

# Outcomes of malignant pleural effusions in patients with Lung Cancer

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## Introduction

- Malignant pleural effusion is present in more than 15% patients at time of diagnosis of lung cancer.
- Median survival - 4.3 months.
- Management - mostly palliative but helps lower hospital stay and inpatient mortality.
- Aim of this study is to identify inpatient mortality in patients with malignant pleural effusion

## Methods

- ICD-10 codes for Lung cancer and malignant pleural effusions (MPE) identified from the NIS database (2016-2018).
- Multivariate logistic regression performed in STATA MP 16.1.
- Confounding variables accounted for in the analysis - previous chemotherapy, history of weight loss, smoking and neutropenia.
- In addition, Charlson-comorbidity index was also utilized.
- Primary outcome was inpatient mortality. Secondary outcomes were hospital length of stay and cost utilization.

Table 1 – Factors affecting Inpatient Mortality

Inpatient Mortality	Odds Ratio	P Value	95% Confidence Intervals
Malignant Pleural Effusion	2.014	0.000	1.900 – 2.136
Charlson Comorbidity Index	1.077	0.000	1.068 – 1.085
History of Coronary Artery Disease	0.815	0.000	0.780 – 0.852
History of Congestive Heart Failure	1.129	0.000	1.075 – 1.187
Diabetes Mellitus	0.763	0.000	0.730 – 0.798
Hypertension	0.910	0.000	0.876 – 0.945
Smoking History	0.794	0.000	0.766 – 0.823
Obesity	0.715	0.000	0.661 – 0.773
Acute Kidney Injury	3.117	0.000	2.994 – 3.245
History of Chemotherapy	0.843	0.000	0.795 – 0.895
Neutropenia	1.159	0.003	1.053 – 1.275
Weight Loss	0.738	0.000	0.632 – 0.861
Weekend Admission	1.184	0.000	1.137 – 1.233
Age	1.002	0.050	1.000 – 1.003
Gender (Female)	0.860	0.000	0.830 – 0.891

Table 2 – Factors affecting Hospital Length of Stay

Length of Stay	Coefficient	P Value	95% Confidence Intervals
Malignant Pleural Effusion	1.262	0.000	1.120 – 1.404
Charlson Comorbidity Index	0.169	0.000	0.155 – 0.183
History of Heart Failure	0.567	0.000	0.470 – 0.665
Obesity	0.612	0.000	0.495 – 0.728
Acute Kidney Injury	1.804	0.000	1.701 – 1.906
Neutropenia	0.878	0.000	0.682 – 1.074

## Results

- Total patients with MPE – 51,747, 48% female. Mean age – 69 years and mean LOS - ~7 days
- Hospitalizations in year 2016 – 15950, 8.7% mortality rate
- Hospitalizations in year 2017 – 17100, 8.4% mortality rate
- Hospitalizations in year 2018 – 18620, 8.6% mortality rate
- Patients with MPE had higher odds of mortality among patients with lung cancer [Odds Ratio (OR) 2.01 (1.90 – 2.14)]
- Additional factors contributing to mortality include – increasing Charlson-comorbidity index, history of heart failure, acute kidney injury, history of neutropenia, increasing age and weekend admissions.
- Patients with MPE had higher hospital length of stay by 1.3 days [1.26 (1.12 – 1.4)]
- Patients with MPE had higher hospitalization charge by \$14,111 (12,012 – 16,210)

## Conclusion

Patients with a history of lung cancer that present to the hospital with malignant pleural effusion have higher odds of inpatient mortality, hospital length of stay and total cost. Efforts need to be put to manage these patients in a timely and effective manner to improve outcomes.