

# Right Ventricular Function in Chronic Tricuspid Regurgitation

---

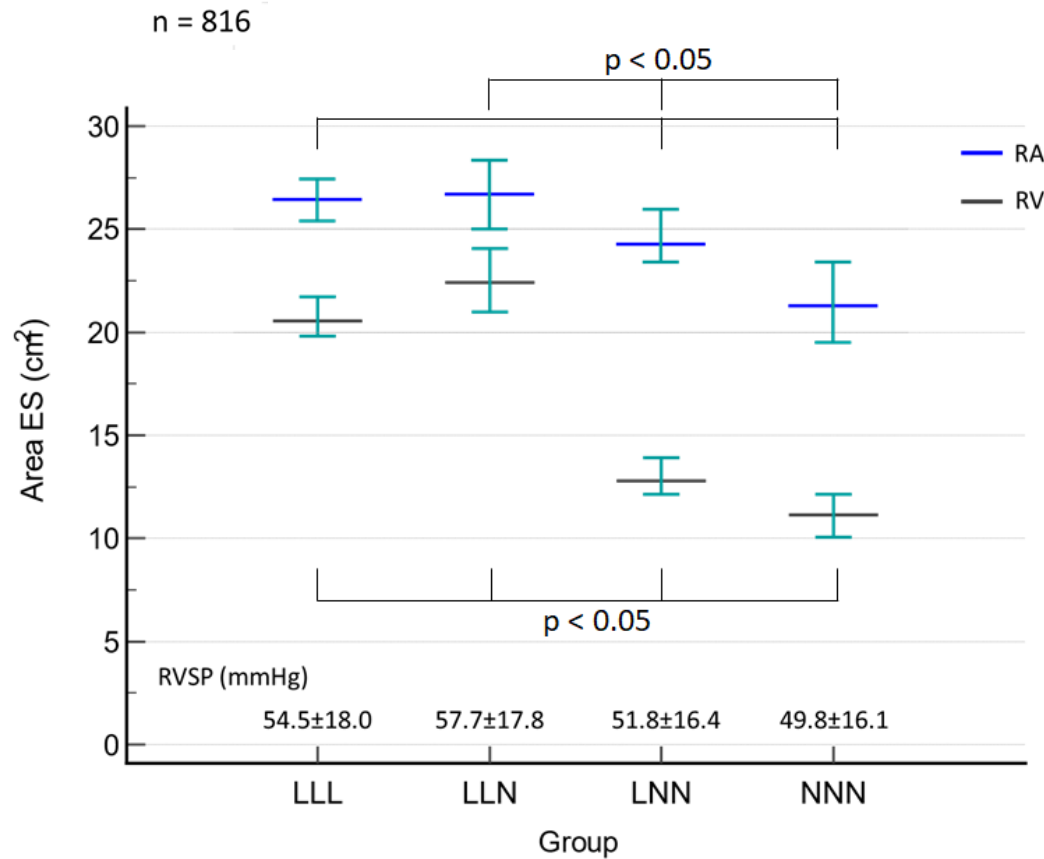
Xiao Zhou MD PhD  
Chinese PLA Hospital  
Beijing China



Conflict of Interest:  
None



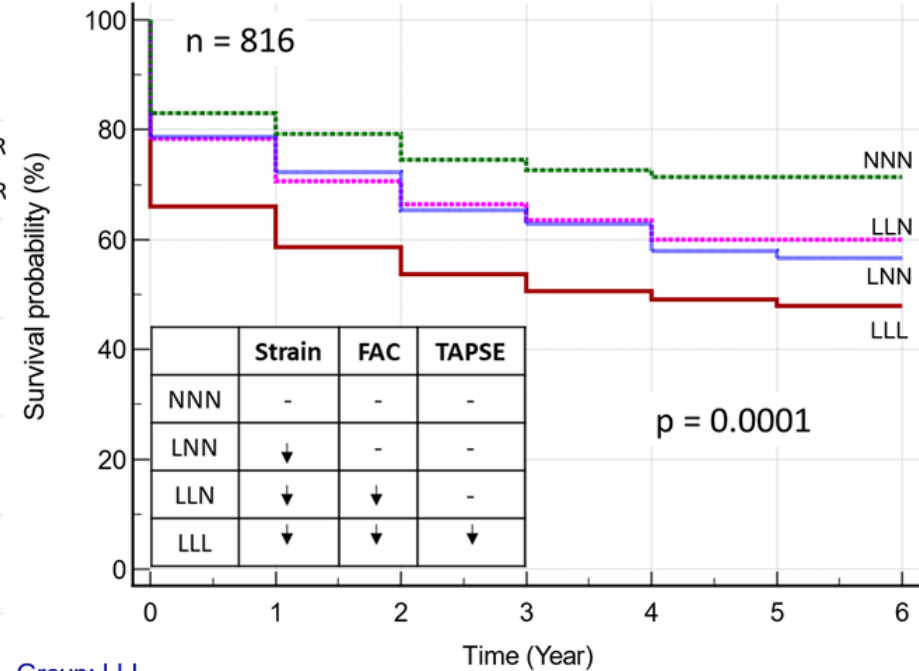
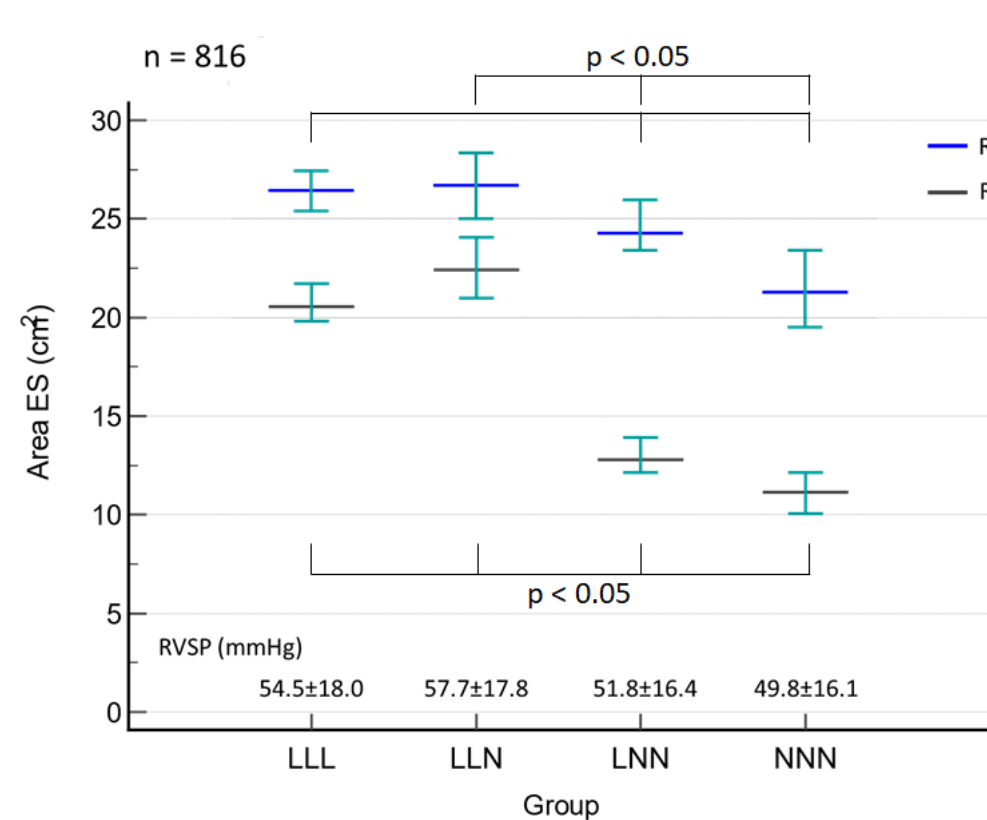
# RV Free Wall Strain in TR



	Strain	FAC	TAPSE
NNN	-	-	-
LNN	↓	-	-
LLN	↓	↓	-
LLL	↓	↓	↓



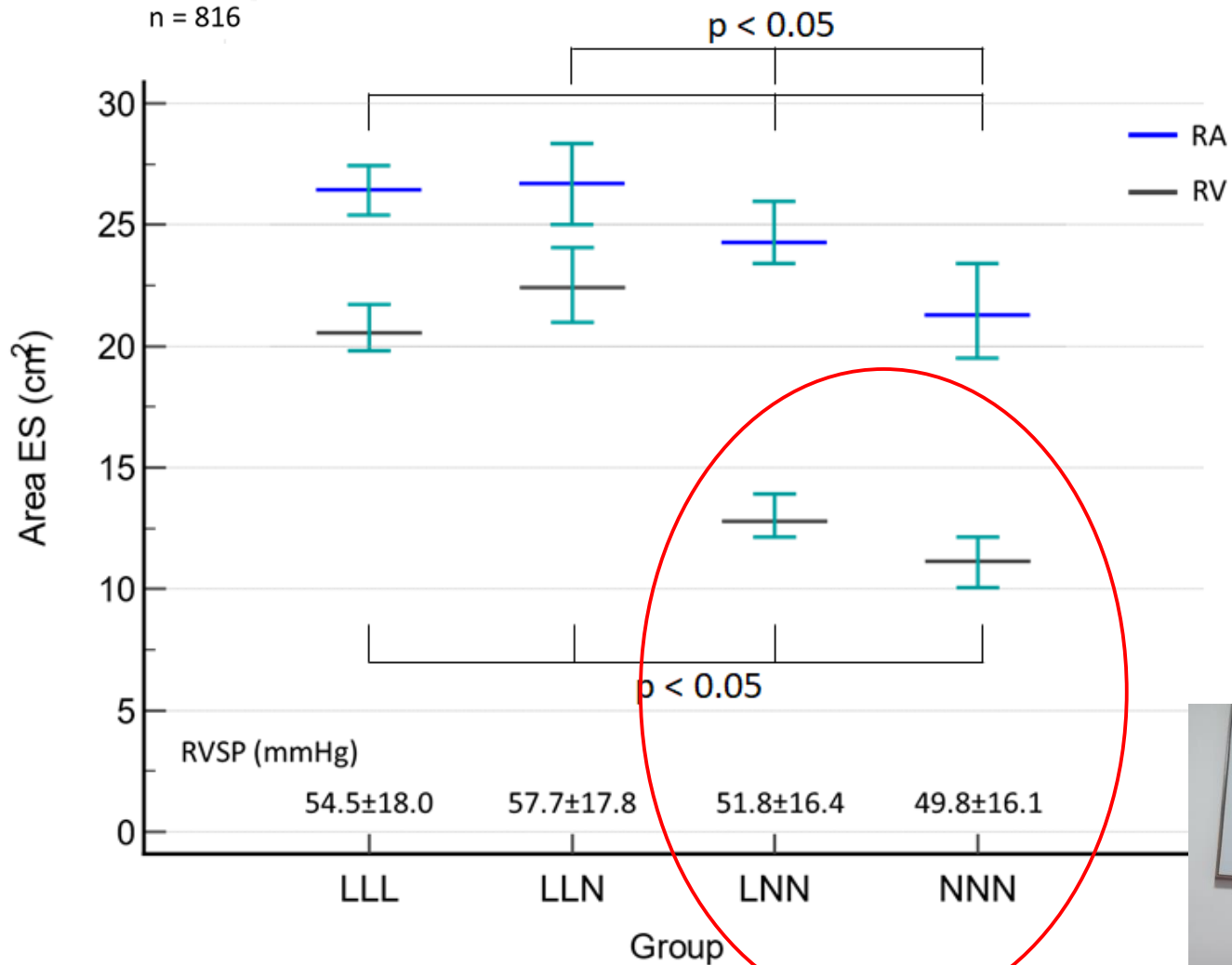
# RV Free Wall Strain in TR



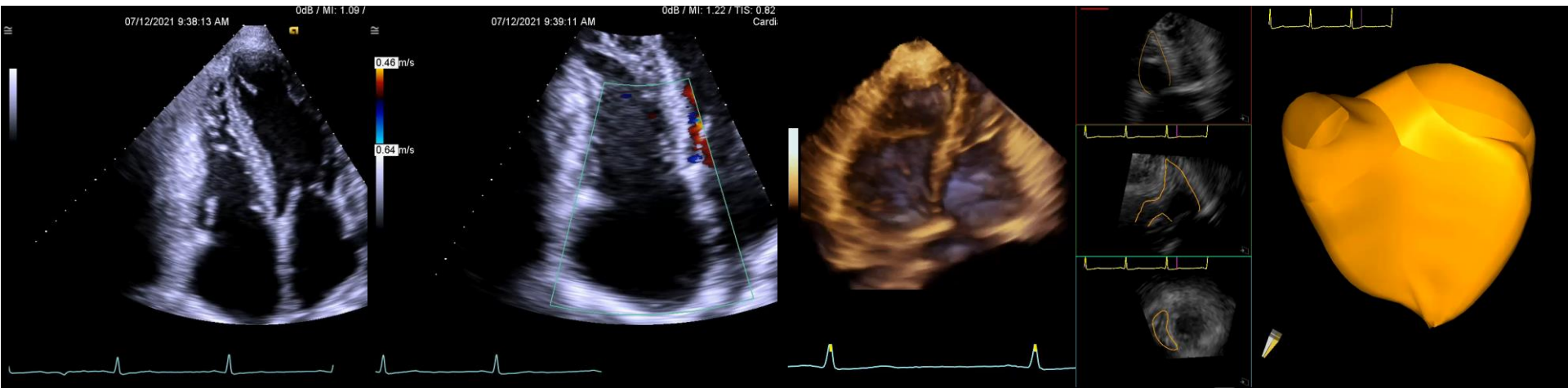
Group: LLL	241	214	191	134	84	40	0
Group: LLN	112	101	91	54			
Group: LNN	159	146	131	89			
Group: NNN	88	84	79	58			



# RV Free Wall Strain in TR



# LNN- TR



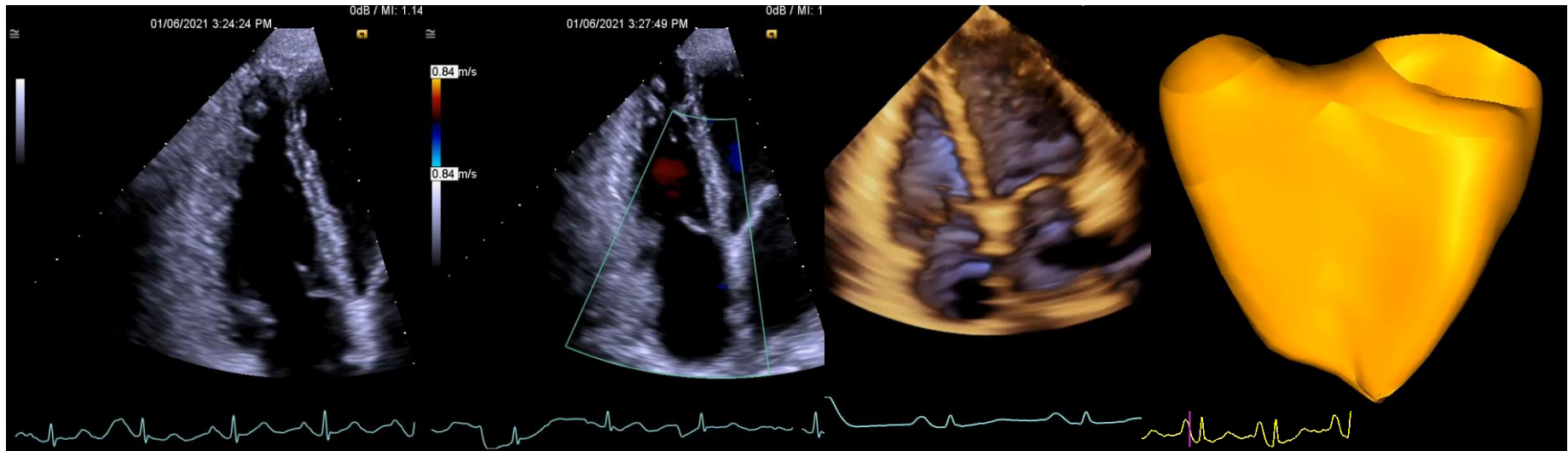
RA Area = 30.3 cm<sup>2</sup>  
**RV Area = 16.1 cm<sup>2</sup>**  
RV Basal D = 42 mm  
TAPSE = 19 mm  
FAC = 46.6%  
FWS = 12.6 %

PISA EROA = 0.86 cm<sup>2</sup>  
VC = 8 mm

**EDV/EDVi = 220 ml/110 ml m<sup>2</sup>**  
RVEF = 43%



# NNN- TR



RA Area =  $19.0 \text{ cm}^2$   
**RV Area =  $16.1 \text{ cm}^2$**   
RV Basal D = 31 mm  
TAPSE = 23 mm  
FAC = 59.2%  
FWS = 28 %

PISA EROA =  $0.38 \text{ cm}^2$   
VC = 8 mm

**EDV/EDVi =  $92 \text{ ml}/63 \text{ ml m}^2$**   
EF = 61%



So, does normal Strain, FAC and TAPSE (NNN)  
in a normal-sized RV with normal EF  
indicate a compensated RV?  
How do we confirm this?

---



# One non-invasive approach is to assess the **Hemodynamic power of the RV**

The hemodynamic power or the intra-ventricular pressure gradient vector considers the spatial contraction pattern (strain) and how it matches with blood flow forces thus providing information on wall stress that is incremental to strain and volume measurements.

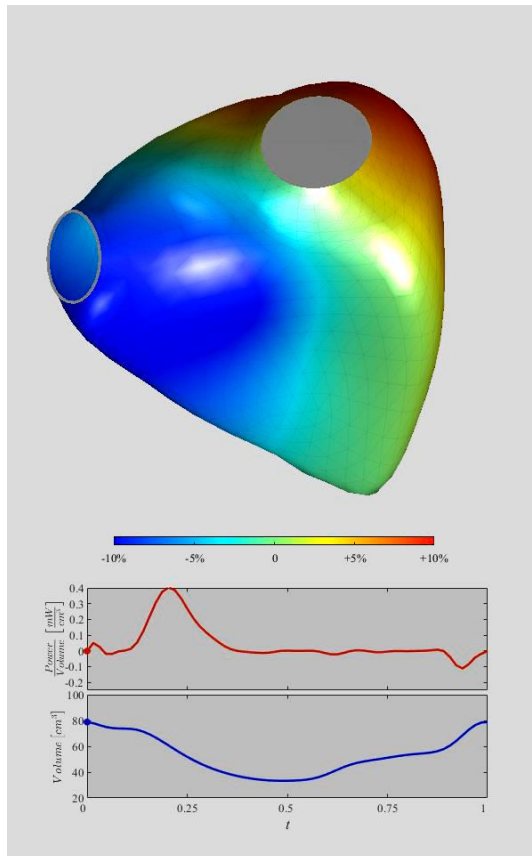
---





# RV Hemodynamic Force

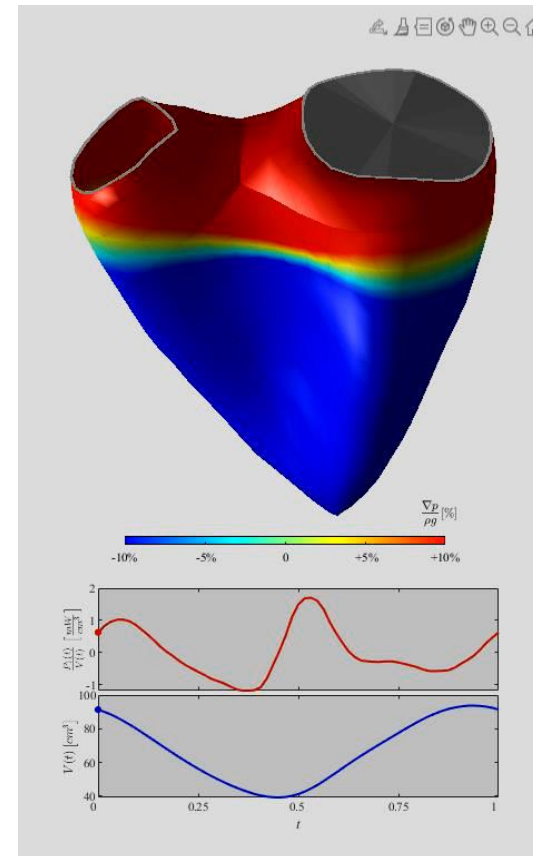
**Normal**



Power normalized  
to volume

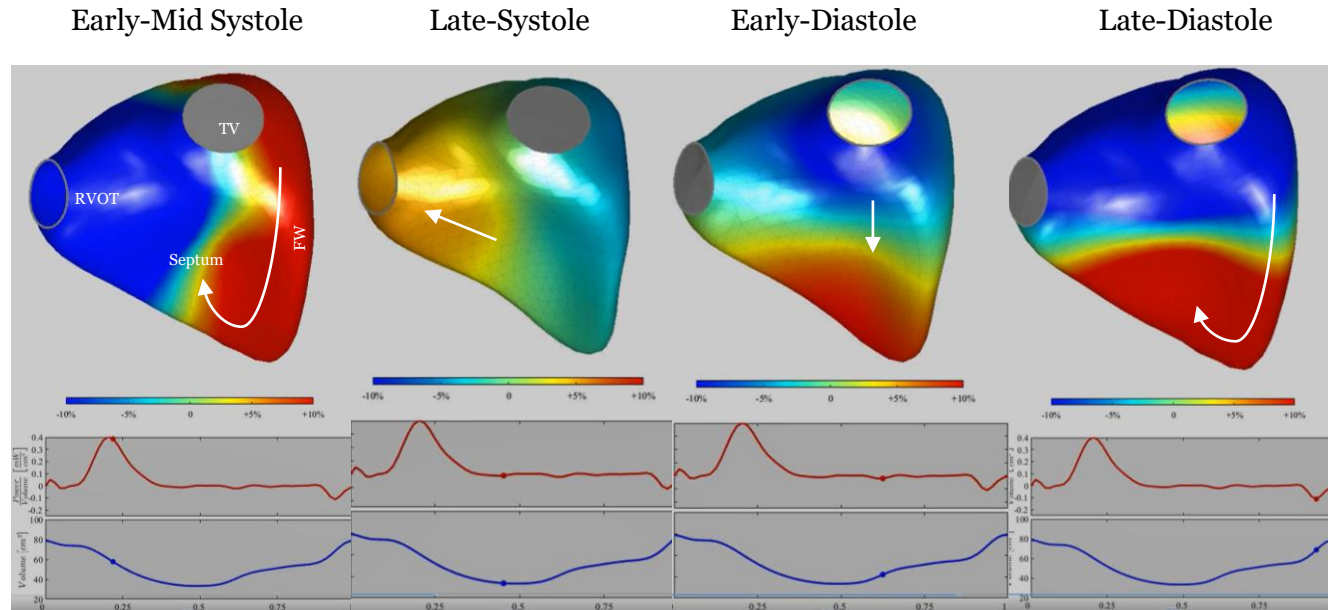
Volume change  
over time

**Moderate to Severe TR with NNN**

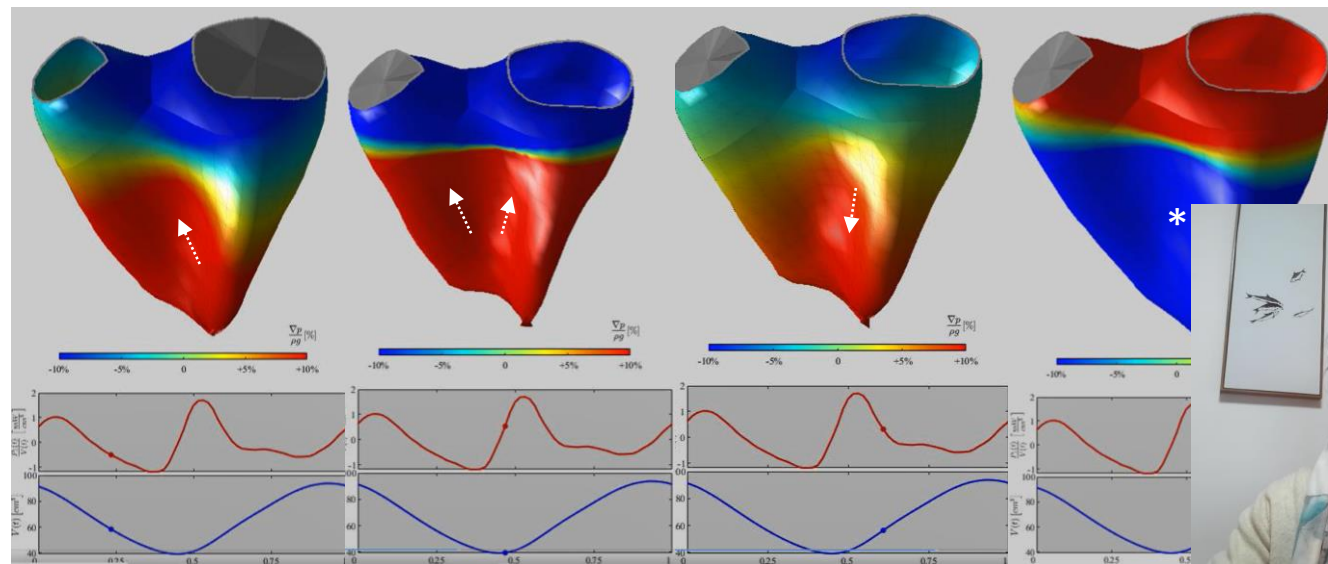


# RV Hemodynamic Power Through Cardiac Cycle

**Normal**

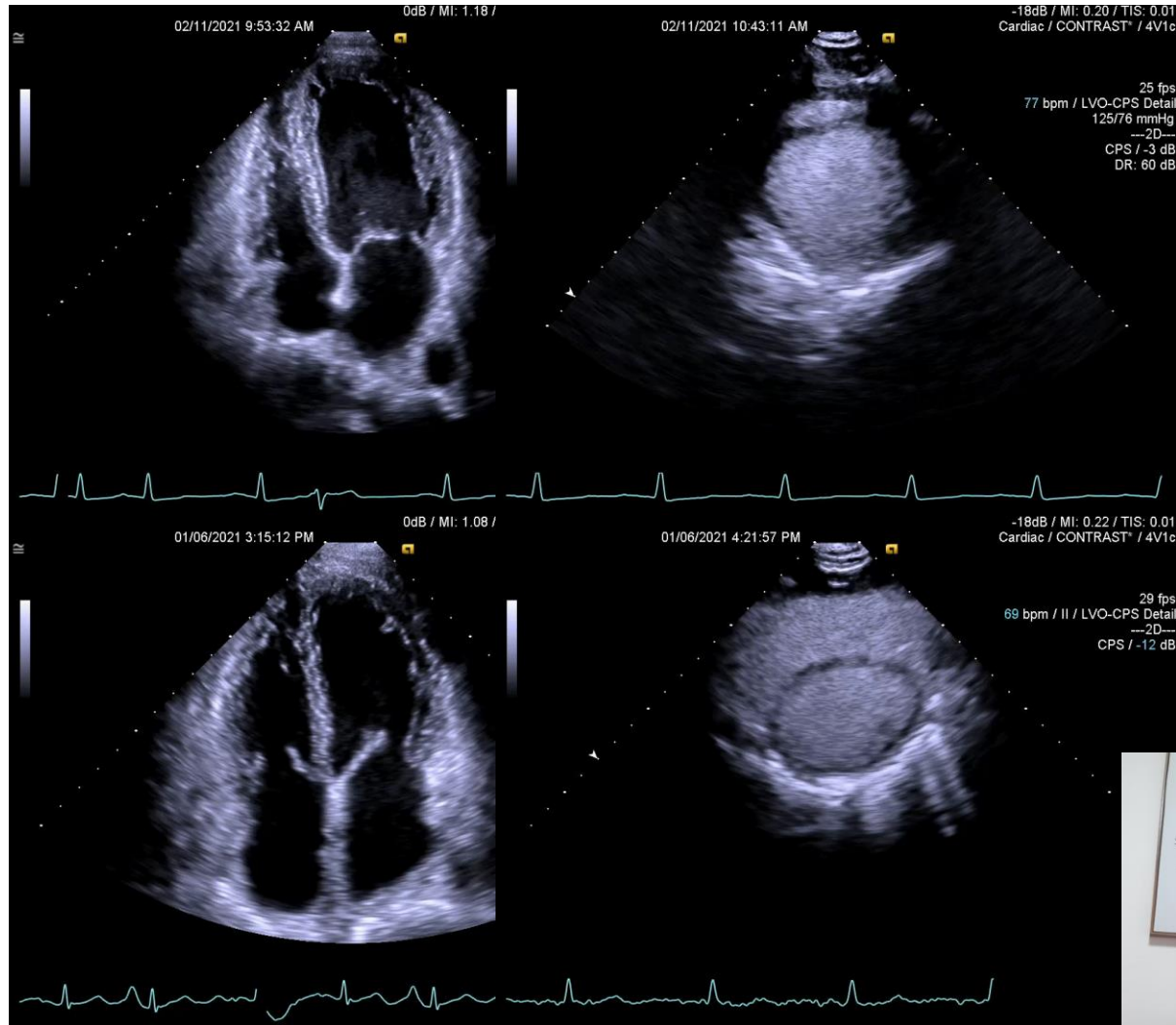


**Moderate to Severe TR with NNN**



# Septal Shape and RV Function

**Normal**



**Moderate to Severe TR with NNN**



# Summary

---

**Hemodynamic power** which integrates direction of **intraventricular pressure gradient** developed by direction of **blood flow**, and the resulting **wall stress** may be an early marker of subclinical RV dysfunction, even before strain becomes abnormal.

This needs further studies.



Thank You

