

# INPLASY PROTOCOL

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None declared.

## Risk Factors of Intraoperative Pressure Injuries in Patients Undergoing Cardiovascular Surgery: A Systematic Review and Meta- analysis

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**Review question / Objective:** Patients undergoing cardiovascular surgery are most likely to develop pressure injuries , with an incidence of 29.5% . In the course of treatment, PI is affected by the physiological status and treatment methods of patients' existing diseases, which leads to difficult cure and high recurrence rate, which increases the risk of death and readmission rate of hospitalized patients, thus wasting medical resources. The global incidence of PI has remained high in the past 20 years. The incidence of PI in the United Kingdom and the Netherlands is as high as 21.8% and 23% respectively. In 2014, the National Health Commission issued rules for quality nursing services, pointing out that medical institutions at all levels should control the risk of stress injury and improve the efficiency of prevention to reduce the incidence. At present, most of the studies on risk factors of PI in patients undergoing cardiovascular surgery are single-center studies, and the sample size and conclusions are different. Studies include cardiovascular surgery patients and acute or critically ill patients, but the conclusions are lack of pertinence. Therefore, this study conducted Meta analysis on the risk factors of PI in patients undergoing cardiovascular surgery published at home and abroad, in order to provide a basis for early clinical identification and prevention of PI.

**INPLASY registration number:** This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 09 May 2023 and was last updated on 09 May 2023 (registration number INPLASY202350035).

### INTRODUCTION

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with an incidence of 29.5% . In the course of treatment, PI is affected by the physiological status and treatment methods of patients' existing diseases, which leads to difficult cure and high

recurrence rate, which increases the risk of death and readmission rate of hospitalized patients, thus wasting medical resources. The global incidence of PI has remained high in the past 20 years. The incidence of PI in the United Kingdom and the Netherlands is as high as 21.8% and 23% respectively. In 2014, the National Health Commission issued rules for quality nursing services, pointing out that medical institutions at all levels should control the risk of stress injury and improve the efficiency of prevention to reduce the incidence. At present, most of the studies on risk factors of PI in patients undergoing cardiovascular surgery are single-center studies, and the sample size and conclusions are different. Studies include cardiovascular surgery patients and acute or critically ill patients, but the conclusions are lack of pertinence. Therefore, this study conducted Meta analysis on the risk factors of PI in patients undergoing cardiovascular surgery published at home and abroad, in order to provide a basis for early clinical identification and prevention of PI.

**Condition being studied:** Patients undergoing cardiovascular surgery are most likely to develop pressure injuries, with an incidence of 29.5% . In the course of treatment, PI is affected by the physiological status and treatment methods of patients' existing diseases, which leads to difficult cure and high recurrence rate, which increases the risk of death and readmission rate of hospitalized patients, thus wasting medical resources. The global incidence of PI has remained high in the past 20 years. The incidence of PI in the United Kingdom and the Netherlands is as high as 21.8% and 23% respectively.

## METHODS

**Search strategy:** PubMed database retrieval strategy:

#1 Search: (((((((((Coronary heart disease [MeSH Terms]) OR (Cardiovascular Diseases[MeSH Terms])) OR (cardiac surgery[MeSH Terms])) OR (cardiovascular surgery[MeSH Terms])) OR (Coronary heart

disease[Title/Abstract])) OR (Cardiovascular Diseases , [Title/Abstract])) OR (Coronary Disease[Title/Abstract])) OR (myocardial infarction[Title/Abstract])) OR (cardiac surgery[Title/Abstract])) OR (cardiovascular surgery[Title/Abstract])) OR (cardiothoracic surgery[Title/Abstract]))

#2 Search: (((((((((pressure ulcer[MeSH Terms]) OR (pressure injur[MeSH Terms])) OR (pressure ulcer[Title/Abstract])) OR (pressure injur[Title/Abstract])) OR (pressure sore[Title/Abstract])) OR (pressure damage[Title/Abstract])) OR (decubitus ulcer[Title/Abstract])) OR (decubitus sore[Title/Abstract])) OR (Bedsore[Title/Abstract])) OR (pressure sore[Title/Abstract]))

#3 Search: intraoperative[Title/Abstract]

#4 Search: #1 AND #2 AND #3.

**Participant or population:** Cardiovascular surgery.

**Intervention:** None.

**Comparator:** None.

**Study designs to be included:** cardiovascular surgery.

**Eligibility criteria:** 1. The type of study design was cohort study, including prospective cohort study and retrospective cohort study; 2 .Baseline characteristics of the included population: patients undergoing cardiopulmonary bypass; 3. End point events: the occurrence of PI;4.Study assessed the risk factors of intraoperative PI in patients undergoing cardiopulmonary bypass and the corresponding RR/HR and its 95%CI could be obtained. 5. The study collected repeated information that could be used to evaluate the skin condition. Literature exclusion criteria: (1) The type of study design is post-analysis of cross-sectional studies, case-control studies or randomized controlled trials; (2) There is no clear evaluation criteria for PI; (3)Risk factors are non-clinical conventional indicators such as genotypes or new molecular markers; (4) RR/HR and its 95%

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CIX ;(5) cohort population is too small (less than 100) based on the data provided. (6) if the same population is repeatedly used to study the risk factors of PI, we will include the study with the longest follow-up and the most complete data.

**Information sources:** We searched the literatures of domestic and foreign periodical databases from self-built database to January 2023, including China knowledge Network CNKI, Wan fang database WF, VIP database VIP, Chinese biomedical literature database CBM, PubMed, Cochrane Library, Web of Science, CINAHL Plus, Embase). In addition, the references included in the study were searched manually in order to improve the retrieval strategy.

**Main outcome(s):** Pressure injury.

**Data management:** EndNote.

**Quality assessment / Risk of bias analysis:** We use Nos Scale to evaluate cohort studies.

**Strategy of data synthesis:** Select RevMan and STATA to merge the extracted data, first examine heterogeneity, if there is heterogeneity, select random effect for Meta analysis, if there is no heterogeneity, select fixed effect for Meta analysis. In addition, need to carry out sensitivity analysis, bias test and so on.

**Subgroup analysis:** In this study, subgroup analysis was conducted according to the four factors of patients' age, operation time, Cardiopulmonary bypass time and diabetes.

**Sensitivity analysis:** We will conduct a sensitivity analysis to identify and remove the literature of significant heterogeneity. We will also perform sensitivity for the included studies with "critically low" methodological quality one by one, and exclude the studies which cause great change in overall effect size.

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

**Keywords:** Cardiovascular surgery; Pressure injury; Risk factors; Meta-analysis.

**Contributions of each author:**

Author 1 - Chen Xiaojun.

Author 2 - Ouyang Qiuyi.

Author 3 - Xie Lihong.