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# Postoperative Nausea and Vomiting

## Nausées-vomissements post-opératoires : évaluation de l'acupuncture

### 3. Systematic Reviews and Meta-Analysis

☆☆☆	Evidence for effectiveness and a specific effect of acupuncture
☆☆	Evidence for effectiveness of acupuncture
☆	Limited evidence for effectiveness of acupuncture
∅	No evidence or insufficient evidence

#### 3.1. Generic Acupuncture

##### 3.1.1. Arslan 2024

Arslan HN, Çelik SŞ. Nonpharmacological Nursing Interventions in Postoperative Nausea and Vomiting: A Systematic Review. J Perianesth Nurs. 2024 Feb;39(1):142-154.

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<b>Purpose</b>	This study aims to assess the impact of nonpharmacological nursing interventions on postoperative nausea and vomiting (PONV).
<b>Design</b>	This is a systematic review.
<b>Methods</b>	MEDLINE, Web of Science, ScienceDirect, Tübitak-ULAKBİM, and TRDizin databases were searched for the following search terms, including “Postoperative Nausea and Vomiting,” “Nurse,” “Nursing,” and “Nonpharmacological Interventions” to identify nonpharmacological nursing interventions for PONV. A systematic review of English and Turkish articles published in the period between January 1, 2012 and June 1, 2023 was conducted. The PICOT-SD method was used to determine the compatibility of the pieces with the eligibility criteria.
<b>Findings</b>	Fifty-eight of 3,874 articles obtained from databases fulfilled the eligibility criteria. This study demonstrated that <b>acupuncture</b> , aromatherapy, the oral intake of ginger, listening to music, education, and visits to patients decreased the incidence of nausea and vomiting and increased the quality of life. Additionally, it was found that patients' quality of life tended to improve along with reductions in postoperative complications.
<b>Conclusions</b>	The results of this study support previous findings in the literature and demonstrate that nonpharmacological nursing interventions help reduce and prevent PONV. Based on our results, we suggest that nonpharmacological nursing interventions can be employed for the management of PONV in patients undergoing surgery.

##### 3.1.2. Lederer 2018

Lederer AK, Schmucker C, Kousoulas L, Fichtner-Feigl S, Huber R. Naturopathic Treatment and Complementary Medicine in Surgical Practice. Dtsch Arztebl Int. 2018;115(49):815-821. [200295].

<b>Background</b>	Many patients in Germany use naturopathic treatments and complementary medicine. Surveys have shown that many also use them as a concomitant treatment to surgery.
<b>Methods</b>	Multiple databases were systematically searched for systematic reviews, controlled trials, and experimental studies concerning the use of naturopathic treatments and complementary medicine in the management of typical post-operative problems (PROSPERO CRD42018095330).
<b>Results</b>	Of the 387 publications identified by the search, 76 fulfilled the inclusion criteria. In patients with abnormal gastrointestinal activity, acupuncture can improve motility, ease the passing of flatus, and lead to earlier defecation. <b>Acupuncture and acupressure can reduce postoperative nausea and vomiting, as well as pain.</b> More-over, aromatherapy and music therapy seem to reduce pain, stress and anxiety and to improve sleep. Further studies are needed to determine whether phytotherapeutic treatments are effective for the improvement of gastrointestinal function or the reduction of stress. It also remains unclear whether surgical patients can benefit from the methods of mind body medicine.
<b>Conclusion</b>	Certain naturopathic treatments and complementary medical methods may be useful in postoperative care and deserve more intensive study. In the publications consulted for this review, no serious side effects were reported.

**3.1.3. Cheong 2013** ☆☆

Cheong KB, Zhang JP, Huang Y, Zhang ZJ. The effectiveness of acupuncture in prevention and treatment of postoperative nausea and vomiting—a systematic review and meta-analysis. PLoS One. 2013 Dec 13;8(12):e82474. [166625]. .

<b>Purpose</b>	This paper included a systematic review and meta-analysis on the effect of different type of acupuncture and acupoint selection in PONV prevention and treatment.
<b>Methods</b>	Randomised controlled trials(RCTs) comparing acupuncture with non-acupuncture treatment were identified from databases PubMed, Cochrane, EBSCO, Ovid, CNKI and Wanfangdata. Meta-analysis on eligible studies was performed using fixed-effects model with RevMan 5.2. Results were expressed as RR for dichotomous data, with 95% CI.
<b>Results</b>	<b>Thirty RCTs, 1276 patients (intervention) and 1258 patients (control)</b> were identified. Meta-analysis showed that PC6 acupuncture significantly reduced the number of cases of early vomiting (postoperative 0-6h) (RR=0.36,95%CI 0.19,0.71; P=0.003) and nausea (postoperative 0-24h) (RR=0.25, 95%CI 0.10,0.61; P=0.002), but not early nausea (postoperative 0-6h) (RR=0.64, 95%CI 0.34,1.19; P=0.150) and vomiting (postoperative 0-24h) (RR=0.82,95%CI 0.48,1.38; P=0.450). PC6 acupressure significantly reduced the number of cases of nausea (RR=0.71, 95%CI 0.57,0.87; P=0.001) and vomiting (RR=0.62, 95%CI 0.49,0.80; P=0.000) at postoperative 0-24h. PC6 electroacupoint stimulation significantly reduced the number of cases of nausea (RR=0.49, 95%CI 0.38,0.63; P<0.000) and vomiting (RR=0.50, 95%CI 0.36,0.70; P<0.000) at postoperative 0-24h. Stimulation of PC6 with other acupoint(s) significantly reduced the number of cases of nausea and vomiting (RR=0.29, 95%CI 0.17,0.49; P<0.000) at postoperative 0-24h. Stimulation of other acupoint(s)(non PC6) also significantly reduced the number of cases of nausea and vomiting (RR=0.63, 95%CI 0.49,0.81; P=0.000) at postoperative 0-24h. However, the quality of study was generally low in studies of PC6 combined with other acupoint(s) and other acupoint(s). Details of blinding were not reported in most reports.
<b>Conclusion</b>	<b>Besides PC6, PC6 combined with other acupoint(s) and other alternative acupoint(s) might be beneficial in prevention and treatment of PONV.</b>

**3.1.4. Abraham 2008 ~**

Abraham J.. Acupressure and acupuncture in preventing and managing postoperative nausea and vomiting in adults. J Perioper Pract. 2008;18(12):543-51. [152488].

<b>Objectives</b>	This literature review sets out to investigate the effectiveness of acupressure and acupuncture in preventing and managing postoperative nausea and vomiting (PONV) in adult patients. PONV is problematic, affecting patient satisfaction, delayed discharge and even patient re-admission. Current treatment of PONV constitutes a variety of drug therapies, which are only partially effective.
<b>Methods</b>	With the integration of complementary and alternative medicines in healthcare, this review examined <b>10 research studies</b> investigating the use of acupressure and acupuncture in treating PONV. Three studies found acupressure to be effective in preventing PONV. However, population samples were small and the research designs had numerous anomalies. Overall the article suggests that acupuncture and acupressure are ineffective in preventing and managing PONV in adult patients.
<b>Conclusions</b>	Further investigation of the effectiveness of acupressure and acupuncture, combined with current drug therapies, using well designed and adequately powered studies is needed. Published studies predominantly examined the use of P6 as the pressure point. Further studies should examine other 'acupoint' sites, to ascertain whether these are effective dependent upon the operative site.

**3.1.5. Shiao 2006 ☆☆**

Shiao SY, Dune LS. Metaanalyses of acustimulations: effects on nausea and vomiting in postoperative adult patients. Explore (NY). 2006;2(3):202-15. [141325].

<b>Objective</b>	Using metaanalysis to examine the effects of acustimulations on nausea and vomiting symptoms (NVS) in postoperative adult populations.
<b>Methods</b>	Metaanalyses of effects of various acupoints stimulations (AS) (including acupuncture, acupressure, and electrical stimulation) on NVS in postoperative adult populations were performed. Thirty-three quality randomized controlled trials (RCT) published over the past three decades were identified by evaluating the quality of randomization and treatment methods, and results were pooled using a fixed effects model.
<b>Results</b>	<b>Twenty-four trials were pooled for nausea, 29 trials for vomiting, and 19 trials for rescue antiemetics, with AS compared with placebo or controls.</b> Two additional trials did not have control groups but compared AS to medication groups. Compared with the controls, AS (all modalities) reduced nausea (relative risk [RR] = 0.60, 95% confidence interval [CI]: 0.54-0.67, P < .0001), vomiting (RR = 0.51, 95% CI: 0.45-0.57, P < .0001), and use of rescue antiemetics (RR = 0.63, 95% CI: 0.54-0.74, P < 0001). All AS modalities were effective in reducing NVS. Korean hand acupressure stimulations (two trials) had the best impact on reducing vomiting. There were no significant differences on pooled RRs for nausea (five trials) and vomiting (eight trials) between medication and AS groups, but medication groups had increased use of rescue antiemetics (two trials, RR = 2.27, 95% CI: 1.48-3.49, P = .0002). There was a placebo effect when compared with controls in reducing nausea (four trials, RR = 0.67, 95% CI: 0.50-0.90, P = .0069) and vomiting (three trials, RR = 0.39, 95% CI: 0.19-0.80, P = .0106).
<b>Conclusions</b>	<b>This metaanalysis demonstrated that AS is just as effective as medications in reducing NVS and that acupressure is just as effective as acupuncture or electrical stimulation in reducing NVS for postoperative adult populations.</b>

### 3.1.6. Chen 2006 ~

Chen Min, Li Sheng-Tao, Zheng Hui. [Progress in acupuncture for treatment of postoperative nausea and vomiting in foreign countries]. Chinese Journal of Clinical Rehabilitation. 2006;10(47):1343-8. [168616].

<b>Objective</b>	To analyze and summarize the efficacy and mechanism of acupuncture and moxibustion on postoperative nausea and vomiting (PONV) abroad.
<b>Methods</b>	DATA SOURCES: A computer-based search of articles about PONV abroad between January 1990 and August 2006 was conducted in Pubmed with the of “PONV, acupuncture, moxibustion, acupression, postperative, nausea, vomit”, and the language was limited to English. STUDY SELECTION: Articles related to the efficacy and mechanism of acupuncture and moxibustion in the treatment of PONV abroad were ranged, and articles with strong aims were selected. As to the literatures similar in content of the same field, those published recently or published in authoritative magazines were included. DATA EXTRACTION: A total of 41 related articles were retrieved, and 20 of them met the inclusion criteria, while 21 repetitive studies were excluded.
<b>Data Synthesis</b>	PONV is the most common complication of after operation of anesthesia. Treatment of PONV with acupuncture and moxibustion is widely applied abroad, while the clinical effects are different due to different acupoints, manipulation of acupuncture and time to intervene. However, researches on the mechanism of acupuncture in the treatment of PONV are less, and it is presently agreed that it may work by activating serotonergic and noradrenergic fibers to change the transmission of 5-HT.
<b>Conclusion</b>	People in China and abroad gradually accept treatment of PONV with acupuncture, but its efficacy hasn't been confirmed in clinical research yet. More randomized clinical trials with massive multi-center samples should be done. The researches on the mechanism are not enough. Therefore, more work should be done to provide theoretical support for clinic.

### 3.1.7. Lee 1999 ☆☆☆

lee A, Done ML. the use of nonpharmacologic techniques to prevent postoperative nausea and vomiting: a metaanalysis. Anesth Analg. 1999;88(6):1362-9. [59021].

<b>Objectives-methods</b>	We assessed the efficacy of nonpharmacologic techniques to prevent postoperative nausea and vomiting (PONV) by systematic review. These studies included acupuncture, electroacupuncture, transcutaneous electrical nerve stimulation, acupoint stimulation, and acupressure.
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<p><b>Results</b></p>	<p>Of the 24 randomized trials retrieved by a search of articles indexed on the MEDLINE and EMBASE databases (1980-1997), <b>19 were eligible for metaanalysis</b>. The primary outcomes were the incidence of nausea, vomiting, or both 0-6 h (early efficacy) or 0-48 h (late efficacy) after surgery. The pooled relative risk (RR) and numbers needed to treat (NNT) were calculated. In children, no benefit was found. Some results in adults were significant. Nonpharmacologic techniques were similar to antiemetics in preventing early vomiting (RR = 0.89 [95% confidence interval 0.47-1.67]; NNT = 63 [10-infinity]) and late vomiting (RR = 0.80 [0.35-1.81]; NNT = 25 [5-infinity]) in adults. Nonpharmacologic techniques were better than placebo at preventing early nausea (RR = 0.34 [0.20-0.58]; NNT = 4 [36]) and early vomiting in adults (RR = 0.47 [0.34-0.64]; NNT = 5 [48]). Nonpharmacologic techniques were similar to placebo in preventing late vomiting in adults (RR = 0.81 [0.46-1.42]; NNT = 14 [6-infinity]). Using nonpharmacologic techniques, 20%-25% of adults will not have early PONV compared with placebo. It may be an alternative to receiving no treatment or firstline antiemetics.</p>
<p><b>Implications</b></p>	<p><b>This systematic review showed that nonpharmacologic techniques were equivalent to commonly used antiemetic drugs in preventing vomiting after surgery. Nonpharmacologic techniques were more effective than placebo in preventing nausea and vomiting within 6 h of surgery in adults, but there was no benefit in children.</b></p>

### 3.2. Special Acupuncture Techniques

#### 3.2.1. Acupuncture prior to surgery

##### 3.2.1.1. Holmer 2012 ☆☆

Holmer Pettersson P, Wengström Y. Acupuncture prior to surgery to minimise postoperative nausea and vomiting: a systematic review. J Clin Nurs. 2012;21(13-14):1799-805. [160404].

<p><b>Objectives</b></p>	<p>The aim of this systematic review was to assess the outcome of acupuncture treatment prior to surgery in order to avoid or minimise postoperative nausea and vomiting.</p>
<p><b>Background</b></p>	<p>The symptoms of nausea and/or vomiting remain a huge problem for many patients after surgery. There is much debate around the best treatment for nausea and/or vomiting, and the most beneficial solution has yet to be found. Postoperative nausea and vomiting is not a life-threatening symptom, but many patients express great distress and dissatisfaction with the existing treatment. Many patients rate their nausea similar to or worse than pain. Historically, treatments often include drug therapy, but not other non-pharmacologic therapies, such as acupuncture or acupressure, which can have beneficial effects on nausea. DESIGN: A systematic literature review.</p>
<p><b>Methods</b></p>	<p>The review was undertaken using key words and electronic databases and <b>included 21 papers</b> from the years November 1996 until August 2009.</p>
<p><b>Results</b></p>	<p>The results indicate that <b>the application of acupuncture reduced the incidence of nausea but not vomiting when compared with the use of antiemetic prophylaxis alone.</b></p>
<p><b>Conclusions</b></p>	<p>The results show that there is a lack of knowledge of the best treatment to minimise postoperative nausea and vomiting prior to surgery.</p>

<b>Relevance To Clinical Practice</b>	The overall results of this review conclude that <b>all kinds of AP stimulation, both non-invasive and invasive, seem to prevent PONV with minimal side effects.</b> The findings from this study can be used to inform future research to evaluate the effects of preoperative treatment with acupuncture vs. sham procedure before surgery to avoid PONV.
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### 3.2.2. Neiguan Acupoint (PC6)

#### 3.2.2.1. Zhang 2020 (Children)

Zhang Y, Zhang C, Yan M, Wang N, Liu J, Wu A. The effectiveness of PC6 acupuncture in the prevention of postoperative nausea and vomiting in children: A systematic review and meta-analysis. *Paediatr Anaesth.* 2020;30(5):552-63. [168211]. doi

<b>Background</b>	A growing number of studies have demonstrated the effectiveness of acupuncture in preventing and treating postoperative nausea and vomiting. Here, we used meta-analysis to confirm these benefits in children and to determine the optimal time to perform this treatment.
<b>Methods</b>	Four databases (MEDLINE, EMBASE, CENTRAL, and Chinese Database of Biology and Medicine) were searched from inception until January 16, 2019. We included randomized controlled trials for evaluating the effectiveness of acupuncture in the prevention and treatment of postoperative nausea and vomiting during the early stage (0-4 hours) and within 24 hours postoperatively in pediatrics. Control groups received standardized care control or standardized care combined with sham control.
<b>Results</b>	<b>Sixteen literatures and 1773 patients</b> undergoing general anesthesia were included in the study. The results indicated that acupuncture was effective in reducing postoperative vomiting, both during the first 4 hours (RR = 0.47, 95% CI 0.26, 0.84; low quality) and within 24 hours postoperatively (RR = 0.74, 95% CI 0.60, 0.91; low quality). Stratifying by the timing of acupuncture, acupuncture was effective in reducing the first 4 hours (RR = 0.34, 95% CI 0.18, 0.64; moderate quality), and 0-24 hours postoperative vomiting (RR = 0.81, 95% CI 0.70, 0.93; moderate quality) when performed before and during anesthesia, respectively. Further, the RR value was more robust when acupuncture was performed before anesthesia. Acupuncture was also effective in treating 0-24 hours postoperative nausea (RR = 0.73, 95% CI 0.60, 0.88; moderate quality) and in reducing the utilization of remedies during the first 4 hours (RR = 0.64, 95% CI 0.45, 0.89; moderate quality).
<b>Conclusion</b>	Acupuncture reduces the incidence of postoperative nausea and vomiting as well as the utilization of antiemetic remedies, particularly during the first 4 hours following the operation. Acupuncture performed before anesthesia was demonstrated to be the most ideal intervention time for children.

#### 3.2.2.2. Lee 2015 ☆☆

lee A, Chan SK, Fan LT. stimulation of the wrist acupuncture point pc6 for preventing postoperative nausea and vomiting. *Cochrane Database Syst Rev.* 2015. [184060].

<b>Background</b>	Postoperative nausea and vomiting (PONV) are common complications following surgery and anaesthesia. Antiemetic drugs are only partially effective in preventing PONV. An alternative approach is to stimulate the PC6 acupoint on the wrist. This is an update of a Cochrane review first published in 2004, updated in 2009 and now in 2015.
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<b>Objectives</b>	To determine the effectiveness and safety of PC6 acupoint stimulation with or without antiemetic drug versus sham or antiemetic drug for the prevention of PONV in people undergoing surgery.
<b>Methods</b>	<p>SEARCH METHODS: We searched the Cochrane Central Register of Controlled Trials (CENTRAL) (Cochrane Library, Issue 12, 2014), MEDLINE (January 2008 to December 2014), EMBASE (January 2008 to December 2014), ISI Web of Science (January 2008 to December 2014), World Health Organization Clinical Trials Registry, ClinicalTrials.gov, and reference lists of articles to identify additional studies. We applied no language restrictions. SELECTION CRITERIA: All randomized trials of techniques that stimulated the PC6 acupoint compared with sham treatment or drug therapy, or combined PC6 acupoint and drug therapy compared to drug therapy, for the prevention of PONV. Interventions used in these trials included acupuncture, electro-acupuncture, transcutaneous electrical acupoint stimulation, transcutaneous nerve stimulation, laser stimulation, capsicum plaster, acu-stimulation device, and acupressure in people undergoing surgery. Primary outcomes were the incidences of nausea and vomiting after surgery. Secondary outcomes were the need for rescue antiemetic therapy and adverse effects. DATA COLLECTION AND ANALYSIS: Two review authors independently extracted the data and assessed the risk of bias domains for each trial. We used a random-effects model and reported risk ratio (RR) with associated 95% confidence interval (95% CI). We used trial sequential analyses to help provide information on when we had reached firm evidence in cumulative meta-analyses of the primary outcomes, based on a 30% risk ratio reduction in PONV.</p>
<b>Main Results</b>	<p>We included <b>59 trials involving 7667 participants</b>. We rated two trials at low risk of bias in all domains (selection, attrition, reporting, blinding and other). We rated 25 trials at high risk in one or more risk-of-bias domains. Compared with sham treatment, PC6 acupoint stimulation significantly reduced the incidence of nausea (RR 0.68, 95% CI 0.60 to 0.77; 40 trials, 4742 participants), vomiting (RR 0.60, 95% CI 0.51 to 0.71; 45 trials, 5147 participants) and the need for rescue antiemetics (RR 0.64, 95% CI 0.55 to 0.73; 39 trials, 4622 participants). As heterogeneity among trials was substantial and there were study limitations, we rated the quality of evidence as low. Using trial sequential analysis, the required information size and boundary for benefit were reached for both primary outcomes. PC6 acupoint stimulation was compared with six different types of antiemetic drugs (metoclopramide, cyclizine, prochlorperazine, droperidol, Ondansetron and dexamethasone). There was no difference between PC6 acupoint stimulation and antiemetic drugs in the incidence of nausea (RR 0.91, 95% CI 0.75 to 1.10; 14 trials, 1332 participants), vomiting (RR 0.93, 95% CI 0.74 to 1.17; 19 trials, 1708 participants), or the need for rescue antiemetics (RR 0.87, 95% CI 0.65 to 1.16; 9 trials, 895 participants). We rated the quality of evidence as moderate, due to the study limitations. Using trial sequential analyses, the futility boundary was crossed before the required information size was surpassed for both primary outcomes. Compared to antiemetic drugs, the combination of PC6 acupoint stimulation and antiemetic therapy reduced the incidence of vomiting (RR 0.56, 95% CI 0.35 to 0.91; 9 trials, 687 participants) but not nausea (RR 0.79, 95% CI 0.55 to 1.13; 8 trials, 642 participants). We rated the quality of evidence as very low, due to substantial heterogeneity among trials, study limitations and imprecision. Using trial sequential analysis, none of the boundaries for benefit, harm or futility were crossed for PONV. The need for rescue antiemetic was lower in the combination PC6 acupoint stimulation and antiemetic group than the antiemetic group (RR 0.61, 95% CI 0.44 to 0.86; 5 trials, 419 participants). The side effects associated with PC6 acupoint stimulation were minor, transient and self-limiting (e.g. skin irritation, blistering, redness and pain) in 14 trials. Publication bias was not apparent in the contour-enhanced funnel plots.</p>

<b>Authors' Conclusions</b>	<b>There is low-quality evidence supporting the use of PC6 acupoint stimulation over sham.</b> Compared to the last update in 2009, no further sham comparison trials are needed. We found that there is moderate-quality evidence showing no difference between PC6 acupoint stimulation and antiemetic drugs to prevent PONV. Further PC6 acupoint stimulation versus antiemetic trials are futile in showing a significant difference, which is a new finding in this update. There is inconclusive evidence supporting the use of a combined strategy of PC6 acupoint stimulation and antiemetic drug over drug prophylaxis, and further high-quality trials are needed.
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**3.2.2.3. Zhu 2010** ☆☆☆

Zhu Dan, Lv Huang-Wei. [Effectiveness of P6 stimulation on postoperative nausea and vomiting: a meta-analysis]. Chinese Journal of EBM. 2010;10(8):923-31. [168119].

<b>Objective</b>	To compare the effectiveness of P6 stimulation and sham stimulation/ drug intervention on prevention of postoperative nausea and vomiting (PONV).
<b>Methods</b>	
<b>Results</b>	A total of <b>21 studies were included</b> . The results of meta-analyses indicated that: (1) Compared with sham stimulation, P6 stimulation could be effective in preventing postoperative nausea (beginning to termination) ( $P < 0.0001$ ), postoperative early nausea (<after surgery 6 h) ( $P = 0.0006$ ) and postoperative late nausea (>after surgery 6 h) ( $P = 0.001$ ). (2) Compared with sham stimulation, P6 stimulation could be effective in preventing postoperative vomiting (beginning to termination) ( $P < 0.0001$ ) and postoperative early vomiting ( $P = 0.002$ ), but as to postoperative late vomiting (>after surgery 6 h), P6 stimulation had no effective preventive effect ( $P = 0.08$ ). (3) Compared with the drug intervention, P6 stimulation had little effect on preventing postoperative nausea ( $P = 0.29$ ) and vomiting ( $P = 0.15$ ).
<b>Conclusion</b>	<b>Compared with sham stimulation, P6 stimulation can be effective in preventing postoperative early nausea and vomiting as well as postoperative late nausea, but not effective in preventing postoperative late vomiting.</b> In comparison with drugs, a large number of clinical trials are needed to prove P6 stimulation can replace drugs to prevent postoperative nausea and vomiting.

**3.2.2.4. Lee 2009** ☆☆

Lee A, Fan Lt. Stimulation of the wrist acupuncture point p6 for preventing postoperative nausea and vomiting. Cochrane Database Syst Rev. 2009;15(2):3281.152667

<b>Purpose</b>	To determine the efficacy and safety of P6 acupoint stimulation in preventing PONV.
<b>Methods</b>	Search strategy : we searched CENTRAL (The Cochrane Library, Issue 3, 2008), MEDLINE (January 1966 to September 2008), EMBASE January 1988 to September 2008), ISI Web of Science (January 1965 to September 2008), the National Library of Medicine publication list of acupuncture studies, and reference lists of articles. Selection criteria : all randomized trials of techniques that stimulated the P6 acupoint compared with sham treatment or drug therapy for the prevention of PONV. Interventions used in these trials included acupuncture, electro-acupuncture, transcutaneous nerve stimulation, laser stimulation, capsicum plaster, an acu-stimulation device, and acupressure in patients undergoing surgery. Primary outcomes were the risks of nausea and vomiting. Secondary outcomes were the need for rescue antiemetic therapy and adverse effects. Data collection and analysis: two review authors independently assessed trial quality and extracted the data. We collected adverse effect information from the trials. We used a random-effects model and reported relative risk (RR) with associated 95% confidence intervals (95% CI).

<b>Results</b>	We included <b>40 trials involving 4858 participants</b> ; four trials reported adequate allocation concealment. Twelve trials did not report all outcomes. Compared with sham treatment P6 acupoint stimulation significantly reduced: nausea (RR 0.71, 95% CI 0.61 to 0.83); vomiting (RR 0.70, 95% CI 0.59 to 0.83), and the need for rescue antiemetics (RR 0.69, 95% CI 0.57 to 0.83). Heterogeneity among trials was moderate. There was no clear difference in the effectiveness of P6 acupoint stimulation for adults and children; or for invasive and noninvasive acupoint stimulation. There was no evidence of difference between P6 acupoint stimulation and antiemetic drugs in the risk of nausea (RR 0.82, 95% CI 0.60 to 1.13), vomiting (RR 1.01, 95% CI 0.77 to 1.31), or the need for rescue antiemetics (RR 0.82, 95%CI 0.59 to 1.13). The side effects associated with P6 acupoint stimulation wereminor. There was no evidence of publication bias from contour-enhanced funnel plots.
<b>Conclusion</b>	<b>P6 acupoint stimulation prevented PONV.</b> There was no reliable evidence for differences in risks of postoperative nausea or vomiting after P6 acupoint stimulation compared to antiemetic drugs.

3.2.2.5. Lee 2004 ☆☆

Lee A, Done ML. Stimulation of the wrist acupuncture point p6 for preventing postoperative nausea and vomiting. Cochrane Database Syst Rev. 2004. [141284].

<b>Background</b>	Postoperative nausea and vomiting (PONV) are common complications following surgery and anaesthesia. Drug therapy to prevent PONV is only partially effective. An alternative approach is to stimulate a P6 acupoint on the wrist. Although there are many trials examining this technique, the results are conflicting.
<b>Objectives</b>	To determine the efficacy and safety of P6 acupoint stimulation in preventing PONV.
<b>Methods</b>	Search strategy: We searched CENTRAL (The Cochrane Library, Issue 1, 2003), MEDLINE (January 1966 to January 2003), EMBASE (January 1988 to January 2003) and the National Library of Medicine publication list of acupuncture studies up to and including January 2003. Reference lists of retrieved papers and reviews were consulted for additional references. Selection criteria: All randomized trials of techniques that stimulated the P6 acupoint compared with: sham treatment or drug therapy for the prevention of PONV. Interventions used in these trials included acupuncture, electro-acupuncture, transcutaneous nerve stimulation, laser stimulation, acustimulation device and acupressure. Data collection and analysis: Two reviewers independently assessed methodological quality and extracted the data. Primary outcomes were incidences of nausea and vomiting. Secondary outcomes were the need for rescue antiemetic therapy and adverse effects. A random effects model was used and relative risk (RR) with associated 95% confidence intervals (95% CI) are reported. Egger's test was used to measure the asymmetry of the funnel plot.
<b>Main results</b>	<b>Twenty-six trials (n = 3347)</b> were included, none of which reported adequate allocation concealment. There were significant reductions in the risks of nausea (RR 0.72, 95% CI 0.59 to 0.89), vomiting (RR 0.71, 95% CI 0.56 to 0.91) and the need for rescue antiemetics (RR 0.76, 95% CI 0.58 to 1.00) in the P6 acupoint stimulation group compared with the sham treatment, although many of the trials were heterogeneous. There was no evidence of difference in the risk of nausea and vomiting in the P6 acupoint stimulation group versus individual antiemetic groups. However, when different antiemetics were pooled, there was significant reduction in the risk of nausea but not vomiting in the P6 acupoint stimulation group compared with the antiemetic group (RR 0.70, 95% CI 0.50 to 0.98; RR 0.92, 95% CI 0.65 to 1.29 respectively). The side effects associated with P6 acupoint stimulation were minor. There was some evidence of asymmetry of the funnel plot.

<b>Reviewers' conclusions</b>	<b>This systematic review supports the use of P6 acupoint stimulation in patients without antiemetic prophylaxis.</b> Compared with antiemetic prophylaxis, P6 acupoint stimulation seems to reduce the risk of nausea but not vomiting.
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### 3.2.3. Acupression

#### 3.2.3.1. Zhang 2015 ☆☆

Zhang GL, Yang SY, Zhu ZL, Mu PX. Meta-analysis on postoperative complications of wristband acupoint pressure therapy. J Biol Regul Homeost Agents. 2015;29(1):187-93. [126161].

<b>Methods</b>	Through searching database such as MEDLINE, CNKI, etc., this paper assesses the effect of wristband acupoint pressure, acting on the neiguan acupoint, to relieve postoperative complications of adults (mainly nausea and vomiting) using nine randomized controlled trials (RCT) and RevMan5.0.
<b>Results</b>	In the experimental group, acupoint pressure wristband effectively reduced the incidence rate of postoperative vomiting by acting on the neiguan point, compared to the placebo control group (RR=0.50, 95% CI: 0.37~0.66, P < 0.01). As to the incidence rate of postoperative nausea, there was no statistical significance between the experimental group and the placebo control group (RR=0.85, 95% CI: 0.72~1.00, P < 0.05).
<b>Conclusions</b>	It was revealed that the application of acupoint pressure wristband on neiguan point in postoperative care could effectively relieve postoperative vomiting; while postoperative nausea was not relieved distinctly. Therefore, researchers are required to carry out more reliable RCT test for further study and discussion, and nurses can bring in acupoint pressure wristband for researches on its effectiveness and adaptability

#### 3.2.3.2. Zhou 2011 ☆☆

Zhou Xuan, Wang Qi. [Acupressure wristbands prevent postoperative nausea and vomiting: a Meta-analysis]. Journal of Nursing Science. 2011;26(6):81-4. [168372].

<b>Objective</b>	To examine the impact of acupressure wristbands encircling the wrist and compressing Neiguan acupuncture point on prevention of postoperative nausea and vomiting in adults.
<b>Methods</b>	MEDLINE, CNKI and other databases were searched, and the randomized controlled trials were enrolled and analysed with Revman 5.0.
<b>Results</b>	<b>Nine studies were recruited.</b> Compared with the placebo controls, acupressure wristbands encircling the wrist and compressing Neiguan acupuncture point reduced vomiting (RR=0.50,95% CI: 0.37-0.66,P0.01). No statistical difference was found in occurrence of nausea between the acupressure wristbands group and the placebo group(RR=0.85,95%CI:0.72-1.00,P0.05).
<b>Conclusion</b>	<b>Usage of acupressure wristbands encircling the wrist and compressing Neiguan acupuncture point can ease postoperative vomiting, but it cannot reduce postoperative nausea.</b> High quality RCTs are still needed to assess the effects of acupressure wristbands on prevention of postoperative nausea and vomiting and Chinese nurses can bring in these wristbands to prove their effectiveness and applicability.

**3.2.3.3. Doran 2010** ☆☆

Doran K, Halm MA. Integrating Acupressure to Alleviate Postoperative Nausea and Vomiting. American Journal of Critical Care. 2010;19(6):553-6. [168528].

Overall, “class 1” evidence exists for the efficacy of acupressure on PONV in surgical populations.

**3.2.4. Electro-acupuncture**

**3.2.4.1. Ge 2023 (gynecologic surgery )**

Ge Y, Zheng J. The efficacy of transcutaneous electronic acupoint stimulation for improving postoperative recovery after gynecologic surgery: A systematic review and meta-analysis. Medicine (Baltimore). 2023 Sep 1;102(35):e34834. <https://doi.org/10.1097/MD.00000000000034834>. <https://pubmed.ncbi.nlm.nih.gov/37657060>; PMID: PMC10476788.

<b>Background</b>	This systematic review and meta-analysis aimed to evaluate the efficacy of transcutaneous electronic acupoint stimulation (TEAS) for improving postoperative recovery after gynecologic surgery.
<b>Methods</b>	We performed a thorough search of 6 databases until March 2023, identifying 12 randomized controlled trials that met our predefined inclusion criteria and encompassed a total of 1510 patients. For continuous outcomes, we calculated the weighted mean difference (WMD), and for binomial outcomes, we used the risk ratio (RR). We evaluated heterogeneity among the included studies using Cochran I2 and Q statistics, utilizing a random-effects model when the I2 value exceeded 50%. To assess publication bias, we employed Egger test.
<b>Results</b>	Our analysis found that <b>TEAS significantly reduced the risk of postoperative nausea (RR: 0.60, 95% CI: 0.43-0.83, P = .002) and postoperative vomiting (RR: 0.54, 95% CI: 0.43-0.67, P &lt; .001)</b> , visual analogue scale (WMD: -0.47, 95% CI: -0.76 to -0.17, P = .002), as well as shortened the time to first bowel movement (WMD: -18.43, 95% CI: -20.87 to -15.99, P < .001) and time to first flatus (WMD: -8.98, 95% CI: -12.46 to -5.51, P < .001) compared to the conventional group.
<b>Conclusions</b>	Our findings suggested that TEAS may improve postoperative recovery following gynecologic surgery. However, to confirm these results, larger randomized controlled trials encompassing a more diverse range of patient populations are urgently required.

**3.2.4.2. Han 2023**

Han Z, Zhang X, Yang H, Yuan P, Wang H, Du G. Suggested Electroacupuncture for Postoperative Nausea and Vomiting: A Comprehensive Meta-Analysis and Systematic Review of Randomized Controlled Trials. Med Sci Monit. 2023 Oct 18;29:e941262. <https://doi.org/10.12659/MSM.941262>

<b>Background</b>	The purpose of this meta-analysis was to evaluate the effectiveness of electroacupuncture in preventing and treating postoperative nausea and vomiting (PONV) after general anesthesia.
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<b>Material and methods</b>	We searched for papers on randomized controlled trials on electroacupuncture for PONV prevention after general anesthesia published in PubMed, Web of Science, and China National Knowledge Infrastructure (CNKI) since October 1, 2016. Primary outcome was incidence of PONV; secondary outcomes were incidence of postoperative nausea (PON) at 6 h, postoperative vomiting (POV) at 6 h, and postoperative antiemetic requirement. Data were combined and analyzed using RevMan 5.4.1 software.
<b>Results</b>	<b>Eight randomized controlled trials, with 899 total participants</b> , were included. Findings showed (1) there was no significant difference in occurrence rate of PONV between electroacupuncture and control groups (OR=0.31, 95% CI [0.06, 1.49], P=0.14, I <sup>2</sup> =82%); (2) electroacupuncture reduced incidence of PON at 6 h postoperatively, compared with controls (OR=0.43, 95% CI [0.27, 0.67], P=0.0002, I <sup>2</sup> =0%); (3) compared with control group, electroacupuncture reduced POV incidence 0-6 h postoperatively (OR=0.38, 95% CI [0.23, 0.63], P=0.0001, I <sup>2</sup> =0%); (4) electroacupuncture group demonstrated a significant reduction in postoperative requirement for antiemetic medications (OR=0.44, 95% CI [0.25, 0.78], P=0.005, I <sup>2</sup> =61%); (5) one study reported adverse reactions during observation, with 3 patients experiencing pain and itching at acupuncture site and 2 patients refusing a second acupuncture treatment; all symptoms lasted less than 2 h.
<b>Conclusions</b>	Based on current evidence, electroacupuncture significantly reduces the occurrence rate of PON and POV at 6 h after surgery and the use of antiemetic medication postoperatively. However, more high-quality, large-sample randomized controlled trials are needed to further validate its efficacy.

**3.2.4.3. Lu 2023**

Lu L, Xie C, Li X, Zhou Y, Yin Z, Wei P, Gao H, Wang J, Yong Y, Song J. Efficacy and safety of electrical acupoint stimulation for postoperative nausea and vomiting: A systematic review and meta-analysis. PLoS One. 2023 May 31;18(5):e0285943. <https://doi.org/10.1371/journal.pone.0285943>

<b>Background</b>	Postoperative nausea and vomiting are typical postsurgical complications. Drug therapy is only partially effective. The goal of our meta-analysis is to systematically evaluate the efficacy and safety of electrical acupoint stimulation for postoperative nausea and vomiting and to score the quality of evidence supporting this concept.
<b>Methods</b>	PubMed, Embase, Cochrane Library, Web of Science, and ClinicalTrials.gov were searched from inception to March 19, 2020.
<b>Results</b>	<b>Twenty-six studies (2064 patients)</b> were included. Compared with control treatment, electrical acupoint stimulation reduced the incidence of postoperative nausea and vomiting (RR 0.49, 95% CI 0.41 to 0.57, P < 0.001), postoperative nausea (RR 0.55, 95% CI 0.47 to 0.64, P < 0.001) and postoperative vomiting (RR 0.56, 95% CI 0.45 to 0.70, P < 0.001). Electrical acupoint stimulation also reduced the number of patients requiring antiemetic rescue (RR 0.60, 95% CI 0.43 to 0.85, P = 0.004). No differences in adverse events were observed. Subgroup analysis showed that both electroacupuncture (RR 0.58, 95% CI 0.46 to 0.74, P < 0.001) and transcutaneous electrical acupoint stimulation (RR 0.44, 95% CI 0.34 to 0.58, P < 0.001) had significant effects. Electrical acupoint stimulation was effective whether administered preoperatively (RR 0.40, 95% CI 0.27 to 0.60, P < 0.001), postoperatively (RR 0.59, 95% CI 0.46 to 0.76, P < 0.001), or perioperatively (RR 0.50, 95% CI 0.37 to 0.67, P < 0.001). The quality of evidence was moderate to low.
<b>Conclusions</b>	Electrical acupoint stimulation probably reduce the incidence of postoperative nausea and vomiting, postoperative nausea, postoperative vomiting, and reduce the number of patients requiring antiemetic rescue, with few adverse events.

**3.2.4.4. Chen 2020**

Chen J , Tu Q , Miao S , Zhou Z , Hu S. Transcutaneous electrical acupoint stimulation for preventing postoperative nausea and vomiting after general anesthesia: A meta-analysis of randomized controlled trials. *Int J Surg.* 2020;73:57-64. [209688]. [doi](#)

<b>Objective</b>	We performed this meta-analysis to evaluate the effectiveness of transcutaneous electrical acupoint stimulation (TEAS) for preventing postoperative nausea and vomiting (PONV) after general anesthesia.
<b>Methods</b>	We searched PubMed, Embase, Ovid, Web of Science for relevant randomized controlled trials (RCTs) about TEAS for the prevention of PONV, published through July 31, 2019. The primary outcome was the incidence of PONV, postoperative nausea (PON) and postoperative vomiting (POV) recorded within 24 h after surgery. Secondary outcomes included the numbers of patients needing antiemetic rescue and the incidence of postoperative adverse effects referred to general anesthesia. Data were pooled and analyzed by RevMan 5.3 software.
<b>Results</b>	<b>Fourteen RCTs (1653 participants)</b> were included in this meta-analysis. The current results suggested that application of TEAS showed obvious superiority in lower incidence of PONV (relative risk [RR] 0.54, 95% confidence interval [CI] 0.42 to 0.68, $P < 0.0001$ ), PON (RR, 0.59, 95% CI 0.49 to 0.71, $P < 0.0001$ ), POV (RR 0.46; 95% CI, 0.33 to 0.65, $P < 0.0001$ ), lower numbers of patients needing antiemetic rescue (RR 0.56, 95% CI 0.40 to 0.78, $P = 0.0005$ ), lower incidence of dizziness (RR 0.43, 95% CI 0.31 to 0.60, $P < 0.0001$ ) and pruritus (RR 0.43, 95% CI 0.31 to 0.58, $P = 0.02$ ), compared with controlled intervention.
<b>Conclusions</b>	TEAS is a reasonable modality to incorporate into a multimodal management approach for the prevention of PONV, PON, POV and associated with lower numbers needing antiemetic rescue, lower incidence of adverse effects after general anesthesia.

**3.2.5. Comparison of Acupuncture techniques**

**3.2.5.1. Zhou 2024**

Zhou T, Hou H, Cairen Z, Wang Y, Wang P, Ge L, Wa M, Zhang S, Xu Z, Tang F, Wang C, Liu R, Li D, Xue J. Comparative effectiveness of acupoint stimulation for preventing postoperative nausea and vomiting after general anesthesia: A network meta-analysis of randomized trials. *Int J Surg.* 2024 Sep 19. <https://doi.org/10.1097/JS9.0000000000001976>

<b>Objective</b>	To systematically evaluate the effectiveness of different acupoint stimulation techniques in preventing postoperative nausea and vomiting (PONV) after general anesthesia.
<b>Methods</b>	We searched PubMed, Cochrane Library, Web of Science, Embase for relevant papers, about the effect of acupoint stimulation for preventing PONV from their inception to July 31, 2023. Two reviewers performed study screening, data extraction, and risk of bias assessment. We focused on patient important outcomes including the incidence of PONV, postoperative nausea (PON), or postoperative vomiting (POV), and the number of patients requiring antiemetic rescue. We conducted network meta-analyses to estimate the relative effectiveness between different acupoint stimulation using Stata 17.0 and Revman 5.3 software.



<b>Results</b>	We included <b>50 randomized trials involving 7,372 participants</b> (median age: 43.5 years, female: 73.3%). The network meta-analysis revealed that compared with the control (sham acupoint stimulation or blank control), antiemetic alone could significantly reduce the incidence of POV (RR 0.49, 95% CI 0.36 to 0.69), but could not significantly reduce the incidence of PONV and PON (RR 0.49, 95% CI 0.36 to 0.69; RR 0.81, 95% CI 0.59 to 1.10; respectively); both TEAS and electroacupuncture alone significantly reduced the incidence of PONV, PON, and POV, and combined with antiemetic was usually more effective than single acupoint stimulation.
<b>Conclusions</b>	Both TEAS and electroacupuncture, with or without antiemetic, could significantly reduce the incidences of postoperative nausea and vomiting after general anesthesia.

### 3.3. Specific Clinical Forms

#### 3.3.1. Children

##### 3.3.1.1. Zhang 2020 (Neiguan Acupoint (PC6))

Zhang Y, Zhang C, Yan M, Wang N, Liu J, Wu A. The effectiveness of PC6 acupuncture in the prevention of postoperative nausea and vomiting in children: A systematic review and meta-analysis. *Paediatr Anaesth.* 2020;30(5):552-63. [168211]. [doi](#)

<b>Background</b>	A growing number of studies have demonstrated the effectiveness of acupuncture in preventing and treating postoperative nausea and vomiting. Here, we used meta-analysis to confirm these benefits in children and to determine the optimal time to perform this treatment.
<b>Methods</b>	Four databases (MEDLINE, EMBASE, CENTRAL, and Chinese Database of Biology and Medicine) were searched from inception until January 16, 2019. We included randomized controlled trials for evaluating the effectiveness of acupuncture in the prevention and treatment of postoperative nausea and vomiting during the early stage (0-4 hours) and within 24 hours postoperatively in pediatrics. Control groups received standardized care control or standardized care combined with sham control.
<b>Results</b>	<b>Sixteen literatures and 1773 patients</b> undergoing general anesthesia were included in the study. The results indicated that acupuncture was effective in reducing postoperative vomiting, both during the first 4 hours (RR = 0.47, 95% CI 0.26, 0.84; low quality) and within 24 hours postoperatively (RR = 0.74, 95% CI 0.60, 0.91; low quality). Stratifying by the timing of acupuncture, acupuncture was effective in reducing the first 4 hours (RR = 0.34, 95% CI 0.18, 0.64; moderate quality), and 0-24 hours postoperative vomiting (RR = 0.81, 95% CI 0.70, 0.93; moderate quality) when performed before and during anesthesia, respectively. Further, the RR value was more robust when acupuncture was performed before anesthesia. Acupuncture was also effective in treating 0-24 hours postoperative nausea (RR = 0.73, 95% CI 0.60, 0.88; moderate quality) and in reducing the utilization of remedies during the first 4 hours (RR = 0.64, 95% CI 0.45, 0.89; moderate quality).
<b>Conclusion</b>	Acupuncture reduces the incidence of postoperative nausea and vomiting as well as the utilization of antiemetic remedies, particularly during the first 4 hours following the operation. Acupuncture performed before anesthesia was demonstrated to be the most ideal intervention time for children.

##### 3.3.1.2. Shin 2016 (Tonsillectomy)☆☆

Shin HC, Kim JS, Lee SK, Kwon SH, Kim MS, Lee EJ, Yoon YJ. The effect of acupuncture on



postoperative nausea and vomiting after pediatric tonsillectomy: A meta-analysis and systematic review. *Laryngoscope*. 2016;126(8):1761-7. [179462].

<b>Objectives/Hypothesis</b>	Tonsillectomy is one of the most frequently performed pediatric surgical procedures worldwide. The complications of this procedure include postoperative nausea and vomiting (PONV) and pain; therefore, both the treatment and prevention of PONV are important. Classical antiemetics include drug therapies such as ondansetron, which are undesirable because they often carry a high cost and several side effects. Therefore, in this study we aimed to evaluate the antiemetic effect of acupuncture after pediatric tonsillectomy.
<b>Methods</b>	We searched for eligible articles that reported on the antiemetic effects of acupuncture after tonsillectomy using the three databases, MEDLINE, Embase, and Cochrane, through July 2015. We included full-length original articles with adequate data for evaluating the antiemetic effects on pediatric tonsillectomy in the form of a relative ratio. The Newcastle-Ottawa scale was used to assess the quality of case control and cohort studies, and the Cochrane risk of bias tool was employed for randomized controlled trials (RCTs).
<b>Results</b>	The search identified 415 publications. After screening, we selected eight articles for review ( <b>4 RCTs</b> , 3 prospective cohorts, and 1 pilot study). A meta-analysis of acupuncture in pediatric tonsillectomy revealed that the number of patients with PONV was significantly reduced with acupuncture compared to the control group, with a risk ratio of 0.77 (95% confidence interval: 0.63-0.94, $P < 0.05$ ).
<b>Conclusion</b>	<b>When acupuncture at PC6 (neiguan) was used to prevent PONV after pediatric tonsillectomy, the risk ratio was significantly lower compared to that of conventional drug therapy.</b> Although further randomized controlled trials are needed, acupuncture at PC6 is considered an economic and effective treatment for emesis after pediatric tonsillectomy.

**3.3.1.3. Dune 2006 (Children) ☆☆**

Dune LS, Shiao SY. Metaanalysis of acustimulation effects on postoperative nausea and vomiting in children. *Explore (NY)*. 2006;2(4):314-20. [143359].

<b>Objective</b>	Using metaanalysis, we sought to determine acustimulation (AS) effects on postoperative nausea and vomiting (PONV) in children.
<b>Methods</b>	Metaanalyses were performed on various acupoint AS effects including acupressure, acupuncture, laser acupuncture, and electrical stimulation (ETS) on PONV in children. On-line databases were searched for randomized controlled trials (RCTs) from 1966 through May 2005. In addition, the reference lists of reviewed papers were scanned for additional trials. The identified RCTs were evaluated for methodological quality using the Quality Reporting of Meta-analyses (QUOROM) guidelines, and results were pooled using the fixed-effects model.

<b>Results</b>	<b>Twelve RCTs</b> were pooled for the outcomes of 24-hour PONV including 12 trials for vomiting and two trials for nausea. Compared with the control groups, all AS modalities reduced vomiting (RR = 0.69, 95% CI: 0.59-0.80, P < .0001) and nausea (RR = 0.59, 95% CI: 0.46-0.76, P < .0001). Acupressure (two trials) and acupuncture (six trials) modalities were effective in reducing vomiting (P < .005); however, ETS (two trials) did not show significant effects in reducing the vomiting (P = .118) in children. Compared with the controls, medications (three trials) reduced vomiting (RR = 0.42, 95% CI: 0.22-0.7, P = .0056). There were no differences between the medication and AS treatments (three trials) in reducing vomiting (RR = 1.25, 95% CI: 0.54-2.93, P = .6025).
<b>Conclusions</b>	<b>This metaanalysis demonstrated that acupressure and acupuncture are effective treatment modalities to reduce postoperative vomiting in children.</b> Acupuncture treatment is as effective as medications to reduce vomiting in children. Acupuncture had the greatest impact on reducing vomiting when compared with acupressure and ETS in children.

**3.3.1.4. Bolton 2006 (Tonsillectomy) Ø**

Bolton CM, Myles PS, Nolan T, Sterne JA. prophylaxis of postoperative vomiting in children undergoing tonsillectomy: a systematic review and meta-analysis. Br J Anaesth. 2006;97(5):593-604. [141426].

<b>Background</b>	Postoperative vomiting (POV) remains one of the commonest causes of significant morbidity after tonsillectomy in children. A variety of prophylactic anti-emetic interventions have been reported, but there has only been a limited systematic review in this patient group.
<b>Objectives &amp; methods</b>	A systematic search was performed by using Cochrane Controlled Trials Register, MEDLINE and EMBASE to identify double-blind, randomized, placebo-controlled trials of prophylactic anti-emetic interventions in children undergoing tonsillectomy, with or without adenoidectomy. The outcome of interest was POV in the first 24 h. Summary estimates of the effect of each prophylactic anti-emetic strategy were derived using fixed effect meta-analysis. Where appropriate, dose-response effects were estimated using logistic regression and 22 articles were identified.
<b>Results</b>	Good evidence was found for the prophylactic anti-emetic effect of dexamethasone [odds ratio (OR) 0.23, 95% CI 0.16-0.33], and the serotonergic antagonists ondansetron (OR 0.36, 95% CI 0.29-0.46), granisetron (OR 0.11, 95% CI 0.06-0.19), tropisetron (OR 0.15, 95% CI 0.06-0.35) and dolasetron (OR 0.25, 95% CI 0.1-0.59). Metoclopramide was also found to be efficacious (OR 0.51, 95% CI 0.34-0.77). <b>There is not sufficient evidence</b> to suggest that dimenhydrinate, perphenazine or droperidol, in the doses studied, are efficacious, nor were gastric aspiration or <b>acupuncture</b> . In conclusion, dexamethasone and the anti-serotonergic agents appear to be the most effective agents for the prophylaxis for POV in children undergoing tonsillectomy.

**3.3.2. Abdominal Surgery**

**3.3.2.1. Fu 2020**

Fu C, Wu T, Shu Q, Song A, Jiao Y. Acupuncture therapy on postoperative nausea and vomiting in abdominal operation: A Bayesian network meta analysis. Medicine (Baltimore). 2020;99(23). [210027]. doi

<b>Background</b>	Postoperative nausea and vomiting (PONV) is a common complication after surgery. However, drugs cannot prevent it completely, and acupuncture therapy shows the potential in preventing PONV, yet the best choice hasn't been demonstrated.
<b>Objective</b>	This network meta-analysis aimed to evaluate the effectiveness of different acupuncture therapies used for preventing PONV in abdominal operation. <b>METHODS:</b> Authors searched articles from PubMed/Medline, Cochrane library, Web of Science, Ebsco and Ovid/Embase, and established database from setup time to June 2019. Quality evaluation of included studies was performed with Cochrane risk-of-bias tool (ROB 2.0). Pairwise and network meta analysis were conducted by RevMan and Addis respectively.
<b>Results</b>	Twenty studies with 2862 patients were included in this research. Pairwise meta analysis shows that compared with placebo, transcutaneous electric nerve stimulation had lower risk of postoperative nausea (PON) (odds ratio (OR) = 0.42, 95%confidence interval (CI): 0.30-0.60), postoperative vomiting (POV) (OR = 0.53, 95%CI: 0.36-0.78), PONVs (OR = 0.46, 95%CI: 0.31-0.68), and postoperative rescue (POR) (OR = 0.61, 95%CI: 0.41-0.90), Capsicum had lower risk of PON (OR = 0.16, 95%CI: 0.09-0.28), PONVs (OR = 0.23, 95%CI: 0.12-0.45), Acupressure had lower risk of POV (OR = 0.42, 95%CI: 0.25-0.70), POR (OR = 0.42, 95%CI: 0.27-0.64). In network meta analysis, compared with usual care, the probability rank suggested that Acupoint Injection showed lowest risk of PON (OR = 0.02, 95%CI: 0.00-0.11), POV (OR = 0.06, 95%CI: 0.01-0.49), Usual care for PONVs (OR = 0.31, 95%CI: 0.13-0.75), and Capsicum for POR (OR = 0.39, 95%CI: 0.07-2.33). Further study should be carried out to verify this result.
<b>Conclusion</b>	Both pairwise and network meta analysis showed acupuncture therapy was superior to placebo and usual care. Different acupuncture therapy regimens may have advantages in different aspects. And compared with POV, PON seems easier to control.

### 3.3.3. Laparoscopic surgery

#### 3.3.3.1. Tang 2025

Tang X, Qu S. The Impact of Acupuncture on Pain Intensity, Nausea, and Vomiting for Laparoscopic Cholecystectomy: A Meta-analysis Study. Surg Laparosc Endosc Percutan Tech. 2025 Feb 1;35(1):e1349. <https://doi.org/10.1097/SLE.0000000000001349>

<b>Background</b>	Acupuncture may have some potential in pain relief after laparoscopic cholecystectomy, and this meta-analysis aims to explore the impact of acupuncture on pain intensity, nausea and vomiting for patients undergoing laparoscopic cholecystectomy.
<b>Methods</b>	PubMed, EMBase, Web of science, EBSCO, Cochrane library databases, CNKI, VIP, and Wangfang were systematically searched, and we included randomized controlled trials (RCTs) assessing the effect of acupuncture on pain control for laparoscopic cholecystectomy.
<b>Results</b>	<b>Five RCTs and 366 patients</b> were included in the meta-analysis. Overall, compared with control intervention for laparoscopic cholecystectomy, acupuncture was associated with significantly reduced pain scores at 6 hours [mean difference (MD)=-0.86; 95% CI=-1.37 to -0.34; P =0.001, 2 RCTs) and pain scores at 8 to 10 hours (MD=-0.71; 95% CI=-1.13 to -0.28; P =0.001, 2 RCTs), decreased incidence of nausea (odds ratio=0.10; 95% CI=0.03-0.34; P =0.0003, 3 RCTs), and vomiting (odds ratio=0.11; 95% CI=0.01-0.85; P =0.03, 3 RCTs), but demonstrated no obvious impact on pain scores at 12 to 24 hours (MD=-0.38; 95% CI=-1.02 to 0.27; P =0.25, 2 RCTs).
<b>Conclusions</b>	Acupuncture may be effective to reduce pain intensity, nausea, and vomiting for laparoscopic cholecystectomy.

**3.3.3.2. Huang 2023**

Huang WH, Zhang J, Ding SS, Xue JJ. Efficacy of acupuncture for nausea and vomiting after Huang WH, Zhang J, Ding SS, Xue JJ. Efficacy of acupuncture for nausea and vomiting after laparoscopic surgery: A systematic review and meta-analysis. *Asian J Surg.* 2023 Oct;46(10):4462-4464. <https://doi.org/10.1016/j.asjsur.2023.04.107> [letter]

**3.3.4. Colorectal cancer resection**

**3.3.4.1. Qi 2023**

Qi L, Shi H, Zhang Y, Zhang X, Jia H, Tian H. The effect of acupuncture on recovery after colorectal cancer resection: A systematic review meta-analysis of randomized controlled trials. *Medicine (Baltimore).* 2023 Sep 1;102(35):e34678. <https://doi.org/10.1097/MD.00000000000034678>

<b>Background</b>	To evaluate the efficacy and safety of acupuncture by systematically reviewing the literature on colorectal cancer resection.
<b>Methods</b>	Seven electronic databases were searched from inception to February 28, 2023. Randomized controlled trials on acupuncture in patients after CRC resection were included. Two reviewers independently selected relevant trials, extracted data, and assessed the risk of bias. A random-effects meta-analysis model was used to obtain summary effect estimates. The data were pooled and analyzed using RevMan 5.3. The heterogeneity of selected studies was evaluated by evaluating the I-squared (I <sup>2</sup> ) statistics.
<b>Results</b>	<b>Twenty-two studies with 1878 patients</b> were included. Results of the meta-analysis showed there was a low level evidence that acupuncture may improve early postoperative symptoms, such as time to first flatus (n = 876, MD -0.77h, 95% CI -1.22 to -0.33 h, I <sup>2</sup> = 89%), time to first bowel movement (n = 671, MD -1.41h, 95% CI -2.20 to -0.63 h, I <sup>2</sup> = 95%), time to first defecation (n = 556, MD -1.03h, 95% CI -1.88 to -0.18 h, I <sup>2</sup> = 95%), and <b>nausea/vomiting</b> (n = 1488, RR 0.72, 95% CI 0.59-0.89, I <sup>2</sup> = 49%) compared with usual care and sham acupuncture. However, there were no statistically significant differences in postoperative pain (n = 1188, MD-0.21, 95% CI -0.59 to 0.17, I <sup>2</sup> = 74%). And there was no sufficient evidence of improving long-term functional outcomes. There was substantial heterogeneity across trials. The adverse events associated with acupuncture stimulation were minor in include studies.
<b>Conclusion subsections</b>	There is currently low-level evidence supporting the use of acupuncture on postoperative symptoms for patients after colorectal cancer resection. More investigations should be established based on the STRICTA statement strictly.

**3.3.5. Breast Surgery**

**3.3.5.1. Sun 2019 ☆☆**

Sun R , Dai W , Liu Y , Liu C , Liu Y , Gong Y , Sun X , Shi T , Song M. Non-needle acupoint stimulation for prevention of nausea and vomiting after breast surgery: A meta-analysis. *Medicine (Baltimore).* 2019;98(10). [196155].

<b>Background</b>	Breast disease has been a global serious health problem, among women. Surgery is the main treatment for the patients suffering from breast disease. Postoperative nausea and vomiting are still disturbing. Acupoint stimulation, an effective treatment of traditional Chinese medicine, has been used to reduce postoperative nausea and vomiting. Recently, non-needle acupoint stimulation becomes a new intervention. Though several clinical trials have been done, there is still no final conclusion on the efficacy. This Meta-Analysis aims at evaluating the efficacy of non-needle acupoint stimulation for prevention of nausea and vomiting after breast surgery.
<b>Methods</b>	Systematic searches were conducted in PubMed, Embase, Cochrane, and Wanfang Med Online databases for studies. The review period covered from the inception of databases to December 31, 2017. The outcome measures of interest were frequency of nausea, frequency of vomiting, frequency of PONV, verbal rating scale of nausea, and use of rescue antiemetic. Data extraction and risks of bias evaluation were accomplished by 2 independent reviewers using the Cochrane Collaboration Review Manager software (RevMan 5.3.5).
<b>Results</b>	<b>Fourteen randomized controlled trials with a total of 1009 female participants</b> in the non-needle acupoint stimulation group and control group met the inclusion criteria. Although the therapeutically effect on vomiting within postoperative 2 hours was not obvious, non-needle acupoint stimulation still had an important role in reducing nausea and vomiting within postoperative 48 hours. According to Jadad scale, there was moderate quality evidence for the pooled analysis results in this study. In addition, stimulating acupoint by wristband acupressure was more likely to cause adverse reactions.
<b>Conclusion</b>	Non-needle acupoint stimulation can be used for female patients undergoing breast surgery to reduce postoperative nausea and vomiting. Into consideration, we recommend transcutaneous acupoint electrical stimulation on PC6 from 30 minutes before induction of anesthesia to the end of surgery for application. This non-pharmaceutical approach may be promising to promote the recovery of patients after breast surgery.

### 3.3.6. Tonsillectomy

#### 3.3.6.1. Shin 2016 (Children)☆☆

Shin HC, Kim JS, Lee SK, Kwon SH, Kim MS, Lee EJ, Yoon YJ. The effect of acupuncture on postoperative nausea and vomiting after pediatric tonsillectomy: A meta-analysis and systematic review. *Laryngoscope*. 2016;126(8):1761-7. [179462].

<b>Objectives/Hypothesis</b>	Tonsillectomy is one of the most frequently performed pediatric surgical procedures worldwide. The complications of this procedure include postoperative nausea and vomiting (PONV) and pain; therefore, both the treatment and prevention of PONV are important. Classical antiemetics include drug therapies such as ondansetron, which are undesirable because they often carry a high cost and several side effects. Therefore, in this study we aimed to evaluate the antiemetic effect of acupuncture after pediatric tonsillectomy.
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<b>Methods</b>	We searched for eligible articles that reported on the antiemetic effects of acupuncture after tonsillectomy using the three databases, MEDLINE, Embase, and Cochrane, through July 2015. We included full-length original articles with adequate data for evaluating the antiemetic effects on pediatric tonsillectomy in the form of a relative ratio. The Newcastle-Ottawa scale was used to assess the quality of case control and cohort studies, and the Cochrane risk of bias tool was employed for randomized controlled trials (RCTs).
<b>Results</b>	The search identified 415 publications. After screening, we selected eight articles for review ( <b>4 RCTs</b> , 3 prospective cohorts, and 1 pilot study). A meta-analysis of acupuncture in pediatric tonsillectomy revealed that the number of patients with PONV was significantly reduced with acupuncture compared to the control group, with a risk ratio of 0.77 (95% confidence interval: 0.63-0.94, P < 0.05).
<b>Conclusion</b>	<b>When acupuncture at PC6 (neiguan) was used to prevent PONV after pediatric tonsillectomy, the risk ratio was significantly lower compared to that of conventional drug therapy.</b> Although further randomized controlled trials are needed, acupuncture at PC6 is considered an economic and effective treatment for emesis after pediatric tonsillectomy.

3.3.6.2. Cho 2016 ☆☆

Cho HK, Park IJ, Jeong YM, Lee YJ, Hwang SH. Can perioperative acupuncture reduce the pain and vomiting experienced after tonsillectomy? A meta-analysis. Laryngoscope. 2016;126(3):608-15. [186329].

<b>Objectives</b>	Acupuncture has been shown to reduce pain, nausea, and vomiting. However, its use alongside surgical interventions remains a novel practice, despite the increasing applications of alternative medicine. The goal of this meta-analysis was to perform a systematic review of the literature addressing the effect of acupuncture on postoperative pain, nausea, and vomiting following tonsillectomy.
<b>Methods</b>	DATA SOURCES: MEDLINE, SCOPUS, and Cochrane database. METHODS: Two authors independently searched the databases from the inception of article collection until June 2015. We included 1) analysis studies that compared groups of patients who had received perioperative acupuncture (acupuncture groups) with those who had received a pain control agent or sham treatment (control group); and 2) analysis studies in which the outcomes of interest were postoperative pain intensity, rescue analgesic consumption, or nausea and vomiting.
<b>Results</b>	The pain score reported by patients during the first 48 hours and the postoperative need for analgesics were significantly lower in the acupuncture group versus the control group. Additionally, <b>the incidence of postoperative nausea and vomiting was significantly lower in the acupuncture group than in the control group.</b> No major adverse effects of perioperative acupuncture were reported in the enrolled studies.
<b>Conclusion</b>	perioperative acupuncture may provide pain relief without side effects in patients undergoing tonsillectomy. However, there were high levels of heterogeneity in several of the measured parameters; thus, the efficacy of acupuncture cannot be considered to have been evaluated sufficiently. For this reason, additional large well-designed trials are required to further support the results of this study.

3.3.6.3. Bolton 2006 (Children) Ø

Bolton CM, Myles PS, Nolan T, Sterne JA. prophylaxis of postoperative vomiting in children undergoing tonsillectomy: a systematic review and meta-analysis. *Br J Anaesth.* 2006;97(5):593-604. [141426].

<b>Background</b>	Postoperative vomiting (POV) remains one of the commonest causes of significant morbidity after tonsillectomy in children. A variety of prophylactic anti-emetic interventions have been reported, but there has only been a limited systematic review in this patient group.
<b>Objectives &amp; methods</b>	A systematic search was performed by using Cochrane Controlled Trials Register, MEDLINE and EMBASE to identify double-blind, randomized, placebo-controlled trials of prophylactic anti-emetic interventions in children undergoing tonsillectomy, with or without adenoidectomy. The outcome of interest was POV in the first 24 h. Summary estimates of the effect of each prophylactic anti-emetic strategy were derived using fixed effect meta-analysis. Where appropriate, dose-response effects were estimated using logistic regression and 22 articles were identified.
<b>Results</b>	Good evidence was found for the prophylactic anti-emetic effect of dexamethasone [odds ratio (OR) 0.23, 95% CI 0.16-0.33], and the serotonergic antagonists ondansetron (OR 0.36, 95% CI 0.29-0.46), granisetron (OR 0.11, 95% CI 0.06-0.19), tropisetron (OR 0.15, 95% CI 0.06-0.35) and dolasetron (OR 0.25, 95% CI 0.1-0.59). Metoclopramide was also found to be efficacious (OR 0.51, 95% CI 0.34-0.77). <b>There is not sufficient evidence</b> to suggest that dimenhydrinate, perphenazine or droperidol, in the doses studied, are efficacious, nor were gastric aspiration or <b>acupuncture</b> . In conclusion, dexamethasone and the anti-serotonergic agents appear to be the most effective agents for the prophylaxis for POV in children undergoing tonsillectomy.

### 3.3.7. Cesarean

#### 3.3.7.1. Griffiths 2021

Griffiths JD, Gyte GM, Popham PA, Williams K, Paranjothy S, Broughton HK, Brown HC, Thomas J. Interventions for preventing nausea and vomiting in women undergoing regional anaesthesia for caesarean section. *Cochrane Database Syst Rev.* 2021;5(5). [220029]. [doi](#)

<b>Background</b>	Nausea and vomiting are distressing symptoms which are experienced commonly during caesarean section under regional anaesthesia and in the postoperative period.
<b>Objectives</b>	To assess the efficacy of pharmacological and non-pharmacological interventions versus placebo or no intervention given prophylactically to prevent nausea and vomiting in women undergoing regional anaesthesia for caesarean section.
<b>Methods</b>	Search methods: For this update, we searched Cochrane Pregnancy and Childbirth's Trials Register, ClinicalTrials.gov and the WHO International Clinical Trials Registry Platform (ICTRP) (16 April 2020), and reference lists of retrieved studies. Selection criteria: We included randomised controlled trials (RCTs) of studies and conference abstracts, and excluded quasi-RCTs and cross-over studies. Data collection and analysis: Review authors independently assessed the studies for inclusion, assessed risk of bias and carried out data extraction. Our primary outcomes are intraoperative and postoperative nausea and vomiting. Data entry was checked. Two review authors independently assessed the certainty of the evidence using the GRADE approach.



<p><b>Main results</b></p>	<p>Eighty-four studies (involving 10,990 women) met our inclusion criteria. Sixty-nine studies, involving 8928 women, contributed data. Most studies involved women undergoing elective caesarean section. Many studies were small with unclear risk of bias and sometimes few events. The overall certainty of the evidence assessed using GRADE was moderate to very low. 5-HT3 antagonists: We found intraoperative nausea may be reduced by 5-HT3 antagonists (average risk ratio (aRR) 0.55, 95% confidence interval (CI) 0.42 to 0.71, 12 studies, 1419 women, low-certainty evidence). There may be a reduction in intraoperative vomiting but the evidence is very uncertain (aRR 0.46, 95% CI 0.29 to 0.73, 11 studies, 1414 women, very low-certainty evidence). There is probably a reduction in postoperative nausea (aRR 0.40, 95% CI 0.30 to 0.54, 10 studies, 1340 women, moderate-certainty evidence), and these drugs may show a reduction in postoperative vomiting (aRR 0.47, 95% CI 0.31 to 0.69, 10 studies, 1450 women, low-certainty evidence). Dopamine antagonists: We found dopamine antagonists may reduce intraoperative nausea but the evidence is very uncertain (aRR 0.38, 95% CI 0.27 to 0.52, 15 studies, 1180 women, very low-certainty evidence). Dopamine antagonists may reduce intraoperative vomiting (aRR 0.41, 95% CI 0.28 to 0.60, 12 studies, 942 women, low-certainty evidence) and postoperative nausea (aRR 0.61, 95% CI 0.48 to 0.79, 7 studies, 601 women, low-certainty evidence). We are uncertain if dopamine antagonists reduce postoperative vomiting (aRR 0.63, 95% CI 0.44 to 0.92, 9 studies, 860 women, very low-certainty evidence). Corticosteroids (steroids): We are uncertain if intraoperative nausea is reduced by corticosteroids (aRR 0.56, 95% CI 0.37 to 0.83, 6 studies, 609 women, very low-certainty evidence) similarly for intraoperative vomiting (aRR 0.52, 95% CI 0.31 to 0.87, 6 studies, 609 women, very low-certainty evidence). Corticosteroids probably reduce postoperative nausea (aRR 0.59, 95% CI 0.49 to 0.73, 6 studies, 733 women, moderate-certainty evidence), and may reduce postoperative vomiting (aRR 0.68, 95% CI 0.49 to 0.95, 7 studies, 793 women, low-certainty evidence). Antihistamines: Antihistamines may have little to no effect on intraoperative nausea (RR 0.99, 95% CI 0.47 to 2.11, 1 study, 149 women, very low-certainty evidence) or intraoperative vomiting (no events in the one study of 149 women). Antihistamines may reduce postoperative nausea (aRR 0.44, 95% CI 0.30 to 0.64, 4 studies, 514 women, low-certainty evidence), however, we are uncertain whether antihistamines reduce postoperative vomiting (average RR 0.48, 95% CI 0.29 to 0.81, 3 studies, 333 women, very low-certainty evidence). Anticholinergics: Anticholinergics may reduce intraoperative nausea (aRR 0.67, 95% CI 0.51 to 0.87, 4 studies, 453 women, low-certainty evidence) but may have little to no effect on intraoperative vomiting (aRR 0.79, 95% CI 0.40 to 1.54, 4 studies; 453 women, very low-certainty evidence). No studies looked at anticholinergics in postoperative nausea, but they may reduce postoperative vomiting (aRR 0.55, 95% CI 0.41 to 0.74, 1 study, 161 women, low-certainty evidence). Sedatives: We found that sedatives probably reduce intraoperative nausea (aRR 0.65, 95% CI 0.51 to 0.82, 8 studies, 593 women, moderate-certainty evidence) and intraoperative vomiting (aRR 0.35, 95% CI 0.24 to 0.52, 8 studies, 593 women, moderate-certainty evidence). However, we are uncertain whether sedatives reduce postoperative nausea (aRR 0.25, 95% CI 0.09 to 0.71, 2 studies, 145 women, very low-certainty evidence) and they may reduce postoperative vomiting (aRR 0.09, 95% CI 0.03 to 0.28, 2 studies, 145 women, low-certainty evidence). Opioid antagonists: There were no studies assessing intraoperative nausea or vomiting. Opioid antagonists may result in little or no difference to the number of women having postoperative nausea (aRR 0.75, 95% CI 0.39 to 1.45, 1 study, 120 women, low-certainty evidence) or postoperative vomiting (aRR 1.25, 95% CI 0.35 to 4.43, 1 study, 120 women, low-certainty evidence). <b>Acupressure:</b> It is uncertain whether acupressure/acupuncture reduces intraoperative nausea (aRR 0.55, 95% CI 0.41 to 0.74, 9 studies, 1221 women, very low-certainty evidence). Acupressure may reduce intraoperative vomiting (aRR 0.52, 95% CI 0.33 to 0.80, 9 studies, 1221 women, low-certainty evidence) but it is uncertain whether it reduces postoperative nausea (aRR 0.46, 95% CI 0.27 to 0.75, 7 studies, 1069 women, very low-certainty evidence) or postoperative vomiting (aRR 0.52, 95% CI 0.34 to 0.79, 7 studies, 1069 women, very low-certainty evidence). Ginger: It is uncertain whether ginger makes any difference to the number of women having intraoperative nausea (aRR 0.66, 95% CI 0.36 to 1.21, 2 studies, 331 women, very low-certainty evidence), intraoperative vomiting (aRR 0.62, 95% CI 0.38 to 1.00, 2 studies, 331 women, very low-certainty evidence), postoperative nausea (aRR 0.63, 95% CI 0.22 to 1.77, 1 study, 92 women, very low-certainty evidence) and postoperative vomiting (aRR 0.20, 95% CI 0.02 to 1.65, 1 study, 92 women, very low-certainty evidence). Few studies assessed our secondary outcomes including adverse effects or women's views.</p>
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<b>Authors' conclusions</b>	This review indicates that 5-HT3 antagonists, dopamine antagonists, corticosteroids, sedatives and <b>acupressure</b> probably or possibly have efficacy in reducing nausea and vomiting in women undergoing regional anaesthesia for caesarean section. However the certainty of evidence varied widely and was generally low. Future research is needed to assess side effects of treatment, women's views and to compare the efficacy of combinations of different medications.
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**3.3.7.2. Allen 2008 Ø**

Allen 2008 Allen TK, Habib AS. P6 stimulation for the prevention of nausea and vomiting associated with cesarean delivery under neuraxial anesthesia: a systematic review of randomized controlled trials. *Anesth Analg*. 2008;107(4):1308-12. [151013].

<b>Background</b>	A number of studies investigated the use of P6 stimulation for the prevention of intraoperative and postoperative nausea and vomiting (IONV and PONV) in women having cesarean delivery under neuraxial anesthesia. We performed a systematic review to determine the overall efficacy of these techniques in preventing IONV and PONV in this patient population.
<b>Methods</b>	
<b>Results</b>	<b>Six studies involving 649 patients</b> were included in this review. Five studies reported on intraoperative outcomes. Of these, two studies reported a significant reduction in the incidence of intraoperative nausea with P6 stimulation, and one study reported a significant reduction in rescue antiemetic requirement. However, none of the studies reported any differences between the treatment and control groups with respect to vomiting. Four studies reported postoperative outcomes. Of these, one study reported a significant reduction in postoperative nausea, two studies reported a significant reduction in postoperative vomiting, and one study reported a significant reduction in the need for postoperative rescue antiemetic therapy.
<b>Conclusions</b>	While some studies showed a benefit of P6 stimulation, <b>this finding was not consistent</b> . The presence of heterogeneity and inconsistent results among the included trials prevents any definitive conclusions on the efficacy of P6 stimulation in reducing IONV and PONV associated with cesarean delivery performed under neuraxial anesthesia.

**3.3.8. Total Knee Arthroplasty**

**3.3.8.1. Chen 2021**

Chen Z, Shen Z, Ye X, Xu Y, Liu J, Shi X, Chen G, Wu J, Chen W, Jiang T, Liu W, Xu X. Acupuncture for Rehabilitation After Total Knee Arthroplasty: A Systematic Review and Meta-Analysis of Randomized Controlled Trials. *Front Med (Lausanne)*. 2021. [216629]. [doi](#)

<b>Background</b>	There is an increasing interest in acupuncture for promoting post-operative rehabilitation, but the effectiveness of acupuncture for rehabilitation after total knee arthroplasty (TKA) remains controversial. Objective: This study aims to investigate the effect of acupuncture on rehabilitation after TKA.
<b>Methods</b>	Database searches of PubMed, EMBASE, CINAHL, and China National Knowledge Infrastructure (CNKI) were conducted to obtain articles published until August 2020. All identified articles were screened, and data from each included study were extracted independently by two investigators. Meta-analysis was performed to examine the effects of acupuncture on pain, range of knee motion, function, and nausea/vomiting after TKA.

<b>Results</b>	A total of <b>nine randomized clinical trials</b> were included according to the inclusion and exclusion criteria in this review. Compared with routine treatment, acupuncture combined with routine treatment showed a significantly greater pain reduction at 8, 12, 24, and 48 h post-operatively after TKA. Meanwhile, we found that the acupuncture groups showed a significant function improvement and a lower percentage of nausea/vomiting in comparison with the control groups after operation. However, acupuncture groups demonstrated no statistically significant improvement in post-operative pain at 4 h, 7 days, 14 days, and more than 21 days, and no significant difference in range of knee motion was observed between the acupuncture groups and control groups after surgery.
<b>Conclusions</b>	Acupuncture, as a supplementary treatment after TKA, could improve function and reduce nausea/vomiting. However, the effect of acupuncture on pain relief may be mainly achieved within post-operative 48 h, and it had no efficacy in improving range of knee motion. More large-scale and high-quality studies are warranted.

## 4. Clinical Practice Guidelines

⊕ positive recommendation (regardless of the level of evidence reported)  
 ∅ negative recommendation (or lack of evidence)

### 4.1. National Institute for Health and Clinical Excellence (NICE, UK) 2021 ⊕

National Institute for Health and Clinical Excellence (NICE). Caesarean section. London (UK): National Institute for Health and Clinical Excellence (NICE). 2021; 44p. [217697].

Women having a CS (Caesarean section) should be offered antiemetics (either pharmacological or **acupressure**) to reduce nausea and vomiting during CS. [2004]

### 4.2. Enhanced Recovery After Surgery Society and the European Society of Thoracic Surgeons (ERASVR, ESTS, Europe) 2019 ⊕

Batchelor TJP, Rasburn NJ, Abdelnour-Berchtold E, Brunelli A, Cerfolio RJ, Gonzalez M et al. Guidelines for enhanced recovery after lung surgery: recommendations of the Enhanced Recovery After Surgery (ERASVR ) Society and the European Society of Thoracic Surgeons (ESTS). Eur J Cardiothorac Surg. 2019;55:91-155. [203434]. [doi](#)

Evidence level: The use of non-pharmacological measures: High. Recommendation level: The use of non-pharmacological measures: Strong. Electrical stimulation of the P6 acupoint has a significant impact on decreasing the rates of PONV. Acupoint stimulation is considered to be just as effective if performed either preoperatively or postoperatively.

### 4.3. Arbeitsgemeinschaft Gynäkologische Onkologie (AGO, Allemagne) 2018

⊕

Diagnosis and Treatment of Patients with Primary and Metastatic Breast Cancer. Complementary Therapy Survivorship. Arbeitsgemeinschaft Gynäkologische Onkologie (AGO). 2018;;35P. [182073].

Postoperative: nausea, vomiting. Acupuncture. Level of evidence : 2b (individual cohort study), grade of evidence (B), AGO recommendation grade **(+)** This examination or therapeutic intervention is for the patient of limited benefit and can be performed

#### 4.4. Aetna (insurance provider, USA) 2018 ⊕

Acupuncture. Aetna (insurance provider, USA). 2018. 73P. [188029].

Aetna considers needle acupuncture (manual or electroacupuncture) medically necessary for any of the following indications: **Post-operative nausea and vomiting**

#### 4.5. Emblemhealth (insurance provider, USA) 2017 ⊕

Acupuncture — Medicare Dual-Eligible Members Emblemhealth. 2017. [111547].

Members with the Medicare Dual-Eligible benefit are eligible for acupuncture when performed by an individual licensed by New York State to perform acupuncture and when performed for the following diagnoses: 1. **Adult postoperative nausea and vomiting** 2. Chemotherapy related nausea and vomiting 3. Pregnancy related nausea and vomiting 4. Carpal tunnel syndrome 5. Epicondylitis (tennis elbow) 6. Headache 7. Low back pain 8. Menstrual pain 9. Myofascial pain 10. Osteoarthritis

#### 4.6. Association of Paediatric Anaesthetists of Great Britain and Ireland (APAGBI, Great Britain - Ireland) 2016 ⊕

Martin S, Baines D, Holtby H, Carr AS. Guidelines on the Prevention of Post-operative Vomiting in Children. The Association of Paediatric Anaesthetists of Great Britain and Ireland. 2016:36p. [197119].

Current evidence base supports acustimulation reducing POV compared to the non-active control situation. Acustimulation appears to be equally effective in preventing POV as anti-emetic drugs in children. The use of acustimulation can be considered as an alternative treatment to antiemetic medications for surgery where there is a high-risk POV in children.

#### 4.7. Australian and New Zealand College of Anaesthetists (ANZCA, Australia-New Zealand) 2015 ⊕

Acute Pain Management: Scientific Evidence. Australian and New Zealand College of Anaesthetists. 2015:714P. [196721].

PC6 acupuncture, PC6 acupressure and PC6 electroacupoint stimulation reduce postoperative nausea and vomiting (N) (Level I [PRISMA]).

#### 4.8. U.S. Navy Bureau of Medicine and Surgery (USA) 2013 ⊕

Acupuncture. U.S. Navy Bureau of Medicine and Surgery. 2013.17p. [180539].

Category B (limited evidence): Authorized but not recommended for routine use (consider as adjunct). **Postoperative nausea/vomiting** .

#### 4.9. National Institute for Health and Clinical Excellence (NICE, UK) 2011 ⊕

National Institute for Health and Clinical Excellence (NICE). Caesarean section. London (UK): National Institute for Health and Clinical Excellence (NICE). 2011; 57p. [167576].

Women having a CS (Caesarean section) should be offered antiemetics (either pharmacological or **acupressure**) to reduce nausea and vomiting during CS. [2004]

#### 4.10. Scottish Intercollegiate Guidelines Network (SIGN, Scotland) 2010 ⊕

Management of sore throat and indications for tonsillectomy. Scottish Intercollegiate Guidelines Network (SIGN). 2010:44p. [196482].

Interventions considered for prevention of PONv include anti-emetic drugs, single dose dexamethasone, acupuncture, and preoperative fasting.

#### 4.11. Society of Obstetricians and Gynecologists of Canada (SOGC, Canada) 2008 ⊕

Mccracken G, Houston P, Lefebvre G; Society of Obstetricians and Gynecologists of Canada. Guideline for the management of postoperative nausea and vomiting. J Obstet Gynaecol Can. 2008;30(7):600-7. [151002].

Acupoint electrical stimulation may be used as an alternative or adjuvant therapy for prevention of PONV. (II-1A)

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