6th September 2026



ERS Highlights & Insights

INDIAN CONTEXT

DAILY NEWS UPDATES
FROM ERS CONGRESS 2026

5th – 9th September 2026



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THE EUROPEAN RESPIRATORY SOCIETY (ERS) CONGRESS 2026 | 5–9 SEPTEMBER | BARCELONA, SPAIN

Targeted Case-Finding and Proactive Clinical Management in a Primary Care Setting Reduces Exacerbations in COPD Patients With Exacerbation History and Scope for Treatment Optimisation: Findings From the PREVAIL Cluster Randomised Trial

Findings from the large PREVAIL cluster randomised trial show that the CONQUEST quality improvement programme (QIP) reduces exacerbations in primary care patients with modifiable high-risk (MHR) COPD, with the greatest benefit seen in those newly diagnosed or receiving minimal maintenance therapy. The results support targeted case-finding, timely clinical review and treatment optimisation to improve outcomes in high-risk COPD.

A high-risk group primary care often misses

Patients with COPD carry a high risk of exacerbations, yet many at-risk patients slip through the cracks of routine primary care. The PREVAIL trial investigated whether the CONQUEST QIP, applied to patients with newly diagnosed (ND) or already diagnosed (AD) MHR COPD, could reduce exacerbations compared with usual care.

Randomising practices, not patients

English general practices were randomised 1:1 to CONQUEST or usual care. Eligible MHR patients were aged 40–80, had a COPD diagnosis or a positive smoking history, were on dual maintenance therapy or less, and had experienced at least two moderate or one severe exacerbation in the prior 24 months (with at least one in the last 12). Newly diagnosed patients were identified either through CONQUEST spirometry or usual care, and the CONQUEST arm added structured case-finding, clinical review for assessment and treatment optimisation, and follow-up. Exacerbations followed by hospitalisation, oral steroids or antibiotics within 8–28 days were classed as complicated, and outcomes were analysed from electronic health records using propensity-score weighted models.

Fewer exacerbations, far fewer complicated ones

Eighty-five intervention and 90 control practices contributed 5,631 patients, followed for a mean of 24 months. Exacerbations fell by 13% and complicated exacerbations by 26% compared with usual care overall; among patients on monotherapy or less at baseline, the falls were steeper still, at 21% and 45%; and among newly diagnosed patients, exacerbations and complicated exacerbations fell by 21% and 40% respectively.

What it means

The authors conclude that the CONQUEST QIP reduced COPD exacerbations in primary care patients with modifiable high-risk disease, particularly those on minimal therapy or newly diagnosed, supporting prompt clinical review and treatment optimisation for at-risk patients.

Reference: Price D, Hurst JR, Kerr M, Hickman K, Singh M, Crooks MG, Alves LA, Ariti C, Bafadhel M, Bhutani M, Busby J, Carter V, Chalmers JD, Chen R, Couper A, Devereux G, Eleangovan N, Evans A, Freeman D, Gale CP, Gibson M, Halpin DMG, Henley W, Marshall J, Martinez F, Miravitlles M, Morris T, Muellerova H, Muro S, Nåtman J, Pullen R, Quint JK, Sharma A, Singh D, Skinner D, Stolz D, Vargese D, Vijaykumar E, Winders T, Wilkinson T, Dickens AP. Targeted case-finding and proactive clinical management in a primary care setting reduces exacerbations in COPD patients with exacerbation history and scope for treatment optimisation: findings from the PREVAIL cluster randomised trial. RCT abstract presented at: European Respiratory Society (ERS) Congress 2026; Barcelona, Spain.

Implementing Predictive Analytics Towards Efficient COPD Treatments (IMPACT): A Cluster Randomised Controlled Trial

A Canadian cluster randomised trial has found that folding a computerised decision support system (CDSS) into everyday COPD clinics measurably improves how closely respirologists' prescribing tracks guideline recommendations — with the intervention making the biggest difference precisely when guidelines called for triple therapy.

Guidelines that don't reach the bedside

Clinical guidelines are written for widespread adoption, but alignment with their recommendations is often low, in part because they are never embedded into the routine flow of care. The IMPACT trial set out to test whether a CDSS integrating COPD management guidelines with exacerbation risk prediction could close that gap and improve guideline-concordant pharmacotherapy.

A crossover trial across two teaching hospitals

The researchers ran a stepped-wedge cluster randomised trial involving 22 respirologists, treated as clusters, across two teaching hospitals. The intervention was an on-screen CDSS that predicted 12-month exacerbation risk using the ACCEPT model and recommended pharmacotherapy in line with the 2023 Canadian COPD guidelines. Every cluster began in routine practice and crossed over, in randomised order, to the CDSS-supported arm. The primary endpoint was how well prescribed treatment classes matched the recommended ones.

Alignment climbs from under 40% to half

Between March 2023 and June 2025, the clusters contributed 1,111 outpatient COPD visits (mean age 70.9 years; 36% female). Guideline alignment rose from 38.6% during routine care to 49.9% once the CDSS was in use, a statistically significant improvement (adjusted odds ratio 1.70, 95% CI 1.08–2.70). The gain was largest when triple therapy was the guideline-recommended option, and there was no evidence that age, sex or GOLD severity grade changed how well the intervention worked.

What it means

The authors conclude that weaving risk prediction and guideline recommendations directly into routine care improves alignment with guideline-based pharmacotherapy in COPD.

Reference: Sadatsafavi M, Burns P, Mokhtaran M, Mehareen J, Lin A, Abercromby S, Gustafson P, Carlsten C, Gupta S, Gershon A, Bansback N, Conklin A, De Vera M, Leung J, van Eden S, Duan K, Alotaibi N, Tan-Hogg W, Sin D. Implementing Predictive Analytics towards efficient COPD Treatments (IMPACT): a cluster randomised controlled trial. RCT abstract presented at: European Respiratory Society (ERS) Congress 2026; Barcelona, Spain.

Glutamate Metabolism Orchestrates Mucociliary Clearance and Mucus Plugging in COPD

Chinese researchers have uncovered an unexpected player behind one of COPD's most damaging features — mucus plugging — showing that circulating glutamate levels track inversely with plug severity, and that boosting glutamate restores mucus clearance in both patient-derived airway cultures and COPD mice.

Mucus plugs with an unknown metabolic cause

Mucus plugs are linked to lung function decline, frequent exacerbations, and higher mortality in COPD, but until now the metabolic basis of how they form has remained unknown.

From patient plasma to airway cultures to mice

The team performed plasma metabolomics on 944 COPD patients from the ECOPD cohort (2021), scoring mucus plugs on chest CT with the Diaz system as assessed by three thoracic radiologists. Sorted basal,

club, goblet and ciliated cells from bronchial brushings and air-liquid interface (ALI) cultures were profiled by transcriptomics and metabolomics, mucociliary clearance (MCC) was measured by μOCT, and both patient-derived ALI cultures and COPD mice were used to probe glutamate's role directly.

Glutamate emerges as a guardian of ciliary function

Six circulating metabolites were significantly associated with mucus plug burden, with glutamate standing out as inversely associated with plug severity. Cell-resolved multi-omics revealed distinct metabolic programmes across airway epithelial lineages: as ciliated cells differentiated, glutamate levels fell while axonemal glutamylation rose, indicating glutamate is consumed during ciliogenesis. Glutamate promoted ciliated-cell differentiation through FOXJ1-dependent programmes and axonemal glutamylation, while blocking glutamate synthesis impaired ciliogenesis altogether. In mature ciliated cells, glutamate stimulated ciliary beating via NMDA receptor-Ca^{2+} signalling, and supplementing glutamate improved mucociliary clearance in both COPD ALI cultures and COPD mice.

What it means

The authors conclude that glutamate level is inversely associated with mucus plug burden in COPD, acting as a central regulator of mucociliary clearance by coordinating ciliogenesis, axonemal glutamylation, and ciliary motility — and that targeting glutamate signalling could offer a novel way to relieve mucus plugging in COPD.

Reference: Chen Z, Li C, Wu F, Li H, Fan M, Wang W, Yang X, Liu L, Ye Z, Zhou Y, Ran P, Hu W, Wang L. Glutamate Metabolism Orchestrates Mucociliary Clearance and Mucus Plugging in COPD. Late Breaking abstract presented at: European Respiratory Society (ERS) Congress 2026; Barcelona, Spain.

Comparison of Diagnostic Yield and Safety of Three Endobronchial Ultrasound-Guided Transbronchial Biopsy Techniques in Diagnosing Patients With Mediastinal/Hilar Lymphadenopathy: A Multicentre Randomised Trial (CONFIDENCE Study)

A large multicentre trial from China, the CONFIDENCE study, has settled a long-running question in interventional pulmonology, finding that transbronchial mediastinal cryobiopsy (EBUS-TBMC) outperforms both needle aspiration and forceps biopsy for diagnosing mediastinal and hilar lymphadenopathy — though the yield gain comes with a somewhat higher bleeding rate.

Three techniques, one unanswered question

Which endobronchial ultrasound (EBUS)-guided approach works best for diagnosing mediastinal and/or hilar lymphadenopathy (MHL) — transbronchial needle aspiration (EBUS-TBNA), transbronchial mediastinal cryobiopsy (EBUS-TBMC), or transbronchial forceps biopsy (EBUS-TBFB) — has remained unclear.

A three-way randomisation across 11 centres

In this open-label, multicentre, parallel randomised trial spanning 11 centres in China, adults with MHL needing tissue diagnosis were randomised 1:1:1 to EBUS-TBNA, EBUS-TBMC, or EBUS-TBFB. The primary endpoint was diagnostic yield, with diagnostic sensitivity and safety — assessed via complication and bleeding rates — as secondary outcomes. The trial is registered at ClinicalTrials.gov (NCT06262620).

Cryobiopsy comes out on top

Between March 5, 2024 and November 25, 2025, 972 participants were randomised and all underwent their assigned biopsy successfully. EBUS-TBMC achieved a higher diagnostic yield than EBUS-TBNA (86.1% vs 72.8%, $p<0.001$) and EBUS-TBFB (86.1% vs 77.2%, $p=0.003$), while EBUS-TBFB

did not significantly outperform EBUS-TBNA (77.2% vs 72.8%, p=0.20). EBUS-TBMC also showed the highest sensitivity for both malignant (89.0%) and benign (93.0%) disease. Grade 2 bleeding occurred in 11.4% of EBUS-TBNA cases, 15.7% of EBUS-TBMC cases and 12.4% of EBUS-TBFB cases, with no deaths reported.

What it means

The authors conclude that EBUS-TBMC should be recommended as the primary diagnostic method for MHL in high-volume centres with cryobiopsy capability, given its superior diagnostic yield and acceptable safety profile.

Reference: Hou G, Deng M, Zheng Z. Comparison of diagnostic yield and safety of three endobronchial ultrasound-guided transbronchial biopsy techniques in diagnosing patients with mediastinal/hilar lymphadenopathy: a multicentre randomised trial (CONFIDENCE Study). Late Breaking abstract presented at: European Respiratory Society (ERS) Congress 2026; Barcelona, Spain.

Shape-Sensing Robotic-Assisted Bronchoscopy Versus Electromagnetic Navigation Bronchoscopy for Peripheral Pulmonary Nodules: A Multicenter, Randomized Controlled Trial (The ARTICULAtE Study)

The first prospective multicentre randomised trial to pit shape-sensing robotic-assisted bronchoscopy (ssRAB) against electromagnetic navigation bronchoscopy (ENB) has delivered a decisive result: ssRAB more than doubled the diagnostic yield for small peripheral pulmonary nodules, with the advantage holding up even in the hardest-to-reach cases.

Small nodules, stubbornly low yields

Despite advances like ENB, biopsying small peripheral pulmonary nodules (PPNs) remains suboptimal, and prospective, randomised, multicentre comparisons against the newer shape-sensing robotic-assisted approach have been scarce. The ARTICULAtE investigators hypothesised that ssRAB would deliver superior diagnostic yield (DY) over ENB for nodules measuring 8–30 mm.

A stratified, head-to-head comparison

In this multicentre, open-label superiority trial, adults with PPNs of 8–30 mm at or beyond the subsegmental bronchi were randomised 1:1 to ssRAB or ENB-guided biopsy, stratified by nodule size, CT bronchus sign, and location. Procedures were performed under general anaesthesia with radial endobronchial ultrasound and fluoroscopic guidance. The primary endpoint was ATS/ACCP-defined diagnostic yield, and the trial was powered to detect a 15% absolute superiority margin for ssRAB over ENB.

A clear, consistent diagnostic advantage

Of 264 patients randomised, 260 underwent the procedure (128 ssRAB, 132 ENB). ssRAB achieved a diagnostic yield of 91.4% (95% CI 85.3–95.1%) versus 65.2% (95% CI 56.7–72.7%) for ENB — an absolute difference of 26.3 percentage points (p<0.0001). The advantage persisted in the subgroups where biopsy is typically hardest: nodules of 20 mm or less (88.3% vs 53.2%, p<0.0001), nodules without a CT bronchus sign (86.5% vs 50.0%, p<0.0001), and outer-third lesions (90.8% vs 66.2%, p=0.0006). Safety profiles were comparable between the two arms.

What it means

The authors conclude that this first prospective multicentre randomised trial shows ssRAB significantly improves diagnostic yield over ENB for PPN biopsy, especially in technically challenging cases, positioning ssRAB as a more effective approach that may help speed up early lung cancer diagnosis.

Reference: Xie F, Li C, Liu D, Song Y, Sun J. Shape-sensing robotic-assisted bronchoscopy versus electromagnetic navigation bronchoscopy for peripheral pulmonary nodules: a multicenter, randomized controlled trial (The ARTICULAtE Study). RCT abstract presented at: European Respiratory Society (ERS) Congress 2026; Barcelona, Spain.

Combined Aerosolized Budesonide and Formoterol for Hospitalized Patients with Pneumonia and Hypoxemia: The Arrest Respiratory Failure due to Pneumonia (ARREST) Multicenter Randomized Controlled Trial

A phase 3 US trial stopped early for futility has delivered a disappointing verdict on a therapy that had shown promise in earlier work. Aerosolised budesonide/formoterol did not significantly reduce rates of acute respiratory failure in hospitalised patients with pneumonia and hypoxaemia. However, a possible signal of benefit was observed among patients who received treatment earlier after hospital presentation, raising questions about whether timing could influence treatment response.

A steroid trial built on an earlier signal

Pneumonia remains a major cause of hospitalisation, respiratory deterioration and death worldwide, particularly among patients who develop hypoxaemia. Although systemic corticosteroids have been studied extensively in pneumonia, results across trials have been inconsistent, and their role remains dependent on disease severity and clinical context. A preliminary study had suggested that aerosolised budesonide/formoterol could improve oxygenation in patients with pneumonia, providing the rationale for the phase 3 ARREST trial. Investigators therefore examined whether these physiological improvements could translate into a clinically meaningful reduction in acute respiratory failure.

Randomising hospitalised patients, tracking time to treatment

This multicentre, double-blind phase 3 trial randomised hospitalised patients with pneumonia and hypoxaemia to receive twice-daily aerosolised budesonide/formoterol or placebo for up to five days. The primary endpoint was acute respiratory failure (ARF), defined as requiring high-flow nasal oxygen or non-invasive or invasive ventilation for more than 36 hours. Patients who already had an indication for inhaled beta agonists or corticosteroids were excluded. The protocol was later amended to permit 6 mg of dexamethasone in patients with COVID-19 only. Investigators also explored heterogeneous treatment effects across pre-specified subgroups using a significance threshold of $p<0.10$, including whether the timing of the first treatment dose influenced outcomes.

Stopped early, no overall benefit

The trial enrolled 465 patients between May 2020 and July 2025 before being stopped for futility at 75% of planned enrolment. The median time from emergency department presentation to administration of the first study dose was 20 hours. ARF occurred in 50 of 230 patients receiving placebo (21.7%) and 47 of 235 patients receiving budesonide/formoterol (20.0%), representing no significant overall difference between groups (OR 0.9, 95% CI 0.6–1.5, p=0.7).

A potential timing-related effect was observed. Patients who received their first dose within 20 hours showed a trend toward lower rates of ARF (OR 0.6, 95% CI 0.3–1.2), whereas those treated after 20 hours showed no apparent benefit (OR 1.4, 95% CI 0.7–2.7; interaction p=0.07). However, this finding did not establish a definitive treatment effect, and no significant differences were identified in the study's secondary endpoints.

What it means

The authors conclude that aerosolised budesonide/formoterol did not significantly reduce acute respiratory failure in hospitalised patients with pneumonia and hypoxaemia. Although earlier treatment showed a possible signal of benefit, the overall findings do not support routine use of this combination for preventing respiratory failure in this setting. The timing signal may nevertheless warrant further investigation to determine whether selected patients could benefit from earlier intervention.

Reference: Levitt J, Haley Hedlin H, Rogers A, Ding V, Lee J, Lu D, Mahaffey K, Gajic O, Matthay M, Wilson J, Bime C, Gentile N, Odeyemi Y, Cartin-Ceba R, Checkley W, Kaufman D, Denson J, Hu K, Elie M, Vojnik R, Desai M, Festic E. Combined Aerosolized Budesonide and Formoterol for Hospitalized Patients with Pneumonia and Hypoxemia: The Arrest Respiratory Failure due to Pneumonia (ARREST) Multicenter Randomized Controlled Trial. Late Breaking abstract presented at: European Respiratory Society (ERS) Congress 2026; Barcelona, Spain.

The Effect of Obesity and Sleepiness on Blood Pressure Evolution in Patients With Obstructive Sleep Apnoea Treated With CPAP: A Retrospective Analysis of Data From Randomised Controlled Trials in the ANDANTE Database

A retrospective analysis of the large ANDANTE database has found that the blood pressure benefits of CPAP therapy in obstructive sleep apnoea (OSA) may depend on the interaction between sleepiness and body weight. Sleepy, non-obese patients showed the clearest improvement, suggesting that body mass index should be considered alongside sleepiness when assessing cardiovascular risk.

A Heterogeneous Response to a Standard Therapy

Patients with OSA face an elevated cardiovascular risk, and although CPAP can improve blood pressure, the response varies considerably between individuals. Both sleepiness and obesity have been associated with adverse cardiovascular outcomes, raising the question of how these factors interact to influence the blood pressure response to CPAP treatment.

Mining a Multi-Trial Database

The researchers analysed the ANDANTE database (ethics: MRA-25/26-53856; NCT07497412) to examine the effects of baseline sleepiness, measured using the Epworth Sleepiness Scale (ESS), and obesity, defined as BMI ≥30 kg/m², on office systolic blood pressure (SBP) response to CPAP. Follow-up SBP was used as the outcome, with age, sex, baseline SBP, study duration, baseline ESS, obesity and the interaction between ESS and obesity included as covariates.

Sleepiness Helps Blood Pressure, but Only Without Obesity

Of 6,412 eligible patients with OSA, 3,271 who received CPAP were included in the analysis. Their mean age was 59±11 years, 71% were male and 49% were obese. Baseline office SBP was 132±17 mmHg, ESS was 8.5±4.4 and the apnoea-hypopnoea index was 35.8±20.9 events/hour. Follow-up SBP was lower in non-obese patients with higher ESS scores (p=0.0164), and this association remained significant when BMI was analysed as a continuous variable (p=0.041).

What It Means

The authors conclude that the blood pressure response to CPAP in patients with OSA appears to vary according to the interaction between sleepiness and obesity. The findings suggest that body mass index should be considered alongside sleepiness when assessing cardiovascular risk and the potential blood pressure benefits of CPAP therapy.

Reference: Serna M, Soranna D, Zambon A, Lombardi C, Pepin J, Steier J. The effect of obesity and sleepiness on blood pressure evolution in patients with obstructive sleep apnoea treated with CPAP: a retrospective analysis of data from randomised controlled trials in the ANDANTE database. Late Breaking abstract presented at: European Respiratory Society (ERS) Congress 2026; Barcelona, Spain.

Robotic Versus Electromagnetic Bronchoscopy With Integrated Intraprocedural Imaging for Peripheral Pulmonary Lesion Assessment: The RELIANT-2 Multicenter Randomized Trial

The RELIANT-2 multicentre trial found that robotic-assisted bronchoscopy combined with intraprocedural cone-beam CT (RAB-CBCT) achieved a substantially higher diagnostic yield for peripheral lung lesions than electromagnetic navigation bronchoscopy combined with digital tomosynthesis (ENB-DT). The RAB-

CBCT approach was also associated with fewer pneumothoraces.

Does More Imaging Mean Better Biopsies?

Intraprocedural cone-beam computed tomography (CBCT) is increasingly being used during robotic-assisted bronchoscopy (RAB) to improve lesion localisation and diagnostic accuracy. The RELIANT-2 trial compared RAB with integrated CBCT against electromagnetic navigation bronchoscopy with integrated digital tomosynthesis (ENB-DT) for the evaluation and biopsy of peripheral lung lesions.

Randomising Procedure Rooms, Day by Day

In this multicentre, cluster-randomised, open-label superiority trial, procedure rooms were randomised each day to either RAB-CBCT or ENB-DT, with each room-day treated as a cluster. All patients undergoing bronchoscopy for biopsy of a lung lesion were eligible. Treatment allocation was concealed using sealed opaque envelopes, and although proceduralists were aware of the assigned technique, pathologists adjudicating the primary outcome were blinded. The primary endpoint was strict diagnostic yield, defined as the proportion of procedures resulting in a specific diagnosis.

A Wide Gap in Yield and Safety

Across 254 clusters, 440 patients were included in the analysis. Diagnostic tissue was obtained in 175 of 230 patients (76.1%) in the RAB-CBCT group compared with 125 of 210 patients (59.5%) in the ENB-DT group. This corresponded to an odds ratio of 2.16 (95% CI 1.44–3.26) and an absolute difference of 16.6 percentage points (95% CI 7.5–26.0).

Pneumothorax was the most common adverse event and occurred in only 1 patient in the RAB-CBCT group compared with 7 patients in the ENB-DT group, suggesting a more favourable safety profile with the robotic approach.

What It Means

The authors conclude that, among patients undergoing bronchoscopy for biopsy of peripheral lung lesions, RAB combined with CBCT achieved a significantly higher diagnostic yield than ENB with digital tomosynthesis. The lower number of pneumothoraces also suggests that the RAB-CBCT approach may offer an important procedural safety advantage.

Reference: Paez R, Duke J, Katsis J, Pickering E, Ratwani A, Yong S, Thinnes W, Bridwell G, Leonard K, Thiboutot J, Chen H, Chen S, Shojaee S, Yarmus L, Lentz R, Maldonado F. Robotic versus electromagnetic bronchoscopy with integrated intraprocedural imaging for peripheral pulmonary lesion assessment: the RELIANT-2 multicenter randomized trial. Late Breaking abstract presented at: European Respiratory Society (ERS) Congress 2026; Barcelona, Spain.

Feasibility and Diagnostic Performance of NodeAI for Real-Time Prediction of Mediastinal Lymph Node Malignancy During EBUS for Lung Cancer Staging

An AI tool designed to flag malignant lymph nodes in real time during EBUS-guided lung cancer staging has proven not just feasible but, at the right threshold, better than expert endoscopists at ruling malignancy in or out, a Canadian-led study has found.

An operator-dependent procedure looking for an assist

EBUS-TBNA is central to lung cancer staging, but its diagnostic yield varies widely depending on operator skill. NodeAI is an AI-powered device that generates a real-time prediction of lymph node malignancy from EBUS images, and this study assessed its feasibility, diagnostic performance, and potential to support endoscopist decision-making.

A run-in study ahead of a multicentre trial

Patients undergoing EBUS-TBNA for lung cancer staging were prospectively enrolled at a single academic centre between January 2025 and March 2026, as the run-in phase of a larger multicentre trial. NodeAI generated a malignancy prediction for every lymph node, and its diagnostic statistics were compared against expert endoscopists' visual predictions, with final pathology serving as the gold standard.

Matching experts overall, beating them at the extremes

197 patients were enrolled, yielding 483 lymph nodes with conclusive pathology, of which 34.0% (164/483)

were malignant. NodeAI produced predictions for every node, achieving 75.8% accuracy, 64.0% sensitivity, 81.8% specificity, 64.4% PPV, 81.6% NPV, and an AUC of 0.827. At a rule-out threshold, NodeAI's sensitivity (94.5%, 95% CI 90.9–97.6) and NPV (92.7%, 95% CI 88.1–96.9) were statistically indistinguishable from expert performance (sensitivity 87.2%, NPV 90.9%). At a rule-in threshold, however, NodeAI significantly outperformed experts on both specificity (89.0% vs 66.1%) and PPV (73.3% vs 57.0%).

What it means

The authors conclude that NodeAI demonstrates feasibility and good-to-excellent discriminative ability, performing comparably to experts in visually detecting malignant lymph nodes but meaningfully outperforming them in predicting true malignancy — a finding they say will now be tested in an upcoming multicentre, multi-platform trial and reader study of endoscopist performance with and without the tool.

Reference: Patel Y, Gatti A, Olszewski A, Kidane B, Villeneuve P, Digby G, Turner S, Nayak R, Yasufuku K, Liberman M, Hanna W, Hanna W. Feasibility and diagnostic performance of NodeAI for real-time prediction of mediastinal lymph node malignancy during EBUS for lung cancer staging. Late Breaking abstract presented at: European Respiratory Society (ERS) Congress 2026; Barcelona, Spain.

Gene Expression Signatures of Usual Interstitial Pneumonia Radiologic Features in Idiopathic Pulmonary Fibrosis Lung Tissue

By precisely matching CT scans to explanted lung tissue, Canadian researchers have mapped out a stepwise molecular progression in idiopathic pulmonary fibrosis (IPF) — tracing how gene expression escalates from early, near-invisible fibrotic activity through to the severe, irreversible-looking damage seen in honeycombing on a scan.

Radiology without a molecular map

IPF is diagnosed by spotting honeycombing (HC) and reticulation (RT) on CT imaging, yet the molecular signatures driving pathology within the tissue behind these radiological features have never been characterised. The study aimed to define gene expression signatures associated with CT-defined regions of normal lung, ground-glass opacity (GGO), RT, and HC within IPF lungs.

Registering live scans to explanted tissue

Lungs from 10 IPF patients and 10 donor control lungs were inflated to 10 cm H2O pressure and frozen. In vivo CT scans were registered to ex vivo CT scans of the explanted lungs, enabling targeted sampling of control lung (n=61), normal-appearing IPF lung (n=56), GGO (n=23), and RT/HC (n=37) tissue. RNA sequencing was performed throughout, with differential gene expression analysed using linear mixed-effects models and pathway analysis via gene set enrichment analysis.

A stepwise molecular escalation

Normal-appearing IPF lung tissue already showed 1,087 up- and 242 downregulated genes compared with control tissue, reflecting extracellular matrix deposition and metabolic suppression. GGO regions showed 894 up- and 302 downregulated genes, with enrichment of extracellular matrix pathways and mesenchyme activation. Tissue with RT and HC — the most advanced radiological features — showed the most extensive changes, with 1,688 up- and 672 downregulated genes, marked by cilium movement, extracellular matrix activation, metabolic repression, impaired wound healing, and T-cell dysregulation. Notably, 998 genes in GGO tissue and 65 genes in RT/HC tissue overlapped with those already altered in normal-appearing IPF lung.

What it means

The authors conclude that their findings reveal a spatial, stepwise molecular progression in IPF lung tissue, running from early fibrotic activation in normal-appearing and ground-glass tissue through to impaired wound healing and immune suppression in the most advanced honeycombing and reticulation regions.

Reference: Abbasidezfouli S, Yang C, Ledoux S, Cooper J, Hogg J, Vasilescu D, Goobie G, Hackett T. Gene expression signatures of usual interstitial pneumonia radiologic features in idiopathic pulmonary fibrosis lung tissue. Presented at: European Respiratory Society (ERS) Congress 2026; Barcelona, Spain.

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