

insights into clinical research

Henneman E, Dracup K, Ganz T, et al: Using a collaborative weaning plan to decrease duration of mechanical ventilation and length of stay in the intensive care units for patients receiving long term ventilation. *Am J Crit Care* 11(2):132–140, 2002

While intensive care units (ICUs) are faced with length-of-stay issues, weaning patients off long-term ventilation becomes more challenging. The purpose of this study was to evaluate the effectiveness of two structures that support communication and are needed to promote collaborative decision making in improving outcomes for patients receiving long-term ventilation. The structures are a weaning board and a flow sheet. “Long term” was defined as 7 days or more.

The sample consisted of all patients admitted to the medical ICU who received mechanical ventilation for 7 or more days. The intervention was termed “the collaborative weaning plan” and consisted of five parts: (1) the multidisciplinary team developed the weaning plan during morning rounds; (2) the plan of care for weaning was then documented on a weaning board; (3) data on the weaning process and the patient’s response to each weaning trial were documented on the flow sheet; (4) any member of the ICU team could fill in the weaning board or the flow sheet; (5) the processes used to wean patients were not manipulated during the intervention period. Eighty-two patients were in the experimental group and 55 in the comparison group. Results showed that outcomes, such as days of ventilation, length of stay, cost, mortality, reventilation, and readmission were better in the experimental group than in the comparison group. These results, despite limitations, indicate that significant improvements in patient outcomes can be obtained by using interventions aimed at improving communication among members of the health care team.

complicated, and involves multiple delays and setbacks. During long-term weaning, the patient may fail a weaning trial and should then be rested on the ventilator before another trial is attempted. The rest period is to allow the recovery of the respiratory muscles. Patients who fail a weaning trial often exhibit rapid, shallow breathing patterns consistent with their respiratory muscle weakness. Regular reevaluation of the weaning plan by the multidisciplinary team, coupled with continuous communication with the patient and family, is necessary (see Box 25-22).

METHODS FOR VENTILATOR WEANING

Various methods have been studied for weaning from the ventilator. Controversies exist over which methods are best. Some of the most common weaning methods include T-piece or CPAP trials and a gradual PSV reduction.⁶¹ Comprehensive assessment of the patient’s needs and progress toward weaning, monitoring of the weaning parameters, and following established goals promote successful weaning. Multidisciplinary and comprehensive approaches to weaning based on a health care professional (nurse) monitoring and promoting a weaning plan with continuity have demonstrated positive outcomes.⁶²

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Epstein C, Mokadem N, Peerless J: Weaning older patients from long-term mechanical ventilation. *Am J Crit Care* 11(4):369–377, 2002

As the number of older persons in the United States increases, the number of older adults who experience traumatic injuries and undergo surgical procedures will also increase. In the United States, the percentage of older adults in the intensive care unit (ICU) ranges from 42% to 48%. With greater numbers of older adults requiring intensive care, the use of long-term mechanical ventilation has increased. This study group defined long-term mechanical ventilation as lasting 3 days or more. This pilot study looked at 10 trauma/surgical patients older than 60 years of age who required 3 or more days of mechanical ventilation. The purpose of this study was to describe the clinical course of weaning in critically ill older adults who were receiving long-term ventilation to determine whether differences exist between patients who can be weaned and those who cannot, and whether systemic factors (age) play a role in these differences.

Participants were monitored daily until they were successfully weaned for 24 hours. Available clinical data were collected every day and weaning decisions were made using these data and the Burns Weaning Assessment Program (BWAP). The BWAP is a 26-item checklist of general and respiratory factors used to assess readiness for weaning. Results of this pilot study showed that the six patients who could be weaned from ventilatory support were significantly younger (mean age, 70 years; median age, 71.5 years; range, 60–80 years) than the four patients who could not be weaned (mean age, 76 years; median age, 80 years; range, 63–82 years). Patients who could be weaned, however, were ready by day 11 of their stay in the ICU, and those who could not be weaned were not ready until day 17.

Results of this study are not surprising and lead to the same conclusions as other studies in geriatrics. Older critically ill patients must generate enormous adaptive responses to the stressors of injury to regain hemostasis. Older adults have many of the risk factors that prolong mechanical ventilation, including respiratory muscle weakness, a blunted ventilatory response to hypoxemia, increased atelectasis due to diminished production of surfactant, and a greater susceptibility to infection. The multidimensional and interactive effects of these factors on weaning from mechanical ventilation most likely are more problematic for older patients than for younger patients.

T-piece Trial

The T-piece is connected to the patient at the desired FiO_2 (usually slightly higher than the previous ventilator setting). The patient’s response to and tolerance of the trial are continuously observed. The duration of T-piece trials is not standardized, and some clinicians extubate if an initial trial of 30 minutes ends with acceptable ABGs and patient response. Some use trials of increasing frequency and duration to evaluate and build the patient’s