TO PERFORM RESPIRATORY MUSCLE ULTRASOUND IN ICU PATIENTS

**PATIENT POSITION**

- Diaphragm
- Expiratory muscles

*Use same position for repeated measurements*

**PROBE HANDLING**

- >10 MHz
  - Muscle thickness
  - B-mode
- 2-5 MHz
  - Diaphragm excursion
  - M-mode

- Perpendicular to skin
- Mark probe location

**TIMING**

- Best during T-piece SBT
- Measurements at start and end of SBT can be compared

**VENTILATOR**

- Muscle thickness
  - All settings, no NMBAs
- Diaphragm excursion
  - No support
  - No PEEP

**PATIENT COOPERATION**

If patient can follow instructions:

*Ask for a maximal breath*

**MEASUREMENTS**

- Diaphragm excursion
  - M-line parallel to diaphragm movement

- Thickness
  - Calipers between fascia & perpendicular to fiber direction

**SYMMETRY**

No asymmetric diaphragm dysfunction?

*Right hemidiaphragm can be used as proxy for whole diaphragm*

1. Diaphragm excursion; 2. Diaphragm thickness and TFdi; 3. Rectus abdominis; 4. External & internal oblique, transversus abdominis; 5. Parasternal intercostal