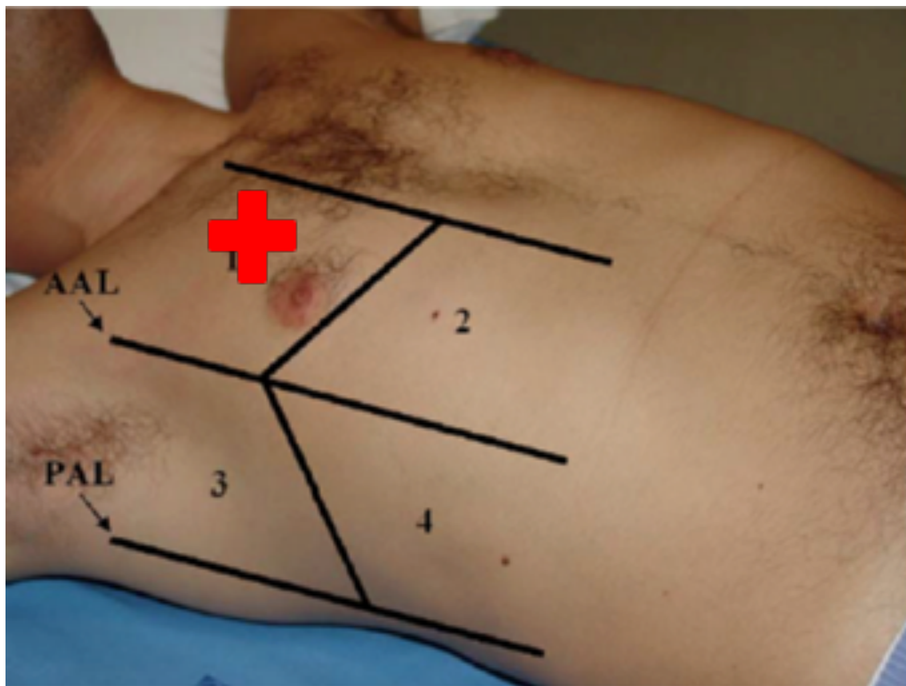
IVC + Lung scan for volume status

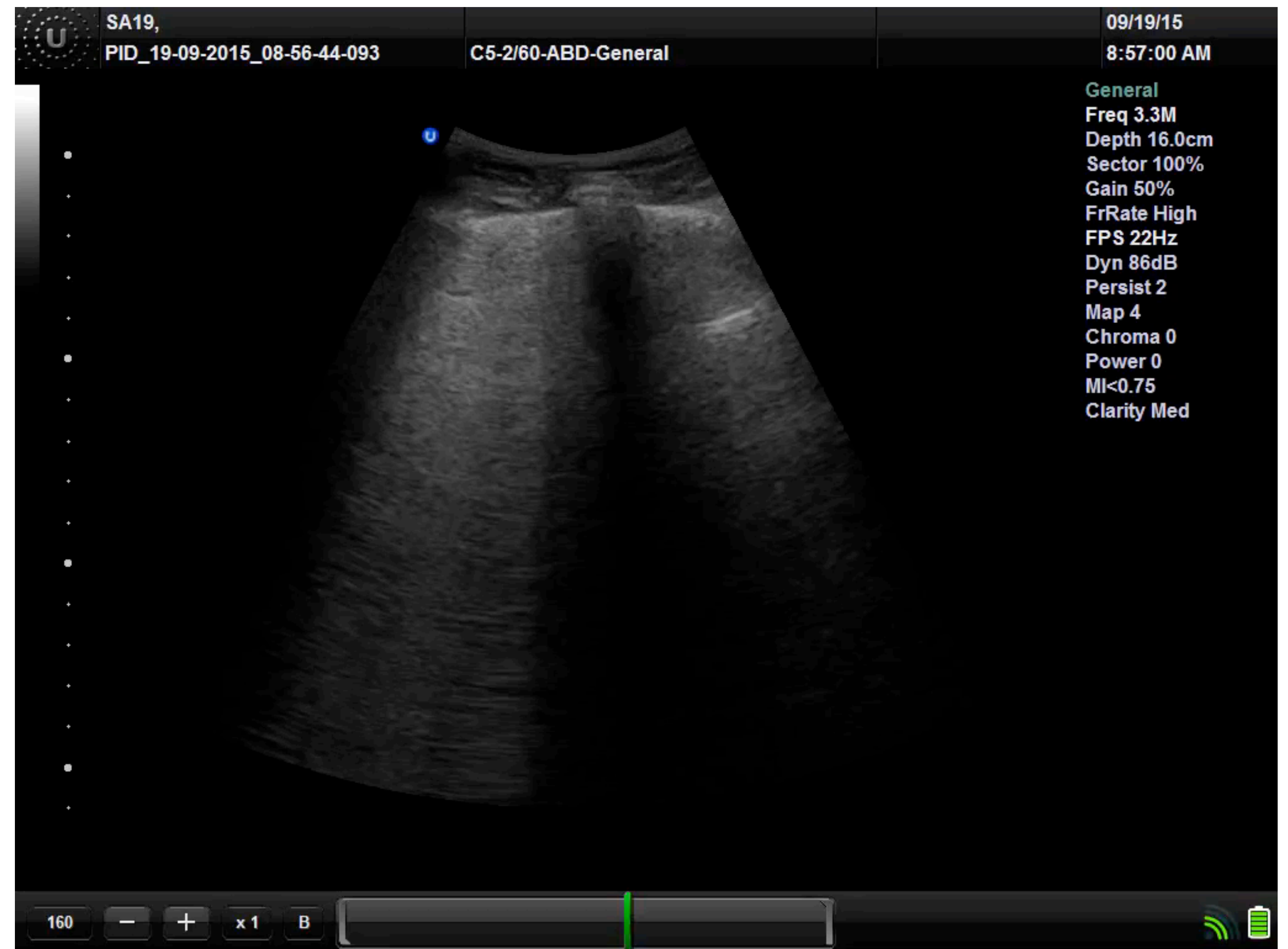
Case Examples

Case 1

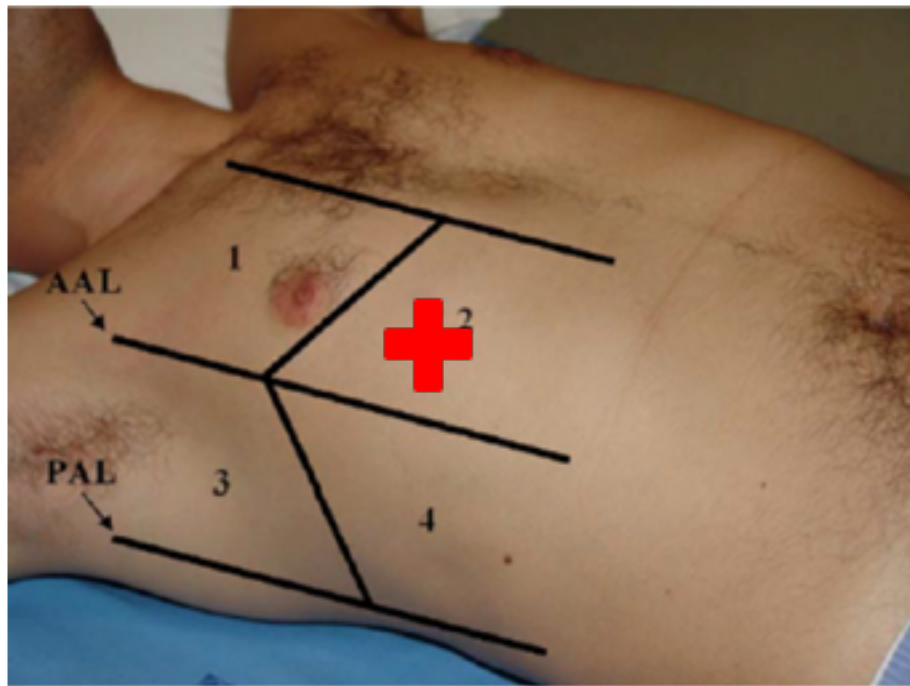
- 55M 40 pack year smoker, HTN, minimal contact with health care system, no known cardiac or lung disease
- Presents to ED with progressive SOB X 2 months, much worse over past 3d
- Sats 88% on R/A, BP 164/95 HR 95 reg afebrile
- No orthopnea, mild LE swelling, JVP not confidently seen, diffuse wheeze and faint breath sounds
- Hgb and WBC normal, BNP pending, Cr normal, technically poor AP CXR difficult to interpret

Lung scan





Lung scan



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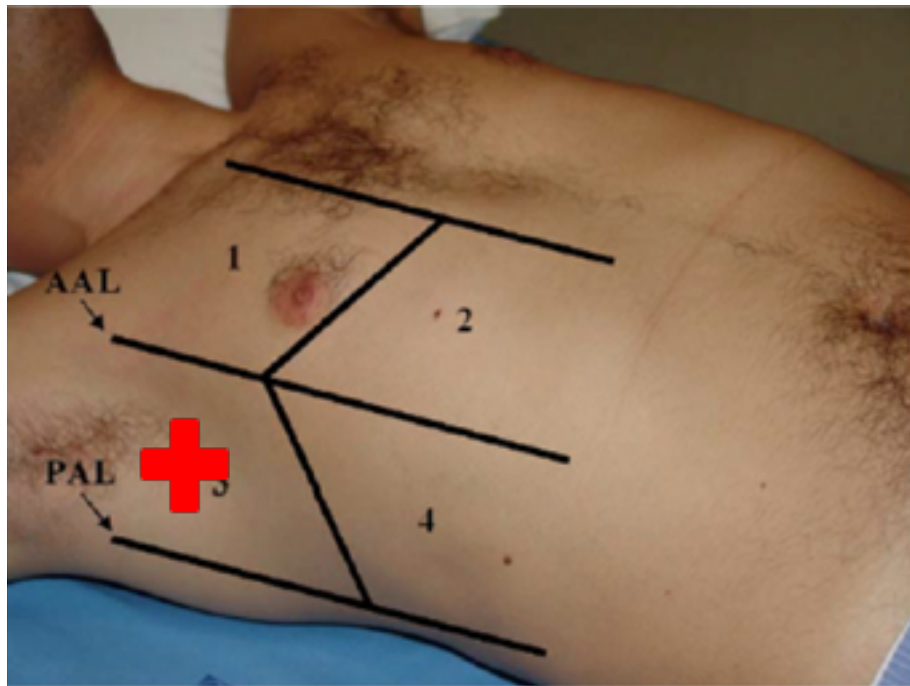
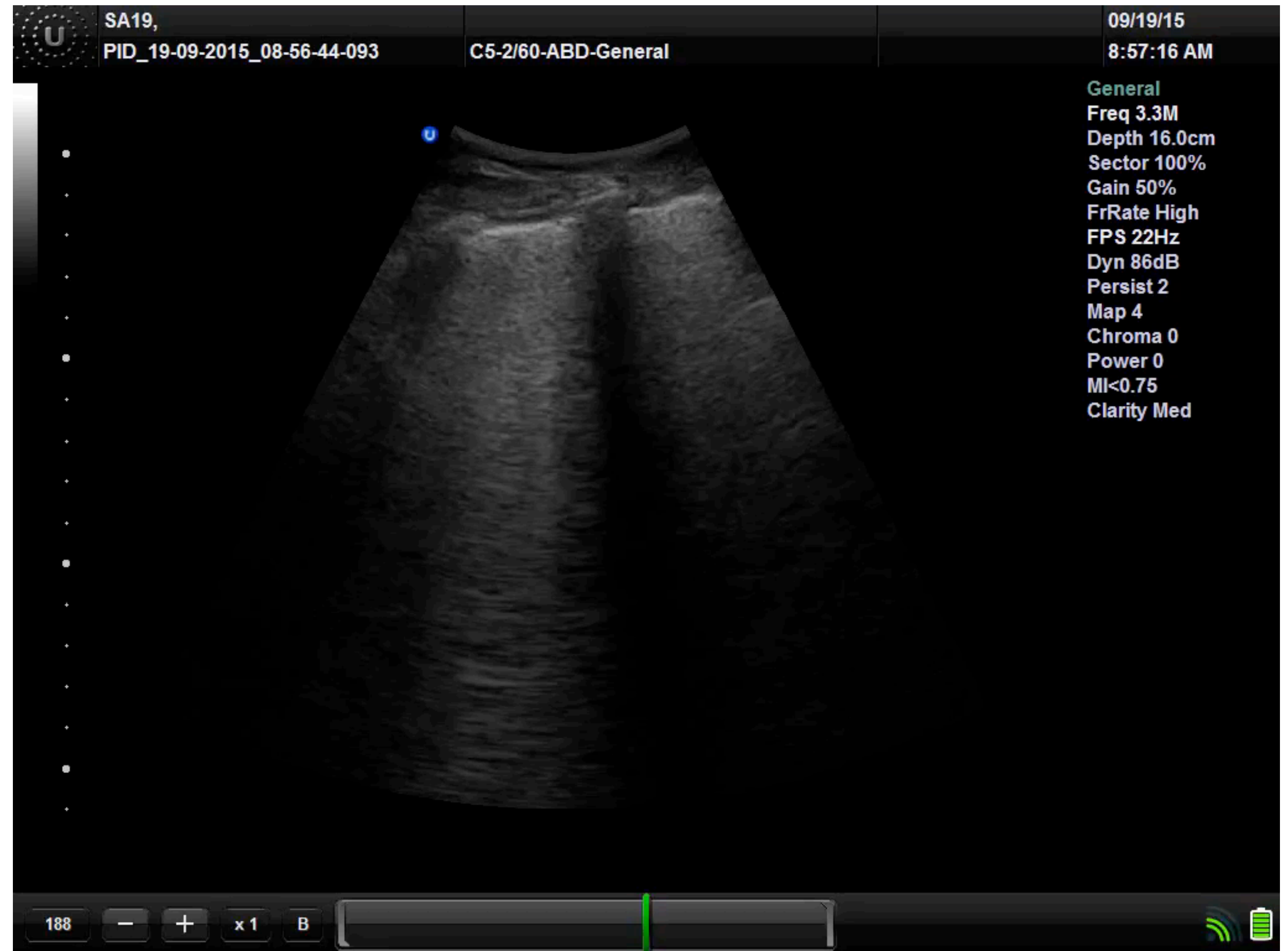
C5-2/60-ABD-General
09/19/15
8:57:35 AM

General
Freq 3.3M
Depth 16.0cm
Sector 100%
Gain 50%
FrRate High
FPS 22Hz
Dyn 86dB
Persist 2
Map 4
Chroma 0
Power 0
MI<0.75
Clarity Med

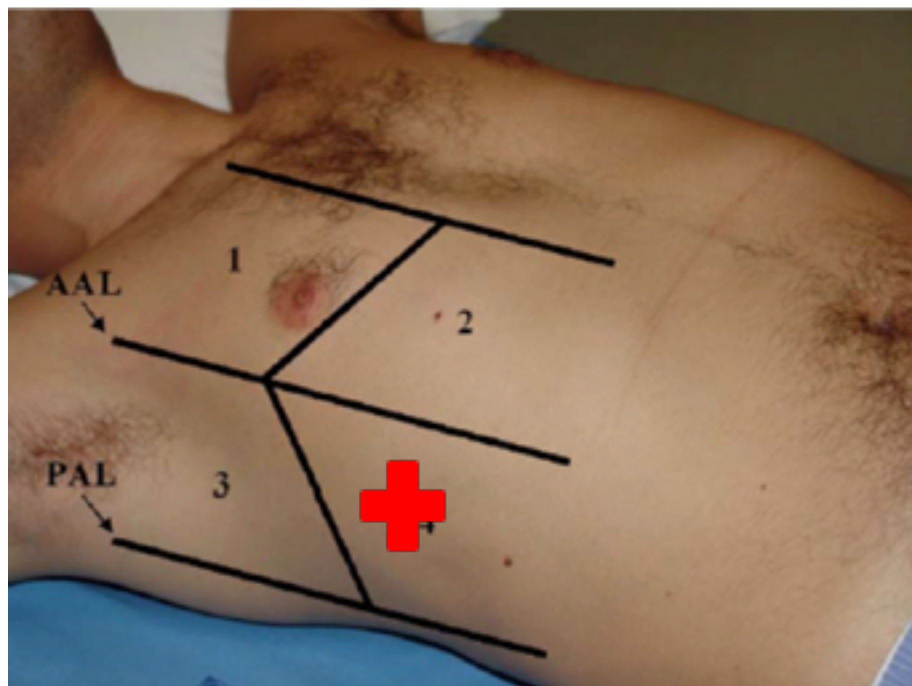
149 − + x 1 B

Lung scan





Lung scan



SJA,
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C5-2/60-ABD-General
08/20/15
8:42:59 AM
General
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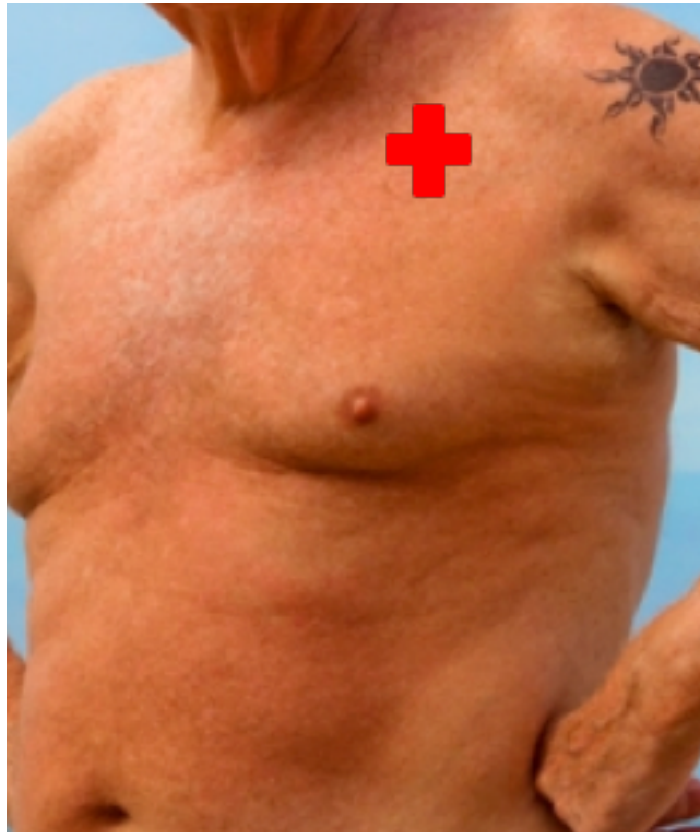
Depth 16.0cm
Sector 100%
Gain 50%
FrRate High
FPS 22Hz
Dyn 86dB
Persist 2
Map 4
Chroma 0
Power 0
MI<0.75
Clarity Med
58
x 1
B

Lung scan



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09/19/15
8:57:16 AM

General
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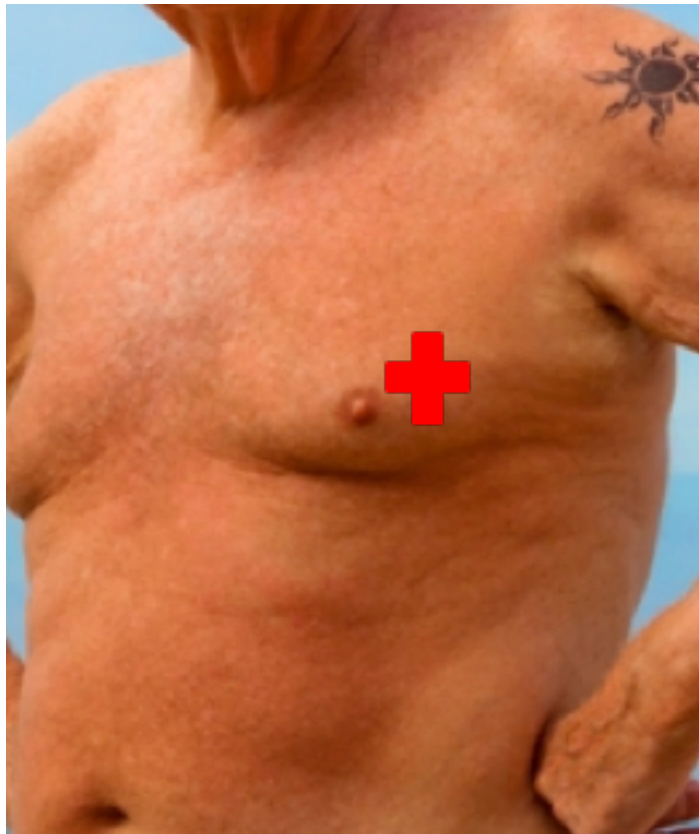
Depth 16.0cm
Sector 100%
Gain 50%
FrRate High
FPS 22Hz
Dyn 86dB
Persist 2
Map 4
Chroma 0
Power 0
MI<0.75
Clarity Med

188 − + x 1 B

Lung scan



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C5-2/60-ABD-General
09/19/15
8:57:52 AM

General
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Sector 100%
Gain 50%
FrRate High
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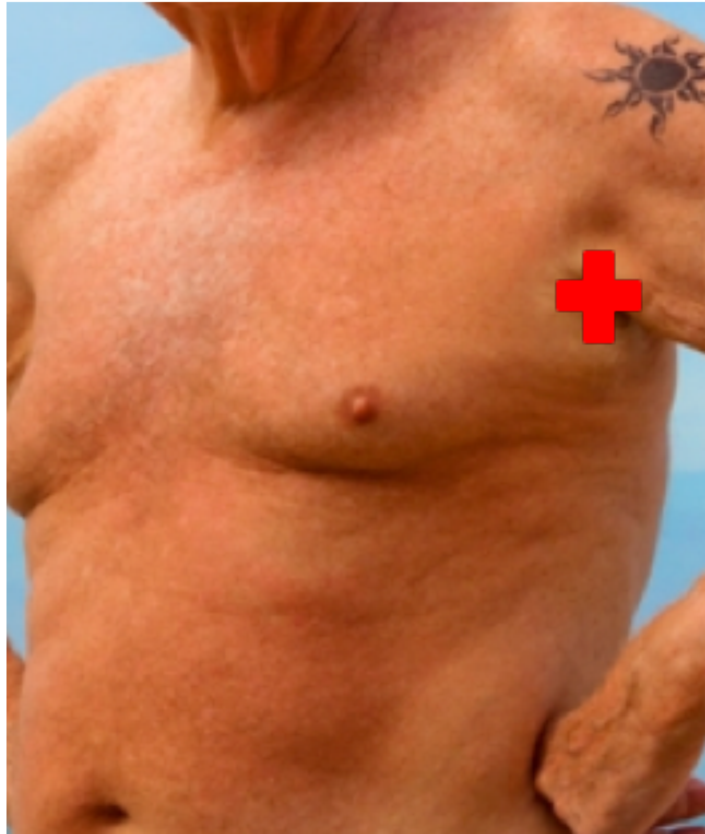
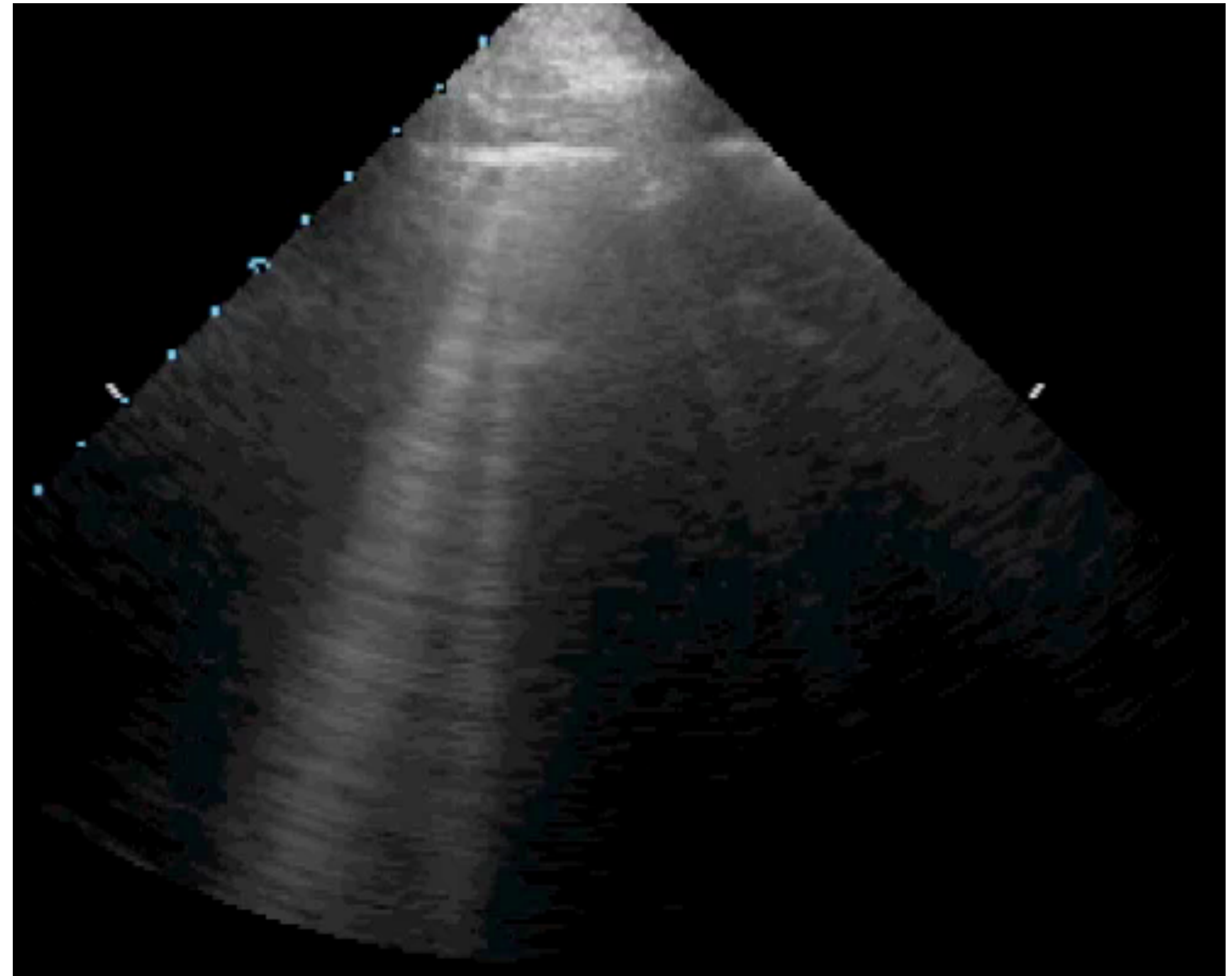
Dyn 86dB
Persist 2
Map 4
Chroma 0
Power 0
MI<0.75
Clarity Med

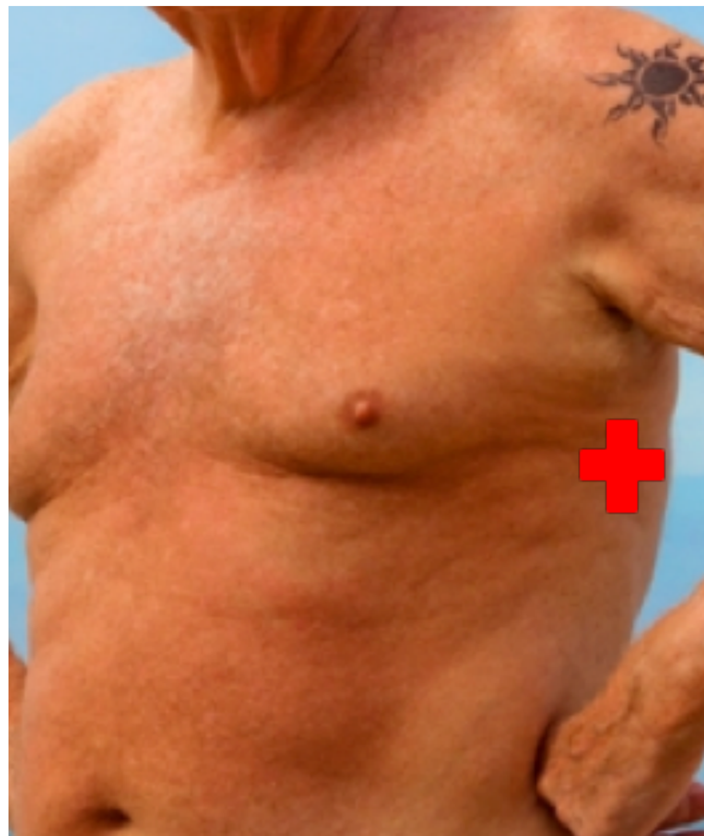
179 − + x 1 B

Lung scan





Lung scan



SJA,
PID_20-08-2015_08-42-47-656
C5-2/60-ABD-General
08/20/15
8:42:59 AM

General
Freq 3.3M
Depth 16.0cm
Sector 100%
Gain 50%
FrRate High
FPS 22Hz
Dyn 86dB
Persist 2
Map 4
Chroma 0
Power 0
MI<0.75
Clarity Med

58 − + x 1 B

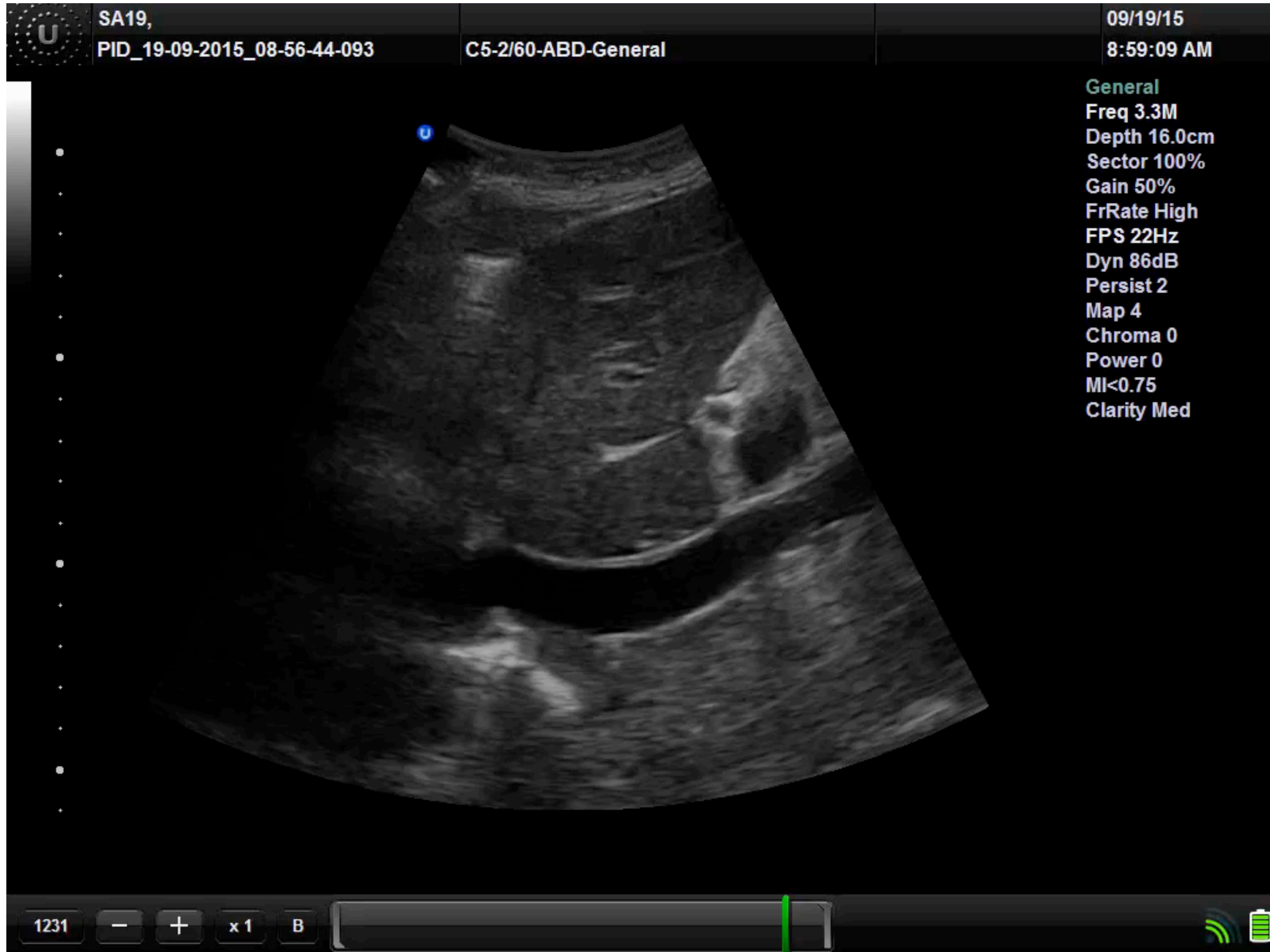
Interpretation

- IVC
  - minimal CI (< 20%)
  - IVCmax > 2cm
- Lung
  - diffuse bilateral B-line patterns with

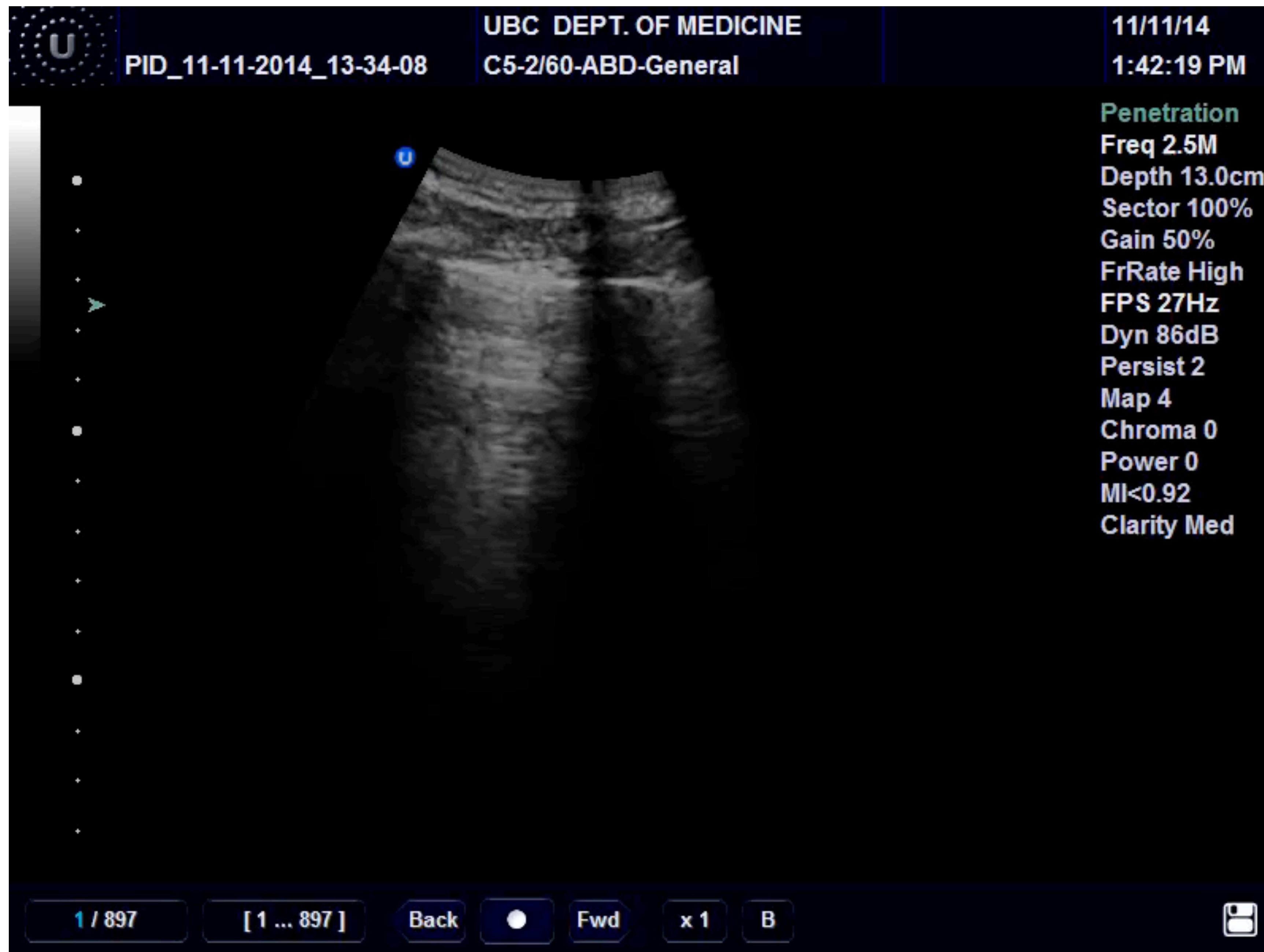
Case 2

- 66M smoker, HTN, CHFpEF, severe TR, COPD
- Presents to ED with 2d worsening SOB and dry cough
- Sats 86% RA, BP 165/96, HR 100 reg
- No orthopnea, mild LE swelling, JVP NOT confidently identified, scattered wheezes and crackles on auscultation
- WBC normal, BNP 300, Cr 130, CXR shows hyperinflation and chronic scarring

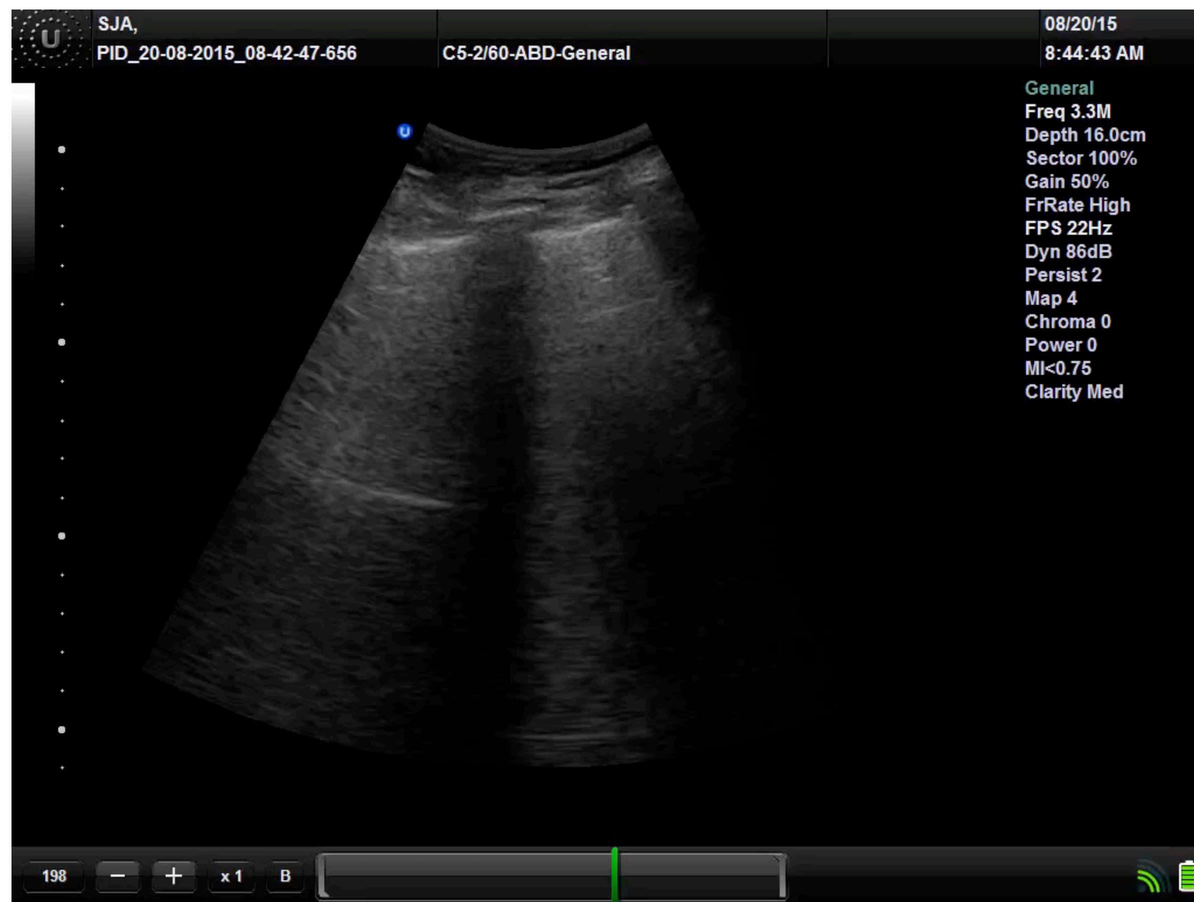
IVC



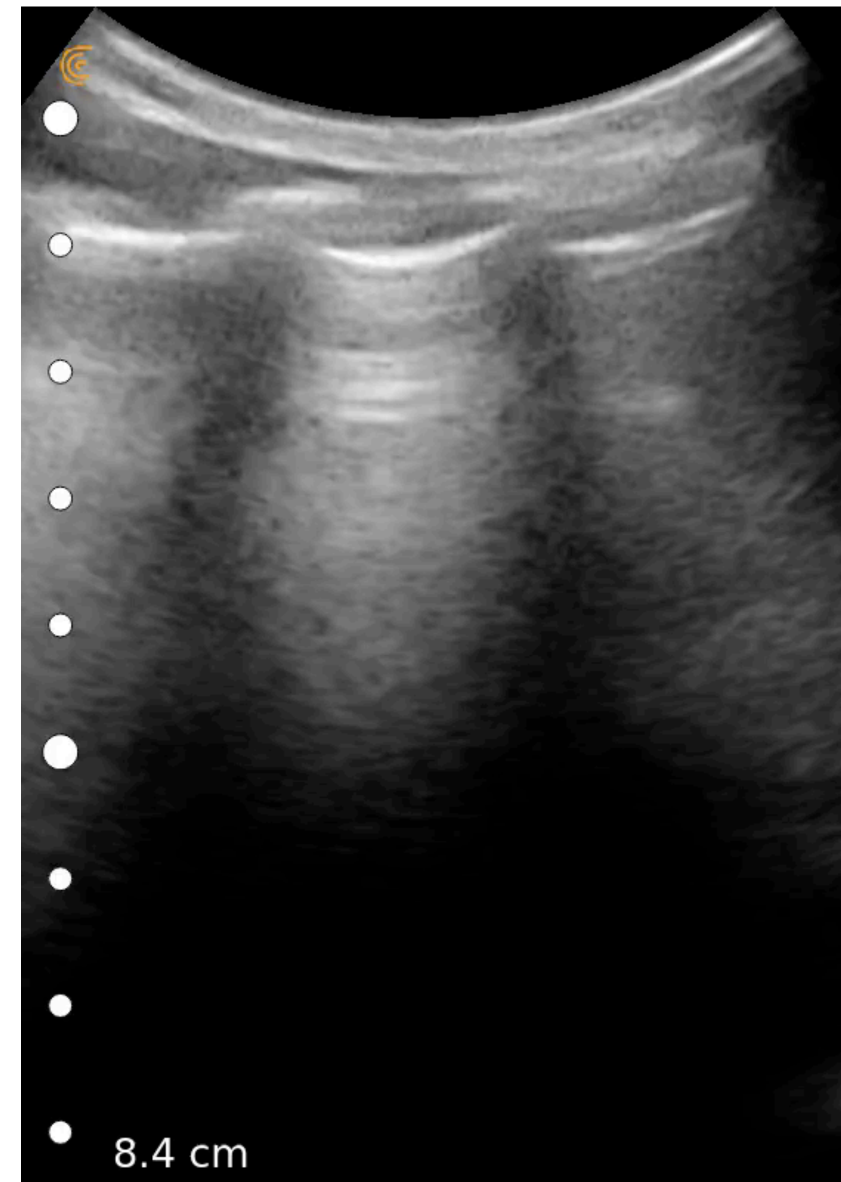
Both Right ant lung zones



Right lateral lung zone

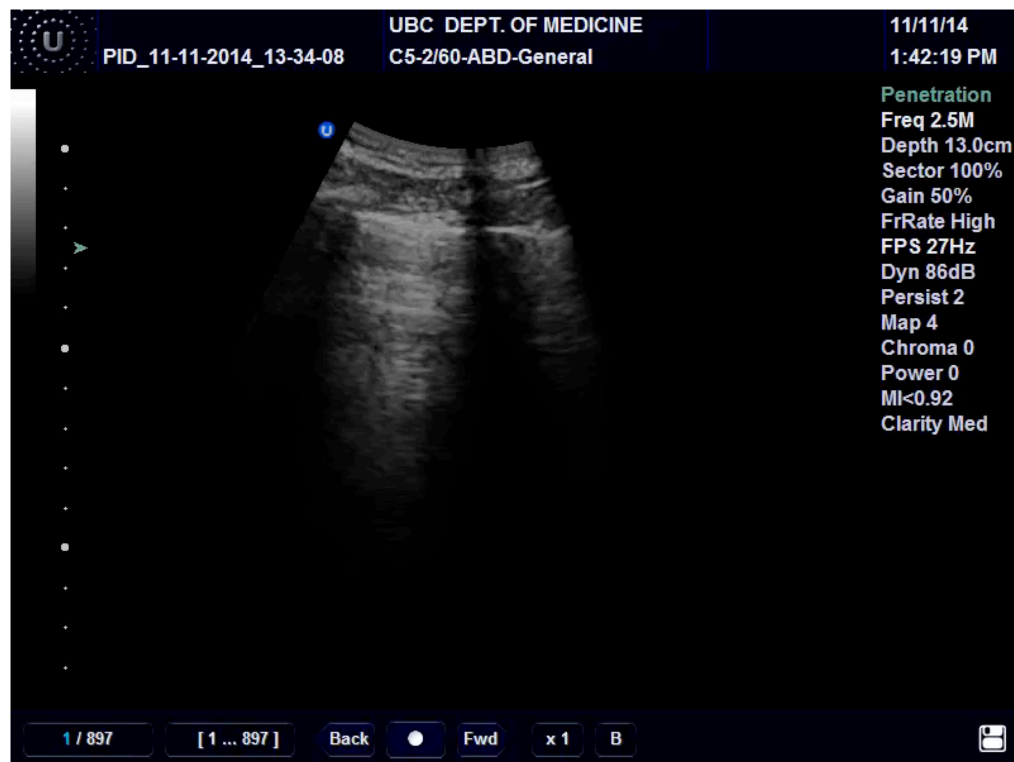


Superior

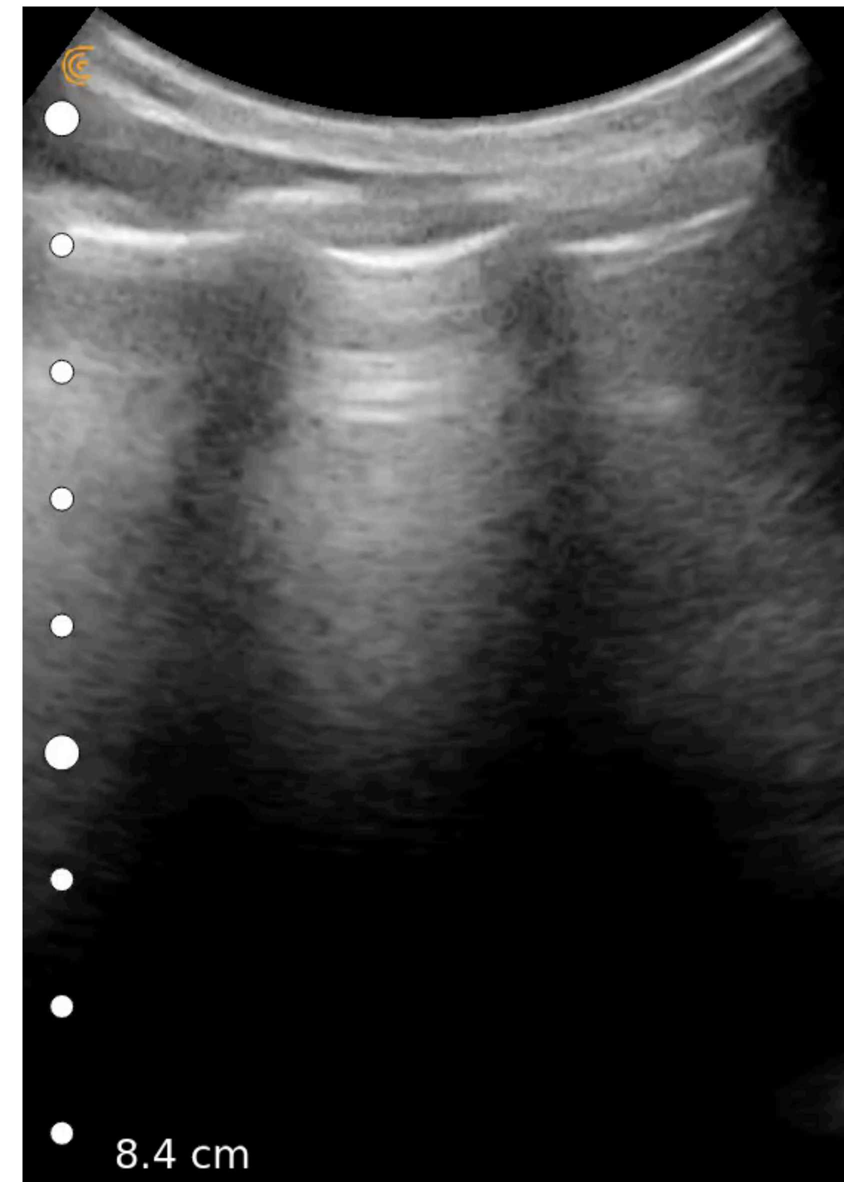


Inferior

Left lung zones



Anterior



Lateral

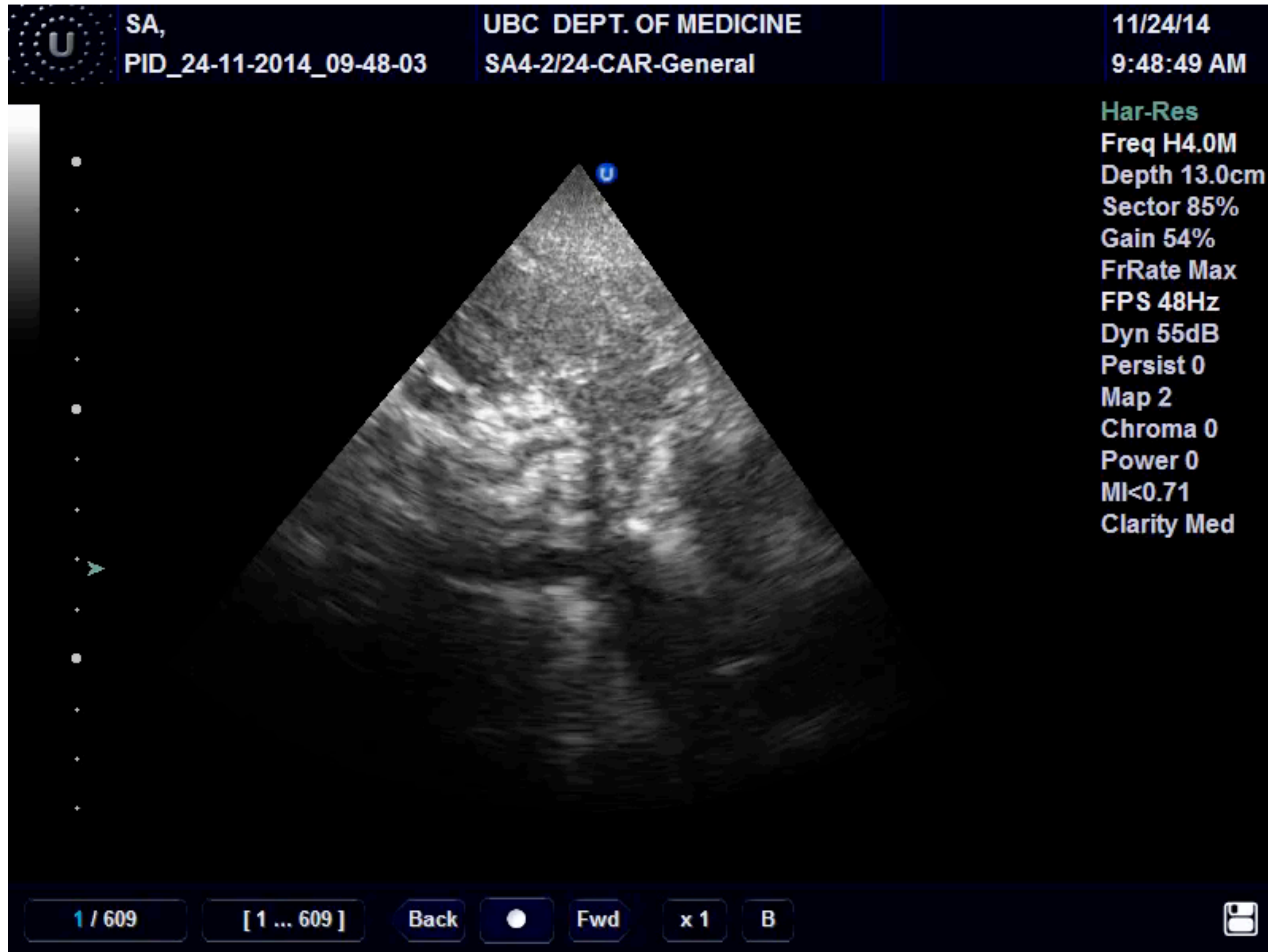
Interpretation

- IVC
  - *Difficult to interpret in context of severe TR
  - CI ~40%, IVCmax < 2cm
  - Not convincing for significant increase in cardiac pressures, but does NOT r/o CHF
- Lung
  - Predominantly A line pattern
  - Isolated B-lines in R lateral superior lung zone
  - No pleural effusions
- Strongly argues against volume overload and pulmonary congestion, consider non-cardiogenic cause such as pneumonia given cough and local B lines

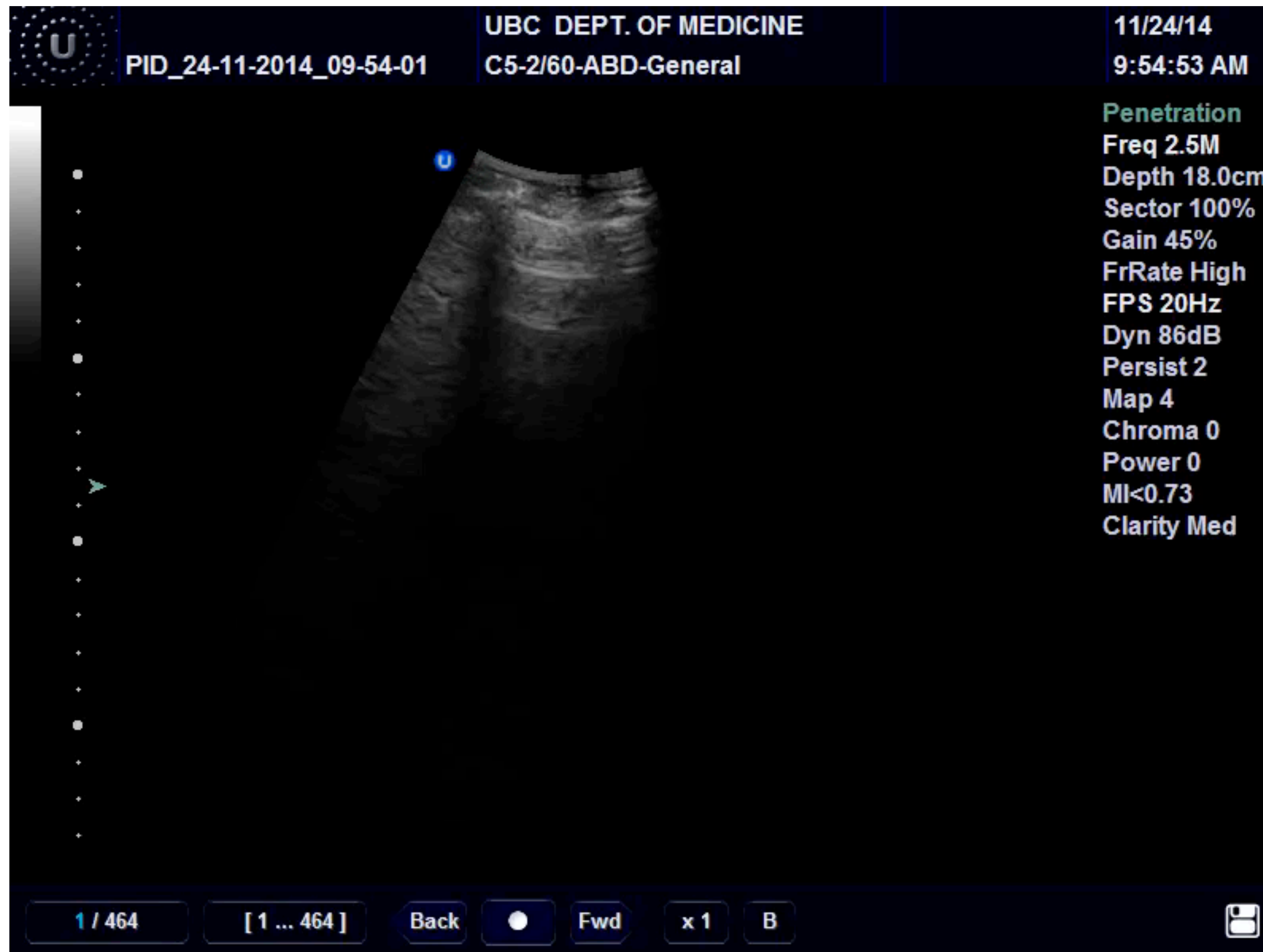
Case 3

- 56M homeless found down, no medical records on the system
- Decreased LOC, unable to obtain any meaningful history
- BP 88/40, HR 110 reg, 92% R/A, T 35.9
- GCS = 13, no focal neuro deficit, neck S+S, JVP not seen, cardioresp exam unremarkable, generalized abdo discomfort, track marks on arms, MSK/derm otherwise unremarkable
- WBC 12, Hgb 110, Cr, 120, lytes unremarkable, lactate 2.9, CK 3,000, CXR, ECG reveal no abnormalities

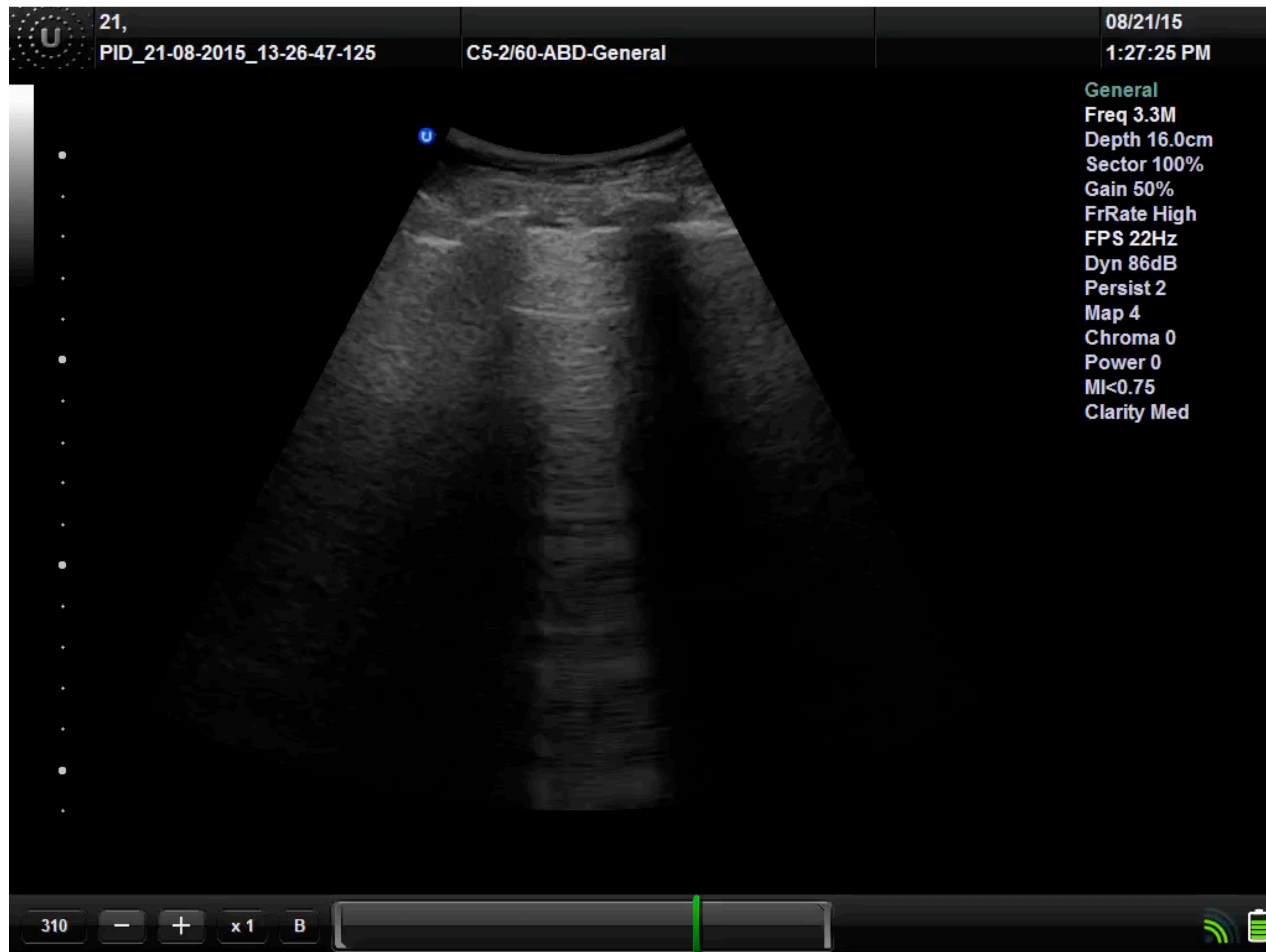
IVC



Anterior lung zones bilaterally



Dependent lateral lung zones



Interpretation

- IVC
  - CI almost 100%
  - IVCmax ~ 1cm
  - in context of hypotension suggest decreased effective circulating volume
  - likely fluid tolerant, maybe fluid responsive
- Lung
  - predominant A-line pattern confirms dry lungs which supports decreased effective circulating volume
  - dependent B-lines in patient found down are likely insignificant, but could be seen in localized interstitial disease such as pneumonia
- This hypotensive patient likely has hypovolemic or distributive shock and should be aggressively fluid resuscitated