

# Evaluation of Controlled Breathing With or Without Peppermint Aromatherapy for Postoperative Nausea and/or Vomiting Relief

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## INTRODUCTION and PURPOSE

Postoperative nausea and/or vomiting (PONV) is one of the most common fears patients report when facing surgery. It has shown to be a major indicator of extended postoperative stays and unplanned admissions, which cost several millions of dollars annually.

So many times, healthcare providers turn first to medications when patients complain of nausea and vomiting. There are potentially adverse drug reactions associated with antiemetics, such as sedation, decreased respiratory status and EKG changes (1). Also, the cost of medications directly impacts not only the patients themselves, but the healthcare industry as a whole.

Although aromatherapy is one of the lesser known alternative therapies in the United States, it is commonly used in the nursing care of patients in the United Kingdom, Canada and Australia (2). The American Society of PeriAnesthesia Nurses (ASPAN) recognizes the need for further study of alternative therapies in the treatment of PONV in their 2010 standards (3).



Perioperative day surgery nurses at this not-for-profit, Magnet community hospital decided to rigorously evaluate their practice of using aromatherapy for the treatment of PONV. They recognized a need for a multidisciplinary approach and recruited CRNAs and PACU nurses to the research team.

This study was designed to evaluate controlled breathing alone (CB) versus controlled breathing with peppermint aromatherapy (AR) for relief of PONV in patients receiving general anesthesia for elective outpatient procedures.

## METHODS

- Study Design: IRB-approved, single blinded, randomized control trial

### Inclusion Criteria

- Males and females  $\geq 18$  years
- Able to breathe through their nose
- Capable of verbalizing PONV symptoms
- Outpatient laparoscopic, ENT, orthopedic or urological procedures
- General anesthesia intubation with ASA score of I or II

### Exclusion Criteria

- Nausea and/or vomiting within 24 hours of admission
- History of alcoholism
- Allergy to menthol or peppermint
- Weekend or emergent surgeries
- Pregnant women, children and Department of Correction clients
- Patients taking disulfiram (Antabuse) or metronidazole (Flagyl)

### Data Collection and Analysis

- Nausea and/or vomiting symptoms, descriptive ordinal scale (DOS) scores, age, gender, PONV risk factors, hours NPO
- Descriptive and inferential statistics; significance at 95% confidence

## INTERVENTION PROTOCOL

- Evaluated single episode of PONV in PACU or Post-Op Day Surgery

### Initial complaint of PONV

- Instructed to inhale deeply through nose to count of 3
- Hold breath to count of 3
- Exhale to count of 3
- Complete 3 cycles = 1 treatment
  - AR: peppermint extract (500  $\mu$ l) vial placed under nose
  - CB: sham vial placed under nose

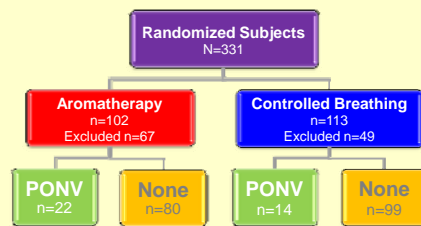
### 5 minutes after initial treatment

- Symptoms reevaluated
- Second treatment given unless PONV resolved

### 10 minutes after initial complaint

- Symptoms reevaluated
- Unresolved PONV subjects offered rescue antiemetic

## POPULATION DISTRIBUTION



- Incidence of PONV in the study population was limited

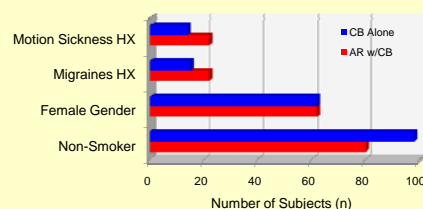
- 12.4% of CB subjects
- 21.6% of AR subjects

## DEMOGRAPHIC CHARACTERISTICS

Characteristic	Controlled Breathing Alone n=113	Aromatherapy with CB n=102	Statistic	p Value
Gender (n)			$\chi^2= .7689$ d.f.=1	.3806
Female	62	62		
Male	51	40		
Age (yr)			t=1.971	.0647
Mean (s.d.)	47.3 (15.1)	47.0 (14.0)		
Range	20 - 83	20 - 90		

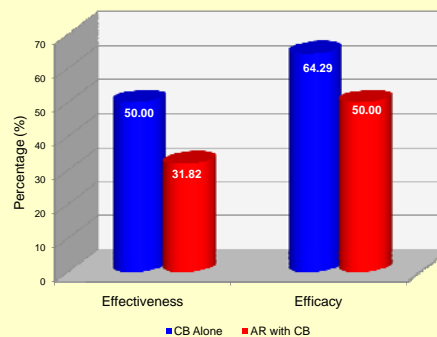
- More females than males were recruited in both groups
- Mean age was not significantly different between CB and AR subjects
- Groups were homogenous with respect to gender and age

## RISK FACTORS of STUDY POPULATION



- History of motion sickness and migraine headaches were more frequent among AR subjects
- CB group had a greater number of non-smokers
- Female gender is a risk factor associated with PONV and both control and experimental groups had similar numbers of females

## EFFECTIVENESS vs. EFFICACY



- PONV was evaluated by subject self-report using DOS

- "0" = no PONV symptoms
- "10" = worst symptoms imagined

### Definitions

- Effectiveness: DOS score of "0" post-intervention
- Efficacy: antiemetic rescue not required

- CB was more effective and efficacious than AR
- CB and AR were both efficacious in  $\geq 50\%$  of the PONV episodes

- Analysis of subjects experiencing PONV revealed a significant difference ( $p=.0455$ ) in history of motion sickness between CB and AR groups with this risk factor being more prevalent among AR subjects

## SUMMARY

### CONCLUSIONS

- Findings showed controlled breathing alone was more effective and efficacious in the treatment of PONV than peppermint aromatherapy with controlled breathing
- Anderson and Gross (4) found a saline placebo was as effective as peppermint oil or isopropyl alcohol (IPA) and suggested the benefit might be conscious controlled breathing, though it was not studied.
- Research evaluating pharmaceuticals vs. IPA (5,6) did not find medications superior to IPA, but reported subjects treated with IPA experienced increased incidence of PONV after discharge compared with the prolonged effect of the pharmaceuticals.
- Winston, et al (5) found the initial episode of PONV resolved more quickly with IPA than with ondansetron
- Teran and Hawkins (6) reported no significant difference between IPA, granisetron and no treatment for prophylactic prevention of PONV

### STUDY LIMITATIONS

- Subject attrition (n=116)
  - Reasons: CRNA availability, hospital admission, patient choice, ASA status, medically unstable, protocol deviation, data irregularities, unknown
- Low incidence of PONV among subjects
- History of motion sickness may have contributed to the decreased efficacy and effectiveness observed among aromatherapy subjects

### STUDY STRENGTHS

- Study design utilized controlled breathing with all PONV subjects in contrast to most previous research
- A metered dose of peppermint extract was utilized where as in earlier research (7) the volume of aromatherapy was not controlled

### IMPLICATIONS

- Controlled breathing is an immediate, cost-free, alternative intervention to prescribed medications for the treatment of PONV
- Future research could address the cost effectiveness of controlled breathing alone or in combination with peppermint aromatherapy

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