



# Sixth International Joint Meeting on **THORACIC SURGERY**

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Auditorio Foment del Treball Nacional, Barcelona (Spain)

11<sup>th</sup> International Meeting on General Thoracic Surgery



Hospital  
Universitari  
Sagrat Cor

10<sup>th</sup> International Workshop on Surgical Exploration of the  
Mediastinum and Systematic Nodal Dissection



5<sup>th</sup> Meeting of the Thoracic Oncology, Thoracic  
Surgery, Techniques & Transplant, Respiratory Nursing  
and Respiratory Physiotherapy Areas of the Spanish  
Society of Pneumology and Thoracic Surgery (SEPAR)



3<sup>rd</sup> Joint Meeting of the Spanish Society of  
Thoracic Surgery (SECT)



30<sup>th</sup> Congress of the "Asociación Iberoamericana  
de Cirugía Torácica" AIACT



10<sup>th</sup> International Workshop on Surgical Exploration of the  
Mediastinum and Systematic Nodal Dissection



## **PREDICTING PROLONGED LENGTH OF STAY IN A THORACIC SURGERY ERAS PROGRAMME**

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**Objectives:** Enhanced Recovery After Surgery (ERAS) protocols are designed to improve post-operative recovery including reducing length of hospital stay (LOS). The aim of this study is to investigate predictors of LOS in our thoracic surgery ERAS programme and design predictive models of prolonged LOS using machine learning (ML) methodology. **Methods:** Consecutive patients undergoing lung cancer resection and following the ERAS programme, from August 2013-December 2023, were included. Our primary outcome was prolonged LOS (5 days or more). Univariable and multivariable logistic regression analyses were performed to identify key predictors of prolonged LOS. For ML predictive models, a training/testing ratio of 70/30 and resampling methods were used; cross-validation was conducted. **Results:** Overall 2284 patients were included. The cases were 64% lobectomy/bi-lobectomy, 22% wedge, 11% segmentectomy and 3% pneumonectomy. VATS was used in 80% of cases. Median LOS was 4 days. Key predictors of LOS were: age (OR1.05, CI 1.03-1.07,  $p<0.001$ ), VATS approach (OR0.37, CI 0.24-0.59,  $p<0.001$ ), pre-operative carbohydrate drink (OR0.87, CI 0.71-0.99,  $p=0.05$ ), early mobilisation (OR0.79, CI 0.60-0.91,  $p=0.04$ ) and ITU/HDU admission (OR3.75, CI 2.93-4.75,  $p<0.001$ ). The predictive abilities of ML models: logistic regression: Area under the Curve (AUC)=0.73, accuracy=0.69; Generalized additive model: AUC=0.70, Accuracy=0.66; Naïve Bayes AUC=0.65, Accuracy=0.62. **Conclusions:** Important factors identified in reducing LOS are VATS approach, pre-operative carbohydrate drinks and early mobilisation. Factors increasing the risk of prolonged LOS are increasing age and ITU/HDU admission. Developing a reliable predictive model for LOS is difficult but several preoperative characteristics have a significant impact on the probability of prolonged LOS.