

Arterial blood gas measurement

Argumentation

Measurement of arterial blood gases (ABGs) is essential to detect hypercapnia and to assess the severity of an exacerbation. Consequently, ABG values are the key determinant for initiating supplemental oxygen therapy, prescribing assisted ventilation, and prescribing home oxygen therapy. A $\text{PaO}_2 < 8.0 \text{ kPa}$ (60 mm Hg) and/or $\text{SaO}_2 < 90\%$ with or without $\text{PaCO}_2 > 6.7 \text{ kPa}$ (50 mmHg) when breathing room air indicate respiratory failure. In addition, moderate-to-severe acidosis ($\text{pH} < 7.36$) plus hypercapnia ($\text{PaCO}_2 > 6\text{--}8 \text{ kPa}$; 45–60 mmHg) in a patient with respiratory failure is an indication for mechanical ventilation (Barbera *et al.*, 1997; Calverley, 2000; Celli *et al.*, 2004; Gibson *et al.*, 2008; GOLD, 2009; NICE, 2004; Rodriguez-Roisin, 2006; Siafkas & Wedzicha, 2006).

In the Delphi study 82.9% of experts were convinced that the key intervention has a high impact on clinical outcomes and therefore should be included in the pathway.

Description: (Celli *et al.*, 2004; Gibson *et al.*, 2008; GOLD, 2009; NICE, 2004; Rodriguez-Roisin, 2006; Siafkas & Wedzicha, 2006)

Measurement of PaO_2 , PaCO_2 , H_2CO_3^- , SaO_2 , and pH by arterial puncture (a. radialis, brachialis, or femoralis) while breathing room air at admission. If measurement of ABGs while breathing room air is not feasible (severe cases), oxygen flow (l/min) should be noted. Twenty to 30 minutes should pass before rechecking the gas tensions when the FiO_2 has been changed.

References:

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