

5.5%

annual growth of patients undergoing prolonged weaning¹

An active diaphragm is needed

CONVENTIONAL VENTILATION

You can **hope** the diaphragm is active



Only **21%**

of clinicians detect asynchrony in form of missed inspiratory efforts²

No specific knowledge about diaphragm activity can lead to asynchrony, over-sedation and over-assist.²



21%

decrease in diaphragmatic thickness already after 48 hours of mechanical ventilation³

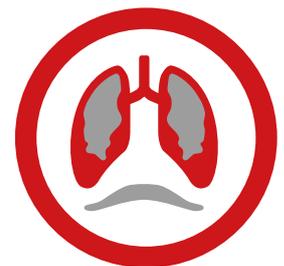
Risk for diaphragm atrophy and contractile dysfunction (VIDD).⁵



67%

ICU mortality reported for patients with Asynchrony Index > 10%⁴

Risk for prolonged weaning due to ventilator associated complications (VILI and VAP).⁶



needed for successful weaning

PERSONALIZED VENTILATION



Or you can **see**
the diaphragm activity clearly



See the diaphragm activity (Edi), reduce sedation and deliver breaths synchronized in time and assist (NAVA).

Edi – The vital sign of respiration

The diaphragm is the “heart” of the respiratory system designed to be continuously active.⁷ The Edi is a bedside diagnostic tool that allows you to monitor and safeguard the patients diaphragm activity.^{8,9} The Edi guides weaning¹⁰ and helps you prevent muscular exhaustion during weaning trials, even after extubation.¹¹



Keep the diaphragm active and exercise it at a personalized level.

NAVA delivers what the patient wants

NAVA¹² follows the Edi, and allows the patient to select tidal volume and respiratory pattern. NAVA[®] promotes lung protective spontaneous breathing^{13,14,15} with higher diaphragmatic efficiency,^{16,17} and fewer periods of over- and under-assist.^{18,19} The patient’s ICU experience is improved by reducing sedation, higher comfort scores^{20,21,22} and improved sleep quality.^{23,24}



Protect the lungs from asynchrony and over-assist to simplify weaning.

Personalized ventilation benefits all patient groups

Edi and NAVA assure that breathing efforts from all patient categories are effectively assessed and responded to. NIV NAVA is also independent of leakage in patient interfaces and may prevent respiratory failure and intubation.^{25,26,27}



Discover how personalized ventilation changes ventilation treatment at bedside.

www.criticalcarenews.com/Edi

References:

- Zilberberg MD, de Wit M, Shorr AF. Accuracy of previous estimates for adult prolonged acute mechanical ventilation volume in 2020: Update using 2000–2008 data. *Crit Care Med*. 2012 Jan;40(1):18-20.
- Colombo D, et al. Efficacy of ventilator waveforms observation in detecting patient-ventilator asynchrony. *Crit Care Med*. 2011 Nov;39(11):2452-7.
- Schepens T, et al. The course of diaphragm atrophy in ventilated patients assessed with ultrasound: a longitudinal cohort study. *Crit Care*. 2015 Dec 7;19:422.
- Blanch L, et al. Asynchronies during mechanical ventilation are associated with mortality. *Intensive Care Med*. 2015 Apr;41(4):633-41.
- Jaber S, et al. Rapidly progressive diaphragmatic weakness and injury during mechanical ventilation in humans. *Am J Respir Crit Care Med*. 2011 Feb 1;183(3):364-71.
- Braun JP, et al. The German quality indicators in intensive care medicine 2013 – second edition. *GMS Ger Med Sci*. 2013;11:Doc09.
- Perry SF, et al. The evolutionary origin of the mammalian diaphragm. *Respir Physiol Neurobiol*. 2010 Apr 15;171(1):1-16.
- Ducharme-Crevier L, et al. Interest of Monitoring Diaphragmatic Electrical Activity in the Pediatric Intensive Care Unit. *Crit Care Res Pract*. 2013;2013:384210.
- Emeriaud G, et al. Evolution of inspiratory diaphragm activity in children over the course of the PICU stay. *Intensive Care Med*. 2014 Nov;40(11):1718-26.
- Bellani G, Pesenti A. Assessing effort and work of breathing. *Curr Opin Crit Care*. 2014 Jun;20(3):352-8.
- Barwing J, et al. Electrical activity of the diaphragm (EAdi) as a monitoring parameter in difficult weaning from respirator: a pilot study. *Crit Care*. 2013 Aug 28;17(4):R182.
- Sinderby C, et al. Neural control of mechanical ventilation in respiratory failure. *Nat Med*. 1999 Dec;5(12):1433-6.
- Blankman P, et al. Ventilation distribution measured with EIT at varying levels of PS and NAVA in Patients with ALI. *Intensive Care Med*. 2013 Jun;39(6):1057-62.
- Brander L, et al. NAVA decreases ventilator induced lung injury and non-pulmonary organ dysfunction in rabbits with acute lung injury. *Intensive Care Med*. 2009 Nov;35(11):1979-89.
- Patroniti N, et al. Respiratory pattern during neurally adjusted ventilatory assist in acute respiratory failure patients. *Intensive Care Med*. 2012 Feb;38(2):230-9.
- Cecchini J, et al. Increased diaphragmatic contribution to inspiratory effort during neurally adjusted ventilatory assistance versus pressure support: an electromyographic study. *Anesthesiology*. 2014 Nov;121(5):1028-36.
- Di Mussi R, et al. Impact of prolonged assisted ventilation on diaphragmatic efficiency: NAVA versus PSV. *Crit Care*. 2016 Jan 5;20(1):1.
- Yonis H, et al. Patient-ventilator synchrony in Neurally Adjusted Ventilatory Assist (NAVA) and Pressure Support Ventilation (PSV). *BMC Anesthesiol*. 2015 Aug 8;15:117.
- Piquilloud L, et al. Neurally adjusted ventilatory assist improves patient-ventilator interaction. *Intensive Care Med*. 2011 Feb;37(2):263-71.
- Kallio M, et al. Neurally adjusted ventilatory assist (NAVA) in pediatric intensive care – a randomized controlled trial. *Pediatr Pulmonol*. 2015 Jan;50(1):55-62.
- Piastra M, et al. Neurally adjusted ventilatory assist vs pressure support ventilation in infants recovering from severe acute respiratory distress syndrome: nested study. *J Crit Care*. 2014 Apr;29(2):312.e1-5.
- de la Oliva P, et al. Asynchrony, neural drive, ventilatory variability and COMFORT: NAVA versus pressure support in pediatric patients. *Intensive Care Med*. 2012 May;38(5):838-46.
- Delisle S, et al. Effect of ventilatory variability on occurrence of central apneas. *Respir Care*. 2013 May;58(5):745-53.
- Delisle S, et al. Sleep quality in mechanically ventilated patients: comparison between NAVA and PSV modes. *Ann Intensive Care*. 2011 Sep 28;1(1):42.
- Bellani G, et al. Clinical assessment of auto-positive end-expiratory pressure by diaphragmatic electrical activity during pressure support and neurally adjusted ventilatory assist. *Anesthesiology*. 2014 Sep;121(3):563-71.
- Doorduyn J, et al. Automated patient-ventilator interaction analysis during neurally adjusted noninvasive ventilation and pressure support ventilation in chronic obstructive pulmonary disease. *Crit Care*. 2014 Oct 13;18(5):550.
- Ducharme-Crevier L, et al. Neurally adjusted ventilatory assist (NAVA) allows patient-ventilator synchrony during pediatric noninvasive ventilation: a crossover physiological study. *Crit Care*. 2015 Feb 17;19:44.
- Hjelmgren J, et al. Health economic modeling of the potential cost saving effects of Neurally Adjusted Ventilatory Assist. *Ther Adv Respir Dis*. 2015 Sep 30.

This document is intended to provide information to an international audience outside of the US.

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MAQUET
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