

## **Cardiopulmonary effects of pressure support ventilation.**

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Pressure support ventilation (PSV) is a newer mode of ventilatory support that augments the patient's spontaneous inspirations to a preselected peak inspiratory pressure. We studied the effects of adding low levels of PSV (5 to 10 cm H<sub>2</sub>O) in conjunction with intermittent mandatory ventilation (IMV) on 15 patients who required mechanical ventilation for flail chest and pulmonary contusion. Patients were selected for the study if, during weaning from IMV, the following criteria were met: (1) a PaCO<sub>2</sub> level greater than 45 mm Hg, (2) a spontaneous respiratory rate (RR) greater than 30 breaths per minute, (3) a minute ventilation (VE) greater than 9.0 L/min, and (4) spontaneous tidal volumes (VT) of less than 2 mL/kg. The PSV was added to the IMV at a level that augmented spontaneous VT to greater than 4 mL/kg. An average of 9 +/- 3 cm H<sub>2</sub>O of pressure support resulted in a fall in the level of PaCO<sub>2</sub> (50 +/- 4 to 43 +/- 5 mm Hg), spontaneous RR (36 +/- 5 to 16 +/- 3 breaths per minute), VE (12 +/- 2 to 8.4 +/- 1.5 L/min), and dead space-tidal volume ratio from (0.68 +/- 0.1 to 0.47 +/- 0.05). Mean airway pressure and PaO<sub>2</sub> both increased, but these changes were not statistically significant. Oxygen consumption was also unchanged. These results suggest that in patients who are difficult to wean due to respiratory muscle fatigue (characterized by increasing RR and decreasing VT), PSV normalizes lung volumes, improves ventilation, and may expedite the weaning process.