



D-3214-2019

Neonatal Non-Invasive Ventilation

It has been emphasized that preterm infants should be managed without mechanical ventilation where possible¹. This is linked to studies showing that the early use of non-invasive ventilation in neonatology can lead to a reduced number of ventilator induced lung injuries (VILI) and aid prevention of adverse complications associated with prolonged hospital stays and intubation^{2,3,4}. Due to various outcome improvements and a reduced need of reintubation following extubation, continuous positive airway pressure (CPAP) is now recommended as the optimal first mode of respiratory support for preterm infants⁵.

Help reduce morbidity of premature infants with innovative ventilation strategies

Still today, more than 60 % of extreme low birth weight (ELBW) infants develop Bronchopulmonary Dysplasia (BPD) with a need for supplemental oxygen which can last for a lifetime⁶. And approximately 7 % of all infants are suffering from RDS and need surfactant treatment and respiratory support⁷. **Non-invasive ventilation has been proven to decrease adverse effects**

of mechanical ventilation, such as Ventilator Induced Lung Injury (VILI) and Bronchopulmonary Dysplasia (BPD)⁸. Consequently, the American Academy of Pediatrics has recently advised that preterm infants should be initially managed with CPAP, rather than intubation⁹.

NIV AND DEVELOPMENTAL CARE ASPECTS

Efforts to optimize developmental care of preterm infants focus on

- minimizing handling and stress for the infant,
- including parental engagement in care,
- reducing the number of painful procedures and
- finding at least invasive means of applying respiratory support^{10,11}.

Non-invasive treatments can enhance developmental care practices as it may be less detrimental to normal neonatal neurological development as their application requires less sedation¹¹.

1 Davis PG, Henderson-Smart DJ. Nasal continuous positive airways pressure immediately after extubation for preventing morbidity in preterm infants. Cochrane Database Syst Rev. 2003;2(2):CD000143.
 2 Fischer HS, Bührer C. Avoiding endotracheal ventilation to prevent bronchopulmonary dysplasia: a meta-analysis. Pediatrics. 2013; 132: e1351-60.
 3 Roehr CC, Proquitté H, Hammer H, Wauer RR, Morley CJ, Schmalisch G. Positive effects of early continuous positive airway pressure on pulmonary function in extremely premature infants: results of a subgroup analysis of the COIN trial. Arch Dis Child Fetal Neonatal Ed. 2011; 96: F371-3.
 4 Schmolzer GM, Kumar M, Pichler G, Aziz K, O'Reilly M, Cheung PY. Non-invasive versus invasive respiratory support in preterm infants at birth: systematic review and meta-analysis. BMJ. 2013; 347: f5980.
 5 Subramaniam P, Ho JJ, Davis PG. Prophylactic nasal continuous positive airway pressure for preventing morbidity and mortality in very preterm infants. Cochrane Database Syst Rev. 2016 Jun;6(6):CD001243.
 6 Davidson LM, Berkelhamer SK. Bronchopulmonary Dysplasia: Chronic Lung Disease of Infancy and Long-Term Pulmonary Outcomes. J Clin Med 2017; 6(1): 4.
 7 Hermansen CL, Lorah KN. Respiratory distress in the newborn. Am Fam Physician 2007; 176(7):987-94.
 8 Roehr CC. Non-invasive respiratory support for neonates. Drägerwerk AG & Co. KGaA. 2018; 9: 9105201.
 9 Polin R. Committee on Fetus and Newborn; American Academy of Pediatrics. Respiratory support in preterm infants at birth. Pediatrics. 2014; 133: 171-4.
 10 Yoder BA, Stoddard RA, Li M, King J, Dimberger DR, Abbasi S. Heated, humidified high-flow nasal cannula versus nasal CPAP for respiratory support in neonates. Pediatrics 2013; 131:e1482-90.
 11 Kugelmann A. Noninvasive respiratory support in the neonate. In Pediatric and Neonatal Mechanical Ventilation 2015 (pp. 1063-1071). Springer Berlin Heidelberg.9.

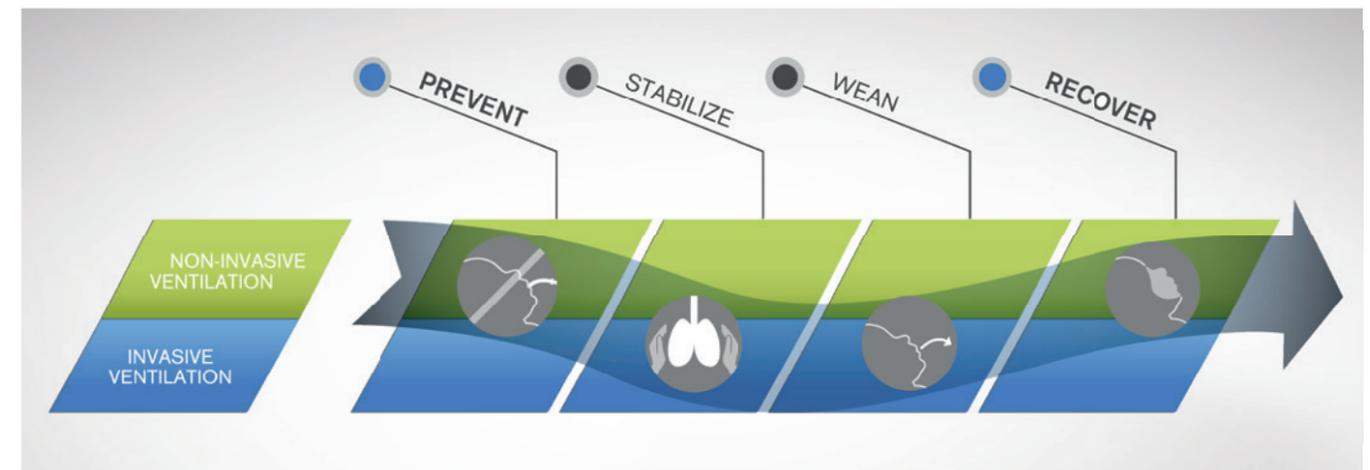
PREVENT AND SHORTEN INTUBATION TIME

Next to surfactant deficiency, intubation has been linked to an increased risk for BPD¹², weaning problems and patient discomfort. NIV helps to avoid re-intubation and shorten recovery times^{13,14}. NIV applied as a weaning method can enable faster weaning⁸.

The goals of non-invasive ventilation are:

- Stabilize pressure even with changing leakages
- Recruit collapsed alveoli and terminal airways
- Minimize work of breathing and enhance patient comfort
- Reduce risk of ventilator associated lung injuries
- Preserve gas exchange

With our Dräger Babylog ventilators, we can help you to manage the whole respiratory pathway, including ventilatory support, prevention of intubation and weaning modes after extubation:



RESPIRATORY PATHWAY IN NEONATAL VENTILATION

From preventing intubation to recover the infant to secure weaning and the developmental process – ventilation strategies can be viewed as a continuum of dependencies that accompany

the infant and the care giver from the beginning to the end of respiratory challenges as pictured in our respiratory pathway.

12 Stevens TP, Harrington EW, Blennow M, Soll RF. Early surfactant administration with brief ventilation vs. selective surfactant and continued mechanical ventilation for preterm infants with or at risk for respiratory distress syndrome. Cochrane Database Review 2007; (4):CD003063.
 13 Warren DK, et al. Outcome and attributable cost of ventilator-associated pneumonia among intensive care unit patients in a suburban medical center. Crit Care Med. 2003.
 14 Saigal S, Doyle LW. An overview of mortality and sequelae of preterm birth from infancy to adulthood. Lancet 2008; 371: 261-9.

Non-Invasive Ventilation (NIV)

ONE DEVICE FOR INVASIVE AND NON-INVASIVE THERAPY

This approach simplifies the implementation of an optimal ventilation strategy. Moreover, one device consumes less space, reduces accessory variety and may reduce human errors through one consistent operating philosophy. Advantages of NIV application with the Babylog series are:

- reliable pressure monitoring
- demand flow principle to correct for leakages (in slope operation), thus stable pressure even in presence of leakages
- ventilation with only one breathing circuit possible, that allows for kangaroo care.
- trend data over the whole ventilation therapy
- easy, guided switch between NIV, O₂ therapy and invasive ventilation

EASY WORKFLOW AND RELIABLE PRESSURE MONITORING

When non-invasive ventilation is chosen, alarms that are not applicable will not be displayed. For improved patient safety, a clearly visible displayed message alerts the user to any deactivated alarms. When switching between therapy types for invasive, noninvasive ventilation and oxygen therapy a guided workflow accelerates and eases the change of therapy in a hectic situation. Airway pressure monitoring is in place to discover leakages between patient and interfaces.

DEMAND FLOW PRINCIPLE TO ENSURE STABLE PRESSURES

In NIV the caregiver faces variable leakages depending on the interfaces, the anatomy and respiratory drive of the patient. The leakages can quickly cause pressure drops in SPN-CPAP and PC-CMV. In slope operation mode the ventilator alters the flow to stabilize the pressure at the patient's interface in each situation. Thereby, variations in blood gases can be decreased. The ventilator only applies the flow that is necessary to achieve the set values.

GENTLE VENTILATION WITH BABYFLOW PLUS

In combination with the Dräger Babylog, the BabyFlow plus respiratory support system enables a comprehensive selection of modalities for non-invasive respiratory support. The design of BabyFlow plus allows you to fit the prongs and masks properly on the patient, thus reducing leaks and providing more stable CPAP levels. More stable CPAP levels reduce noise levels, making BabyFlow plus a low noise level respiratory support system, therefore, supporting Developmental Care practices and offering the best possible therapy for tiny patients¹.



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CUSTOMER VOICES

“We know that ventilation can damage the lungs of premature babies. There has also been great progress in invasive ventilation. However, the best way to avoid ventilation is to avoid it - with non-invasive ventilation we can do just that.”

“If we look at the advantages of non-invasive ventilation from the parents' point of view, then it is always a great shock for parents to experience seeing their own child in the NICU. The more invasively the child is treated, the worse it is likely to be felt. Additionally, it is a little easier for the parents to make contact with their child when using non-invasive ventilation. [...] The background to all is the so-called developmental care for premature babies.”



Dr. Tobias Trips,
Traunstein Hospital, Germany

¹ Kirchner et al. In vitro Comparison of Noise Levels Produced by Different CPAP Generators, 2012, Neonatology, 101:95-100.

Neonatal Non-Invasive Ventilation is available for the following Dräger ventilators



D-5755-2018

Babylog VN800



D-5755-2016

Babylog VN600



D-12081-2019

Evita V800



D-12080-2019

Evita V600

Not all products or features are for sale in all countries or are only available as an option.

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Learn more about neonatal non-invasive ventilation under www.draeger.com/neonatal-ventilation

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