Introduction:
Diaphragm dysfunction occurs quickly in mechanically ventilated patients and is associated with prolonged mechanical ventilation and poor outcome. Recent literature suggest that diaphragm thickening fraction (DTF) measured by ultrasound can be useful to predict weaning outcome. However, there is no standardized approach in the measurement of diaphragm thickness (DT) and limited data exist comparing different measurement techniques of diaphragm thickness (M mode-MM or B mode-BM). For example movements of the diaphragm relative to the transducer during the respiratory cycle may result in unintended comparison of different points of the diaphragm at end expiration and inspiration during MM measurements. The goal of this study was to compare MM with BM in the measurement of diaphragm thickness and DTF in the ICU patients.

Methods:
DT was measured in right diaphragm during tidal breathing. Three measurements of the DT were taken both in MM and BM and averaged to report the mean. DT was measured during inspiration and expiration and DTF was calculated. Bias and agreement between the 2 measurement methods was evaluated with Blant and Altman test.

Results:
Forty-two patients were enrolled in the study. Diaphragm could not visualize or measured in 8 patients and measurements of 34 patients were analyzed. Despite existance of different degree diaphragm movements relative to the ultrasound transducer secondary to respiratory movement there was no significant difference between the measurement results of MM and BM. There was good agreement and no significant proportional bias between the measurements of 2 modes (p>0.05). BM and MM measurements during the inspiratory (0.29±0.07 & 0.30±0.07 cm; p: 0.159) , expiratory (0.22±0.06 & 0.22±0.06 cm; p:0.9 ) phases and DTF were (29±15 & 32±15 %, p:0.217) respectively.

Conclusion:
Our results suggest that there is no significant difference between in the measurement of diaphragm thickness with MM or BM.