

Why Can't We All Just Get Along?

Liberation from mechanical ventilation is one of the most common procedures performed daily in the ICU, yet remains one of the most complex, and is associated with many predicaments. This is usually a 2-step process of assessing readiness for liberation using a spontaneous breathing trial (SBT) followed by removal of the artificial airway if the SBT is deemed successful and other criteria of extubation are met (eg, adequate cough, gag reflex, mental status, presence of secretions).¹ Among those predicaments are: when to do an SBT, the best way of doing it, how to grade it, and why patients fail liberation despite passing the trial.²

Ample numbers of studies have been done over the last 3 decades trying to answer those questions, resulting in multiple criteria, complex indices, and newer ventilatory modes of weaning and protocols were developed that added to the weaning dilemma. This prompted multiple task forces of different concerned medical societies and organizations to attempt to organize and incorporate the research and to translate it into guidelines.^{3,4}

Despite all these years of work and available body of evidence, we still find ourselves confined with a failure rate of liberation of ~10–15%.^{1,4,5} This failure has led to increased mortality, prolonged mechanical ventilation, longer ICU and hospital stays, and increased costs. On the other hand, failure to recognize patients who can be liberated can lead to prolonged mechanical ventilation, with its consequences of ventilator-induced lung injury, ventilator-associated pneumonia, tracheostomies, and cost burdens.^{3,4} Both kinds of failures could be traced to 2 factors. First are disease-related factors, and second are clinicians' imposed factors (eg, delay of recognition, inappropriate ventilatory mode settings, misinterpreting the results of an SBT).¹

The success of an SBT is usually assessed through multiple subjective and objective parameters (Table 1)^{1,2}; naming all parameters is beyond the scope of this editorial. Most of the weaning protocols available incorporate a mix of subjective and objective parameters to gauge the result of the trial.^{6,7} Of note, some of those objective parameters

Table 1. Subjective and Objective Predictors of Success of Spontaneous Breathing Trials

Parameters	
Subjective	Respiratory distress Accessory muscle use Diaphoresis Depressed mental status Anxiety/agitation
Objective	Breathing frequency Heart rate Blood pressure Adequate oxygenation (P_{aO_2}/F_{IO_2}) Adequate ventilation (P_{aCO_2}) Vital capacity Minute ventilation Muscle pressures ($P_{I_{max}}$ and $P_{0.1}$) Frequency/tidal volume or rapid shallow breathing index CROP and CORE indices Esophageal pressures and pressure-time product End-tidal CO_2 Oxygen consumption

$P_{I_{max}}$ = maximum inspiratory pressure
 $P_{0.1}$ = airway-occlusion pressure 0.1 s after the start of inspiratory flow
 CROP = compliance, rate, oxygenation, and pressure: (dynamic compliance $\times P_{(A-a)O_2}$ $\times P_{I_{max}}$)/breathing frequency
 CORE = compliance, oxygenation, respiration, and effort: [dynamic compliance $\times (P_{I_{max}}/P_{0.1})$ $\times P_{(A-a)O_2}$]/breathing frequency

lack sensitivities and specificities, and their predictive value in predicting the success of an SBT may be low in clinical practice.^{2,4} It is recommended that no single parameter be used to judge SBT success or failure.³

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In this issue of *RESPIRATORY CARE*, Figueroa-Casas et al⁸ present a simple real-life emulating study of inter-observer agreement of SBT outcome. Their results showed > 90% agreement between the therapists with regard to success or failure of the trial. Although the agreement levels were considered to be statistically high, the remaining 10% disagreement may pose a dilemma clinically. Disagreement about the subjective criteria is understandable and expected.⁹ The merit of this study is the disagreement between clinicians regarding some of the objective crite-

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ria. The human element is involved in obtaining, evaluating, and interpreting even the objective criteria and is subject to different measurements and interpretations. The element of variability of such measurements also (eg, breathing frequency, effort, heart rate, blood pressure) makes it nearly impossible to have a 100% agreement between clinicians. Interestingly, in a study on the pathophysiologic basis of acute respiratory distress in subjects failed an SBT, the authors found that 20% of subjects who failed had the same respiratory mechanics as those who were successful.¹⁰ Granted that new research, further clarity of definitions, and training may improve the clinicians' agreement regarding the SBT,⁸ it is unlikely, however, that the art and science of weaning will lead to a perfect agreement between clinicians, and it is likely that the conundrum will continue. It would be of interest to repeat the same study after a period of education and training to evaluate whether we have better agreement levels and if we are getting along better.

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