

# Society of Thoracic Surgeons General Thoracic Surgery Database

## Quality Improvement Series: Reducing Readmission Rates

February 27, 2025

The logo for the STS National Database is centered within a large white circle. It features the text "STS National Database" in a bold, sans-serif font, with "STS" in red and "National Database" in dark blue. Below this, the tagline "Trusted. Transformed. Real-Time." is written in a smaller, dark blue font.

**STS National Database**<sup>™</sup>  
Trusted. Transformed. Real-Time.

# STS NDB Quality Improvement Series

## What are our GOALS?

To demonstrate the value of the database beyond reports and Star Ratings

Decrease Cost

Demonstrating how important YOU are in abstracting Data

Be part of a National Team Effort

Making your STS data actionable for improving outcomes at your hospital

Because it's rewarding to work toward something together

# Readmission Rates – Why do we care

## Readmitted Patients

- Higher Complication Rates
- Higher Rate of Infection
- Increased Rate of Mortality
- Longer Recovery Times
- Increased Opioid Utilization
- Quality of Life Impact
  - Patient-Reported Outcomes

## Health Systems

- Throughput Challenges
  - Complications & Readmissions Increase LOS
- Increase cost associated with complications
- Decreased reimbursement risk
  - CMS Hospital Readmission Reduction Program



# How do we do it?

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## Define

Nationally decrease readmission rates for Lung Cancer patients.

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## Measure

Baseline data to be pulled from the Spring 24 Harvest Analysis Report. Mean readmission rate and mean LOS will be reported.

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## Analyze

Using the STS Harvest Reports, sites will implement processes at their sites to decrease readmission rates. STS will provide education and support for processes.

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## Improve

Will engage site leaders who have already accomplished decreased readmission rates and to provide education on webinars and be available as resources.

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## Control

Will track monthly to see improvement nationally.

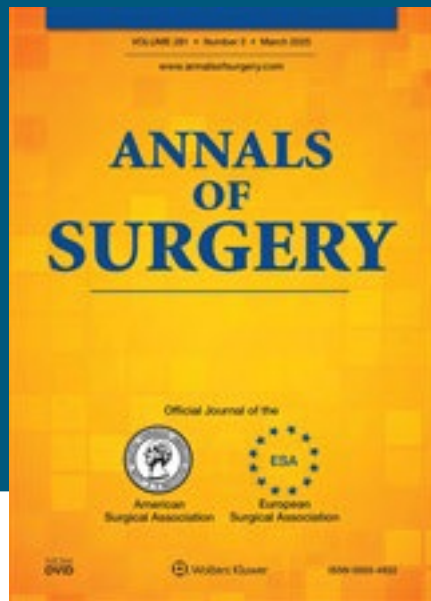
## ORIGINAL ARTICLE

# Readmission After Lobectomy for Lung Cancer

## *Not All Complications Contribute Equally*

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# Objective

- To identify independent predictors of hospital readmission within 30 days of discharge for patients undergoing lobectomy for lung cancer.
- Our goal was to determine whether preoperative, intraoperative, or postoperative factors were most predictive of readmission
  - We hypothesized that postoperative complications would have the greatest effect on the risk of readmission

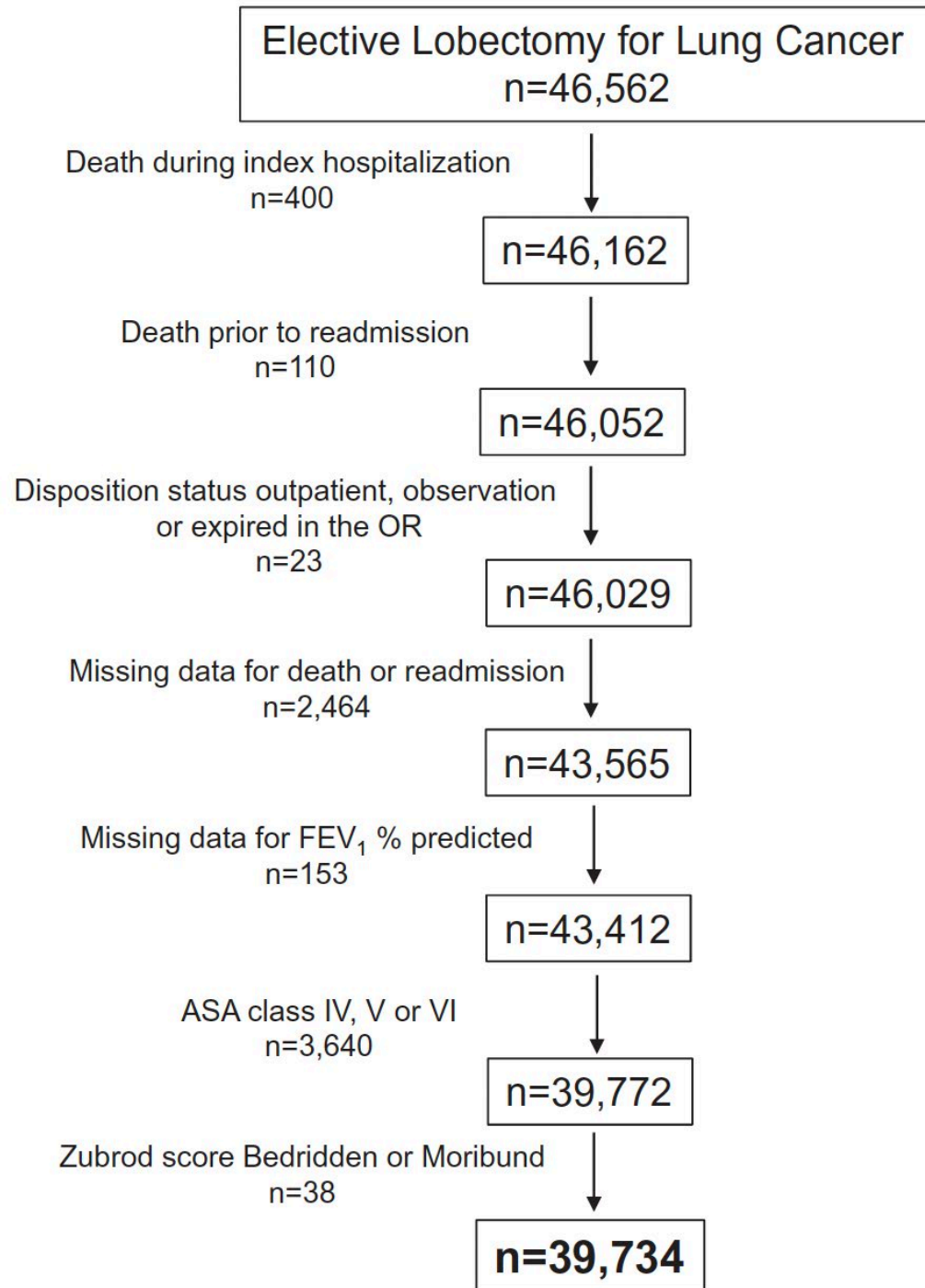
**Readmission within 30 days of discharge to any hospital**



# Patient Cohort

January 2, 2012 - June 30, 2017

(data collection form versions 2.2 and 2.3)



# Results

- 30-day readmission rate: 8.2% (N=3,237)
- Preoperative risk factors (*c* statistic 0.600)

Risk Factor	OR	95% CI	P-value
Interstitial fibrosis	1.69	1.31— 2.19	<0.0001
Steroid use	1.42	1.18 – 1.72	0.0002
Cerebrovascular accident	1.36	1.13 – 1.63	0.001
Zubrod score 2 or 3	1.35	1.12 – 1.62	0.001





# Results

- Preoperative and Intraoperative risk factors (c statistic 0.604)

Risk Factor	OR	95% CI	P-value
Interstitial fibrosis	1.66	1.28— 2.14	0.0001
Steroid use	1.43	1.19 – 1.73	0.0002
Cerebrovascular accident	1.38	1.15 – 1.66	0.0007
Zubrod score 2 or 3	1.32	1.10 – 1.57	0.003
Intraoperative PRBCs	1.31	1.01 – 1.69	0.04
Middle lobectomy*	0.75	0.64 – 0.89	0.001
Lower lobectomy*	1.15	1.05 – 1.25	0.002

\*reference: Upper lobectomy



# Results

<b>Postoperative Complications</b>	<b>Not Readmitted N=36,497</b>	<b>Readmitted N=3,237</b>	<b>P-value</b>
Unexpected reoperation	935 (2.6%)	247 (7.6%)	<0.0001
Air leak with duration >5 days	3728 (10.2%)	694 (21.4%)	<0.0001
Pneumonia	911 (2.5%)	390 (12.1%)	<0.0001
Bronchopleural fistula	73 (0.2%)	41 (1.3%)	<0.0001
Atelectasis requiring bronchoscopy	1,132 (3.1%)	184 (5.7%)	<0.0001
Pulmonary embolus	75 (0.2%)	96 (3.0%)	<0.0001
Pleural effusion requiring drainage	315 (0.9%)	290 (9.0%)	<0.0001
Pneumothorax requiring chest tube	872 (2.4%)	457 (14.1%)	<0.0001
Atrial arrhythmia requiring treatment	3694 (10.1%)	521 (16.1%)	<0.0001
Myocardial infarction	69 (0.2%)	30 (0.9%)	<0.0001
Deep venous thrombosis	108 (0.3%)	63 (2.0%)	<0.0001
Urinary complication	3084 (8.5%)	472 (14.6%)	<0.0001
Empyema	61 (0.2%)	126 (3.9%)	<0.0001
Sepsis	95 (0.3%)	73 (2.3%)	<0.001
Central neurologic event	94 (0.3%)	50 (1.5%)	<0.0001
Delirium	734 (2.0%)	146 (4.5%)	<0.0001
Renal failure	123 (0.3%)	42 (1.3%)	<0.0001
Chylothorax requiring Drainage/medical treatment	171 (0.5%)	28 (0.9%)	0.002
Postoperative packed red blood cells transfusion	1125 (3.1%)	238 (7.4%)	<0.0001
Unexpected admission to ICU	918 (2.5%)	232 (7.2%)	<0.0001
Discharge location other than home	2013 (5.5%)	335 (10.3%)	<0.0001

# Results

- Preoperative, Intraoperative, and Postoperative risk factors (c statistic 0.736)

Risk Factor	OR	95% CI	P-value
Pulmonary embolus	12.34	7.94 – 19.18	<0.0001
Empyema	11.66	7.31 – 18.63	<0.0001
Pleural effusion requiring drainage	7.52	6.01 – 9.41	<0.0001
Pneumothorax requiring chest tube	5.08	1.12 – 1.62	0.001
Central neurologic event	3.67	2.23 – 6.04	<0.0001
Myocardial infarction	3.16	1.71 – 5.82	0.0002
Pneumonia	3.13	2.43 – 4.05	<0.0001
Atelectasis requiring bronchoscopy	0.63	0.49 – 0.80	0.0002



# Conclusions

- 1 in every 12 patients undergoing lobectomy for lung cancer is readmitted
  - Up to one third of admissions are to hospitals other than where the index operation was done
- Postoperative complications have the greatest effect on risk of readmission, especially those requiring a procedure or inpatient medical treatment



# Open Discussion



# Contact Information

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**Thank You for Joining!**