

# **TITLE: THE EFFECT OF PULSE OXIMETRY, AGE, AND ASA PHYSICAL STATUS ON SEVERITY OF ANESTHESIA COMPLICATIONS: AN OUTCOME ANALYSIS**

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The clinical importance of anesthesia-related complications depends on their severity. We defined a "serious" Recovery Room Impact Event (RRIE) as either unexpected transfer from the RR to an ICU or ICU admission directly from the OR (bypassing the RR) in patients who were not elective candidates for the ICU. The clinical course of such patients and those factors related to the probability of a "serious" RRIE occurring were evaluated.

**Methods:** An RRIE is "an unanticipated, undesirable, possibly anesthesia-related effect that required intervention, was pertinent to RR care and did or could cause mortality or at least moderate morbidity." Of the 17,095 patients who underwent anesthesia, surgery and expected RR admission with return to floor care, we identified all "serious" outcome patients; those admitted to an ICU from the RR, or unexpectedly admitted to an ICU directly from the OR. Detailed retrospective chart review characterized the specific problems for which ICU admission was required, demographic data, the anesthetic contribution and the patient's hospital course. We also compared the frequency of "serious" outcomes before and after pulse oximetry was introduced into all ORs.

**Results:** 17% of patients had at least one RRIE, but only 71 of the 17,095 patients (0.42%) suffered a "serious" outcome! 46 "serious" events occurred during the 28 weeks prior to pulse oximetry, whereas 25 "serious" events occurred during the 37 weeks after pulse oximetry was introduced, ( $Z=3.902$ ,  $p<0.00001$ ). Ventilatory problems ( $n=22$ ) and ECG changes leading to a r/o MI protocol ( $n=20$ ) were most common. 71% of the "serious" outcomes occurred in the 32% of patients who were ASA PS III or IV, age  $>65$  or both ( $Z=8.5$ , and  $4.9$  respectively,  $p<0.00001$ ). On a logistic scale, risk of "serious" outcome increased linearly with age ( $p=0.0047$ ) and ASA-PS ( $p=0.0002$ ) [Table]. Clinical data indicated that the acuity of "serious" outcome patients is much less than most surgical ICU patients. Only 2 of the 71 patients required intensive physician care, most stayed 1-2 nights in the ICU and most were discharged from the hospital within an appropriate length of stay.

**Conclusion:** Although anesthesia-related complications are common, their severity is very low. Serious complications increased significantly with age and ASA-PS and decreased when pulse oximetry was introduced into all ORs.

ASA-PS	I	II	III & IV
Age			
< 41	2/4049 (0.05%)	2/2297 (0.09%)	0/278
41-65	0/1428	11/3776 (0.29%)	11/849 (1.3%)
> 65	1/196 (0.51%)	18/2854 (0.63%)	26/1366 (1.9%)

The number of patients with a "serious" outcome increased significantly as age ( $p=0.0047$ ) and ASA Physical Status ( $p=0.0002$ ) increased (logistic regression).

## **A1250**

**Title:** DOES 360 ML OF APPLE JUICE BEFORE ELECTIVE SURGERY INCREASE ASPIRATION RISK FACTORS?

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150 ml of water consumed preoperatively with oral H-2 blockers produces acceptable residual gastric volumes (RGVs) and gastric pHs.<sup>1</sup> The purpose of this study was to determine if a relatively large volume (360 ml) of a palatable clear fluid (apple juice) could be consumed before elective surgery when combined with ranitidine and metoclopramide prophylaxis.

The protocol was approved by the Human Protection Committee and written informed consent was obtained from all patients. This study was done in two phases. Exclusion criteria were: 1) hiatal hernia; 2) peptic ulcer disease; 3) pregnancy; 4) significant preoperative pain; 5) opioids within 24 h; 6) BMI  $[Wt(kg)/[Ht(M)]^2] > 30.0$ ; 7) anticholinergic medication; and, 8) antacid therapy. In the first phase 52 adult inpatients (ages 18 to 49) scheduled for elective surgery under general anesthesia were randomly assigned to one of three groups. All patients received 10 milligrams of diazepam orally at 0700 on the morning of surgery plus one of the following three preoperative regimens. (All oral medications were administered with 30 ml of water)

**Group 1 (fluids + prophylactic therapy):** 1. two six-ounce cans of apple juice (360 ml) between two and four hours before the scheduled time of surgery. 2. ranitidine 150 mg orally the evening before surgery and at 0700 on the morning of surgery. 3. metoclopramide 10 mg orally one hour before surgery.

**Group 2 (prophylactic therapy only):** management as in Group 1 except apple juice withheld.

**Group 3 (control):** no clear liquids or prophylactic therapy.

In the second phase 29 additional patients were randomized to only Groups 1 and 2 above. The final eight consecutive eligible consenting patients were all included in Group 1. Group 1 patients were discontinued from the protocol if apple juice was not consumed in the prescribed two to four hr period before the induction of anesthesia. The experimental sequence was: 1) induction of anesthesia and tracheal intubation; 2) oral placement of 18 Fr. Salem Sump into stomach; 3) confirmation of sump placement by injection of air into proximal end; 4) aspiration of RGV with a catheter-tipped syringe at 30, 26, 22, and 18 in; 5) immediate gastric pH measurement with Corning 125 pH meter. Groups were compared for differences in gastric pH, RGV, and the % of patients with  $pH \leq 2.5$  and  $RGV \geq 25$  ml. Statistical analysis was by ANOVA, Tukey test, Chi square with Yates correction and Bonferroni when applicable.

There was no morbidity associated with aspiration. One Group 3 patient vomited approximately 100 ml prior to anesthetic induction. 14 Group 1 patients were excluded because preoperative fluids were not consumed 2 to 4 h before surgery. Results are presented in the table.

Group	N	Gastric pH	Gastric vol	RGV $\geq 25$ & pH $\leq 2.5$
1	20	5.52 $\pm$ 0.68	15 $\pm$ 4 ml	2/20 (10%)
2	34	5.78 $\pm$ 0.43	11 $\pm$ 2 ml	2/34 (6%)
3	23	1.97 $\pm$ 0.27*	28 $\pm$ 4 ml**	13/23 (57%)*

\* $P<0.001$  vs Gp1&2; \*\* $P<0.005$  vs Gp 2; \*\*\* $P<0.05$  vs Gp 2.

Preoperative fasting is unpleasant to the patient and often results in undesirable volumes of acidic stomach contents. If one of the anesthesiologist's preoperative goals is to minimize the potential for aspiration pneumonia, then the decision to prescribe H-2 antagonists  $\pm$  metoclopramide is more important than the decision to withhold preoperative clear fluids.

### **References:**

1. Can J Anaesth 1987;34:117-121.