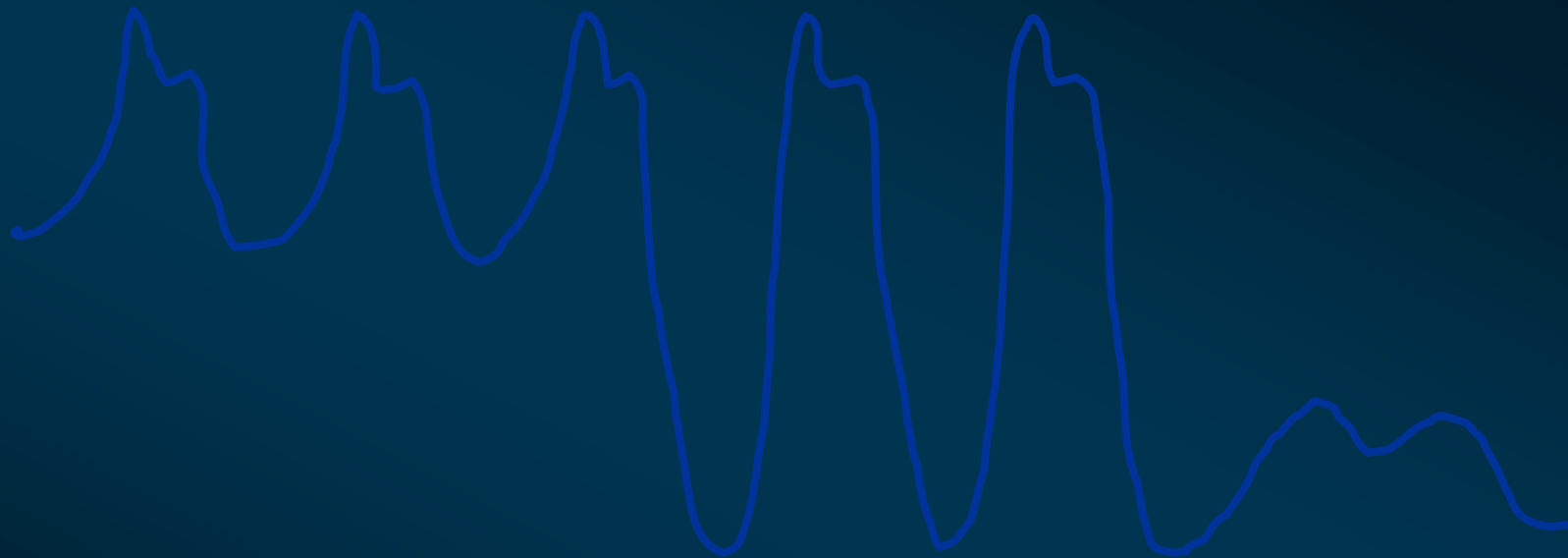


Cardiovascular Hemodynamics in the Cardiac Catheterization Laboratory

William R. Alexis, MD, MPH, FACC

Arterial Pressure Tracings From Guiding Catheter



This is all there is...Right???

Normal

Ventricularization

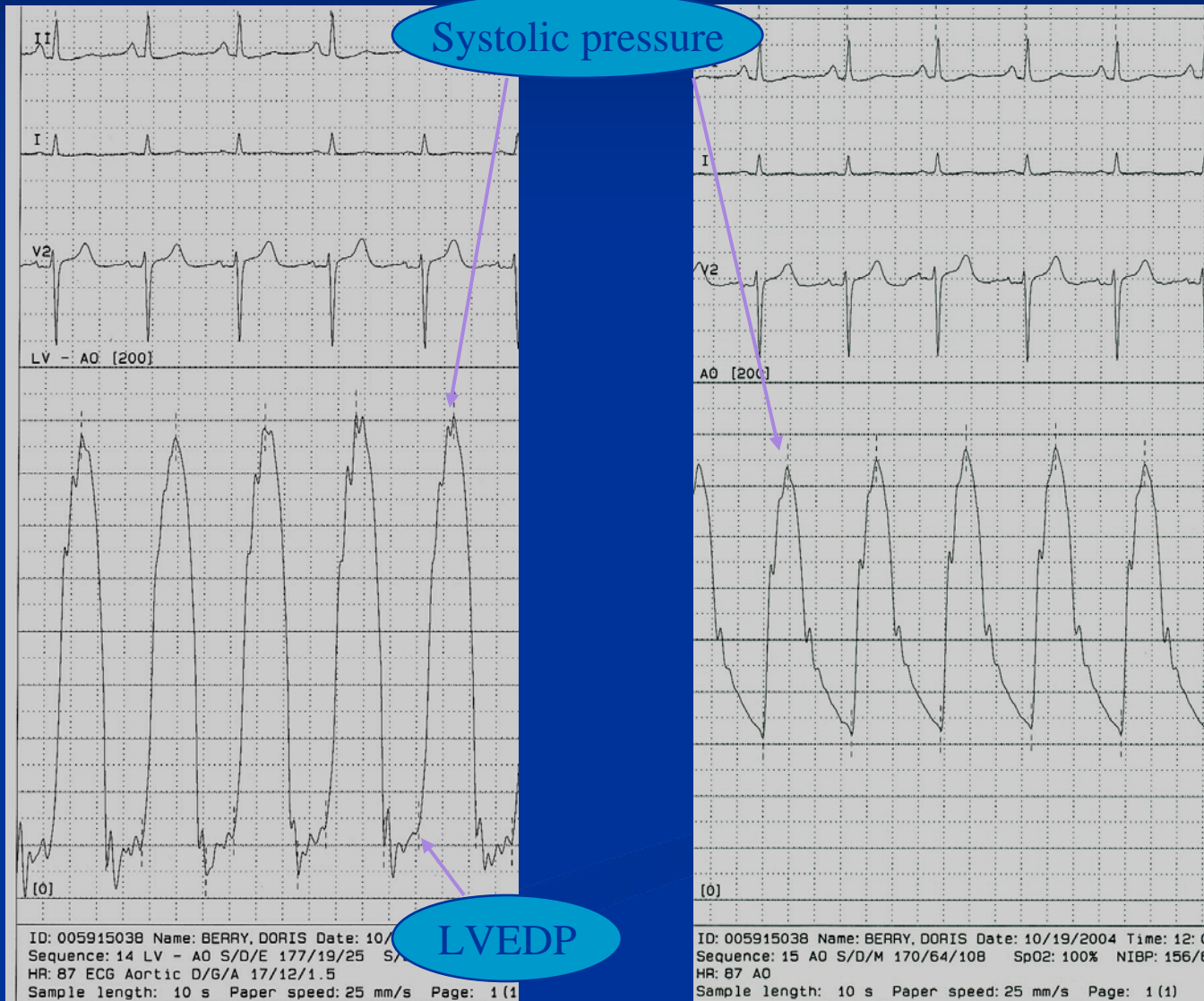
Damped

Left Heart Catheterization

- Allows for assessment of left ventricular filling pressures
- Allows for simple assessment of aortic valvular disease
- Allows for simple assessment of subaortic valvular disease (i.e. Hypertrophic obstructive Cardiomyopathy)



Left Ventricular and Aortic Pressure

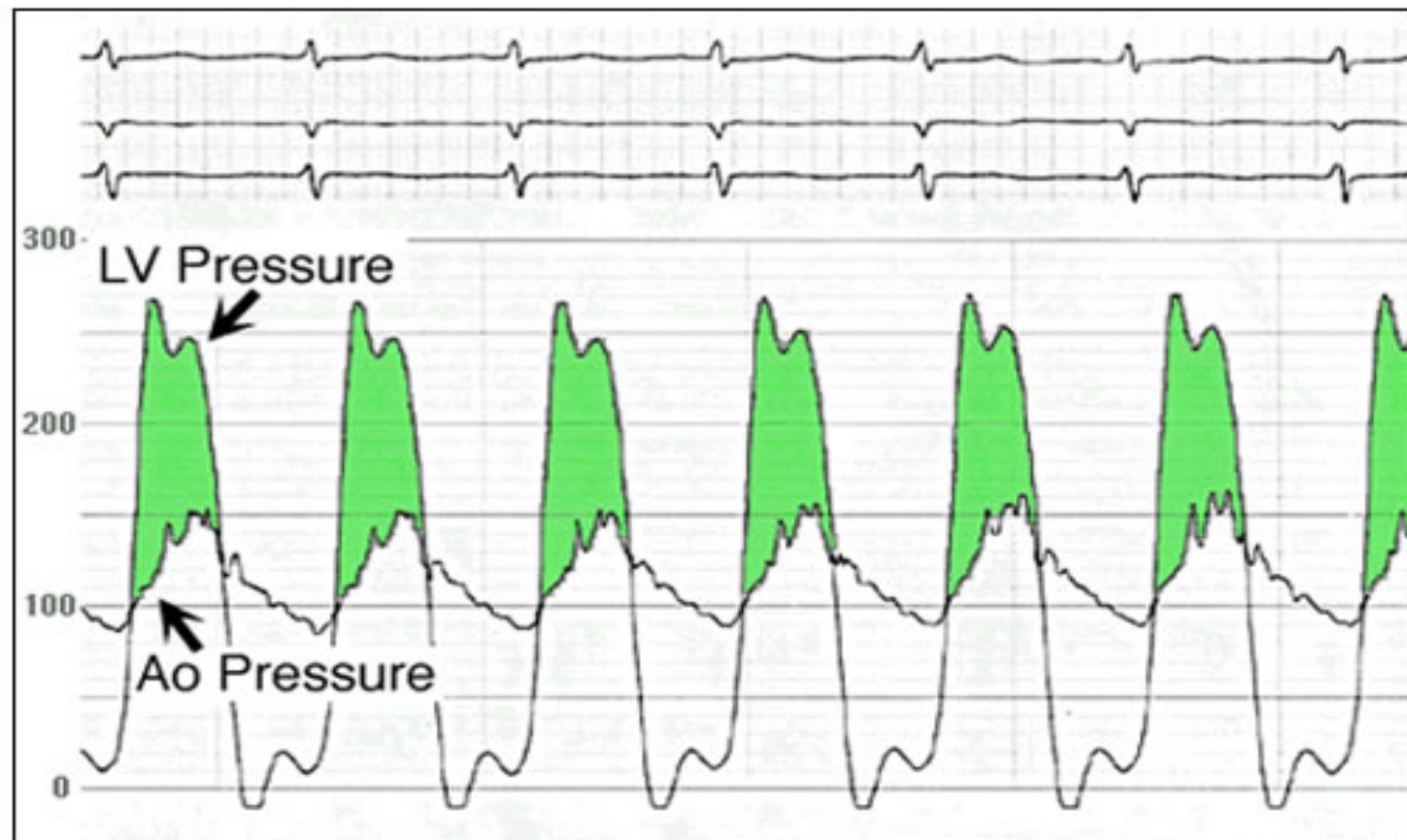


Aortic Valve Disorders

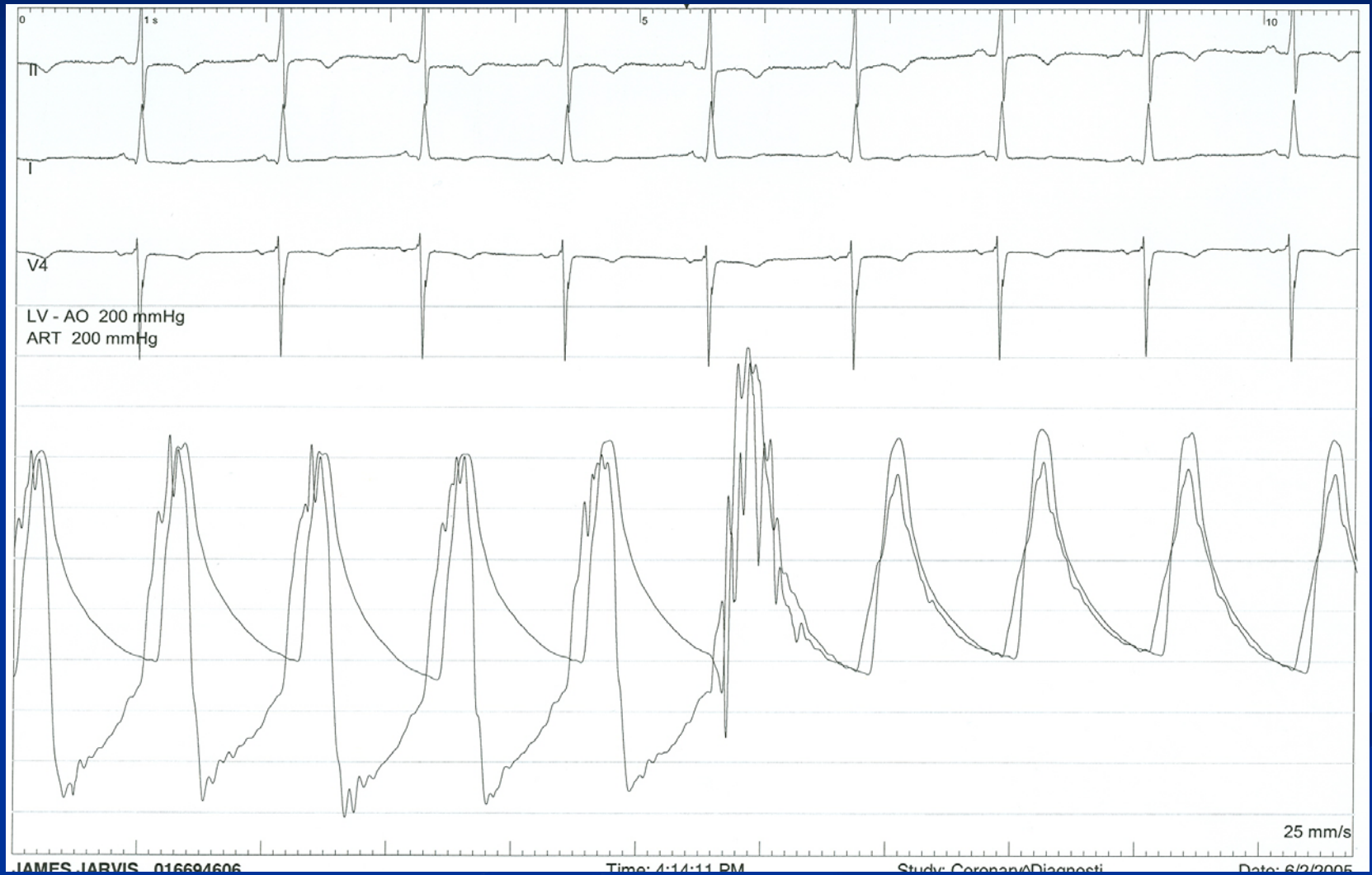
Aortic Stenosis



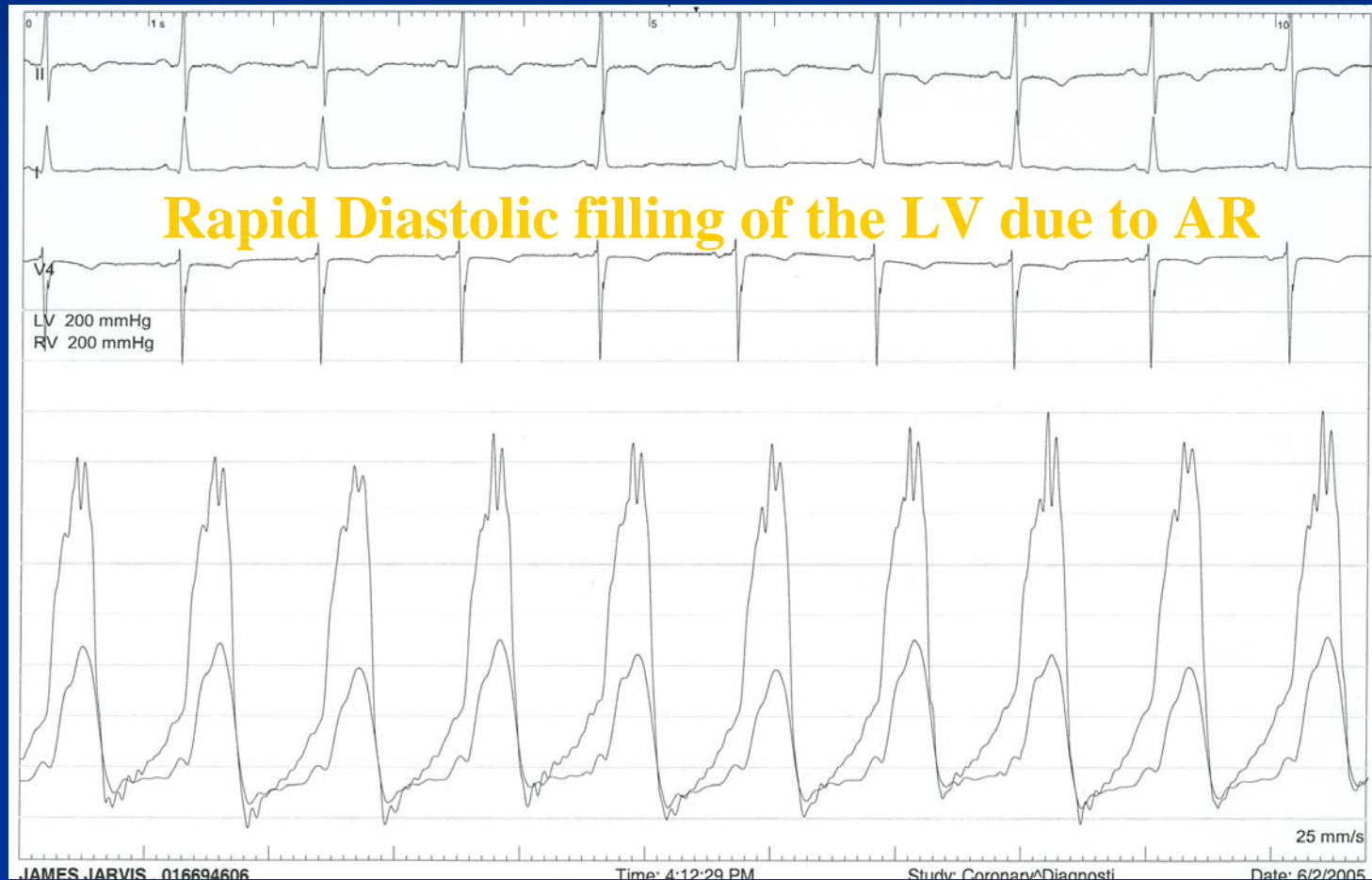
Severe Aortic Stenosis Pressure Tracing



Aortic Valve Regurgitation



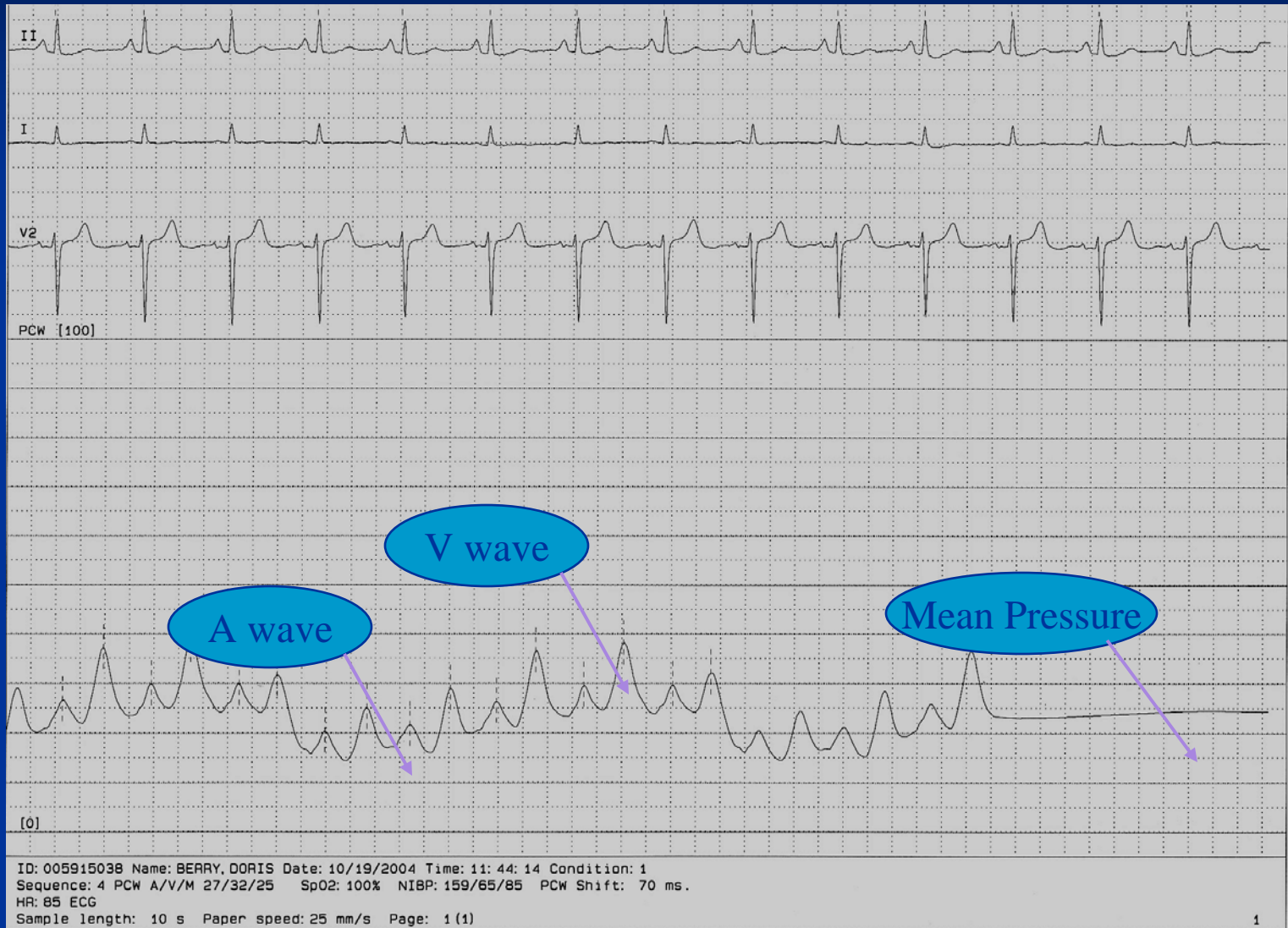
Aortic Valve Regurgitation



Indications for Right Heart Catheterization

- Evaluation of CHF or dyspnea
- Evaluation of valvular heart disease
- Evaluation of cardiomyopathy (restrictive, constrictive, dilated)
- Evaluation of pericardial disease (i.e. tamponade)
- Evaluation of pulmonary hypertension
- Evaluation of severe hypotension post MI

Pulmonary Capillary Wedge Pressure

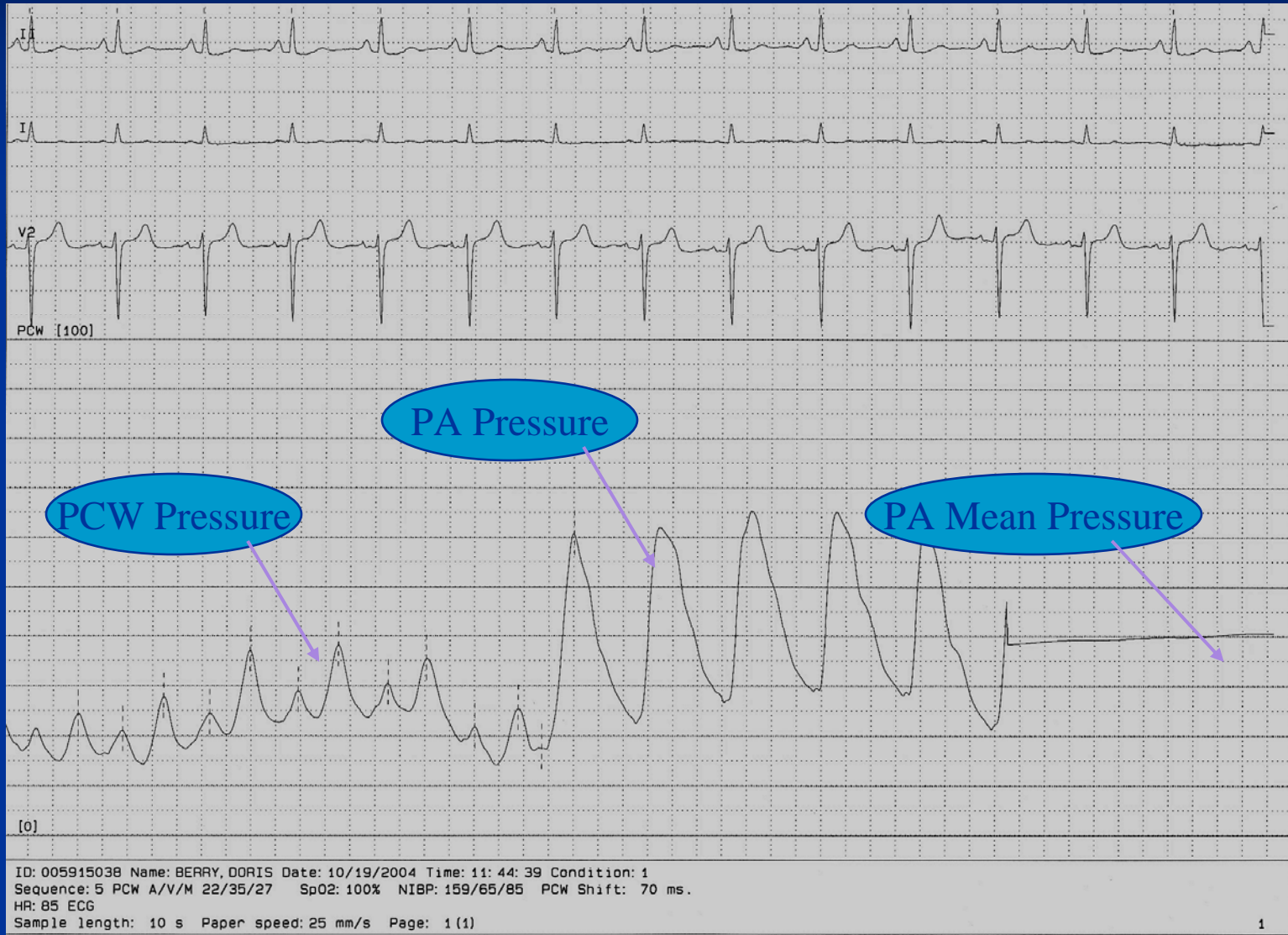


LV and PCW Pressure



ID: 005915038 Name: BERRY, DORIS Date: 10/19/2004 Time: 11: 43: 55 Condition: 1
Sequence: 3 LV S/D/E 164/11/21 PCW A/V/M 25/31/24 SpO2: 100% NIBP: 159/65/85 PCW Shift: 70 ms.
HR: 85 ECG Mitral D/G/A 3/6 LV dP/dt: 1904 dP/dt/P: 28
Sample length: 5 s Paper speed: 50 mm/s Page: 1 (1)

PCW - PA Transition



Pulmonary Artery Pressure



LV and RV Pressure



ID: 00591503B Name: BERRY, DORIS Date: 10/19/2004 Time: 11: 45: 36 Condition: 1
Sequence: 8 LV S/D/E 164/13/22 RV S/D/E 65/6/16 SpO2: 99% NIBP: 159/65/85
HR: 83 ECG LV dP/dt: 1887 dP/dt/P: 26 RV dP/dt: 403 dP/dt/P: 13
Sample length: 5 s Paper speed: 50 mm/s Page: 1 (1)

Right Atrial Pressure

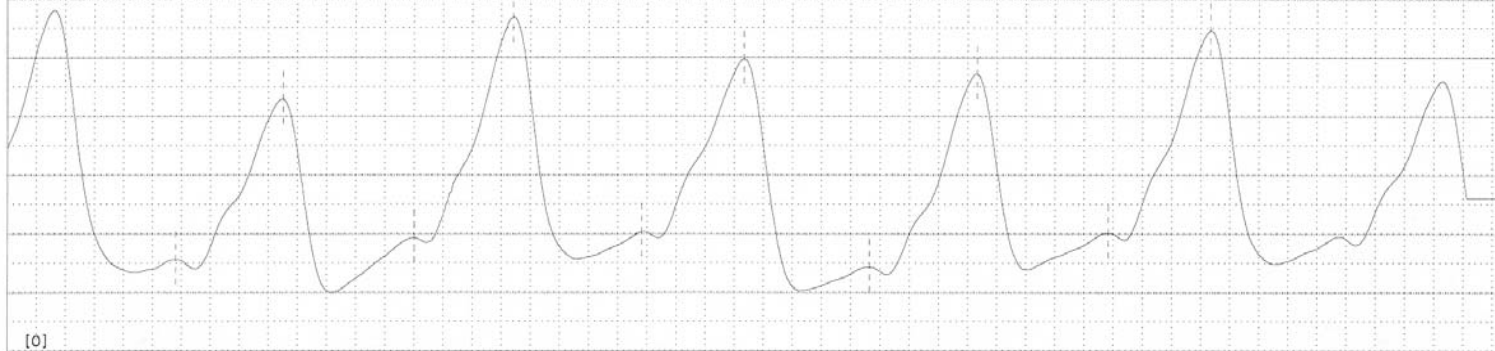


Mitral Valve Disorders

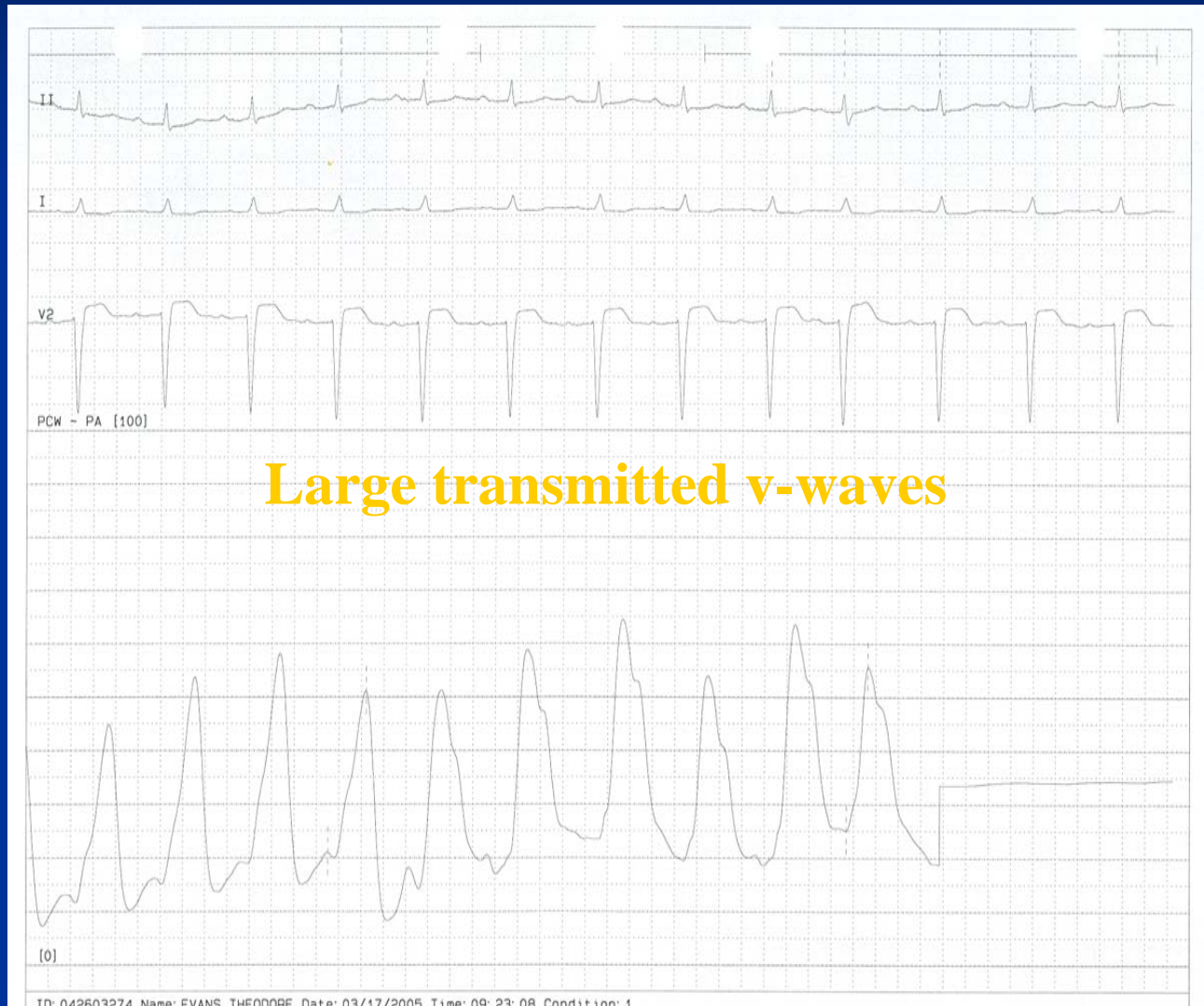
Mitral Valve Regurgitation



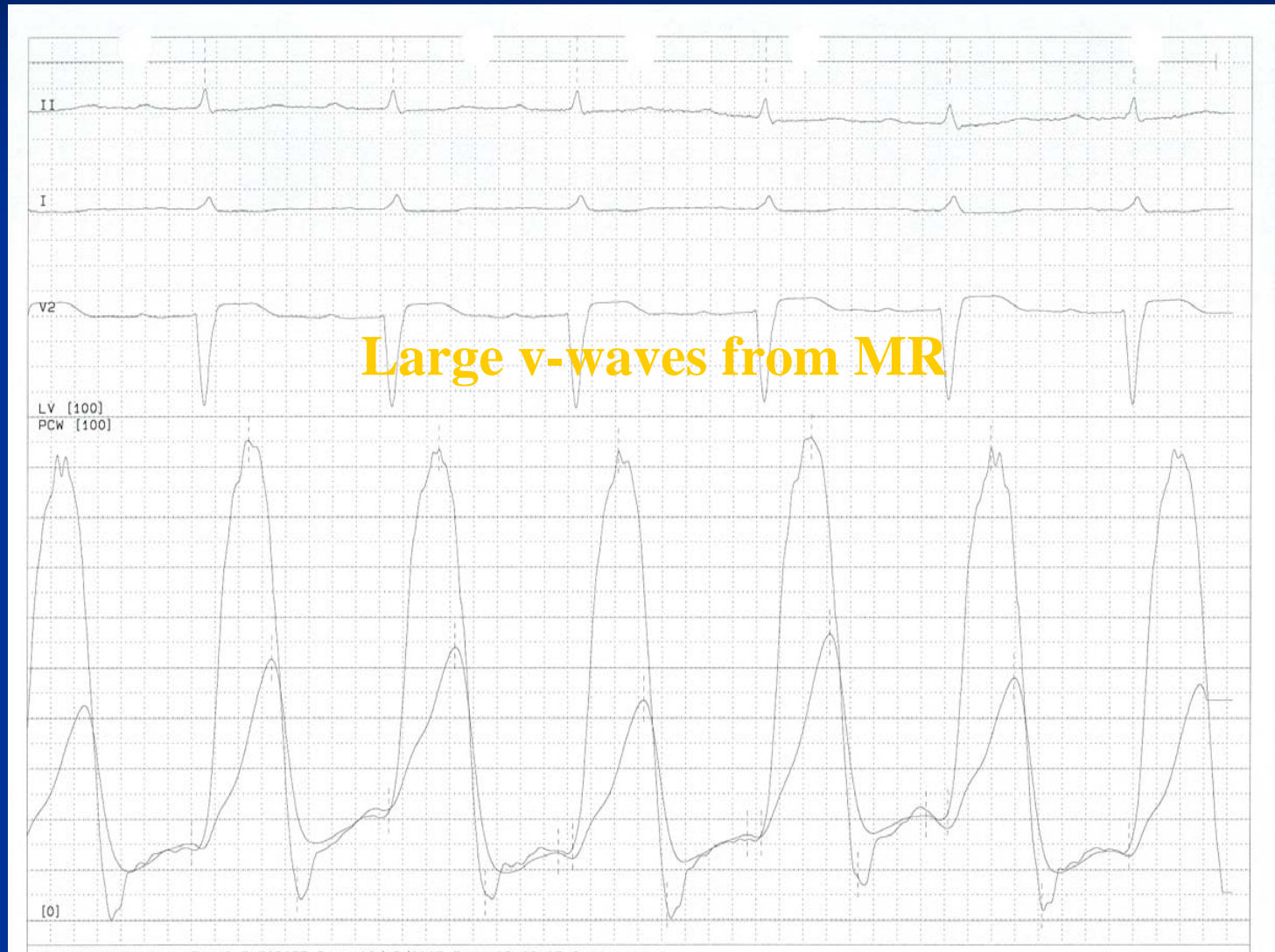
Large v-waves from MR



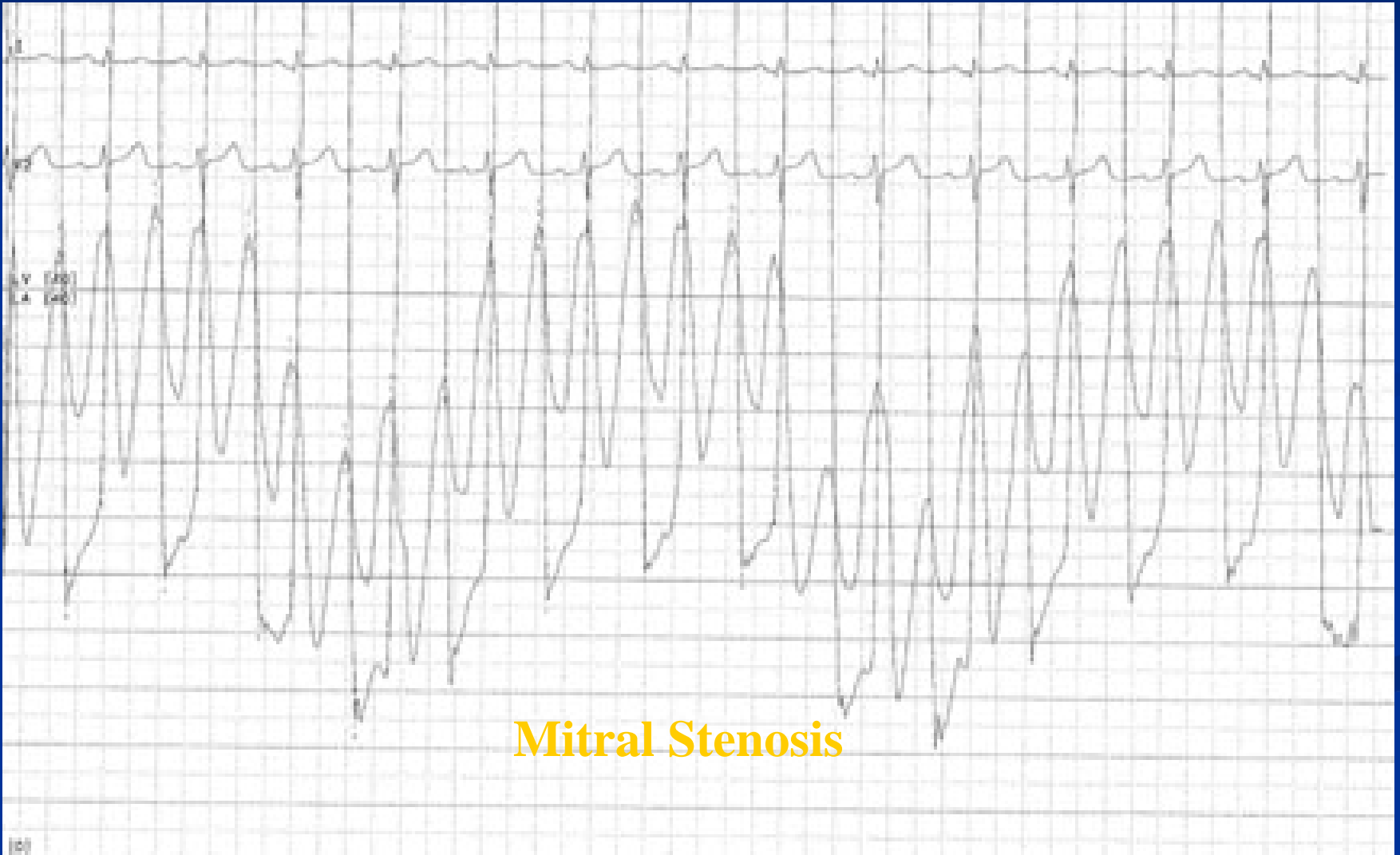
Mitral Valve Regurgitation



Mitral Valve Regurgitation

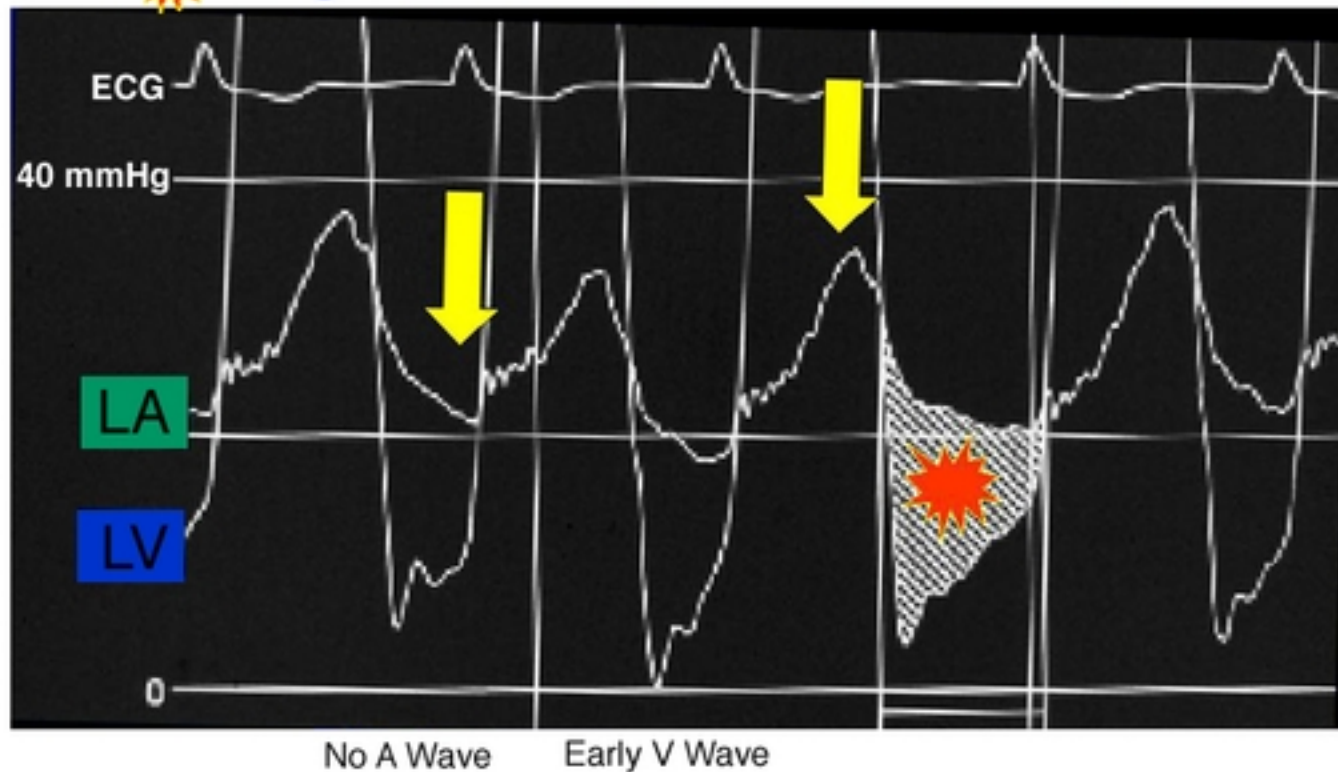


Mitral Valve Stenosis



Mitral Valve Stenosis

 Large LA-LV Gradient = Mitral Stenosis



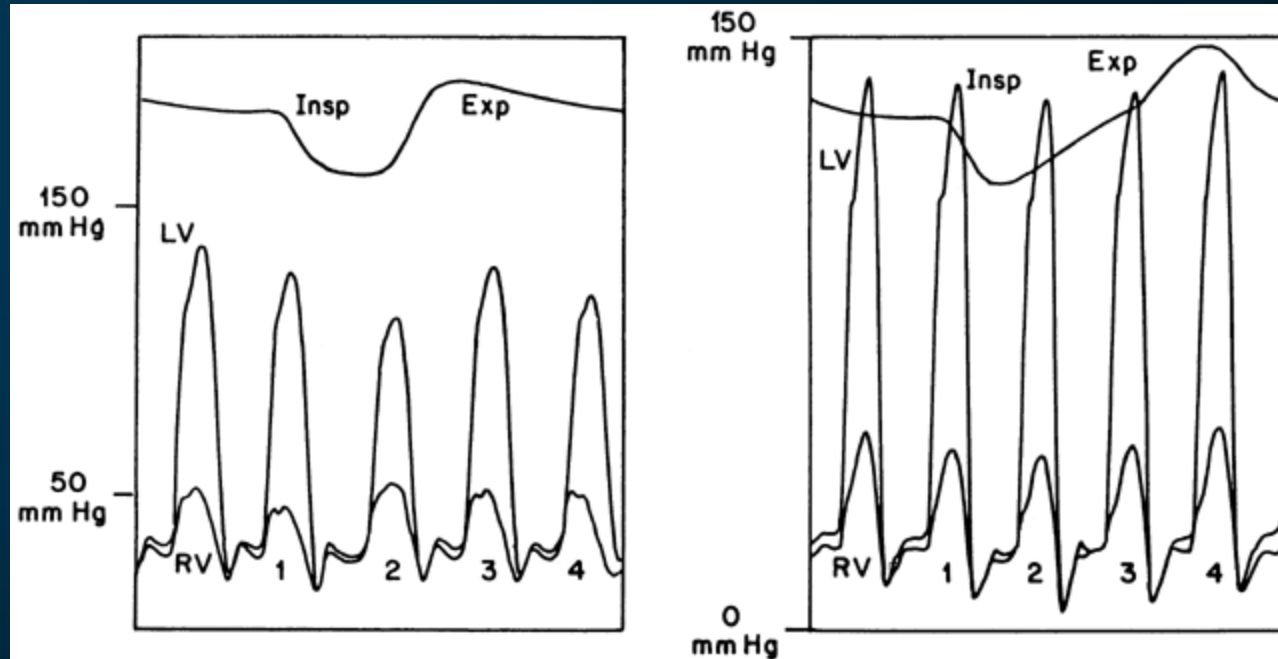
Cardiomyopathies and Pericardial Diseases

Traditional Hemodynamic Criteria for Diagnosing Constrictive Pericarditis

	Constrictive Pericarditis	Restrictive Cardiomyopathy
End-diastolic pressure equalization	LVEDP-RVEDP \leq 5mm Hg	LVEDP-RVEDP $>$ 5mm Hg
Pulmonary artery pressure	PASP $<$ 55mm Hg	RASP $>$ 55mm Hg
High RVEDP	RVEDP/RVSP $>$ 1/3	RVEDP/RVSP \leq 1/3
Dip-plateau morphology	LV rapid filling wave $>$ 7mm Hg	LV rapid filling wave \leq 7mm Hg
Kussmaul's sign	Lack of respiratory variation in mean RAP	Normal respiratory variation in mean RAP

Ventricular Interdependence During Respirations

Differentiates Constrictive Pericarditis from Restrictive Cardiomyopathy



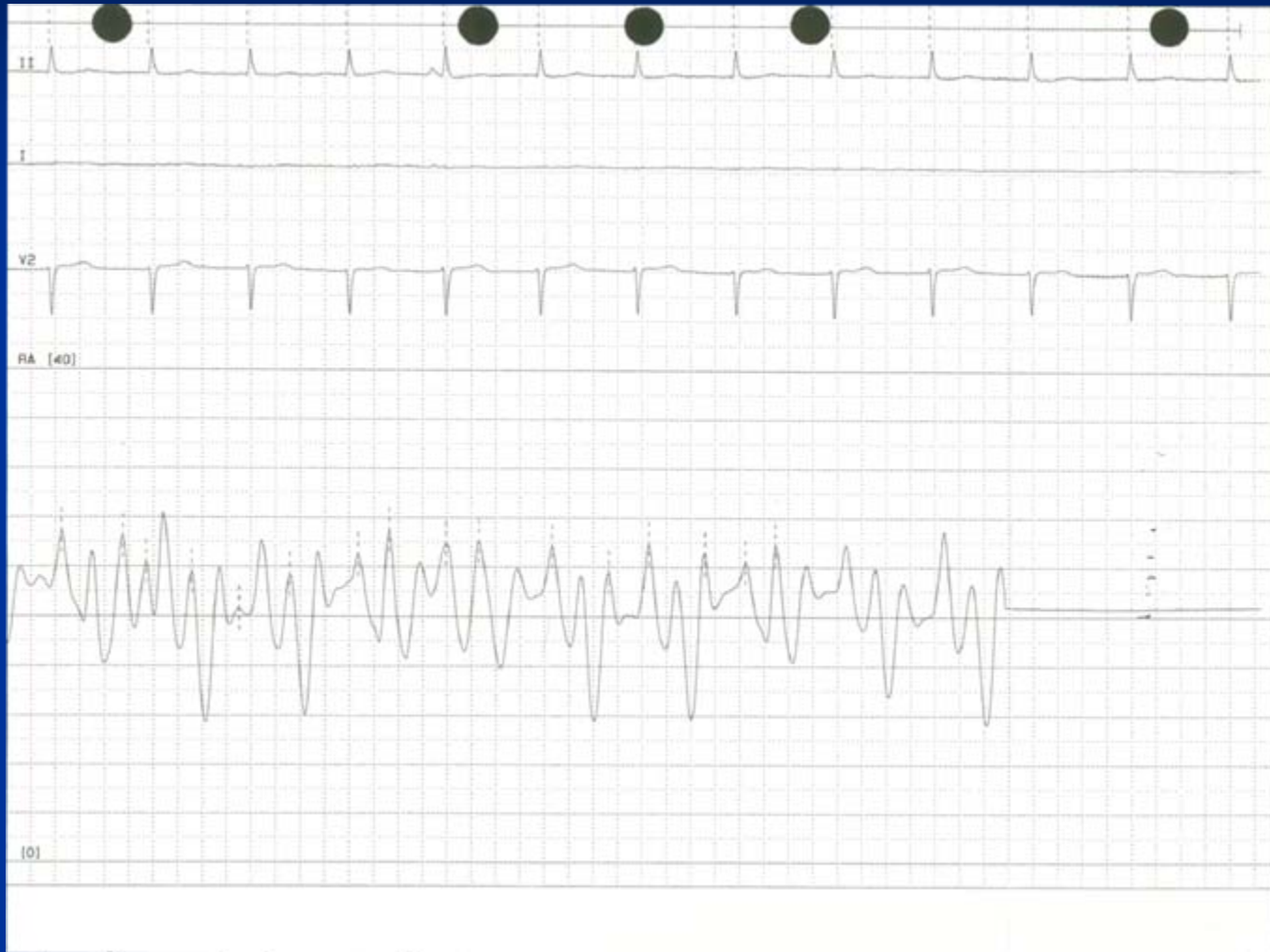
**Constrictive
Pericarditis**
(LV and RV discordant)

**Restrictive
Cardiomyopathy**
(LV and RV concordant)

Pericardial Constriction

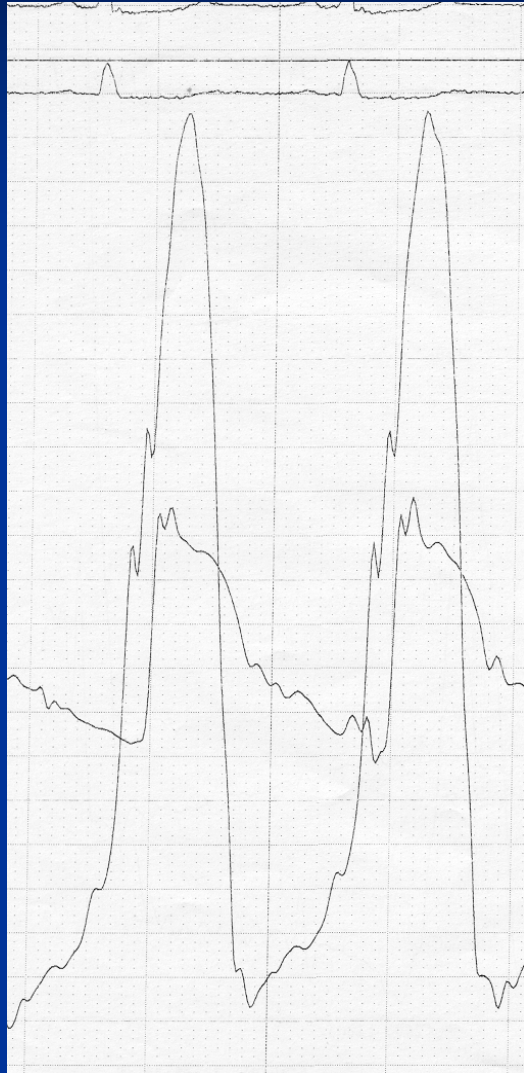


Pericardial Constriction



LV Body

HOCM



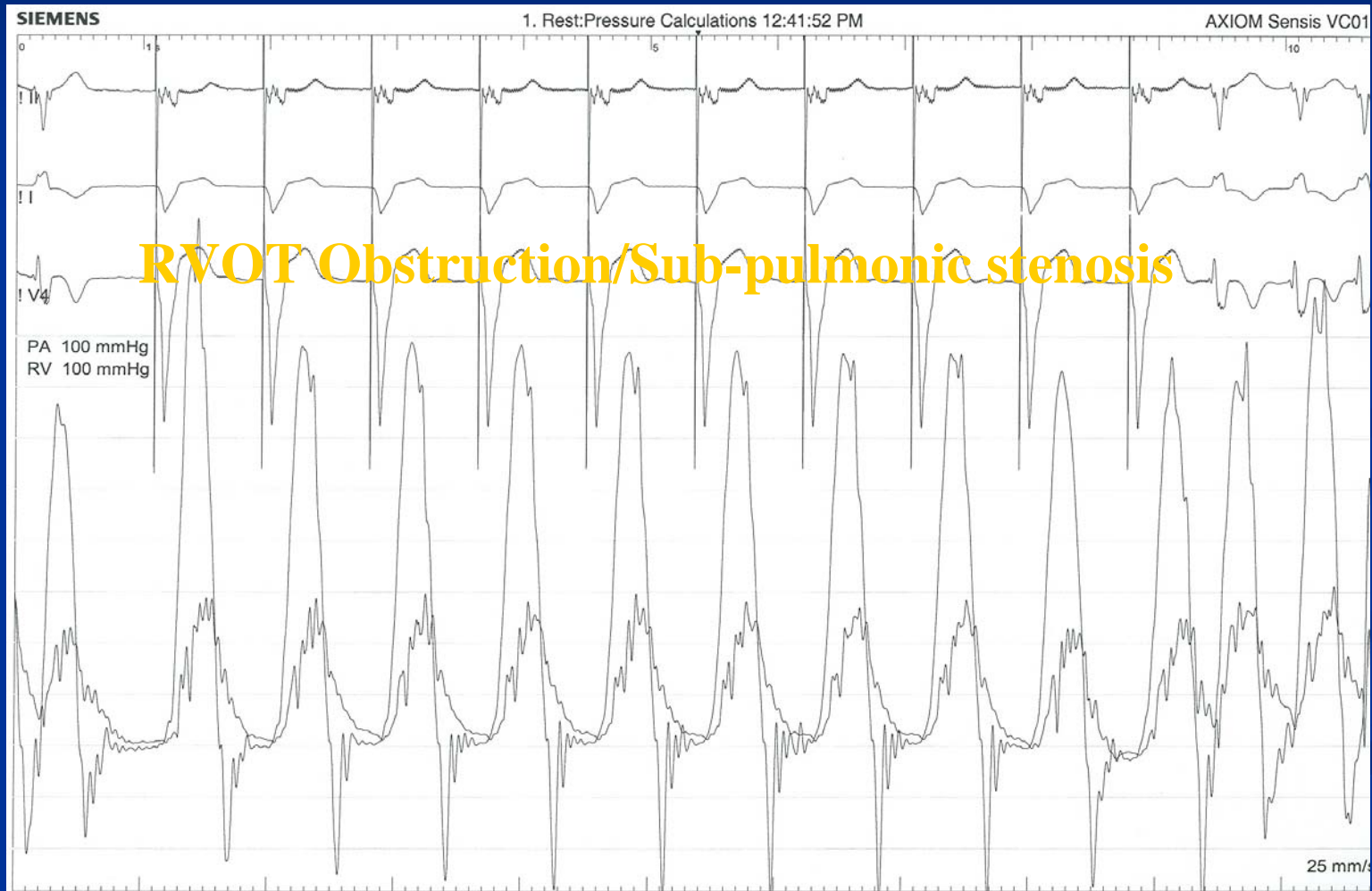
LVOT

Aorta

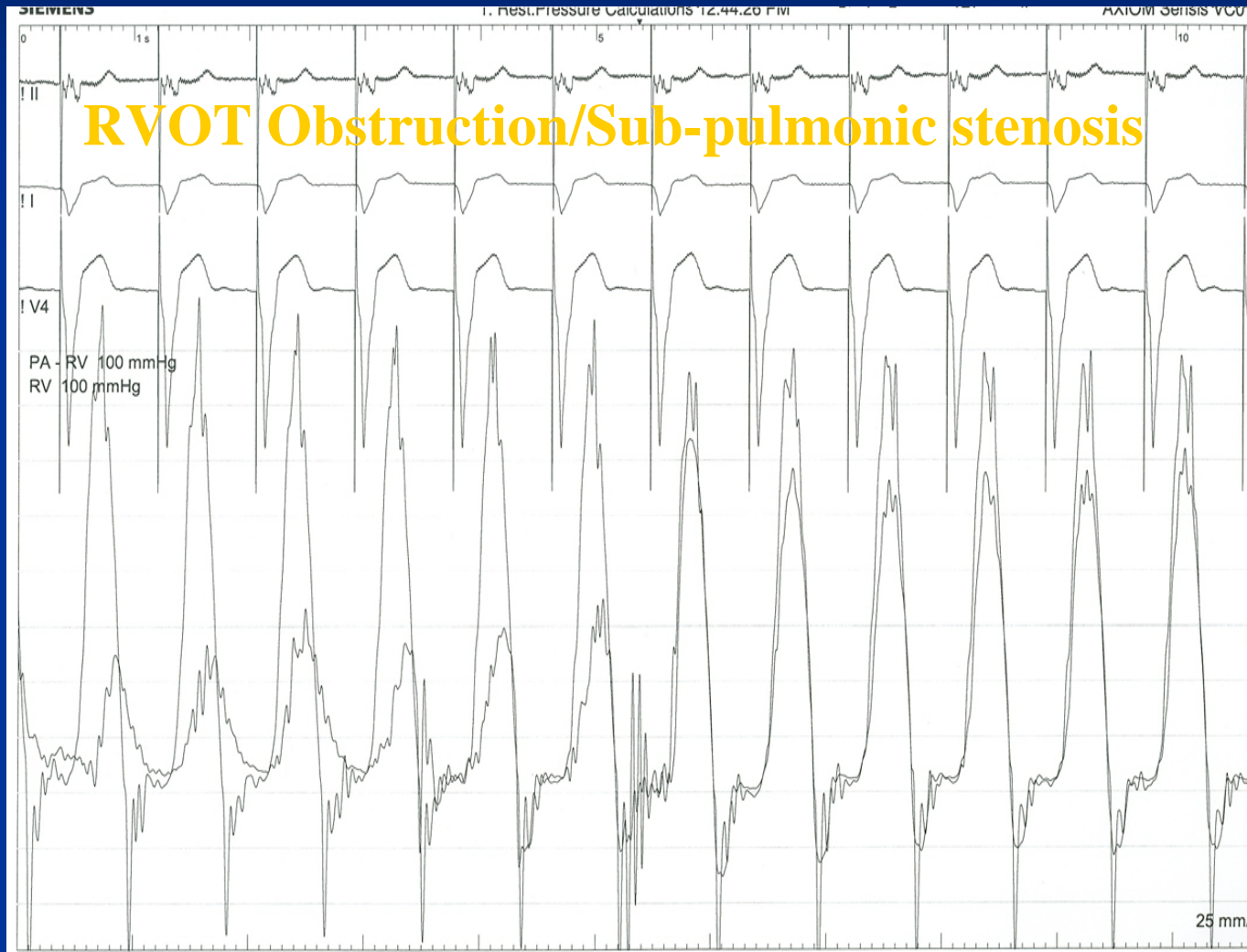


Hypertrophic Obstructive CardioMyopathy

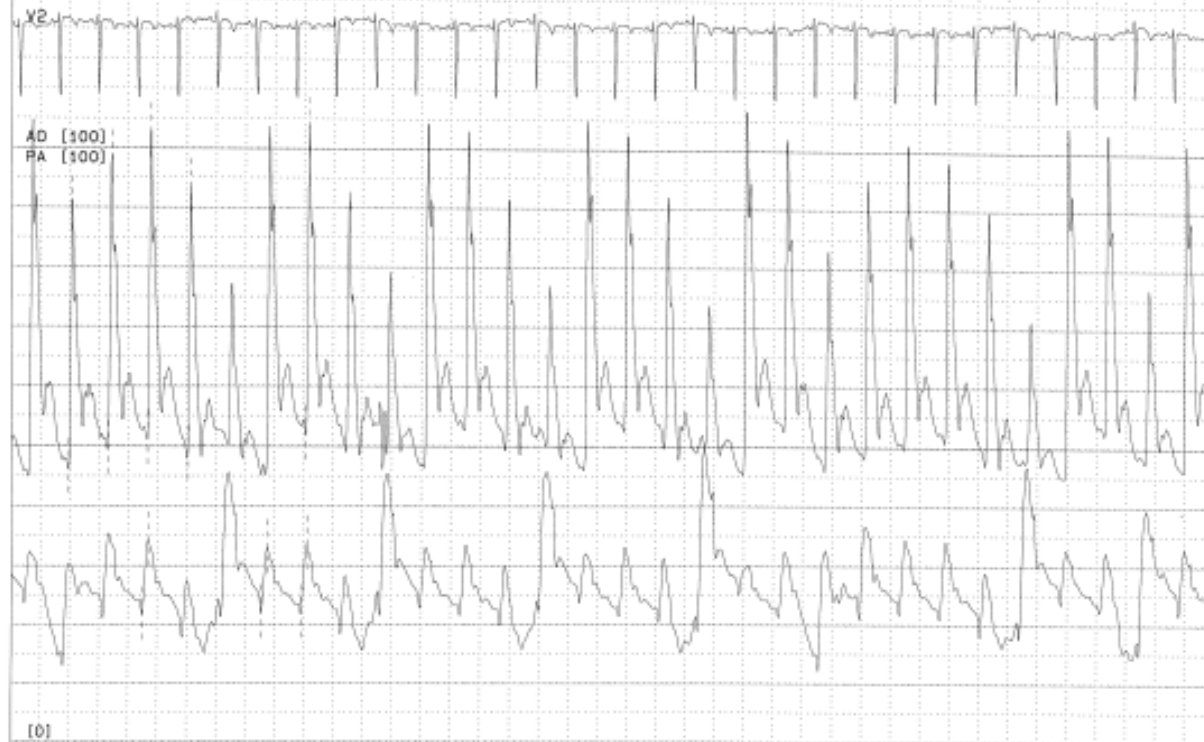
RVOT Obstruction



RVOT Obstruction

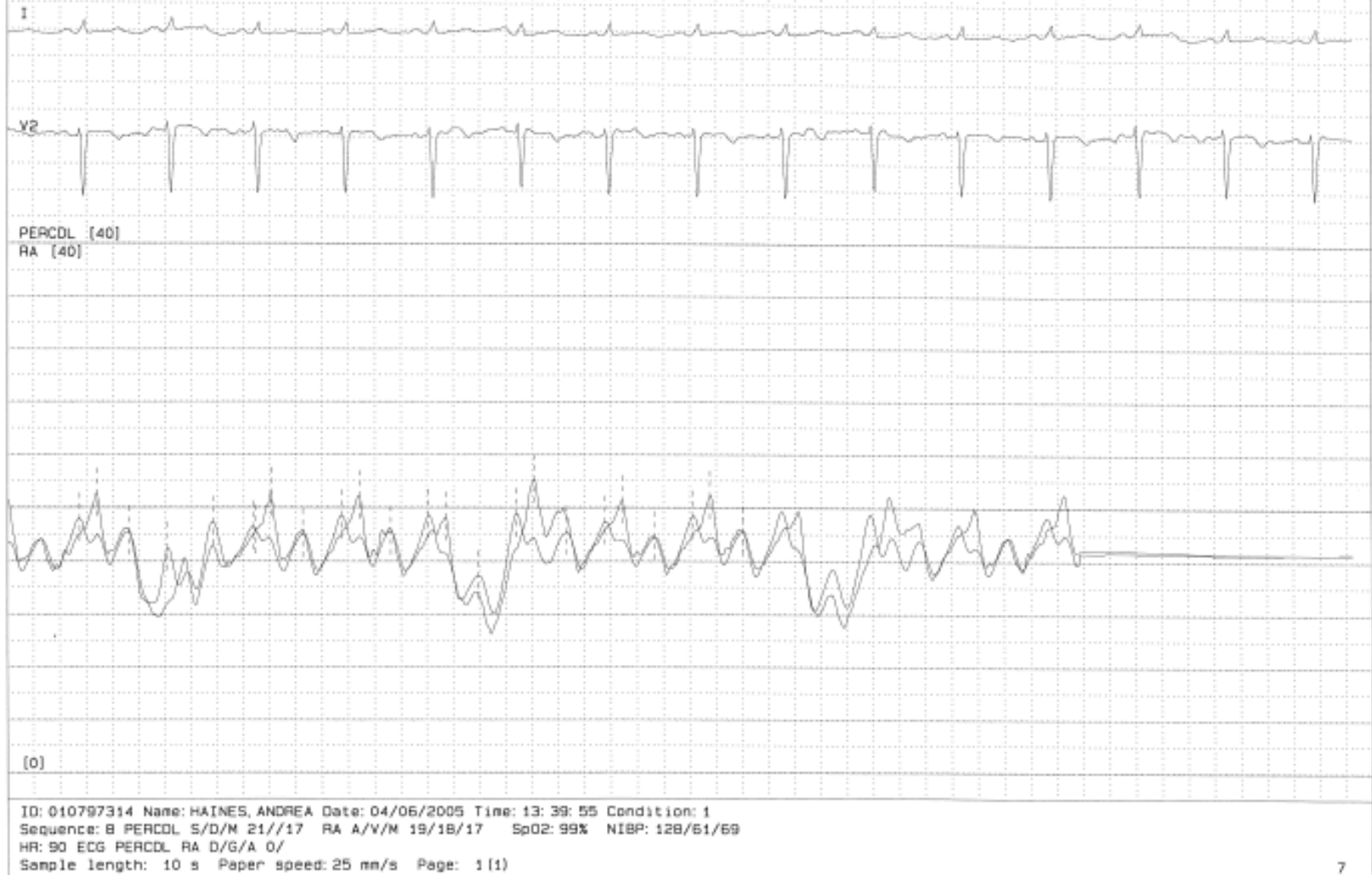


Cardiac Tamponade

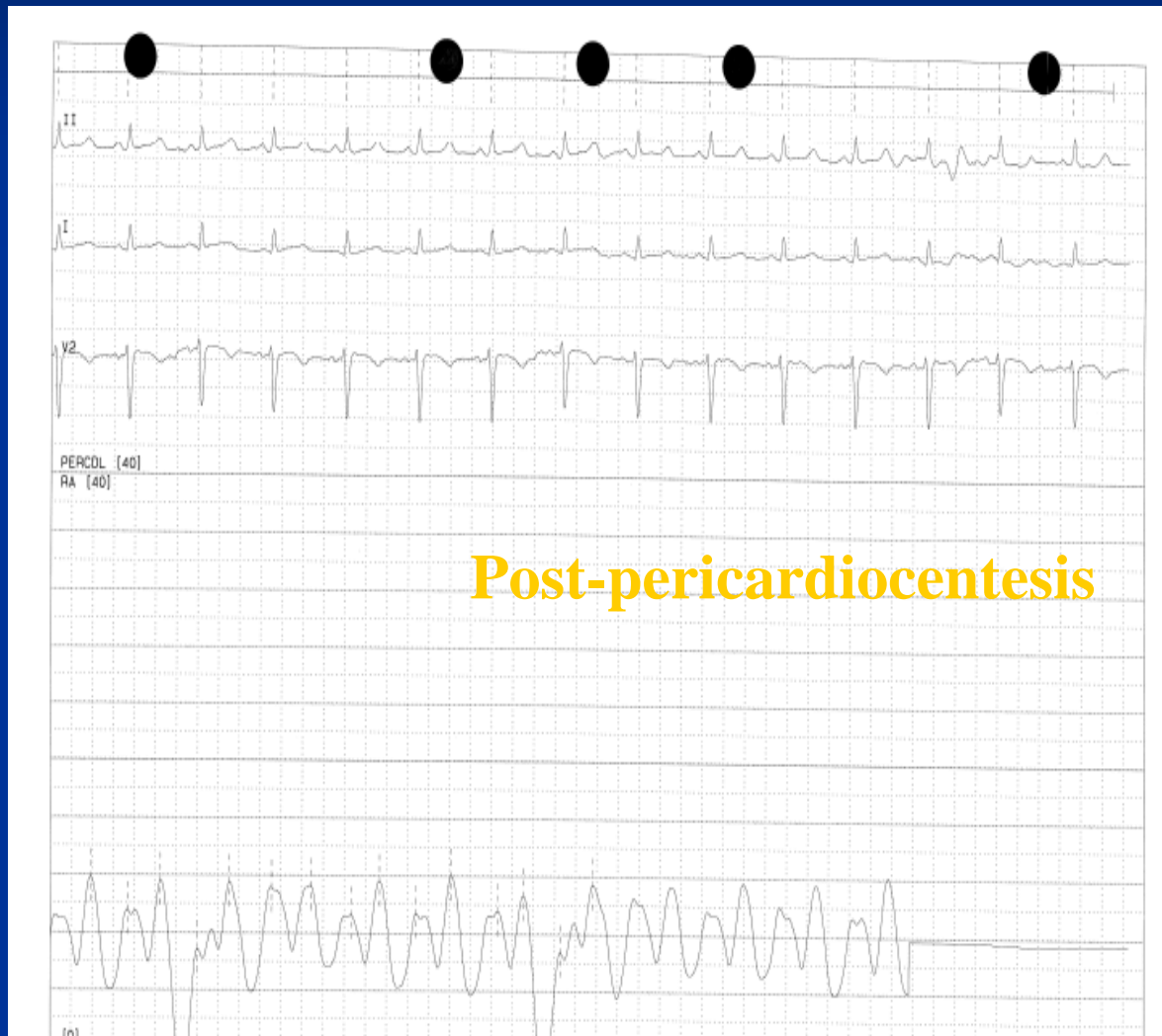


ID: 010797314 Name: HAINES, ANDREA Date: 04/06/2005 Time: 13: 28: 43 Condition: 1
Sequence: 5 AD S/D/M 98/49/62 PA S/D/M 34/22/26 SpO2: 100%
HR: 87 AD
Sample length: 20 s Paper speed: 10 mm/s Page: 1 (1)

Cardiac Tamponade



Cardiac Tamponade



Cardiovascular Hemodynamics

- The most important information obtained from **CARDIAC CATHETERIZATION**
- Helps with diagnosis, management, assessment of risk, assessment of procedural success and prognosis of patients with coronary artery disease, valvular heart disease, cardiomyopathy, and congestive heart failure.