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Postoperative Nausea and Vomiting

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

3. Systematic Reviews and Meta-Analysis

3.1. Generic Acupuncture

3.1.1. Guo 2026

Guo Y, Guo J, Qiu Y, Ren M, Cao J. Efficacy of Different Nonpharmacological Interventions as Adjunctive Treatments for Postoperative Nausea and Vomiting: A Systematic Review and Bayesian Network Meta-analysis. J Perianesth Nurs. 2026:S1089-9472(26)00062-6. https://doi.org/10.1016/j.jopan.2026.03.004

Purpose	This network meta-analysis aimed to compare the efficacy of nonpharmacological adjunctive interventions for postoperative nausea and vomiting (PONV) in patients undergoing non-gastrointestinal surgery, with formal assessment of transitivity and consistency.
Design	Systematic review and NMA.
Methods	Eight electronic databases were searched up to October 2024. Pairwise and Bayesian network meta-analyses were performed. Transitivity, consistency, and sensitivity analyses were conducted. Evidence quality was rated using the GRADE approach.
Findings	Fifty-four randomized controlled trials involving 8275 participants and nine nonpharmacological interventions were included. For PONV incidence, preoperative carbohydrate loading ranked highest (35%); for rescue antiemetic usage, **acupuncture** was most effective (59%); and for PONV VAS severity, ginger was most effective (29%). Transitivity and sensitivity analyses supported the robustness of results. GRADE ratings indicated low or very low certainty of evidence for most comparisons, mainly due to risk of bias, indirectness, and imprecision.
Conclusion	Carbohydrate loading, **acupuncture**, and ginger appear beneficial as adjunctive interventions for specific PONV outcomes. However, the low evidence quality limits definitive clinical recommendations. Large, well-designed randomized controlled trials are needed to strengthen the evidence base.

3.1.2. Lee 2025

Lee A, Zhang JZ, Xie J, Cheng V, Wong MKH, Yau DKW. Stimulation of the wrist acupuncture point PC6 for preventing postoperative nausea and vomiting: a network meta-analysis. Cochrane Database Syst Rev. 2025 Sep 12;9(9):CD003281. https://doi.org/10.1002/14651858.CD003281.pub5

Rationale	Postoperative nausea and vomiting (PONV) are common complications following surgery and anaesthesia. Antiemetic drugs are only partially effective in preventing PONV. Stimulating the PC6 acupoint(s) on the wrist offers an alternative approach, but the effectiveness of the various common techniques is unclear.
Objectives	To update and compare the effects and safety of PC6 acupoint stimulation with or without antiemetic drug(s) versus sham or antiemetic drug(s) for preventing postoperative nausea (PON) and postoperative vomiting (POV) in people undergoing surgery, and to identify the most effective techniques using network meta-analyses (NMAs).
Methods	Search methods: We searched CENTRAL, MEDLINE, Embase, ISI Web of Science, CINAHL, WHO Global Index Medicus, major trial registries, and reference lists of articles for studies up to 6 June 2025, with no language restrictions. Eligibility criteria: Parallel randomised controlled trials of techniques that compared any combinations of PC6 acupoint stimulation, drug therapy, and sham for preventing PONV in children and adults were eligible. Interventions included invasive techniques (e.g. needle acupuncture) and noninvasive techniques (e.g. acupressure wristbands). Drug therapy included antiemetics that belonged to one of the following substance classes: 5-HT3 receptor antagonists, D2 receptor antagonists, corticosteroids, and antihistamines. The sham group included sham PC6 interventions and/or placebo saline antiemetic interventions. Outcomes: Critical outcomes: incidence of PON and POV. Important outcomes: need for rescue antiemetic therapy when prophylaxis failed and adverse events (side effects). Risk of bias: We assessed the risk of bias in the included studies using RoB 1. Synthesis methods: We performed frequentist NMAs using random-effects models to report risk ratios (RRs) with 95% confidence intervals (95% CIs). We compared the relative effects (with sham as reference) of six broad classes of PC6 acupoint stimulation techniques and their combined use with antiemetic drugs on the outcomes. We summarised the safety data narratively due to heterogeneous reporting of adverse events (side effects). We assessed the certainty of evidence of the NMA treatment effect on outcomes according to the CINeMA and GRADE approaches.
Included studies	This update included **77 trials**, conducted between 1986 and 2022, involving **9847 participants**. The majority were adults across several countries (USA, South Korea, India, China, Turkey, and Iran). There were 58 (33.9%) sham groups, 16 (9.4%) invasive PC6 acupoint stimulation groups, 50 (29.3%) noninvasive PC6 acupoint stimulation groups, 32 (18.7%) antiemetic(s) groups, 4 (2.3%) combined invasive PC6 acupoint stimulation and antiemetic(s) groups, 10 (5.8%) combined noninvasive PC6 acupoint stimulation and antiemetic(s) groups, and one (0.6%) combined invasive and noninvasive PC6 acupoint stimulation group for the NMAs. The high risk of bias was primarily due to selective reporting.

Synthesis of results	Postoperative nausea The evidence from the NMA (63 studies; 7534 participants) suggests that the combined invasive PC6 and antiemetics technique probably results in a larger reduction in PON than sham (RR 0.21, 95% CI 0.10 to 0.45; moderate confidence from indirect evidence only). The evidence also suggests that invasive PC6, noninvasive PC6, and antiemetic(s) may reduce PON, compared to sham (invasive PC6: RR 0.49, 95% CI 0.38 to 0.64, low confidence; noninvasive PC6: RR 0.67, 95% CI 0.58 to 0.76, low confidence; antiemetic(s): RR 0.73, 95% CI 0.59 to 0.91, very low confidence). The combined use of noninvasive PC6 and antiemetic(s) may reduce PON, compared to sham, based on indirect evidence (RR 0.65, 95% CI 0.45 to 0.96; low confidence). Postoperative vomiting The evidence from the NMA (75 studies; 8627 participants) suggests that the combined invasive PC6 and antiemetics technique may result in a moderate reduction in POV, compared to sham (RR 0.37, 95% CI 0.18 to 0.76; low confidence from indirect evidence only). The evidence also suggests that invasive PC6, noninvasive PC6, antiemetic(s), and combined noninvasive PC6 and antiemetic(s) may reduce POV, compared to sham (invasive PC6: RR 0.47, 95% CI 0.34 to 0.64, low confidence; noninvasive PC6: RR 0.58, 95% CI 0.49 to 0.70, low confidence; antiemetic(s): RR 0.62, 95% CI 0.47 to 0.81, very low confidence; combined noninvasive PC6 and antiemetic(s): RR 0.52, 95% CI 0.33 to 0.83, very low confidence). The combined use of noninvasive PC6 and invasive PC6 may result in little to no difference in POV, compared to sham, based on direct evidence (RR 1.02, 95% CI 0.43 to 2.44; low confidence). Need for rescue antiemetic drug(s) The evidence from the NMA (55 studies; 6614 participants) suggests that combined use of noninvasive PC6 and antiemetic(s) probably reduces the need for rescue antiemetic drug(s) when prophylactic techniques fail, compared to sham (RR 0.44, 95% CI 0.28 to 0.70; moderate confidence from indirect evidence). Antiemetic(s), noninvasive PC6, and invasive PC6 may reduce the need for rescue antiemetics, compared to sham (antiemetic(s): RR 0.56, 95% CI 0.40 to 0.80, very low confidence; noninvasive PC6: RR 0.60, 95% CI 0.51 to 0.70, low confidence; invasive PC6: RR 0.61, 95% CI 0.44 to 0.84, low confidence). The combined use of invasive PC6 and antiemetic(s) (RR 0.31, 95% CI 0.04 to 2.49; low confidence from indirect evidence only) and the combined use of noninvasive PC6 and invasive PC6 may result in little or no difference in the need for rescue antiemetic drug(s), compared to sham (RR 1.41, 95% CI 0.64 to 3.09; low confidence from direct evidence only). Adverse events (side effects) None of the included studies reported serious or long-term complications. Thirty-nine studies, involving 5334 participants, reported minor side effects that go away (e.g. skin irritation, redness, and swelling) with PC6 acupoint stimulation, but the evidence is very uncertain. Publication bias was not apparent in the NMA funnel plots.
Authors' conclusions	NMAs suggest that both invasive and noninvasive PC6 acupoint stimulation combined with antiemetics may reduce PON and POV, compared to sham, and likely lower rescue antiemetic use. PC6 acupoint stimulation may cause minor side effects, but the evidence is very uncertain.

3.1.3. 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. https://doi.org/10.1016/j.jopan.2023.06.096

Purpose	This study aims to assess the impact of nonpharmacological nursing interventions on postoperative nausea and vomiting (PONV).
Design	This is a systematic review.

Methods	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.
Findings	Fifty-eight of 3,874 articles obtained from databases fulfilled the eligibility criteria. This study demonstrated that **acupuncture**, 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.
Conclusions	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.

3.1.4. 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].

Background	Many patients in Germany use naturopathic treatments and complementary medicine. Surveys have shown that many also use them as a concomitant treatment to surgery.
Methods	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).
Results	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. **Acupuncture and acupressure can reduce postoperative nausea and vomiting, as well as pain**. 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.
Conclusion	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.

3.1.5. Lee 2015

Lee A, Chan SKC, Fan LTY. Stimulation of the wrist acupuncture point PC6 for preventing postoperative nausea and vomiting. Cochrane Database Syst Rev. 2015;(11):CD003281. https://doi.org/10.1002/14651858.CD003281.pub4

Background	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.

Objectives	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.
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.
Results	We included **59 trials involving 7667 participants**. 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.

Conclusion	There is low-quality evidence supporting the use of PC6 acupoint stimulation over sham. 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.

3.1.6. 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]. .

Purpose	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.
Methods	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.
Results	**Thirty RCTs, 1276 patients (intervention) and 1258 patients (control)** 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.
Conclusion	**Besides PC6, PC6 combined with other acupoint(s) and other alternative acupoint(s) might be beneficial in prevention and treatment of PONV**.

3.1.7. Lee 2009

Lee A, Fan LTY. Stimulation of the wrist acupuncture point P6 for preventing postoperative nausea and vomiting. Cochrane Database Syst Rev. 2009;(2):CD003281. https://doi.org/10.1002/14651858.CD003281.pub3

Background	Postoperative nausea and vomiting (PONV) are common complications following surgery and anaesthesia. Drugs to prevent PONV are only partially effective. An alternative approach is to stimulate the P6 acupoint on the wrist. This is an update of a Cochrane review first published in 2004.
Objectives	To determine the efficacy and safety of P6 acupoint stimulation in preventing PONV.

Methods	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).
Results	We included **40 trials involving 4858 participants**; 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 were minor. There was no evidence of publication bias from contour-enhanced funnel plots.
Conclusion	P6 acupoint stimulation prevented PONV. There was no reliable evidence for differences in risks of postoperative nausea or vomiting after P6 acupoint stimulation compared to antiemetic drugs.

3.1.8. 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].

Objectives	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.
Methods	With the integration of complementary and alternative medicines in healthcare, this review examined **10 research studies** 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.
Conclusions	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.

3.1.9. 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].

Objective	Using metaanalysis to examine the effects of acustimulations on nausea and vomiting symptoms (NVS) in postoperative adult populations.
Methods	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.
Results	**Twenty-four trials were pooled for nausea, 29 trials for vomiting, and 19 trials for rescue antiemetics, with AS compared with placebo or controls**. 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).
Conclusions	**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**.

3.1.10. 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].

Objective	To analyze and summarize the efficacy and mechanism of acupuncture and moxibustion on postoperative nausea and vomiting (PONV) abroad.
Methods	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.

Data Synthesis	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.
Conclusion	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.

3.1.11. Lee 2004

Lee A, Done ML. Stimulation of the wrist acupuncture point P6 for preventing postoperative nausea and vomiting. Cochrane Database Syst Rev. 2004;(3):CD003281. https://doi.org/10.1002/14651858.CD003281.pub2

Background	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.
Objectives	To determine the efficacy and safety of P6 acupoint stimulation in preventing PONV.
Methods	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.
Results	**Twenty-six trials (n = 3347)** 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.
Conclusion	This systematic review supports the use of P6 acupoint stimulation in patients without antiemetic prophylaxis. Compared with antiemetic prophylaxis, P6 acupoint stimulation seems to reduce the risk of nausea but not vomiting.

3.1.12. 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].

Objectives-methods	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.
Results	Of the 24 randomized trials retrieved by a search of articles indexed on the MEDLINE and EMBASE databases (19801997), **19 were eligible for metaanalysis**. The primary outcomes were the incidence of nausea, vomiting, or both 06 h (early efficacy) or 048 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 0.471.67]; NNT = 63 [10infinity]) and late vomiting (RR = 0.80 [0.351.81]; NNT = 25 [5infinity]) in adults. Nonpharmacologic techniques were better than placebo at preventing early nausea (RR = 0.34 [0.200.58]; NNT = 4 [36]) and early vomiting in adults (RR = 0.47 [0.340.64]; NNT = 5 [48]). Nonpharmacologic techniques were similar to placebo in preventing late vomiting in adults (RR = 0.81 [0.461.42]; NNT = 14 [6infinity]). 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.
Implications	**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**.

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].

Objectives	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.
Background	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.

Methods	The review was undertaken using key words and electronic databases and **included 21 papers** from the years November 1996 until August 2009.
Results	The results indicate that **the application of acupuncture reduced the incidence of nausea but not vomiting when compared with the use of antiemetic prophylaxis alone**.
Conclusions	The results show that there is a lack of knowledge of the best treatment to minimise postoperative nausea and vomiting prior to surgery.
Relevance To Clinical Practice	The overall results of this review conclude that **all kinds of AP stimulation, both non-invasive and invasive, seem to prevent PONV with minimal side effects**. 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.

3.2.2. Neiguan Acupoint (PC6)

3.2.2.1. Li 2026

Li Y, Mao L, Zhao C, Liu M, Yu J, Yang X, et al. Comparative effectiveness of Neiguan acupoint stimulation in preventing postoperative nausea and vomiting following general anesthesia: A network meta-analysis. Complement Ther Med. 2026 Nov 24:103487.
https://doi.org/10.1016/j.ctim.2026.103487

Background	To compare the relative efficacy of different Neiguan (PC6) acupoint stimulation modalities, alone or combined with antiemetics, for preventing postoperative nausea and vomiting (PONV).
Methods	Eleven English and Chinese databases were searched for relevant randomized controlled trials (RCTs) up to March 2026. Primary outcomes were the incidence of PONV, postoperative nausea (PON), and postoperative vomiting (POV). The secondary outcome was the number of patients requiring antiemetic rescue. Risk of bias and certainty of evidence were assessed using the Cochrane RoB 2.0 tool and CINeMA. Frequentist pairwise and network meta-analyses were conducted using Stata 17.0 and R 4.4.1, and interventions were ranked by the surface under the cumulative ranking curve (SUCRA).
Results	**Sixty-three RCTs involving 7,874 participants** and 14 interventions were included. All PC6 stimulation modalities (acupuncture, electroacupuncture, acupressure, or transcutaneous electrical acupoint stimulation [TEAS]) reduced PONV, PON, and POV. No significant differences were observed between any stimulation modality and a single antiemetic. Among the stimulation modalities, electroacupuncture ranked highest overall, followed by TEAS and acupuncture, whereas acupressure ranked lowest. When combined with antiemetics, TEAS plus two antiemetics was most effective for PONV and POV (RR = 0.50, 95% CI: 0.33-0.76; RR = 0.43, 95% CI: 0.27-0.68; SUCRA = 99%, 93%). For PON and the need for antiemetic rescue, acupuncture plus two antiemetics appeared to be the most effective (RR = 0.21, 95% CI: 0.06-0.77; RR = 0.31, 95% CI: 0.12-0.81; SUCRA = 95%, 92%). However, this result was based on a single study. After excluding this comparison in sensitivity analyses, TEAS plus two antiemetics remained the most effective intervention.
Conclusions	Electroacupuncture ranked as the most effective PC6 stimulation modality. The combination of PC6 stimulation and antiemetics was more effective than antiemetics alone, with TEAS plus two antiemetics showing the best overall performance. The certainty of evidence ranged from very low to moderate, highlighting the need for further high-quality studies.

3.2.2.2. Yang 2026 (wearable devices)

Yang X, Chen X, Liu Z, Han F, Zhan M, Lu X, Chen J, Guo X. Effectiveness and mechanisms of wearable Neiguan (P6) stimulation in preventing postoperative nausea and vomiting: A systematic review and meta-analysis. Eur J Integr Med. 2026;83:102628. https://doi.org/10.1016/j.eujim.2026.102628

Background	Postoperative nausea and vomiting (PONV) is a common and distressing complication following surgery. Although acupuncture demonstrates efficacy, wearable P6 (Neiguan) stimulation devices represent a novel, patient-controlled alternative. This systematic review and meta-analysis evaluates the effectiveness of these devices, with particular attention to clinical heterogeneity and the influence of various control interventions.
Methods	A PRISMA-compliant systematic review and meta-analysis was conducted. An expanded search of five electronic databases, including PubMed, Web of Science, and Embase, was performed from inception to January 2025 using comprehensive terms related to wearable acupoint stimulation devices. Due to clinical heterogeneity, Mantel–Haenszel random-effects models were used to pool relative risks (RRs) and 95 % confidence intervals (CIs). Subgroup analyses were conducted to distinguish comparisons against sham stimulation from those against active antiemetics. The certainty of evidence was evaluated using the GRADE framework.
Results	A total of eleven RCTs were identified, with six included in the quantitative synthesis. In the subgroup analysis comparing wearable devices to sham stimulation (five trials), wearable devices significantly reduced the incidence of postoperative nausea and vomiting (PONV) (RR = 0.57, 95 % CI: 0.49–0.67; I2 = 0 %), resulting in an absolute risk reduction of 25 % and a number needed to treat (NNT) of 4. In the comparison with ondansetron (one trial), wearable devices demonstrated superior efficacy (RR = 0.64, 95 % CI: 0.43–0.96). Qualitative synthesis of the remaining five trials indicated that wearable stimulation, when used as an adjunct to pharmacotherapy, significantly improved recovery quality, reduced the need for rescue antiemetics, and shortened hospital stays. Leave-one-out sensitivity analyses confirmed the robustness of these findings. Assessment of publication bias was attempted, but was not feasible due to the small number of studies included in the quantitative synthesis. The overall certainty of evidence was rated as moderate.
Conclusion	P6 stimulation using wearable devices is an effective adjunctive therapy for PONV prevention. Future RCTs should emphasize age-stratified analyses, protocol standardization, and high-quality sham-controlled designs.

3.2.2.3. 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

Background	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.
Methods	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.

Results	**Sixteen literatures and 1773 patients** 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).
Conclusion	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.

3.2.2.4. 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].

Background	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.
Objectives	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.
Methods	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.

Main Results	We included **59 trials involving 7667 participants**. 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.
Authors' Conclusions	**There is low-quality evidence supporting the use of PC6 acupoint stimulation over sham**. 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.

3.2.2.5. 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].

Objective	To compare the effectiveness of P6 stimulation and sham stimulation/ drug intervention on prevention of postoperative nausea and vomiting (PONV).
Methods	

Results	A total of **21 studies were included**. 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<0.000 01), postoperative early nausea (<after surgery 6 h) (P=0.000 6) 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<0.0.000 1) 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).
Conclusion	**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**. 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.

3.2.2.6. 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

Purpose	To determine the efficacy and safety of P6 acupoint stimulation in preventing PONV.
Methods	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).
Results	We included **40 trials involving 4858 participants**; 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.
Conclusion	**P6 acupoint stimulation prevented PONV**. There was no reliable evidence for differences in risks of postoperative nausea or vomiting after P6 acupoint stimulation compared to antiemetic drugs.

3.2.2.7. 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].

Background	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.
Objectives	To determine the efficacy and safety of P6 acupoint stimulation in preventing PONV.
Methods	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.
Main results	**Twenty-six trials (n = 3347)** 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.
Reviewers' conclusions	**This systematic review supports the use of P6 acupoint stimulation in patients without antiemetic prophylaxis**. Compared with antiemetic prophylaxis, P6 acupoint stimulation seems to reduce the risk of nausea but not vomiting.

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].

Methods	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.

Results	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).
Conclusions	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].

Objective	To examine the impact of acupressure wristbands encircling the wrist and compressing Neiguan acupuncture point on prevention of postoperative nausea and vomiting in adults.
Methods	MEDLINE, CNKI and other databases were searched, and the randomized controlled trials were enrolled and analysed with Revman 5.0.
Results	**Nine studies were recruited**. 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).
Conclusion	**Usage of acupressure wristbands encircling the wrist and compressing Neiguan acupuncture point can ease postoperative vomiting, but it cannot reduce postoperative nausea**. 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. Wang 2026 (gynecological laparoscopic surgery)

Wang K, Xiang S, Zuo H, Wu S. Effect of transcutaneous electrical acupoint stimulation on recovery following gynecological laparoscopic surgery: a meta-analysis. BMC Surg. 2026;26(1):400. https://doi.org/10.1186/s12893-026-03730-5

Background	This meta-analysis aimed to evaluate the efficacy of transcutaneous electrical acupoint stimulation (TEAS) for postoperative recovery following gynecological laparoscopic surgery.
Methods	Seven electronic databases (CNKI, Wanfang, VIP, Embase, Web of Science, PubMed, and Cochrane Library) were searched up to September 24, 2025. Continuous outcomes were pooled as mean differences (MDs) and dichotomous outcomes as risk ratios (RRs), both with 95% confidence intervals. Risk of bias was assessed using the Cochrane Risk of Bias tool (RoB 1). Sensitivity analyses and publication bias assessments were performed. Meta-analysis was conducted using Stata 15.0 and Review Manager 5.4.
Results	**Thirty randomized controlled trials involving 2,573 patients** were included. TEAS significantly reduced postoperative pain at 6 hours [MD=-0.64, 95% CI: -1.17 to -0.12], 12 hours [MD=-0.85, 95% CI: -1.35 to -0.35], 24 hours [MD=-0.92, 95% CI: -1.29 to -0.55], and 48 hours [MD=-0.75, 95% CI: -1.30 to -0.20]. TEAS also reduced the incidence of postoperative nausea and vomiting (PONV) [RR=0.50, 95% CI: 0.44-0.57], shortened the time to first flatus [MD=-7.52, 95% CI: -10.17 to -4.87], first defecation [MD=-15.12, 95% CI: -21.97 to -8.26], and bowel sound recovery [MD=-4.80, 95% CI: -7.67 to -1.93]. In addition, TEAS significantly improved Quality of Recovery-15 (QoR-15) scores [MD=2.87, 95% CI: 1.15-4.60] and Mini-Mental State Examination (MMSE) scores [MD=1.80, 95% CI: 0.40-3.19].
Conclusions	Current evidence suggests that TEAS may improve postoperative recovery after gynecological laparoscopic surgery, particularly by reducing pain, postoperative nausea and vomiting, and accelerating gastrointestinal recovery. However, the certainty of the evidence is limited by methodological weaknesses, heterogeneity, and the overall quality of the included studies. Further high-quality randomized controlled trials are needed to confirm these findings.

3.2.4.2. Yuan 2025 (laparoscopic surgery)

Yuan L, Quan SJ, Li XY, Chen BZ, Huang YB, Zheng H. Transcutaneous electrical acupoint stimulation for preventing postoperative nausea and vomiting after laparoscopic surgery: A meta-analysis. J Nurs Scholarsh. 2025 May;57(3):371-379. https://doi.org/10.1111/jnu.13033

Background	Postoperative nausea and vomiting (PONV) is a common adverse event after general surgery. This study aimed to examine the effectiveness and safety of transcutaneous electrical acupoint stimulation (TEAS) for the prevention of nausea and vomiting after laparoscopic surgery.
Methods	The Cochrane Library, Pubmed, Embase, and Web of Science databases were accessed from inception to 23 January 2024. The incidence of PONV was the primary outcome measure. The required information size (RIS) of each outcome was estimated by Trial sequential analysis (TSA). The RoB 2.0 tool was used to assess the risk of bias and GRADE to assess the quality of evidence.
Results	Seventeen RCTs including 3698 participants were included. In comparison to the control group, TEAS reduced the incidence of PONV (13 trials, n = 3310; RR, 0.56; 95% CI, 0.46-0.67; I2 = 64%; p < 0.01; RIS = 1100), with the level of evidence graded as low. TEAS reduced the incidence of PON (9 trials, n = 2762; RR, 0.64; 95% CI, 0.52-0.79; I2 = 57%, p < 0.01; RIS = 1595), and was also associated with a lower incidence of POV (9 trials, n = 2797; RR, 0.53; 95% CI, 0.45-0.63; I2 = 0%, p < 0.01; RIS = 773).
Conclusion	The current meta-analysis and TSA provide reliable evidence that TEAS is an effective and safe method to prevent PONV. It may reduce the workload of nursing professionals, alleviate emotional stress, and decrease exposure risk. Adverse events related to TEAS were mild. Clinical relevance: Nurses can incorporate TEAS into the rehabilitation nursing of patients experiencing PONV.

3.2.4.3. 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.0000000000034834. https://pubmed.ncbi.nlm.nih.gov/37657060; PMCID: PMC10476788.

Background	This systematic review and meta-analysis aimed to evaluate the efficacy of transcutaneous electronic acupoint stimulation (TEAS) for improving postoperative recovery after gynecologic surgery.
Methods	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.
Results	Our analysis found that **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 < .001)**, 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.
Conclusions	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.

3.2.4.4. 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

Backgound	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.
Material and methods	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.

Results	**Eight randomized controlled trials, with 899 total participants**, 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^2=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^2=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^2=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^2=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.
Conclusions	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.

3.2.4.5. 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

Background	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.
Methods	PubMed, Embase, Cochrane Library, Web of Science, and ClinicalTrials.gov were searched from inception to March 19, 2020.
Results	**Twenty-six studies (2064 patients)** 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.
Conclusions	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.

3.2.4.6. 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

Objective	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.
Methods	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.
Results	**Fourteen RCTs (1653 participants)** 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.
Conclusions	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 2025

Zhou T, Hou H, Cairen Z, Wang Y, Wang P, Ge L, Wa M, Xu Z, Tang F, Wang C, Liu R, Li D, Xue J, Zhang S. Comparative effectiveness of acupoint stimulation for preventing postoperative nausea and vomiting after general anesthesia: a network meta-analysis of randomized trials. Int J Surg. 2025 Jan 1;111(1):1330-1347. https://doi.org/10.1097/JS9.0000000000001976

Objective	The objective was to systematically evaluate the effectiveness of different acupoint stimulation techniques in preventing postoperative nausea and vomiting (PONV) after general anesthesia.
Methods	The authors searched PubMed, Cochrane Library, Web of Science, and Embase for relevant papers, about the effect of acupoint stimulation for preventing PONV from their inception to 31 July 2023. Two reviewers performed study screening, data extraction, and risk of bias assessment. The authors 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. The authors conducted network meta-analyses to estimate the relative effectiveness between different acupoint stimulation using Stata 17.0 and Revman 5.3 software.
Results	The authors included **50 randomized trials** involving **7372 participants** (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: 0.36-0.69), but could not significantly reduce the incidence of PONV and PON (RR 0.49, 95% CI: 0.36-0.69; RR 0.81, 95% CI: 0.59-1.10; 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.
Conclusions	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

Background	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.
Methods	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.
Results	**Sixteen literatures and 1773 patients** 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).
Conclusion	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].

Objectives/Hypothesis	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.

Methods	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).
Results	The search identified 415 publications. After screening, we selected eight articles for review (**4 RCTs**, 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).
Conclusion	**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**. 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].

Objective	Using metaanalysis, we sought to determine acustimulation (AS) effects on postoperative nausea and vomiting (PONV) in children.
Methods	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.
Results	**Twelve RCTs** 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).
Conclusions	**This metaanalysis demonstrated that acupressure and acupuncture are effective treatment modalities to reduce postoperative vomiting in children**. 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].

Background	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.
Objectives & methods	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.
Results	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 serotinergic 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). **There is not sufficient evidence** to suggest that dimenhydrinate, perphenazine or droperidol, in the doses studied, are efficacious, nor were gastric aspiration or **acupuncture**. In conclusion, dexamethasone and the anti-serotinergic 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

Background	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.
Objective	This network meta-analysis aimed to evaluate the effectiveness of different acupuncture therapies used for preventing PONV in abdominal operation. METHODS: 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.

Results	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.
Conclusion	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. Chen 2026

Chen J, Sheng H. Efficacy of transcutaneous electrical acupoint stimulation for the prevention of postoperative nausea and vomiting after laparoscopic surgery: a Meta-analysis. Zhongguo Zhen Jiu. 2026;46(4):655-668. https://doi.org/10.13703/j.0255-2930.20240915-k0001

Background	Postoperative nausea and vomiting (PONV) remain common complications after laparoscopic surgery. Transcutaneous electrical acupoint stimulation (TEAS) has been proposed as a non-invasive adjunctive intervention for prevention and treatment, but its efficacy requires systematic evaluation.
Objective	To systematically evaluate the efficacy of transcutaneous electrical acupoint stimulation (TEAS) in the prevention and treatment of postoperative nausea and vomiting (PONV) after laparoscopic surgery.
Methods	Computerized searches were conducted in SinoMed, CNKI, Wanfang, VIP, Duxiu, PubMed, EMbase, Web of Science, Cochrane Library, Scopus, ProQuest, and Ovid from inception to June 6, 2024. Randomized controlled trials (RCTs) on TEAS for PONV after laparoscopic surgery were included. Two researchers independently performed study selection, data extraction, and quality assessment. Meta-analysis was conducted using RevMan5.3 and StataMP14.
Results	A total of **33 studies involving 6,271 patients** were included (3,372 in the TEAS group and 2,899 in the control group). Compared with controls, TEAS significantly reduced the incidence of PONV within 24 hours [RR=0.52, 95% CI (0.46, 0.58), P<0.00001], reduced the need for rescue antiemetic medication [RR=0.68, 95% CI (0.55, 0.85), P<0.001], and decreased PONV severity scores within 48 hours [MD=-0.67, 95% CI (-0.92, -0.41), P<0.00001].
Conclusion	TEAS effectively reduces the incidence and severity of PONV and decreases the requirement for rescue antiemetics after laparoscopic surgery, suggesting a beneficial role in postoperative recovery.

3.3.3.2. 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

Backgound	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.
Methods	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.
Results	**Five RCTs and 366 patients** 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).
Conclusions	Acupuncture may be effective to reduce pain intensity, nausea, and vomiting for laparoscopic cholecystectomy.

3.3.3.3. Yuan 2025

Yuan L, Quan SJ, Li XY, Chen BZ, Huang YB, Zheng H. Transcutaneous electrical acupoint stimulation for preventing postoperative nausea and vomiting after laparoscopic surgery: A meta-analysis. J Nurs Scholarsh. 2025 May;57(3):371-379. https://doi.org/10.1111/jnu.13033

Background	Postoperative nausea and vomiting (PONV) is a common adverse event after general surgery. This study aimed to examine the effectiveness and safety of transcutaneous electrical acupoint stimulation (TEAS) for the prevention of nausea and vomiting after laparoscopic surgery.
Methods	The Cochrane Library, Pubmed, Embase, and Web of Science databases were accessed from inception to 23 January 2024. The incidence of PONV was the primary outcome measure. The required information size (RIS) of each outcome was estimated by Trial sequential analysis (TSA). The RoB 2.0 tool was used to assess the risk of bias and GRADE to assess the quality of evidence.
Results	Seventeen RCTs including 3698 participants were included. In comparison to the control group, TEAS reduced the incidence of PONV (13 trials, n = 3310; RR, 0.56; 95% CI, 0.46-0.67; I2 = 64%; p < 0.01; RIS = 1100), with the level of evidence graded as low. TEAS reduced the incidence of PON (9 trials, n = 2762; RR, 0.64; 95% CI, 0.52-0.79; I2 = 57%, p < 0.01; RIS = 1595), and was also associated with a lower incidence of POV (9 trials, n = 2797; RR, 0.53; 95% CI, 0.45-0.63; I2 = 0%, p < 0.01; RIS = 773).
Conclusion	The current meta-analysis and TSA provide reliable evidence that TEAS is an effective and safe method to prevent PONV. It may reduce the workload of nursing professionals, alleviate emotional stress, and decrease exposure risk. Adverse events related to TEAS were mild. Clinical relevance: Nurses can incorporate TEAS into the rehabilitation nursing of patients experiencing PONV.

3.3.3.4. 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.0000000000034678

Background	To evaluate the efficacy and safety of acupuncture by systematically reviewing the literature on colorectal cancer resection.
Methods	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 (I2) statistics.
Results	**Twenty-two studies with 1878 patients** 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, I2 = 89%), time to first bowel movement (n = 671, MD -1.41h, 95% CI -2.20 to -0.63 h, I2 = 95%), time to first defecation (n = 556, MD -1.03h, 95% CI -1.88 to -0.18 h, I2 = 95%), and **nausea/vomiting** (n = 1488, RR 0.72, 95% CI 0.59-0.89, I2 = 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, I2 = 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.
Conclusion subsections	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].

Background	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.
Methods	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).
Results	**Fourteen randomized controlled trials with a total of 1009 female participants** 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.
Conclusion	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].

Objectives/Hypothesis	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.

Methods	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).
Results	The search identified 415 publications. After screening, we selected eight articles for review (**4 RCTs**, 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, $P < 0.05$).
Conclusion	**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**. 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].

Objectives	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.
Methods	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.
Results	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, **the incidence of postoperative nausea and vomiting was significantly lower in the acupuncture group than in the control group**. No major adverse effects of perioperative acupuncture were reported in the enrolled studies.
Conclusion	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].

Background	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.
Objectives & methods	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.
Results	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 serotinergic 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). **There is not sufficient evidence** to suggest that dimenhydrinate, perphenazine or droperidol, in the doses studied, are efficacious, nor were gastric aspiration or **acupuncture**. In conclusion, dexamethasone and the anti-serotinergic 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

Background	Nausea and vomiting are distressing symptoms which are experienced commonly during caesarean section under regional anaesthesia and in the postoperative period.
Objectives	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.
Methods	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.

Main results	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). **Acupressure**: 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.

Authors' conclusions	This review indicates that 5-HT3 antagonists, dopamine antagonists, corticosteroids, sedatives and **acupressure** 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.

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].

Background	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.
Methods	
Results	**Six studies involving 649 patients** 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.
Conclusions	While some studies showed a benefit of P6 stimulation, **this finding was not consistent**. 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

Background	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.
Methods	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.

Results	A total of **nine randomized clinical trials** 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.
Conclusions	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)
Ø negative recommendation (or lack of evidence)

4.1. Chinese Society of Anesthesiology 2025 ⊕

Hu J, Wang Z, Ma B, Wang T, Wang E, Yu W; Chinese Society of Anesthesiology Working Group on Clinical Practice Guidelines for the Prevention and Management of Postoperative Nausea and Vomiting (2025 Edition). Clinical practice guidelines for the prevention and management of postoperative nausea and vomiting (2025 edition). J Anesth Transl Med. 2025 Dec 27;4(4):286-302. https://doi.org/10.1016/j.jatmed.2025.12.002

Clinical question 17: Should acupoint stimulation be used to prevent and treat PONV? *Recommendation 17.1*: Acupoint stimulation is suggested to reduce the incidence of PONV (weak recommendation, very low-quality evidence). **Recommendation 17.2**: Acupoint stimulation is suggested to increase the complete PONV response rates (GPS).
Clinical question 18: Should auricular stimulation be used to prevent and treat PONV? *Recommendation 18*: Auricular stimulation is suggested to reduce the incidence of PON (weak recommendation, very low-quality evidence).
Clinical question 21: What about combination regimens of drugs plus acupoint stimulation? *Recommendation 21.2*: For patients at moderate or high risk of PONV with concerns about medication use, a two- or three-drug regimen combined with acupoint stimulation is suggested (GPS).

4.2. Fifth Consensus Guidelines for the Management of Postoperative Nausea and Vomiting (International) 2025 ⊕

- Gan TJ, Jin Z, Ayad S, Belani KG, Habib AS, Meyer TA, Urman RD, Andrew BY, Bergese SD, Chung F, Diemunsch P, Kovac AL, Candiotti K, Englesakis M, Grant MC, Hedrick TL, Huang H, Kranke P, Lloyd SJ, Manahan MA, Minkowitz HS, Philip BK, Phillips BJ, Simpson KD, Stever J. Fifth Consensus Guidelines for the Management of Postoperative Nausea and Vomiting: Executive Summary. Anesth Analg. 2025 Nov 14. https://doi.org/10.1213/ANE.0000000000007816
- Fifth Consensus Guidelines for the Management of Postoperative Nausea and Vomiting - Full Report. https://cdn-links.lww.com/permalink/aa/f/aa_1_1_2025_11_24_cd_1_sdc1.pdf

PONV PROPHYLAXIS. Adults. Acupoint stimulation at the 6th point of the pericardial meridian (PC6) stimulation is comparable to pharmacological PONV prophylaxis (A1). Combination Therapy. Acupoint stimulation/ acupuncture (PC6, LI4, ST 36) + 1-3 antiemetics (A2). Acupoint stimulation (including acupuncture and electrostimulation) consistently demonstrated efficacy when used in addition to 5-HT3 receptor antagonists and dexamethasone (A1).1 This may be particularly useful in high-risk patients or procedures who require 3 or more prophylactic interventions. Pediatric patient. Acupuncture (PC6) (A1)

4.3. 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]

4.4. Fourth Consensus Guidelines for the Management of Postoperative Nausea and Vomiting (International) 2020 ⊕

Gan TJ, Belani KG, Bergese S, Chung F, Diemunsch P, Habib AS, Jin Z, Kovac AL, Meyer TA, Urman RD, Apfel CC, Ayad S, Beagley L, Candiotti K, Englesakis M, Hedrick TL, Kranke P, Lee S, Lipman D, Minkowitz HS, Morton J, Philip BK. Fourth Consensus Guidelines for the Management of Postoperative Nausea and Vomiting. Anesth Analg. 2020 Aug;131(2):411-448. https://doi.org/10.1213/ANE.0000000000004833

Nonpharmacologic Prophylaxis. Acupuncture (evidence A1). *Nonpharmacological Therapies in Children.* Acupuncture (evidence A3)

4.5. 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.

4.6. 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

4.7. Aetna (insurance provider, USA) 2018 ⊕

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

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

4.8. 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

4.9. 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.

4.10. Australian and New Zealand College of Anaesthetists (ANZCA, Autralia-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]).

4.11. Society for Ambulatory Anesthesia (SAMBA, USA) 2014 ⊕

Gan TJ, Diemunsch P, Habib AS, Kovac A, Kranke P, Meyer TA, Watcha M, Chung F, Angus S, Apfel CC, Bergese SD, Candiotti KA, Chan MT, Davis PJ, Hooper VD, Lagoo-Deenadayalan S, Myles P, Nezat G, Philip BK, Tramèr MR; Society for Ambulatory Anesthesia. Consensus guidelines for the management of postoperative nausea and vomiting. Anesth Analg. 2014 Jan;118(1):85-113. https://doi.org/10.1213/ANE.0000000000000002

Nonpharmacologic Prophylaxis. *Adults.* A meta-analysis of 40 articles including 4858 subjects226 concluded that P6 stimulation with 10 different acupuncture modalities reduces nausea, vomiting, and the need for rescue antiemetics compared with sham stimulation (Evidence A1). The efficacy of P6 stimulation is similar to that of prophylactic antiemetics such as ondansetron, droperidol, metoclopramide, cyclizine, and prochlorperazine. In subgroup analysis, there was no difference in effectiveness in adults compared with children or invasive versus noninvasive modalities for P6 stimulation. *Children.* Two meta-analyses showed acupuncture and acustimulation were effective in reducing POV in children.290,291 Pooled data from 12 studies showed all modalities reduce vomiting (risk reduction 0.69, 95% CI, 0.59–0.8).

4.12. 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** .

4.13. 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]

4.14. 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.

4.15. Société française d’anesthésie et de réanimation (SFAR, France) 2008 ⊕

Diemunsch P. Conférence d’experts – Texte court. Prise en charge des nausées et vomissements postopératoires. Ann Fr Anesth Reanim. 2008;27:866-878. https://sfar.org/wp-content/uploads/2015/10/2_AFAR_Prise-en-charge-des-nausees-et-vomissements-postoperatoires.pdf

Recommandation : chez les patients à risque de NVPO qui sont opposés à une prophylaxie pharmacologique et qui recherchent des alternatives thérapeutiques, une technique par stimulation de points d’acupuncture peut être considérée (G2+)

4.16. 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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