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Comments on “Predictive accuracy of lung and diaphragmatic ultrasound in weaning from mechanical ventilation: a comparison with the Rapid Shallow Breathing Index”

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Dear Editor,

We read with interest the study by Shalini Bellan *et al.* on weaning outcomes in critically ill patients who underwent invasive mechanical ventilation (MV) for more than 24 hours [1]. In this study, complementary ultrasound parameters, including the modified lung ultrasound score (mLUS), diaphragmatic thickening index (DTI), diaphragmatic excursion (DE), and the rapid shallow breathing index (RSBI), were integrated to improve prediction of successful ventilator weaning and extubation.

As in many studies evaluating diaphragmatic ultrasound during weaning, Shalini Bellan *et al.* do not provide a detailed description of some methodological and technical aspects that may influence the interpretation and reproducibility of the measurements [1]. Although the technique used to assess DTI was adequately described, further clarification regarding the respiratory conditions under which diaphragmatic thickness was measured at end-inspiration and end-expiration would have been valuable. Specifying whether these measurements were obtained during tidal breathing or during a standardized inspiratory maneuver may be relevant, as diaphragmatic ultrasound measurements can be influenced by acquisition conditions and patient positioning. Previous evidence has identified considerable methodological heterogeneity across studies, with patient positioning being recognized as one of the factors that may contribute to heterogeneity in diagnostic performance [2]. Furthermore, information regarding interobserver agreement and the experience of the operators performing the ultrasound assessments would have strengthened the methodological reproducibility and external applicability of the reported findings.

On the other hand, the timing of measurements during the spontaneous breathing trial (SBT) may be an important methodological consideration when interpreting ultrasound parameter performance. Previous studies have proposed serial assessment of diaphragmatic excursion (DE), diaphragmatic thickening fraction (DTF), and the rapid shallow breathing index (RSBI) during the SBT, including measurements at the beginning and at different time points throughout the trial, to characterize dynamic changes occurring during the weaning process [3]. In this context, assessing ultrasound parameters both during the first minutes and at the end of the SBT would have been of interest, as this could have allowed exploration of whether their behavior changes throughout the period of spontaneous breathing. Furthermore, expressing these changes as percentage variations relative to an initial measurement could provide additional information on the evolution

of diaphragmatic function during the SBT [2]. This consideration is consistent with current recommendations, which emphasize the assessment of changes in breathing pattern during an ongoing SBT [4].

Furthermore, it would have been of interest to explore the performance of the diaphragmatic rapid shallow breathing index (D-RSBI) in the population studied by Bellan *et al.* [1]. This index replaces tidal volume in the conventional RSBI with diaphragmatic excursion, integrating breathing pattern and a specific component of diaphragmatic function into a single measure. Previous studies have suggested its potential value for predicting weaning outcomes, and recent evidence has shown favorable overall predictive performance [5]. Nevertheless, D-RSBI should currently be regarded as a promising index requiring further validation rather than an established predictor of weaning outcome. Its evaluation in Bellan *et al.* [1] could therefore have provided additional insight into the potential value of integrating physiological and diaphragmatic information during the weaning process.

Regarding the integration of ultrasound parameters, the findings of Bellan *et al.* [1] reinforce the potential complementary value of pulmonary and diaphragmatic assessment during weaning. While mLUS provides information on lung aeration, DE and DTI assess different aspects of diaphragmatic function, thereby addressing distinct mechanisms involved in weaning failure. Recent studies have explored this integrated approach and reported favorable results for specific combinations of pulmonary and diaphragmatic parameters [6]. However, pathophysiological complementarity does not necessarily imply improved predictive performance. In this context, the findings of Bellan *et al.* [1] support the interest in an integrated ultrasound assessment and warrant further investigation to determine whether this approach provides incremental predictive value beyond individual measurements.

References

1. Bellan S, Kaur K, Jaggi S. Predictive accuracy of lung and diaphragmatic ultrasound in weaning from mechanical ventilation: a comparison with the Rapid Shallow Breathing Index. *Monaldi Arch Chest Dis* 2026. doi:10.4081/monaldi.2026.3639
2. Parada-Gereda HM, Tibaduiza AL, Rico-Mendoza A, et al. Effectiveness of diaphragmatic ultrasound as a predictor of successful weaning from mechanical ventilation: a systematic review and meta-analysis. *Crit Care* 2023;27:174.

3. Zhou P, Zhang Z, Hong Y, et al. The predictive value of serial changes in diaphragm function during the spontaneous breathing trial for weaning outcome: a study protocol. *BMJ Open* 2017;7:e015043.
4. Roberts KJ, Goodfellow LT, Battey-Muse CM, et al. AARC clinical practice guideline: spontaneous breathing trials for liberation from adult mechanical ventilation. *Respir Care* 2024;69:891-901.
5. Parada-Gereda HM, Molano-Franco D, Peña-López LA, et al. Diaphragmatic rapid shallow breathing index for predicting successful weaning from mechanical ventilation: a systematic review and meta-analysis. *Australian Critical Care* 2025;38:101266.
6. Liu Y, Zhou Y, Liu P, et al. Combined lung and diaphragm ultrasound predicts extubation outcomes in ARDS: a prospective study. *Eur J Med Res* 2024;29:510.