



Clinical literature

NAVA, NIV NAVA and Edi monitoring for neonatal and pediatric patients



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Abbreviations

| Year | Article title | Author | Patients | No | Modes | pubmed.ncbi.nlm.nih.gov/ |
|------|--|---------|---------------------------|-----|------------------|---|
| 2020 | Diaphragm-triggered non-invasive respiratory support in preterm infants. | Goel | Preterm neonatal | 23 | NAVA NIV NAVA | 32176939 |
| 2019 | Clinical Application of Neurally Adjusted Ventilatory Assist in Neonates with Respiratory Distress: A Systematic Review. | Kadivar | Mixed neonatal RDS | 186 | NAVA NIV NAVA | ¹ |
| 2017 | Neurally adjusted ventilatory assist compared to other forms of triggered ventilation for neonatal respiratory support. | Rossor | Term and preterm neonatal | 60 | NAVA | 29077984 |
| 2016 | Neurally-adjusted ventilatory assist (NAVA) in children: A systematic review. | Beck | Neonatal and pediatric | 457 | NAVA NIV NAVA | 26375790 |

Reviews

| Year | Article title | Author | Patients | No | Modes | pubmed.ncbi.nlm.nih.gov/ |
|------|---|------------------|-----------------|-----|------------------|---|
| 2019 | Neurally adjusted ventilatory assist versus conventional ventilation in the pediatric population: Are there benefits? | Karikari | Pediatric | — | NAVA NIV NAVA | 31231985 |
| 2017 | Neurally adjusted ventilatory assist in pediatrics: why, when, and how? | Andrade | Mixed pediatric | 278 | NAVA | ² |
| 2016 | Neurally adjusted ventilator assist in very low birth weight infants: Current status | Narchi | VLBW neonatal | 41 | NAVA NIV NAVA | 26140273 |
| 2016 | Non-invasive ventilation with neurally adjusted ventilatory assist in newborns | Stein | Neonatal | — | NIV NAVA | 26899957 |
| 2013 | Interest of Monitoring Diaphragmatic Electrical Activity in the Pediatric Intensive Care Unit. | Ducharme Crevier | Pediatric | — | Edi mon | ³ |

1. <https://sites.kowsarpub.com/jcp/articles/62634.html>

2. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5764551/>

3. <https://pubmed.ncbi.nlm.nih.gov/?term=Interest+of+Monitoring+Diaphragmatic+Electrical+Activity+in+the+Pediatric+Intensive+Care+Unit>



Randomized controlled trials

| Year | Article title | Author | Patients | No | Modes | pubmed.ncbi.nlm.nih.gov/ |
|------|--|---------|----------------------|-----|----------|---|
| 2020 | Comparison of extubation success using noninvasive positive pressure ventilation (NIPPV) versus noninvasive neurally adjusted ventilatory assist (NI-NAVA). | Makker | Preterm neonatal | 30 | NIV NAVA | 31911641 |
| 2019 | 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. | Yagui | Neonatal VLBW | 123 | NIV NAVA | 31393072 |
| 2019 | NIV NAVA versus Nasal CPAP in Premature Infants: A Randomized Clinical Trial. | Kallio | Preterm neonatal | 40 | NIV NAVA | 31487718 |
| 2016 | Early Noninvasive Neurally Adjusted Ventilatory Assist Versus Noninvasive Flow-Triggered Pressure Support Ventilation in Pediatric Acute Respiratory Failure: A Physiologic Randomized Controlled Trial. | Chidini | Pediatric ARF | 18 | NIV NAVA | 27749511 |
| 2016 | Neurally adjusted ventilatory assist (NAVA) in preterm newborn infants with respiratory distress syndrome: A randomized controlled trial. | Kallio | Preterm neonatal RDS | 60 | NAVA | 27502948 |
| 2015 | Neurally adjusted ventilatory assist (NAVA) in pediatric intensive care: A randomized controlled trial. | Kallio | Mixed pediatric | 170 | NAVA | 24482284 |
| 2014 | Neurally adjusted ventilatory assist vs pressure support ventilation in infants recovering from severe acute respiratory distress syndrome: nested study. | Piastra | Mixed pediatric ARDS | 30 | NAVA | 24209903 |

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| Year | Article title | Author | Patients | No | Modes | pubmed.ncbi.nlm.nih.gov/ |
|------|--|--------------|---------------------------|----|---------------------|---|
| 2020 | Electrical Activity of the Diaphragm in a Small Cohort of Preterm Infants on Noninvasive Neurally Adjusted Ventilatory Assist and Continuous Positive Airway Pressure. | Di Nardo | Mixed pediatric | 10 | Edi mon | 32755090 |
| 2019 | Electrical Activity of the Diaphragm in a Small Cohort of Preterm Infants on Noninvasive Neurally Adjusted Ventilatory Assist and Continuous Positive Airway Pressure. | Gupta | Preterm neonatal | 10 | Edi mon | 31938585 |
| 2018 | A Randomised Cross-Over Study Showed No Difference in Diaphragm Activity During Weaning From Respiratory Support. | Brenne | Preterm neonatal | 21 | Edi mon | 29504671 |
| 2018 | Neural breathing patterns in preterm newborns supported with non-invasive neurally adjusted ventilatory assist. | Garcia-Munoz | Preterm neonatal | 19 | Edi mon NIV NAVA | 29910465 |
| 2018 | Neural Breathing Pattern and Patient-Ventilator Interaction During Neurally Adjusted Ventilatory Assist and Conventional Ventilation in Newborns. | Mally | Preterm and term neonatal | 23 | Edi mon NIV NAVA | 29189671 |
| 2018 | Rapid respiratory transition at birth as evaluated by electrical activity of the diaphragm in very preterm infants supported by nasal CPAP. | Oda | Preterm neonatal | 8 | Edi mon | 30273719 |
| 2018 | Neurally adjusted ventilatory assist in extremely low-birthweight infants. | Oda | ELBW neonatal | 8 | NAVA | 29944776 |
| 2017 | Neural breathing pattern in newborn infants pre- and postextubation. | Iyer | Preterm neonatal | 25 | Edi mon | 28833570 |
| 2017 | Patient-ventilator asynchrony during conventional mechanical ventilation in children. | Mortamet | Mixed pediatric | 52 | Edi mon | 29264742 |
| 2016 | Impact of feeding method on diaphragm electrical activity and central apnea in preterm infants (FEAdi study). | Ng | VLBW Neonatal | 10 | Edi mon | 27405054 |
| 2015 | The effect of caffeine citrate on neural breathing pattern in preterm infants. | Parikka | Preterm neonatal | 17 | Edi mon | 26217936 |
| 2015 | Electrical activity of the diaphragm during neurally adjusted ventilatory assist in pediatric patients. | Kallio | Mixed pediatric | 81 | Edi mon NAVA | 25103680 |
| 2015 | Tonic diaphragmatic activity in critically ill children with and without ventilatory support. | Larouche | Mixed pediatric | 55 | Edi mon | 25940232 |

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|------|---|----------|-----------------------------------|----|-----------------------------|--|
| 2015 | High-flow nasal cannulae are associated with increased diaphragm activation compared with nasal continuous positive airway pressure in preterm infants. | Nassef | VLBW neonatal | 10 | Edi mon | 25759095 |
| 2015 | The effect of caffeine citrate on neural breathing pattern in preterm infants. | Parikka | Preterm neonatal | 17 | Edi mon | 26217936 |
| 2015 | Electrical activity of the diaphragm during neurally adjusted ventilatory assist in pediatric patients. | Kallio | Mixed pediatric | 81 | Edi mon NAVA | 25103680 |
| 2015 | Tonic diaphragmatic activity in critically ill children with and without ventilatory support. | Larouche | Mixed pediatric | 55 | Edi mon | 25940232 |
| 2015 | High-flow nasal cannulae are associated with increased diaphragm activation compared with nasal continuous positive airway pressure in preterm infants. | Nasef | VLBW neonatal | 10 | Edi mon | 25759095 |
| 2014 | Evolution of inspiratory diaphragm activity in children over the course of the PICU stay. | Emeriaud | Mixed pediatric | 55 | Edi mon | 25118865 |
| 2013 | Electrical activity of the diaphragm (Edi) values and Edi catheter placement in non-ventilated preterm neonates. | Stein | Preterm neonatal (non-ventilated) | 17 | Edi mon | 23636099 |
| 2012 | Synchronized mechanical ventilation using electrical activity of the diaphragm in neonates. | Stein | Term neonatal | 3 | Edi mon | 22954267 |
| 2011 | Characterization of Neural Breathing Pattern in Spontaneously Breathing Preterm Infants. | Beck | Preterm neonatal | 10 | Edi mon | 21857389 |
| 2009 | Patient-Ventilator Interaction During Neurally Adjusted Ventilatory Assist in Low Birth Weight Infants. | Beck | LBW neonatal | 7 | Edi mon NAVA NIV NAVA | ⁴ |
| 2006 | Diaphragm electrical activity during expiration in mechanically ventilated infants. | Emeriaud | Ready-to-wean pediatric | 16 | Edi mon | 16627886 |

4. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2762820/>

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|------|---|-----------|-----------------------|-----|----------|--|
| 2020 | Nasal continuous positive airway pressure versus noninvasive NAVA in preterm neonates with apnea of prematurity: a pilot study with a novel approach. | Firestone | Preterm neonatal | 17 | NIV NAVA | 32218494 |
| 2019 | NAVA-synchronized compared to nonsynchronized noninvasive ventilation for apnea, bradycardia, and desaturation events in VLBW infants. | Tabacuru | VLBW neonatal | 108 | NIV NAVA | 31373180 |
| 2018 | Neural Breathing Pattern and Patient-Ventilator Interaction During Neurally Adjusted Ventilatory Assist and Conventional Ventilation in Newborns. | Mally | Preterm neonatal | 23 | NAVA | 29189671 |
| 2018 | Non-invasive neurally adjusted ventilatory assist versus nasal intermittent positive-pressure ventilation in preterm infants born before 30 weeks' gestation. | Yonehara | Preterm neonatal | 34 | NIV NAVA | 30133079 |
| 2017 | Feasibility and physiological effects of noninvasive neurally adjusted ventilatory assist in preterm infants. | Gibu | Preterm neonatal | 8 | NIV NAVA | 28399118 |
| 2015 | The effect of caffeine citrate on neural breathing pattern in preterm infants. | Parikka | Preterm neonatal | 17 | Edi mon | 26217936 |
| 2014 | Neurally adjusted ventilatory assist in preterm neonates with acute respiratory failure. | Longhini | Preterm neonatal | 12 | NAVA | 25401284 |
| 2014 | The effects of skin-to-skin care on the diaphragmatic electrical activity in preterm infants. | Soukka | Preterm neonatal | 17 | Edi mon | 24819407 |
| 2013 | Neurally adjusted ventilatory assist (NAVA) mode as an adjunct diagnostic tool in congenital central hypoventilation syndrome. | Rahmani | CCHS preterm neonatal | 1 | Edi mon | 23374524 |
| 2013 | Monitoring diaphragm electrical activity and the detection of congenital central hypoventilation syndrome in a newborn. | Szczapa | CCHS term neonate | 1 | Edi mon | 24169930 |



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|------|---|-------------|-------------------------------|-----|------------------|---|
| 2020 | Application of Neurally Adjusted Ventilatory Assist in Premature Neonates Less Than 1,500 Grams With Established or Evolving Bronchopulmonary Dysplasia. | Rong | VLBW neonatal BPD | 30 | NAVA NIV NAVA | 32266188 |
| 2018 | Comparison of neurally-adjusted ventilator assist in infants before and after extubation. | Longhini | Term neonatal | 10 | NAVA NIV NAVA | 26583456 |
| 2018 | Neurally adjusted ventilatory assist in extremely low-birthweight infants. | Oda | ELWB neonatal | 35 | NAVA | 29944776 |
| 2017 | Neurally adjusted ventilatory assist for infants under prolonged ventilation. | Lee | Preterm neonatal Prolonged MV | 14 | NAVA | 28063223 |
| 2016 | Neurally adjusted ventilatory assist (NAVA) in preterm newborn infants with respiratory distress syndrome-a randomized controlled trial. | Kallio | Preterm neonatal RDS | 60 | NAVA | 27502948 |
| 2015 | Effects of propofol on diaphragmatic electrical activity in mechanically ventilated pediatric patients. | Amigoni | Mixed pediatric | 20 | Edi mon NAVA | 26122971 |
| 2015 | Electrical activity of the diaphragm during neurally adjusted ventilatory assist in pediatric patients. | Kallio | Mixed pediatric | 81 | Edi mon NAVA | 25103680 |
| 2015 | Neurally adjusted ventilatory assist (NAVA) in pediatric intensive care--a randomized controlled trial. | Kallio | Mixed pediatric | 170 | NAVA | 24482284 |
| 2015 | Neurally adjusted ventilatory assist in preterm neonates with acute respiratory failure. | Longhini | Preterm neonatal ARF | 14 | NAVA | 25401284 |
| 2014 | Neurally adjusted ventilatory assist vs pressure support ventilation in infants recovering from severe acute respiratory distress syndrome: nested study. | Piastra | Pediatric ARDS | 30 | NAVA | 24209903 |
| 2013 | Neurally adjusted ventilatory assist: assessing the comfort and feasibility of use in neonates and children. | Duynham | Mixed neonatal and pediatric | 21 | NAVA | 23419184 |
| 2012 | Asynchrony, neural drive, ventilatory variability and COMFORT: NAVA versus pressure support in pediatric patients. A non-randomized cross-over trial. | de la Oliva | Mixed pediatric | 12 | NAVA | 22481227 |



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|------|--|------------------|-------------------------------------|----|------------------|--|
| 2020 | Work of Breathing in Premature Neonates: Noninvasive Neurally-Adjusted Ventilatory Assist versus Noninvasive Ventilation. | Matlock | Preterm neonatal | 15 | NAVA NIV NAVA | 32071130 |
| 2020 | Pressure Support Ventilation (PSV) versus Neurally Adjusted Ventilatory Assist (NAVA) in difficult to wean pediatric ARDS patients: a physiologic crossover study.. | Spinazzola | Pediatric ARDS Difficult to wean | 12 | NAVA | 32631305 |
| 2018 | Neural Breathing Pattern and Patient-Ventilator Interaction During Neurally Adjusted Ventilatory Assist and Conventional Ventilation in Newborns. | Mally | Preterm neonatal | 23 | NAVA | 29189671 |
| 2016 | Early Noninvasive Neurally Adjusted Ventilatory Assist Versus Noninvasive Flow-Triggered Pressure Support Ventilation in Pediatric Acute Respiratory Failure: A Physiologic Randomized Controlled Trial. | Chidini | Pediatric ARF | 18 | NIV NAVA | 27749511 |
| 2015 | Neurally adjusted ventilator assist (NAVA) reduces asynchrony during non-invasive ventilation for severe bronchiolitis. | Baudin | Pediatric RSV bronchiolitis | 11 | NIV NAVA | 25488197 |
| 2015 | Neurally adjusted ventilatory assist (NAVA) allows patient-ventilator synchrony during pediatric noninvasive ventilation: A crossover physiological study. | Ducharme-Crevier | Mixed pediatric | 13 | NIV NAVA | 25886793 |
| 2015 | Non-invasive neurally adjusted ventilatory assist in preterm infants: a randomised phase II crossover trial. | Lee | Preterm infants | 15 | NIV NAVA | 26178463 |
| 2015 | Neurally adjusted ventilatory assist in preterm neonates with acute respiratory failure. | Longhini | Preterm neonatal ARF | 14 | NIV NAVA | 25401284 |
| 2013 | Optimizing patient-ventilator synchrony during invasive ventilator assist in children and infants remains a difficult task. | Vignaux | Mixed pediatric | 19 | NAVA | 23842584 |
| 2013 | Patient-ventilator asynchrony during noninvasive pressure support ventilation and neurally adjusted ventilatory assist in infants and children. | Vignaux | Mixed pediatric | 6 | NIV NAVA | 23863816 |
| 2012 | Neurally adjusted ventilatory assist improves patient – ventilator interaction in infants as compared with conventional ventilation. | Bordessoule | Mixed pediatric | 10 | NAVA | 22580718 |
| 2012 | Asynchrony, neural drive, ventilatory variability and COMFORT: NAVA versus pressure support in pediatric patients. A non-randomized cross-over trial. | de la Oliva | Mixed pediatric | 12 | NAVA | 22481227 |
| 2011 | Neurally triggered breaths reduce trigger delay and improve ventilator response times in ventilated infants with bronchiolitis. | Clement | Pediatric bronchiolitis | 23 | NAVA | 21946913 |
| 2011 | Comparison of pressure-, flow-, and NAVA-triggering in pediatric and neonatal ventilatory care. | Ålander | Mixed pediatric | 18 | NAVA | 21830318 |



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| Year | Article title | Author | Patients | No | Modes | pubmed.ncbi.nlm.nih.gov/ |
|------|--|------------|----------------------------------|-----|------------------|---|
| 2020 | Proportional Assist Ventilation (PAV) Versus Neurally Adjusted Ventilator Assist (NAVA): Effect on Oxygenation in Infants With Evolving or Established Bronchopulmonary Dysplasia. | Hunt | Preterm neonatal BPD | 18 | NAVA | 31980954 |
| 2020 | Pressure Support Ventilation (PSV) versus Neurally Adjusted Ventilatory Assist (NAVA) in difficult to wean pediatric ARDS patients: a physiologic crossover study. | Spinazzola | Pediatric ARDS Difficult to wean | 12 | NAVA | 32631305 |
| 2019 | NAVA-synchronized compared to nonsynchronized noninvasive ventilation for apnea, bradycardia, and desaturation events in VLBW infants. | Tabacuru | VLBW neonatal | 108 | NIV NAVA | 31373180 |
| 2018 | Neurally Adjusted Ventilatory Assist After Pediatric Cardiac Surgery: Clinical Experience and Impact on Ventilation Pressures. | Crulli | Post-op cardiac pediatric | 28 | NAVA NIV NAVA | 29208756 |
| 2017 | Feasibility and physiological effects of noninvasive neurally adjusted ventilatory assist in preterm infants. | Gibu | Preterm neonatal | 11 | NAVA | 28399118 |
| 2017 | Crossover study of assist control ventilation and neurally adjusted ventilatory assist. | Shetty | Preterm neonatal BPD / ARDS | 9 | NAVA | 28180985 |
| 2016 | Early Noninvasive Neurally Adjusted Ventilatory Assist Versus Noninvasive Flow-Triggered Pressure Support Ventilation in Pediatric Acute Respiratory Failure. | Chidini | Pediatric ARF | 18 | NAVA | 27749511 |
| 2016 | Neurally Adjusted Ventilatory Assist in Preterm Infants With Established or Evolving Bronchopulmonary Dysplasia on High-Intensity Mechanical Ventilatory Support. | Jung | Preterm neonatal BPD / RDS | 29 | NAVA | 27918385 |
| 2016 | Neurally adjusted ventilatory assist (NAVA) in preterm newborn infants with respiratory distress syndrome-a randomized controlled trial. | Kallio | Preterm neonatal RDS | 60 | NAVA | 27502948 |
| 2016 | Physiological effects of invasive ventilation with neurally adjusted ventilatory assist (NAVA) in a crossover study. | Liet | Post-op cardiac pediatric | 6 | NAVA | 27821162 |
| 2016 | Mechanical Ventilation After Bidirectional Superior Cavopulmonary Anastomosis for Single-Ventricle Physiology: A Comparison of PSV and NAVA. | Zhu | Post-op BCPA pediatric | 21 | NAVA | 27090649 |
| 2015 | Neurally adjusted ventilator assist (NAVA) reduces asynchrony during non-invasive ventilation for severe bronchiolitis. | Baudin | Post-op BCPA pediatric | 11 | NIV NAVA | 25488197 |

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|------|---|-----------|------------------------------|-----|-------|---|
| 2015 | Neurally adjusted ventilatory assist (NAVA) in pediatric intensive care – a randomized controlled trial. | Kallio | Mixed pediatric | 170 | NAVA | 24482284 |
| 2014 | Neurally adjusted ventilatory assist vs pressure support ventilation in infants recovering from severe acute respiratory distress syndrome: nested study. | Piastra | Mixed pediatric ARDS | 30 | NAVA | 24209903 |
| 2013 | Neurally adjusted ventilatory assist in weaning of neonates affected by congenital diaphragmatic hernia. | Gentili | Neonatal CDH | 12 | NAVA | 23126605 |
| 2012 | Neurally adjusted ventilatory assist in neonates weighing <1500 grams: a retrospective analysis. | Stein | Neonatal CDH | 52 | NAVA | 22137670 |
| 2012 | Randomized crossover study of neurally adjusted ventilatory assist in preterm infants. | Lee | Preterm neonatal | 26 | NAVA | 22658785 |
| 2012 | Synchronized mechanical ventilation using electrical activity of the diaphragm in neonates. | Stein | Preterm neonatal | 5 | NAVA | 22954267 |
| 2011 | Neurally adjusted ventilatory assist mode used in congenital diaphragmatic hernia. | Durrani | Term neonatal | 1 | NAVA | 22015130 |
| 2011 | Respiratory support by neurally adjusted ventilatory assist (NAVA) in severe RSV-related bronchiolitis: a case series report. | Liet | Pediatric RSV bronchiolitis | 3 | NAVA | 22014152 |
| 2011 | Comparison of pressure-, flow-, and NAVA-triggering in pediatric and neonatal ventilatory care. | Alander | Mixed pediatric | 18 | NAVA | 21830318 |
| 2010 | A prospective crossover comparison of neurally adjusted ventilatory assist and pressure-support ventilation in a pediatric and neonatal intensive care unit population. | Breatnach | Mixed neonatal and pediatric | 16 | NAVA | 19593246 |

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|------|---|------------|-------------------------------------|----|------------------|---|
| 2020 | Neurally Adjusted Ventilatory Assist After Pediatric Cardiac Surgery: Clinical Experience and Impact on Ventilation Pressures. | Spinazzola | Pediatric ARDS Difficult to wean | 12 | NAVA | 32631305 |
| 2018 | Neurally Adjusted Ventilatory Assist After Pediatric Cardiac Surgery: Clinical Experience and Impact on Ventilation Pressures. | Crulli | Post-op cardiac pediatric | 28 | NAVA NIV NAVA | 29208756 |
| 2018 | Neurally adjusted ventilatory assist in extremely low-birthweight infants. | Oda | ELWB neonatal | 35 | NAVA | 29944776 |
| 2018 | The impact of neurally adjusted ventilatory assist mode on respiratory severity score and energy expenditure in infants: a randomized crossover trial. | Rosterman | Mixed neonatal | 24 | NAVA | 29072677 |
| 2017 | Feasibility and physiological effects of noninvasive neurally adjusted ventilatory assist in preterm infants. | Gibu | Preterm neonatal | 11 | NIV NAVA | 28399118 |
| 2017 | Crossover study of assist control ventilation and neurally adjusted ventilatory assist. | Shetty | Preterm neonatal BPD / ARDS | 9 | NAVA | 28180985 |
| 2016 | Early Noninvasive Neurally Adjusted Ventilatory Assist Versus Noninvasive Flow-Triggered Pressure Support Ventilation in Pediatric Acute Respiratory Failure. | Chidini | Pediatric ARF | 18 | NIV NAVA | 27749511 |
| 2016 | Neurally adjusted ventilatory assist (NAVA) in preterm newborn infants with respiratory distress syndrome: A randomized controlled trial. | Kallio | Preterm neonatal RDS | 60 | NAVA | 27502948 |
| 2016 | Neurally Adjusted Ventilatory Assist in Preterm Infants With Established or Evolving Bronchopulmonary Dysplasia on High-Intensity Mechanical Ventilatory Support. | Jung | Preterm neonatal BPD / RDS | 29 | NAVA | 27918385 |
| 2016 | Physiological effects of invasive ventilation with neurally adjusted ventilatory assist (NAVA) in a crossover study. | Liet | Post-op cardiac pediatric | 6 | NAVA | 27821162 |
| 2016 | Comparing changing neurally adjusted ventilatory assist (NAVA) levels in intubated and recently extubated neonates. | LoVerde | Preterm neonatal | 15 | NAVA NIV NAVA | 27629375 |
| 2016 | Mechanical Ventilation After Bidirectional Superior Cavopulmonary Anastomosis for Single-Ventricle Physiology: A Comparison of PSV and NAVA. | Zhu | Post-op BCPA pediatric | 21 | NAVA | 27090649 |

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|------|---|-----------|------------------------------|-----|------------------|---|
| 2015 | Non-invasive neurally adjusted ventilatory assist in preterm infants: a randomised phase II crossover trial. | Lee | Preterm infants | 15 | NIV NAVA | 26178463 |
| 2015 | Effect of changing NAVA levels on peak inspiratory pressures and electrical activity of the diaphragm in premature neonates. | Firestone | NICU | 21 | NAVA NIV NAVA | 25764328 |
| 2015 | Neurally adjusted ventilatory assist (NAVA) in pediatric intensive care--a randomized controlled trial | Kallio | Mixed pediatric | 170 | NAVA | 24482284 |
| 2015 | Neurally adjusted ventilatory assist in preterm neonates with acute respiratory failure. | Longhini | Preterm neonatal ARF | 14 | NAVA | 25401284 |
| 2014 | Neurally adjusted ventilatory assist vs pressure support ventilation in infants recovering from severe acute respiratory distress syndrome: nested study. | Piastra | Pediatric ARDS | 30 | NAVA | 24209903 |
| 2013 | Neurally adjusted ventilatory assist: assessing the comfort and feasibility of use in neonates and children. | Duyndam | Mixed neonatal and pediatric | 21 | NAVA | 23419184 |
| 2013 | Neurally adjusted ventilatory assist in weaning of neonates affected by congenital diaphragmatic hernia. | Gentili | Neonatal CDH | 12 | NAVA | 23126605 |
| 2013 | Prospective crossover comparison between NAVA and pressure control ventilation in premature neonates less than 1500 grams. | Stein | VLBW neonatal | 5 | NAVA | 23100042 |
| 2012 | Randomized crossover study of neurally adjusted ventilatory assist in preterm infants. | Lee | Preterm neonatal | 26 | NAVA | 22658785 |
| 2012 | Neurally adjusted ventilatory assist in neonates weighing <1500 grams: A retrospective analysis. | Stein | Neonatal VLBW | 52 | NAVA | 22137670 |
| 2011 | Respiratory support by neurally adjusted ventilatory assist (NAVA) in severe RSV-related bronchiolitis: a case series report. | Liet | Pediatric RSV bronchiolitis | 3 | NAVA | 22014152 |
| 2010 | Neurally adjusted ventilatory assist in children: An observational study. | Bengtsson | Mixed neonatal and pediatric | 21 | NAVA | 19593241 |
| 2010 | A prospective crossover comparison of neurally adjusted ventilatory assist and pressure-support ventilation in a pediatric and neonatal intensive care unit population. | Breatnach | Mixed neonatal and pediatric | 16 | NAVA | 19593246 |

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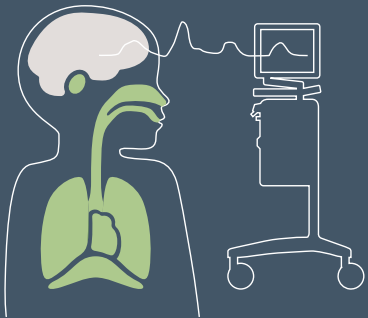
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|------|---|----------------|------------------------------|-----|------------------|--|
| 2020 | Effects of NAVA Compared to SIMV Ventilation on Cardiac Function in Preterm Neonates. | Hovespyan | Preterm neonatal | 14 | NAVA | ⁵ |
| 2019 | Utilization of Neurally Adjusted Ventilatory Assist (NAVA) Mode in Infants and Children Undergoing Congenital Heart Surgery: A Retrospective Review. | Baez-Hernandez | CDH post-op pediatric | 81 | NAVA NIV NAVA | 30600371 |
| 2019 | Neurally Adjusted Ventilatory Assist Mode of Mechanical Ventilation in Neonates with Hypoxic-Ischemic Encephalopathy. | Surkov | Term neonatal Acute HIE | 16 | NAVA | ⁶ |
| 2019 | NAVA-synchronized compared to nonsynchronized noninvasive ventilation for apnea, bradycardia, and desaturation events in VLBW infants. | Tabacuru | VLBW neonatal | 108 | NIV NAVA | 31373180 |
| 2016 | Physiological effects of invasive ventilation with neurally adjusted ventilatory assist (NAVA) in a crossover study. | Liet | Post-op cardiac pediatric | 6 | NAVA | 27821162 |
| 2016 | Mechanical Ventilation After Bidirectional Superior Cavopulmonary Anastomosis for Single-Ventricle Physiology. | Zhu | Post-op BCPA pediatric | 21 | NAVA | 27090649 |
| 2015 | Effect of changing NAVA levels on peak inspiratory pressures and electrical activity of the diaphragm in premature neonates. | Firestone | Preterm neonates | 21 | NAVA NIV NAVA | 25764328 |
| 2014 | Impact of Ventilatory Modes on the Breathing Variability in Mechanically Ventilated Infants. | Baudin | Mixed pediatric | 11 | NAVA | 25505779 |
| 2014 | Neurally adjusted ventilatory assist vs pressure support ventilation in infants recovering from severe acute respiratory distress syndrome: Nested study. | Piastra | Pediatric ARDS | 30 | NAVA | 24209903 |
| 2012 | Neurally adjusted ventilatory assist improves patient-ventilator interaction in infants as compared with conventional ventilation. | Bordessoule | Mixed pediatric | 10 | NAVA | 22580718 |
| 2012 | Asynchrony, neural drive, ventilatory variability and COMFORT: NAVA versus pressure support in pediatric patients. A non-randomized cross-over trial. | de la Oliva | Mixed pediatric | 12 | NAVA | 22481227 |
| 2009 | Application of neurally adjusted ventilatory assist in infants who underwent cardiac surgery for congenital heart disease. | Zhu | Post-op CDH neonatal | 21 | NAVA | 19558804 |

5. http://rc.rcjournal.com/content/65/Suppl_10/3451491

6. <http://cvs.org.ua/index.php/ujcvs/article/view/127>



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| Year | Article title | Author | Patients | No | Modes | pubmed.ncbi.nlm.nih.gov/ |
|------|--|-----------|------------------------|------|------------------|---|
| 2020 | Comparison of extubation success using noninvasive positive pressure ventilation (NIPPV) versus noninvasive neurally adjusted ventilatory assist (NI-NAVA). | Makker | Preterm neonates | 30 | NIV NAVA | 31911641 |
| 2020 | Neurally-Adjusted Ventilatory Assist Can Facilitate Extubation in Neonates With Congenital Diaphragmatic Hernia. | Meinen | Neonatal CDH | 10 | NAVA NIV NAVA | 32753531 |
| 2019 | Neurally adjusted ventilatory assist mitigates ventilator-induced diaphragm injury in rabbits. | Shimatani | Rabbits 2.4–2.9 kg | (20) | NAVA | 31870367 |
| 2019 | Feasibility of Non-invasive Neurally Adjusted Ventilator Assist After Congenital Diaphragmatic Hernia Repair. | Amin | CDH post-op neonatal | 7 | NIV NAVA | 29884552 |
| 2019 | Neurally adjusted ventilatory assist decreases work of breathing during non-invasive ventilation in infants with severe bronchiolitis. | Baudin | Neonatal Bronchiolitis | 7 | NIV NAVA | 30992076 |
| 2019 | Weaning in Neurally Adjusted Ventilatory Assist (NAVA): A prospective interventional study in neonates. | Cosi | Mixed neonatal | 34 | NAVA | 30961339 |
| 2019 | Comparison of NIV-NAVA and NCPAP in facilitating extubation for very preterm infants. | Lee | Preterm neonatal | 30 | NIV NAVA | 31462232 |
| 2019 | 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. | Yagui | Neonatal VLBW | 123 | NIV NAVA | 31393072 |
| 2018 | Predicting extubation readiness by monitoring the electrical activity of the diaphragm after prolonged mechanical ventilation: a pediatric case report. | Naito | Pediatric Prolonged MV | 1 | NAVA | 32026039 |
| 2018 | Neurally adjusted ventilatory assist can be used to wean infants with congenital diaphragmatic hernias off respiratory support. | Oda | Neonatal CDH | 14 | NAVA Edi mon | 29247545 |
| 2018 | Does Diaphragmatic Electrical Activity in Preterm Infants Predict Extubation Success? | Singh | Preterm neonatal RDS | 21 | Edi mon | 29184049 |
| 2018 | Non-invasive neurally adjusted ventilatory assist versus nasal intermittent positive-pressure ventilation in preterm infants born before 30 weeks' gestation. | Yonehara | Preterm neonatal | 34 | NIV NAVA | 30133079 |
| 2017 | Neural breathing pattern in newborn infants pre- and postextubation. | Iyer | Preterm neonatal | 25 | Edi mon | 28833570 |

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| Year | Article title | Author | Patients | No | Modes | pubmed.ncbi.nlm.nih.gov/ |
|------|--|--------------|------------------------------|----|----------|---|
| 2017 | Patient-ventilator asynchrony during conventional mechanical ventilation in children. | Mortamet | Mixed pediatric | 52 | Edi mon | 29264742 |
| 2017 | Noninvasive Neurally Adjusted Ventilatory Assist in Premature Infants Postextubation. | Colaizy | VLBW neonatal | 24 | NIV NAVA | 27919117 |
| 2016 | Neurally adjusted ventilatory assist (NAVA) in preterm newborn infants with respiratory distress syndrome-a randomized controlled trial. | Kallio | Preterm neonatal RDS | 60 | NAVA | 27502948 |
| 2015 | Feasibility Study on Neurally Adjusted Ventilatory Assist in Noninvasive Ventilation After Cardiac Surgery in Infants. | Houtekie | Post-op cardiac pediatric | 10 | NIV NAVA | 25691764 |
| 2015 | The Effect of High Flow Nasal Cannula Therapy on the Work of Breathing in Infants with Bronchiolitis. | Pham | Neonatal CHD /Bronchiolitis | 28 | Edi mon | 24846750 |
| 2014 | Neurally adjusted ventilatory assist vs pressure support ventilation in infants recovering from severe acute respiratory distress syndrome: Nested study. | Piastra | Pediatric ARDS | 30 | NAVA | 24209903 |
| 2013 | Neurally adjusted ventilatory assist in weaning of neonates affected by congenital diaphragmatic hernia. | Gentili | Neonatal CDH | 12 | NAVA | 23126605 |
| 2012 | Mechanisms of ventilator dependence in children with neuromuscular and respiratory control disorders identified by monitoring diaphragm electrical activity. | Fine-Goulden | Pediatric NMD | 6 | Edi mon | 23093244 |
| 2011 | Electrical activity of the diaphragm during extubation readiness testing in critically ill children. | Wolf | Mixed pediatric (during ERT) | 20 | Edi mon | 21057368 |

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| Year | Article title | Author | Patients | No | Modes | pubmed.ncbi.nlm.nih.gov/ |
|------|---|----------|---------------------------|-----|------------------|---|
| 2020 | Proportional Assist Ventilation (PAV) Versus Neurally Adjusted Ventilator Assist (NAVA): Effect on Oxygenation in Infants With Evolving or Established Bronchopulmonary Dysplasia. | Hunt | Preterm neonatal BPD | 18 | NAVA | 31980954 |
| 2020 | Multicenter Experience with Neurally Adjusted Ventilatory Assist in Infants with Severe Bronchopulmonary Dysplasia. | McKinney | Neonatal BPD | 112 | NAVA | 32208500 |
| 2020 | Application of Neurally Adjusted Ventilatory Assist in Premature Neonates Less Than 1,500 Grams With Established or Evolving Bronchopulmonary Dysplasia. | Rong | VLBW neonatal BPD | 30 | NAVA NIV NAVA | 32266188 |
| 2017 | Crossover study of assist control ventilation and neurally adjusted ventilatory assist. | Shetty | Preterm neonatal BPD/ARDS | 9 | NAVA | 28180985 |
| 2016 | Neurally Adjusted Ventilatory Assist in Preterm Infants With Established or Evolving Bronchopulmonary Dysplasia on High-Intensity Mechanical Ventilatory Support: A Single-Center Experience. | Jung | Preterm neonatal BPD/ARDS | 29 | NAVA | 27918385 |



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|------|--|------------|---------------------------|----|--------------|---|
| 2019 | Neurally adjusted ventilatory assist for children on veno-venous ECMO. | Assy | Pediatric ARF/Trauma | 6 | NAVA Edi mon | 30610519 |
| 2019 | Physiological Effect of Prone Position in Children with Severe Bronchiolitis: A Randomized Cross-Over Study (BRONCHIO-DV). | Baudin | Preterm and term neonatal | 14 | Edi mon | 30448014 |
| 2019 | 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. | Miyahara | Preterm neonatal | 15 | NIV NAVA | 30906554 |
| 2017 | Combined use of Neurally Adjusted Ventilatory Assist (NAVA) and Vertical Expandable Prosthetic Titanium Rib (VEPTR) in a patient with Spondylocostal dysostosis and associated bronchomalacia. | Pons-Odena | Pediatric JLS | 1 | NAVA | 28196820 |
| 2015 | The effect of caffeine citrate on neural breathing pattern in preterm infants. | Parikka | Preterm neonatal | 17 | Edi mon | 26217936 |
| 2014 | The effects of skin-to-skin care on the diaphragmatic electrical activity in preterm infants. | Soukka | Preterm neonatal | 17 | Edi mon | 24819407 |
| 2010 | Neurally adjusted ventilatory assist and lung transplant in a child: A case report. | Vitale | Pediatric CF | 1 | NAVA | 20407397 |
| 2010 | Effect of prone or spine position on mechanically ventilated neonates after cardiac surgery with acute lung injury. | Zhu | Post-op cardiac neonatal | 15 | NAVA | 20646599 |

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| Abbreviation | Definition |
|--------------|--|
| ARDS | Acute respiratory distress syndrome |
| BCPA | Bidirectional superior cavopulmonary anastomosis |
| BPD | Bronchopulmonary dysplasia |
| CCHS | Central hypoventilation syndrome |
| CDH | Congenital heart disease |
| CF | Cystic fibrosis |
| Edi | Electrical activity of the diaphragm |
| Edi mon | Edi monitoring |
| ELBW | Extremely low birth weight , which is less than 1000 g |
| HIE | Hypoxic-ischemic encephalopathy |
| NAVA | Neurally adjusted ventilatory assist |
| NIV | Non-invasive ventilation |
| NIV NAVA | Non-invasive Neurally adjusted ventilatory assist |
| NMD | Neuromuscular disorder |
| PSV | Pressure support ventilation |
| RDS | Respiratory distress syndrome |
| RSV | Respiratory syncytial virus |
| VLBW | Very low birth weight , which is less than 1500 g |



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