

NAVA and NIV-NAVA: What Every Neonatologist Should Know

References

Chidini G, De Luca D, Conti G, Pelosi P, Nava S, Calderini E. Early Noninvasive Neurally Adjusted Ventilatory Assist Versus Noninvasive Flow-Triggered Pressure Support Ventilation in Pediatric Acute Respiratory Failure: A Physiologic Randomized Controlled Trial. *Pediatr Crit Care Med*. 2016 Nov;17(11):e487-e495. doi: 10.1097/PCC.0000000000000947. PMID: 27749511.

Firestone KS, Fisher S, Reddy S, White DB, Stein HM. Effect of changing NAVA levels on peak inspiratory pressures and electrical activity of the diaphragm in premature neonates. *J Perinatol*. 2015 Aug;35(8):612-6. doi: 10.1038/jp.2015.14. Epub 2015 Mar 12. PMID: 25764328.

Gibu CK, Cheng PY, Ward RJ, Castro B, Heldt GP. Feasibility and physiological effects of noninvasive neurally adjusted ventilatory assist in preterm infants. *Pediatr Res*. 2017 Oct;82(4):650-657. doi: 10.1038/pr.2017.100. Epub 2017 Jul 12. PMID: 28399118; PMCID: PMC5605676.

Jones ML, Bai S, Thurman TL, Holt SJ, Heulitt MJ, Courtney SE. Comparison of Work of Breathing Between Noninvasive Ventilation and Neurally Adjusted Ventilatory Assist in a Healthy and a Lung-Injured Piglet Model. *Respir Care*. 2018 Dec;63(12):1478-1484. doi: 10.4187/respcare.06192. Epub 2018 Sep 25. PMID: 30254048.

Kuitunen I, Räsänen K. Non-invasive neurally adjusted ventilatory assist (NIV-NAVA) reduces extubation failures in preterm neonates-A systematic review and meta-analysis. *Acta Paediatr*. 2024 Sep;113(9):2003-2010. doi: 10.1111/apa.17261. Epub 2024 May 4. PMID: 38703014.

Latremouille S, Bhuller M, Shalish W, Sant'Anna G. Cardiorespiratory effects of NIV-NAVA, NIPPV, and NCPAP shortly after extubation in extremely preterm infants: A randomized crossover trial. *Pediatr Pulmonol*. 2021 Oct;56(10):3273-3282. doi: 10.1002/ppul.25607. Epub 2021 Aug 11. PMID: 34379891.

Lee BK, Shin SH, Jung YH, Kim EK, Kim HS. Comparison of NIV-NAVA and NCPAP in facilitating extubation for very preterm infants. *BMC Pediatr*. 2019 Aug 28;19(1):298. doi: 10.1186/s12887-019-1683-4. PMID: 31462232; PMCID: PMC6712684.

Lee J, Kim HS, Jung YH, Shin SH, Choi CW, et al. Non-invasive neurally adjusted ventilatory assist in preterm infants: a randomised phase II crossover trial. *Arch Dis Child Fetal Neonatal Ed*. 2015 Nov;100(6):F507-13. doi: 10.1136/archdischild-2014-308057. Epub 2015 Jul 15. PMID: 26178463.

Lee J, Parikka V, Oda A, Wallström L, Lehtonen L, Soukka H. NIV-NAVA versus NCPAP immediately after birth in premature infants: A randomized controlled trial. *Respir Physiol Neurobiol*. 2022 Aug;302:103916. doi: 10.1016/j.resp.2022.103916. Epub 2022 Apr 29. PMID: 35500883.

Makker K, Cortez J, Jha K, Shah S, Nandula P, et al. Comparison of extubation success using noninvasive positive pressure ventilation (NIPPV) versus noninvasive neurally adjusted ventilatory assist (NI-NAVA). *J Perinatol*. 2020 Aug;40(8):1202-1210. doi: 10.1038/s41372-019-0578-4. Epub 2020 Jan 7. PMID: 31911641; PMCID: PMC7222927.

Matlock DN, Bai S, Weisner MD, Comtois N, Beck J, et al. Work of Breathing in Premature Neonates: Noninvasive Neurally-Adjusted Ventilatory Assist versus Noninvasive Ventilation. *Respir Care*. 2020 Jul;65(7):946-953. doi: 10.4187/respcare.07257. Epub 2020 Feb 18. PMID: 32071130.

Miyahara J, Sugiura H, Ohki S. The evaluation of the efficacy and safety of non-invasive neurally adjusted ventilatory assist in combination with INTubation-SURfactant-Extubation technique for infants at 28 to 33 weeks of gestation with respiratory distress syndrome. *SAGE Open Med*. 2019 Mar 15;7:2050312119838417. doi: 10.1177/2050312119838417. PMID: 30906554; PMCID: PMC6421598.

Protain AP, Firestone KS, McNinch NL, Stein HM. Evaluating peak inspiratory pressures and tidal volume in premature neonates on NAVA ventilation. *Eur J Pediatr*. 2021 Jan;180(1):167-175. doi: 10.1007/s00431-020-03728-y. Epub 2020 Jul 6. PMID: 32627057; PMCID: PMC7335731.

Shin SH, Shin SH, Kim SH, Song IG, Jung YH, et al. Noninvasive Neurally Adjusted Ventilation in Postextubation Stabilization of Preterm Infants: A Randomized Controlled Study. *J Pediatr*. 2022 Aug;247:53-59.e1. doi: 10.1016/j.jpeds.2022.04.025. Epub 2022 Apr 20. PMID: 35460702.

Tabacaru CR, Moores RR Jr, Khoury J, Rozycki HJ. NAVA-synchronized compared to nonsynchronized noninvasive ventilation for apnea, bradycardia, and desaturation events in VLBW infants. *Pediatr Pulmonol*. 2019 Nov;54(11):1742-1746. doi: 10.1002/ppul.24464. Epub 2019 Aug 2. PMID: 31373180.

Vignaux L, Grazioli S, Piquilloud L, Bochaton N, Karam O, et al. Patient-ventilator asynchrony during noninvasive pressure support ventilation and neurally adjusted ventilatory assist in infants and children. *Pediatr Crit Care Med*. 2013 Oct;14(8):e357-64. doi: 10.1097/PCC.0b013e3182917922. PMID: 23863816.

Yagui AC, Meneses J, Zólio BA, Brito GMG, da Silva RJ, Rebello CM. Nasal continuous positive airway pressure (NCPAP) or noninvasive neurally adjusted ventilatory assist (NIV-NAVA) for preterm infants with respiratory distress after birth: A randomized controlled trial. *Pediatr Pulmonol*. 2019 Nov;54(11):1704-1711. doi: 10.1002/ppul.24466. Epub 2019 Aug 8. PMID: 31393072.

Yonehara K, Ogawa R, Kamei Y, Oda A, Kokubo M, et al. Non-invasive neurally adjusted ventilatory assist versus nasal intermittent positive-pressure ventilation in preterm infants born before 30 weeks' gestation. *Pediatr Int*. 2018 Oct;60(10):957-961. doi: 10.1111/ped.13680. PMID: 30133079.