Next Generation SedLine® Brain Function Monitoring

More Complete Data, Featuring an Enhanced Patient State Index (PSi)

Next Generation SedLine helps clinicians monitor the state of the brain under anaesthesia with:

> An enhanced signal processing engine, which improves performance of the Patient State Index (PSi)

> Enhanced PSi with less susceptibility to EMG interference and improved performance in low power EEG cases

> Four simultaneous channels of frontal electroencephalogram (EEG) waveforms, enabling bilateral data acquisition and processing of EEG signals

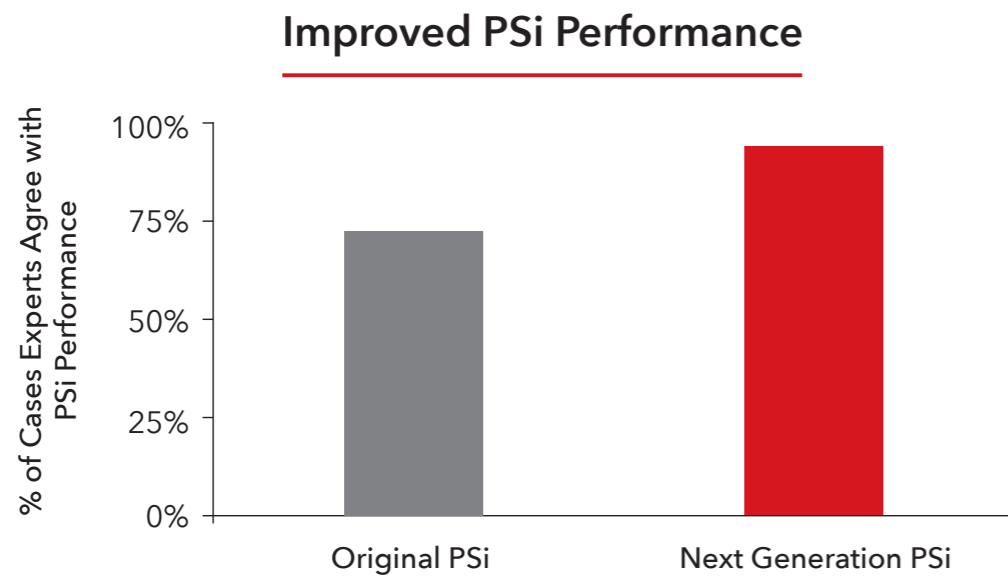> A Multitaper Density Spectral Array (DSA), which may enhance visibility of EEG features

MASIMO

Improved Patient State Index (PSi)

Next Generation SedLine features an enhanced signal processing engine which provides an enhanced Patient Sate Index (PSi), a processed EEG parameter related to the effect of anaesthetic agents.

Expert Scoring of Next Generation SedLine[1]

EEG experts scored the improvement in PSi performance between the original SedLine PSi and Next Generation SedLine PSi.

Experts found a **25% average improvement** in Next Generation PSi performance.

Improved PSi Performance

Bar chart — Y-axis: % of Cases Experts Agree with PSi Performance (0% to 100%); X-axis categories: Original PSi, Next Generation PSi.

To evaluate the performance of Original PSi and Next Generation PSi, independent EEG experts reviewed validation cases with both Original PSi and Next Generation PSi (blinded to the version), along with additional clinical information (MOAAS scores, EEG waveforms, drug doses, and vital signs). Compared to the expert-assessed anaesthetic depth, an error was defined as a case when expert assessment of PSi was 'Low' or 'High' and success was defined as a case when the expert assessment of PSi was 'Good'.
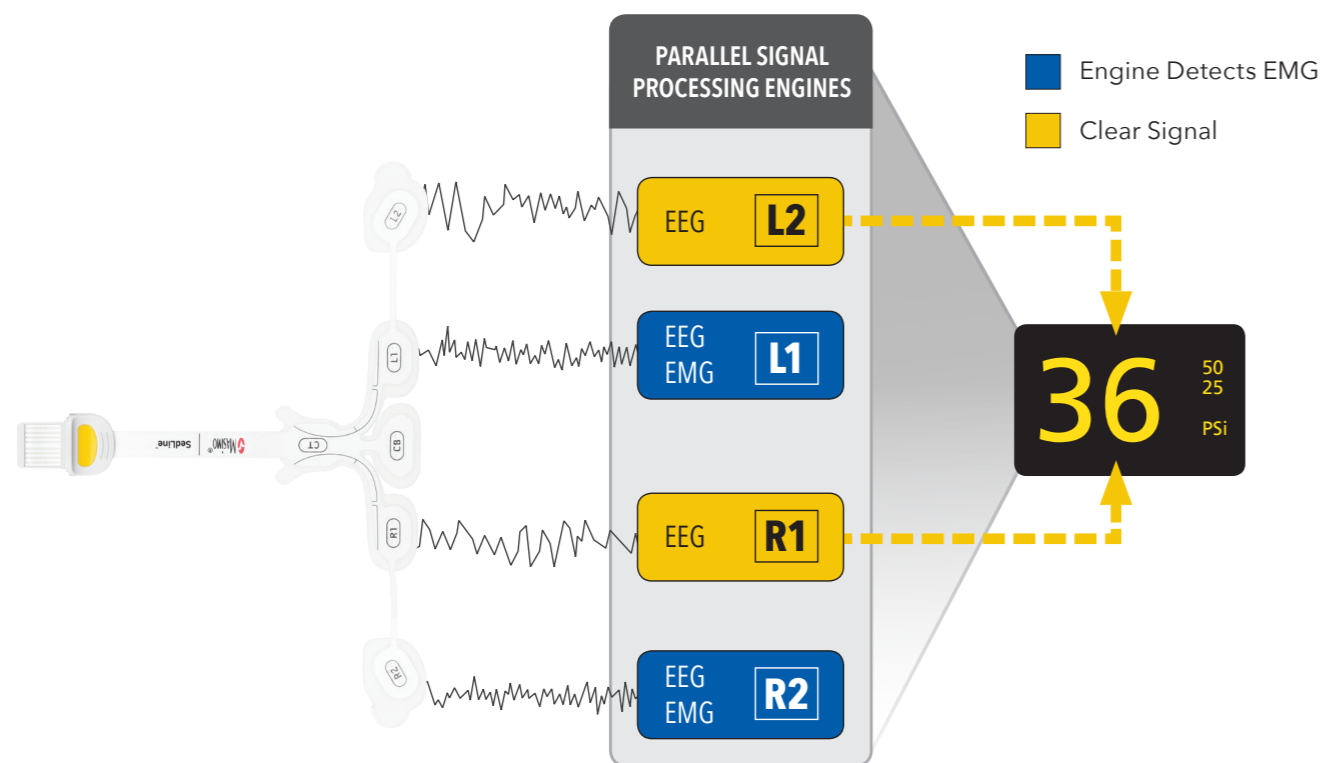

Next Generation SedLine Brain Function Monitoring helps clinicians monitor the state of the brain under anaesthesia with bilateral data acquisition and processing of four leads of electroencephalogram (EEG) signals.

Reducing Electromyography (EMG) Susceptibility

EMG is a common confounding factor that can interfere with EEG signals used in brain function monitoring.[2] Researchers have found that EMG interference existed in up to 38% of monitored patients.[3]

Next Generation SedLine utilises Masimo's Parallel Signal Processing Engines to extract a clearer EEG signal and compute a processed EEG parameter (PSi) less influenced by EMG.

PARALLEL SIGNAL PROCESSING ENGINES

Engine Detects EMG
Clear Signal

EEG **L2**
EEG EMG **L1**
EEG **R1**
EEG EMG **R2**

36 50 25 PSi

This image captures a moment when Next Generation SedLine detects EMG in the two engines depicted.

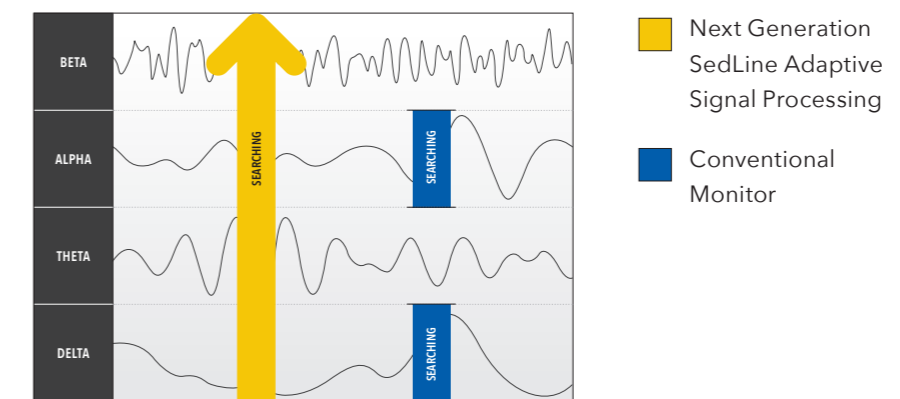The case below demonstrates Next Generation SedLine's improvement to PSi in the presence of EMG interference.[1]

Next Generation PSi
Original PSi

EMG

PSi / Time (minutes)
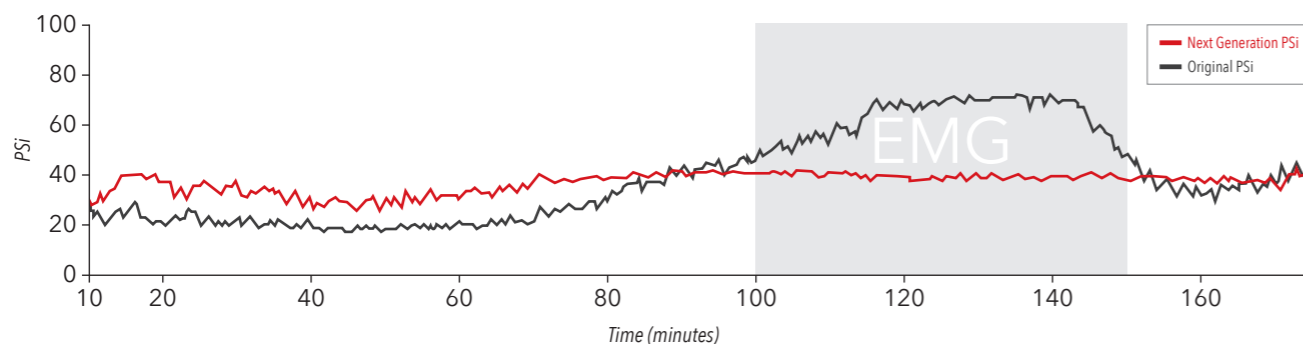
Improved PSi Performance in Low Power EEG

Power across all frequency bands decreases with age.[4] Low power EEG can present a challenge for conventional brain function monitors.[2]

22-year-old Patient   59-year-old Patient
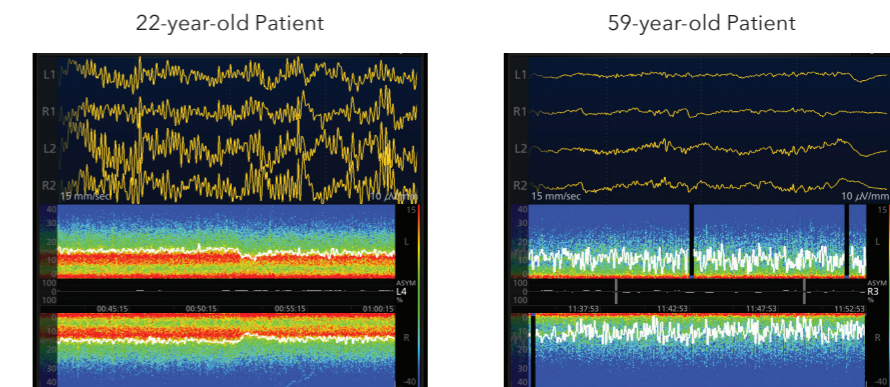
The subjects above were administered Propofol and were in a comparable anaesthetic state.[5]

When computing PSi, Next Generation SedLine uses adaptive signal processing with band-independent features to search for EEG features across many frequency bands and offer improved PSi performance in cases of lower power EEG.

BETA
ALPHA
THETA
DELTA
SEARCHING

Next Generation SedLine Adaptive Signal Processing

Conventional Monitor

The case below demonstrates Next Generation SedLine's improvement to PSi in low power EEG.[1]

Next Generation PSi
Original PSi

Low Power EEG   Low Power EEG

PSi / Time (minutes)
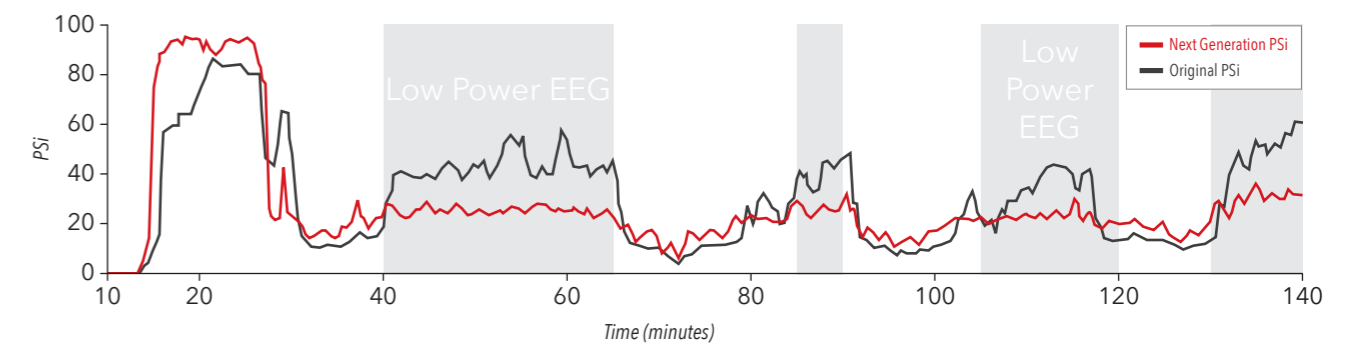
Multitaper Density Spectral Array (DSA)
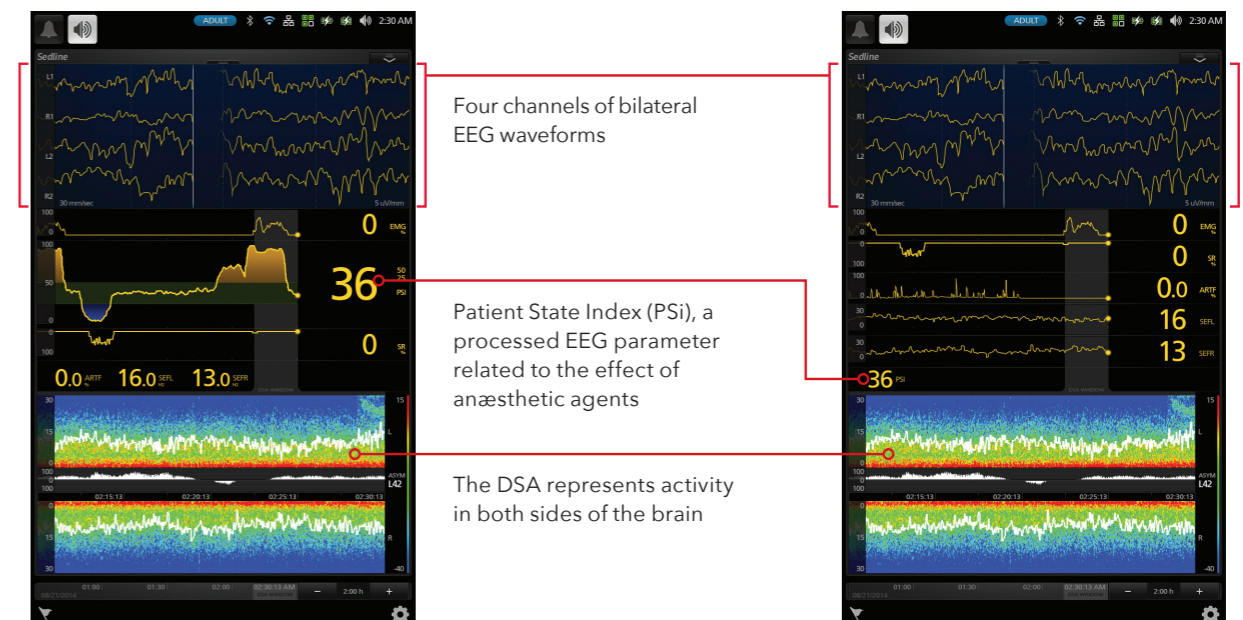
Next Generation SedLine offers clinicians the flexibility of choosing to display either an enhanced Multitaper Density Spectral Array (DSA) or a standard Hanning DSA. The DSA contains left and right spectrograms representing the power of the EEG on both sides of the brain.

When using a Multitaper DSA, EEG data are transformed into the frequency domain, which may provide a better display of EEG features.
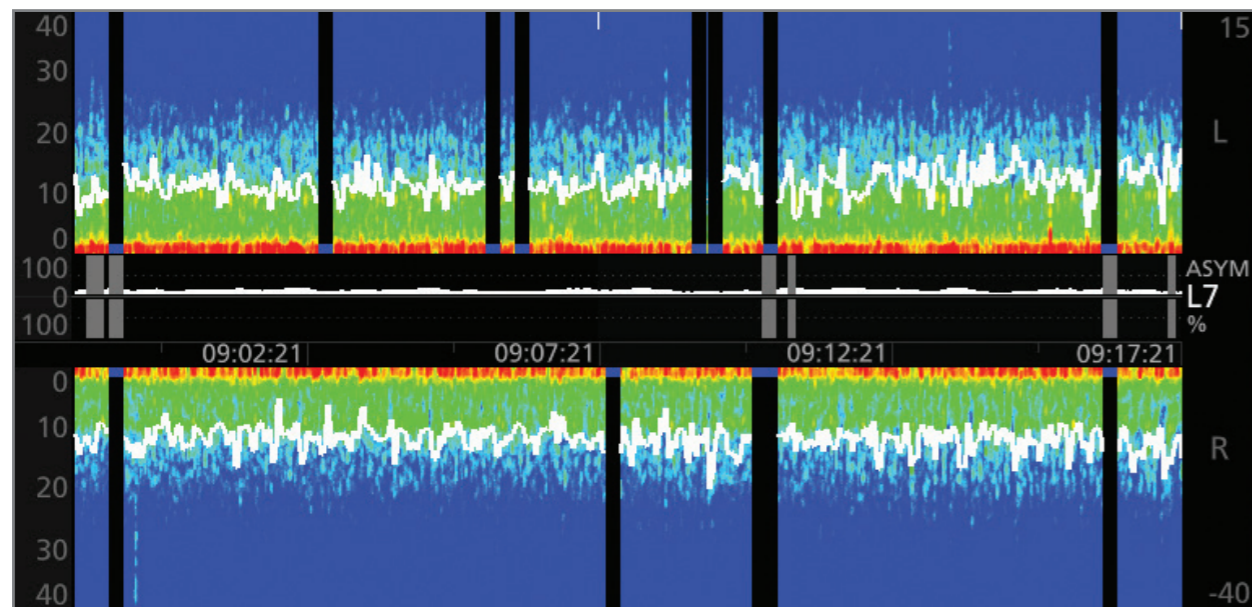
Next Generation SedLine on Root®

The Next Generation SedLine module easily plugs into the Root patient monitoring platform via Masimo Open Connect® (MOC-9®) ports. Root's customisable, easily-interpretable display offers multiple views of brain monitoring information expanding visibility in the operating room and intensive care unit.

Four channels of bilateral EEG waveforms

Patient State Index (PSi), a processed EEG parameter related to the effect of anæsthetic agents

The DSA represents activity in both sides of the brain

A More Complete Picture of the Brain

Next Generation SedLine can be used simultaneously with **O3® Regional Oximetry** on the Root platform for a more complete picture of the brain.

RD SedLine™ EEG Sensor

> Soft foam pads for comfortable application on a patient's forehead

> Adhesive anchors ensure secure sensor placement for optimal signal quality

> Pre-filled gel electrodes help streamline sensor application workflows

> Durable, heat-laminated flex cables allow flexible placement and repositioning

❯ Four active EEG leads on the RD SedLine sensor collect data in the frontal lobe
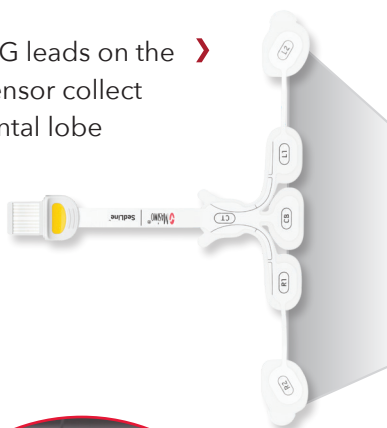
❮ Application graphics for O3 regional oximetry sensor placement simplify simultaneous application of both monitoring technologies

SedLine Specifications

PHYSICAL CHARACTERISTICS

Module Physical Dimensions
Width . . . . 1.3 in (3.3 cm)
Length . . . . 4.0 in (10.2 cm)
Thickness . . . . .0.8 in (2.0 cm)

ENVIRONMENTAL

Module Operating Conditions
Operating Temperature. . . . . 41–104°F (5–40°C)
Operational Humidity . . . . 15–95%, non-condensing

Module Storage Conditions
Storage Temperature . . . .-40–158°F (-40–70°C)
Storage Humidity . . . . 15–95%, non-condensing
Exposure to Pressure . . . . .500–1060 mbar

Sensor Specifications

Application Site . . . . .Forehead
Active Channels 4
Active Electrodes . . . . L1, L2, R1, and R2

Ground Electrode. . . . . CB
Reference Electrode . . . . CT
Duration of Use . . . . .Maximum of 24 hours
Latex Content . . . . Does not contain natural rubber latex

[1] Retrospective analysis of clinical data on file. [2] Purdon P et al. *Brit J of Anaesth*. 10.1093 46-57. [3] Narasway et al. *Critical Care Med*. 2002 Jul;30(7):1483-7. [4] Lobo, Francisco A., and Stefan Schraag. Limitations of anaesthesia depth monitoring. *Current Opinion in Anesthesiology*. 24, no. 6 (2011): 657-664. [5] Masimo Data on File.

The RD SedLine EEG Sensor is not licensed for sale in Canada.

For professional use. See instructions for use for full prescribing information, including indications, contraindications, warnings, and precautions.

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