A consensus on weaning from mechanical ventilation

Weaning covers the entire process of liberating the patient from mechanical support and from the endotracheal tube. Many controversial questions remain concerning the best methods for conducting this process.

Editorial comments

An International Consensus Conference was held in Budapest in April 2005 to provide recommendations regarding the management of weaning from mechanical ventilation. One of the sponsors was the European Respiratory Society. An 11-member international jury answered five predefined questions. The following key issues were addressed.

What is known about the epidemiology of weaning problems?

Patients can be categorised into three groups, based on the difficulty and duration of weaning. Group 1 represents the majority (69%) of weaning patients. Prognosis in this group is good, with low intensive care unit mortality (5%) and in-hospital mortality (12%). Group 2 (difficult weaning) includes patients who require up to three spontaneous breathing trials (SBTs) or up to 7 days from the first SBT to achieve successful weaning. Group 3 (prolonged weaning) includes patients who require more than three SBTs or >7 days of weaning after the first SBT. About half of the patients who failed initial SBT (group 2) still required mechanical ventilation at day 7. About 15% of patients are in group 3.

What is the pathophysiology of weaning failure?

A thorough and systematic search for potentially reversible pathologies should be conducted in all patients who do not fulfil simple weaning as previously defined (group 2). Reversible aetiologies for weaning failure may be categorised as follows: respiratory load, cardiac load, neuromuscular competence (central and peripheral), critical illness neuromuscular abnormalities, neuropsychological factors, and metabolic and endocrine disorders. The same factors should be sought in group 3 patients. The pathophysiology of weaning failure in group 3 may be complex and multifactorial. Irreversible lesions may become apparent or co-pathologies may be difficult to optimise or slow to resolve. In this group it is imperative that there is a disciplined approach to ongoing surveillance for any reversible or remediable factors.

What is the usual process of initial weaning from the ventilator?

The SBT is the major diagnostic test to determine whether patients can be extubated successfully. Weaning should be considered as early as possible in patients receiving mechanical ventilation; a majority of patients can be weaned successfully at the first attempt. The process of initial weaning from the ventilator begins with a readiness assessment. This is followed by an SBT as a diagnostic test to determine the likelihood of successful extubation. The initial SBT should last 30 min and consist of either T-tube breathing or low levels of pressure support with or without 5 cmH\textsubscript{2}O positive end-expiratory pressure.

Is there a role for different ventilator modes in more difficult weaning?

In group 2 and 3 patients, pressure-support or assist-control ventilation should be favoured. Noninvasive ventilation (NIV) techniques to shorten the duration of intubation should be considered in selected patients, especially those with hypercapnic respiratory failure. NIV should not be routinely used in the event of extubation failure and should be used with caution in patients with hypoxic respiratory failure. Continuous positive airway pressure may be effective in preventing hypoxic respiratory failure after major surgery; otherwise there is no clear advantage over other modes of mechanical ventilation used during weaning.

How should patients with prolonged weaning failure be managed?

It would now be unusual for clinicians to persist with orotracheal intubation in patients perceived as being difficult to wean, in the absence of contraindications to tracheostomy. Conversely, clinicians should also consider the possibility that tracheostomy promotes only short-term survival and increases the proportion of dependent survivors suffering a heavy burden of chronic disease. Specialised weaning units may be cost-effective for certain groups of patients with prolonged weaning failure but guidelines are needed for admission criteria, minimum structural and operating standards and risk-adjusted benchmarks to assess efficacy and safety. Home NIV might be an option for patients with prolonged weaning failure after careful attention to home discharge planning. Decisions to withhold or withdraw mechanical ventilatory support should reflect a shared decision-making model informed by a full disclosure of prognostic data and should be based on patient-centred interests and values.

B. Schoenhofer, Hanover, Germany