# INPLASY PROTOCOL

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**None declared.**

# Acupuncture for prevention of chronic pain after surgery: A systematic review and meta-analysis preventing chronic postoperative pain

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**Review question / Objective:** **Chronic postsurgical pain (CPSP) is defined as the pain that persists for at least 3 months after a surgical procedure, with a prevalence of 5%-80% depending on the type of surgery and other risk factors. CPSP is accumulatively recognized for associating with poor general health, disability, anxiety, depression, social withdrawal, and increasing the risk of further comorbidities, and has become a prominent medical and socio-economic issue. Acupuncture is often used for releasing acute or chronic pain, however, there is a lack of systematic review of the effect of acupuncture for prevention chronic pain after surgery. Therefore, it is of great significance to carry out this systematic review and meta-analysis of randomized controlled trials and cohort studies to evaluate the efficacy and safety of acupuncture on prevention chronic pain after surgery.**

**INPLASY registration number:** This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 12 May 2022 and was last updated on 12 May 2022 (registration number INPLASY202250077).

## INTRODUCTION

**Review question / Objective:** **Chronic postsurgical pain (CPSP) is defined as the pain that persists for at least 3 months after a surgical procedure, with a prevalence of 5%-80% depending on the type of surgery and other risk factors. CPSP is accumulatively recognized for associating with poor general health, disability, anxiety, depression, social withdrawal, and increasing the risk of further comorbidities, and has become a prominent medical and socio-economic issue. Acupuncture is often used for releasing acute or chronic pain, however, there is a lack of systematic review of the effect of acupuncture for prevention**

chronic pain after surgery. Therefore, it is of great significance to carry out this systematic review and meta-analysis of randomized controlled trials and cohort studies to evaluate the efficacy and safety of acupuncture on prevention chronic pain after surgery.

**Condition being studied:** CPSP develops after acute pain, the transition from acute to chronic pain is a complex process. CPSP impacts 5% to 80% of patients after surgery such as mastectomy, cardiac surgery, hysterectomy, hernia repair, joint replacement, back surgery as well as some minor surgery procedures. As more than 320 million people undergo surgery each year in the worldwide scale, CPSP emerges to be a tremendous potential problem. CPSP causes not only poor general health, disability, anxiety, depression, social withdrawal, and more risk of further comorbidities, but also substance abuse, since most pharmacological interventions are useless in preventing CPSP. Acupuncture, used in China for 3,000 years, is a potentially valuable adjunct for pain relief. Clinically, acupuncture is widely used to manage chronic pain, such as non-specific musculoskeletal pain, chronic headache, osteoarthritis pain, back pain, neck pain, Shoulder pain. Acupuncture was significantly superior to sham acupuncture and no acupuncture in decreasing chronic pain, however, there is a dearth of systematic evaluation research on the effectiveness of acupuncture on prevention chronic pain after surgery. Therefore, it is of great significance to carry out this systematic review and meta-analysis to evaluate the efficacy and safety of acupuncture on prevention chronic pain after surgery.

## METHODS

**Search strategy:** We will search articles in 7 English databases including: PubMed MEDLINE, Cochrane Library, EMbase, ISI the Web of Science, ProQuest, Ovid MEDLINE and Scopus Database from their inception to present in any language. All the English and Chinese publications until 30 April 2022 will be searched without any restriction of countries. We performed an initial search of PubMed as follows: ((("Pain, Postoperative"[Mesh]) OR ((((((((((((((((((((((((((Post-surgical Pain[Title/Abstract]) OR (Pain, Post-surgical[Title/Abstract])) OR (Post surgical Pain[Title/Abstract])) OR (Pain, Post-operative[Title/Abstract])) OR (Pain, Post operative[Title/Abstract])) OR (Postsurgical Pain[Title/Abstract])) OR (Pain, Postsurgical[Title/Abstract])) OR (Post-operative Pain[Title/Abstract])) OR (Post operative Pain[Title/Abstract])) OR (Post-operative Pains[Title/Abstract])) OR (Postoperative Pain[Title/Abstract])) OR (post-operative analgesi*[Title/Abstract])) OR (postoperative analgesi*[Title/Abstract])) OR (pain relief after surg*[Title/Abstract])) OR (pain relief after operat*[Title/Abstract])) OR (posttreatment pain*[Title/Abstract])) OR (pain control after surg*[Title/Abstract])) OR (pain control after operat*[Title/Abstract])) OR ((post-extraction[Title/Abstract] OR postextraction[Title/Abstract] OR post-surg*[Title/Abstract]) AND (pain*[Title/Abstract] OR discomfort[Title/Abstract]))) OR (analgesi* postoperat*[Title/Abstract])) OR (analgesi* post-operat*[Title/Abstract])) OR (pain* after surg*[Title/Abstract])) OR (pain* after operat*[Title/Abstract])) OR (analgesi* after operat*[Title/Abstract])) OR (analgesi* after surg*[Title/Abstract])) OR (pain* follow* operat*[Title/Abstract])) OR (pain* follow* surg*[Title/Abstract])) OR (analgesi* follow* operat*[Title/Abstract])) OR (analgesi* follow* surg*[Title/Abstract])))) OR ((((pain*[Title/Abstract]) OR (discomfort[Title/Abstract])) OR (analgesi*[Title/Abstract])) AND ((((((((((Mastectomy[Title/Abstract]) OR (Postmastectomy[Title/Abstract])) OR (post-mastectomy[Title/Abstract])) OR (hernia[Title/Abstract])) OR (herniorrhaphy[Title/Abstract])) OR (amputat*[Title/Abstract])) OR (thoracotomy[Title/Abstract])) OR (pneumonectomy[Title/Abstract])) OR (lobectomy[Title/Abstract])) OR (sternotomy[Title/Abstract]))))) AND ((((((((((chronic*[Title/Abstract]) OR (constant*[Title/Abstract])) OR (continu*[Title/Abstract])) OR (persist*[Title/

Abstract])) OR (longterm[Title/Abstract])) OR (long-term[Title/Abstract])) OR (longstanding[Title/Abstract])) OR (long-standing[Title/Abstract])) OR (long lasting[Title/Abstract])) OR (longlasting[Title/Abstract])) OR (phantom[Title/Abstract])).

**Participant or population:** Inclusion criteria:1. patients undergoing selected surgery;2. there is no limitation on sex, age, race, disease category, et al; 3. there is no limitation of anesthesia.Exclusion criteria:1. the adjacent nerves of acupoints are confirmed to have impaired function and hypoesthesia due to cervical spondylosis or trauma;2. there is local infection or chronic inflammation on the surface of the acupoint stimulation site, or the electrode cannot be applied;3. patients with severe central system diseases, rheumatic immune system diseases and severe mental diseases before operation;4. patients who have participated in other clinical trials in recent 4 weeks;5. patients who cannot cooperate to complete the study plan, including those with language difficulties, infectious diseases or other medical history.

**Intervention:** Inclusion criteria: 1.Patients receiving selected surgery with perioperative acupuncture therapy; 2.There is no limitation on the acupuncture therapies in the experimental group, including acupuncture, electroacupuncture, transcutaneous electrical acupoint stimulation, auricular acupuncture, et al;3.The intervention time, frequency, and the electrical stimulation wave of acupuncture is not limited;4.There is no limitation on the method of anesthesia during surgery.Exclusion criteria: 1. Animal experiments; 2. No acupoints or main and collateral channels are involved.

**Comparator:** Inclusion criteria: The control group underwent sham-acupuncture or blank control; Exclusion criteria: Compared with the other treatment group, underwent different frequency, waveform, intervention time, or other stimulation factor of acupuncture.

**Study designs to be included:** RCTs and cohort studie.

**Eligibility criteria:** Inclusion criteria: (1) article type of randomized controlled trial (RCT) and cohort studies; (2) the intervention in experimental group is acupuncture; (3) articles involved in evaluating the effectiveness of acupuncture on chronic pain after surgery.Exclusion criteria: (1) article type of comments, case reports, crossover studies, letters, editorials, review articles, meta-analysis and retrospective studies;(2) studies of animal experiments;(3) studies involving data that cannot be extracted or lacking of adequate data.The following information will be extracted from each study: the first author's name, publication year, country, sample size, type of surgery, type of anesthesia, details of acupuncture intervention, outcomes of interest.

**Information sources:** We will search articles in 7 English databases including: PubMed MEDLINE, Cochrane Library, EMbase, ISI the Web of Science, ProQuest, Ovid MEDLINE and Scopus Database. All the English publications until 30 November 2021 will be searched without any restriction of countries or article type. Reference list of all selected articles will independently screened to identify additional studies left out in the initial search. We also further searched the grey literature and the retrieved references to avoid omission. For the literature to be difficult to obtain the full text, we checked and identify the ongoing or unpublished studies through the World Health Organization International Clinical Trials Registry Platform (WHO ICTRP) ClinicalTrials.gov, Chinese Clinical Trial Registry (Chi CTR), and the reference list of eligible RCTs.

**Main outcome(s):** The incidence of chronic pain after at 3 months surgery, and pain score at 3 months after surgery.

**Additional outcome(s):** Quality of recovery and quality of life.

**Quality assessment / Risk of bias analysis:** Two authors will evaluate the risk of bias of included studies using the Cochrane Risk of Bias Tool, based on the following criteria: (1) random sequence generation, (2) allocation concealment, (3) blinding of participants and personnel, (4) blinding of outcome assessment, (5) incomplete outcome, (6) selective reporting, (7) other bias. The modified Jadad scale will be used to evaluate the literature. Generation, randomization, concealment, blindness, withdrawal and withdrawal will be scored. The score is 0-7, of which 4-7 is high-quality literature. The quality of literature will be evaluated by two researchers independently, and if there will be any inconsistencies, they will discuss and solve them.

**Strategy of data synthesis:** Analyses will be conducted using STATA version 16, and RevMan version 5.3. Heterogeneity between trials will be identified using the $\chi^2$ test and $I^2$ statistic. If heterogeneity exists, random-effects model will be selected for analysis, otherwise, fixed-effects model will be selected. Sensitivity analyses and meta-regression will be performed to analyze the initial data, and the Grading of Recommendations on Assessment, Development, and Evaluation (GRADE) system will be adopted to test the rationality of our findings and to gain a more conservative evaluation. When at least ten trials are available, funnel plots and Egger's test for asymmetry will be used to assess publication bias.

**Subgroup analysis:** We will conduct subgroup analyses of the study from four aspects: 1. the types of anesthesia; 2. the types of surgery; 3. the details of the intervention of acupuncture; 4. kinds of intervention used for control group; 5. genders of patients.

**Sensitivity analysis:** Sensitivity analysis will be used to test reliability and stability of the systematic review results, and to assess the source of heterogeneity. We will compare the results before and after by excluding trials with a high risk of bias or eliminating trials with a high risk of bias or eliminating each study individually one study each time and then pooling the remaining studies.

**Country(ies) involved:** China.

**Keywords:** acupuncture; chronic pain; Chronic postsurgical pain; surgery.

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