



Tricuspid Regurgitation: The Last Frontier

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Disclosures

- None

Tricuspid Regurgitation

2008 AHA/ACC Guidelines

- TR: 1 page out of 107
- Probable mechanism by PA pressure
 - RVSP > 55 mmHg: likely functional
 - RVSP < 40 mmHg: likely organic

- Se

- Or

-

The Forgotten Valve

What is the clinical impact of
TR?

All Patients with Tricuspid Regurgitation



TR is not good for you
....but patients die **with** TR not
because of TR

	0	200	400	600	800	1000	1200	1400
No. at risk	4,105	3,158	2,298	1,591	1,043	573	183	

Nath et al: JACC 43(3), 2004

TR due to Flail Leaflets



TR is not good for you
....but this is only for **organic** TR



Clinical Outcome of Isolated Tricuspid Regurgitation



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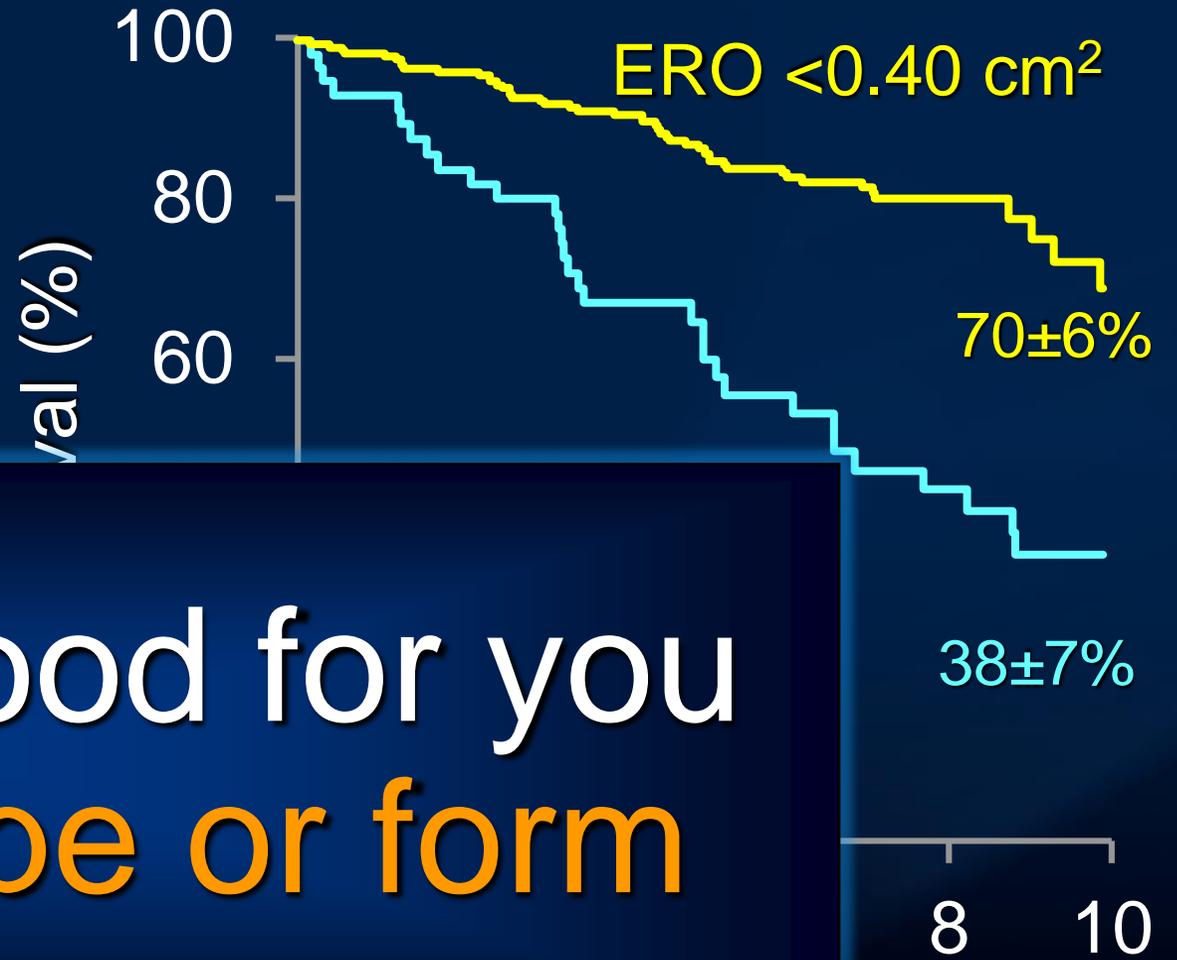
ABSTRACT

OBJECTIVES The aim of this study was to assess the outcome of isolated tricuspid regurgitation (TR) and the added value of quantitative evaluation of its severity.

BACKGROUND TR is of uncertain clinical outcome due to confounding comorbidities. Isolated TR (without significant comorbidities, structural valvular disease, or noncardiac cause) is of unknown clinical significance.

METHODS In patients with isolated TR, a quantitative evaluation of its severity was performed using the continuity equation and the surface area method, a long-term follow-up was performed, and patients with significant comorbidities were excluded.

RESULTS The study involved 100 patients with isolated TR. The mean right ventricular systolic pressure was 35 mm Hg. The 10-year cardiac event rates were 63% and 38% for an ERO ≥ 40 mm² and < 40 mm², respectively (hazard ratio: 1.78 [95% confidence interval, 1.18 to 2.70] for an ERO ≥ 40 mm²). The significance of the quantitative evaluation of TR severity for cardiac events was not significant (p < 0.0001, independent of age, sex, and comorbidities) (p < 0.0001 for all), and lower with an ERO ≥ 40 mm² than with an ERO < 40 mm² (16 \pm 5% 5 years after diagnosis vs 22 \pm 5% 5 years after diagnosis).

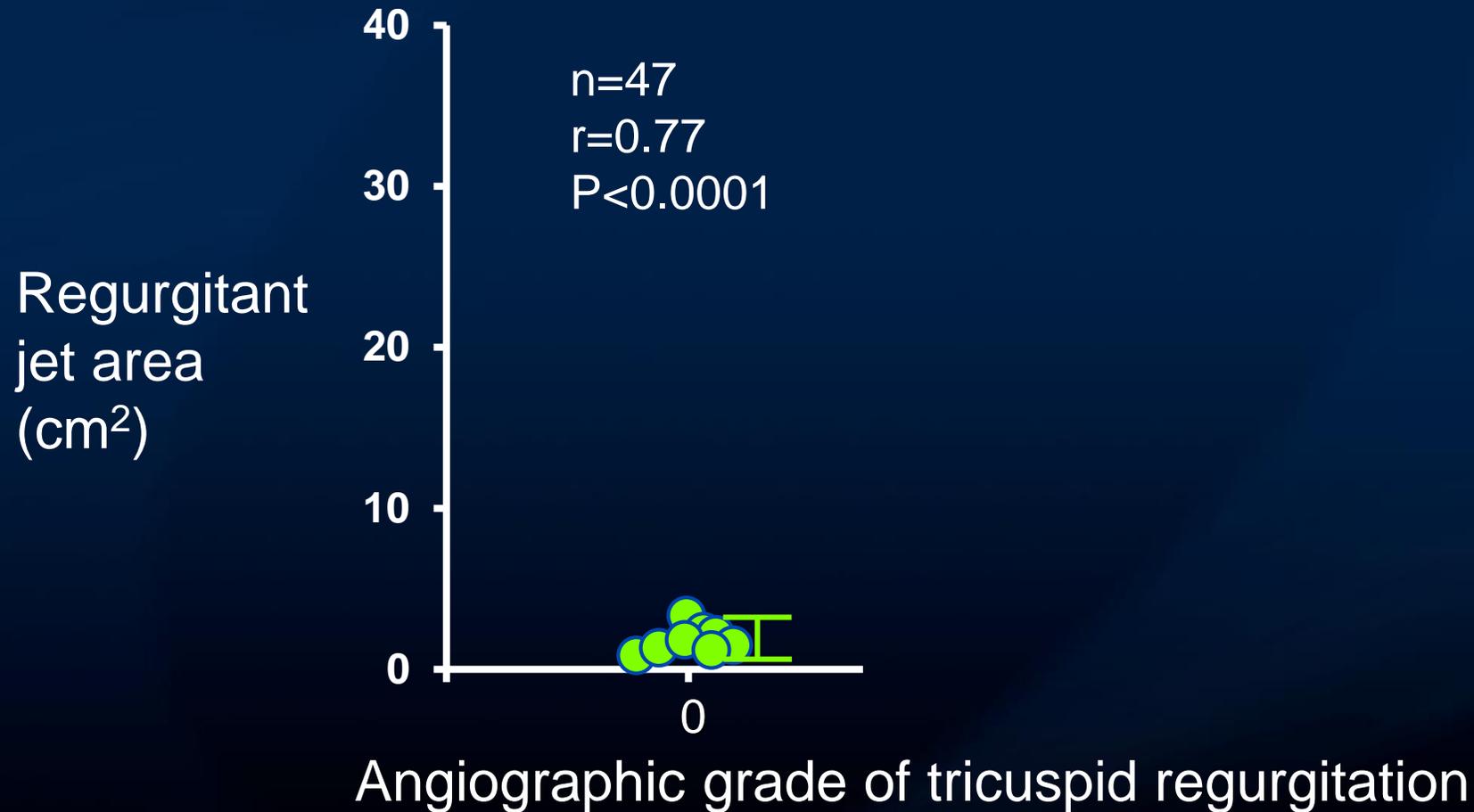


TR is not good for you
In any shape or form

Why are we not doing a
better job with TR?

Why are we not doing a better job with TR?

1. We do not quantitate enough



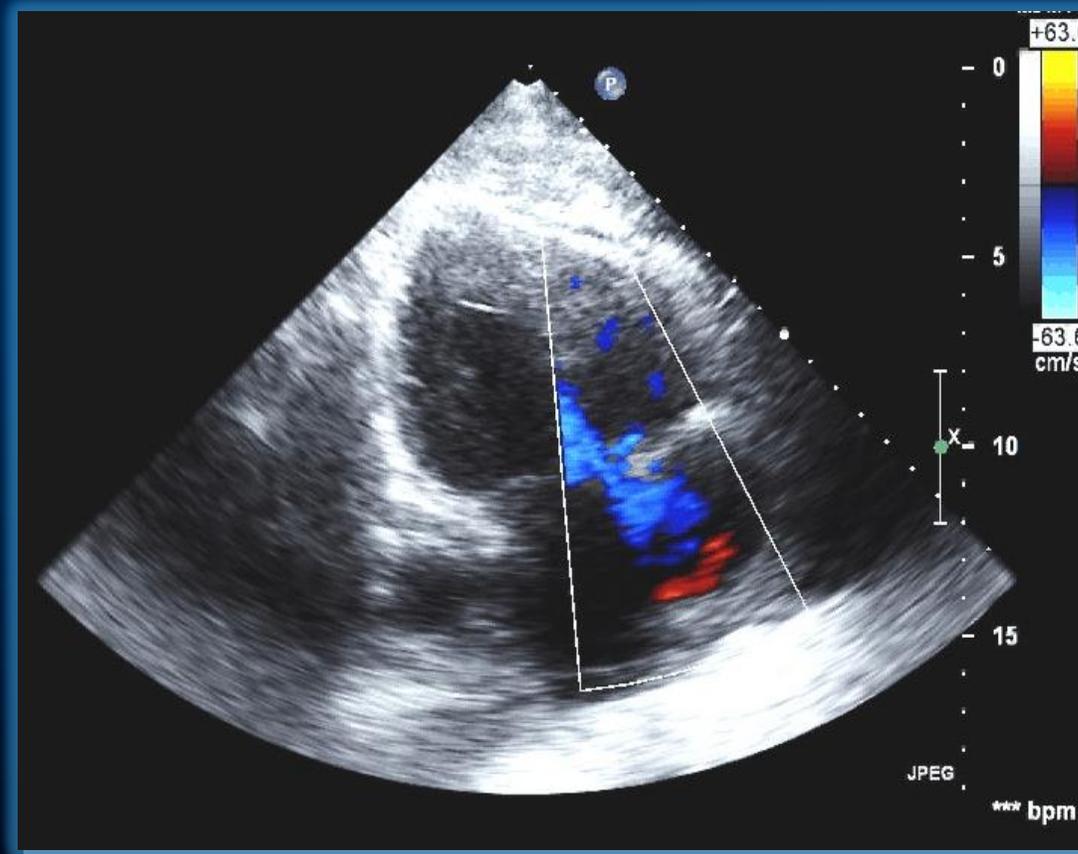
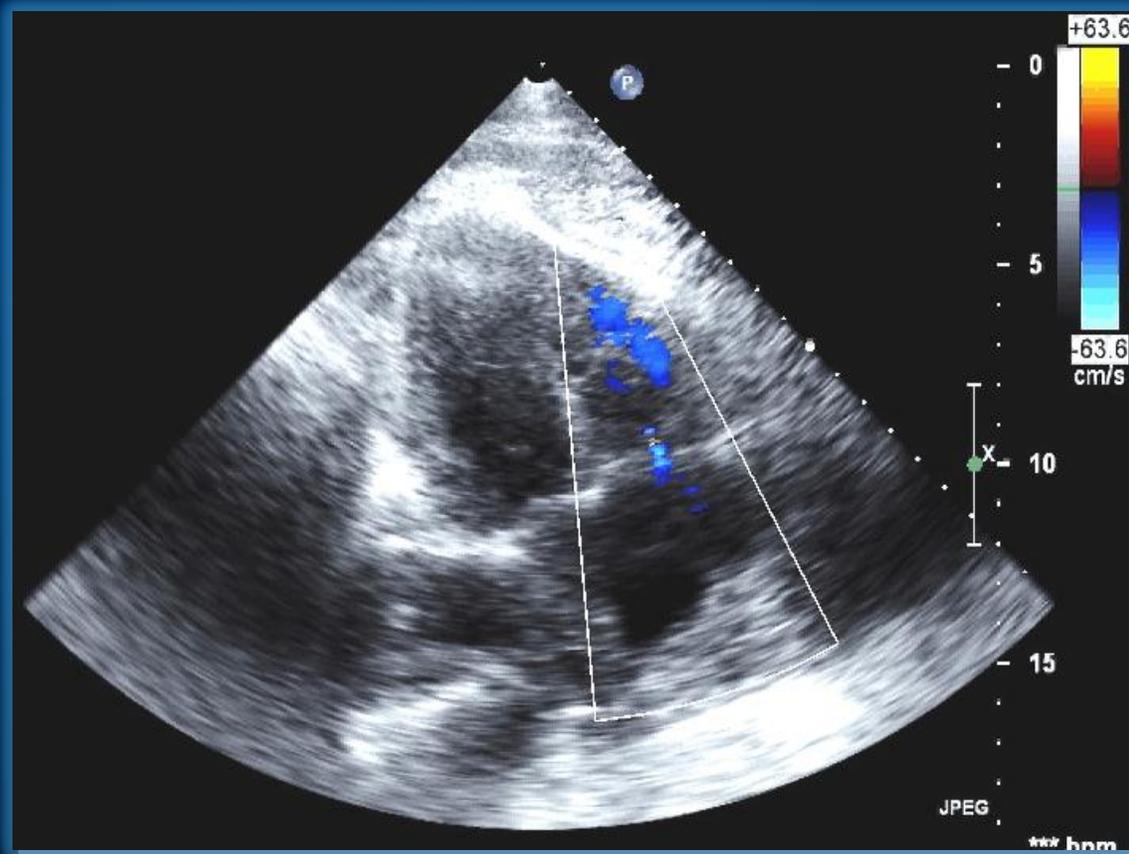
Why are we not doing a better job with TR?

2. We do not account for variability

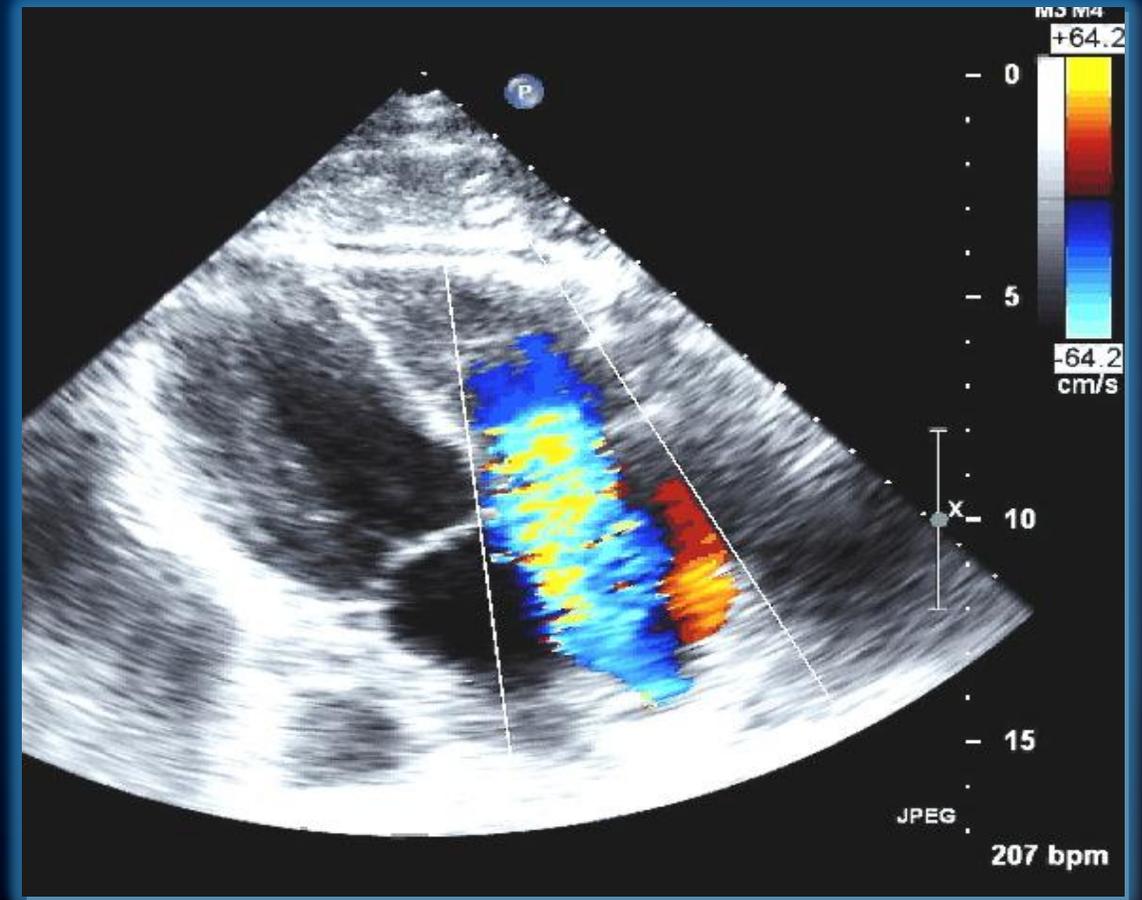
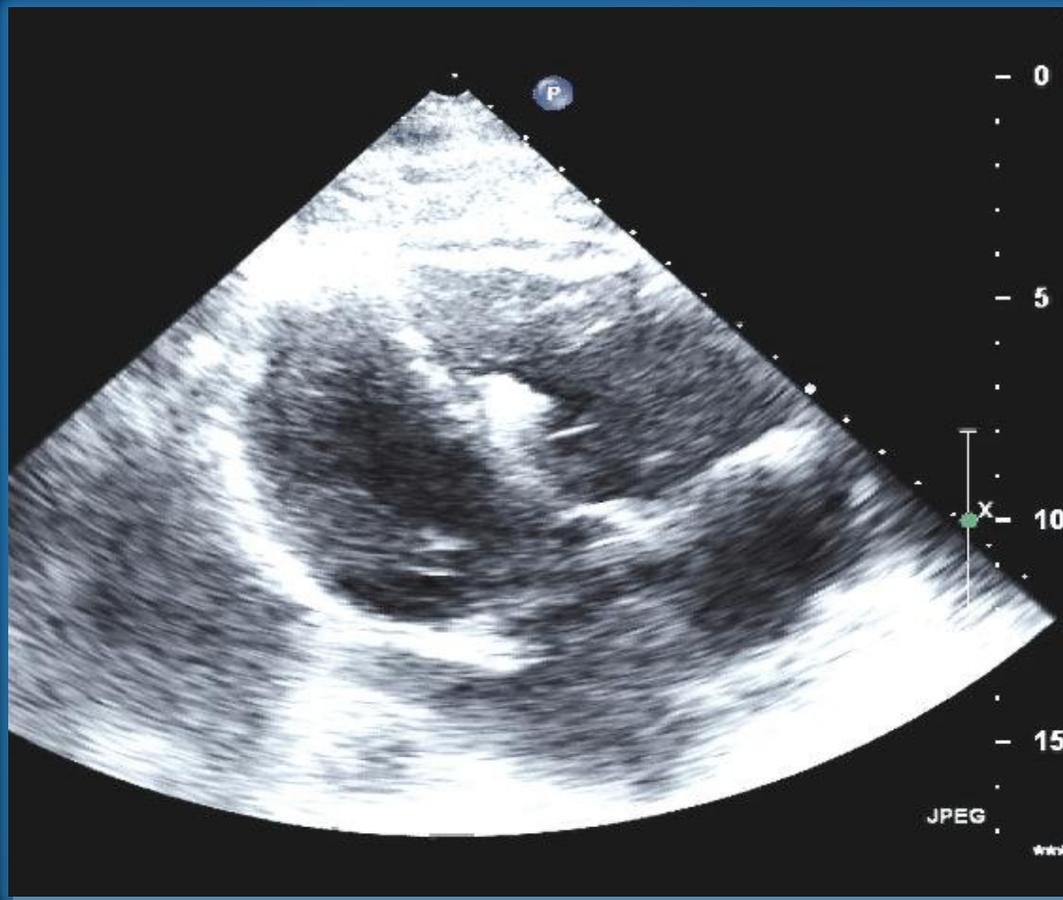


Respiratory Variability:
Measure **average** PISA

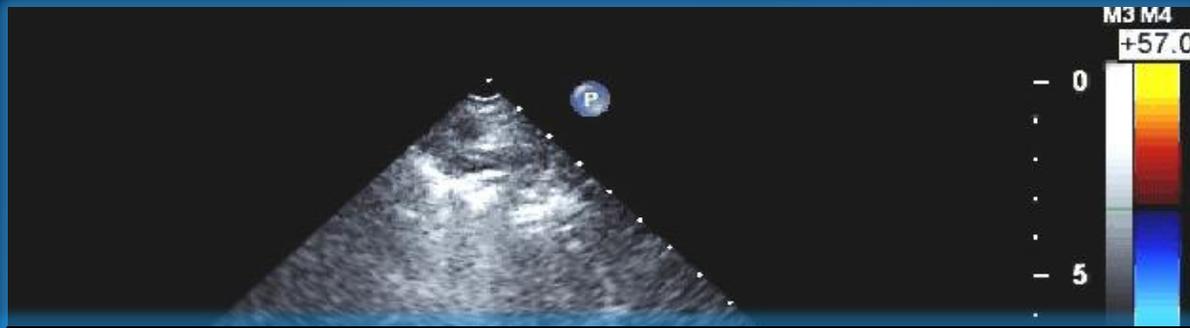
Baseline Echo for Biopsy



11:12 AM



11:19 AM



Load-dependent variability:
What is the **average**?

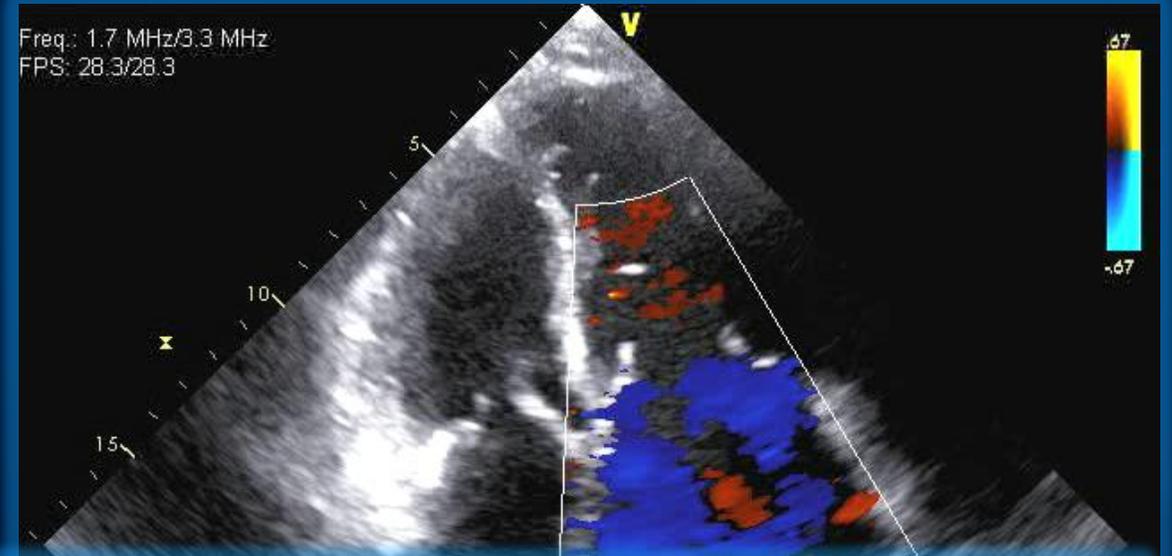
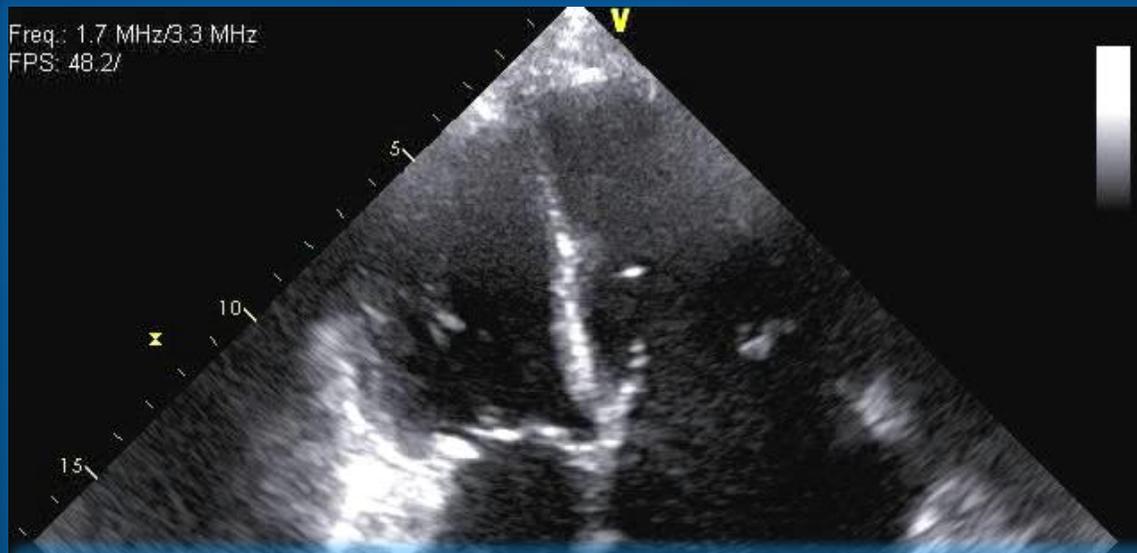
Why are we not doing a better job with TR?

3. We do not understand the symptoms

Typical symptoms in TR

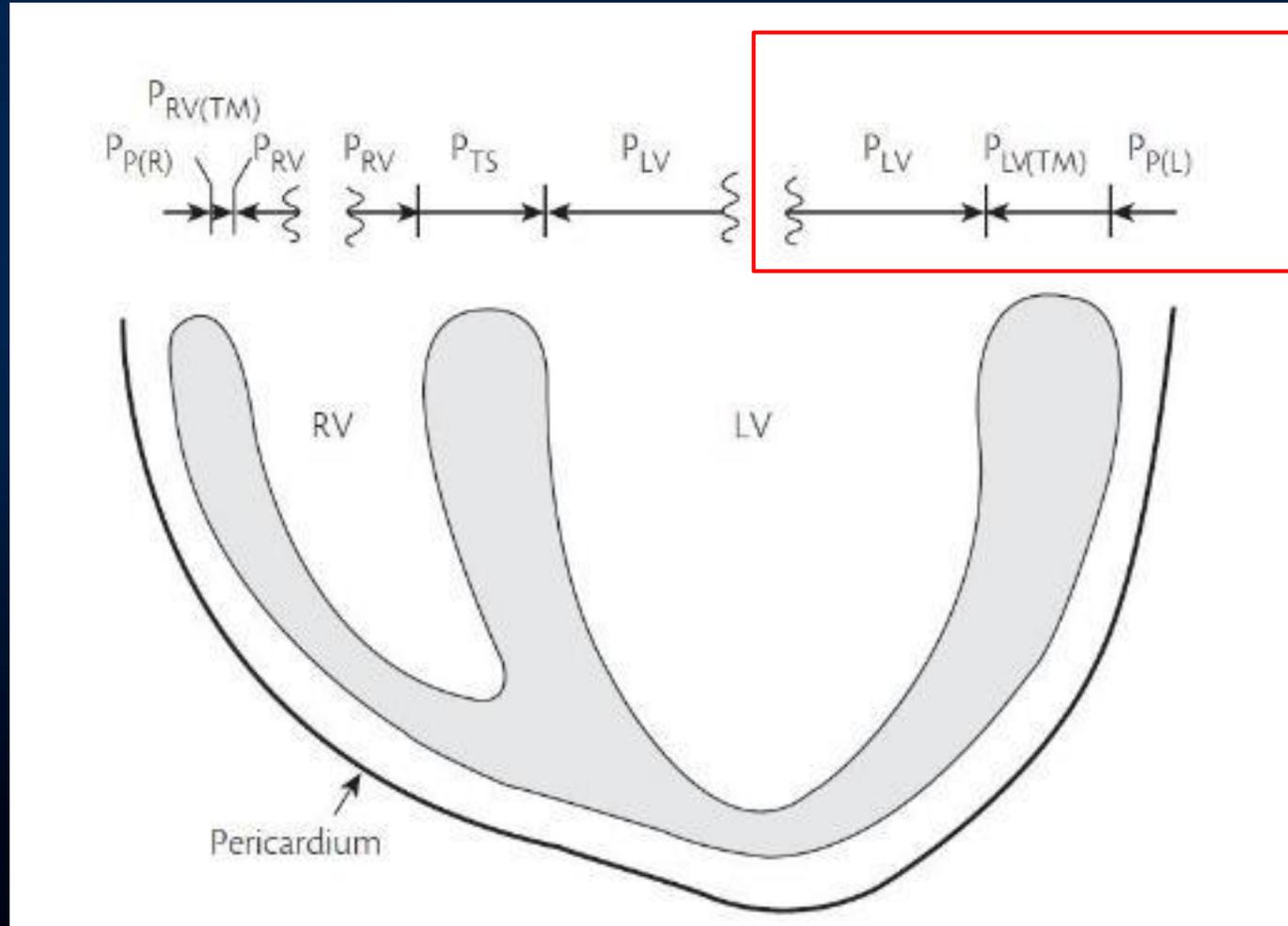
- Fatigue (low cardiac output)
- Passive congestion due to high RA pressure
 - Edema
 - Ascites
 - Abdominal fullness (liver / bowel congestion)

71 yo with dyspnea, ascites, edema



Why is she dyspneic?

LV Transmural Pressure

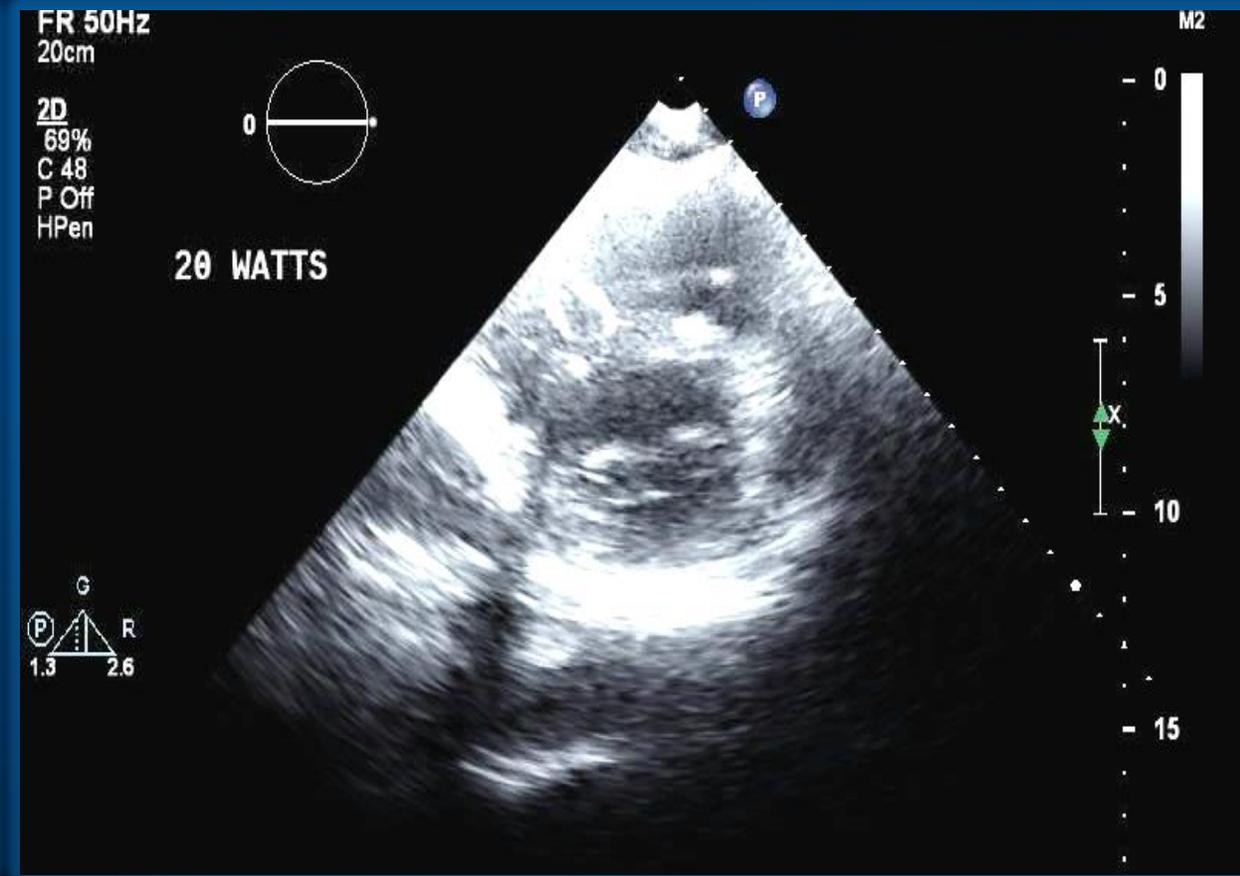
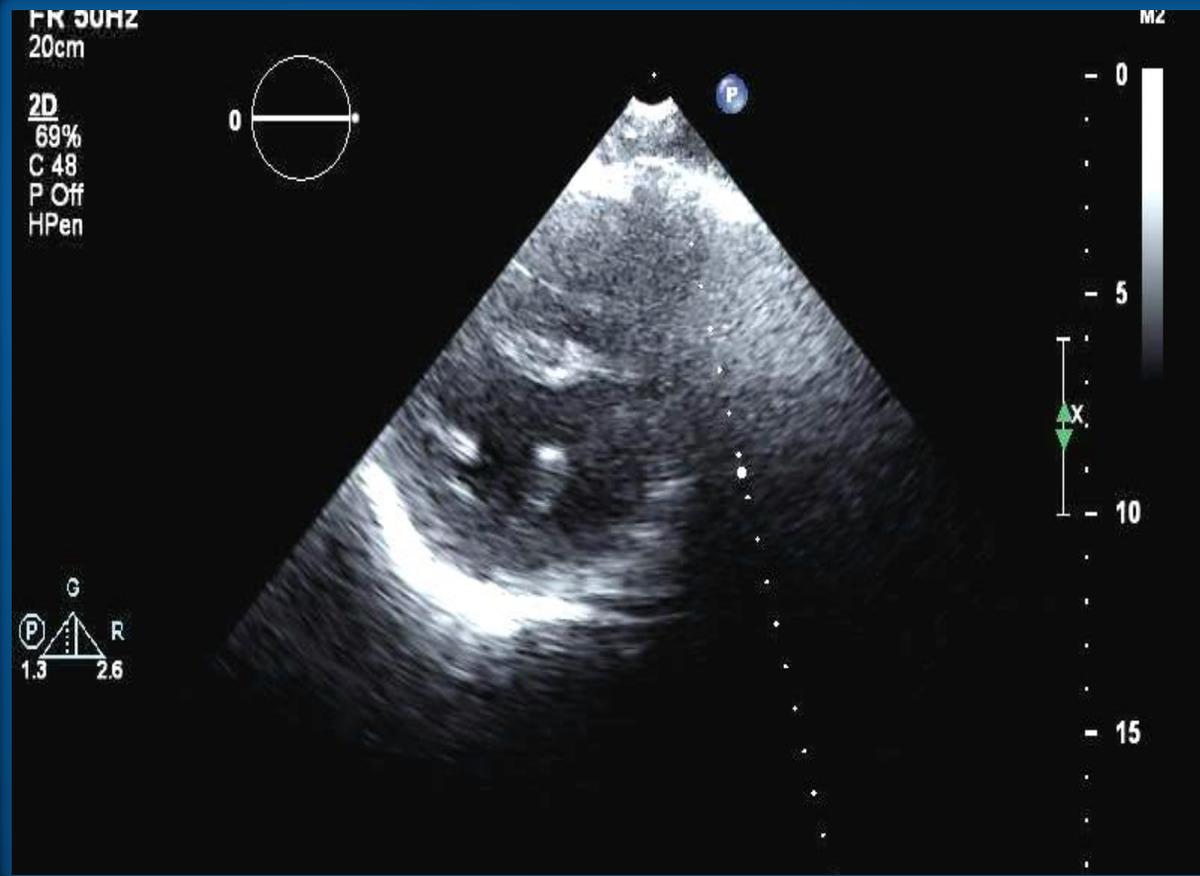


Tyberg JV. Oxford Textbook of Cardiomechanic Feedback 2011

Exercise Hemodynamic Catheterization

Base

20 W



	RA mmHg	PCW mmHg	CO l/min	SV ml	LVTMP
Rest	23	20	3.2	41	-3
Peak	40	34	4.1	33	-6
NTG	10	11	3.7	71	+1

Improvement in SV correlated with LVTMP

TR symptoms: modified teaching

- Fatigue (low cardiac output)
- Passive congestion due to high RA pressure
 - Edema
 - Ascites
 - Abdominal fullness (liver / bowel congestion)
- **Dyspnea**
 - **increased pericardial pressure and PCW**
 - **Improves with NTG / volume reduction**

Why are we not doing a better job with TR?

4. We were not able to do much about it

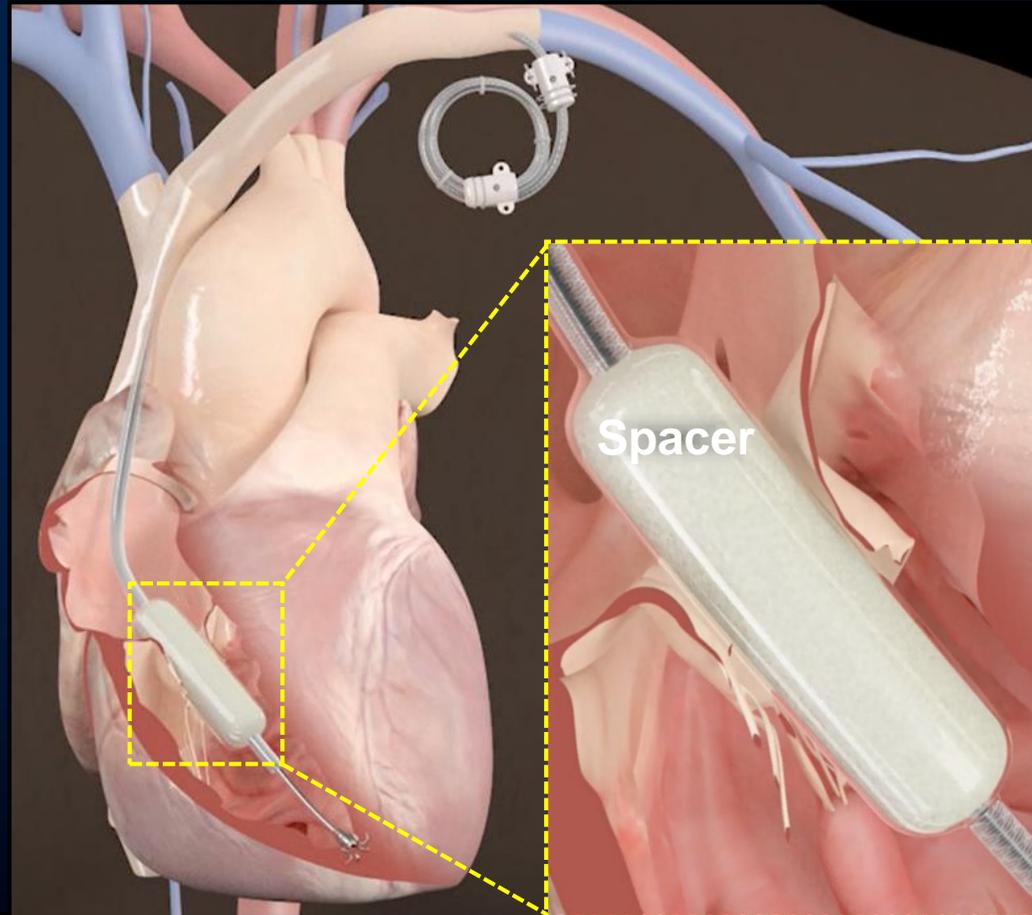
- High mortality for isolated tricuspid surgery (~8-10%)
- Apparent control of Sx with medication
- Lack of formal guideline indications

Low number of surgical interventions

Can we do something
about it?

FORMA Repair System

- **Spacer**
 - Positioned into the regurgitant orifice
 - Creates a platform for native leaflet coaptation
- **Rail**
 - Tracks Spacer into position
 - Distally and proximally anchored



Coaptation Device Diameter Size	Sheath Size (Fr)
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Ø12mm	20
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Ø15mm	20
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Select Layout ?

Select View ?

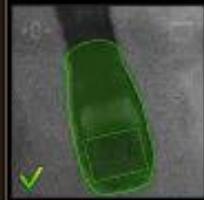
- C-arm
- Free
- Echo
- X-ray

Annotation ?

Clear All

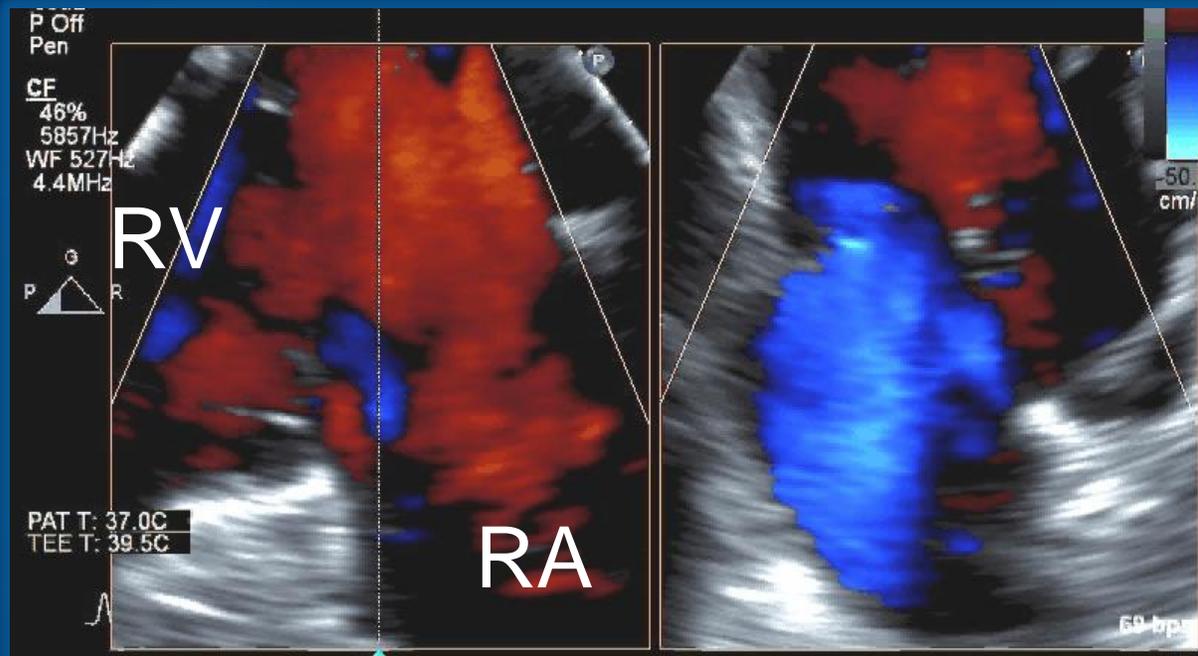
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Show Names

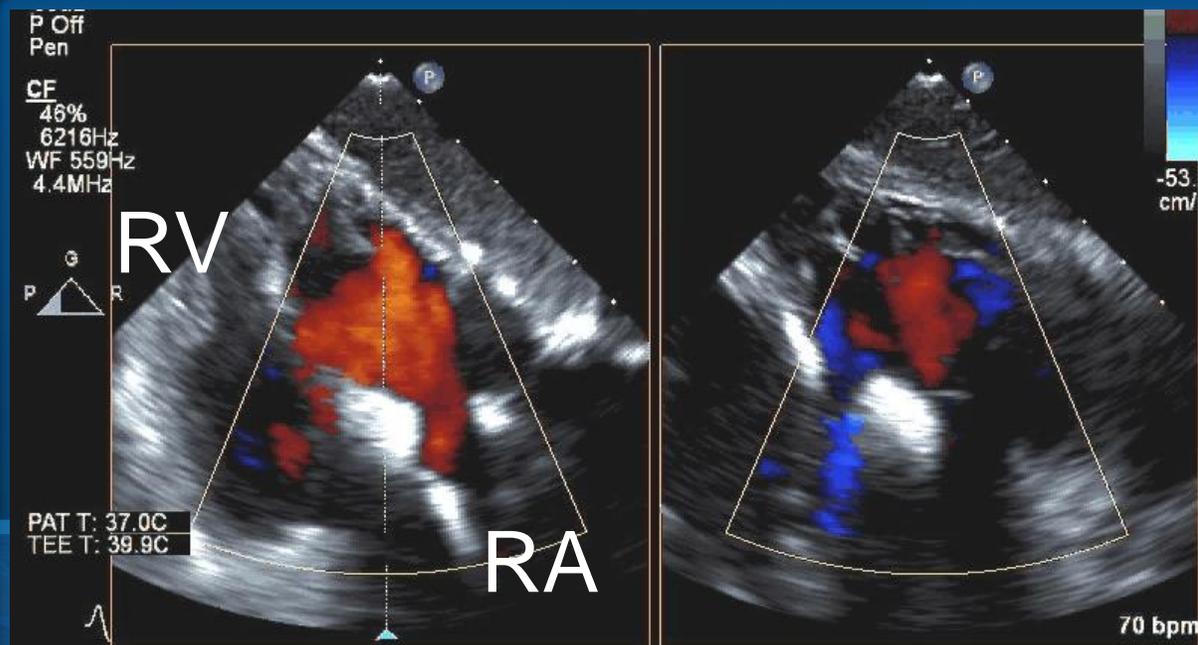


CAUD 2°
RAO 41°

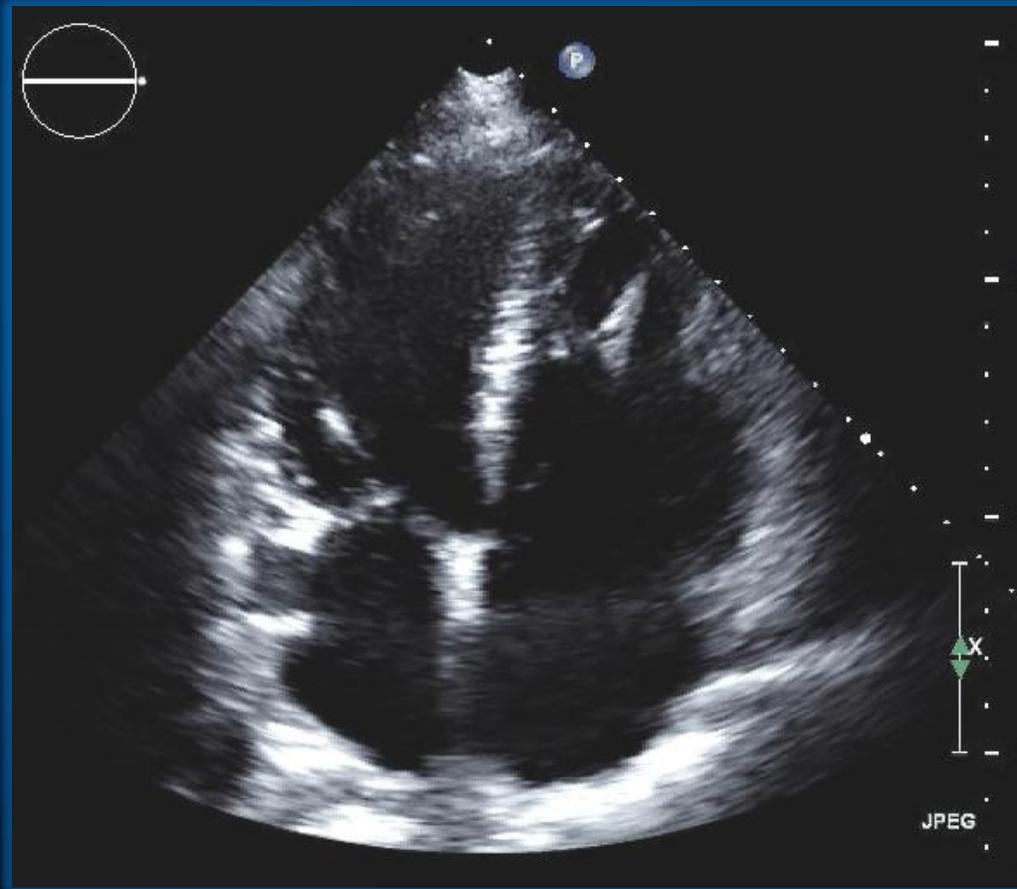
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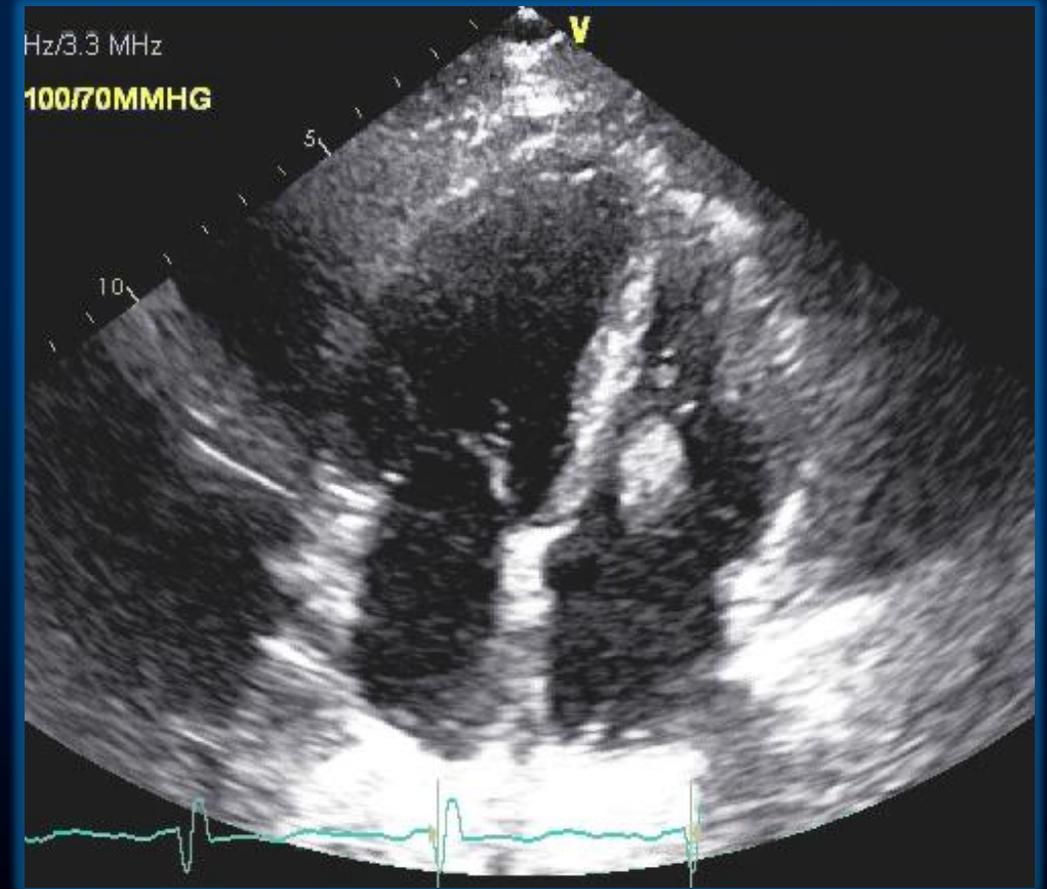
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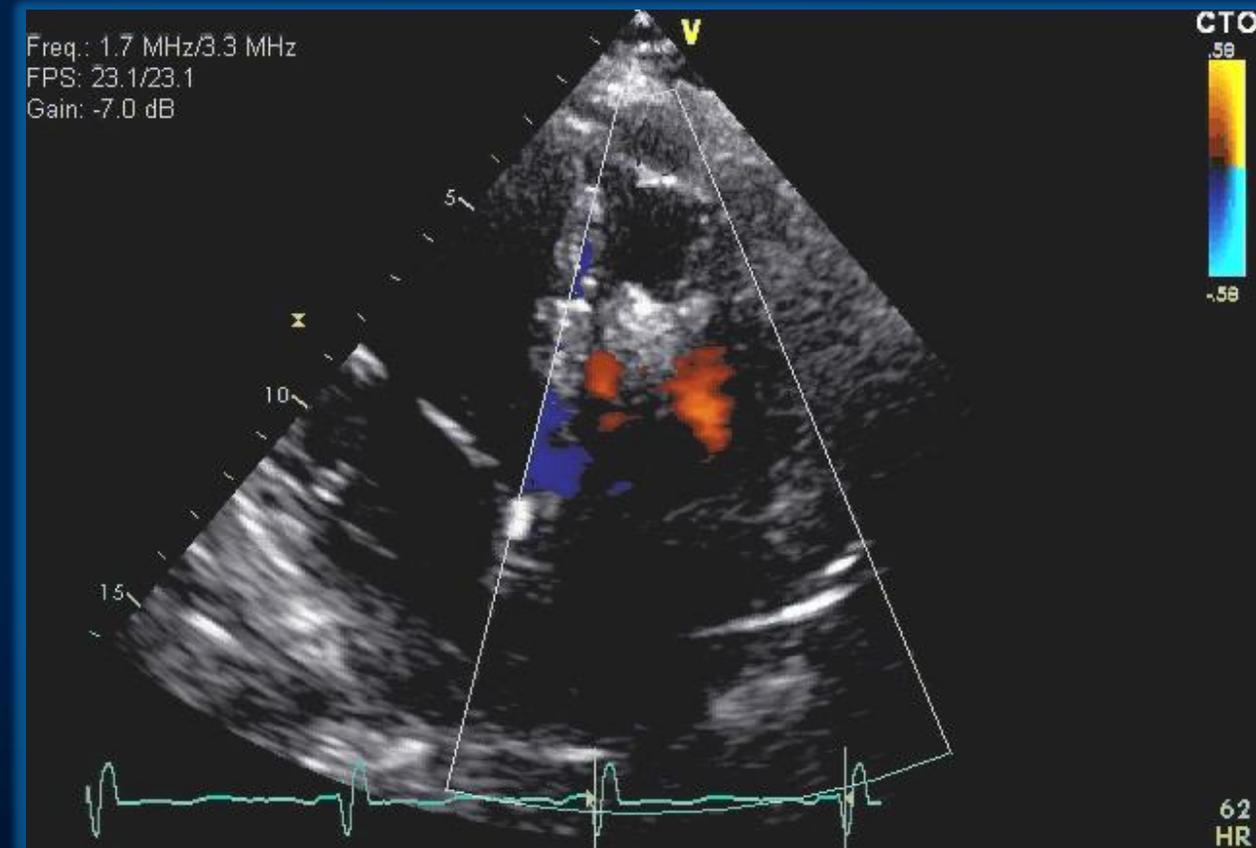
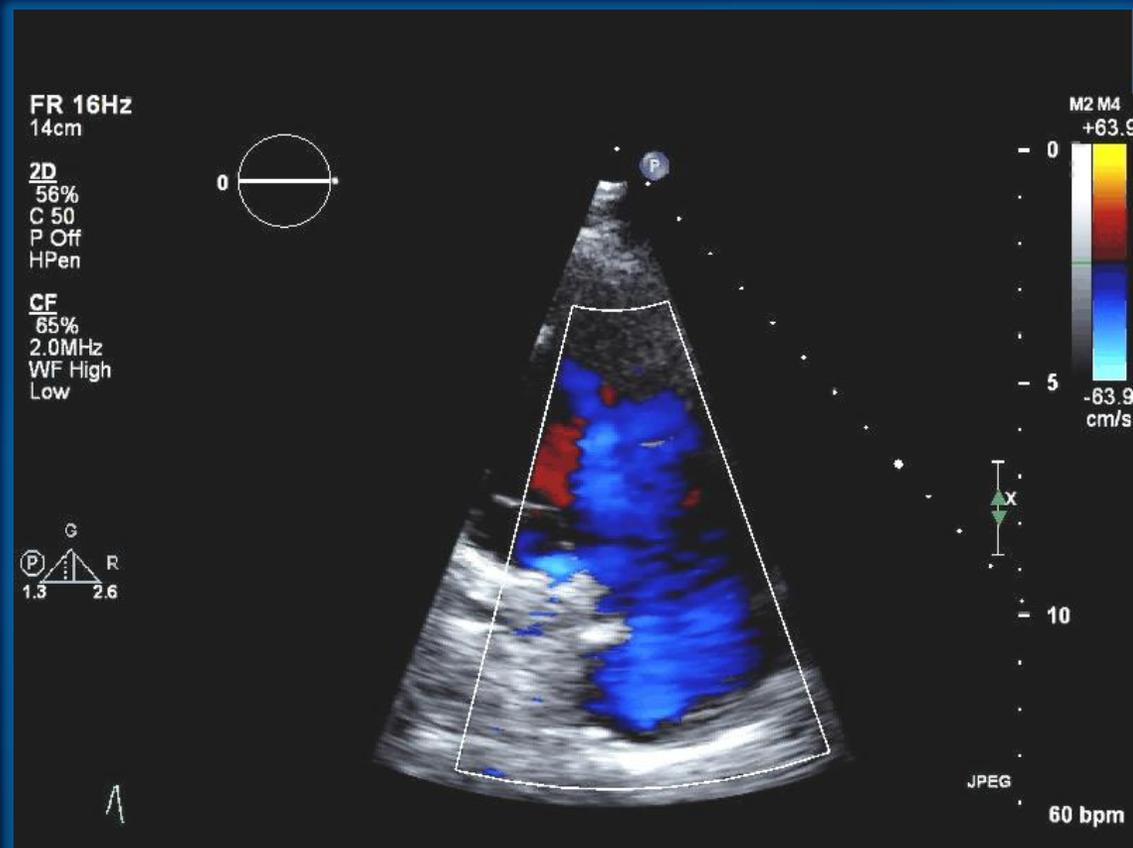
FORMA: follow-up



Baseline



6 months



Baseline

NYHA class II

6 months

Improved 6 min walk

Reduced NT-proBNP

TR: Take Home Points

- **Clinical impact:** TR is bad for you

- **Quantitation:** Eyeball assessment frequently wrong

Tricuspid Valve
Forgotten No More

- **Interventions:** game changer in TR



Thank you

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