

VENTILATION: VOLUME GUARANTEE/TARGETED TIDAL VOLUME

Supporting information

This guideline has been prepared with reference to the following:

NICE. Specialist neonatal respiratory care for babies born preterm - quality standard (QS193). 2020. London. NICE

<https://www.nice.org.uk/guidance/qs193>

NICE. Specialist neonatal respiratory care for babies born preterm. 2019. London. NICE

<https://www.nice.org.uk/guidance/ng124>

Volume targeted is more effective than pressure limited ventilation for preterm infants?

A systematic review of 20 RCTs (Klingenberg, 2017) found that use of volume targeted ventilation (VTV) resulted in a reduction in death or bronchopulmonary dysplasia at 36 weeks' gestation (RR 0.73, 95% CI 0.59 to 0.89), rates of pneumothorax (RR 0.52, 95% CI 0.31 to 0.87), mean days of mechanical ventilation (MD -1.35 days, 95% CI -1.83 to -0.86), rates of hypocarbia (RR 0.49, 95% CI 0.33 to 0.72), rates of grade 3 or 4 intraventricular haemorrhage (RR 0.53, 95% CI 0.37 to 0.77) and the combined outcome of periventricular leukomalacia with or without grade 3 or 4 intraventricular haemorrhage (RR 0.47, 95% CI 0.27 to 0.80). No statistical difference was found for death before hospital discharge (RR 0.75, 95% CI 0.53 to 1.07). VTV modes were not associated with any increased adverse outcomes.

A systematic review of 18 RCTs and quasi-RCTS (Peng, 2014) found that volume targeted ventilation (VTV) did not significantly (statistical) reduce the number of deaths when compared with pressure-limited ventilation (RR 0.73, 95% CI 0.51 to 1.05). The use of VTV did though result in a reduction in the incidence of bronchopulmonary dysplasia (RR 0.61, 95% CI 0.46 to 0.82) and duration of mechanical ventilation (mean difference (MD) -2.0 days, 95% CI -3.14 to -0.86). VTV modes also resulted in reductions in intraventricular haemorrhage (IVH) (RR 0.65, 95% CI 0.42 to 0.99), grade 3/4 IVH (RR 0.55, 95% CI 0.39 to 0.79), periventricular leukomalacia (PVL) (RR 0.33, 95% CI 0.15 to 0.72), pneumothorax (RR 0.52, 95% CI 0.29 to 0.93), failure of primary mode of ventilation (RR 0.64, 95% CI 0.43 to 0.94), hypocarbia (RR 0.56, 95% CI 0.33 to 0.96), mean airway pressure (MD -0.54 cmH₂O, 95% CI -1.05 to -0.02) and days of supplemental oxygen administration (MD -1.68 days, 95% CI -2.47 to -0.88).

Klingenberg C, Wheeler KI, McCallion N et al. Volume-targeted versus pressure-limited ventilation in neonates. Cochrane Database Syst Rev. 2017

<http://onlinelibrary.wiley.com/doi/10.1002/14651858.CD003666.pub4/full>

Peng W, Zhu H, Shi H et al. Volume-targeted ventilation is more suitable than pressure-limited ventilation for preterm infants: a systematic review and meta-analysis. *Arc dis childhood. Fetal & neonatal ed*, 2014;99:F158.

Evidence Level: I

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