

# Lung Ultrasound

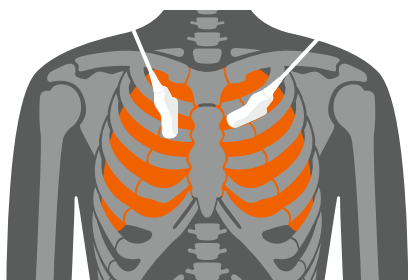
## Quick Reference Card

[siemens-healthineers.com/ultrasound](https://www.siemens-healthineers.com/ultrasound)

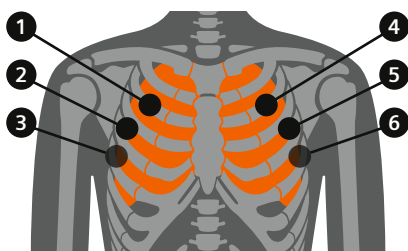


### Procedure

Evaluate each quadrant in a sagittal or oblique plane.



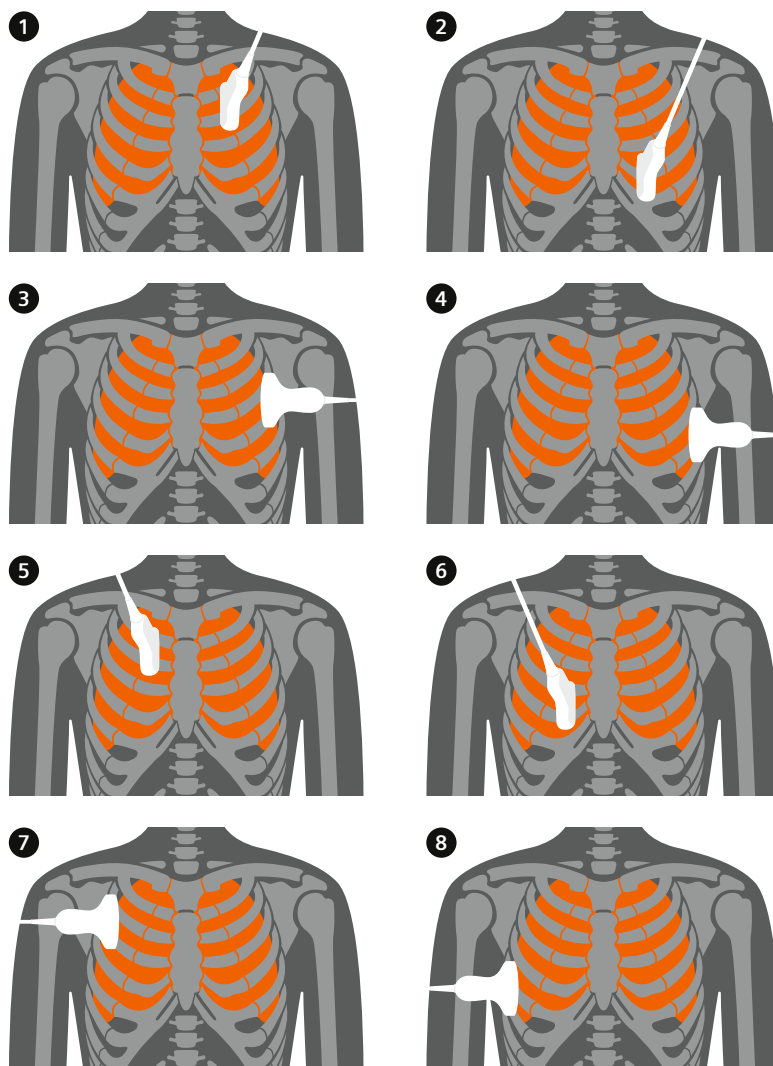
The 6-zone abbreviated BLUE protocol (Bedside Lung Ultrasound Evaluation) allows for rapid evaluation for acute respiratory failure.<sup>1</sup>



<sup>1</sup> Lichtenstein, D.A. Lung ultrasound in the critically ill. *Ann. Intensive Care* 4, 1 (2014). <https://doi.org/10.1186/2110-5820-4-1>

### Zones

The 8-zone method is preferred to evaluate critically ill patients with limited mobility. Additionally, 4 posterior zones may be evaluated in mobile patients if desired.



## Transducers

### Curved Array

- Preferred transducer for pleural evaluation
- Optimal image quality and penetration

### Linear Array

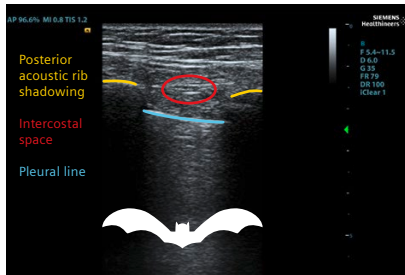
- Preferred transducer to evaluate superficial lung surfaces and pleural lining

### Phased Array

- Multi-purpose
- Excellent penetration

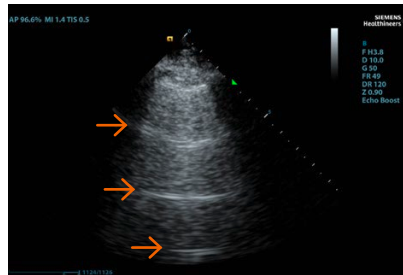
## Imaging landmarks / artifacts

### Bat Sign



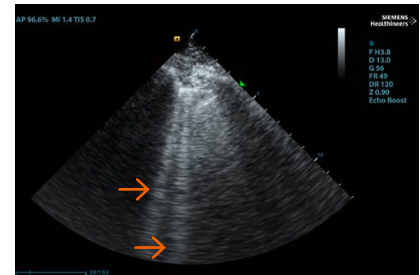
- Rib shadows on either side of bright pleural line

### A-Lines



- Reverberation artifacts display as horizontal lines evenly spaced throughout the image

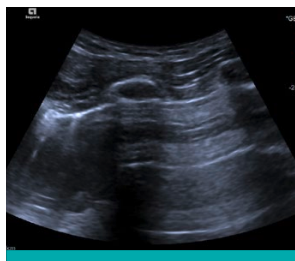
### B-Lines



- Comet-tail artifacts display as vertical lines extending from the pleural line to the far field of the image
- May obscure A-lines

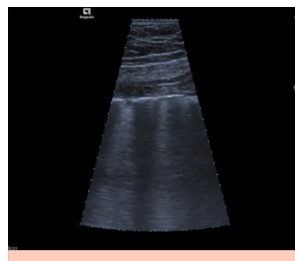
## Disease progression

### Normal



- Normal lung demonstrates evenly spaced A-lines

### Early pneumonia



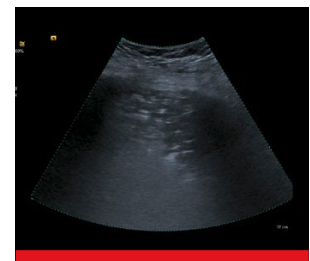
- Early pneumonia demonstrates 2-3 B-lines

### Moderate pneumonia



- Moderate pneumonia demonstrates 4 or more B-lines
- Irregular pleural borders

### Severe pneumonia



- Severe pneumonia may demonstrate consolidation/hepatization which displays a tissue-like echotexture

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