

## **Comparison of PSA and BIS Monitoring during General Anesthesia with Propofol and Desflurane.**

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### **Introduction**

The bispectral index (BIS) monitor has been utilized to improve the titration of both intravenous (1) and inhalational (2) anesthetics during general anesthesia (GA). This study was designed to compare the use of two cerebral monitors, the recently introduced physical state analysis (PSA) and BIS, during a standardized general anesthetic technique.

### **Methods**

Twenty patients undergoing GA were monitored simultaneously using the PSA and BIS monitors. All patients were premedicated with midazolam (2 mg) and anesthesia was induced with propofol 2 mg/kg IV. Following induction, anesthesia was maintained with desflurane 3-5% and nitrous oxide 60% in oxygen. During surgery, the patients were administered bolus doses of propofol (20 mg IV), or the inspired concentration of desflurane was increased or decreased by 2%, and the changes in PSA and BIS values were recorded. In addition, the effect of the electrocautery on the ability to record a PSA or BIS value was noted. Data were analyzed using Student's t-test for continuous variables, paired t-test for intragroup differences, and Chi-square test for categorical data. ( $p < 0.05$  vs before administration of propofol bolus or desflurane).

### **Results**

The PSA monitor appeared to be comparable to the BIS with respect to changes after propofol or desflurane administration. However, the PSA monitor experienced less interference from the electrocautery unit during surgery (16% vs 65% for the PSA and BIS, respectively).

### **Conclusion**

The new PSA monitor appears to be a viable alternative to the BIS monitor for titrating both intravenous (propofol) and volatile (desflurane) anesthetics during surgery.

1. Gan TJ, Glass PS, Windsor A, Payne F, Rosow C, Sebel P, Manberg P. BIS utility study group: Bispectral index monitoring allows faster emergence and improved recovery from propofol, alfentanil, and nitrous oxide. *Anesthesiology* 1997; 87: 808-15.
2. Song D, Joshi GP, White PF. Titration of volatile anesthetics using bispectral index facilitates recovery after ambulatory anesthesia. *Anesthesiology* 1997; 87: 842-8.

	<b>BIS</b>	<b>PSA</b>
Before desflurane increased	62 ± 14	45 ± 20
1 min after change	56 ± 11	37 ± 19 <sup>a</sup>
2 min after change	49 ± 14	39 ± 18
3 min after change	45 ± 16	38 ± 16
5 min after change	47 ± 14	40 ± 16
Before desflurane decreased	36 ± 15	36 ± 24
1 min decreased	39 ± 14	30 ± 18
2 min after decreased	40 ± 13	34 ± 19
3 min after decreased	43 ± 12 <sup>a</sup>	31 ± 18
5 min after decreased	48 ± 17 <sup>a</sup>	32 ± 15
Before propofol bolus	71 ± 16	64 ± 19
1 min after bolus	52 ± 14 <sup>a</sup>	53 ± 18 <sup>a</sup>
2 min after bolus	40 ± 13 <sup>a</sup>	43 ± 17 <sup>a</sup>
3 min after bolus	41 ± 14 <sup>a</sup>	36 ± 12 <sup>a</sup>
5 min after bolus	47 ± 13 <sup>a</sup>	35 ± 12 <sup>a</sup>