

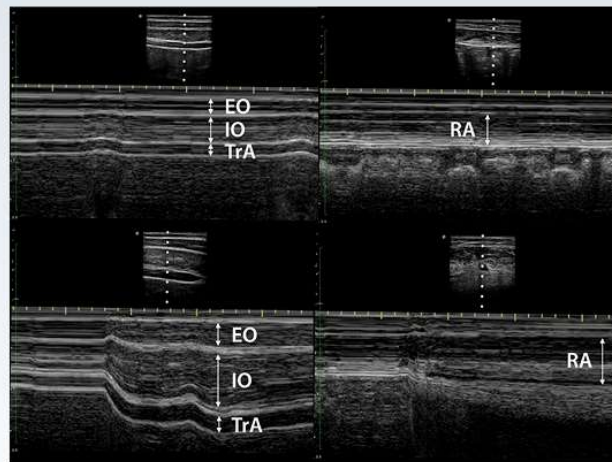
Does Ultrasound Measurement of Abdominal Muscle Thickening Provide Clinically Relevant Information?

STUDY DESIGN

CONDUCTED TWO PART STUDY:

1. Physiological study in **20 healthy subjects** of measurements of abdominal muscle thickness (MT) and thickening fraction (TF) during cough and exhalation
2. Prospective observational study in **57 mechanically ventilated patients** of measurements of MT and TF before and during spontaneous breathing trial

RESULTS



Ultrasound images of abdominal muscle thickening during tidal breathing (upper panel) and during cough (lower panel)

EO: external oblique, IO: internal oblique, TrA: transverse abdominis, RA: rectus abdominis

Healthy subjects: pressure generated during exhalation correlated with TF of IO and RA ($p < 0.001$)

Ventilated patients: MT and TF measurement feasible, with moderate reproducibility

During failed SBT: TF of TrA and IO increased substantially (+13.2% and +7.2%, respectively)

In patients subsequently extubated: combined TF of TrA, IO, and RA measured during cough was associated with an **increased risk of reintubation** (OR 2.1; 1.1 – 4.4 per 10% decrease in combined TF)

Ultrasound is a feasible tool to assess and monitor the structure and activity of the abdominal muscles in mechanically ventilated patients.