

# Non-invasive Ventilation and Bronchopulmonary Dysplasia: Has There Been A Decrease in BPD?

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*“I sense that although providers have worked hard to decrease BPD and chronic lung disease (CLD) rates in extremely low birth weight infants (ELBW) and very low birth weight infants, BPD and CLD rates remain as steady as they were in the 1980s (1).”*

I wanted to review recent non-invasive ventilation and bronchopulmonary dysplasia (BPD) literature. I sense that although providers have worked hard to decrease BPD and chronic lung disease (CLD) rates in extremely low birth weight infants (ELBW) and very low birth weight infants, BPD and CLD rates remain as steady as they were in the 1980s (1). Some of the efforts that have been used to decrease the rates of BPD include increased use of non-invasive ventilation and antenatal corticosteroids and surfactants, but they have not been as successful as one would hope.

The risk factors for BPD or CLD include a complex interaction between immaturity, genetic predisposition, and prenatal and postnatal insults (2). BPD is also associated with ventilator-induced lung injury with prolonged ventilation beginning on postnatal day 1 (2,3). Other pre- and postnatal risk factors include male sex, iatrogenic preterm birth, maternal hypertensive disorders of pregnancy, low gestational age, small for gestational age, birth weight, and the need for patent ductus arteriosus (PDA) management (3).

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An excellent retrospective cohort study from the NICUs in Spain of 17,952 infants from 23<sup>0</sup>-31<sup>6</sup> weeks' gestation and birthweight of less than 1500 grams from 2010-2019 demonstrated that there were no significant differences in BPD-free survival or survival without moderate-to-severe BPD despite significant changes in

respiratory care practices in this period (1).

From the United Kingdom, Laura Sand and colleagues report National Neonatal Research Database information on 56,000 infants born at less than 32 weeks gestation in England and Wales from 2010 to 17 (4). There were substantial increases in continuous positive airway pressure (CPAP) and High-Flow Nasal Cannula (HFNC) therapy over time, including as primary therapy. Increasing use of these therapies was associated with an increased risk of BPD (4).

An accompanying editorial by Brett Manley and Kate Hodgson discusses the difficulties with defining BPD (5). There may be confounding by indication whereby infants who survive to get HFNC may be those who already have BPD. The gestation ages and birthweights included in these studies grouped infants with dramatically different risks and care needs.

As a result, despite the clinical improvements with the use of antenatal corticosteroids and surfactant therapy, as well as some data supporting forms of non-invasive ventilation in premature infants with lung disease, we have not yet seen a significant decrease in BPD or CLD up to this point in time.

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