

**Introduction**

**Background:**

PONV is a frequent, distressing, costly and potentially preventable traumatic phenomenon in high-risk ambulatory surgical patients that persists despite current pharmacologic prophylaxis and rescue interventions. Acupressure, an energy medicine, has shown promising results in relieving PONV in various surgical populations. There is little research specifically targeting high-risk PONV ambulatory surgical patients.

**Problem:**

70-80% of general anesthesia patients are at substantial risk for development of PONV.<sup>1</sup> PONV risk assessment tool developed by the American Society of PeriAnesthesia Nurses (ASPAN)<sup>2</sup> identifies 5 risk factors associated with increased incidence of PONV:

- 1) Female
- 2) Non-smoker
- 3) History of PONV or motion sickness
- 4) Planned general anesthesia (volatile gas) or nitrous oxide
- 5) Planned use of postoperative opioid pain management

Risk is cumulative with each additional risk factor. A patient with one identified risk factor has a 10% risk for PONV; however, a patient with 4 risk factors has an 80% PONV risk.<sup>3</sup>

**Cost of PONV**

PONV is the number one fear patients express before elective surgery and is rated by patients as more debilitating than postoperative pain or the surgery itself.<sup>4,5</sup> When faced with a choice between pain and PONV, many patients will choose to experience pain. Patients were willing to pay \$56-\$100 out-of-pocket to avoid PONV.<sup>6</sup>

Not only is PONV experientially distressing, it also costs, on average, an additional \$400+ per patient.<sup>7</sup> PONV costs have been estimated at \$1.2 billion a year in the United States alone. PONV results in an estimated 47-61 extra minutes in the post anesthesia care unit, further increasing costs.<sup>8</sup>

Rank	Postoperative Outcomes Least Preferred by Patients
1	Vomiting
2	Gagging on endotracheal tube
3	Incisional pain
4	Nausea
5	Recall without pain
6	Residual weakness
7	Shivering
8	Sore throat
9	Somnolence



**Purpose**

The purpose of this randomized sham-controlled blinded study was to investigate the efficacy of preoperative placement of acupressure at P6 on PONV incidence in ambulatory surgical patients identified as high risk, measured over 24 hours at three phases of recovery: Phase I (PACU), Phase II (pre-discharge), and Phase III (24 hours post discharge).

**ASPAN defines three phases to ambulatory surgical recovery:**

- Phase I occurs in a Postanesthesia Care Unit (PACU), a critical care area providing postanesthesia nursing care for patients immediately after operative and invasive procedures...
- Phase II, the ambulatory setting is "a dedicated patient care area providing perianesthesia nursing care for patients prior to discharge"
- Phase III) home or alternate home care setting" (ASPAN, 2008, ¶ 1).

**Research Questions**

**Clinical Questions**

1. Does preoperative placement of acupressure beads at P6 affect the incidence and severity of PONV immediately post surgery (Phase I) in high-risk ambulatory surgical patients, compared to usual care of preventative and rescue antiemetics?
2. Does preoperative placement of acupressure beads at P6 worn for 24 hours after surgery affect the incidence of PONV at postoperative Phases II, and III in high-risk ambulatory surgical patients, compared to usual care of preventative and rescue antiemetics?

**Literature Review**

**Literature Review:**

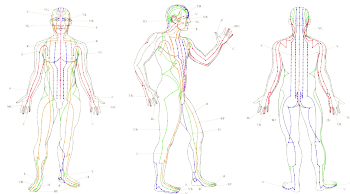
- Databases searched (2002-2012) MEDLINE, CINAHL, PubMed, Cochrane Library, DynaMed
- Keywords: PONV, acupressure/nurse, post-operative nausea and vomiting, acupressure, surgery, postoperative nausea vomiting risk assessment, risk assessment for PONV & post discharge nausea and vomiting, acupressure/nurse (MeSH terms)
- Only evidence from 2002 to 2012 in English and seminal work was included. Articles that were not interventional studies or systematic review of interventional studies were excluded. Any articles reporting findings on pediatric population (age<19 years) were excluded. Studies that had mixed populations of inpatients and outpatients were excluded. Other exclusions include evidence rating less than III in strength. Scholarly (Peer-Reviewed) Studies was included in search limits.
- 13 studies measuring nurse PONV, acupressure, adult and surgery were identified including 4 meta-analyses & 9 randomized controlled trials
- Strength of the evidence was rated as suggested by ASPAN's evidence-based practice (EBP) conceptual framework (2006). The evidence ranges from Level I, meta-analysis, to Level III quasi-experimental. The quality of each study is rated from A to D, with A representing a well-designed study and D representing a study with a major flaw or questions about scientific credibility. Variables used by authors used in analysis included sample description and size, research design/objective or purpose of the stud, methodology, time of data retrieval, outcome measures, findings and limitations.

**Current Evidence**

Authors	Study Design/Method Sample Size/Setting	Purpose/Variables/ Measurement	Results/Findings Conclusions Nursing Implications	Evidence Quality
Done & Lee (2004) <sup>26</sup>	Systematic (Cochrane) Meta-analysis 3347 26 RCT	Determine efficacy & safety of P6 acupoint stimulation in preventing PONV Larger effect size	Supports use of P6 stimulation in patients without antiemetic prophylaxis. Compared with antiemetic prophylaxis, P6 acupoint stimulation reduced nausea risk but not vomiting	Level I Grade A
Doran & Halm (2010) <sup>12</sup>	Systematic (Cochrane) literature review 2 meta-analysis and 13 RCT	Efficacy of P6 acupoint stimulation; acupressure as effective as acupuncture or electrical stimulation in reducing PONV in adults	Class I evidence exists for the efficacy of acupoint stimulation on reducing PONV in surgical populations  Recommend use	Level I Grade A
Shiao et al. (2011) <sup>27</sup>	Meta-analyses Exhaustive review 24 RCT Included all methods of P6 acupoint stimulation; acupuncture, transcutaneous electrostimulation & acupressure	Efficacy of acupoint stimulation in treatment PONV	Acupoint stimulation as effective as medications reducing PONV	Level I Grade A

**Literature Synthesis**

Acupressure, an energy CAM, has shown promising results in relieving PONV in various surgical populations.<sup>8,28, 29</sup> It is a variation of acupuncture based on more than 3000 years of Chinese medicine, involves applying pressure on points without puncturing skin. These acupoints correspond to invisible circuitry of channels (meridians) that conduct energy (qi) to specific anatomic regions. When meridians are disturbed, e.g. qi flow is too slow, fast, turbulent or static; the imbalance causes phenomenon such as nausea, vomiting, pain, etc. From the Eastern perspective, acupressure is believed to stimulate or interrupt energy, thereby altering responses to negative stimuli, whereas the Western medicine proposes the mechanism of action involves triggered release of endogenous endorphins.<sup>12</sup> The majority of the research on use of acupressure in relieving PONV has lacked specific targeting of high-risk PONV population. The significance of this review will be in evaluating effects of acupressure beads specifically among those patients identified as being at high-risk for PONV. There is a paucity of research that specifically targets post discharge PONV, applied preoperatively, and maintained for the first 24 hours postoperatively for ambulatory surgical patients. Most studies measure only immediately postoperatively in Phase I recovery.



**Research Study Design**

- Experimental
- Controlled
- Blinded
- Randomized – A randomizer generator was used to create folders prior to study start and blinded to researcher, patient, family and nurses collecting postoperative data from VAS ratings.
- Intervention Acupressure Bead Patch Control Bandaid Sham Patch
- Ethical Compliance: Study given Full Review Approval from Aspirus/Wausau Hospital Institutional Review Board. Anonymity has been protected.



**Methods**

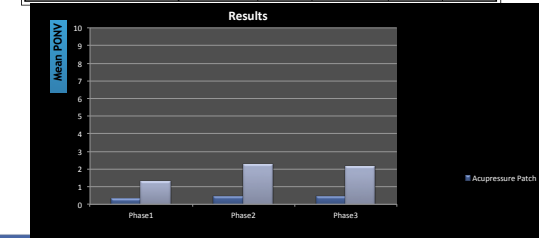
110 elective ambulatory surgical patients were randomly assigned to receive active acupressure beads/patch (n=57) or an inactive placebo acupressure beads/patch (n=53) placed unilaterally at P6 Chinese Medicine point 30-60 minutes prior to induction of general anesthetic. Nausea and vomiting was assessed using a visual analog scale (VAS) 0-10 during recovery Phase I and II. Participants were contacted by phone for assessment of Phase III PONV within 24-48 hours postoperatively. All participants received usual care including prophylactic and rescue antiemetics and routine instructions for managing nausea and vomiting after discharge. PACU and day surgery nurses assessing nausea and vomiting were blinded to patient group (acupressure or placebo).

**Demographics**

Coming for elective outpatient surgery	Range: 19 to 89 years
110 participants	83 completed study (all 3 phases)
105 women (95.4%)	13 admitted to hospital from PACU
5 men (4.6%)	4 cases dropped out or didn't meet
Mean age 46.6 years (SD=14.0)	Surgeons wide range, including lap chole, gyn, EENT, appendectomy, vein stripping

**Findings**

ANOVA						
		Sum of Squares	df	Mean Square	F	Sig.
phase1_1	Between Groups	22.142	1	22.142	6.594	.012
	Within Groups	305.557	91	3.358		
	Total	327.699	92			
phase2_1	Between Groups	79.610	1	79.610	18.338	.000
	Within Groups	395.057	91	4.341		
	Total	474.667	92			
phase3_1	Between Groups	66.794	1	66.794	9.113	.003
	Within Groups	667.012	91	7.330		
	Total	733.806	92			



**Limitations**

- The limitations of this study were:
- Limited to ambulatory surgical patients
  - Measurement scale not tested for reliability
  - Focused only on patients at high-risk of PONV/PDNU
  - Conducted at one Midwestern hospital

**Clinical Practice Implications**

- Acupressure beads may prove a viable alternative and/or adjunct to current pharmaceutical interventions.
- Conduct using other acupressure points
- Implement acupressure project at Aspirus Wausau Hospital in Spring 2013
- Current national drug shortage beckons alternatives
- Implement PONV risk factor assessment as routine
- Nurses should be utilizing acupressure as CAM intervention