To Evaluate Potency of Volatile Anesthetics.

Seeking to obtain a more complete concentration-response curve for volatile anesthetics than that provided by minimum alveolar concentration (MAC), Rehberg et al. used the spectral edge frequency at the 95th percentile of the power spectrum (SEF₉₅) as a measure of cerebral effect after administration of isoflurane, sevoflurane, or desflurane in 39 study participants. They reasoned that MAC multiples or fractions of MAC do not represent equal levels of central nervous system depression for different anesthetics.

All patients received 7.5 mg midazolam 60 min before induction of anesthesia with propofol (2.5 mg/kg). Depending on randomization grouping, patients were maintained either with isoflurane (n = 13), sevoflurane (n = 13), or desflurane (n = 13). After a 30-min waiting period, data collection began. The end-tidal anesthetic concentration of each respective anesthetic was varied according to a randomized sequence of monotonic increases and decreases between 0.6 and 1.3 MAC. Electroencephalogram signals were recorded continuously, digitized, and stored to hard disk for off-line analysis. Fast Fourier transformation was performed on 8-s intervals, and the SEF₉₅ was calculated. The SEF₉₅ was then used as a measure of drug effect in the pharmacodynamic model.

The population mean EC₉₀ values of the final model for SEF₉₅ suppression were 0.66 ± 0.08 vol% for isoflurane, 1.18 ± 0.08 vol% for sevoflurane, and 3.48 ± 0.66 vol% for desflurane. When concentration data were converted into fractions of the respective MAC values, no significant difference of the C₅₀ values for the three anesthetic agents was found. Because the concentration-response curves for spectral edge frequency slowing had the same slope, the researchers concluded that MAC and MAC multiples for the three anesthetics are valid representations of the concentration-response curve for anesthetic suppression of SEF₉₅.

Comparative Pharmacodynamic Modeling
To Evaluate Potency of Volatile Anesthetics. Rehberg et al. (page 397)

Efficacy of Rectal Acetaminophen in Day-case Pediatric Surgery Evaluated. Korpela et al. (page 442)
children were randomized to receive either placebo or a single dose (20, 40, or 60 mg/kg) of acetaminophen rectally. In the postanesthesia care unit, heart rate, $\text{SaO}_2$, and spontaneous breathing rates were recorded, and pain levels were assessed by an observer who was unaware of the acetaminophen dose given intraoperatively. Rescue pain medication (intravenous morphine 0.1 mg/kg) was administered at the discretion of the nursing staff. Children were kept in the postanesthesia care unit for a minimum of 2 h or until they were comfortable and were discharged if they had no nausea or vomiting. An investigator interviewed parents by phone 24 h after their child’s surgery to ascertain levels of pain and postoperative nausea and vomiting, if any. At home, rescue medication was rectal ibuprofen (10 mg/kg).

Results of the study showed that acetaminophen had a clear dose-dependent morphine-sparing effect. Ninety percent of the children who received placebo required postoperative morphine, compared with only 23% of those who received 60 mg/kg acetaminophen. The need for rescue pain medication at home was also less in children who received either 40 or 60 mg/kg acetaminophen than in children who received 20 mg/kg acetaminophen or placebo. In addition, the children who had adequate analgesia experienced less postoperative nausea and vomiting than those who received lower doses or no dose of acetaminophen before surgery. For best postoperative pain management, the authors recommend a dose of 60 mg/kg because the ED$_{50}$ of rectal acetaminophen is 35 mg/kg.

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