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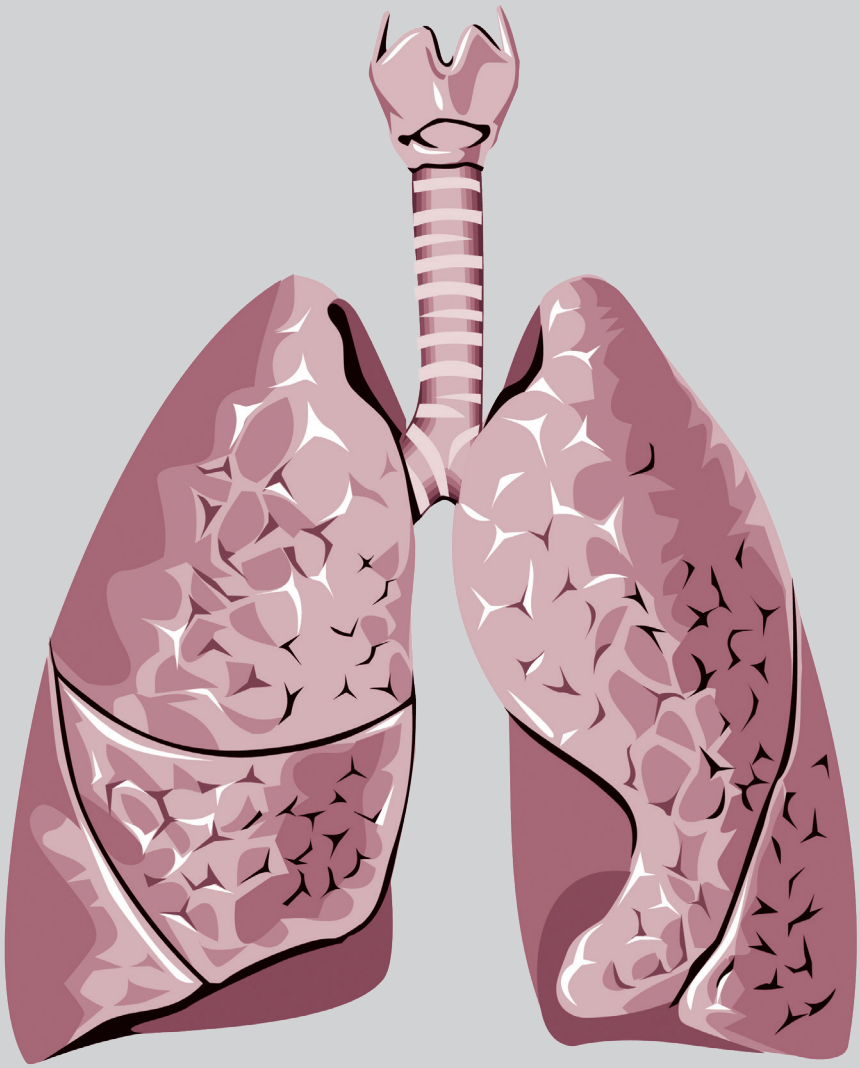

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Impact of Pulmonary Rehabilitation on COPD Patients

Chiao-Ning Hu[1*], Hsiu-Chin Wu[1*], Ya-Hui Wang[2], Yueh-Lan Huang[1], Cheng-Yi Wang[1], Ping-Keung Yip[3], Hen-I Lin[1]

Background: Chronic obstructive pulmonary disease (COPD) is a progressive lung condition that commonly presents with symptoms such as dyspnea, fatigue, reduced exercise capacity, and peripheral muscle dysfunction. These symptoms often lead to a diminished quality of life for patients. Pulmonary rehabilitation (PR) has been recognized as a therapeutic approach aimed at alleviating these clinical manifestations and improving patient outcomes. Despite its known benefits, there is limited research specifically addressing its impact on quality of life and lung function improvements in COPD patients. Therefore, this study aimed to evaluate the effectiveness of PR in enhancing both quality of life and lung function in patients with COPD.

Methods: This retrospective study analyzed data from patients enrolled in the national Pay-for-Performance (P4P) program for COPD at a teaching hospital between January 1, 2017 and December 31, 2020. Key parameters, including the Modified Medical Research Council scale, COPD Assessment Test, and lung function indicators such as FEV1 (L), FEV1 (%), and FEV1/FVC (%), were reassessed. Descriptive statistics were used to summarize patient characteristics, and inferential statistics were applied to assess the effects of PR.

Results: A total of 465 patients with COPD were included, with 298 in the control group and 167 in the PR group. Stratified analysis based on the occurrence of acute exacerbations in the preceding year revealed that PR improved mMRC scores. However, its effect on improving lung function parameters, including FEV1 (L), FEV1 (%), and FEV1/FVC (%), was not significant.

Conclusion: PR is effective in improving the mMRC scores of COPD patients, and in enhancing their quality of life. However, its impact on lung function parameters remains limited. ***(Thorac Med 2026; 41: 1-10)***

Key words: Chronic obstructive pulmonary disease, pulmonary rehabilitation

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Outcome Predictors for Patients with Candidemia Receiving Prolonged Mechanical Ventilation

Yu-An Hsiao[1], Chen-Yiu Hung[1,2,3]

Background: Recently, candidemia has received considerable critical attention in intensive care units. Studies have shown the role of risk factor identification, molecular diagnosis, and new antifungal agents, although there have been mixed results and gaps in the early diagnosis.

Aim: To investigate the clinical characteristics, risk factors, and outcome predictors of candidemia in patients receiving prolonged mechanical ventilation (PMV).

Methods: Data of 45 candidemia patients receiving PMV between 2001 and 2012 were obtained. The patients' characteristics and outcomes were determined through a retrospective chart review, and data were evaluated using Student's t test, the chi-square test, and Fisher's exact test. Variables that were statistically significant ($p < 0.05$) in the univariate analysis were included in a multivariate analysis by multiple logistic regression. The variance inflation factor was used to identify any correlation between the independent variables and the strength of that correlation.

Results: Data from the survival and non-survival groups, comprising a total of 45 patients, were compared. The overall mortality rate was 71.1% (32/45). Both acute respiratory distress syndrome and steroid use may have had possible associations with candidemia, but the 2 variables were interconnected. The delay in starting antifungal treatment may have been associated with mortality.

Conclusion: Delay in starting appropriate antifungal treatment was associated with mortality. Additional prospective studies are required to identify these risk factors through a laboratory method to ensure timely treatment. ***(Thorac Med 2026; 41: 11-22)***

Key words: candidemia; acute respiratory distress syndrome; prolonged mechanical ventilation; sepsis; steroid

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Experience in Training an Artificial Intelligence Model for Lung Nodule Detection

Chih-Hsiung Chen[1], Kuang-Yu Hsieh[1], Kuo-En Huang[1]

Background: The mainstream approach in artificial intelligence (AI) training using chest X-rays (CXRs) focuses on pneumonia detection. This study adopted a TensorFlow-based model to run on a home computer, utilizing a publicly available dataset designed for pulmonary nodule detection. The objective was to train an AI model to identify pulmonary nodules.

Methods: The dataset from the Japanese Society of Radiological Technology (JSRT) comprises 247 CXRs, including 154 images with nodules and 93 without nodules. For training, the dataset was divided into a training set for training and a test set for model validation. The AI model was adopted from Ethan Chapman's architecture designed for pneumonia detection. Upon achieving successful training, the model's performance was evaluated using the area under the receiver operating characteristic curve (AUROC).

Results: We trained a pulmonary nodule detection model on a home computer. After 1,000 training epochs, the loss converged toward 0.5 without divergence, and the model's accuracy stabilized within the range of 0.9 to 0.95. The model's AUROC achieved a score of 0.77.

Conclusion: The final results revealed moderate performance compared to pneumonia detection reported in previous literature. Our work broadens the scope of AI applications in pneumonia detection and offers valuable experience for AI training in medical imaging. ***(Thorac Med 2026; 41: 23-31)***

Key words: AI training, medical imaging, pneumonia, pulmonary nodule, TensorFlow

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Endobronchial Ultrasound-Guided Cryobiopsy in the Diagnosis of Primary Pulmonary Lymphoma: Case Report of a Novel Application

Yu-Hua Su[1], Chia-Hung Chen[1,2], Yu-Chang Fu[1], Chih-Yen Tu[1,2]

Primary pulmonary lymphomas (PPLs) are rare lung malignancies, and their diagnosis requires large amounts of tissue via open lung biopsy. A prompt diagnosis is vital, as PPLs are highly responsive to chemotherapy, and complete remission is possible. Cryobiopsy with endobronchial ultrasound guidance (EBUS-cryobiopsy) can provide significantly larger amounts of tissues than standard percutaneous CT-guided and traditional transbronchial forceps biopsies. Herein, we report a 66-year-old female who presented with an asymptomatic and incidental mass-like lesion in the right lower lung. Tissues from CT-guided needle and EBUS-guided traditional forceps biopsies failed to yield a specific diagnosis, whereas those from EBUS-guided cryobiopsy confirmed the diagnosis of PPL. This case indicates that cryobiopsy can be used to diagnose PPLs, especially when large amounts of tissue are required, and that it may be an alternative to open lung biopsy in certain cases. ***(Thorac Med 2026; 41: 32-38)***

Key words: Cryobiopsy, forceps biopsy, primary pulmonary lymphoma

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Successful Conservative Management of Tracheal Granulation Tissue Following Tracheostomy: A Case Report

Chun-Chia Chen[1,2], Wen-Kuang Yu[1,2,3]

We reported the case of an 18-year-old female with respiratory failure secondary to a cerebellar hemorrhage who developed circumferential granulation tissue in the middle third of the trachea following tracheostomy. This granulation tissue partially obstructed the airway, particularly during expiration, leading to intermittent acute CO_2 retention that mimicked asthma exacerbations. Conservative management using an extended-length tracheostomy tube was able to effectively bypass the obstruction, and the patient's acute hypercapnia resolved. Gradual resolution of the granulation tissue was confirmed bronchoscopically, without the need for ablative therapies. This case highlights potential tracheostomy complications and underscores the importance of early recognition and non-invasive management to prevent further airway compromise. We included the bronchoscopic findings and clinical course to raise awareness of tracheostomy-related airway complications and support conservative approaches in selected patients. ***(Thorac Med 2026; 41: 39-43)***

Key words: Tracheostomy; tracheal granulation; post-tracheostomy complication

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Lung Carcinosarcoma with pre-operative Presentation of Adenocarcinoma and Small cell Carcinoma

Chun-Yen Chen[1], Wei-Ciao Wu[1]

A 53-year-old man suffered from hemoptysis for 2 months. Chest/heart computed tomography (CT) revealed a 9.5x7.3x7.6-cm mass at the left upper lobe (LUL) with air pockets within. Bronchoscopy was performed and the cell block showed many clusters of malignant cells admixed with many macrophages and neutrophils. Adenocarcinoma was favored. CT-guided biopsy was done the next day and pathology showed a small cell malignant tumor. Since the symptoms of hemoptysis persisted, video-assisted thoracoscopic surgery LUL lobectomy was performed without incidence and a specimen was sent for examination. Post-operation pathology showed carcinosarcoma. We also compared pre-operative and postoperative immunohistochemical studies. ***(Thorac Med 2026; 41: 44-47)***

Key words: carcinosarcoma, adenocarcinoma, small cell carcinom

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