



BIS™ Monitoring Technology
Enabling Safety and Quality
Improvements in the Operating Room



COVIDIEN

positive results for life™

BIS™ technology backs you up with proven brain monitoring



Given the complexity of the decisions you face, it makes sense to incorporate the added security of BIS™ monitoring into your practice. Used in millions of procedures requiring anesthesia, BIS technology can provide insight into the direct and patient-specific effects of anesthesia on the brain.

HOW BIS TECHNOLOGY WORKS

- Raw EEG data are obtained through a sensor placed on the patient's forehead.
- The BIS monitoring system processes the EEG information and calculates a number between 0 and 100 that provides a direct measure of the patient's level of consciousness.
- A BIS value of 100 indicates the patient is fully awake.
- A BIS value of 0 indicates the absence of brain activity.

BIS INDEX RANGE AND CLINICAL STATES

100	Awake – Responds to normal voice
80	Light/Moderate Sedation – May respond to loud commands or mild prodding/shaking
60	General Anesthesia – Low probability of explicit recall – Unresponsive to verbal stimulus
40	Deep Hypnotic State
20	Burst Suppression
0	Flatline EEG

This chart reflects a general association between clinical state and BIS monitoring values. Ranges are based on results from a multicenter study of BIS monitoring involving the administration of specific anesthetic agents. BIS values and ranges assume that the EEG is free of artifacts that can affect its performance. Titration of anesthetics to BIS value ranges should be dependent upon the individual goals established for each patient. These goals and associated BIS value ranges may vary over time and in the context of patient status and treatment plan.

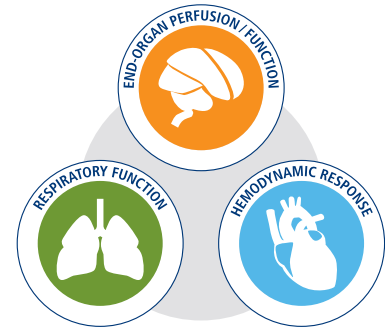
“Using the BIS™ monitor has made me more of a scientist and a more perceptive clinician. It is, in short, an essential part of modern anesthesia.”

— Irene Osborn, M.D., Mt. Sinai Medical Center

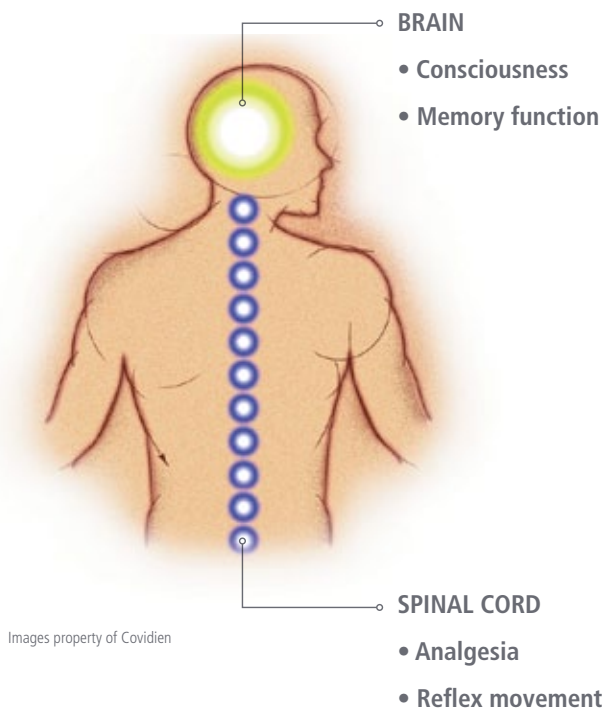


INSIGHT INTO BRAIN RESPONSES¹

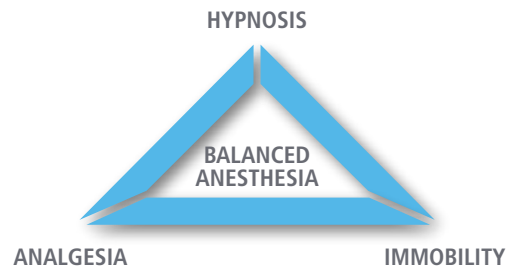
- BIS™ monitoring can help clarify the distinction between brain and spinal cord responses, enabling you to manage anesthetic goals of hypnosis, analgesia and immobility.
- Because BIS™ technology measures electrical activity in the brain, it provides a direct correlation with depth of consciousness (hypnosis).
- Responses to surgical stimulation are frequently indicators of the need for additional analgesia. These responses are often mediated in the spinal cord.
- BIS monitoring enables you to assess consciousness and sedation separately from cardiovascular reactivity.



The Sensing Systems of Covidien



Images property of Covidien

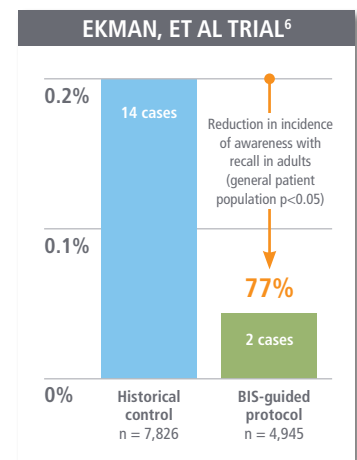
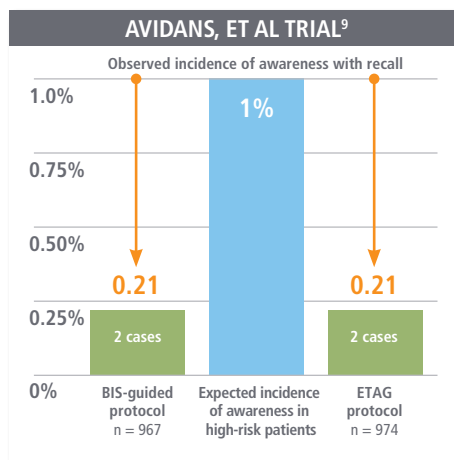
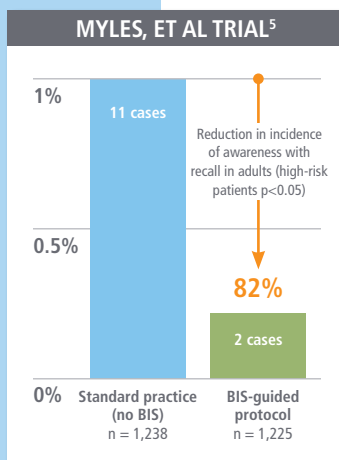


BIS™ technology improves safety and efficiency in the OR

The Cochrane Review on BIS Monitoring author's conclusion: "Anaesthesia guided by BIS within the recommended range (40-60) could improve anaesthetic delivery and postoperative recovery from relatively deep anaesthesia. In addition, BIS-guided anaesthesia has a significant impact on reduction of the incidence of intra-operative recall in surgical patients with a high risk of awareness."⁸

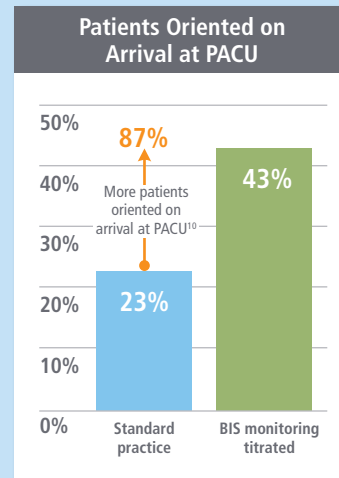
BIS™ MONITORING AND REDUCED RISK OF AWARENESS IN ADULTS

- Research demonstrates that awareness with recall occurs in one to two patients per 1,000 receiving general anesthesia.²⁻⁴
- BIS technology is the only consciousness monitoring system proven in rigorous prospective clinical studies to help clinicians reduce the incidence of awareness with recall in adults by approximately 80%.^{5,6}
- BIS monitoring may play a role in helping health care organizations address the recommendations proposed in the Joint Commission Sentinel Event Alert² on preventing and managing the impact of anesthesia awareness.
- Awareness is a leading cause of patient dissatisfaction with anesthesia.⁷
- 20,000 to 40,000 cases of awareness with recall occur each year in the U.S.



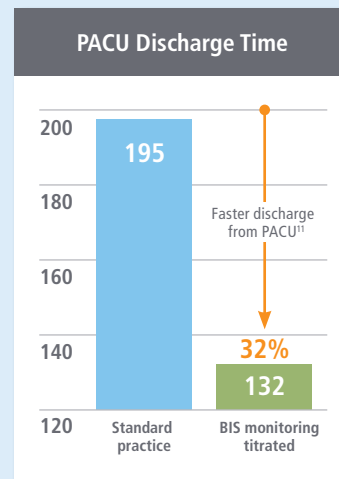
BIS™ MONITORING AND FASTER WAKE-UPS¹⁰

BIS™ technology-monitored patients wake up faster, are extubated sooner and are more oriented on arrival at the post-anesthesia care unit (PACU).



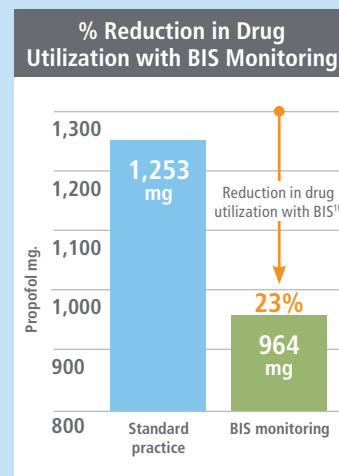
BIS MONITORING AND SHORTER PACU STAYS¹¹

BIS technology-monitored patients have been shown to be eligible for PACU discharge 32% sooner.



BIS MONITORING AND DRUG SAVINGS¹⁰⁻¹³

- Multiple prospective randomized studies have measured the influence of BIS-guided anesthesia care compared to standard practice.
- Studies have shown reductions in the use of hypnotic anesthetics when anesthetics are titrated to the BIS monitoring index.





IMPROVING QUALITY AND SAFETY FOR A VARIETY OF PATIENTS^{10,12-14}

BIS™ technology offers you added security in providing specialized care and comfort for your patients, including those who may be more sensitive to the hemodynamic effects of anesthesia.

BIS™ monitoring provides valuable information about the status of your patients to help address their unique anesthetic requirements. This may be particularly valuable for:

- Patients with complex conditions whose status may suddenly or frequently change
- Patients with cardiovascular conditions
- Obese patients
- Trauma patients or others requiring reduced levels of anesthesia

WIDELY STUDIED, WIDELY ACCEPTED, WIDELY INTEGRATED

BIS technology is...

- Supported by thousands of published articles and abstracts*
- Available extensively throughout Europe, Asia, Australia and the Americas
- Licensed for integration into the patient monitoring systems of leading manufacturers

*<http://biseducation.com/ViewAsset.aspx?aaaid=35&lang=en-US>

“BIS information enables us to give each patient the precise amount of anesthetic they require, thereby increasing efficiency and reducing the risk of awareness and postoperative side effects of drugs, such as nausea and vomiting. With BIS, patients wake faster, feel more alert and go home earlier.”

—James Mayfield, M.D., Medical Director of Perioperative Services, Medical College of Georgia Health System

“BIS™ technology is an invaluable teaching tool. It equips my students with the information they need to determine when they can safely titrate back their anesthetic. The added confidence that BIS technology provides has a significant impact on the quality and efficiency of the anesthesia they administer.”

—John O'Donnell, CRNA, University of Pittsburgh Medical Center



BIS™ TECHNOLOGY IS READY WHEN YOU ARE

You can now access the full benefits of BIS technology, which allows you to interface with any BIS Ready™ patient monitoring system. Simply plug the BIS™ LoC device into a BIS Ready system and BIS™ monitoring information is displayed along with other vital signs.*

The BIS LoC device integrates with systems in virtually every healthcare environment, from high-end systems in ORs and intensive care units (ICU) to preconfigured systems in ambulatory surgery centers or procedural sedation locations. The BIS LoC device also provides the flexibility to travel with the patient throughout the hospital (requires compatible brand/connectors on patient monitoring systems).

*Available in select monitors.

THE BIS™ SENSOR FAMILY

The family of BIS sensors includes

- The BIS™ 4 Electrode Sensor for adult patients undergoing general anesthesia or sedation
- The BIS™ Extended Sensor for adult patients monitored for a long period of time, such as those in the ICU
- The BIS™ Pediatric Sensor for smaller patients
- The BIS™ Bilateral Sensor to enable detection of hemispheric differences in the brain which may prove useful for advanced monitoring applications*

*Bilateral hardware required. Hardware includes BIS LoC 4 Channel monitor and PIC-4 cable.

BIS 4 ELECTRODE SENSOR
186-0106



BIS PEDIATRIC SENSOR
186-0200



BIS EXTENDED SENSOR
186-0160



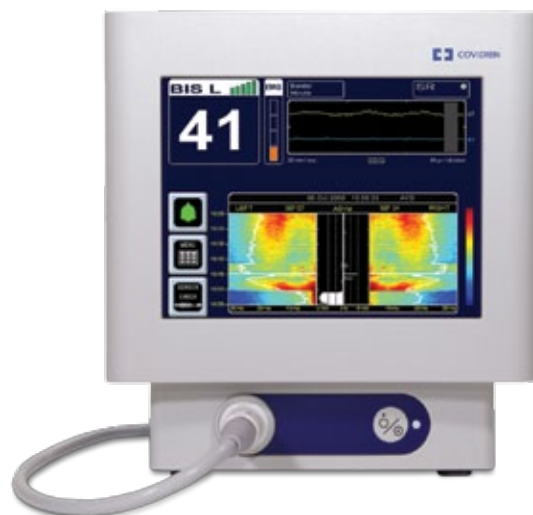
BIS BILATERAL SENSOR
186-0212



BIS™ monitoring solutions to meet your needs

Covidien offers proven BIS™ brain function monitoring in a variety of solutions to provide you with the flexibility to monitor across the continuum of care.

BIS™ technology is available stand-alone and as an integrated solution with leading OEM monitoring systems



BIS COMPLETE 4 CHANNEL MONITORING SYSTEM
186-1014

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6135 GUNBARREL AVENUE
BOULDER, CO
80301
800-635-5267

WWW.COVIDIEN.COM