

## **Physiometrix PSA 4000 Processed EEG Monitoring Augments the Anesthesia Sparing Effect of Dexmedetomidine.**

Cassingham S.F., Hebert T., Cook R., Biggs R., McPherson P.K. *Anesthesiology* 2002; 96: A546.

### **Introduction**

Dexmedetomidine, a selective alpha-2 agonist and potent anesthetic sparing agent, decreases the MAC of Desflurane by 55%.<sup>1</sup> Dexmedetomidine's sympatholytic effects make anesthetic depth difficult to assess in patients requiring paralysis. Dexmedetomidine's anesthetic sparing potential can be more clearly defined using the Physiometrix PSA 4000, a processed quantitative EEG (QEEG) monitor. Levels of consciousness are scaled on the Patient State Index (PSI). The PSI scales full consciousness at 100, loss of consciousness adequate for anesthesia at less than 50, and burst suppression at 0. A Medline search yielded no reports of QEEG monitoring during Dexmedetomidine augmented Desflurane anesthesia. This report documents a series of 7 patients, ages 27-41, undergoing abdominal hysterectomies receiving Dexmedetomidine combined with Desflurane while utilizing the PSA 4000.

### **Method**

After informed consent, patients were pre-medicated with Midazolam 0.075mg/kg. Dexmedetomidine infusions were begun with boluses of 1µg/kg, given over 15 minutes. After bolusing, Dexmedetomidine was infused at 0.7µg/kg throughout each procedure. Inductions were performed with Propofol 1.75mg/kg, Fentanyl 2.5µg/kg, Vecuronium 0.1mg/kg. After intubation, patients were administered 60%/40% N<sub>2</sub>O/O<sub>2</sub>. Induction produced PSIs below 15 in all patients. Desflurane was begun as the PSI rose above 25 and then titrated to maintain a PSI between 35 and 48. At skin closure, Desflurane and Dexmedetomidine were discontinued and 30mg of Ketorolac was administered. Muscle relaxants were reversed and 100% O<sub>2</sub> was initiated as dressings were placed. Within 5 minutes, all patients exhibited adequate reversal and responsiveness, and were extubated.

### **Results**

The mean end-tidal concentration of Desflurane (minutes at Desflurane concentration multiplied (X) by the Desflurane concentration/surgical length in minutes) administered in combination with Dexmedetomidine, while employing the PSA 4000, ranged from 0.9% to 1.2% (0.9%,0.9%,0.9%,1.0%,1.0%,1.1%,1.2%), with a mean of 1.0%. The MAC of Desflurane with 60% N<sub>2</sub> is 3.4%.<sup>2</sup> The 1.0% mean End-tidal Desflurane concentration observed in this series is 71% less than the 3.4% MAC of Desflurane with 60% N<sub>2</sub>O.

### **Discussion**

Sympathetic blocking agents such as Dexmedetomidine obtund hemodynamic responses to light planes of anesthesia. The anesthetic sparing capability of Dexmedetomidine is augmented when the PSA 400 is used to assess depth of consciousness. This series employing Dexmedetomidine and the PSA 4000 reduced Desflurane usage by 71%. A previous report using Dexmedetomidine alone demonstrated a 55% reduction in Desflurane requirements.<sup>2</sup> The use of the PSA 4000 provided an additional 29% reduction in Desflurane usage.

References: [1] *Anesthesiology* 95:A457,2001; [2] *Anesthesiology* 74:429-33,1991