

# INPLASY PROTOCOL

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## Predictors of readmission after pulmonary resection in patients with lung cancer

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**Review question / Objective:** At present, risk factors for readmission after pulmonary resection in patients with lung cancer are still not fully elucidated, and related studies have shown inconclusive results. We conducted a meta-analysis of the existing literature with the aim of clarifying the risk factors for readmission and providing evidence for the prevention of readmission after surgical resection in patients with lung cancer.

**Eligibility criteria:** Included articles needed to meet the following criteria: (I) the full article could be retrieved and had sufficient data for extraction; (II) the study focused on risk factors for readmission after pulmonary resection for lung cancer; and (III) patients were readmitted to the same institution. Studies were excluded if: (I) they were abstracts, letters, reviews, or case reports; (II) patients were readmitted to the emergency department or there was early return to the clinic; and (III) study contained repeated data or did not report the outcomes of interest.

**INPLASY registration number:** This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 13 October 2022 and was last updated on 13 October 2022 (registration number INPLASY2022100049).

## INTRODUCTION

**Review question / Objective:** At present, risk factors for readmission after pulmonary resection in patients with lung cancer are still not fully elucidated, and related studies have shown inconclusive results. We conducted a meta-analysis of the existing literature with the aim of

clarifying the risk factors for readmission and providing evidence for the prevention of readmission after surgical resection in patients with lung cancer.

**Condition being studied:** Surgical resection is the gold-standard treatment method for patients with early-stage lung cancer. Readmissions after surgical procedures

have become an increasingly important indicator for healthcare utilization and surgical quality. Reducing hospital readmission has been considered as an important strategy to improve patient care and reduce healthcare expenditures. At present, risk factors for readmission after pulmonary resection in patients with lung cancer are still not fully elucidated, and related studies have shown inconclusive results. We conducted a meta-analysis of the existing literature with the aim of clarifying the risk factors for readmission and providing evidence for the prevention of readmission after surgical resection in patients with lung cancer. Data regarding the risk factors for readmissions following surgical resection of lung cancer are limited. To our knowledge, this is the first meta-analysis to assess the risk factors for readmission after pulmonary resection in patients with lung cancer. Our study aimed to identify preoperative, perioperative and postoperative risk factors for readmission in lung cancer patients. An improved understanding of the risk factors for readmission after pulmonary resection may be beneficial for implementing relevant preventative interventions and alleviating the burden of readmissions. In the future, more well-designed studies are warranted to verify these results.

## METHODS

**Search strategy:** We conducted a search of the following databases: PubMed, Web of Science, the Cochrane library, CNKI, and Wanfang. The databases were searched for articles published in English from the date of establishment of each database up to May 10, 2022. The key words, including “lung cancer or “lung carcinoma” , and “thoracic surgery” or “pulmonary resection” or “lung resection”, and “readmission” or “rehospitalization”, and “predictor” or “risk factor” were searched in the above databases.

**Participant or population:** Readmission after pulmonary resection in patients with lung cancer, including readmission group and non-readmission group.

**Intervention:** Predictors of readmission after pulmonary resection in patients with lung cancer were analyzed between readmission group and non-readmission group.

**Comparator:** Improve pre-operative patient healthy lifestyle education, adopt a more proactive smoking-cessation programme before pulmonary resection; Preoperative assessment of pulmonary function, and treatment for pneumonia with intravenous antibiotics. Take more careful post-operative discharge planning, visit an outpatient clinic earlier after discharge for follow-up examinations, especially for high-risk patients with many baseline risk factors, and thus to decrease unexpected readmission.

**Study designs to be included:** We conducted a meta-analysis of the existing literature with the aim of clarifying the risk factors for readmission and provide evidence for the prevention of readmission after surgical resection in patients with lung cancer. Our study aimed to identify preoperative, perioperative and postoperative risk factors for readmission in lung cancer patients.

**Eligibility criteria:** Included articles needed to meet the following criteria: (I) the full article could be retrieved and had sufficient data for extraction; (II) the study focused on risk factors for readmission after pulmonary resection for lung cancer; and (III) patients were readmitted to the same institution. Studies were excluded if: (I) they were abstracts, letters, reviews, or case reports; (II) patients were readmitted to the emergency department or there was early return to the clinic; and (III) study contained repeated data or did not report the outcomes of interest.

**Information sources:** Electronic databases, PubMed, Web of Science, the Cochrane library, CNKI, and Wanfang.

**Main outcome(s):** The predictive factors for readmission can help in establishing individualized discharge and follow-up plans and programs for reducing hospital

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readmissions after pulmonary resection in patients with lung cancer.

**Quality assessment / Risk of bias analysis:**

Quality was assessed using the NOS and involved selection of the study groups, evaluation of inter-comparability between the groups, and measurement of outcomes, with a maximum score of 9 points, and studies  $\geq 6$  points were considered to be of relatively higher quality. Metaregression was employed to explore the potential source of heterogeneity. A subgroup analysis was performed if there were enough studies. The power of each study included in this meta-analysis was calculated with Gpower software 3.1.

**Strategy of data synthesis:** Statistical analysis was carried out using STATA SE12.0 (Stata Corp., College Station, TX) software. Odds ratio (OR) was adopted as the effect quantity index, and standardized mean difference (SMD) was used as the effect index for continuous variables. Heterogeneity was examined using Cochran's Q ( $\chi^2$ ) test and quantified by the I<sup>2</sup> statistic. If the I<sup>2</sup>>50%, stratified analysis or random-effect should be used. Otherwise, a fixed-effect model (the Mantel Haenszel method) was adopted. The weight given to each study is chosen to be inverse of the variance of the effect estimate. Due to some studies using the median and interquartile range (IQR) value for reporting the age, operative time and length day (LOS), we adopted the mathematical method used by Wan et al. to estimate the mean value and standard deviation from the sample size, median, range and/or IQR. Every index effect was expressed with a 95% confidence interval (CI). The power of each study included in this meta-analysis was calculated adopted by the method of Turner RM et al.

**Subgroup analysis:** Results of subgroup analyses were conducted by different ethnic groups, such as Asian, North America, and Europe population.

**Sensitivity analysis:** Sensitivity analysis was performed to assess the reliability and stability of the results.

**Language restriction:** English.

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

**Keywords:** Lung cancer, Readmission, Pulmonary resection, Risk factor, Meta-analysis.

**Contributions of each author:**

**Author 1 - Jie Liu -** Author 1 Conceived and designed the study; Drafted the manuscript; Conducted the literature search and selection, data extraction, and appraisal of the study quality; Wrote the first draft of the manuscript.

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