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Lung Protective Strategy for Acute Respiratory Distress Syndrome Saves Lives

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A quality improvement approach to this proven strategy lowered associated mortality, with a number needed to treat between 6 and 7.

Lung-protective ventilation has been shown to improve outcomes for patients with acute respiratory distress syndrome (ARDS) but compliance is poor in the emergency department (ED). After finding that their center had poor compliance with four recommended practices (low tidal volumes, appropriate positive end-expiratory pressure [PEEP] settings, oxygen weaning, and elevating the head of the bed), investigators implemented a quality improvement intervention and measured effects on mortality and duration of invasive ventilation.

The intervention consisted of an ED ventilator protocol targeted to improving the four target areas. A training period used journal clubs, lectures, meetings, and bedside education. With a before-and-after design that measured outcomes among patients who developed ARDS within 7 days of ED presentation, the authors demonstrated significant improvement in all four target areas and in outcomes. Mean tidal volume decreased from 8.1 to 6.4 mL/kg. The proportion of patients with tidal volumes <6.5 mL/kg increased from 11% to 62%, mortality decreased from 55% to 40% (number needed to treat 6–7), and number of ventilator-free days increased (from 7.7 to 11.6).

Comment: This before-and-after design cannot prove causality. Nevertheless, those who want to optimize their practice should use tidal volumes <6.5 mL/kg, use a PEEP of 5–24 cm H2O within a plateau pressure <30 cm H2O, decrease FIO2 as permitted to achieve saturation of 88%–95%, and elevate the head of the bed. Hypercapnia with a pH >7.25 is permissible. Use a higher flow rate (up to 100 L/min) for obstructive airway disease when necessary to achieve a satisfactory I:E ratio. This seems like a perfect subject for an order set.

Citation(s):
Fuller BM et al. A quasi-experimental, before-after trial examining the impact of an emergency department mechanical ventilator protocol on clinical outcomes and lung-protective ventilation in acute respiratory distress syndrome. Crit Care Med 2017 Feb 2; [e-pub]. (http://dx.doi.org/10.1097/CCM.0000000000002268)

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