



Surgical Pleth Index

For monitoring the patient's hemodynamic responses to surgical stimuli and analgesic medication under general anesthesia



What is the Surgical Pleth Index?

The Surgical Pleth Index, or SPI, is a digit that may be used to monitor the patient's hemodynamic responses to surgical stimuli and analgesic medications during general anesthesia. SPI reflects the patient's responses, which result from increased sympathetic activity as a reaction to painful (nociceptive) stimuli.

SPI monitoring is based on the acquisition of the readily available plethysmographic pulse wave, which is processed with a unique algorithm. The calculation analyzes the photoplethysmographic amplitude and the photoplethysmographic pulse interval, and then combines these two parameters to create a single digit, the Surgical Pleth Index.

The details of the SPI algorithm have been published in an article in the British Journal of Anaesthesia titled, "Assessment of surgical stress during general anaesthesia".(1).



SPI learning at the beginning of the operation. The number is displayed in grey.



SPI index and trend active during the operation.

Clinical use of the SPI

SPI can be used to help assess both acute nociceptive events, as well as long-term state reactions during general anesthesia. In general, when the SPI goes up, the patient is responding to the events. When the index goes down, the level of surgical responsiveness has decreased.

At the beginning of measurement, and as needed, the SPI's algorithm starts learning and processing the signals. The digit will be grey in color, and a "learning" message is shown. Learning is marked in the trends as a dashed, vertical line. When the measurement is started, it will take about three minutes for the learning process to take place.

1 Huiku, M., et al. Assessment of surgical stress during general anaesthesia. *British Journal of Anaesthesia* 98, 447-455 (2007).

Things to remember when using SPI

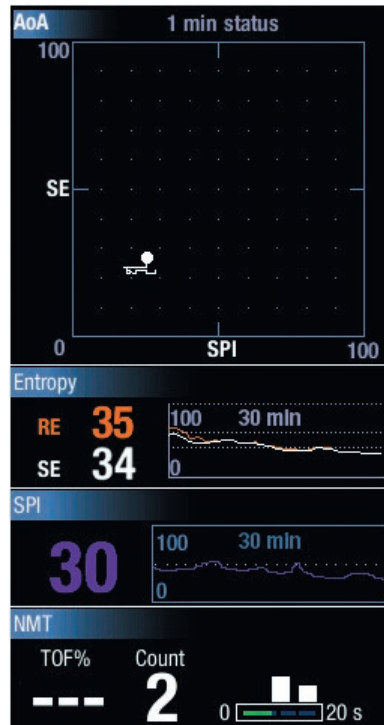
SPI is a parameter for adults (over 18 years old) undergoing general anesthesia. SPI may be affected by cardiac pacemaker and during the use of atropine. Factors which effect the hemodynamic stability of the anesthetized patient may effect SPI, as well.

SPI is an optional software licence that has certain requirements for the monitor used. Also it needs GE Ohmeda SpO2 technology and compatible sensors. Please contact your GE Healthcare representative for a complete list of SPI-supporting components.

Integrated information in the BalView

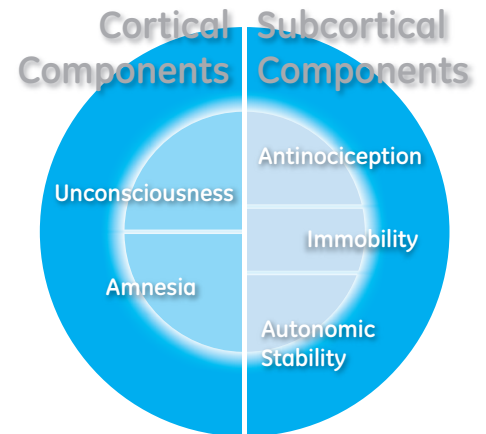
In the AoA (Adequacy of Anesthesia) split screen, you will find the BalView, which balances SPI and State Entropy™ values on an x-y graph. This view is a tool for visualizing the effects of anesthetic and analgesic pharmaceuticals administered during general anesthesia: The current, combined values are expressed as a dot, and a trace shows the trend for the last minute.

This AoA split screen view incorporates values and trends obtained from the SPI, Entropy (State Entropy, Response Entropy and Burst Suppression Ratio) and Neuromuscular Transmission (NMT) modules, providing a holistic view of the patient's response to anesthesia. The monitor must have active SPI, Entropy and NMT measurements for the BalView to function.



Completing the Adequacy of Anesthesia concept

Adequate anesthesia results from a balance of many components, and needs to be assessed with more than one parameter. When the Surgical Pleth Index is used together with other monitored parameters, such as hemodynamics, NMT, and Entropy, you can get a complete picture of the patient's status combined on one screen.



Imagination at work

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