

Title: RECOVERY CHARACTERISTICS FOLLOWING PROPOFOL ANESTHESIA:  
A COMPARISON WITH THIOPENTAL-ISOFURANE

Authors: V. A. Doze, B.S., A. Shafer, M.D. and P. F. White, Ph.D., M.D.

Affiliation: Department of Anesthesia, Stanford University Medical Center,  
Stanford, California 94305

**Introduction.** Propofol is a rapid and short-acting intravenous sedative-hypnotic that can be administered by continuous infusion for maintenance of general anesthesia.<sup>1</sup> When a propofol infusion was used during brief outpatient surgical procedures, recovery was rapid with few postoperative sequelae.<sup>1,2</sup> However, little data exists regarding propofol's postoperative effects after prolonged infusions. We evaluated the recovery characteristics of propofol (*vs.* thiopental-isoflurane) when used for induction and maintenance of anesthesia in patients undergoing short superficial procedures or longer intra-abdominal operations.

**Methods.** Eighty patients presenting for superficial procedures and 40 patients scheduled to undergo intra-abdominal operations were randomly assigned to either a control (thiopental-isoflurane) or propofol group. The protocol was approved by the Institutional Review Board and informed consent was obtained from each patient. Preoperatively, patients were administered psychometric tests: Trieger, p-deletion, and sedation analog scales. All patients received meperidine, 1 mg·kg<sup>-1</sup> iv, and d-tubocurarine, 3 mg iv, 3-5 min prior to induction of anesthesia with either thiopental, 4 mg·kg<sup>-1</sup> iv, or propofol, 2 mg·kg<sup>-1</sup> iv. Succinylcholine, 1.5 mg·kg<sup>-1</sup> iv, was used to facilitate endotracheal intubation. In the control groups, anesthesia was maintained with isoflurane, 0.2-3.0%, and 70% nitrous oxide (N<sub>2</sub>O). The propofol groups received a variable-rate infusion of propofol, 2-25 mg·min<sup>-1</sup> iv, and 70% N<sub>2</sub>O. In the intra-abdominal groups, pancuronium, 2-10 mg iv, and supplemental meperidine, 10-80 mg iv, were administered during the maintenance period. The administered dose of isoflurane or propofol was titrated to maintain hemodynamic stability. Postoperatively, times from discontinuation of maintenance anesthetic agent and N<sub>2</sub>O to awakening and orientation were recorded. Psychometric tests were repeated at 30 min intervals until the patient returned to baseline scores (or for a period of three hours). Data are presented as mean values ± S.D. and were analyzed using ANOVA, Chi-square and t-test, with p < 0.05 considered significant.

**Results:** The study groups were comparable with respect to demographic data and baseline vital signs. Induction of anesthesia was rapid (<30s) in all groups. Maintenance hemodynamic values were comparable for the two superficial groups and the two intra-abdominal groups. Following the superficial procedures, the awakening and orientation times, as well as psychometric test scores were significantly decreased in the propofol group as compared to the control group; however, the recovery times and test scores were similar after the intra-abdominal procedures (figure and table). Although the incidences of postoperative side effects after the shorter superficial procedures were significantly decreased in the propofol (*vs.*

control) group, no significant differences were found after the longer intra-abdominal procedures.

**Discussion:** A propofol infusion can be administered in a titrated fashion analogous to the inhaled volatile anesthetics for maintenance of general anesthesia. Although recovery was more rapid when propofol (*vs.* isoflurane) was administered as an adjuvant to N<sub>2</sub>O for short superficial procedures, when propofol was infused during long intra-abdominal operations, recovery was comparable to a thiopental-isoflurane-N<sub>2</sub>O anesthetic technique. Recovery after more stressful surgical procedures is influenced by non-anesthetic factors (e.g., analgesic medication). Another possible explanation for our findings relates to a prolongation of propofol's elimination half-life after intra-abdominal operations. In summary, propofol may offer advantages over conventional barbiturate and volatile anesthetics for short superficial procedures. However, a propofol-N<sub>2</sub>O combination does not appear to provide for a more rapid recovery when used during intra-abdominal operations.

#### References:

1. Doze V, White P. *Anesth Analg* 65:1189, 1986.
2. Spelina K, et al. *Br J Anaesth* 58:1080, 1986.

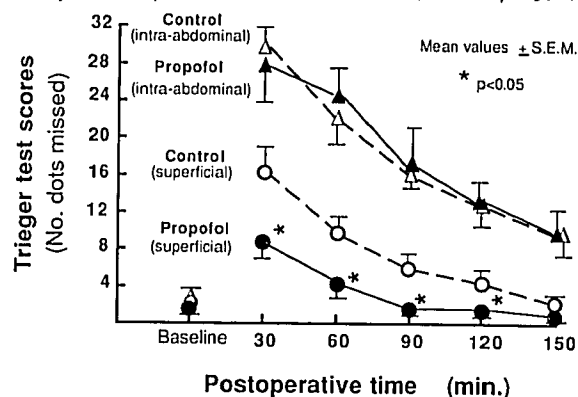


Table. Anesthetic dosages, recovery times and postoperative side effects for the two anesthetic treatment groups

	Superficial		Intra-abdominal	
	Control	Propofol	Control	Propofol
Avg. maint. dosages				
isoflurane (%)	0.9±0.3	-	1.0±0.2	-
propofol (mg/min)	-	7.9±2.8	-	8.1±2.4
total dose (mg)	-	510±239	-	1266±594
meperidine (mg)	-	-	23±29	21±27
Anes. duration (min)	74±28	76±29	167±53	169±51
Recovery times				
awakening (min)	8±7	4±3*	10±9	8±12
orientation (min)	11±9	6±4*	22±16	20±22
Postop. symptoms				
sedation (%)	20	5*	40	30
dizziness (%)	10	20	5	5
nausea (%)	45	20*	30	45
vomiting (%)	25	10*	10	10
IV analgesics (%)	40	38	80	85

\*Significantly different from respective control group, p<0.05