BIS and us

Pierre Kaygin Sales and Clinical Applications

Certified Anesthesia Nurse MBA Int Mail:pierre.kaygin@anandic.com

For internal use only





History of Anandic Medical Systems AG

Our Domestic Business

- Distributor of GE over last >26 years
- 60 Employers
- Good after sales support for devices
- Selling BIS sensors 1>Mio CHF
- High quality demand in market

Export Business

- BIS sensors for Medtronic and OEM modules
- Entropy sensors for GE
- Made in China
- Warehouse in Europe, fast delivery
- And after sales support





Waves of EEG

Electric signals are measured and displayed



Awake with mental activity	>mmmmmmmmmmmmmmmmmmmmmmmmmmmmmmmmmmmmm	Beta 14-30 Hz
Awake and resting		Alpha 8-13 Hz
Sleeping		Theta 4-7 Hz
Deep sleep		Delta < 3.5 Hz
	1 second	





Spectral Entropy

Level of consciousness

Entropy parameters

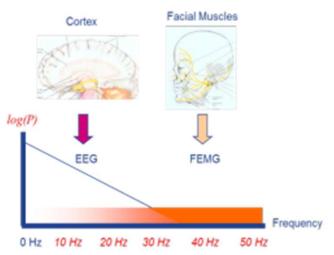
RESPONSE ENTROPY (RE):

- Sensitive to activation of facial muscles
- Rapid reaction

STATE ENTROPY (SE):

- Assesses the hypnotic effect of anaesthetics on the brain
- Stable and robust

Entropy monitoring is based on the acquisition and processing of raw electroencephalogram (EEG) and frontal electromyogram (f-EMG) data.





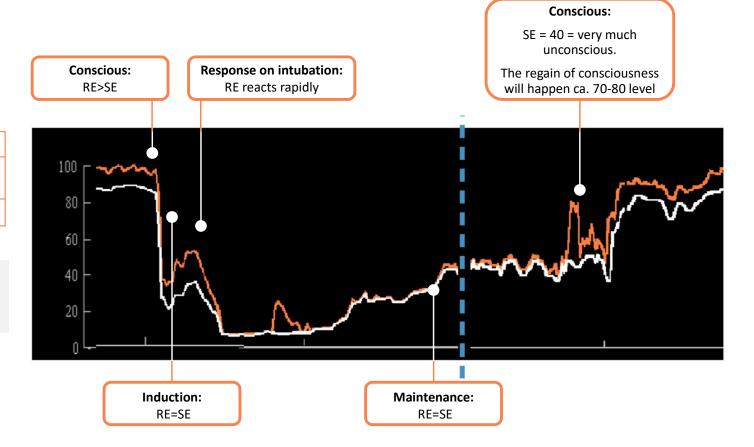


Spectral Entropy

Level of consciousness

100	Fully awake and responsive
60 40	Clinically meaningful anaesthesia with low probability of consciousness
0	Suppression of cortical electrical activity

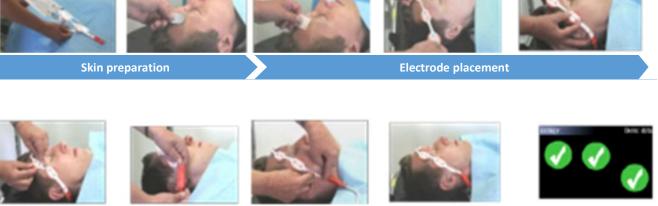
Note: the data shown in the graph are a simulation of a typical case.





Spectral Entropy





Tail fixation



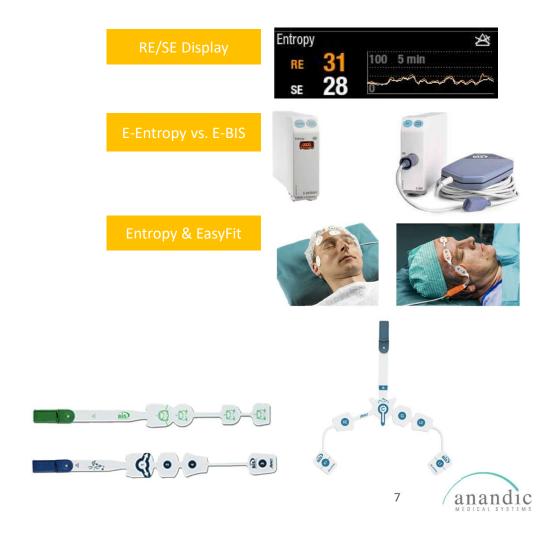
Start monitoring

Entropy vs BIS

Comparison:

- Two meaningful indexes State Entropy (SE) based on 1-channel raw EEG and Response Entropy (RE) based on EMG. For BIS EMG is just an artifact
- GE uses other parameters like NMT and SSI(Surgical Stress Index)
- More real time information RE reacts in few seconds, while BIS may take 30 to 120 seconds to reflect the state change⁽¹⁾ → RE detects status changes quicker than BIS





Other technologies

Masimo Sedline, USA

- SedLine Patient State Index (PSi) for monitoring state of the brain during anesthesia - bilateral acquisition and processing of 4-ch EEG signals. RD SedLine EEG sensor and O3 Regional Oximetry sensors. Monitor Root
- 4-ch EEG more diagnostic and improved performance during interference (electrocautery, EMG interference, low power EEG)
- Raw EEG analyzes





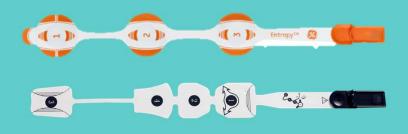
Medtronic BIS, USA

- BIS for depth of anesthesia in OR
- BISx4: OR > ICU + 4-ch EEG
 - OR; prognostic value esp. cardiac surgery
 - ICU; avoid awareness/over-light sedation, detect changes and help treat status epilepticus
- Standalone monitor available
- Module integration by all major competitors (GE, Mindray, Philips etc.)
- Uses EEG waveforms in database and compares this
- Sensor can be 3 times connected, after it cannot be used





Our commitment



- Best compatible BIS and Entropy sensors
- High quality
- Affordable
- Experienced company
- Our BIS can be connected 10 times to a Medtronic device/Module
- Soft sensors, less irritation



