# A Single-institution Analysis of Postoperative Pulmonary Embolism Within 30 Days of Spine Surgery: A Retrospective Analysis of 1346 Consecutive Spine Patients

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## Introduction

Neurosurgeons continually seek opportunities to reduce morbidity and mortality for patients undergoing spinal surgery. One of the more devastating perioperative complications of elective and emergent spinal surgery is pulmonary embolism (P.E.). The incidence and risk factors for its occurrence are not well described.

## Methods

We evaluated all medical records and radiographic data of 1346 consecutive patients who underwent spinal surgery at Duke University from 2008 to 2010 for incidence of pulmonary embolism within 30 days of surgery and documented all demographic, preoperative, operative, and postoperative variables. Associations between postoperative pulmonary embolism and individual risk factors in all patients were determined using logistic regression analysis. Presence of postoperative pulmonary embolism was determined by clinical documentation, ventilation-perfusion scan demonstrating V/Q mismatch or diagnostic chest CT. Patients were stratified into emergent and elective groups and a similar analysis was performed

## Results

Overall, 10 patients (0.73%) had a pulmonary embolism in the 30 days following surgery, 6 patients (0.52%) undergoing elective surgery and 4 patients (0.12%) after emergent surgery (p > .05). Overall, multivariate logistic regression determined that obesity and peripheral vascular disease were independent predictors for postoperative pulmonary embolism, while use of postoperative drain, preoperative creatinine > 2.0 mg/dL and American Indian were identified as negative predictors. When stratified by elective surgery, we found low albumin (<3.5mg/dL), postoperative atrial fibrillation, post-op hospital days> 7 days, EBL > 2 L, and creatinine > 2.0 mg/dL to be independently associated with increased risk of postoperative pulmonary embolism. When stratified by emergent surgery, we found that COPD, insulin use, hyperlipidemia, 30-day readmission, sepsis, postoperative atrial fibrillation, and use of intraoperative pressors were associated with increased risk of pulmonary embolism. No were associated with reduced risk of posto factorsperative pulmonary embolism.

## Conclusions

The present study demonstrates a low incidence of pulmonary embolism after elective surgery with no significant difference in incidence between emergent and elective spine surgery. This study also functions to identify patient factors predictive of postoperative pulmonary embolism. Knowledge and identification of these factors influences discussions of risk calculation and surgical decision-making.

## Learning Objectives

By the conclusion of this session, participants should be able to : 1) Describe the importance of pulmonary embolism in the perioperative period, 2) Discuss, in small groups, the demographic, preoperative, and intraoperative risk factors for perioperative pulmonary embolism, and 3) Identify an effective treatment that addresses the risk of perioperative pulmonary embolism.

## References

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