VENTILATION (CONVENTIONAL)
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

Synchronised mechanical ventilation is superior to conventional ventilation?
A Cochrane systematic review of 22 studies (Greenough, 2016) found that synchronised mechanical ventilation was associated with a reduction in the risk of air leak (RR 0.69, 95% CI 0.51 to 0.93) and a shorter duration of ventilation (weighted mean difference -38.3 hrs, 95% CI -53.9 to -22.7), compared to conventional ventilation.

Greenough A, Rossor T, Sundaresan et al. Synchronized mechanical ventilation for respiratory support in newborn infants. Cochrane Database Syst Rev. 2016, No.: CD000456
http://onlinelibrary.wiley.com/doi/10.1002/14651858.CD000456.pub5/full

Evidence Level: I

Babies who are intubated and ventilated should be sedated unless there is a specific reason not to do so?
A Cochrane review of 13 studies on 1505 infants (Bellu, 2008) concluded that "There is insufficient evidence to recommend routine use of opioids in mechanically ventilated newborns. Opioids should be used selectively, when indicated by clinical judgement and evaluation of pain indicators. If sedation is required, morphine is safer than midazolam." A 2017 Cochrane review similarly concluded that there was insufficient evidence to support the use of Clonidine as a sedative in the mechanical ventilation of newborns (Romantsik, 2017).

Bellù R, de Waal KA, Zanini R. Opioids for neonates receiving mechanical ventilation. Cochrane Database Syst Rev. 2008, No.: CD004212
http://onlinelibrary.wiley.com/doi/10.1002/14651858.CD004212.pub3/full

Romantsik O, Calevo MG, Norman E et al. Clonidine for sedation and analgesia for neonates receiving mechanical ventilation. Cochrane Database Syst Rev. 2017: CD012468
http://onlinelibrary.wiley.com/doi/10.1002/14651858.CD012468.pub2/full

Evidence Level: I

Caffeine is beneficial in babies of <30 weeks' gestation?
A Cochrane Review of 7 studies (Henderson-Smart, 2010) found that methylxanthine treatment resulted in a reduction in failure of extubation within one week (summary RR 0.48, 95% CI 0.32 to 0.71; summary RD -0.27, 95% CI -0.39 to -0.15; NNT 4, 95% CI 3 to 7; six trials, 172 infants). There was significant heterogeneity in the RD meta-analysis perhaps related to the large variation in baseline rate in the control groups (range 20 to 100%). The CAP trial enrolled the largest number of infants, but did not report extubation rates. In the caffeine group, there were lower rates of bronchopulmonary dysplasia, PDA ligation, cerebral palsy and death or major disability at 18 to 21 months. Infants receiving caffeine had reduced postmenstrual ages at time of discontinuing oxygen therapy, positive pressure ventilation and endotracheal intubation.
A 2020 RCT found that a higher maintenance dose of caffeine citrate reduced the incidence of extubation failure and apnea of prematurity without increasing the occurrence of adverse reactions (Wan, 2020). The study compared high (10 mg/kg daily) and low (5 mg/kg daily) maintenance dose groups. Extubation failure (16.7% vs 36.8%), age of extubation (8.2 ± 2.1 vs 10.7 ± 2.3 day), duration of invasive ventilation (7.2 ± 2.1 vs 8.5 ± 2.4 day), duration of ventilation before extubation (8.0 ± 1.8 vs 10.1 ± 1.9 day), and number of days of apnea (1.8 ± 1.3 vs 3.2 ± 1.1 day) were significantly lower in

the high dose group than the low dose group. Difference in time until failure (6.7 ± 1.7d vs 7.0 ± 1.9d) and duration of nasal continuous positive airway pressure (7.8 ± 1.8 vs 8.0 ± 2.2 day) were not significant. Furthermore, no significant differences in the incidence of tachycardia (9.3% vs 12.3%), abdominal distension (16.7% vs 12.3%), feeding intolerance (3.7% vs 5.3%), or irritability (7.4% vs 5.3%) were observed between groups.

Henderson-Smart DJ, Davis PG. Prophylactic methylxanthines for endotracheal extubation in preterm infants. Cochrane Database Syst Rev. 2010, No.: CD000139
http://onlinelibrary.wiley.com/doi/10.1002/14651858.CD000139.pub2/full

Wan L, Huang L & Chen P. Caffeine citrate maintenance doses effect on extubation and apnea postventilation in preterm infants. Pediatr Pulmonol. 2020;55:2635-40

Evidence Level: I

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