Title: **A COMPARISON OF DESFLURANE AND ISOFLURANE FOR CORONARY SURGERY**

Authors: JB Bowering MD, IR Thomson MD, RJ Hudson MD, D Peters MD, M Rosenbloom BSc(Hon)
Affiliation: University of Manitoba, Canada R2H 2A6

INTRODUCTION: Desflurane is an investigational, volatile anesthetic with a blood-gas partition coefficient of 0.42[1] and a MAC of approximately 6.0 %. This open-label, randomized trial compared desflurane (DES) and isoflurane (ISO) during elective coronary artery surgery (CAS).
METHODS: With institutional approval and written informed consent, we studied 17 patients with ejection fractions (EF) ≥ 0.35. Premedication consisted of the patient's usual antianginal drugs, plus morphine 0.1 mg/kg IM, and scopolamine 6μg/kg IM. After insertion of monitoring catheters, anesthesia was induced with IV thiopental 2 mg/kg/min until loss of the lash reflex. Pancuronium 0.1 mg/kg and fentanyl 10μg/kg were then infused over 5 min, and ≤ 1 MAC end-tidal (ET) DES or ISO administered in 100% O_2. After intubation, ventilation was controlled to achieve an $ETCO_2$ of 35 mmHg. The inhaled agent, ≤ 2 MAC, was titrated to maintain heart rate (HR) ≤ 120% and mean systemic arterial pressure (MAP) ≥ 70% and ≤ 120% of ward values. If the inhaled agent was ineffective, or if myocardial dysfunction or ischemia occurred, additional fentanyl, and/or vasoactive drugs were given. Systemic arterial, pulmonary arterial, and central venous pressures, ECG leads II and CS5, ST segment trends and ET agent concentration (AC) were continuously monitored and recorded. Thermodilution cardiac output (CO), and wedge pressure (PCWP), were recorded at baseline (B), and 1 min after induction (IND), intubation (INT), and sternotomy (S). Serial 12-lead ECG and CK-MB concentrations were measured postoperatively. Statistical analysis employed t-test, Fisher Exact Test or ANOVA when appropriate.
RESULTS: Eight patients received DES and 9 ISO. The groups did not differ with respect to demographics, preoperative hemodynamics or EF. Prebypass hemodynamics were similar in both groups (Table, Mean ± SD), as were the respective (DES vs ISO) mean ET-AC/MAC (0.68 ± 0.19 vs 0.68 ± 0.12), the number of patients given additional fentanyl (2 vs 2), propranolol (2 vs 2) and vasodilators (1 vs 1). New prebypass ST depression ≥ 0.1 mV (2 vs 2), initial postoperative CK-MB (48±34 vs 56±34 IU) and the incidence of new Q waves (0 vs 0) were not different.
CONCLUSION: Desflurane is comparable to isoflurane when used as the primary anesthetic agent for CAS.

Variable	Agent	Base	Ind	Int	Stern
HR (b/min)	Des	54±13	57±8	61±6	63±11
	Iso	59±14	59±13	71±18	68±10
MAP (mmHg)	Des	98±16	73±9	76±9	89±10
	Iso	94±9	72±15	80±11	99±10
CI ($l/min/m^2$)	Des	2.4±.6	2.2±.4	2.3±.3	2.1±.4
	Iso	2.9±.8	2.3±.6	2.7±.6	2.4±.4
PCWP (mmHg)	Des	17±5	12±2	11±2	17±3
	Iso	15±4	12±3	11±3	14±5

REFERENCE: 1. Anesth Analg 66: 971-973, 1987.

A322

TITLE: EFFECT OF N_2O ON VITAMIN B_{12} AND FOLATE METABOLISM IN PATIENTS

AUTHORS: D. D. Koblin, Ph.D, M.D., B. W. Tomerson, M.S., F. M. Waldman, M.D., Ph.D., G. H. Lampe, M.D., L. Z. Wauk, R.N., E. I. Eger, II, M.D.
AFFILIATION: Departments of Anesthesia and Laboratory Medicine, UCSF, San Francisco, CA 94143

Introduction: Patients occasionally develop hematological and neurological abnormalities after surgery with an anesthetic technique that includes N_2O. These abnormalities presumably result from N_2O-inactivation of the vitamin B_{12}-dependent enzyme methionine synthase and disruption of vitamin B_{12}-folate interrelationships. We designed this study to measure the effect of N_2O on vitamin B_{12} and folate status in two groups of patients: 1) elderly patients having total hip replacements (HIP), and 2) patients undergoing resection of acoustic neuromas (AN) requiring prolonged anesthesia and surgery.
Methods: With approval from our committee on human research and informed consent, we studied 49 patients (23 HIP, 26 AN). All patients received isoflurane, but were randomly assigned to receive either N_2O 50-70% or O_2 100%. Inhaled isoflurane concentrations were adjusted to maintain clinically acceptable levels of anesthesia. Serum vitamin B_{12} and serum and red cell folate were determined by radioassay preoperatively and on postoperative day 1. Spot urine samples were collected preoperatively and on postoperative days 1-3. Urine was assayed by spectrophotometric techniques for formic acid and formiminoglutamic acid (FIGLU); the excretion of these compounds in urine may be markedly elevated in individuals with a folate deficiency. Data were examined as mean values and change and percentage change from preoperative values using paired or unpaired t-tests, the Mann-Whitney test, or Fisher's exact test.
Results: Average duration of anesthesia was 3.3 hrs in HIP and 9.6 hrs in AN patients. No patient was deficient in vitamin B_{12} and vitamin B_{12} levels did not change on postoperative day 1 in either those exposed or not exposed to N_2O. Prior to surgery, no patient had an abnormally low serum folate, although 19 patients had low red cell folate values. Serum folate levels tended to increase on the first postoperative day in patients exposed to N_2O, but decreased in those not exposed. Red cell folate levels increased on postoperative day 1, independent of exposure to N_2O. For HIP patients, ratios of formic acid-to-creatinine and FIGLU-to-creatinine in urine did not differ significantly between patients anesthetized with and without N_2O. For AN patients given N_2O, ratios of FIGLU-to-creatinine in urine increased during and immediately after anesthesia when compared to preoperative values ($p=0.0057$), whereas patients not given N_2O had FIGLU-to-creatinine ratios that were lower than preoperative values. The elevated FIGLU-to- creatinine ratios in AN patients given N_2O returned toward baseline by postoperative day 1.
Discussion: These findings suggest a minimal disruptive effect of N_2O on vitamin B_{12} and folate status in patients, even in elderly individuals who tend to be deficient in these vitamins and in those who receive N_2O for prolonged surgical procedures.