Servo NAVA
Neurally Adjusted Ventilatory Assist
Overview
GOD JUL

From:
jb, cs, and m&m
Neurally Adjusted Ventilatory Assist

Respiratory Control Feedback System

- Parasympathetic fibers
- Sympathetic fibers
- Afferent fibers
- Adrenergic terminals (norepinephrine and/or epinephrine)
- Cholinergic terminals (acetylcholine)
Ideal Technology vs. Current Technology

Central nervous system ➔ Phrenic nerve ➔ Diaphragm excitation ➔ Diaphragm contraction ➔ Chest wall, lung and esophageal response ➔ Airway flow, pressure and volume changes

Ideal Technology

Ventilator

Current Technology

PC, VC, PRVC, PS & VS
NAVA - Edi Catheter

- Lower esophageal sphincter
- External and Internal
- Phrenoesophageal ligament
- Longitudinal muscle
- Circular muscle
- Diaphragm
- Costal part
- Crural part
- Sling fibers
- Squamocolumnar junction
- Stomach
Electrical Activity Captured
Converted into Edi Waveform

- Edi signal is averaged **62.5 times per second** & transferred to Servo-i.
Edi Catheter Positioning Screen

- Leads: μV x 10
- Edi: μV
- Sweep: mm/s

Additional values:
- VTi (ml): 188
- VTe (ml): 198
- Edi peak (μV): 7.0
- Edi min (μV): 0.3

Monitoring parameters:
- Ppeak (cmH₂O): 24
- Pmean (cmH₂O): 8
- PEEP (cmH₂O): 3
- RR (b/min): 80
- O₂ (%): 29
- Ti/Ttot: 0.27
- MVe (l/min): 4.4
- C (l/min): 9.1
- VTi (ml): 188
- VTe (ml): 198

Servo-i NAVA
Edi Catheter Positioning Screen

Freeze
Scales: 10 12 40 Close
NEUROVENTILATORY COUPLING
From Health To Disease
NAVA Parameters

Set Ventilation Mode

- Pressure Control
- Automode
- Admit patient
- Nebulizer
- Status

**Basic**
- NAVA level: 1.0 cmH₂O/μV
- NAVA Ppeak est.: cmH₂O

**Trigg. Edi**
- Trigg. Edi: 0.5 μV

**Pressure Support**
- Trigg. Flow: 5

**Backup ventilation**

Cancel  Accept
NAVA Level

\[ P_{\text{peak}} \text{ in NAVA} = \text{NAVA Level} \times (\text{Edi Peak} - \text{Edi Min}) + \text{PEEP} \]
NAVA Case Study
Volume Control with NAVA Preview

- **Volume Control**
- **Admit patient**

**Status**

- **Peak (cmH₂O)**: 43
- **Pmean (cmH₂O)**: 23
- **PEEP (cmH₂O)**: 19
- **RR (b/min)**: 33
- **O₂ (%)**: 40
- **MVe (L/min)**: 25.0
- **VTi (ml)**: 407
- **VTe (ml)**: 427
- **Edi peak (µV)**: 22
- **Edi min (µV)**: 0.2

**Additional settings**

- **O₂ conc.**: 40%
- **PEEP**: 20 cmH₂O
- **Resp. Rate**: 10 b/min
- **Tidal Volume**: 400 ml

**Values**

- **Date/Time**: 10-16 08:49
On NAVA – Expiratory Effort
Decreasing NAVA Level and PEEP

- NAVA
- Admit patient
- Status

- Ppeak (cmH₂O): 38
- Pmean (cmH₂O): 14
- PEEP (cmH₂O): 10
- RR (b/min): 16
- O₂ (%): 36
- Ti/Ttot: 0.31
- MVE (l/min): 9.2
- VTi (ml): 468
- VTe (ml): 429
- Edi peak (µV): 29
- Edi min (µV): 0.1

Additional settings:
- O₂ conc. (%): 35
- PEEP (cmH₂O): 10
- NAVA level (cmH₂O/µV): 1.0

Additional values
NIV NAVA Patient
NIV NAVA - NAVA Level 1.5
Edi Peak 18 (Normal 5 to 15)
NAVA Titration Start - NAVA Level 0.0
Edi Peak 30 & Vt 418
Increase NAVA Level 1.0
Edi Peak 14 – Vt 548

![Neuro Ventilatory Tool Graph](image)
CURRENT PROBLEMS & DIAGNOSIS: EXTREME PREMATURITY

- 27 weeks gestation, born at 1140 grams.
- Age: 22 days, Adjusted gestational age: 31 weeks 3 days. Current Weight 1.460 kg
- Laboratory Studies: 8/21/2008 phenobarbital 66.4 MCG/ML
- Current Medications: Phenobarbital, Fentanyl, Ampicillin
- Respiratory Support: Ventilator since 8/4/2008
  - MODE: SIMV PC 12 + PS 5, FiO2: 0.21-0.35 Rate: 35, PEEP: 5 cmH2O, IT: 0.3 sec; O2 SATS: 89 -100
- RESPIRATORY DISTRESS SYNDROME: ONSET: 7/30/2008 STATUS: Active
  - Comments: Patient remains intubated due to recurrent central apnea-likely related to seizure activity
- SEIZURES: ONSET: 7/30/2008 STATUS: Active
- PROCEDURES: EEG on 8/11/2008 (abnormal) EEG on 8/19/2008 (normal)
- MRI 8/19/2008 (no seizure activity-infant on Phenobarbital and Fosphenytoin)
NAVA Level 2.0 – Edi Peak 3.2
Good Breathing Pattern
NIV NAVA – Good Breathing Pattern
Leak 96%
Edi Min ↑ Effort = Lung Recruitment
On NIV NAVA – NAVA Level 3.0
Servo_i NAVA
Neurally Adjusted Ventilatory Assist

MAQUET
GETINGE GROUP