

Table III - General data from cohort studies using diaphragmatic USG as a predictor of success in weaning and extubation

Author /Year	Study design	Objective	Results
Sklar <i>et al.</i> [16], 2020	Cohort	Determine whether lower Tdi is associated with delayed MV release and complications of acute respiratory failure (reintubation, tracheostomy, prolonged ventilation >14 days, or in-hospital death).	The reduction in baseline Tdi was associated with prolonged mechanical ventilation, an increased risk of complications and increased hospital mortality. And a higher baseline Tdi was associated with an increased risk of developing diaphragmatic atrophy.
Vivier <i>et al.</i> [17], 2019	Cohort	To evaluate whether the diaphragmatic dysfunction detected by ultrasound only at the time of extubation was associated with the failure of extubation in high-risk patients who underwent successful ERT.	After the success of an ERT, evaluation of diaphragm function by ultrasound before extubation did not allow prediction of extubation in patients at high risk of reintubation in the ICU. In contrast, clinical assessment of cough strength was found to be a strong predictor of extubation failure.
Eltrabili <i>et al.</i> [18], 2019	Cohort	To evaluate the effectiveness of ultrasound-derived variables in predicting the success of mechanical ventilation release in patients who are seriously ill and with abdominal sepsis.	Both indexes of diaphragmatic ultrasound, that is, fraction of diaphragmatic thickening and diaphragmatic excursion, can be useful parameters for assessing the successful release of patients on MV with abdominal sepsis.
Zhang <i>et al.</i> [19] 2020	Cohort	Explore the value of right ND and its variation evaluated by ultrasound to predict the outcome of extubation in mechanically ventilated COPD patients.	This study demonstrated that DE 30 and Δ DE 30-5 can be used to predict the outcome of extubation in patients with COPD. The combination of two indicators can improve the predictive value.
Palkar <i>et al.</i> [20], 2018.	Cohort	Track the ED and the contraction speed using USG in order to correlate the change in ultrasound measurements during the weaning process with the result of extubation.	The results of this study demonstrate that during weaning from ventilatory support, ED is a better predictor of the outcome of extubation than the speed of contraction of the diaphragm. The ED in the extubation success group was significantly higher than the failed patients who had a value < 1 cm.

Dres <i>et al.</i> [21], 2016	Cohort	Quantify the prevalence and coexistence of these two forms of ICU-AW and their impact on the outcome.	DD was significantly associated with prolonged weaning, and DTF was an independent variable for weaning failure.
Khan <i>et al.</i> [22], 2018	Cohort	Comparar a DE com IRRS como preditores de desmame.	ED is a clinical predictor of the outcome of weaning and extubation, it is also a preventive factor for reintubation. Of the patients analyzed, 62 were successfully weaned (68.9%) and had an ED on average of 1.44 ± 0.26 cm. The difference between the failed and successful groups was statistically significant ($p < 0.0001$).
Soliman <i>et al.</i> [23], 2019	Cohort	A aplicação de USG de tórax pode ajudar no desmame e na previsão de seu resultado.	The DTF was significantly higher in the group successfully weaned ($p 0.001$) off value ≥ 29.5 and can predict the success of weaning with a sensitivity of 88.0% and specificity of 80.0%. The authors found that DTF was significantly higher in patients who were successfully weaned (43.0 ± 10.7 vs 28.9 ± 2.8 cm, $P = 0.001$) than in the group that failed. DTF can be effective to predict success in weaning, being reported by some authors as the best index representing diaphragmatic strength.
Huang <i>et al.</i> [24], 2017	Cohort	To evaluate the usefulness of M-mode USG in the results of ventilator weaning in elderly patients.	Patients with DD also had a higher incidence of weaning failure than patients without DD (24/30 vs. 4/10), $P = 0.017$.
Pirompanich <i>et al.</i> [25], 2018	Cohort	Evaluate the effectiveness of a combination of DTF and IRRS to predict successful weaning compared to IRRS alone.	The baseline characteristics were not significantly different between the successful and unsuccessful weaning groups, DTF on both sides were significantly different between the successful and failed TRE patients (right FTD: successful group $57.7 \pm 21, 2\%$, failure group $22.9 \pm 9.2\%$, $p < 0.001$ (Fig. 2); left DTF: success group $68.8 \pm 41.2\%$, failure group $42.8 \pm 18.5\%$, $p = 0.017$).
Yoo <i>et al.</i> [26], 2018	Cohort	Compare the clinical utility of these two diaphragmatic parameters to predict extubation success.	The average degree of diaphragmatic excursion was higher in patients with extubation success than in those with extubation failure. Successful extubation patients had a $\Delta tdi\%$ higher than those with extubation failure.

DE = diaphragmatic excursion; DTF = fraction of diaphragmatic thickening; COPD = chronic obstructive pulmonary disease; IRRS = rapid and shallow breathing index; MV = mechanical ventilation; NIV = non-invasive ventilation; Tdi = diaphragm thickness; DD = diaphragmatic dysfunction; TRE = spontaneous breathing test; ΔDE = variation in diaphragmatic excursion; Δtdi = variation in diaphragm thickness; USG = ultrasound; ICU = intensive care unit; ICU-AW = muscle weakness acquired in the intensive care unit