

# Lung Ultrasound Cheat Sheet

## Basics

- Use low frequency probe (2-5 MHz) to evaluate lung fields
- Can use high frequency probe (5-10 MHz) to evaluate pleural line
- Air scatters ultrasound = artifacts of lung US
- Fluid or thickening of interstitial tissue, lung behaves more like solid organ
- Use rib shadows to orient yourself
- Pleura: bright white line between rib shadows

## A-Lines

- A-lines = air in lung (normal or ptx)
- A-lines are repeating horizontal lines (horizontal reverberation artifact)

## B-Lines

- B-lines = interstitial fluid
- B-line: start at pleural line and travel at least 18 cm deep
- $\geq 3$  per rib space or any in anterior/apex is abnormal

## Pleural Effusion

- Probe position: anterior or posterior axillary line in longitudinal plane
- Effusion: dark stripe of fluid separate visceral from parietal pleura
- Diaphragm: bright white line, pulls inferiorly with inspiration
- Mirror image sign: reflection of liver/spleen tissue above diaphragm (no effusion)
- Spine sign: spine visualized above diaphragm (fluid present)
- Pericardial and pleural effusions have different fluid positions
- Pericardial effusions: cross anterior to aorta
- Pleural effusions: taper to descending aorta

## Pneumothorax

- Probe position: anterior chest wall

- Lung sliding: pleural line looks shimmery or like ants marching in a line
- Lung sliding = no pneumothorax
- No lung sliding = pneumothorax (unless scarring present)
- Comet-tail: single vertical, bright-line (reverberation artifact), no pts
- Seashore Sign (M-mode) = near field is straight lines, far field is grainy; no ptx
- Barcode Sign (M-mode) = all straight lines; ptx present
- Lung point: point where visceral pleura reattaches to chest wall, lung sliding and no lung sliding in same rib space
- In M-mode lung point appears as alternately barcode and seashore sign

## Interstitial Disease

- Pulmonary edema, infection, & fibrosis
- 8 scanning zones (4 on each side): anterior superior, anterior inferior, lateral superior, lateral inferior
- $>3$  B-lines = pathologic, zone is positive for interstitial disease
- More B-lines = more pathologic process
- Congestive heart failure: B-lines with thin, regular pleural line (unaffected pleural)
- Fibrosis or pneumonia: pleural line is irregular and lumpy with areas of subpleural fluid (pleura affected)

## Pneumonia, Consolidation, and Atelectasis

- Fluid-filled lung will transmit sound
- Hepatization: fluid filled area of the lung takes on appearance of liver
- Ultrasound can distinguish between consolidation and atelectasis
- Consolidation: generally unobstructed bronchi, air moving within airways appear as bright, shimmery columns
- Atelectasis: causes bronchial plugging, so airway column is static