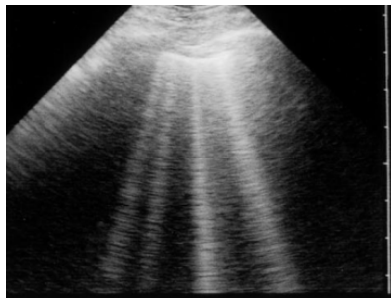


Introduction to FOCUS in hemodynamic instability: bedside cardiac ultrasound

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Centre Hospitalier Universitaire de Montréal



Montreal 2012

Université 
de Montréal



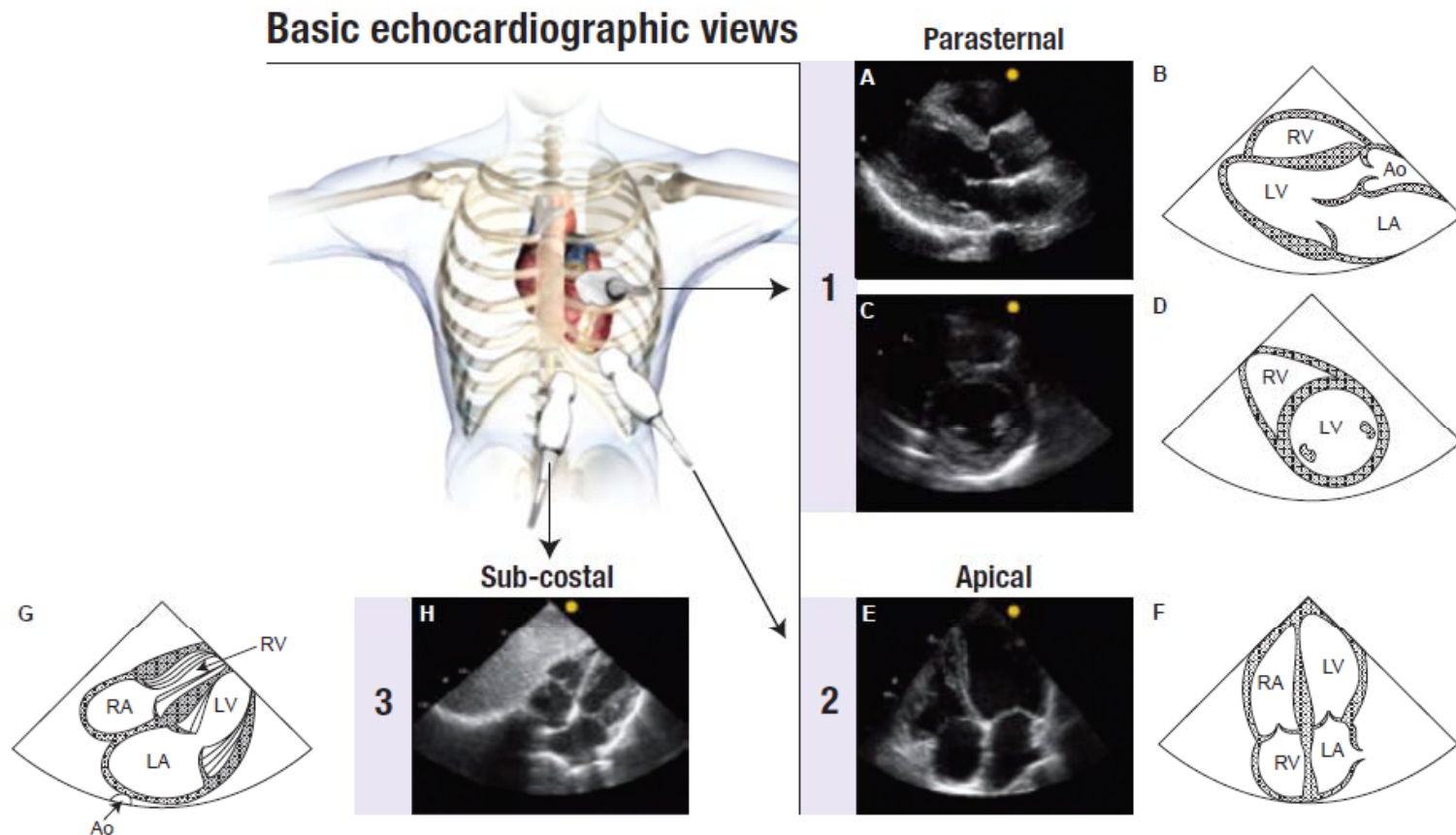
General principles

- Positionning
 - ✓ Patient: respiration
 - ✓ Operator
- Procedure: sterile technique and universal precautions
- What is the key question?

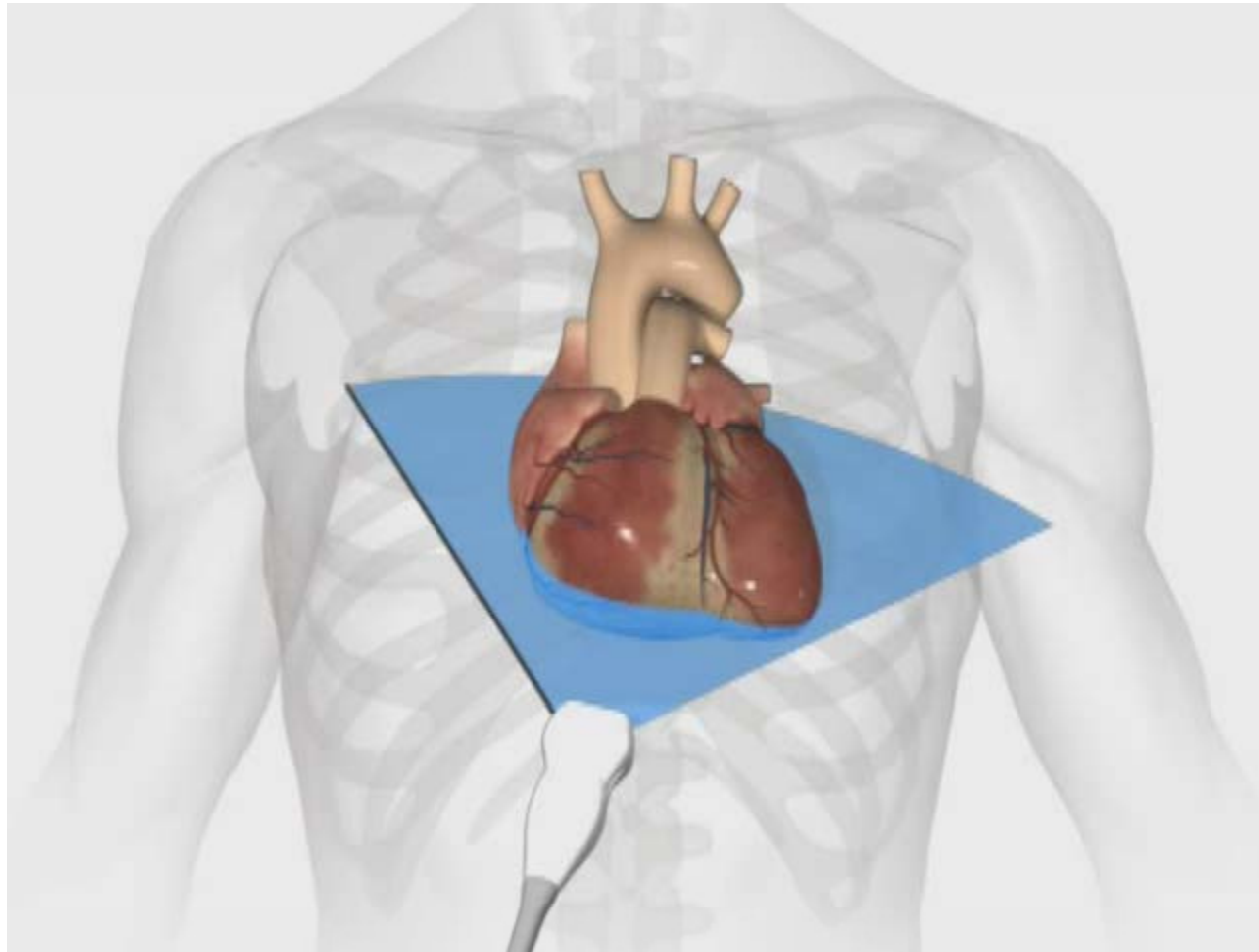
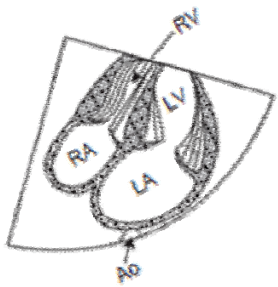
General ultrasound: conventions

- Marker on the transducer
 - ✓ On the right side of the patient
 - ✓ On the top
- Images on the screen
 - ✓ Left screen = right sided or inferior structures
 - ✓ Right screen = left sided or superior
- Movement of the probe
 - ✓ Tilting, rotation, shifting

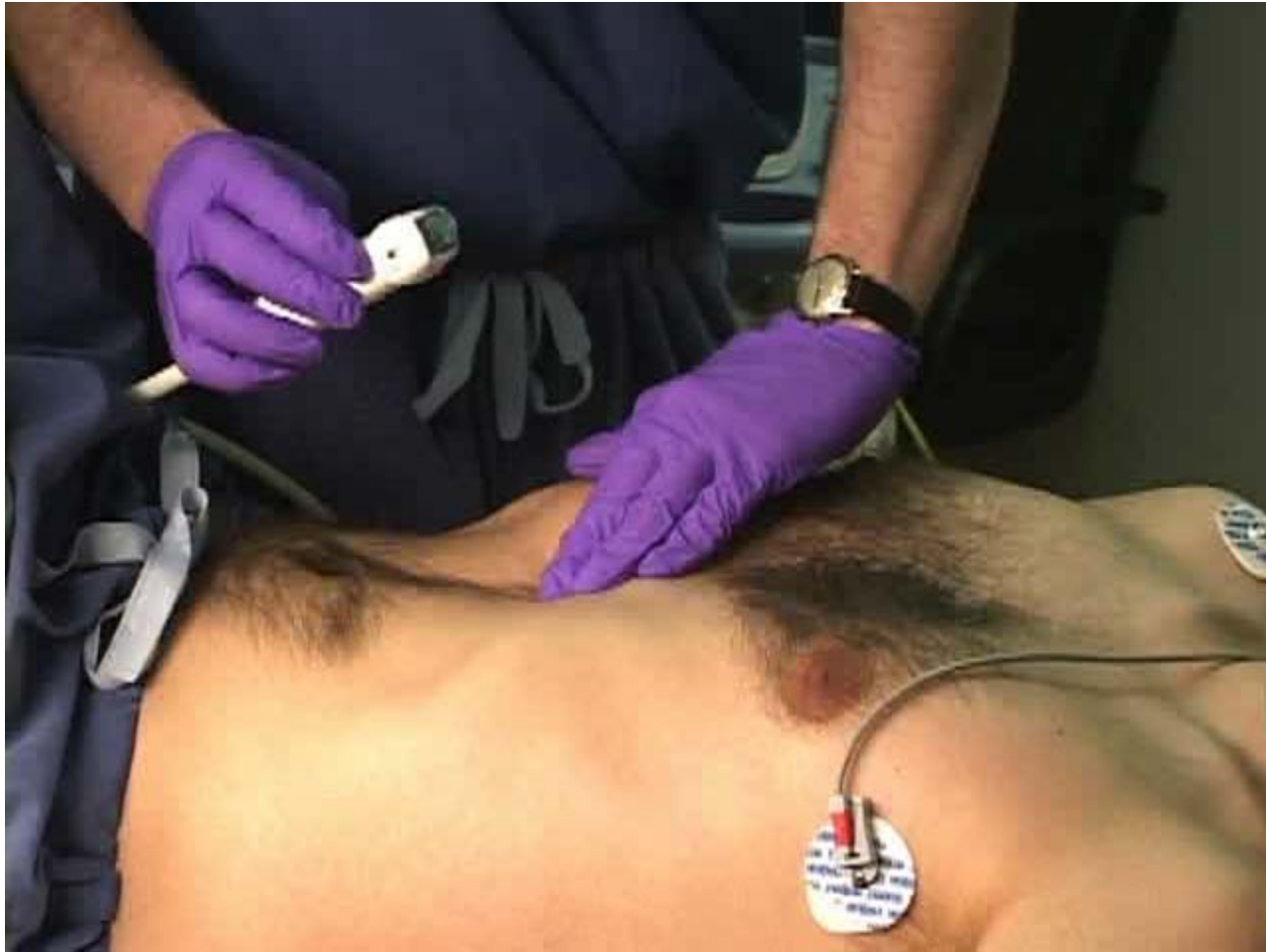
Cardiac ultrasound

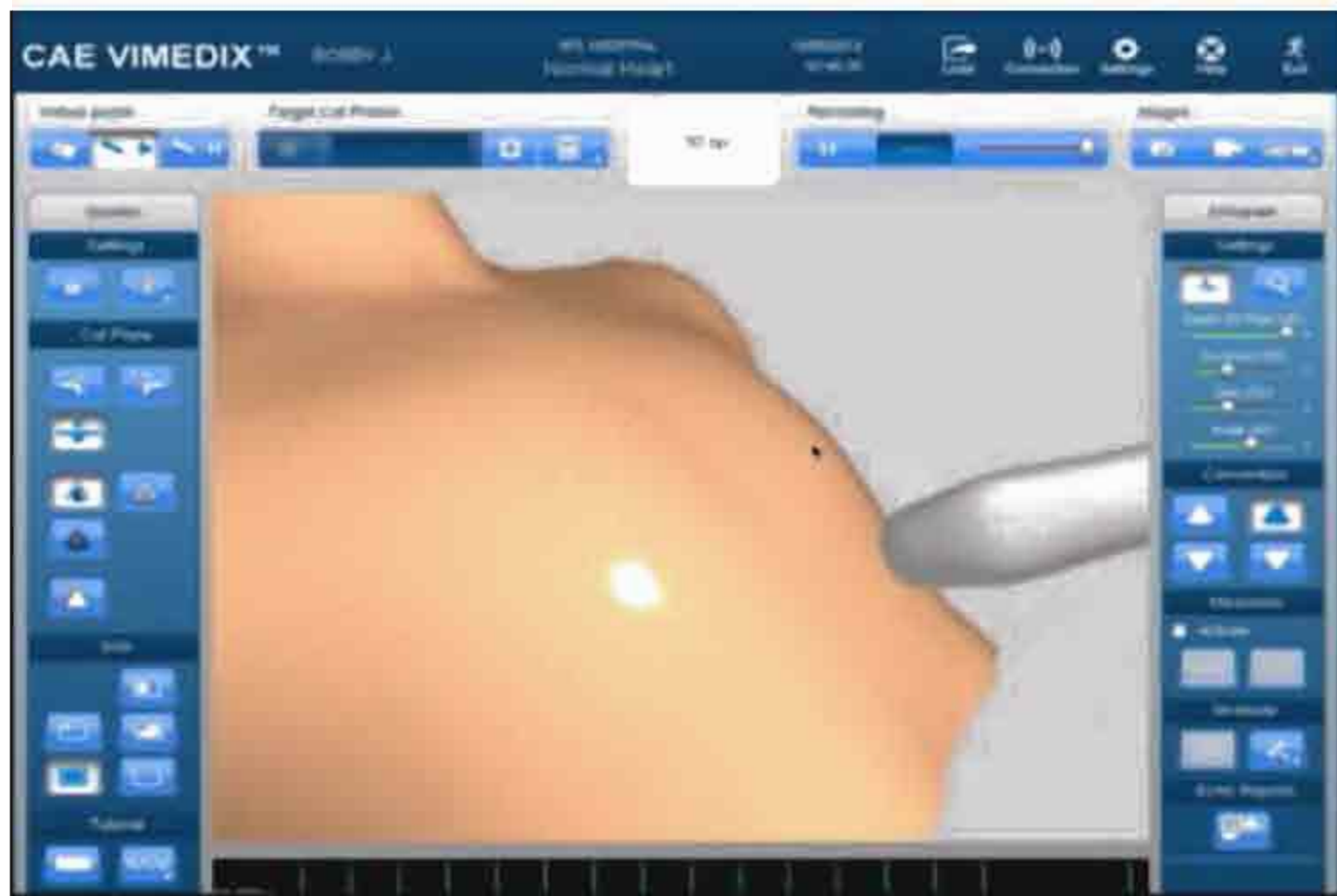


The sub-costal view



The sub-costal view





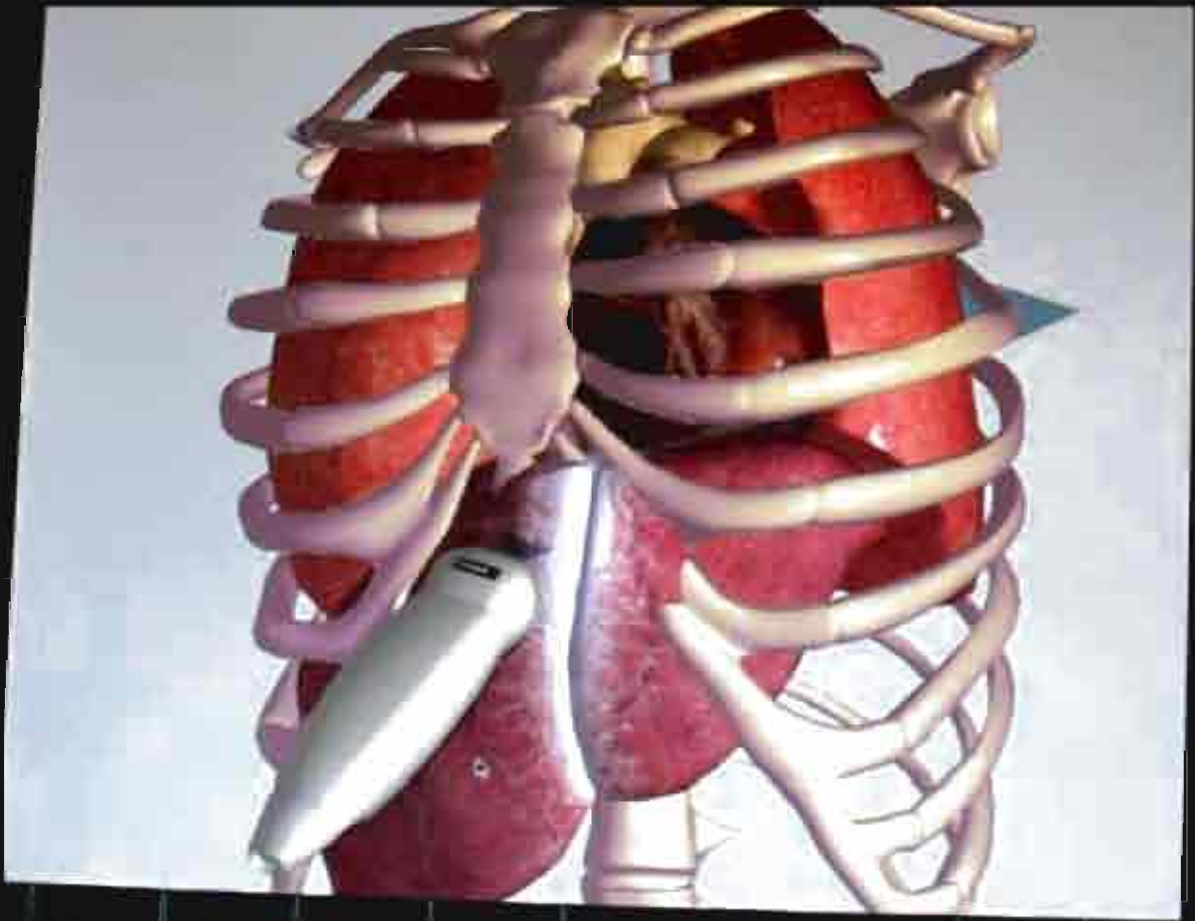
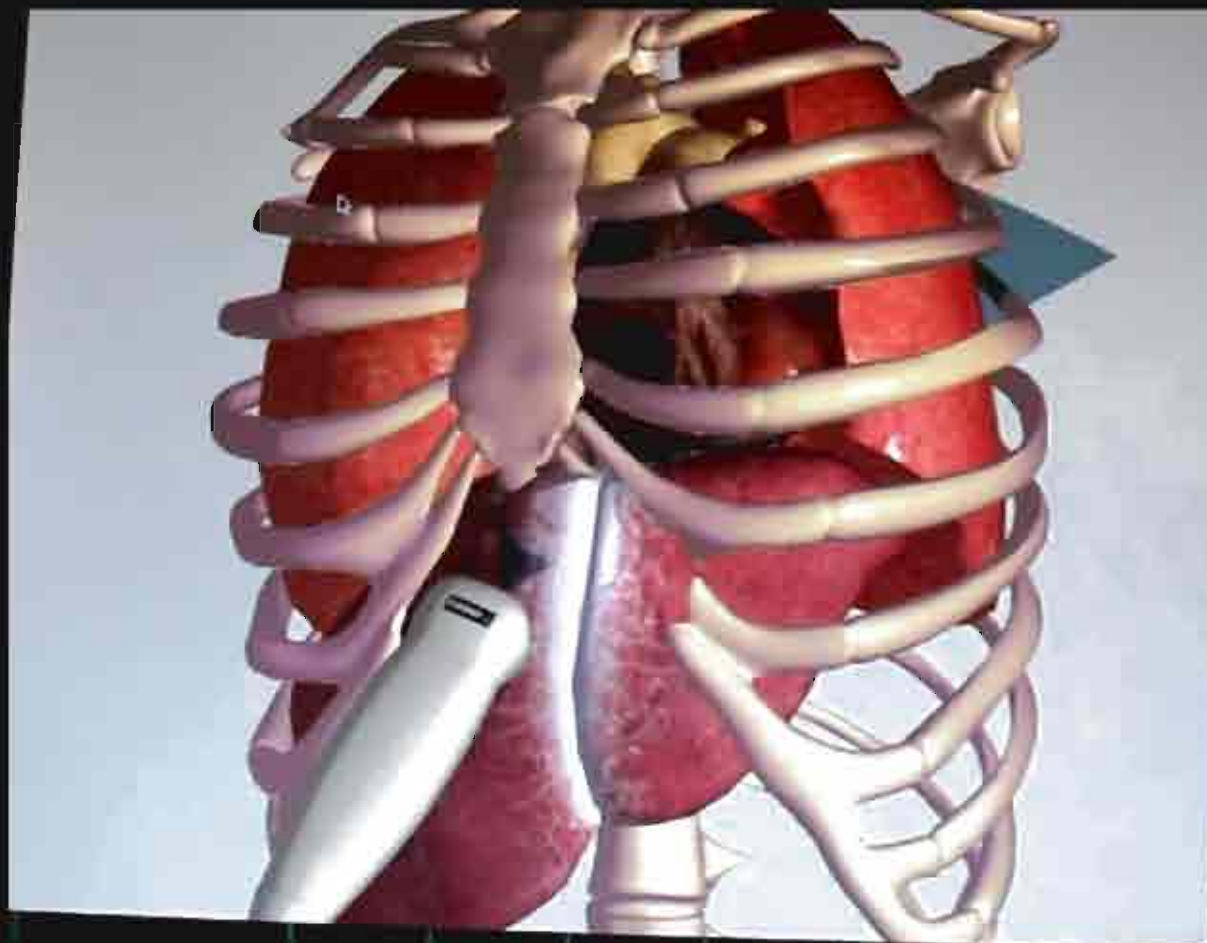
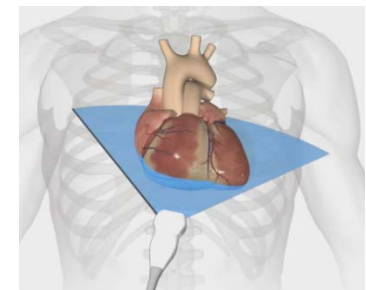
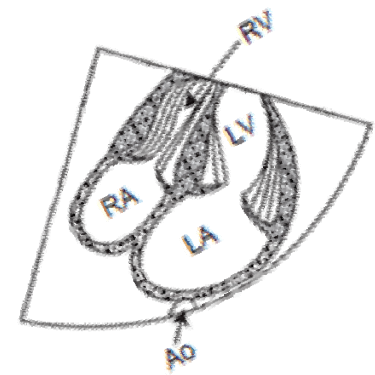
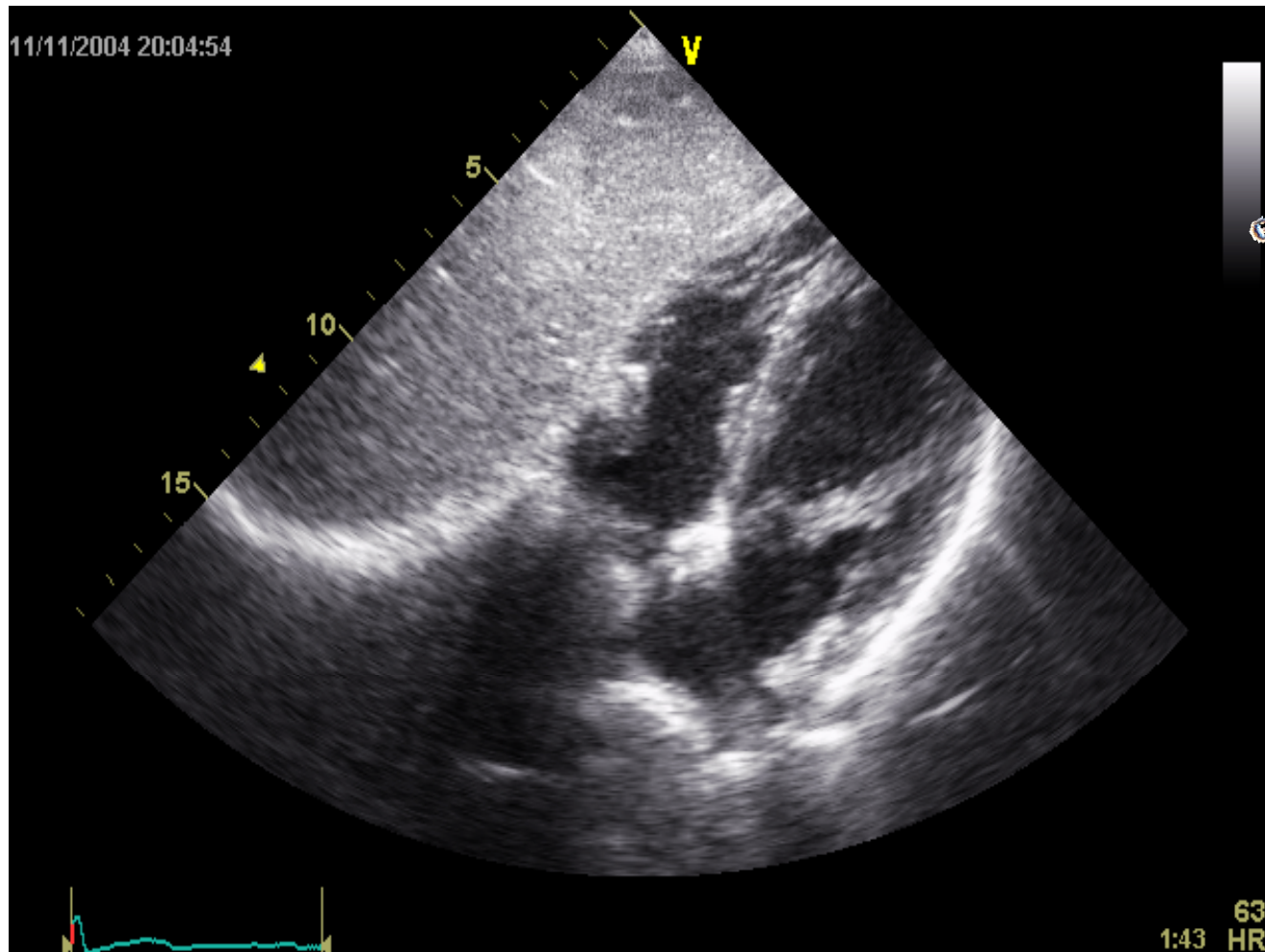


Figure 1: Thoracic cage and lungs

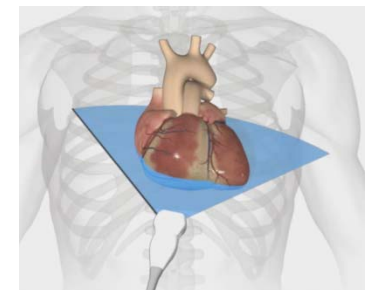
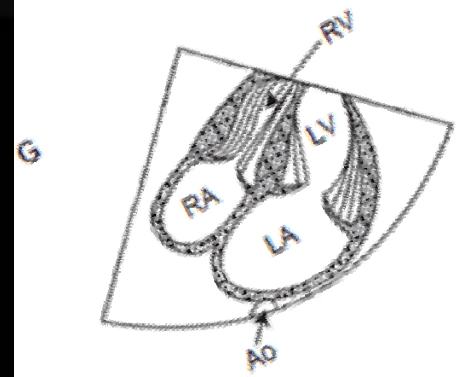
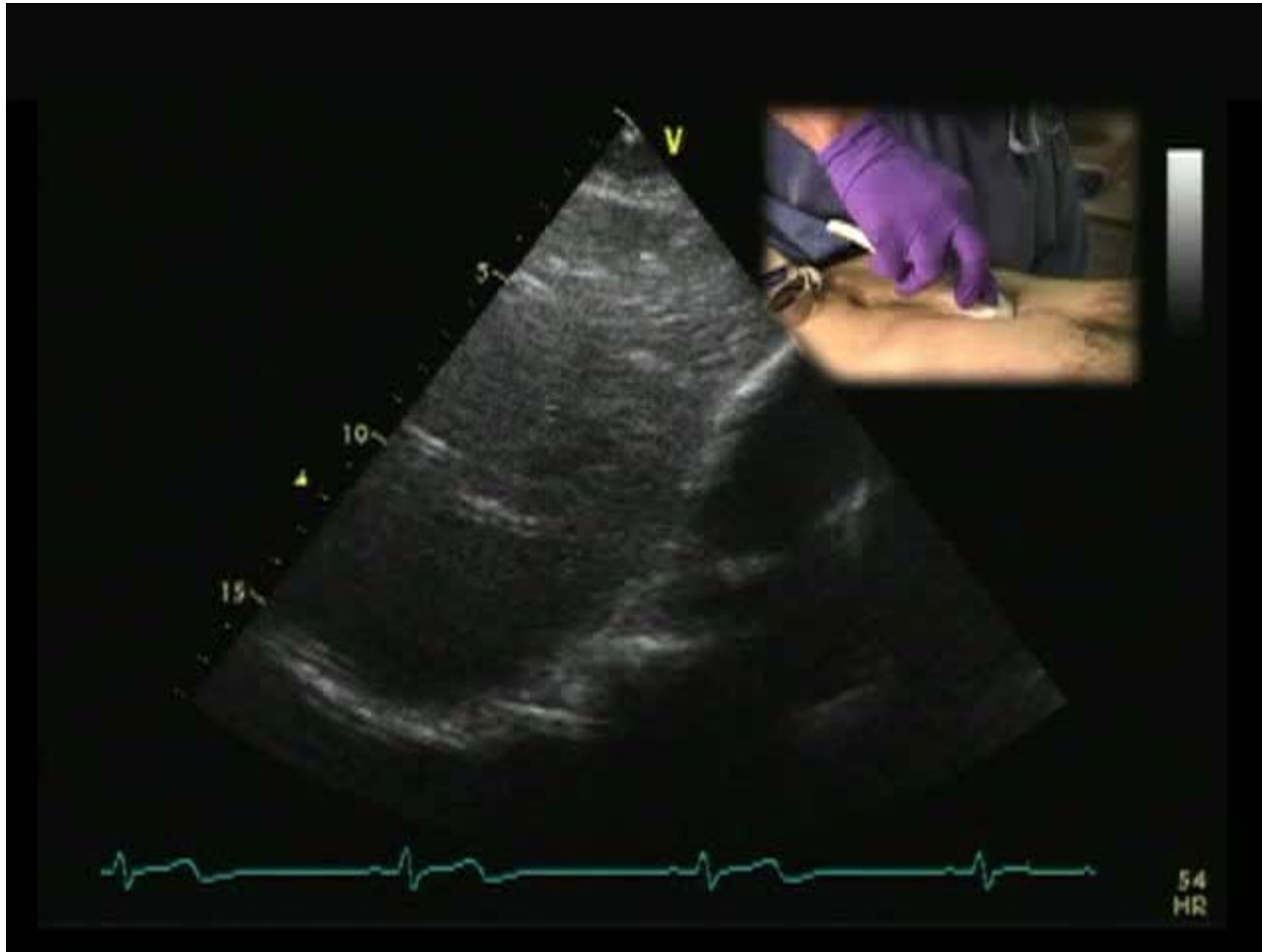




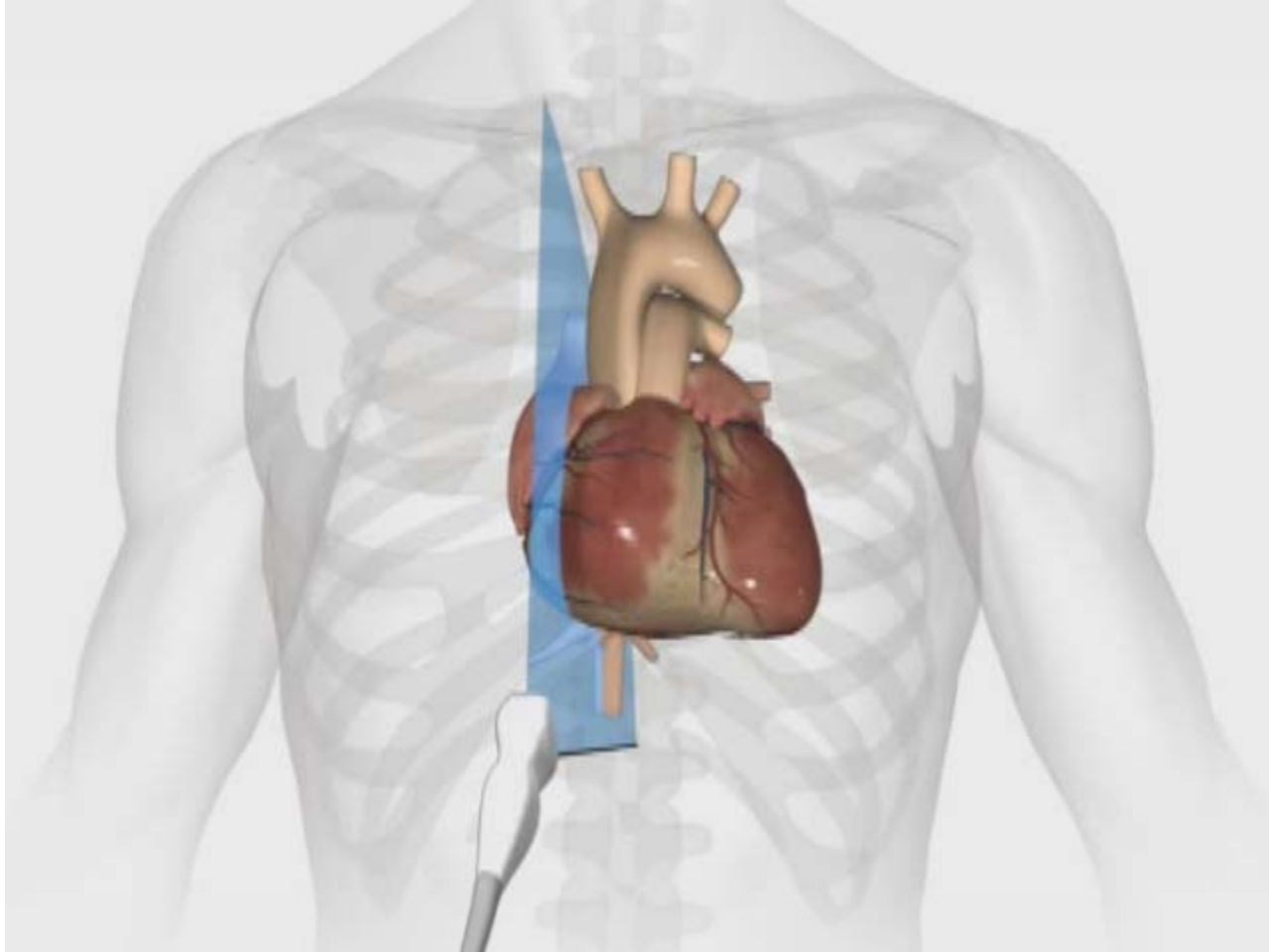
Subcostal: normal



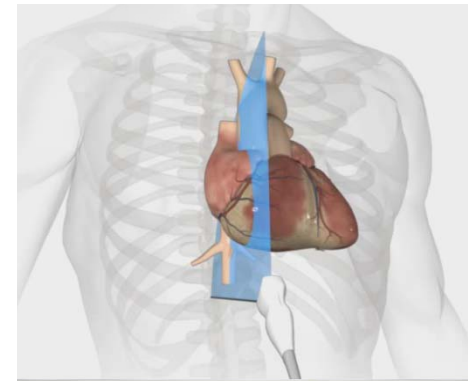
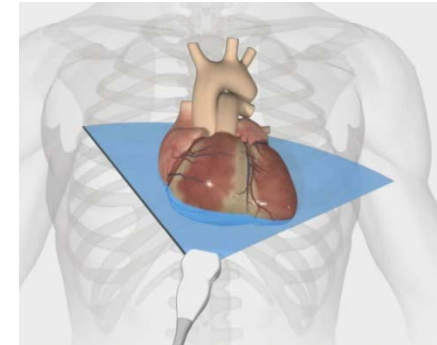
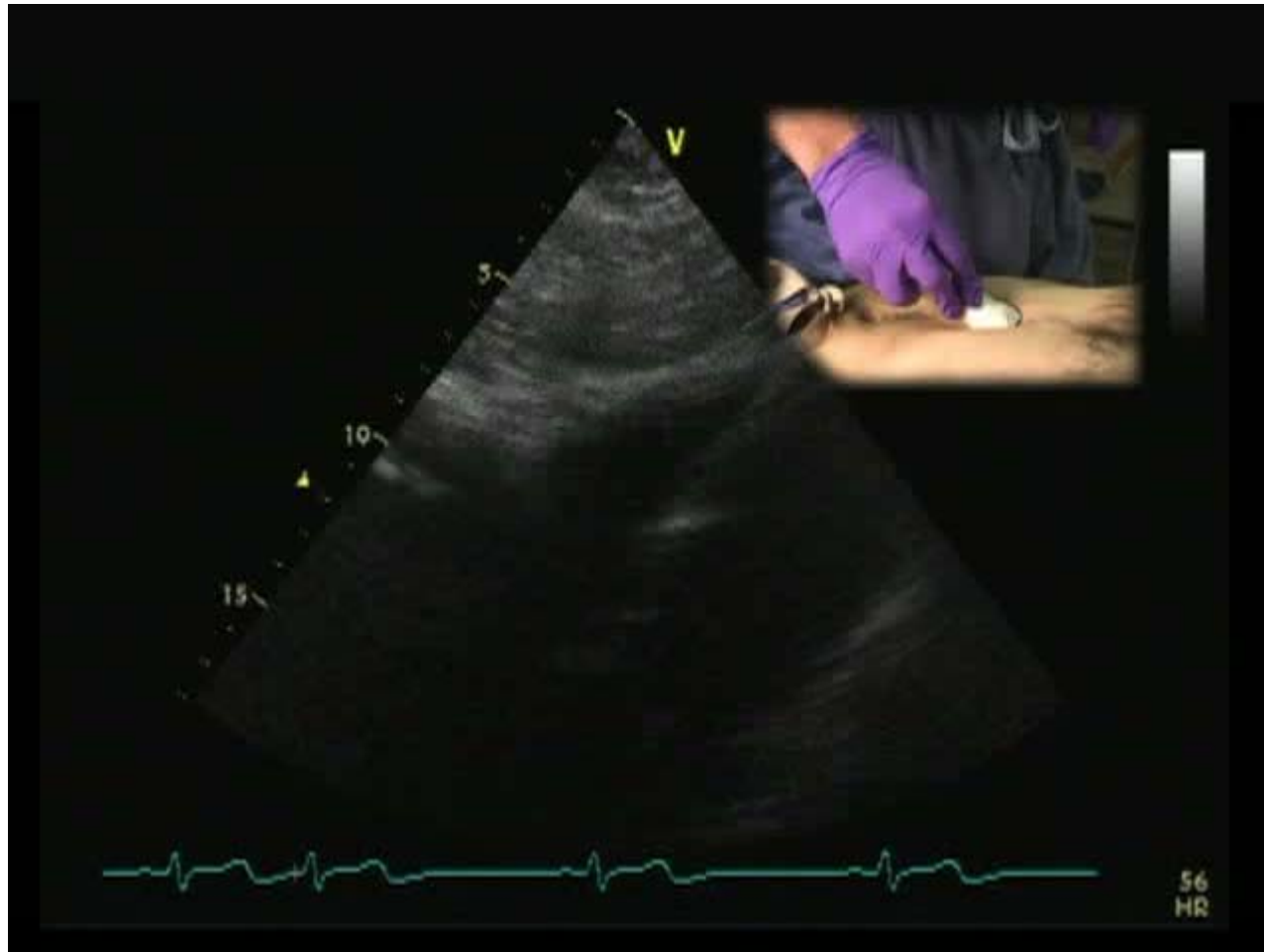
Subcostal view: tricuspid annulus

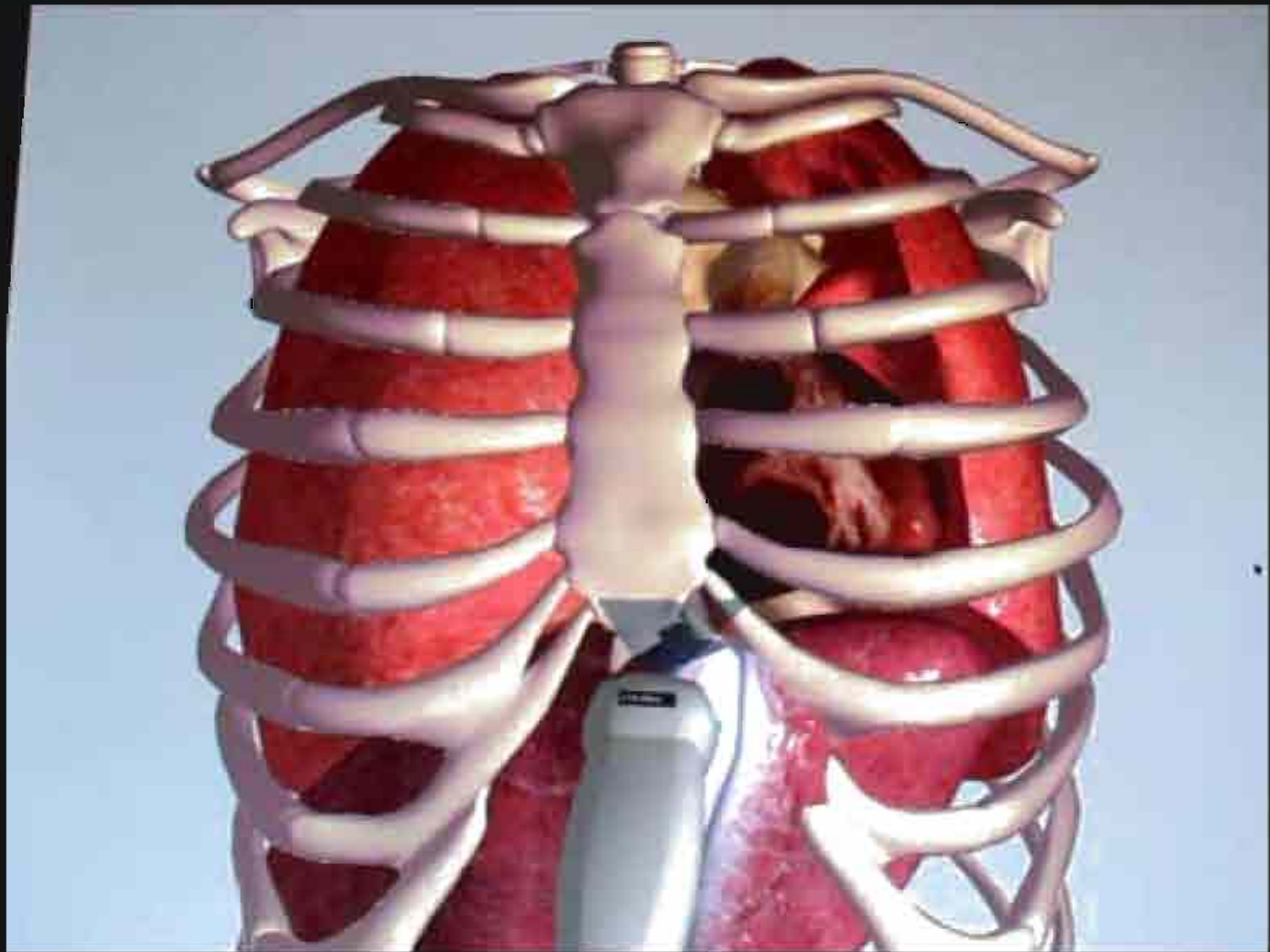


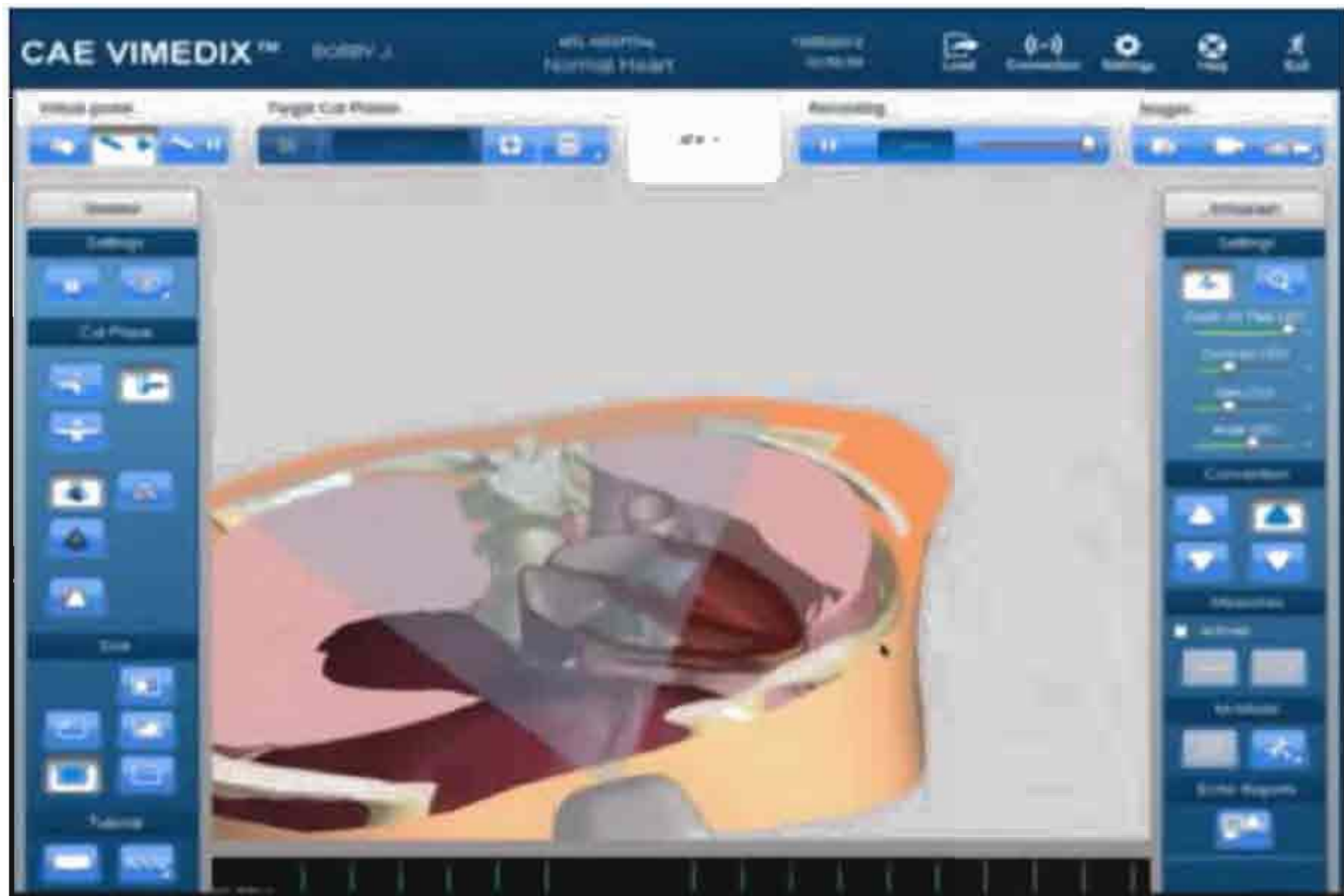
The 90° subcostal view

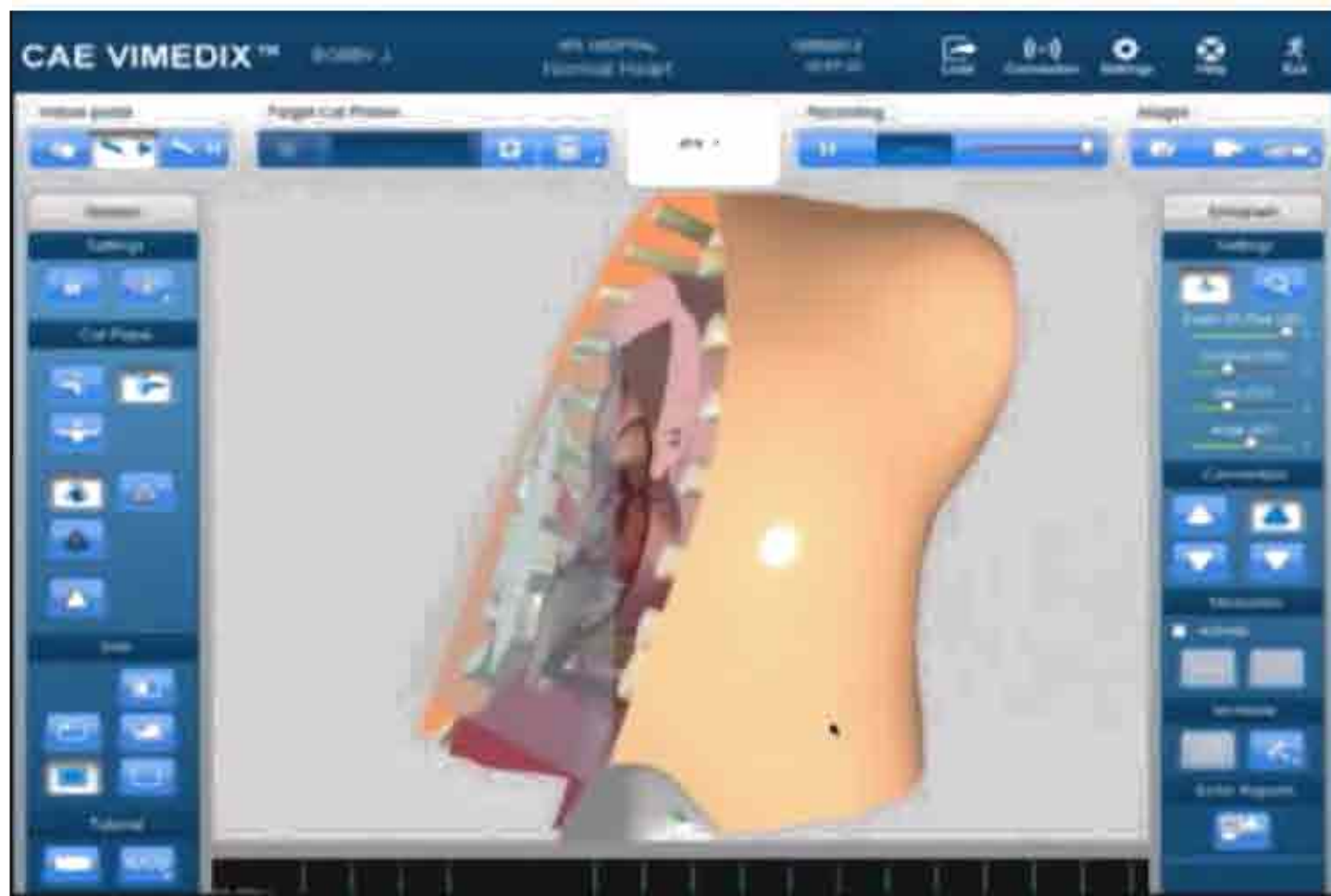


Subcostal view: RV to IVC

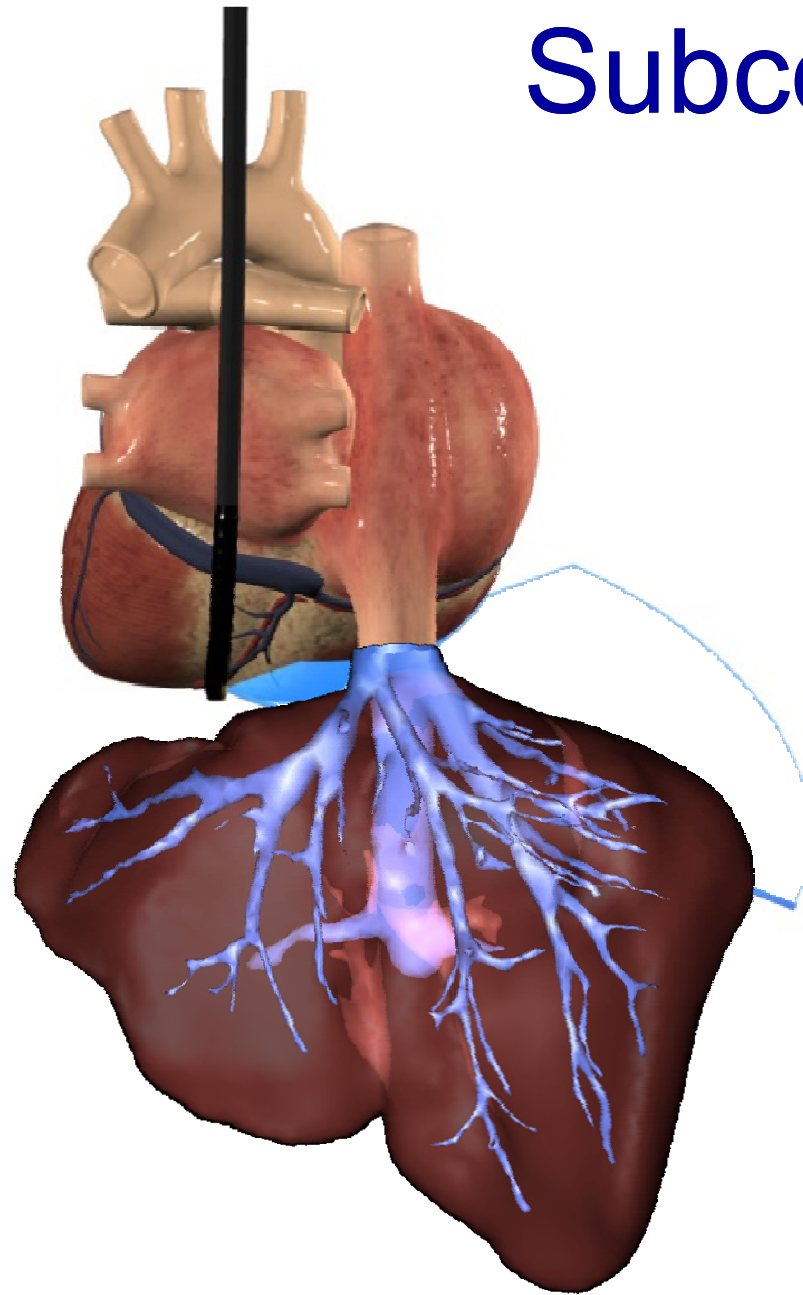




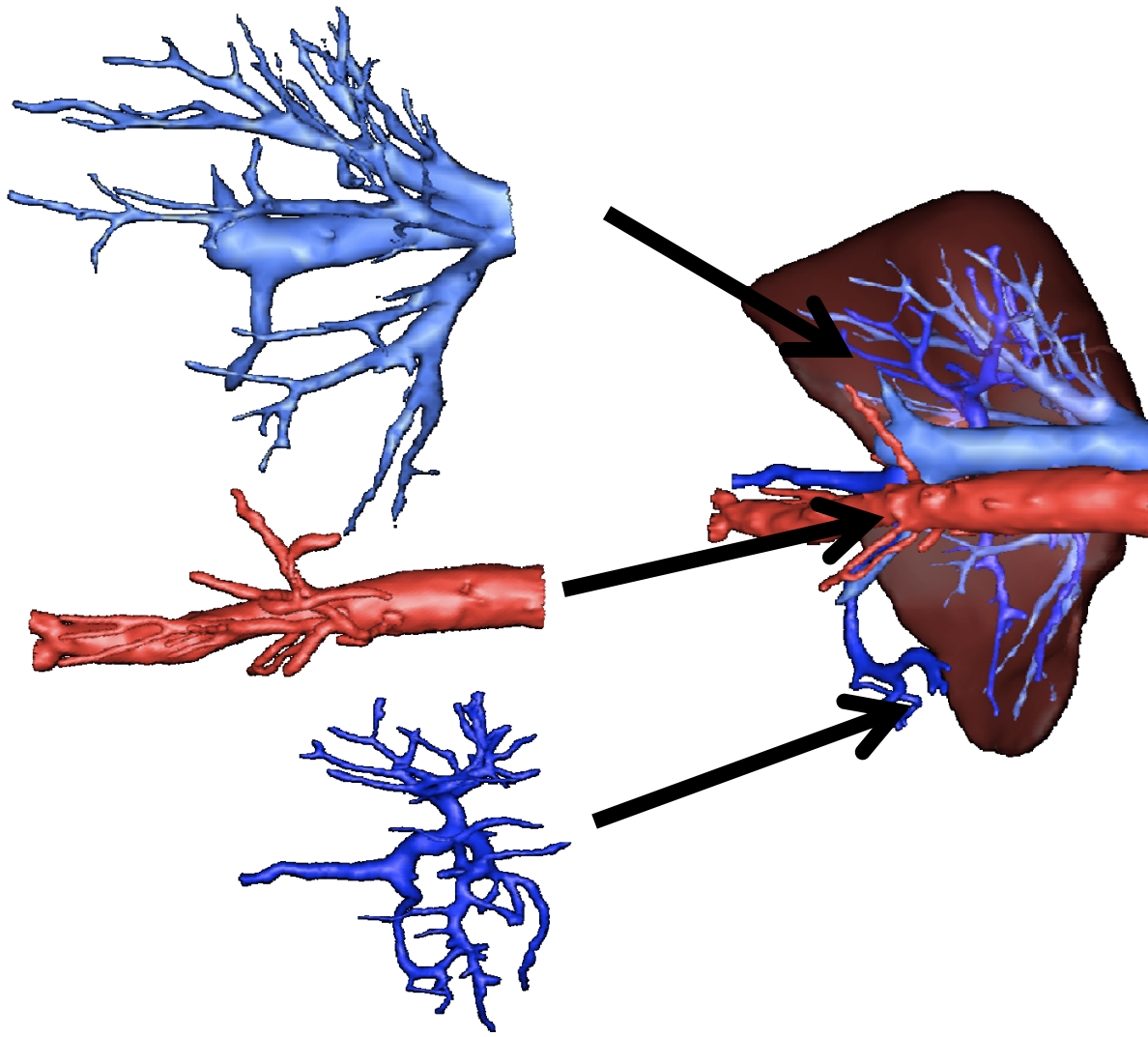




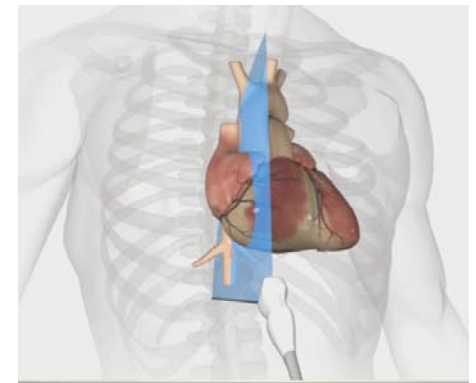
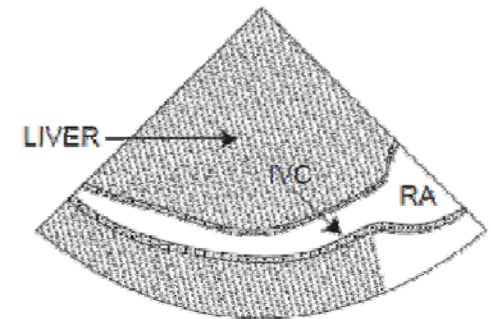
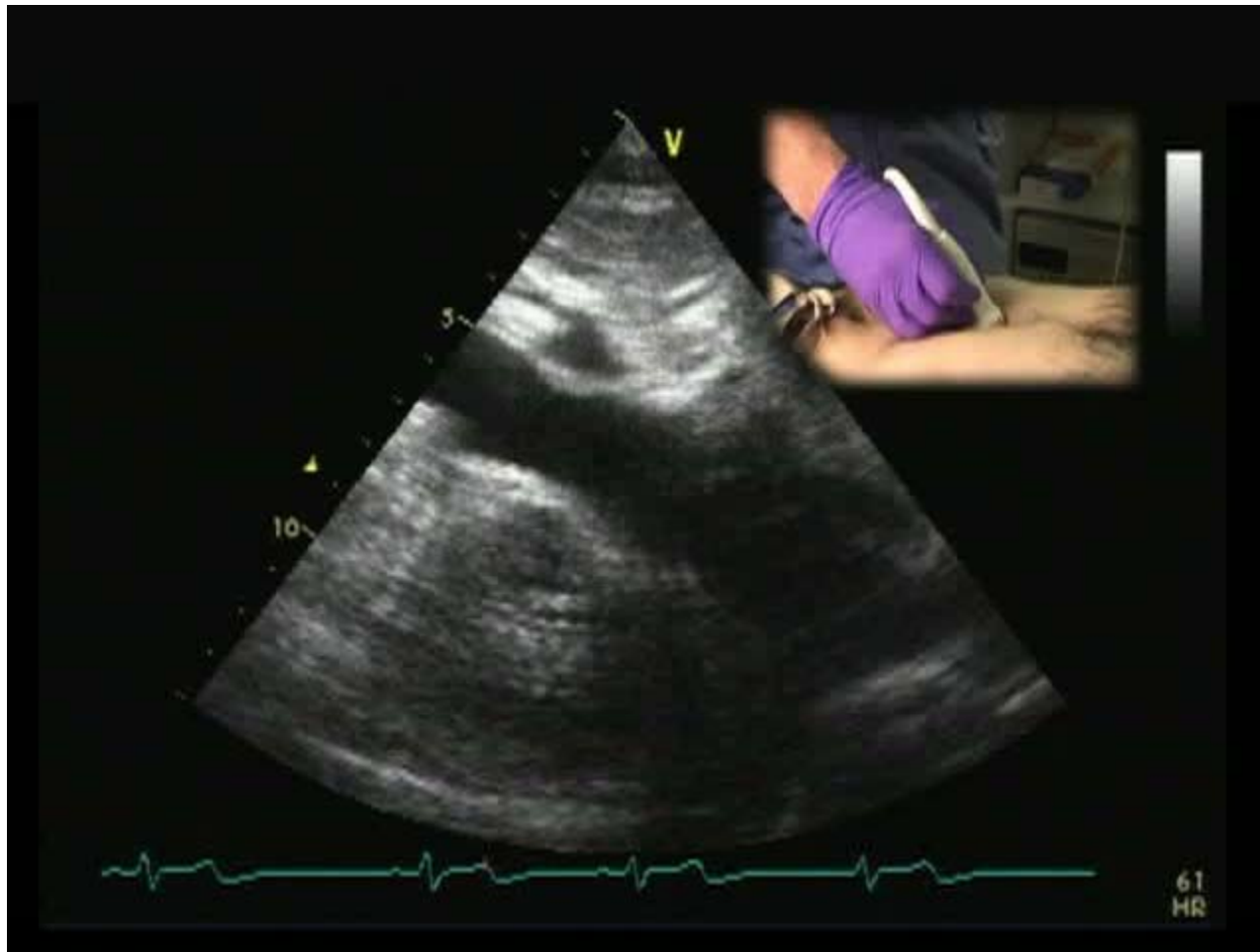
Subcostal: IVC



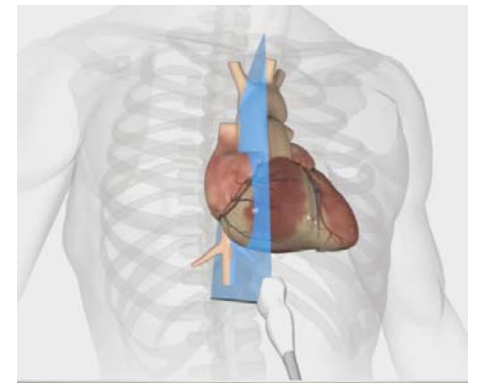
Subcostal view: IVC or aorta?



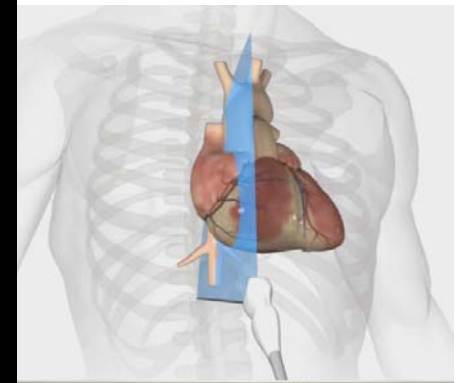
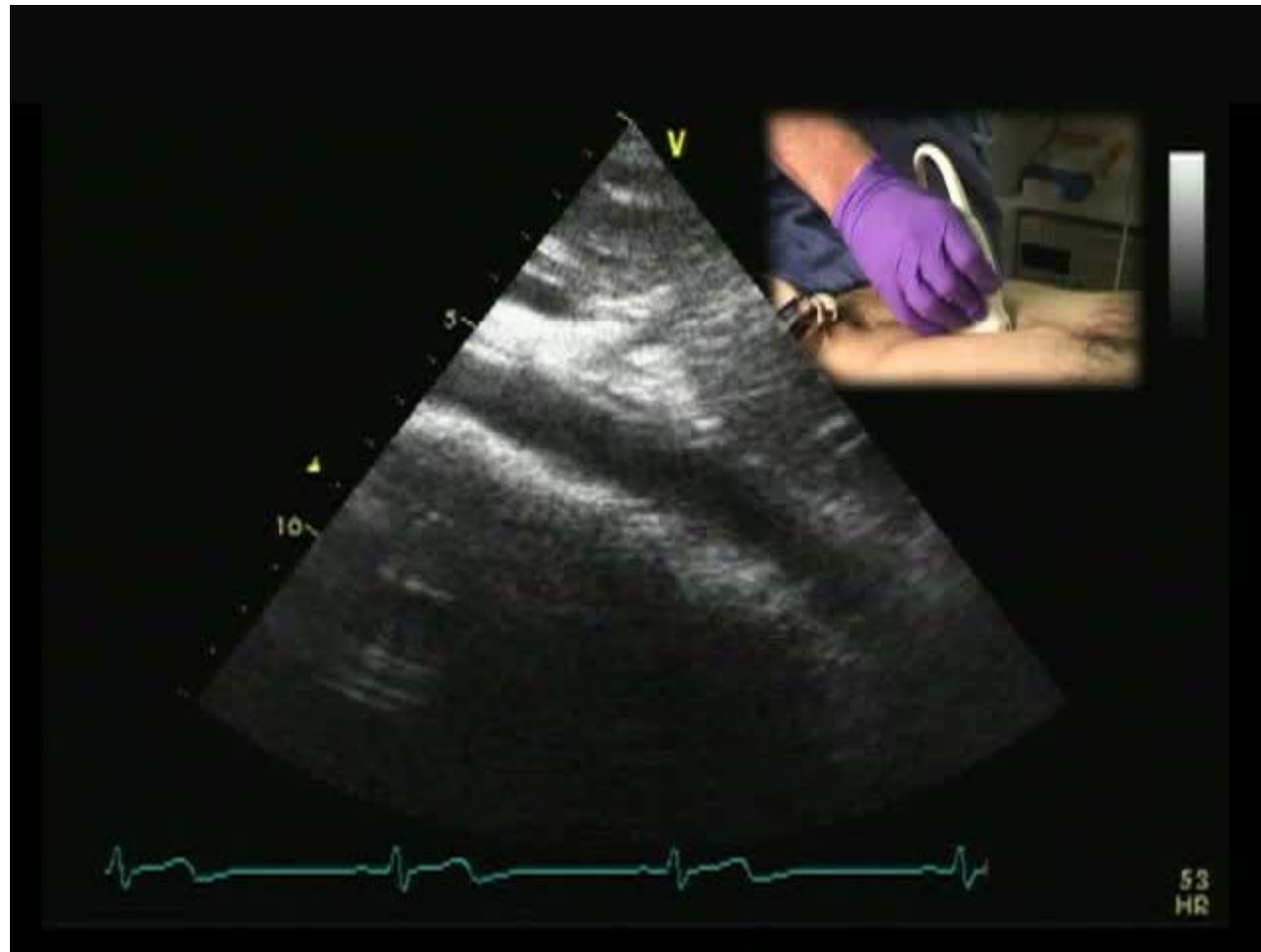
Subcostal view: IVC or aorta?



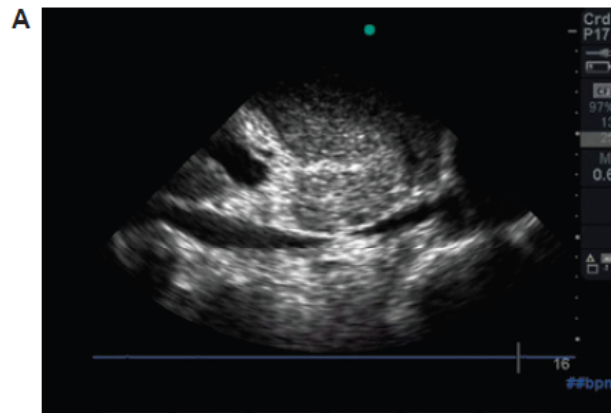
Subcostal view: IVC or aorta?



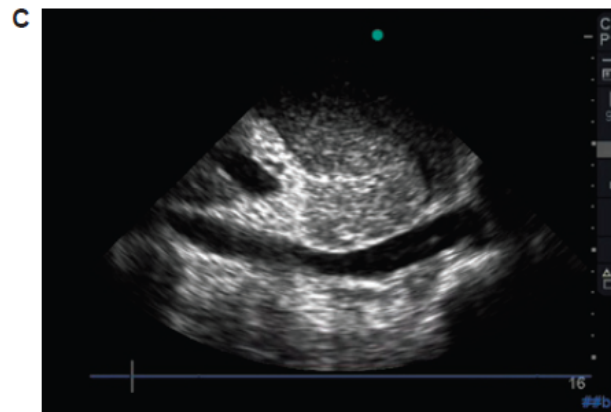
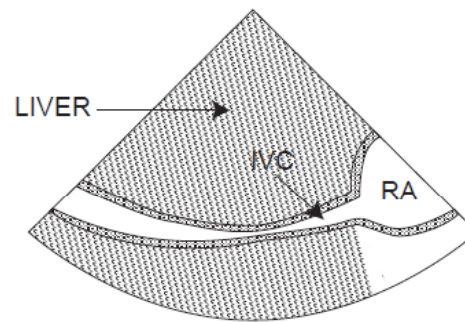
Subcostal view: Aorta



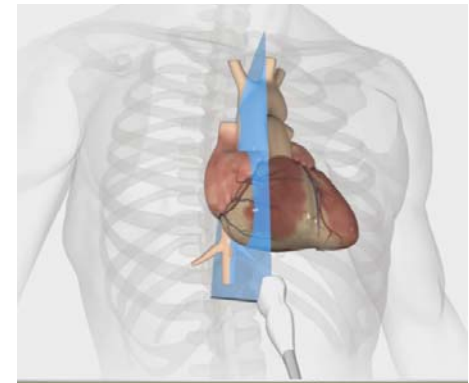
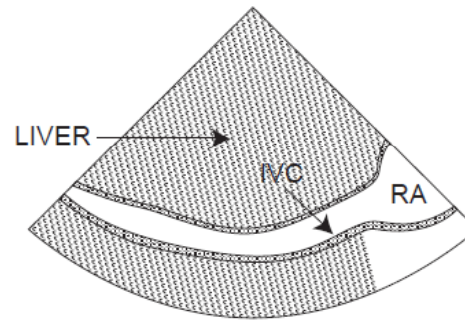
Normal or ↓ Pms



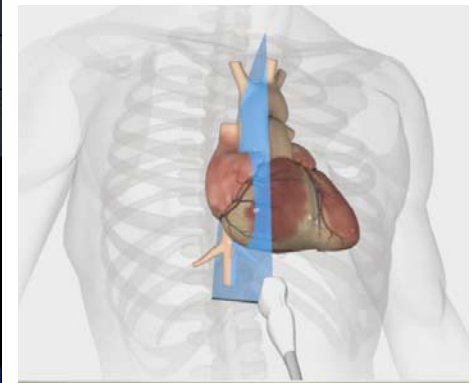
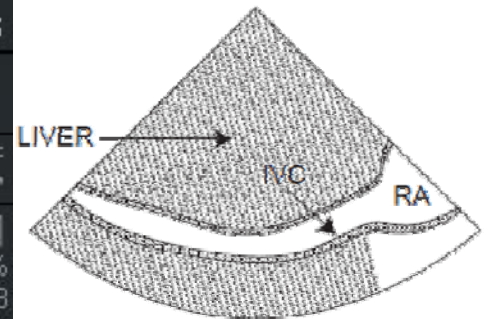
B Spontaneous inspiration



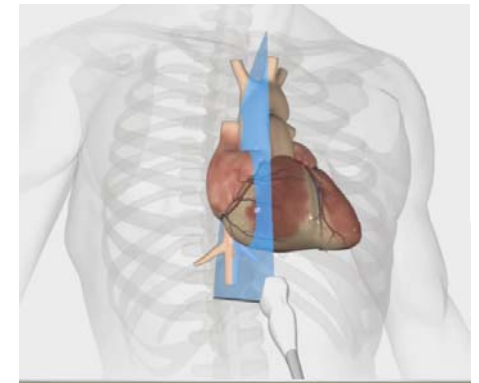
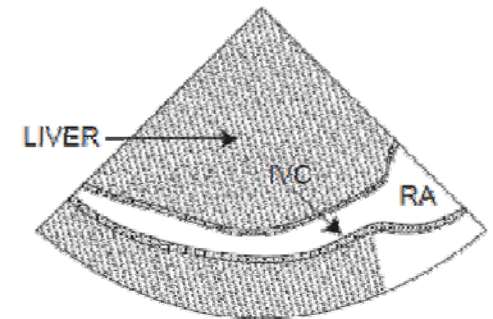
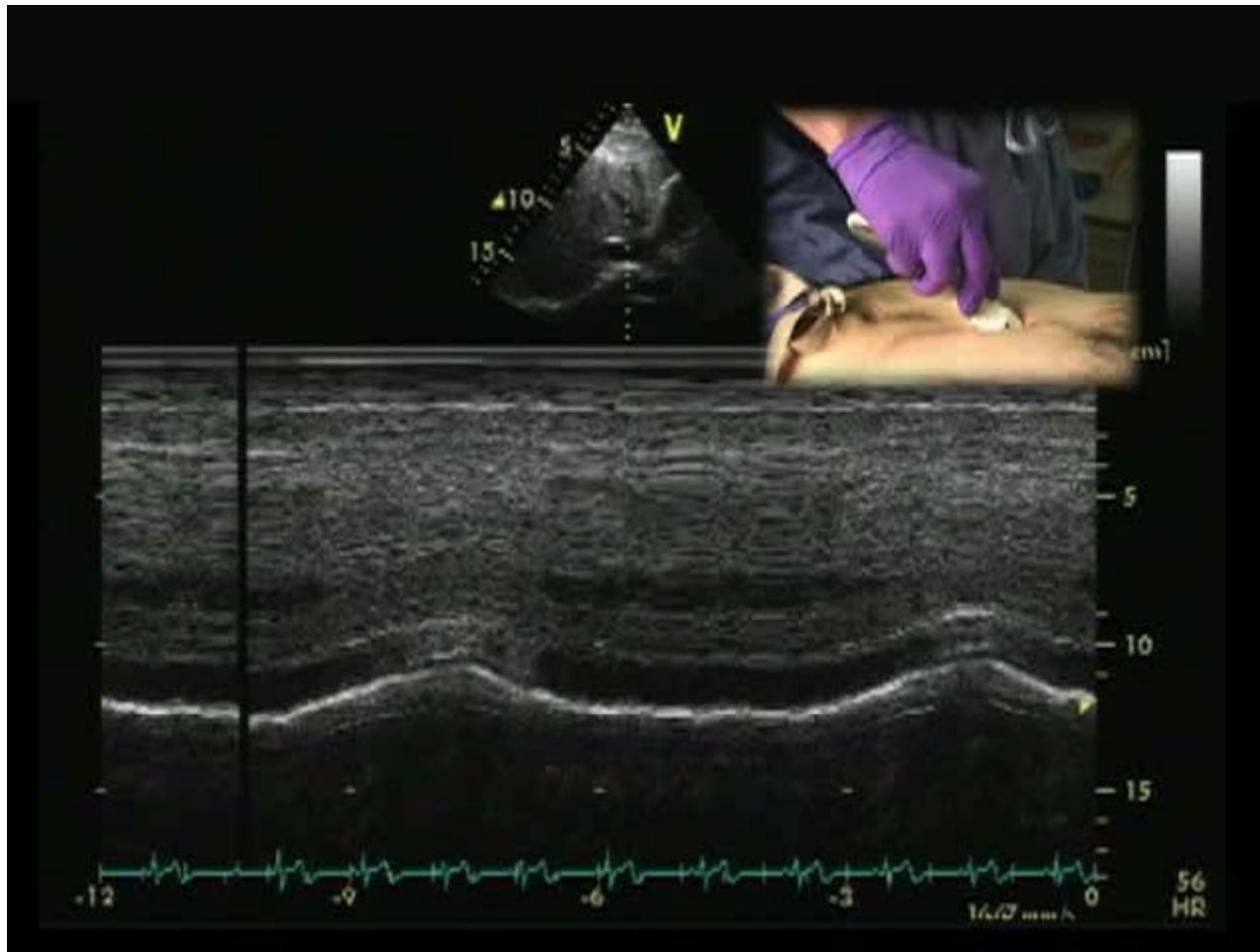
D Expiration



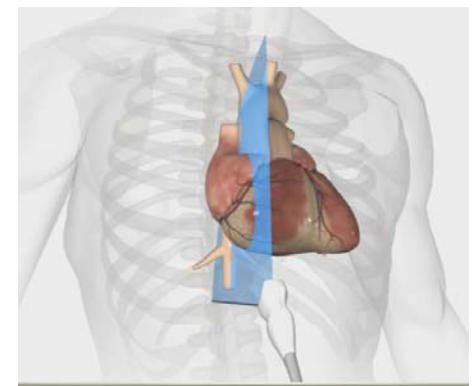
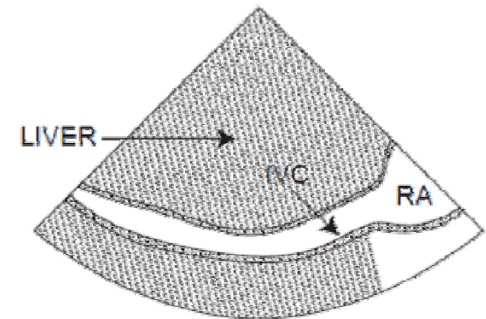
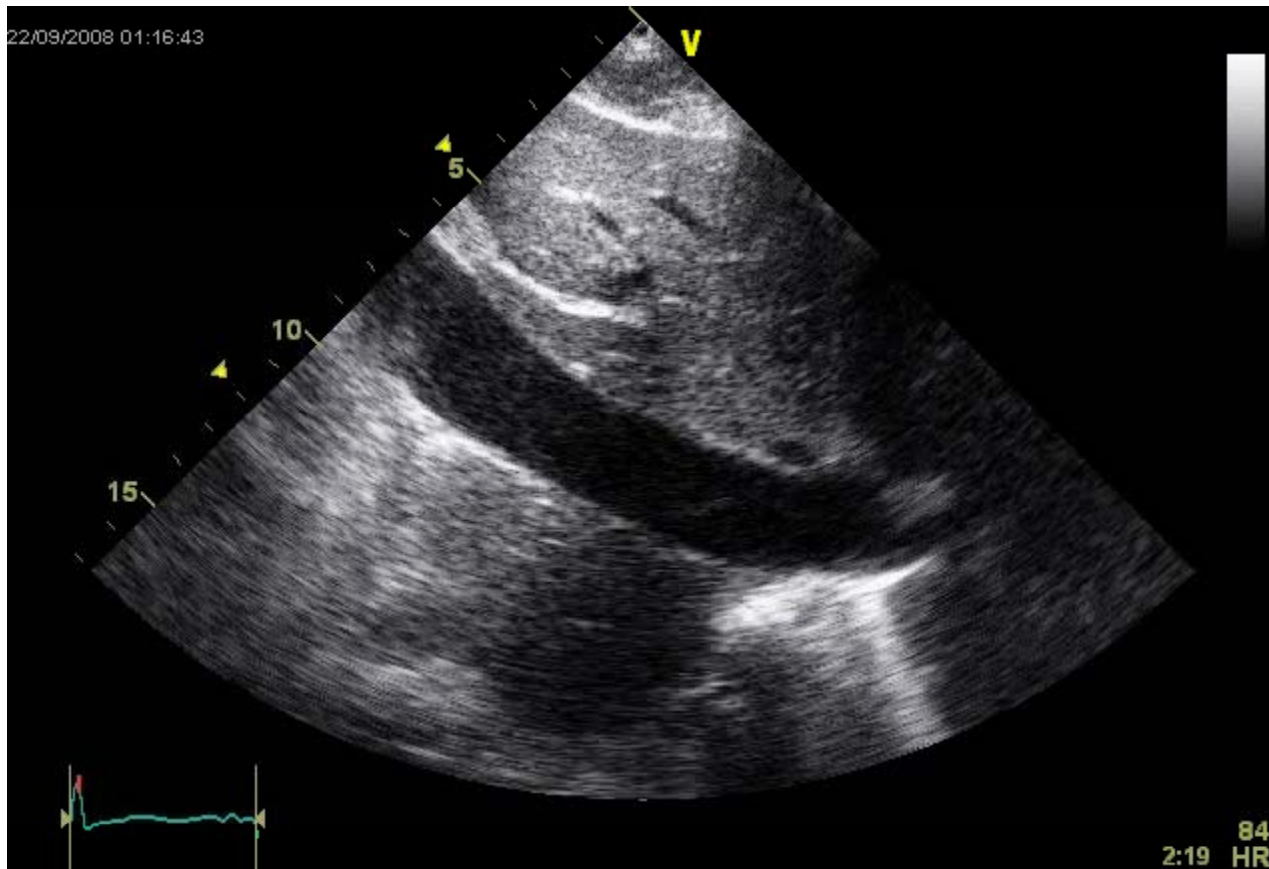
Subcostal view: why unstable?



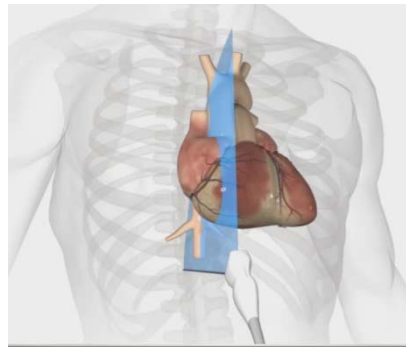
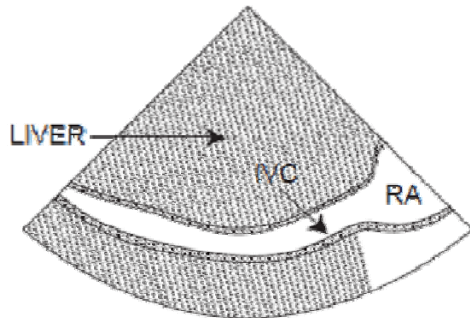
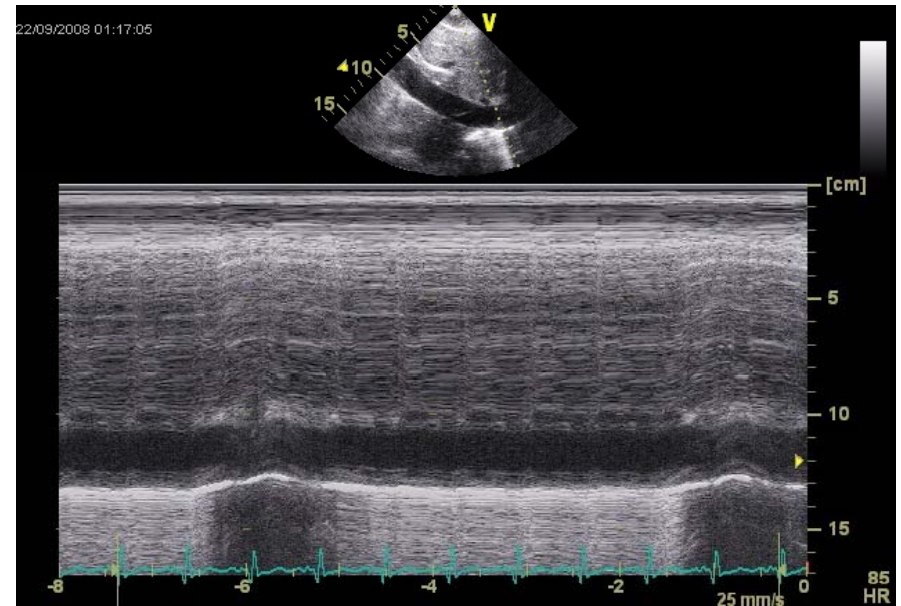
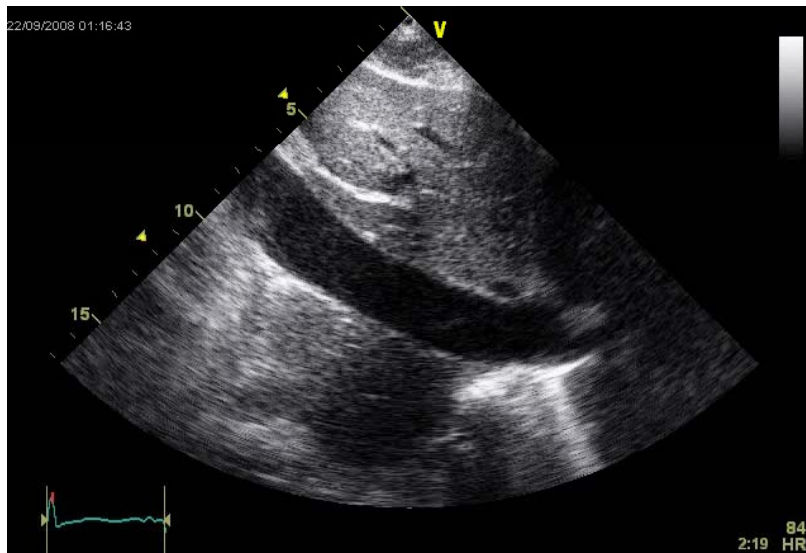
Subcostal: respiratory variation



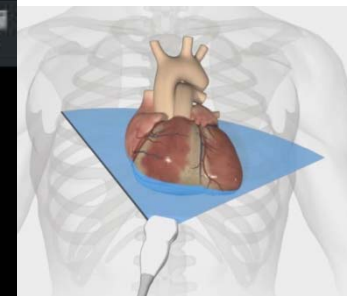
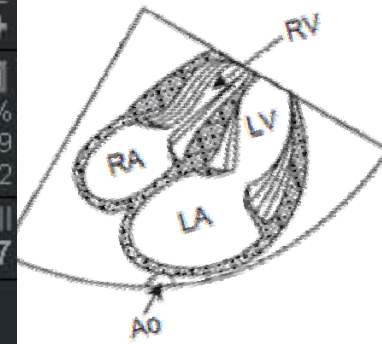
Subcostal view: volume responsive?



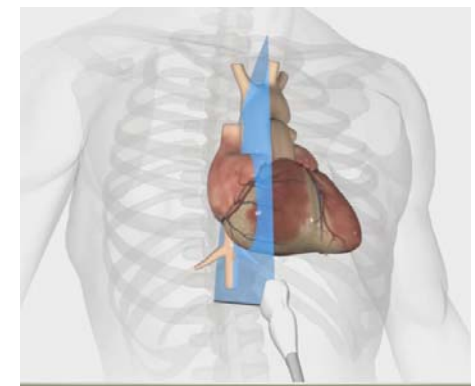
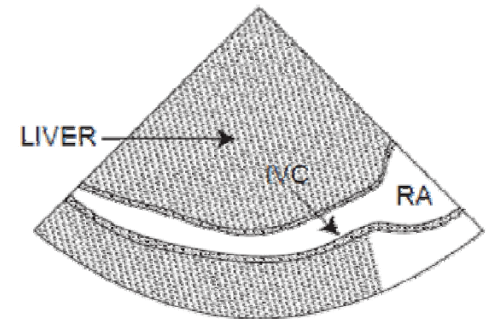
Subcostal: 19 yo ♂ organ door unstable. Volume?



68 yo ♀ in the ER: hypotensive
despite 1 liter of fluid

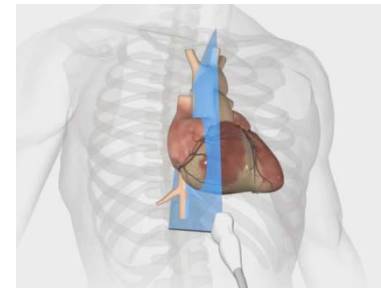
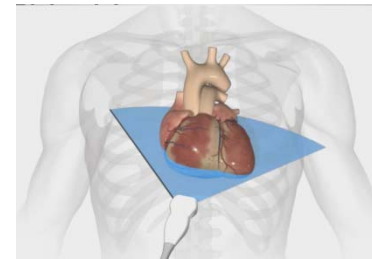
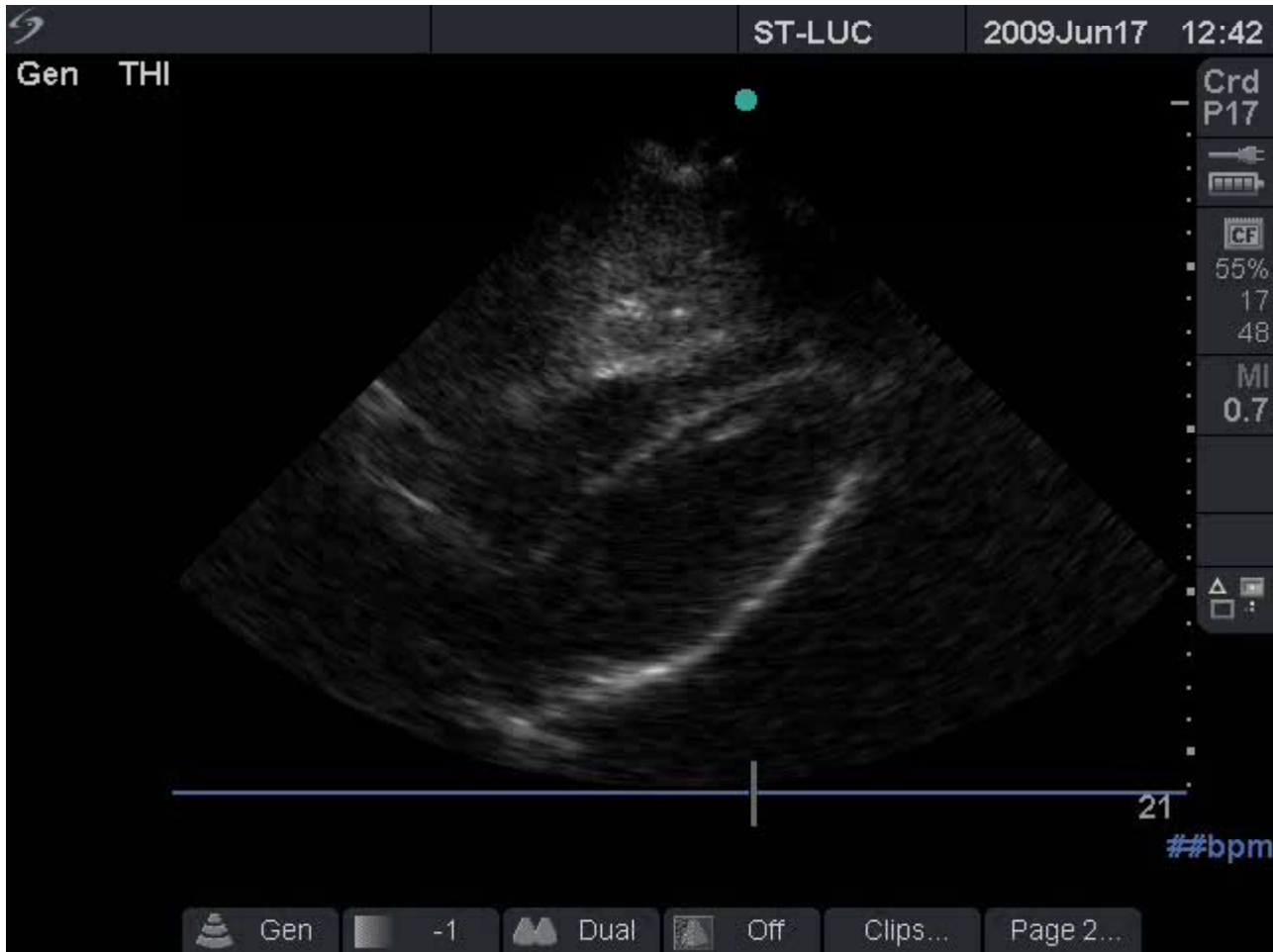


68 yo ♀ in the ER: hypotensive
despite 1 liter of fluid: IVC



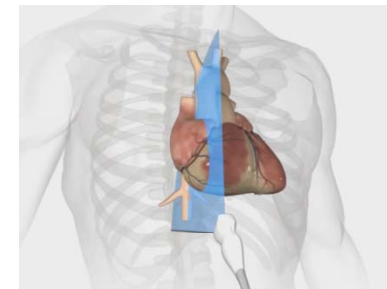
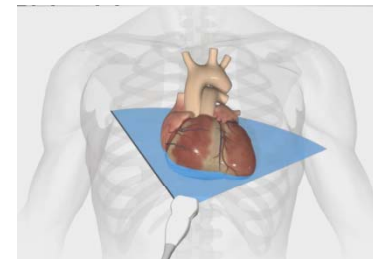
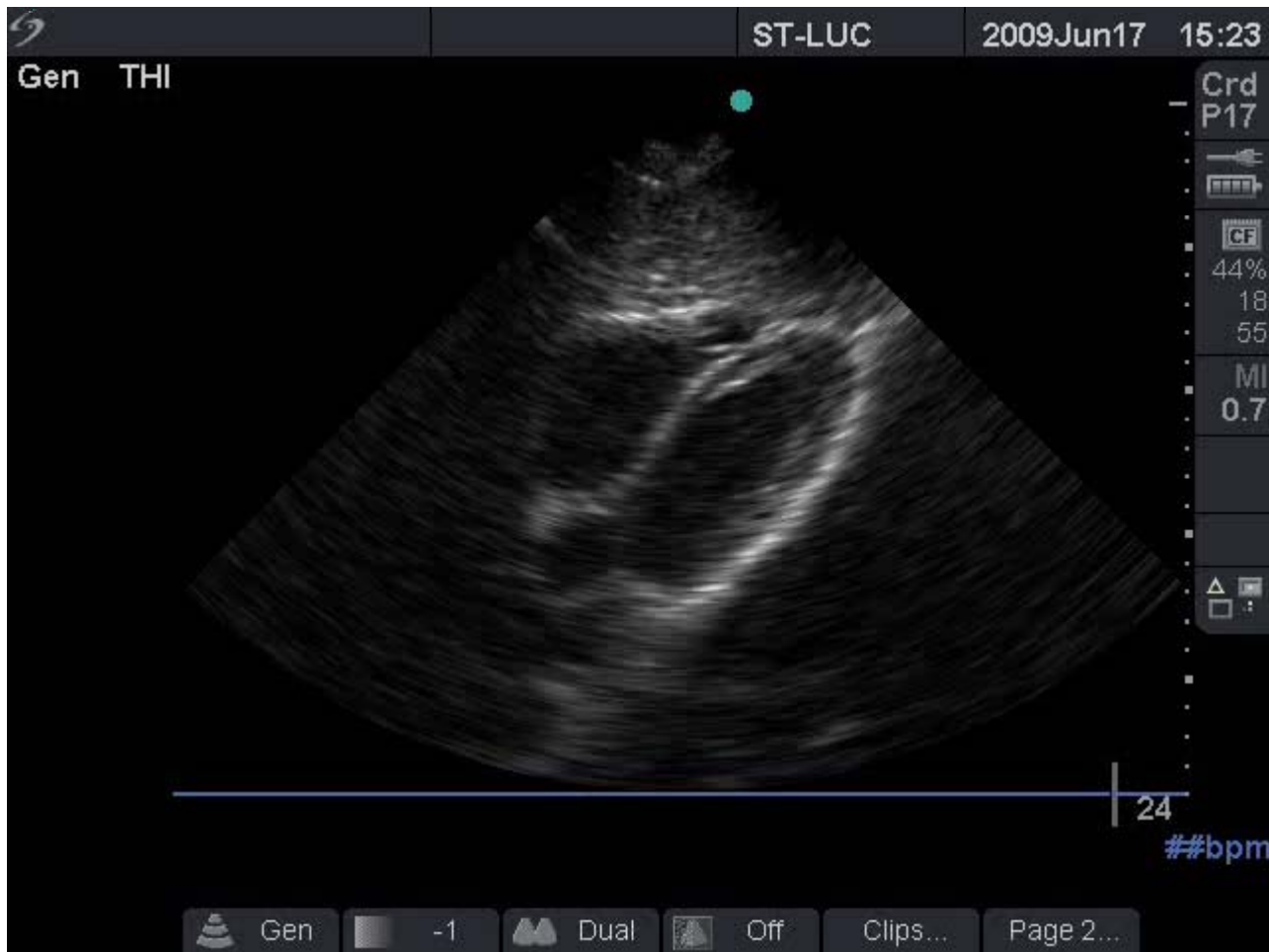
25 yo ♂ post-op laparotomy for abdominal perforation.

On noradrenalin 0.17 ug/kg/m (50ml/h)

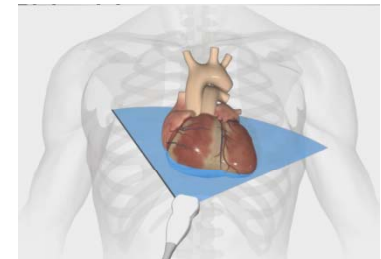
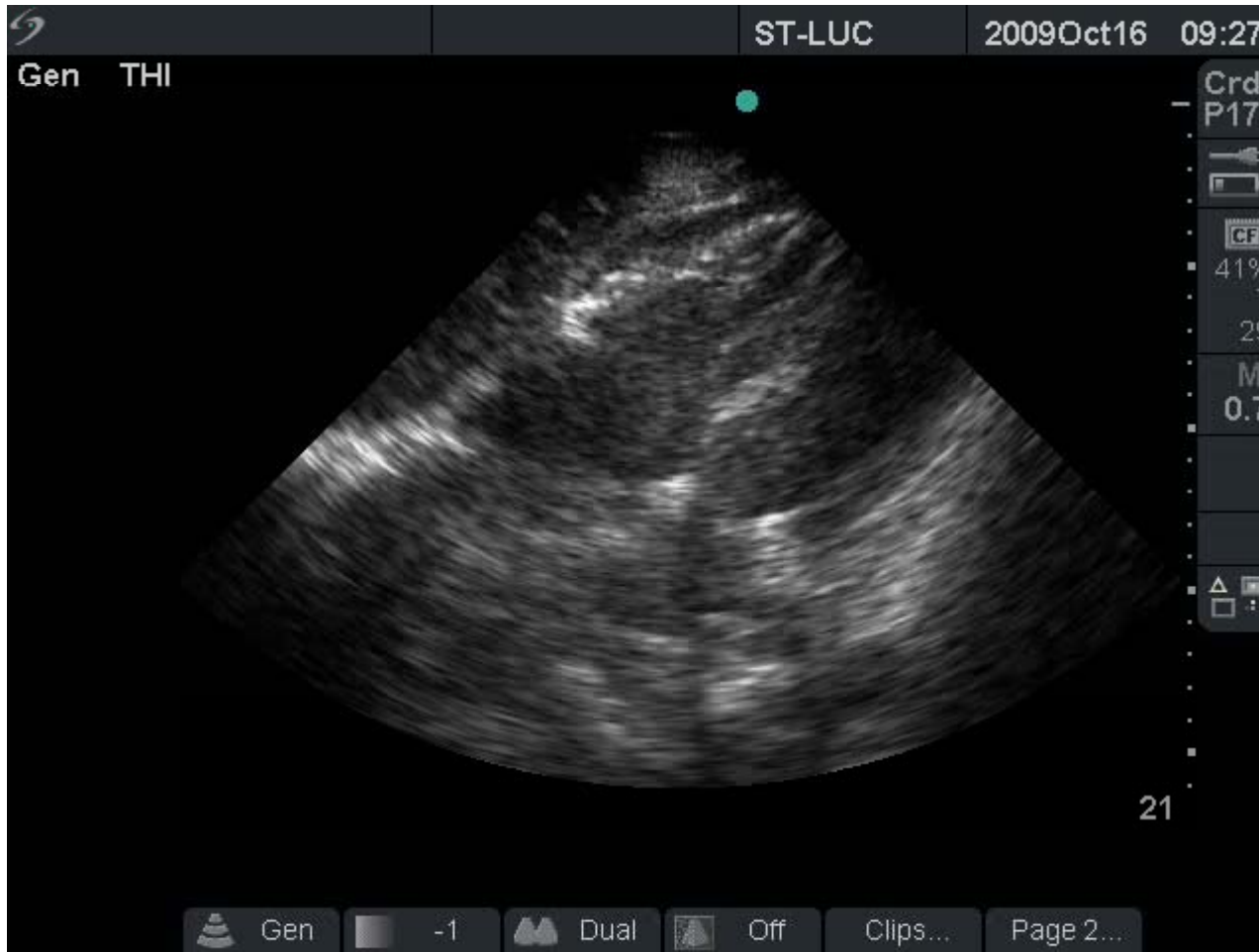


25 yo ♂ post-op laparotomy for abdominal perforation.

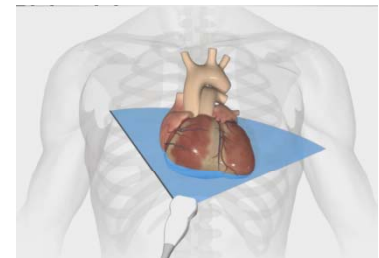
Noradrenalin stopped after 2h of dobutamine



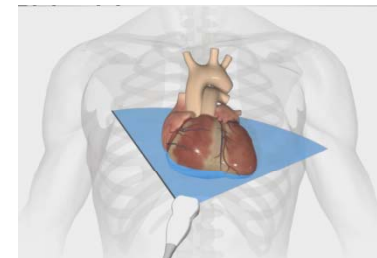
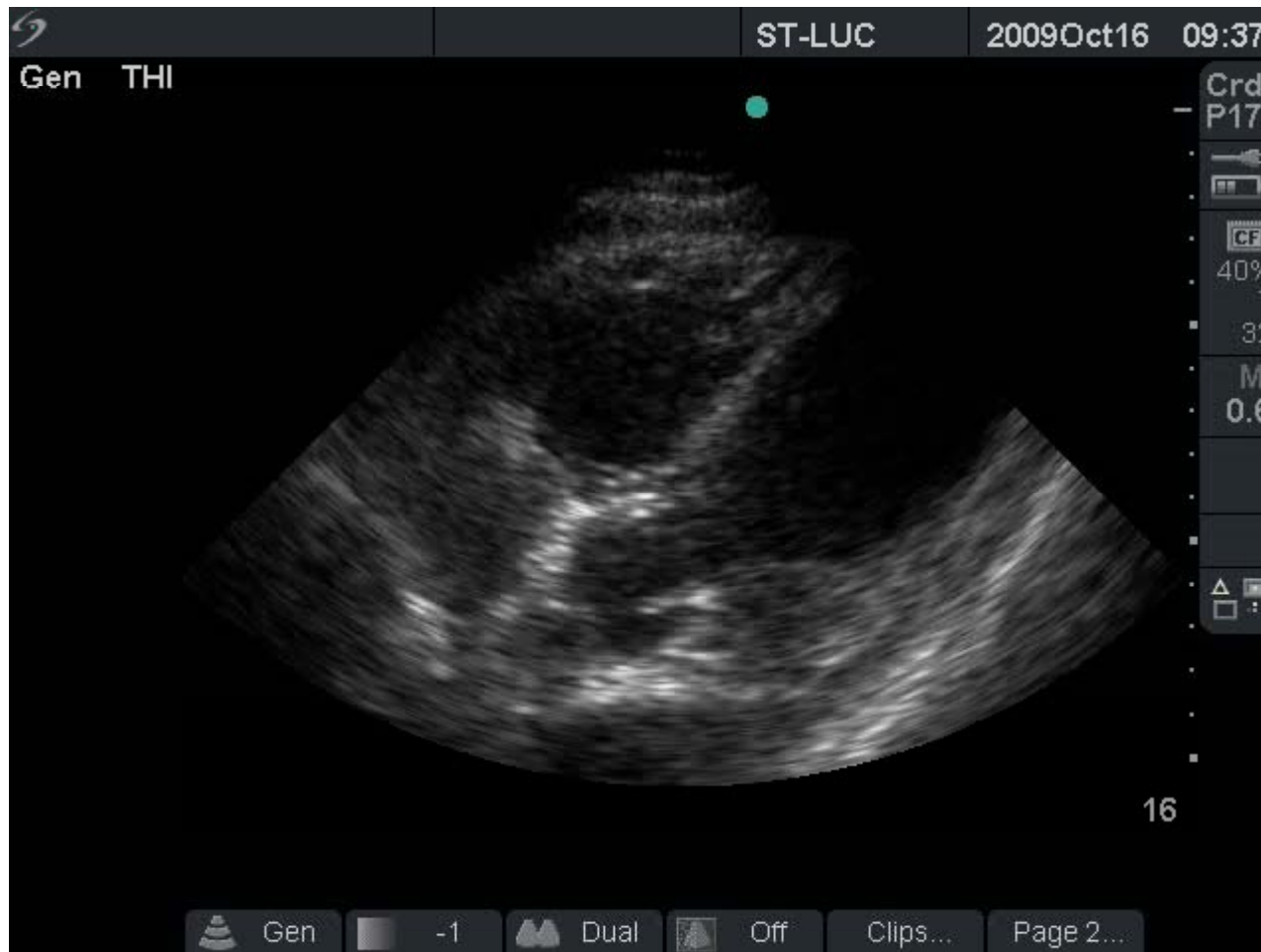
Blue code :arrival. What do you do?



Blue code : 5 minutes



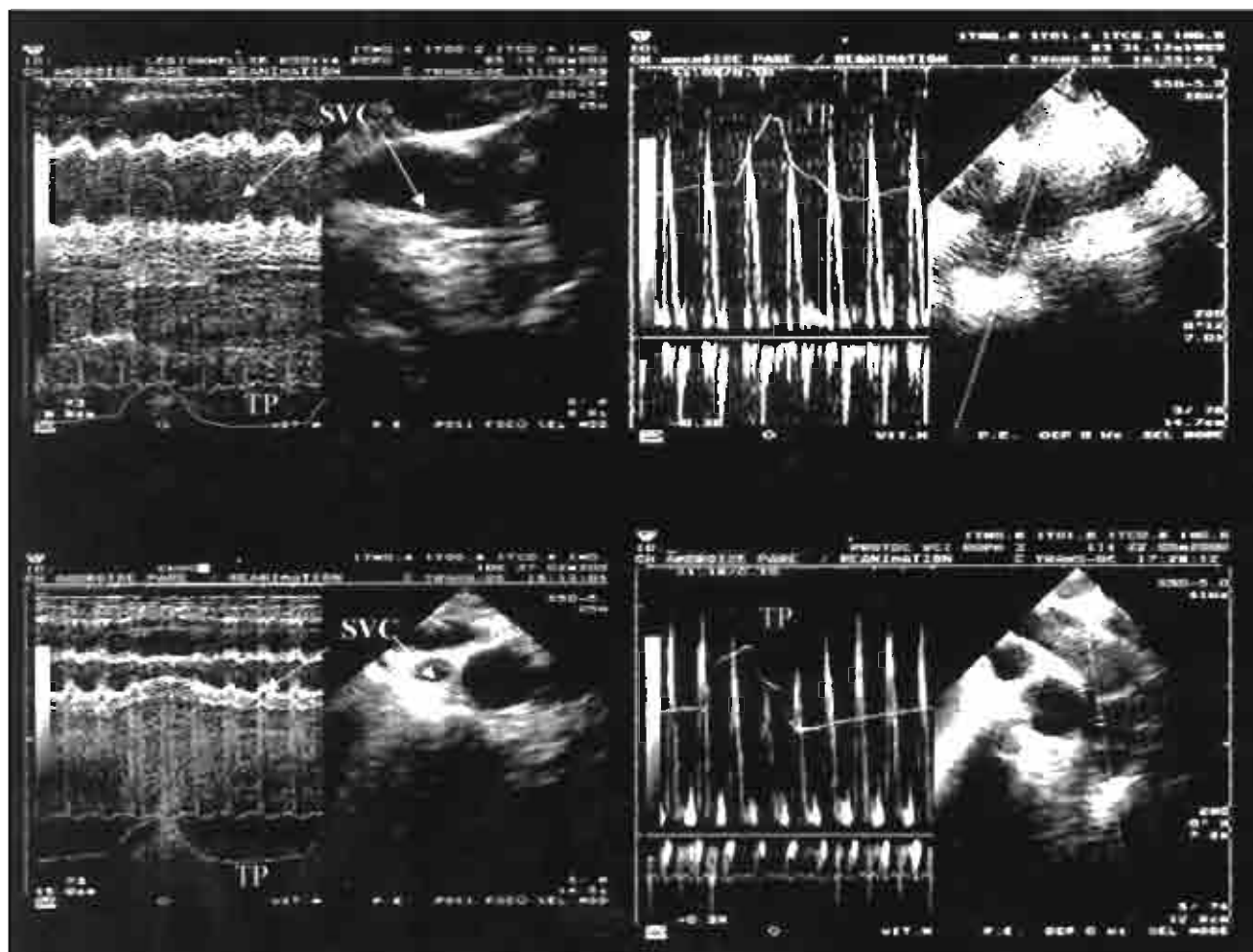
Blue code : 8 minutes

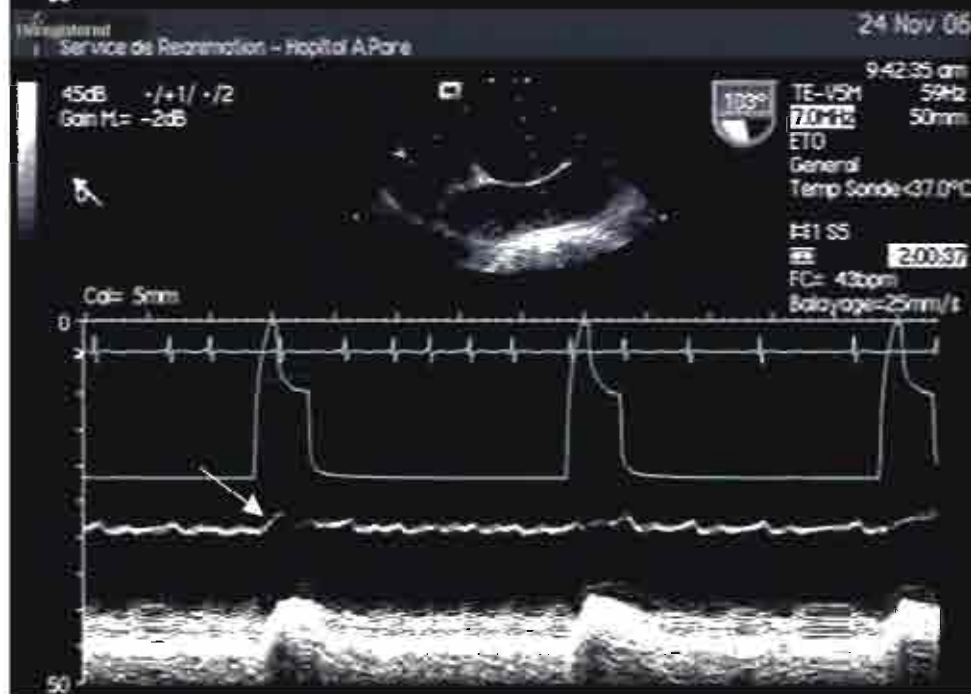
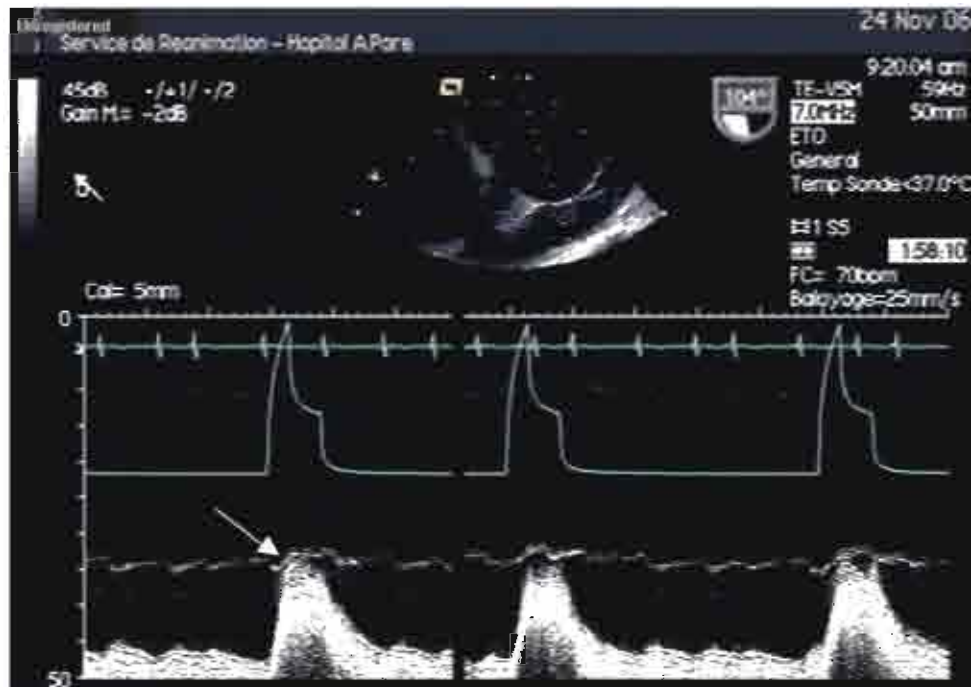


Other approach: SVC

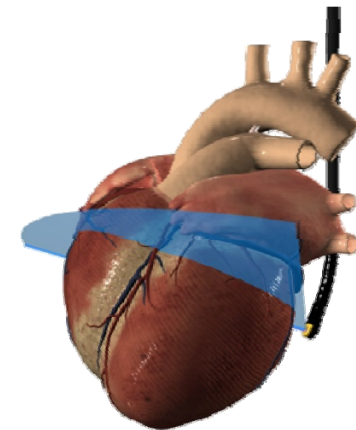
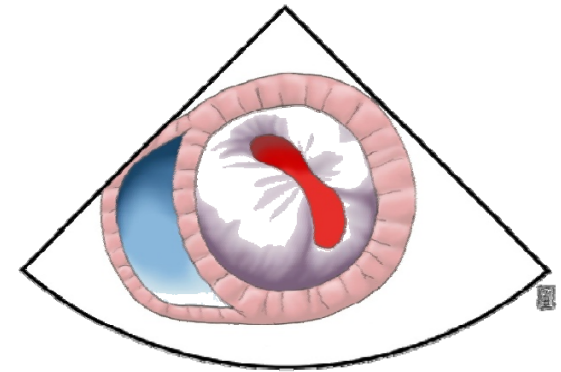
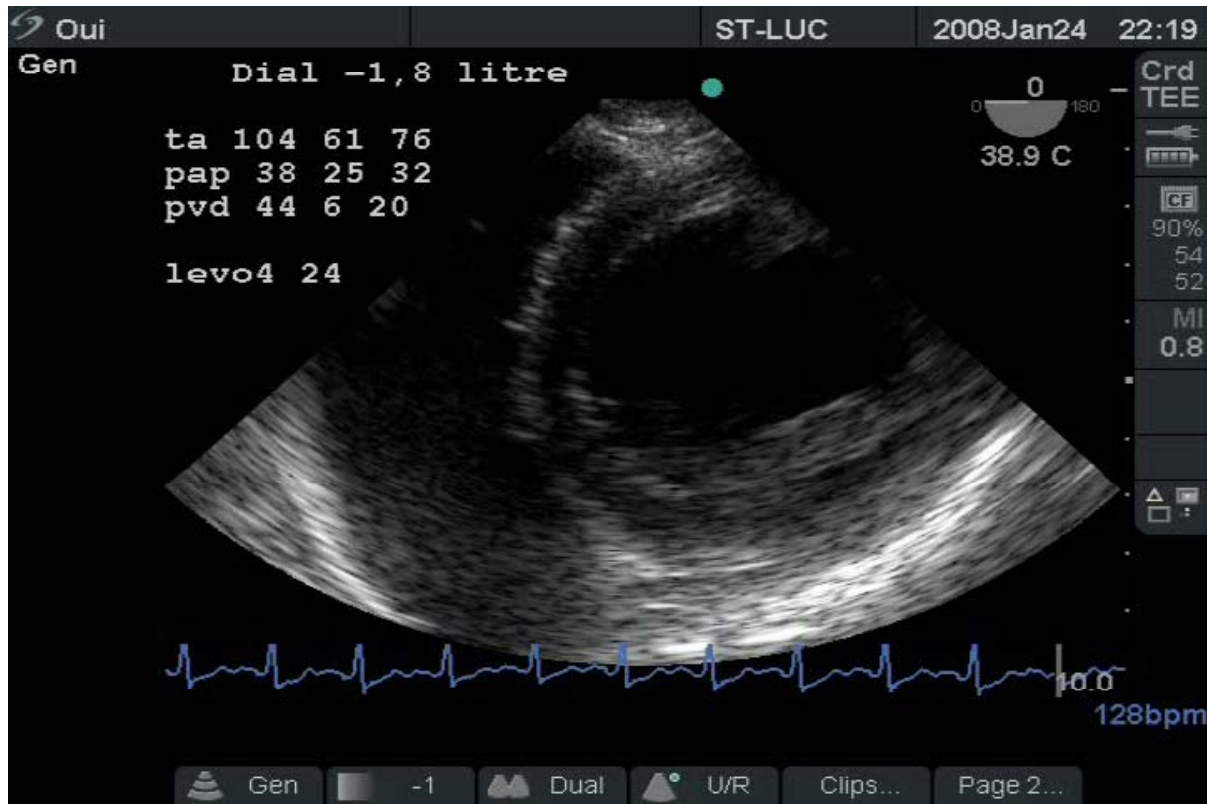
Influence of Superior Vena Caval Zone Condition on Cyclic Changes in Right Ventricular Outflow during Respiratory Support

Antoine Vieillard-Baron, M.D.,* Roch Augarde, M.D.,† Sebastien Prin, M.D.,† Bernard Page, M.D.,‡ Alain Beauchet, M.D.,§ François Jardin, M.D.¶

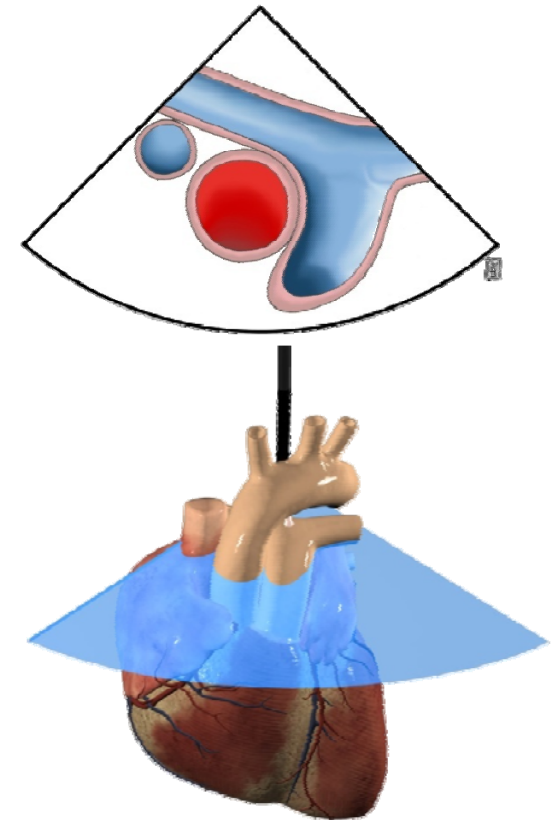
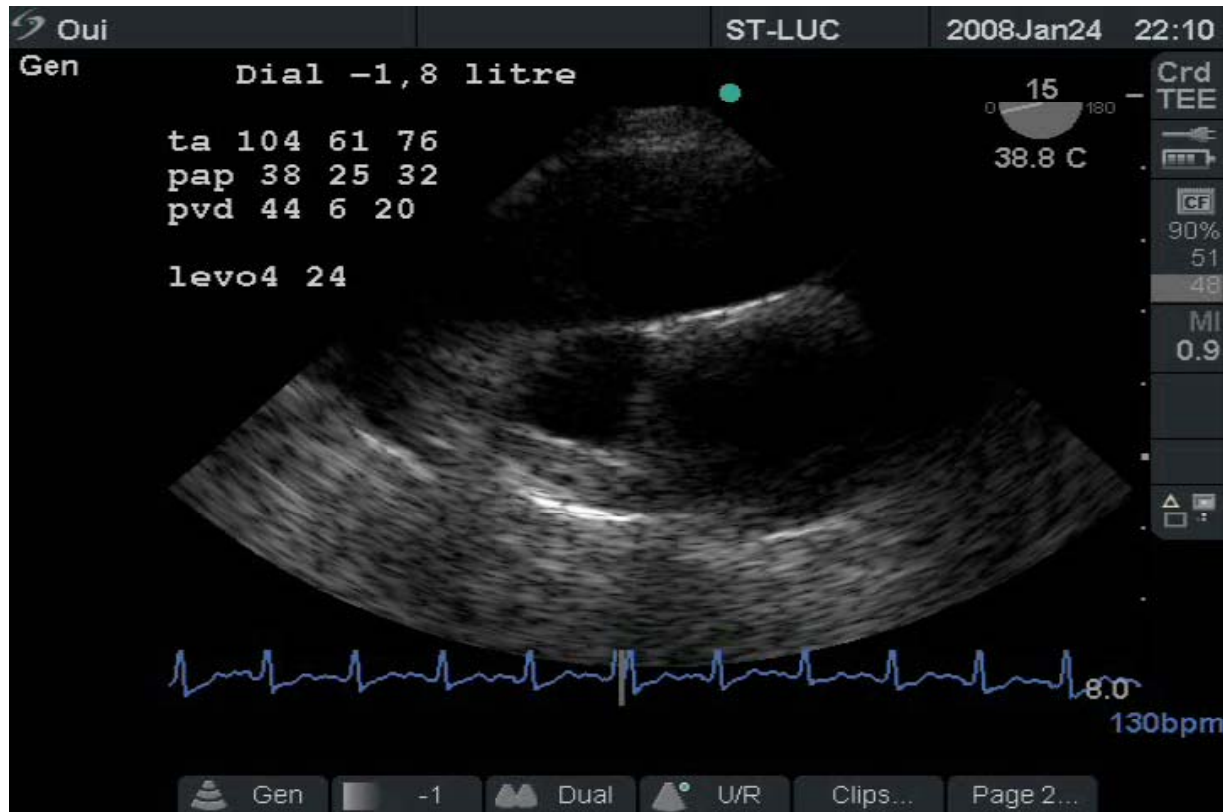




76 yo ♂ ICU during dialysis



76 yo ♂ ICU during dialysis: SVC



Oui

ST-LUC

2008Jan24 22:10

Gen

Dial -1,8 litre

15
0 180
38.6 C

Crd
TEE



CF

90%
51
49

TIS
0.1



Oui ST-LUC 2008Jan24 22:13

Gen

Dial -1,8 litre

ta 104 61 76
pap 38 25 32
pvd 44 6 20

levo4 24

0 0
38.9 C

Crd
TEE



CF

90%
52

MI
0.8

MI
0.8

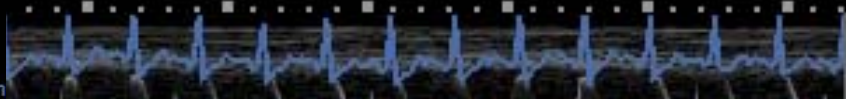
MI
0.8

MI
0.8

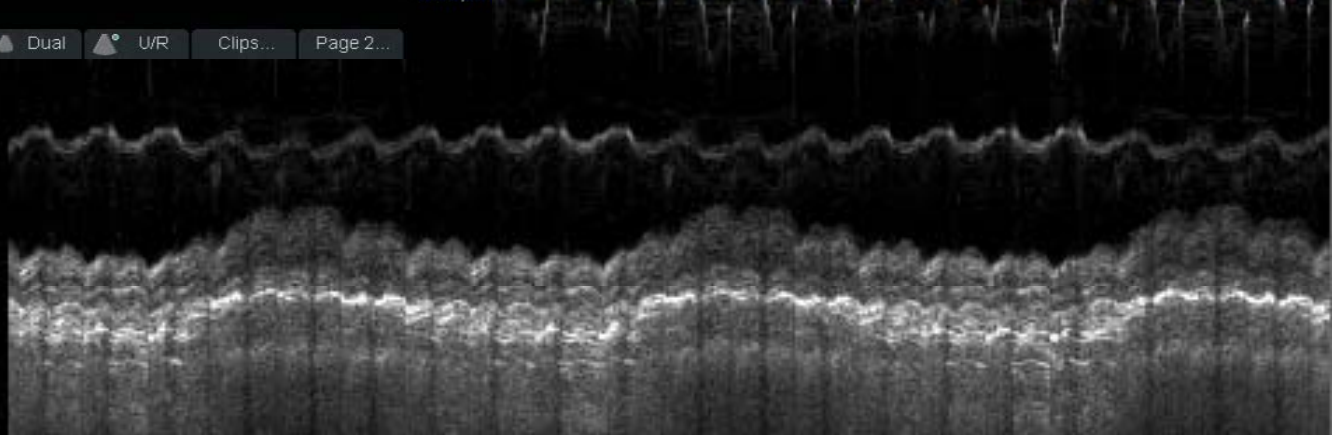


129bpm

Gen -1 Dual U/R Clips... Page 2...



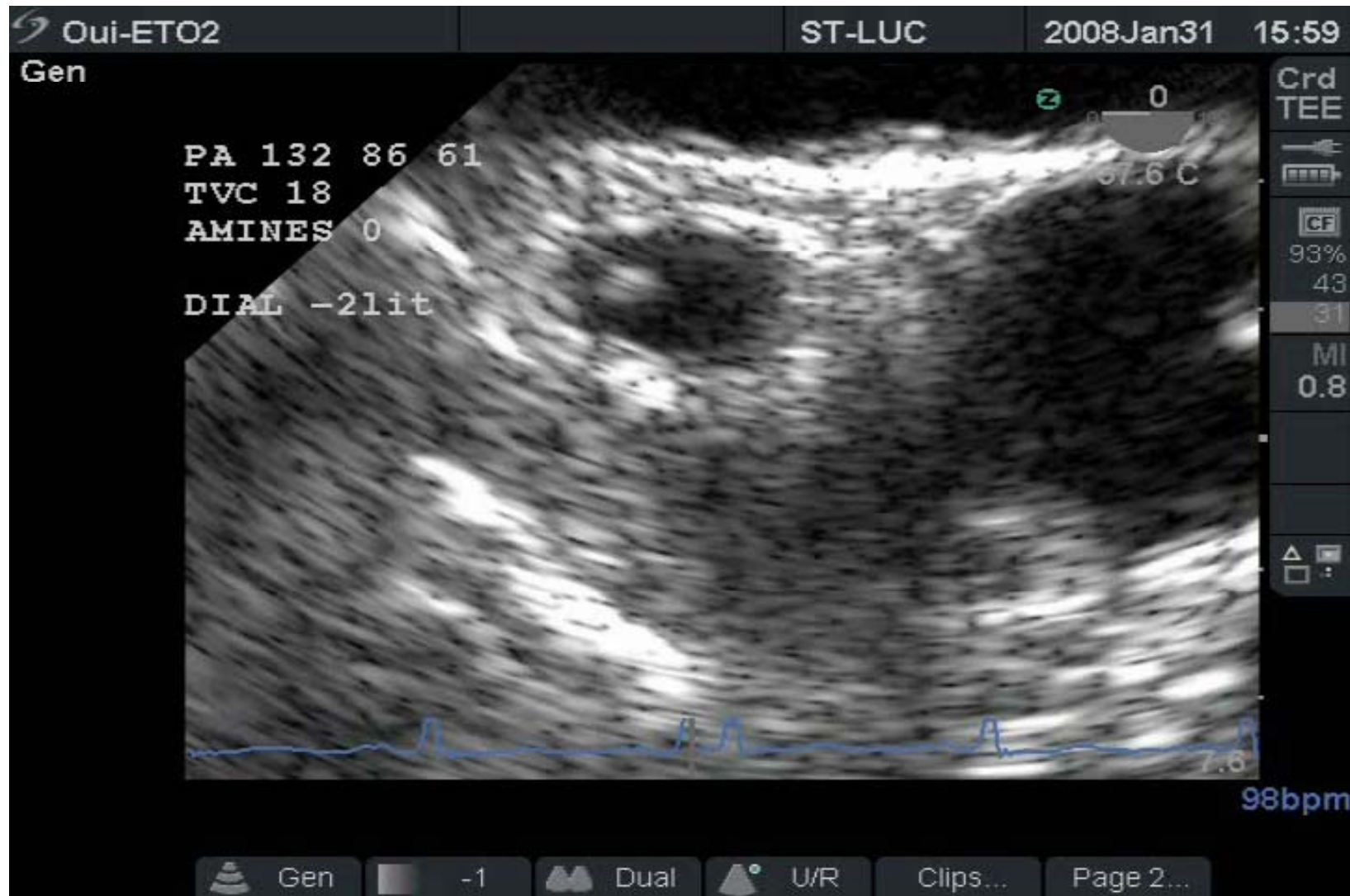
8.0



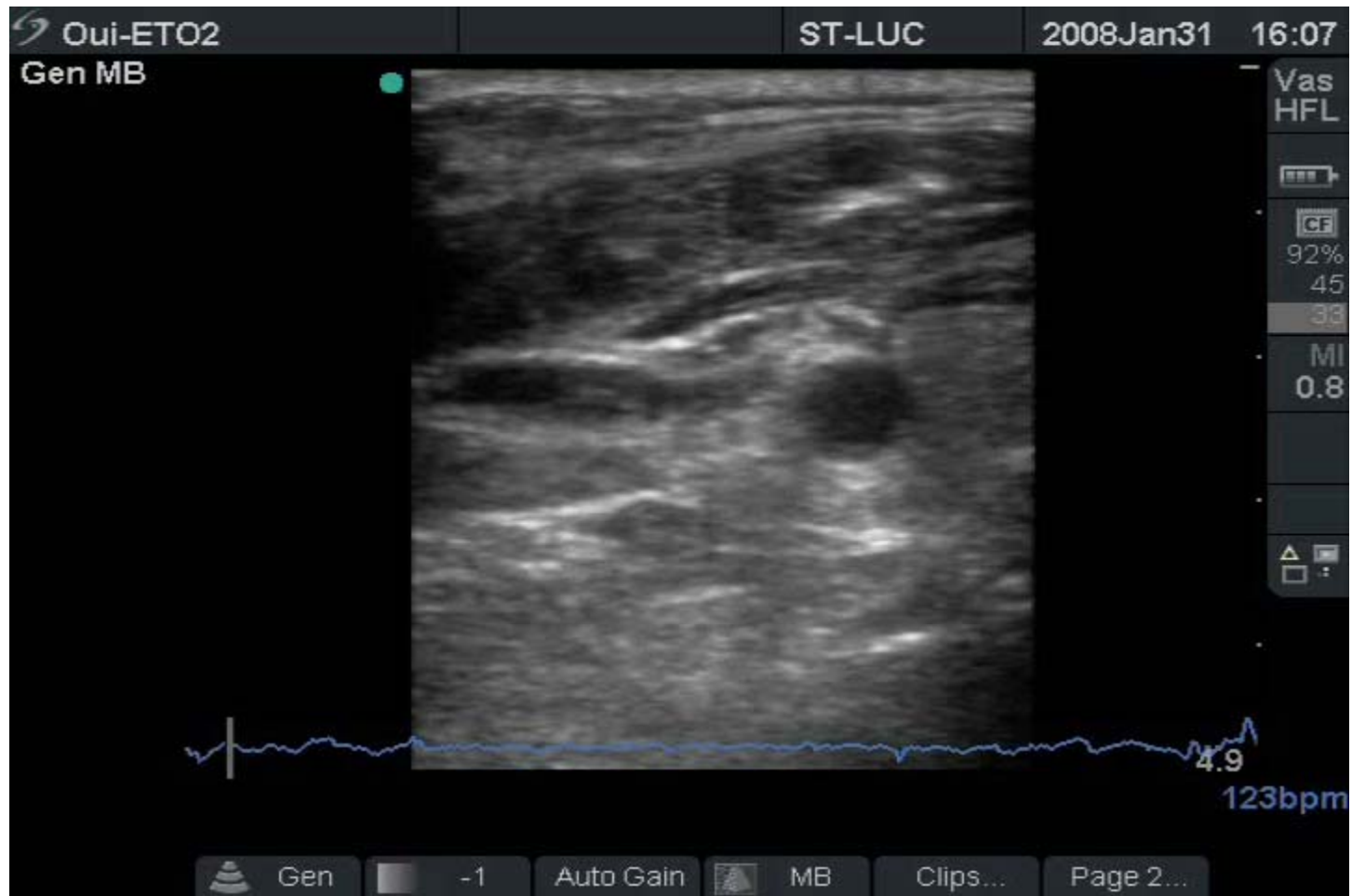
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129bpm

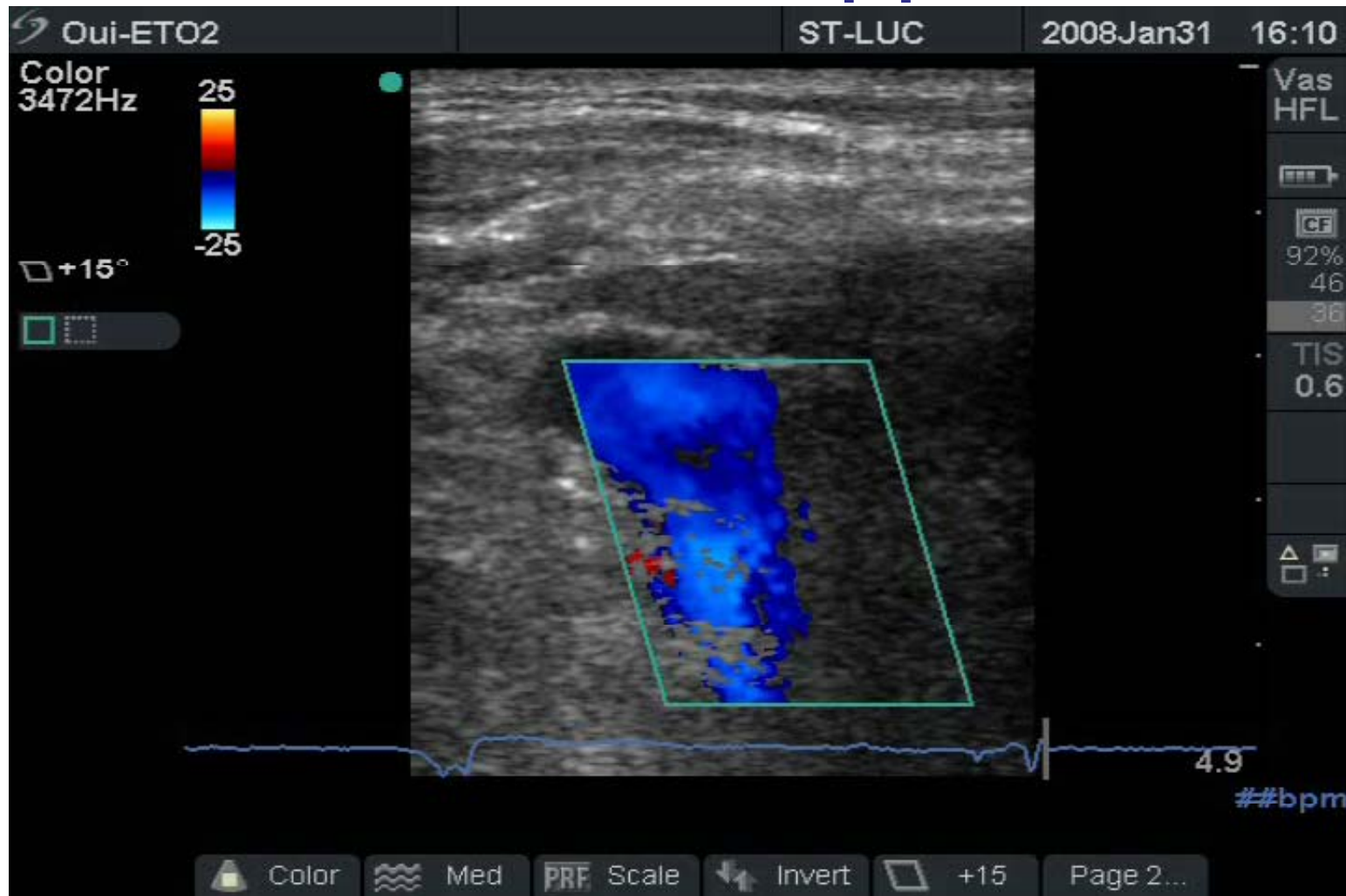
76 yo ♂ ICU 7 days later unstable: SVC



76 yo ♂ ICU day #7 unstable:
left internal jugular vein



76 yo ♂ ICU 7 days later unstable: LIJ color Doppler



76 yo ♂ ICU 7 days later unstable: LIJ PW Doppler

