Title: PSYCHOMOTOR FUNCTION FOLLOWING BALANCED, ENFLURANE, AND 
ISOFLURANE ANESTHESIA IN AMBULATORY SURGICAL PATIENTS

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Introduction: Ambulatory surgery has become popular and patients are being 
discharged and sent home within a few hours of anesthesia and surgery. A major 
concern to the anesthesiologist is the psychomotor function of the patient before 
discharge. Isoflurane has a low blood/gas partition coefficient and it produces 
rapid induction of anesthesia with quick recovery (1). Theoretically it could 
become the agent of choice for ambulatory surgery. This study compares the rate of 
recovery of psychomotor function in ambulatory surgical patients following 
balanced, enflurane, or isoflurane anesthesia.

Method: Informed consent was obtained from 57 ASA class I patients 
scheduled for ambulatory surgery. Premedication consisted of diazepam 5 mg 
v 15 minutes prior to induction with sodium thiopental 4 mg/Kg iv. Each 
patient was then assigned to Balanced (B), 
Enflurane (E), or Isoflurane (I) group. 
In the B group the patients received fentanyl 0.1 mg iv before induction and 
and anesthesia was maintained with N2O 70% in 
and inspired oxygen. In the E and I groups the 
patients received initially 2 MAC (3.4% 
and 2.6%, respectively) inspiratory 
concentration of the volatile agent in N2O 
50%. The end tidal concentration of the 
volatile agent was monitored continuously 
by an Engstrom EMMA quartz crystal 
transducer and when it reached 1 MAC (1.7% 
for enflurane and 1.3% for isoflurane) the 
inspiratory concentration was reduced and 
maintained at one MAC. All patients 
received intermittent doses of 20-30 mg of 
succinylcholine in order to facilitate 
ventilation and maintain the arterial PCO2 
at the normal range. An investigator who 
was unaware of the anesthetic management 
carried out the psychomotor tests: 
visualisation, response time, and a modified tapping test (2) 
before and at one and two hours after 
termination of anesthesia. The results 
were analyzed by Student's t-test and p 
values less than 0.05 were considered 
significant.

Results: The results are shown in 
the Table. Mean anesthesia times for 
the B, E, and I groups were 18.2, 17.5, and 
18.0 minutes, respectively. There were no 
statistical differences in psychomotor 
function scores between the B and E 
groups. The I group scored better than 
The E group in the visualization and 
modified tapping tests two hours after 
anesthesia. The I group also scored 
better than the B group in the 
visualization test two hours after 
anesthesia. However, the differences were 
small and not clinically significant.

<table>
<thead>
<tr>
<th>Group</th>
<th>n</th>
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<th>RT</th>
<th>TT</th>
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<td>25</td>
<td>76±13</td>
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<tr>
<td>I</td>
<td>17</td>
<td>78±35</td>
<td>113±15</td>
<td>88±13</td>
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</tbody>
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Table: Psychomotor Function Testing 
Scores (mean SD) one and two hours after 
termination of anesthesia expressed as 
percent of the preanaesthesia values. B = 
Balanced, E = Enflurane, I = Isoflurane,

Visualisation Test, RT = Response 
Time Test, TT = Tapping Test. *p<0.05 
when I is compared to E. **p<0.025 when 
I is compared to B.

References:
1. Cromwell TH, Eger EI II, Stevens WC, 
Dolan WM: Forane uptake excretion and 
and blood solubility in man. Anesthesiology 
35:401-408, 1971
2. Edwards H, Rose EA, Schorow M, King 
TC: Post operative deterioration in 
psychomotor function. JAMA 245:1342-1343, 
1981