

To Lyse or Not to Lyse

POCUS FOR PULMONARY EMBOLISM

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NO DISCLOSURES

RV ASSESSMENT FOR RV FAILURE

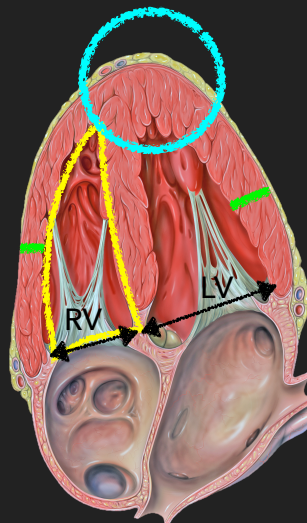
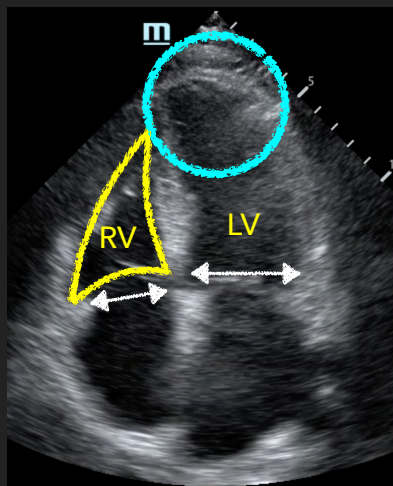
- ▶ Sudden pulmonary hypertension
- ▶ Pulmonary embolus

RV ASSESSMENT

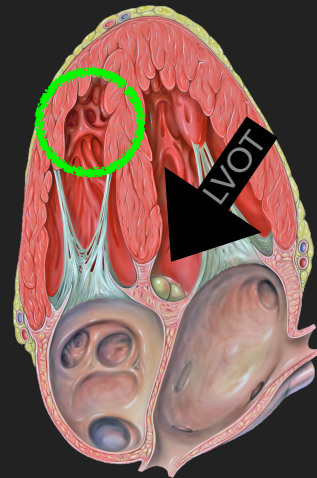
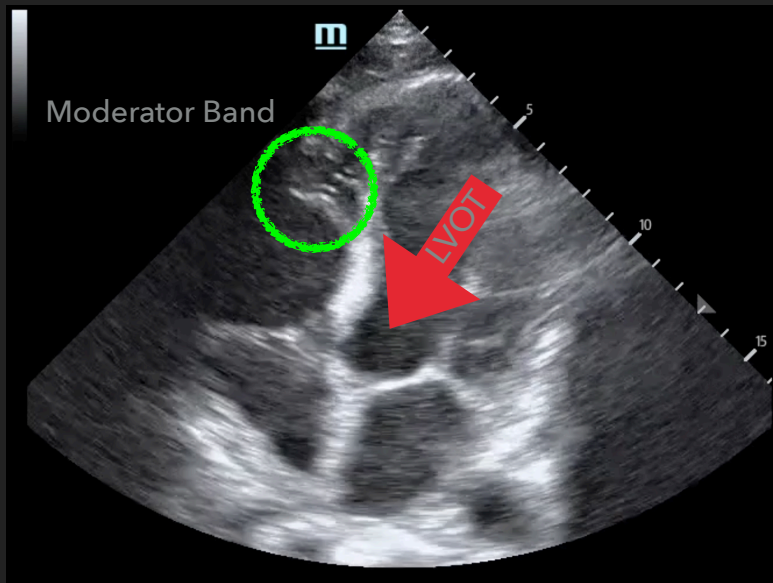
- ▶ RV morphology (size, shape)
- ▶ Interventricular septum
- ▶ McConnell's sign
- ▶ Systolic Function (TAPSE)
- ▶ RV wall thickness

NORMAL RV ANATOMY

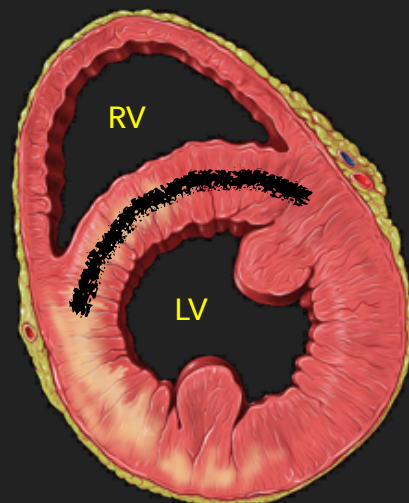
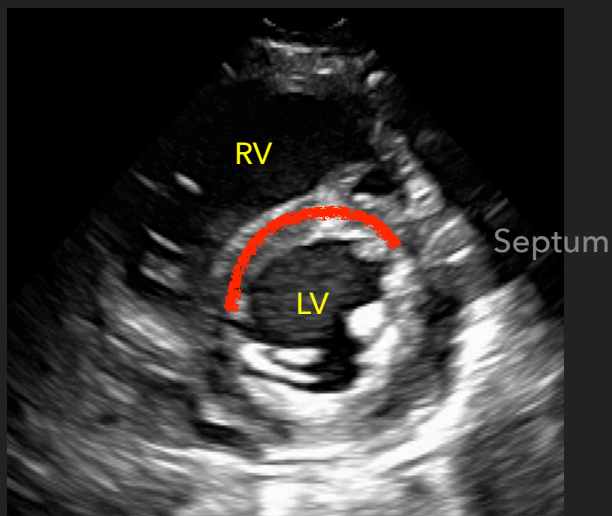
NORMAL RV: APICAL 4 CHAMBER



RIGHT VERSUS LEFT VENTRICLE



NORMAL RV: PSSA



RV MORPHOLOGY

RV MORPHOLOGY

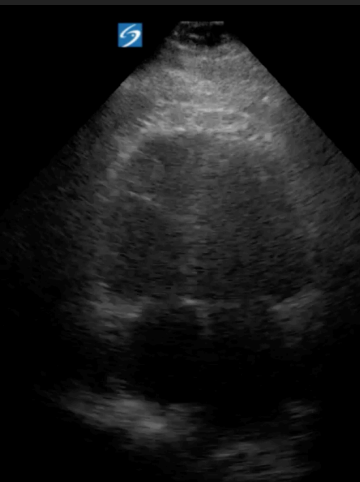
Normal

Moderate Dilatation

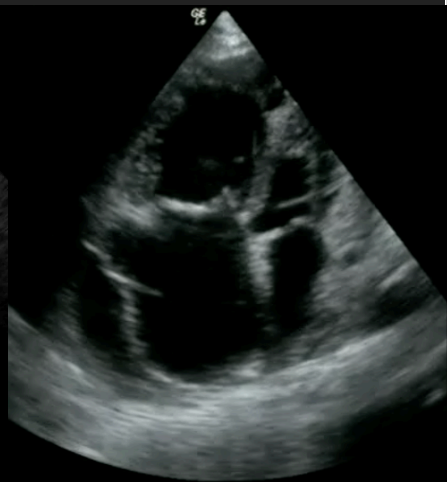
Severe RV Dilatation



RV < 2/3 LV
Apex LV

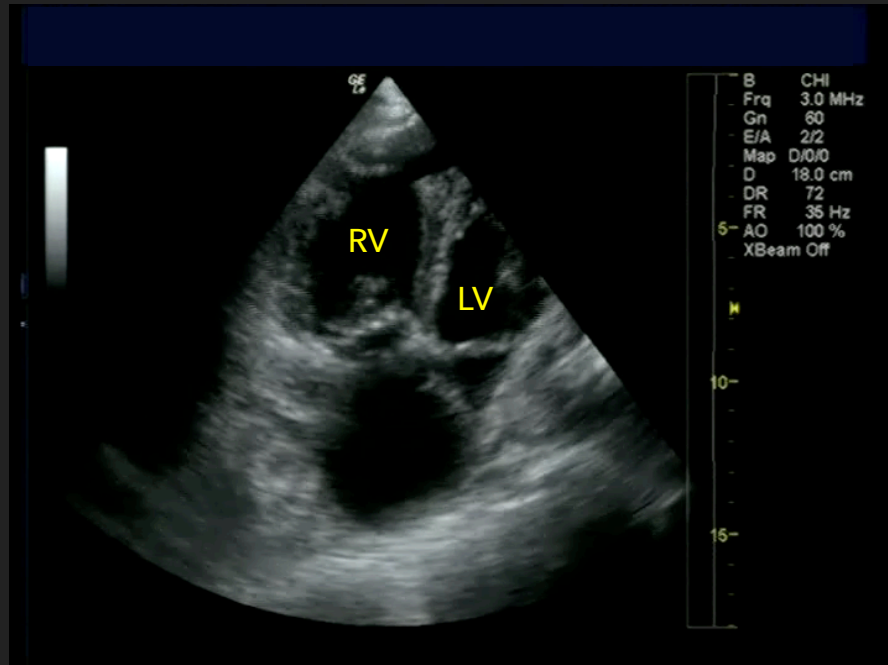


RV = LV
Apex Both



RV > LV
Apex RV

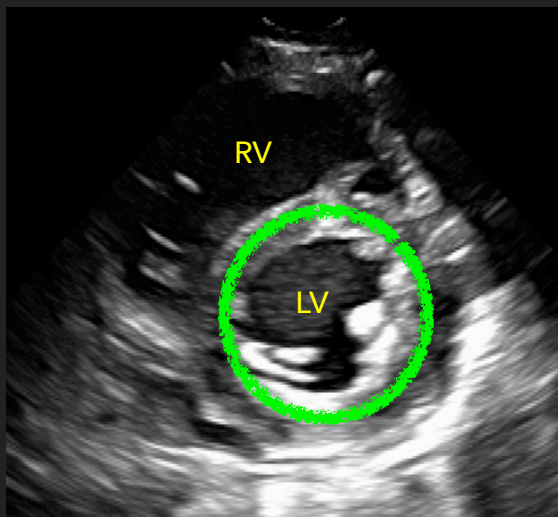
RV DILATATION



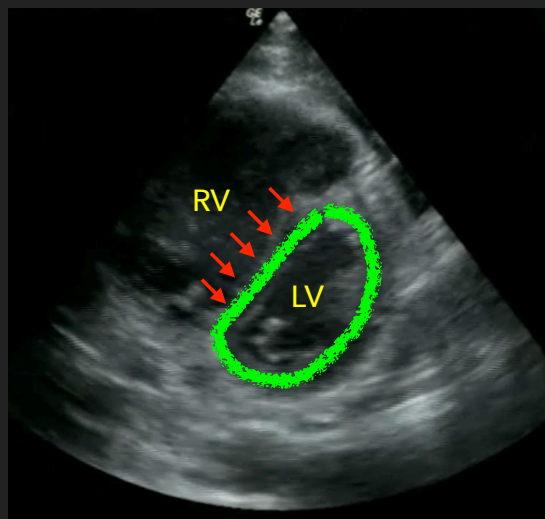
INTERVENTRICULAR SEPTUM

INTERVENTRICULAR SEPTAL CHANGES

Normal

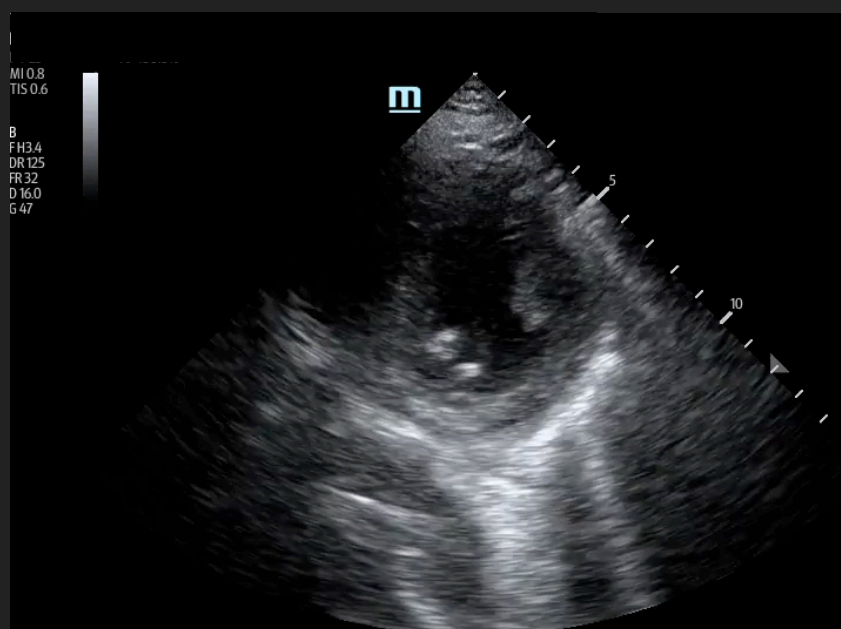


RV STRAIN

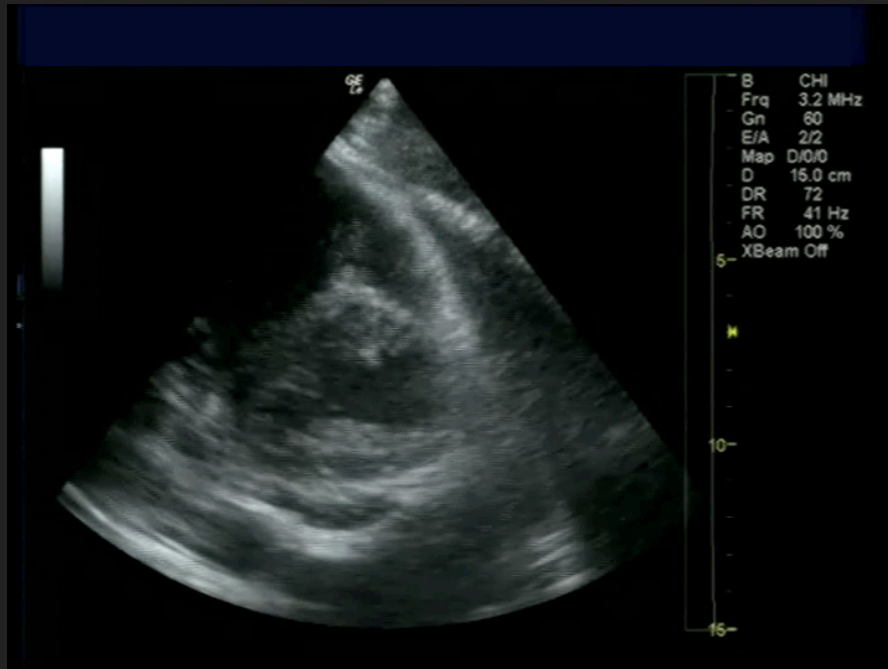


"D Sign"

SEPTAL DEVIATION (EARLY)



SEPTAL FLATTENING (LATE)



McCONNELL'S SIGN

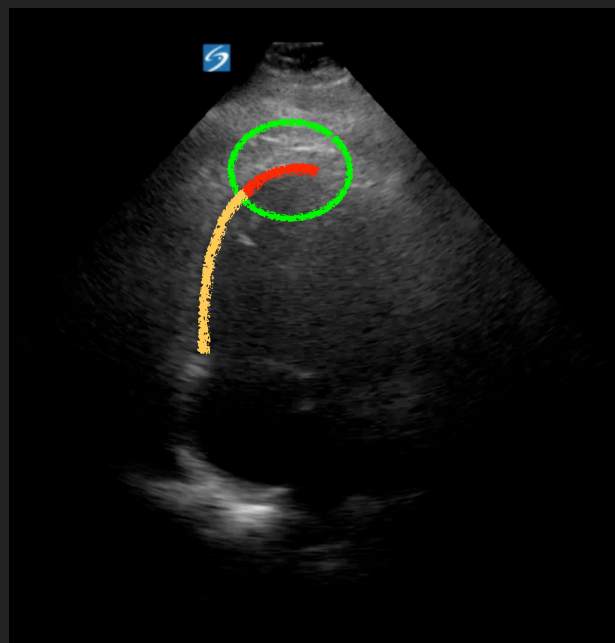
McCONNELL'S SIGN

Hypokinesis/akinesis of RV free wall

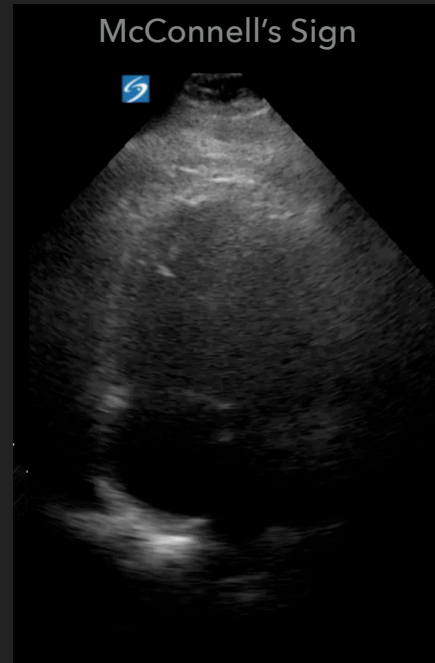
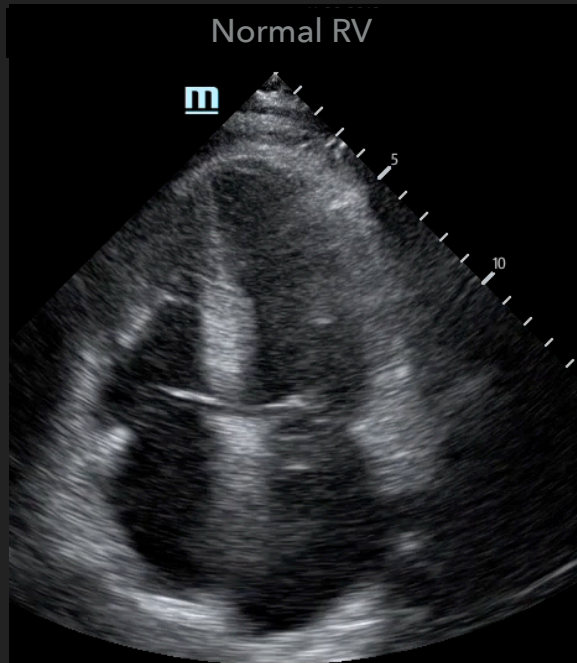
+

Normal/hyperdynamic RV apical movement

McCONNELL'S SIGN



McCONNELL'S SIGN



SYSTOLIC FUNCTION TAPSE

TAPSE

Tricuspid

Annular

Plane

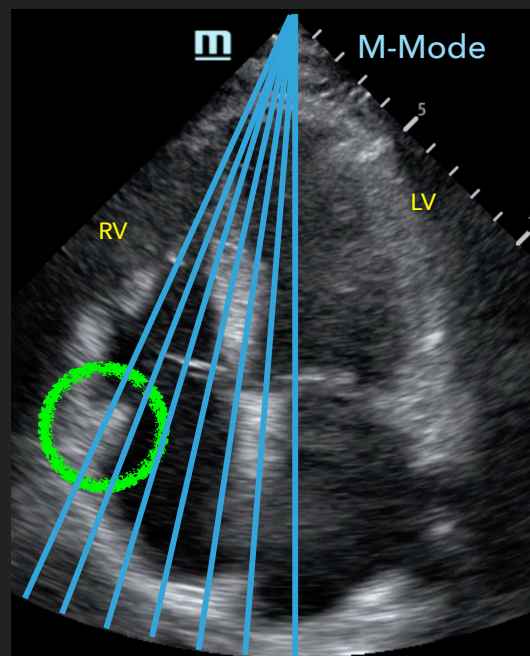
Systolic

Excursion

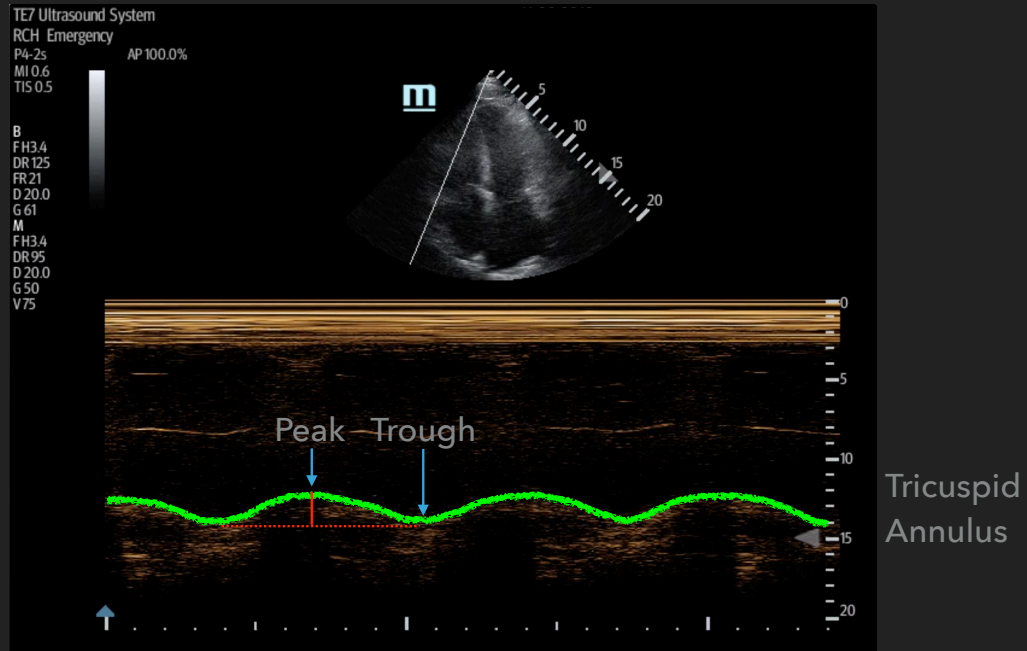
Assess the maximal longitudinal movement of tricuspid annulus to estimate RV systolic function

TAPSE

Lateral Tricuspid Annulus



TAPSE



**TAPSE < 16 MM SUGGESTS
RV DYSFUNCTION**

TEST CHARACTERISTICS FOR PE

	SENS	SPEC	+LR	-LR
TAPSE	36.96%	94.12%	6.28	0.67
RV Dilatation	26.09%	96.08%	6.65	0.77
D Sign	13.04%	100.00%		0.87
McConnell's	31.74%	98.05%	11.16	0.80

Dwyer KH et al. Diagnosing centrally located pulmonary embolisms in the emergency department using point-of-care ultrasound. Am J Emerg Med 2018.

POCUS CAN HELP RULE IN
ACUTE PE, NOT RULE OUT

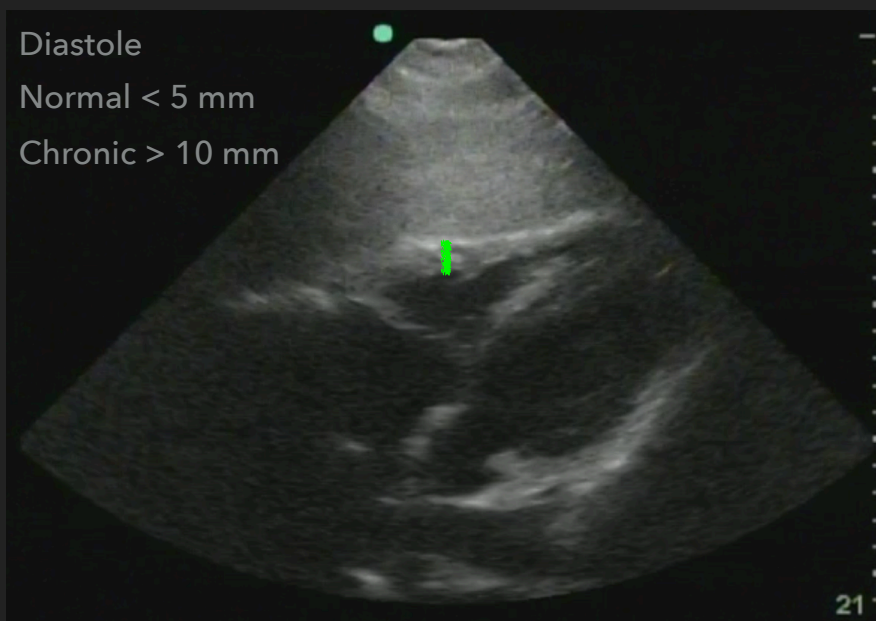
WALL THICKNESS

RV WALL THICKNESS

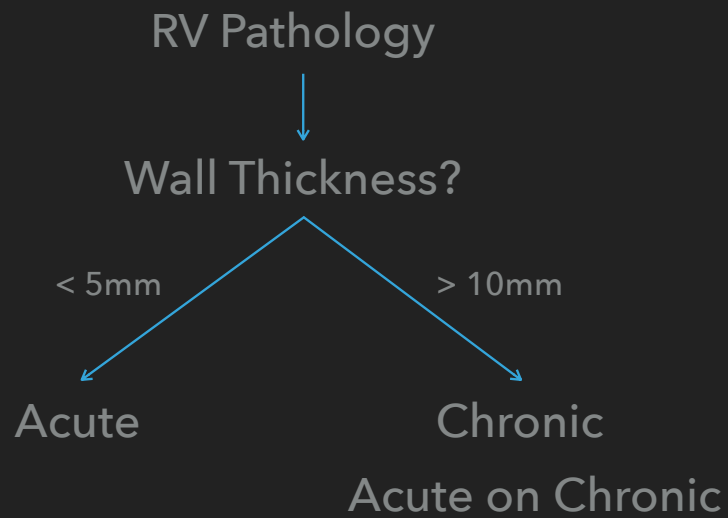
Diastole

Normal < 5 mm

Chronic > 10 mm



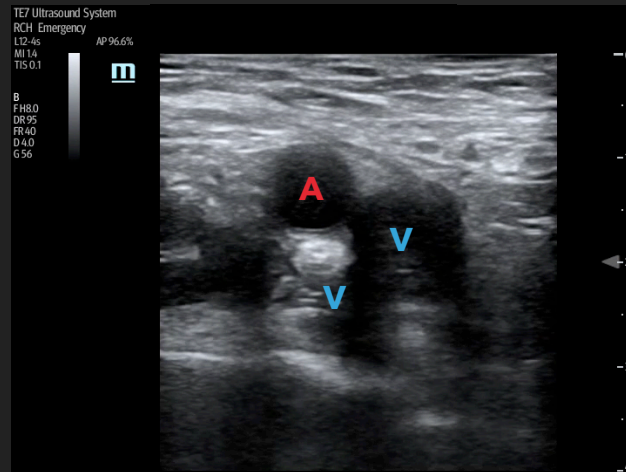
RV WALL THICKNESS



+DVT

DVT

- ▶ RV dilatation combined with compression ultrasound for DVT can improve your sensitivity and specificity



**POCUS IS MOST USEFUL IN PATIENTS
LIKELY TO HAVE HEMODYNAMICALLY
SIGNIFICANT PE**

SUMMARY

- ▶ Many causes of RV dysfunction - interpret within the clinical context
- ▶ POCUS does NOT rule out PE

SUMMARY

- ▶ Signs of RV dysfunction
 - ▶ RV diameter $> 2/3$ of LV diameter
 - ▶ RV morphology more ovoid/apex dominant
 - ▶ Septal deviation or "D Sign" of LV
 - ▶ McConnell's sign
 - ▶ TAPSE < 16 mm
 - ▶ RV wall thickness < 5 mm suggest acute

SUMMARY

- ▶ Add compression US for DVT for added performance
- ▶ Most useful in high pre-test probability for submassive/
massive PE

TO LYSE OR NOT TO LYSE?