出國報告 （出國類別：其他）

參加 2024 歐洲呼吸道年會會後心得報告
(2024 European respiratory society)

服務機關：國立陽明交通大學附設醫院
姓名職稱：賴怡君 醫師
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出國期間：113.09.05～113.09.13
報告日期：113.09.23

摘要

2024 年歐洲呼吸道年會在奧地利的首都維也納舉辦，本次大會主題為 “Humans and machines：getting the balance right”。人工智能在醫學領域的核心價值應該是醫療人員如何應用來協助診斷治療疾病，還包括健康促進、預防、診斷、治療、康復。在這個全世界最大規模的呼吸領域的學術研討會中程聚集超過兩萬名以上來自世界各地的醫學專業人士，交流相關領域的最新知識和研究促進臨床發展。會議議程包羅萬象，有肺部腫瘤和肋膜有肺部腫瘤和肋膜處理、肺功能測試、慢性阻塞性肺病、氣喘、睡眠呼吸終止症、呼吸衰竭、肺高壓、肺部感染症、肺部纖維化、肺部影像處理、小兒呼吸道疾病、呼吸重症。

目次

壹、 目的

European Respiratory Society Congress (ERS) 歐洲呼吸道年會是世界上最盛大關於呼吸的專家會議，來自世界各地超過數萬名醫學相關人士會參與的盛會。這是 2024 ERS 在奧地利維也納舉行，一起研討關於呼吸系統疾病領域中最新的發展研究，臨床指引和治療方法。這次大會的主題在於人工智能 (Artificial Intelligence, AI) ，人類和機器獲得正確的平衡，尤其是在呼吸生理上面應用很廣。

貳、過程

這次 ERS 會議包含各種主題，有氣喘、慢性阻塞性肺病 (COPD)、感染症、肺高壓、睡眠、呼吸器、小孩呼吸系統疾病、肺部影像、肺部腫瘤等...包羅萬象，也有各地專家的海報展覽研究呈現。

2024/09/07 先到會場領取識別證後 (圖 1)，就選擇想要瞭解的主題，這次主要是氣喘和慢性阻塞性肺病的部分居多。之後先到海報區看一下世界各地專家的研究，其中一篇 (圖 2)提到用神經傳導來看病人和呼吸器配合程度吸引我的注意。這也是利用 AI 在儀器上判斷病人和呼吸器的配合度，進而增加臨床醫師調整儀器設定，讓呼吸器發揮更大功效的方式，很特別。然後進到會場準備聽課 (圖 3)，發現熱門課都擠的水洩不通。聽了新的 2023 年肺功能指引，針對 body box 測完 lung volume 後的建議判讀流程，並強調了測量 body box 時 panting 可以用來評估 tidal breath 的氣道阻塞。針對肺功能在種族分類的難題和爭議，探索解決方案。

2024/09/08 學習到在中國如何提高輕度氣喘和不典型氣喘的診斷率及治療方式 (圖 4，圖 5)。先介紹流行病學，氣喘是慢性呼吸道發炎的疾病，有各種細胞和 cytokine 參與，在世界各地氣喘盛行率不一 1~29%都有，且逐年增加，但中國只診斷 4570 萬氣喘病人，只佔了 4.2%人口，覺得是明顯低估，其中有 26.2%病人已經存在肺功能異常造成氣流受限，影響病人日常生活作息。而氣喘發作和治療又會增加醫療和家庭負擔，早期診斷和早期治療是很重要的幫助。所以中國學者通過症狀，肺功能和一些發炎指標作為提高氣喘診斷的方法，也建立了專家共識來加強精準醫療，提高氣喘的控制。一個瑞典研究探討呼氣一氧化氮 (FeNO) ≥25ppb 和氣喘病人年紀、性別、過敏史、氣流阻塞、控制不佳有關係。

另外就是討論惡性肋膜積液的診斷和處理方式 (圖 6，圖 7)。診斷包含 pleural biopsy 或是胸腔鏡取樣，也討論何時該用引流管，何時該由外科手術介入，控制肋膜積液產生看來是最好的方法，根據病人狀況選擇留置引

流管的時間，引流頻率，引流管大小或是輔助藥物都是重點。

2024/09/09 (圖 8 和圖 9)呼吸道融合病毒(RSV)為副黏液病毒科，具有外套膜的單股反鏈 RNA 病毒，RSV 感染鼻咽或結膜黏膜，傳播至呼吸道的纖毛上皮細胞，在長期照護機構中，成人 RSV 疫情爆發很容易發生。疾病侵襲率高(80%)，並伴隨著顯著的肺炎發病率(30%)和死亡率 (5%)。60 歲以上慢性肺部或心臟疾病患者建議接種 RSV 疫苗，氣喘治療指引也把 RSV 疫苗施打列入建議。AREXVY 疫苗透過將 RSVPreF3 抗原與佐劑系統 ($AS01_E$) 結合，AREXVY 能誘導抗原特異性細胞免疫反應合中和抗體，有助於預防 RSV 相關 LRTD[1]

關於困難控制氣喘治療已經有很多生物製劑可以選擇 (圖 10,圖 11)，可以根據病人的共病症作為選擇參考，如果是 urticaria 或孕婦可以考慮 anti IGE monoclonal antibody, 如果是合併 EGPA, HES 等風濕免疫科疾病，可考慮 anti IL5, 如果有 allergic dermatitis 或是 eosinophilic esophagitis 可使用 anti IL4, 如果是 neutrophil asthma, 選用 anti TSLP。過去 clinical remission 指的是病人在 12 個月內沒有出現急性發作或是症狀加劇的情況，通常包含無氣喘症狀，無急性發作，肺功能穩定或改善，可以不用口服類固醇。

2024/09/10 (圖 12, 圖 13) 關於急性呼吸窘迫症候群(acute respiratory distress syndrome，簡稱 ARDS)，有 30%為罕發炎的 ARDS，死亡率是低發炎 ARDS 兩倍，Permissive Hypercapnia 可能會增加死亡率，因此肺保護策略下還是盡量降低二氧化碳，ECMO 在高 Blood flow 下較不易溶血。

關於慢性阻塞性肺病 (COPD) (圖 14-16), 頻發急性發作病人中，30%有 eosinophilia + T2 high 可使用 ICS 或生物製劑，70% neutrophil 發炎為主的可使用 Azithromycin; 做 6 分鐘運動測試會掉血氧的病人，及時沒有符合長期用氧氣的條件，使用攜帶式氧氣機可顯著改善症狀與生活品質。Dupixent 在 COPD 3 期試驗的數據進一步證實了與安慰劑相比，減少急性惡化和改善肺功能。COPD 的病人一旦惡化，會造成心血管共病症死亡率增加(圖 17-19) ，對於 COPD 是否要使用 triple therapy 各位專家還是保留中，對於 eosinophil count 高的病人才建議使用含 ICS 的藥物，一般 COPD 病人還是建議由 dual bronchodilator 開始。本次 ERS 會議討論了許多和 COPD 診斷及嚴重度分級，急性惡化預測的相關研究，探討不同措施在 COPD 病人的治療效益和價值。小氣道疾病 (small airway disease, SAD) 在 COPD 也扮演重要角色，會導致小氣道阻力增加和 air trapping, 一項瑞典研究發現 COPD GOLD 4 病人都有 SAD, GOLD 2-4 的有 83.3%有 SAD

2024/09/11 阻塞型睡眠呼吸中止症 (OSA)是心血管疾病的危險因子之一(圖 20)，一般常用的嚴重度評估為呼吸暫停低通氣指數(Apnea–Hypopnea Index，AHI), 在反應 OSA 風險存在一定的侷限性。大陸學長設計了新指標，睡眠呼吸受損指数（sleep breathing impairment index，SBII），發現和 Framingham 心血管風險評估有相關聯，對於心血管死亡風險有好的預測能力。

參、心得

這次難得有機會可以參與國際級的會議，在會場和世界各地的學者交流，當然也有遇到台灣其他醫學的先進共襄盛舉。自己在臨床工作中雖然肺癌、肺結核、肺炎等都有涉獵，但最大宗的還是呼吸道疾病的病人。尤其是各種生物制劑都有使用經驗，代表台灣甚至是我們醫院的治療方針都是和世界接軌的最新治療。在面對疾病時，如何診斷、治療、甚至是預防疾病產生，在人工智能這創新的技術平台面前我們要如何好好運用找到自己的價值和定位。利用這個寶貴的經驗學習到歐洲在診斷、治療、預防等研究的方法和經驗分享，對於多團隊合作和不同國家間的溝通及交流模式提供我們珍貴的學習經驗。現在 ERS 和世界衛生組織 (WHO) 擴大合作規模，關注各種慢性呼吸系統疾病，不管是造成醫療負擔加重或是流行病學研究，描述現在的生活方式和環境暴露對於大家呼吸健康的危害，也致力於未來城市如何改善呼吸健康。我們生活在一個地球村上，在資訊發達又方便的年代，透過一系列一系列演講、臨床研究、年會發表、案例等方式分享。希望未來還有機會能夠參與各種年會甚至分享自己的台灣經驗。

肆、建議事項

台灣因為健保制度的關係，許多藥物的使用不一定能即時和國際接軌，尤其是生物制劑因為單價較高所以限制比研究的 inclusion criteria 適應症更嚴格，藥物使用也因為需要臨採或是申請常會延誤病人用藥治療。台灣在一個亞熱帶氣候，宜蘭本身又是潮濕多雨，許多病患都有一些慢性呼吸道疾病，像氣喘，過敏性鼻炎等。ERS 作為一個重要又盛大的呼吸道年會，每年制訂各種疾病新的診斷治療標準和建議，希望能讓臨床醫師有機會參與。也有機會可以讓台灣或是宜蘭經驗登上國際舞台。台灣其實在肺部疾病不管是肺結核，癌症，感染，之前 COVID 經驗或是氣喘，COPD 各方面研究和治療其實並不亞於國外先進國家，因此建議政府機關應該多舉辦大型國際研討會，提供平台和實際計畫協調促進各醫學中心院所合作，整合各家資源和經驗，提供好的環境讓大家一起提升研究和技術創新，讓台灣的經驗可以在國際間展露能見度。

伍、附錄

圖 1 會場領識別證

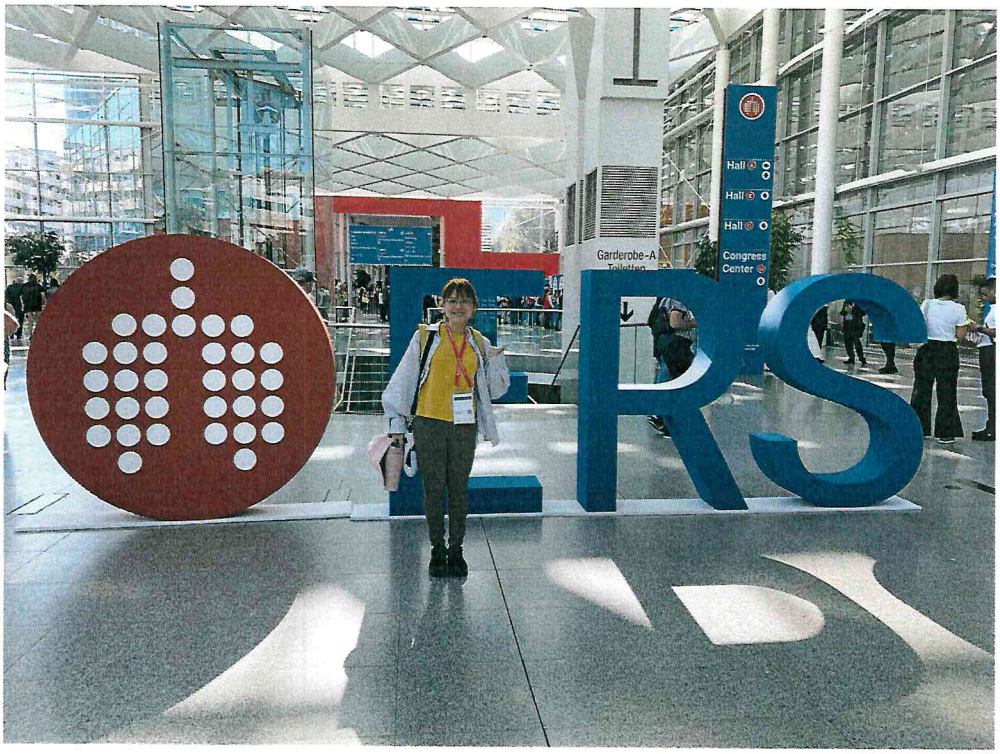


圖 2 海報展覽

圖 3 會場一角

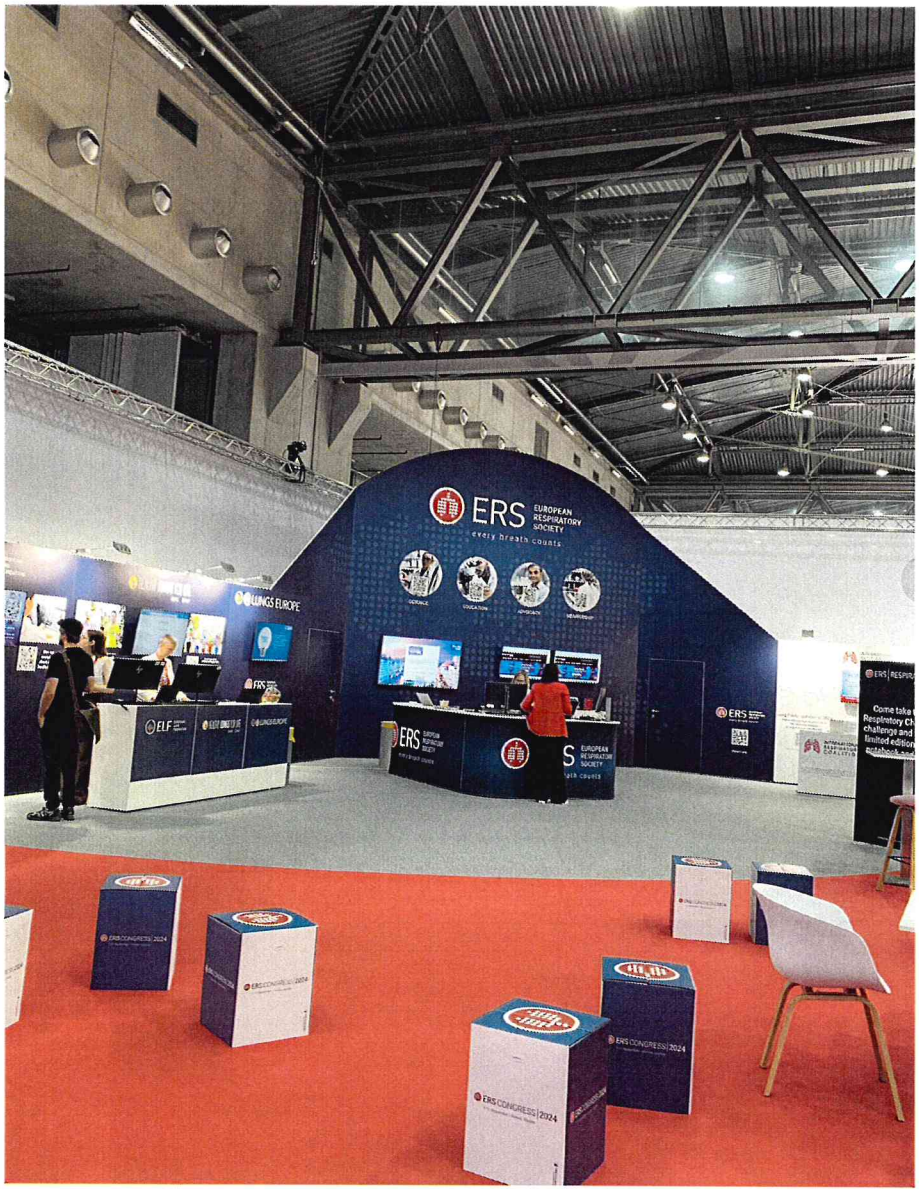

ERS
EUROPEAN RESPIRATORY SOCIETY
every breath counts
LUNGS EUROPE
ELF
ERS CONGRESS 2024

圖 4


上海市第一人民醫院
SHANGHAI GENERAL HOSPITAL
Department of the Respiratory and Critical Care Medicine, Shanghai General Hospital
Mild Asthma and Atypical Asthma,
how to improve the diagnosis and treatment
Min Zhang
CTS Asthma Group,
Department of Respiratory and Critical Care Medicine
Shanghai General Hospital
Shanghai Jiao Tong University School of Medicine
Vienna 2024/09/08

圖 5

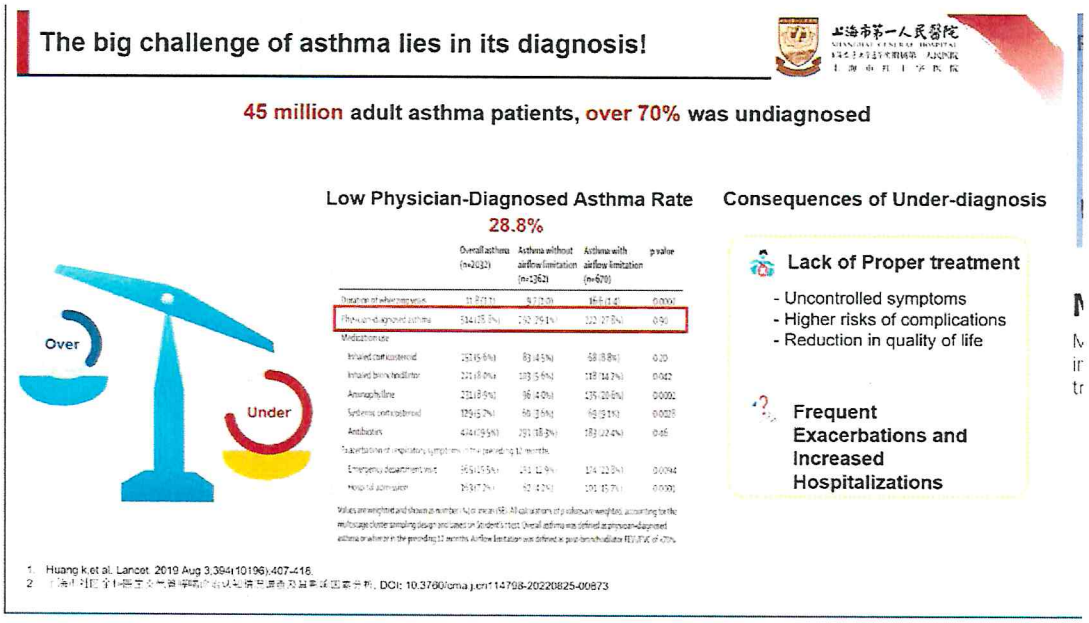

The big challenge of asthma lies in its diagnosis!
45 million adult asthma patients, over 70% was undiagnosed
Low Physician-Diagnosed Asthma Rate
28.8%
Over
Under
Consequences of Under-diagnosis
Lack of Proper treatment
- Uncontrolled symptoms
- Higher risks of complications
- Reduction in quality of life
Frequent Exacerbations and Increased Hospitalizations
1. Huang k,et al. Lancet. 2019 Aug 3;394(10196):407-418.

圖 6

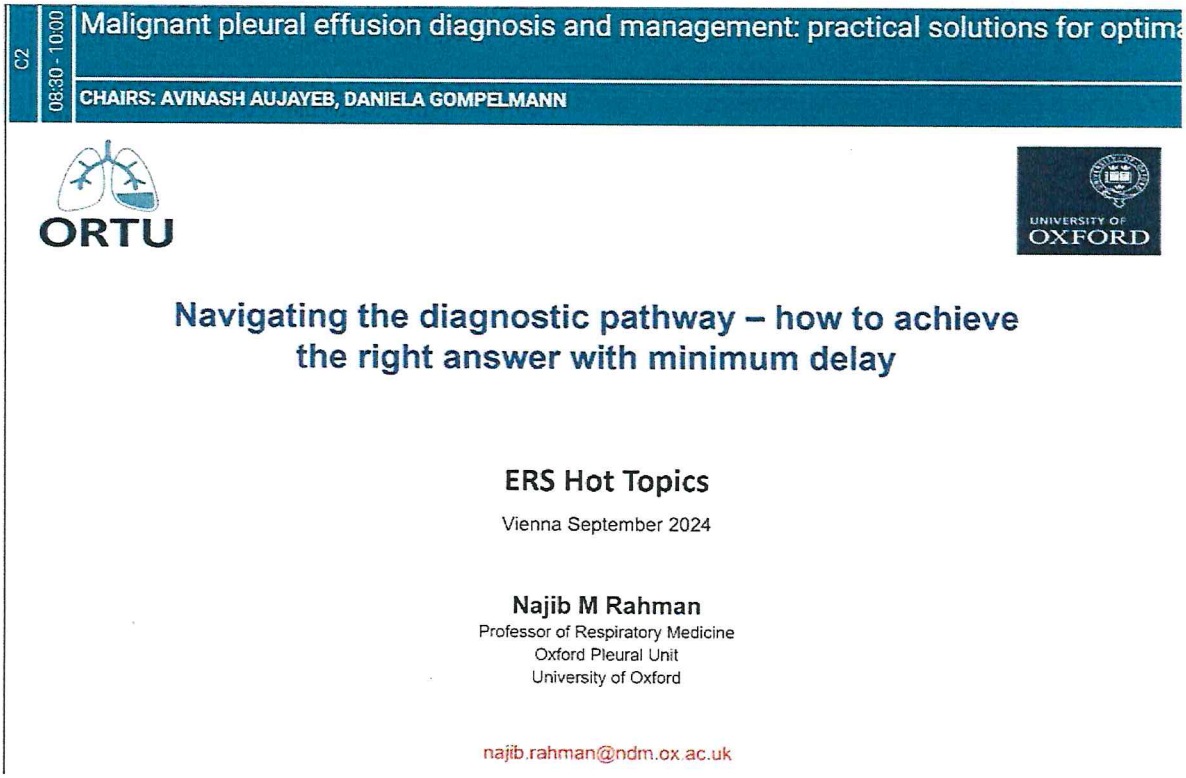

C2
08:30 - 10:00
Malignant pleural effusion diagnosis and management: practical solutions for optima
CHAIRS: AVINASH AUJAYEB, DANIELA GOMPELMANN
ORTU
UNIVERSITY OF OXFORD
Navigating the diagnostic pathway – how to achieve the right answer with minimum delay
ERS Hot Topics
Vienna September 2024
Najib M Rahman
Professor of Respiratory Medicine
Oxford Pleural Unit
University of Oxford
najib.rahman@ndm.ox.ac.uk

圖 7

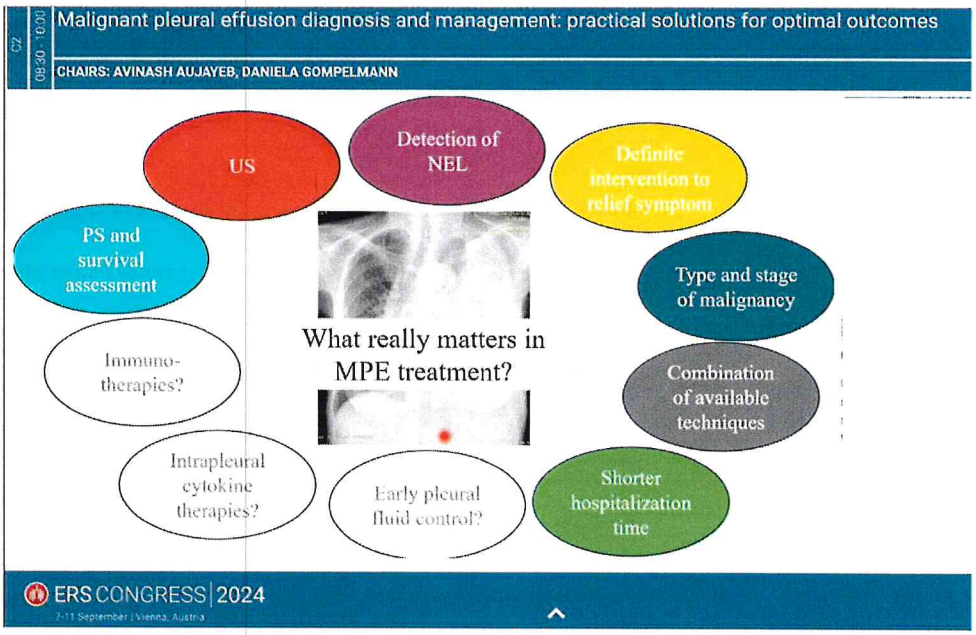

C2
08:30 - 10:00
Malignant pleural effusion diagnosis and management: practical solutions for optimal outcomes
CHAIRS: AVINASH AUJAYEB, DANIELA GOMPELMANN
US
Detection of NEL
Definite intervention to relief symptom
PS and survival assessment
Type and stage of malignancy
Immuno-therapies?
What really matters in MPE treatment?
Combination of available techniques
Intrapleural cytokine therapies?
Early pleural fluid control?
Shorter hospitalization time
ERS CONGRESS 2024
7-11 September | Vienna, Austria

圖 8

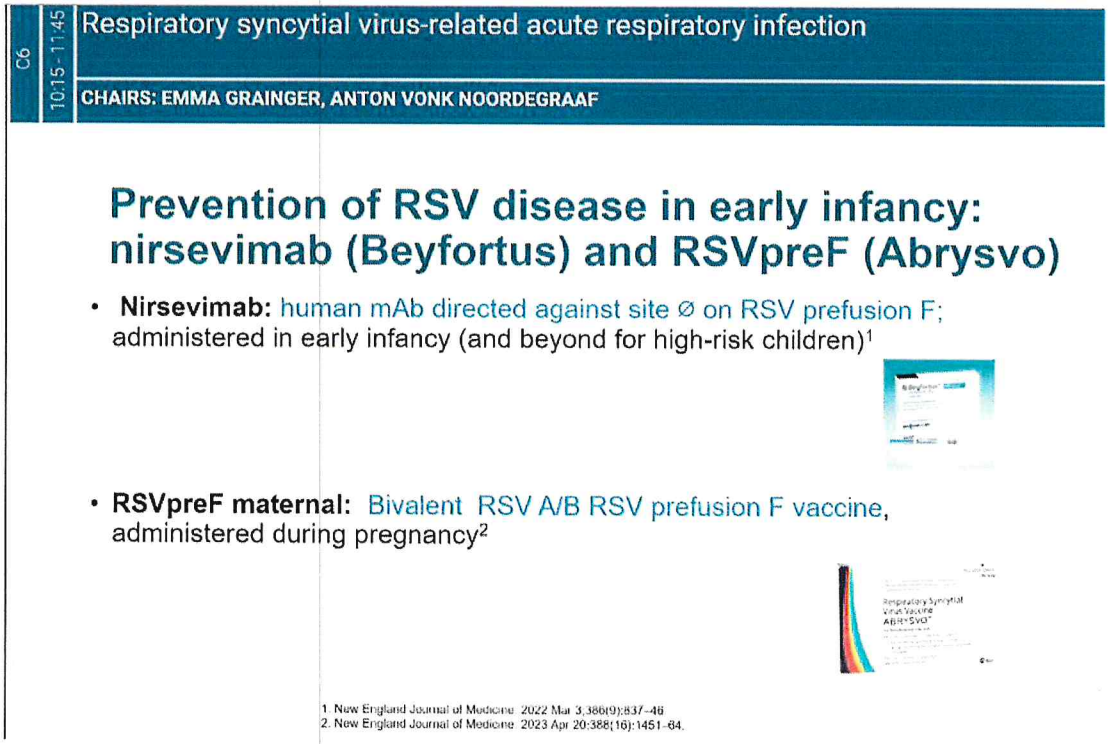
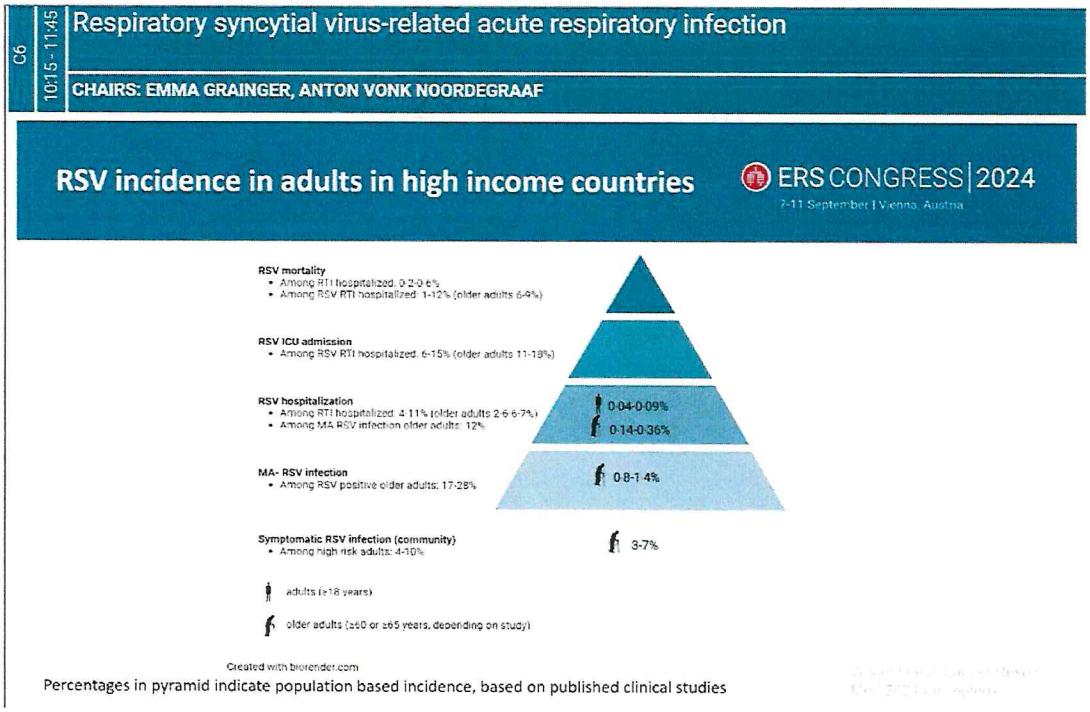

C6
10:15 - 11:45
Respiratory syncytial virus-related acute respiratory infection
CHAIRS: EMMA GRAINGER, ANTON VONK NOORDEGRAAF
Prevention of RSV disease in early infancy: nirsevimab (Beyfortus) and RSVpreF (Abrysvo)
• Nirsevimab: human mAb directed against site Ø on RSV prefusion F; administered in early infancy (and beyond for high-risk children)[1]
• RSVpreF maternal: Bivalent RSV A/B RSV prefusion F vaccine, administered during pregnancy[2]
1. New England Journal of Medicine 2022 Mar 3;386(9):837-46
2. New England Journal of Medicine 2023 Apr 20;388(16):1451-64.

圖 9



Percentages in pyramid indicate population based incidence, based on published clinical studies

圖 10

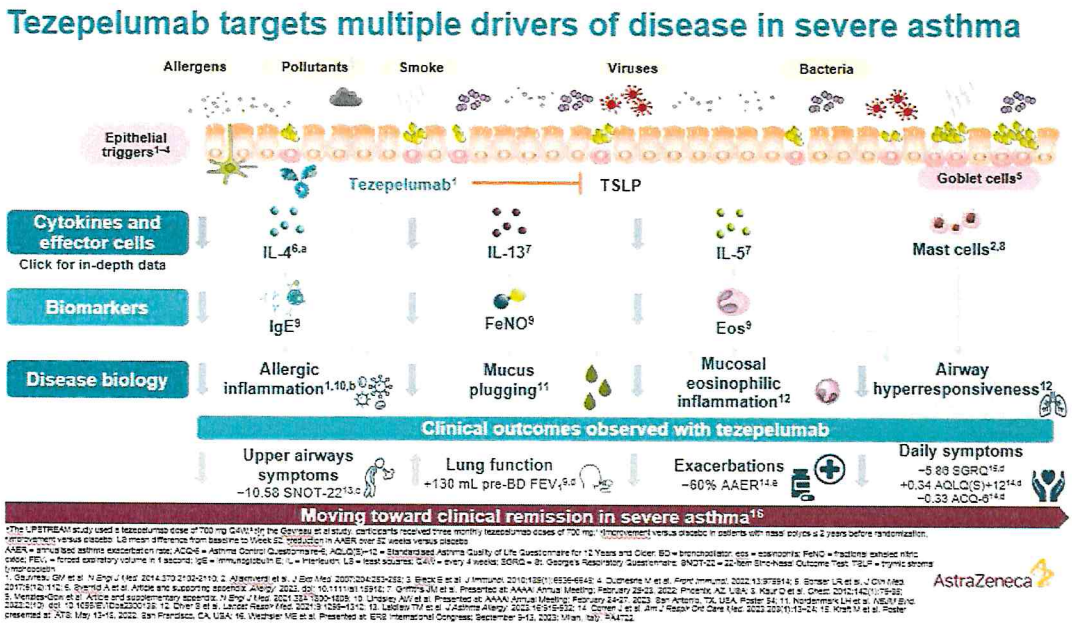


圖 11

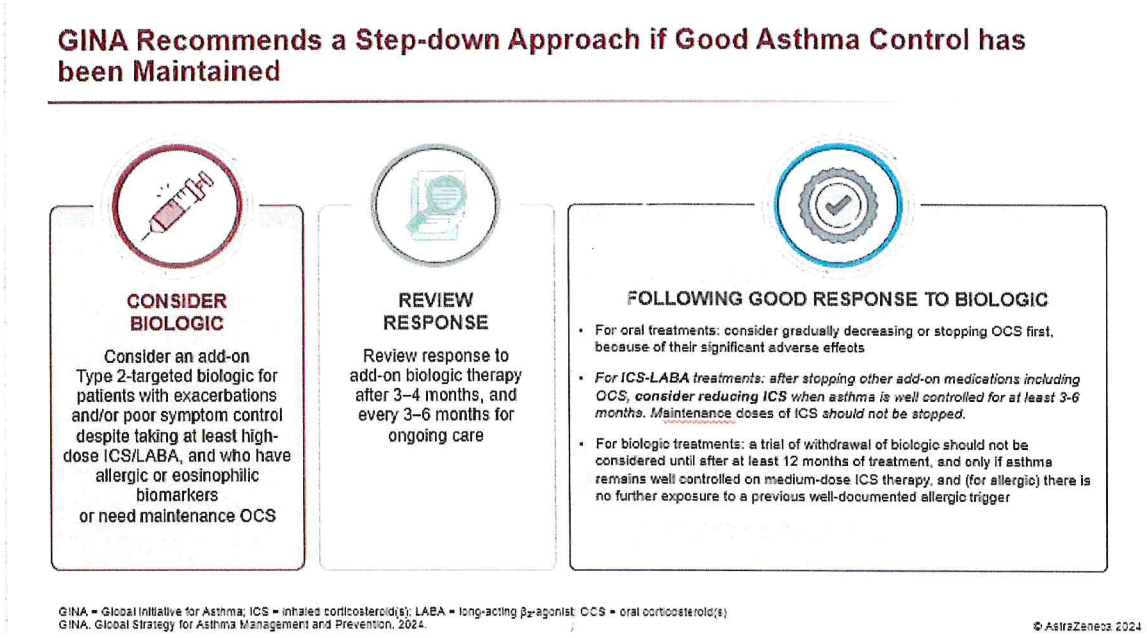

GINA Recommends a Step-down Approach if Good Asthma Control has been Maintained
CONSIDER BIOLOGIC
Consider an add-on Type 2-targeted biologic for patients with exacerbations and/or poor symptom control despite taking at least high-dose ICS/LABA, and who have allergic or eosinophilic biomarkers or need maintenance OCS
REVIEW RESPONSE
Review response to add-on biologic therapy after 3–4 months, and every 3–6 months for ongoing care
FOLLOWING GOOD RESPONSE TO BIOLOGIC
For oral treatments: consider gradually decreasing or stopping OCS first, because of their significant adverse effects
For ICS-LABA treatments: after stopping other add-on medications including OCS, consider reducing ICS when asthma is well controlled for at least 3-6 months. Maintenance doses of ICS should not be stopped.
For biologic treatments: a trial of withdrawal of biologic should not be considered until after at least 12 months of treatment, and only if asthma remains well controlled on medium-dose ICS therapy, and (for allergic) there is no further exposure to a previous well-documented allergic trigger
GINA = Global Initiative for Asthma; ICS = inhaled corticosteroid(s); LABA = long-acting β2-agonist; OCS = oral corticosteroid(s)
GINA. Global Strategy for Asthma Management and Prevention, 2024.
© AstraZeneca 2024

圖 12

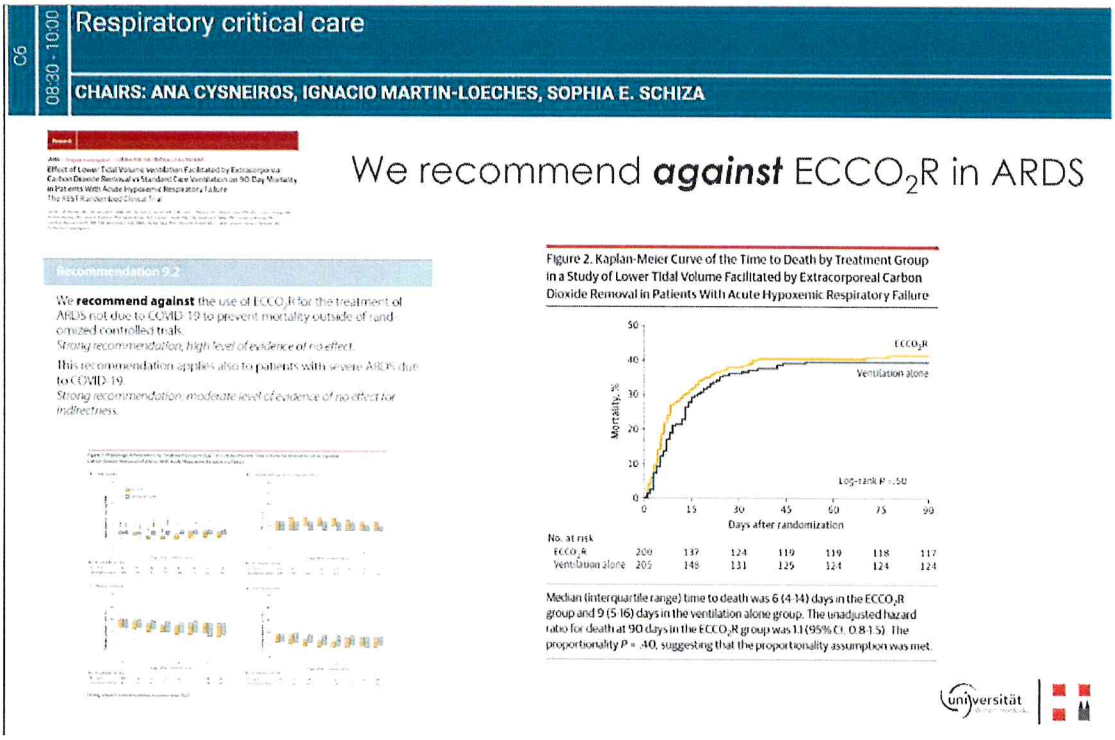
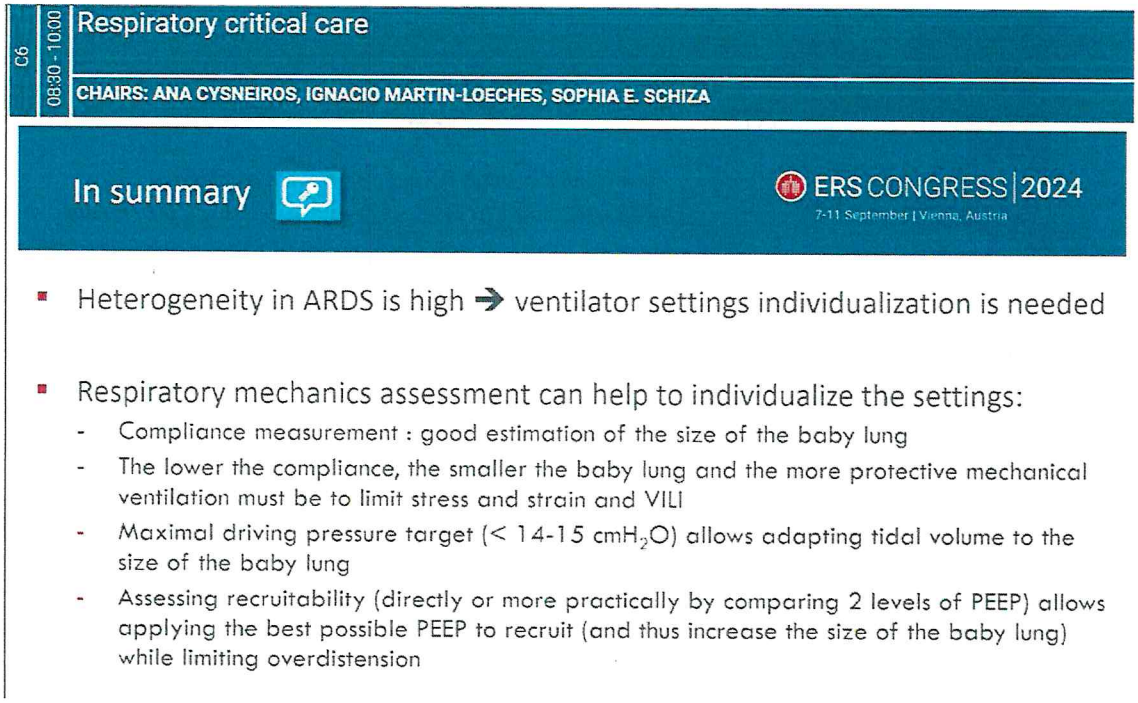

C6
08:30 - 10:00
Respiratory critical care
CHAIRS: ANA CYSNEIROS, IGNACIO MARTIN-LOECHES, SOPHIA E. SCHIZA
We recommend against ECCO2R in ARDS
Recommendation 9.2
We recommend against the use of ECCO2R for the treatment of ARDS not due to COVID-19 to prevent mortality outside of randomized controlled trials.
Strong recommendation, high level of evidence of no effect.
This recommendation applies also to patients with severe ARDS due to COVID-19.
Strong recommendation, moderate level of evidence of no effect for indirectness.
Figure 2. Kaplan-Meier Curve of the Time to Death by Treatment Group in a Study of Lower Tidal Volume Facilitated by Extracorporeal Carbon Dioxide Removal in Patients With Acute Hypoxemic Respiratory Failure
ECCO2R
Ventilation alone
Mortality, %
Days after randomization
Log-rank P = .50
No. at risk
ECCO2R 200 137 124 119 119 118 117
Ventilation alone 205 148 131 125 124 124 124
Median (interquartile range) time to death was 6 (4-14) days in the ECCO2R group and 9 (5-16) days in the ventilation alone group. The unadjusted hazard ratio for death at 90 days in the ECCO2R group was 1.1 (95% CI, 0.8-1.5). The proportionality P = .40, suggesting that the proportionality assumption was met.
universität

圖 13


C6
08:30 - 10:00
Respiratory critical care
CHAIRS: ANA CYSNEIROS, IGNACIO MARTIN-LOECHES, SOPHIA E. SCHIZA
In summary
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Heterogeneity in ARDS is high → ventilator settings individualization is needed
Respiratory mechanics assessment can help to individualize the settings:
- Compliance measurement : good estimation of the size of the baby lung
- The lower the compliance, the smaller the baby lung and the more protective mechanical ventilation must be to limit stress and strain and VILI
- Maximal driving pressure target (< 14-15 cmH2O) allows adapting tidal volume to the size of the baby lung
- Assessing recruitability (directly or more practically by comparing 2 levels of PEEP) allows applying the best possible PEEP to recruit (and thus increase the size of the baby lung) while limiting overdistension

圖 14

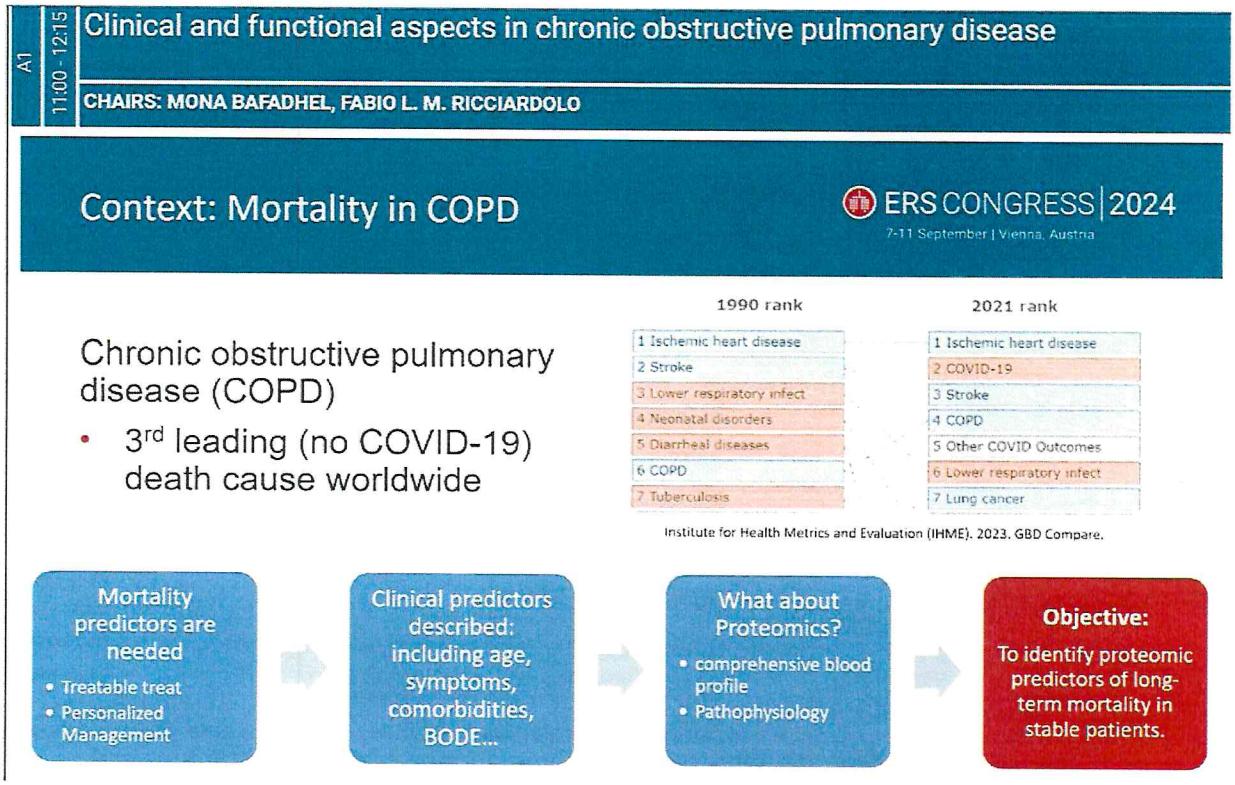
A1
11:00 - 12:15
Clinical and functional aspects in chronic obstructive pulmonary disease
CHAIRS: MONA BAFADHEL, FABIO L. M. RICCIARDOLO
Context: Mortality in COPD
ERS CONGRESS | 2024
7-11 September | Vienna, Austria
Chronic obstructive pulmonary disease (COPD)
• 3rd leading (no COVID-19) death cause worldwide
1990 rank
1 Ischemic heart disease
2 Stroke
3 Lower respiratory infect
4 Neonatal disorders
5 Diarrheal diseases
6 COPD
7 Tuberculosis
2021 rank
1 Ischemic heart disease
2 COVID-19
3 Stroke
4 COPD
5 Other COVID Outcomes
6 Lower respiratory infect
7 Lung cancer
Institute for Health Metrics and Evaluation (IHME). 2023. GBD Compare.
Mortality predictors are needed
• Treatable treat
• Personalized Management
Clinical predictors described: including age, symptoms, comorbidities, BODE...
What about Proteomics?
• comprehensive blood profile
• Pathophysiology
Objective:
To identify proteomic predictors of long-term mortality in stable patients.

圖 15

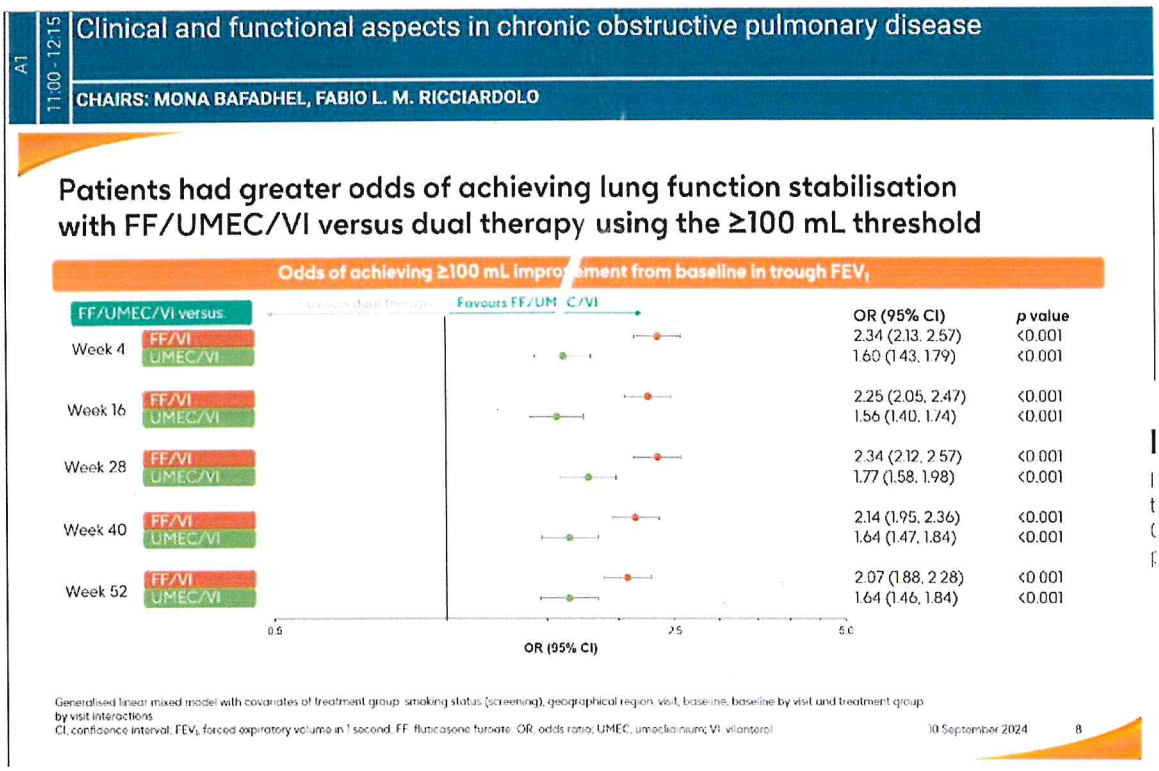
A1
11:00 - 12:15
Clinical and functional aspects in chronic obstructive pulmonary disease
CHAIRS: MONA BAFADHEL, FABIO L. M. RICCIARDOLO
Patients had greater odds of achieving lung function stabilisation with FF/UMEC/VI versus dual therapy using the ≥100 mL threshold
Odds of achieving ≥100 mL improvement from baseline in trough FEV1
FF/UMEC/VI versus:
Favours dual therapy
Favours FF/UMEC/VI
OR (95% CI)
p value
Week 4
FF/VI
UMEC/VI
2.34 (2.13, 2.57)
1.60 (1.43, 1.79)
<0.001
<0.001
Week 16
2.25 (2.05, 2.47)
1.56 (1.40, 1.74)
<0.001
<0.001
Week 28
2.34 (2.12, 2.57)
1.77 (1.58, 1.98)
<0.001
<0.001
Week 40
2.14 (1.95, 2.36)
1.64 (1.47, 1.84)
<0.001
<0.001
Week 52
2.07 (1.88, 2.28)
1.64 (1.46, 1.84)
<0.001
<0.001
0.5
2.5
5.0
OR (95% CI)
Generalised linear mixed model with covariates of treatment group, smoking status (screening), geographical region, visit, baseline, baseline by visit and treatment group by visit interactions
CI, confidence interval; FEV1, forced expiratory volume in 1 second; FF, fluticasone furoate; OR, odds ratio; UMEC, umeclidinium; VI, vilanterol
10 September 2024
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圖 16

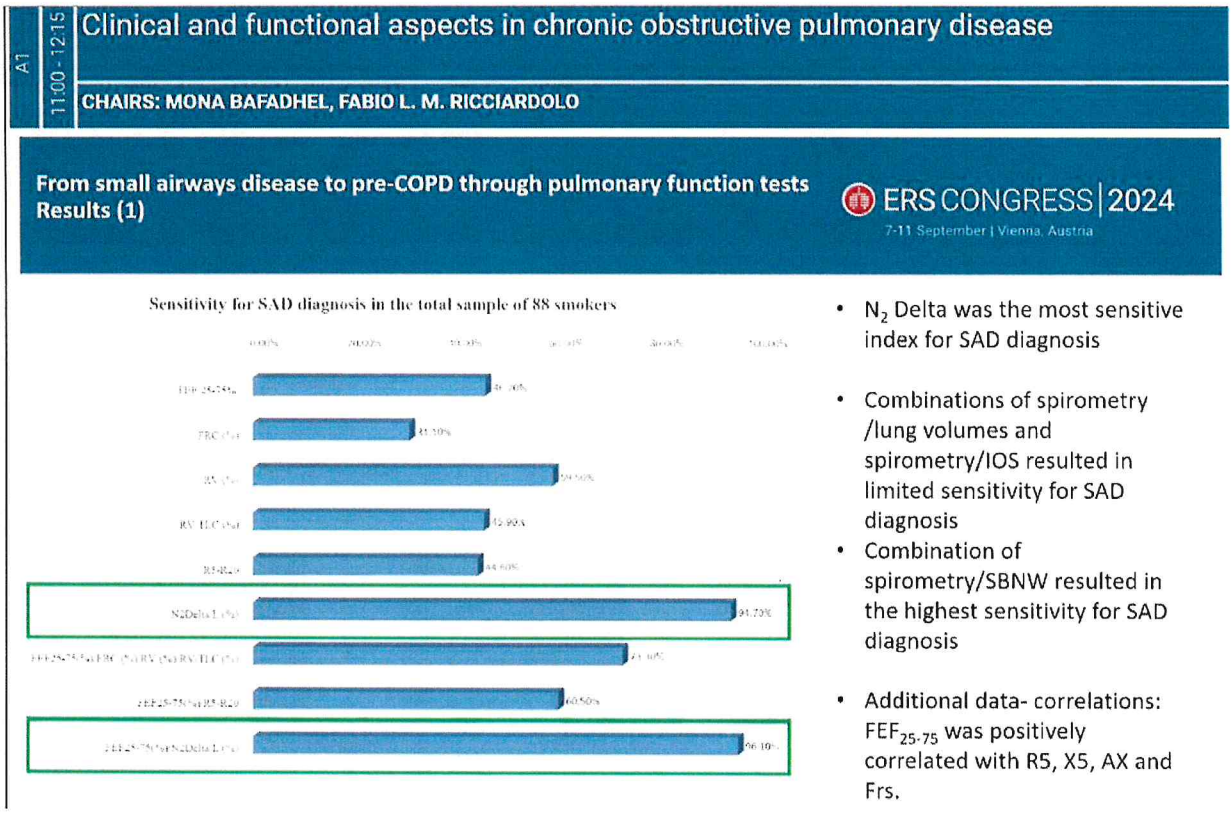

A1
11:00 - 12:15
Clinical and functional aspects in chronic obstructive pulmonary disease
CHAIRS: MONA BAFADHEL, FABIO L. M. RICCIARDOLO
From small airways disease to pre-COPD through pulmonary function tests
Results (1)
ERS CONGRESS | 2024
7-11 September | Vienna, Austria
Sensitivity for SAD diagnosis in the total sample of 88 smokers
N2Delta
• N2 Delta was the most sensitive index for SAD diagnosis
• Combinations of spirometry /lung volumes and spirometry/IOS resulted in limited sensitivity for SAD diagnosis
• Combination of spirometry/SBNW resulted in the highest sensitivity for SAD diagnosis
• Additional data- correlations: FEF25-75 was positively correlated with R5, X5, AX and Frs.

圖 17

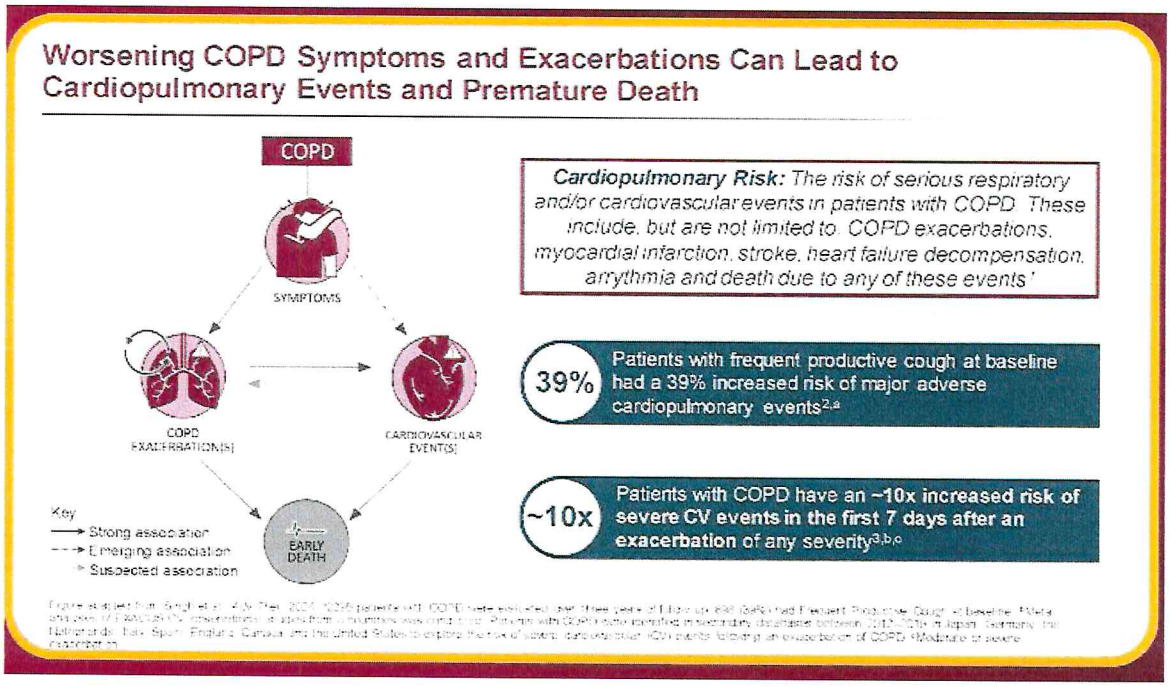

Worsening COPD Symptoms and Exacerbations Can Lead to Cardiopulmonary Events and Premature Death
COPD
SYMPTOMS
COPD EXACERBATION(S)
CARDIOVASCULAR EVENT(S)
EARLY DEATH
Key
Strong association
Emerging association
Suspected association
Cardiopulmonary Risk: The risk of serious respiratory and/or cardiovascular events in patients with COPD. These include, but are not limited to: COPD exacerbations, myocardial infarction, stroke, heart failure decompensation, arrythmia and death due to any of these events1
39%
Patients with frequent productive cough at baseline had a 39% increased risk of major adverse cardiopulmonary events2,a
~10x
Patients with COPD have an ~10x increased risk of severe CV events in the first 7 days after an exacerbation of any severity3,b,c

圖 18

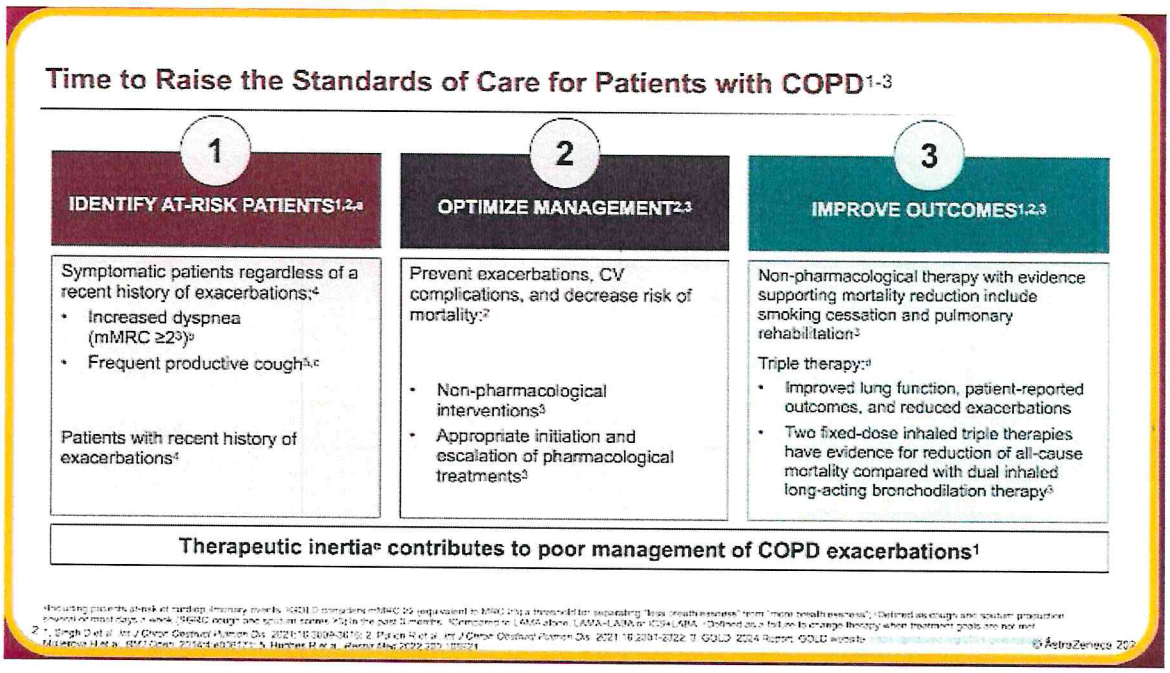

Time to Raise the Standards of Care for Patients with COPD1-3
1
IDENTIFY AT-RISK PATIENTS1,2,a
Symptomatic patients regardless of a recent history of exacerbations:4
Increased dyspnea (mMRC ≥2[3])b
Frequent productive coughb,c
Patients with recent history of exacerbations4
2
OPTIMIZE MANAGEMENT2,3
Prevent exacerbations, CV complications, and decrease risk of mortality:2
Non-pharmacological interventions3
Appropriate initiation and escalation of pharmacological treatments3
3
IMPROVE OUTCOMES1,2,3
Non-pharmacological therapy with evidence supporting mortality reduction include smoking cessation and pulmonary rehabilitation3
Triple therapy:d
Improved lung function, patient-reported outcomes, and reduced exacerbations
Two fixed-dose inhaled triple therapies have evidence for reduction of all-cause mortality compared with dual inhaled long-acting bronchodilation therapy3
Therapeutic inertiae contributes to poor management of COPD exacerbations1

圖 19

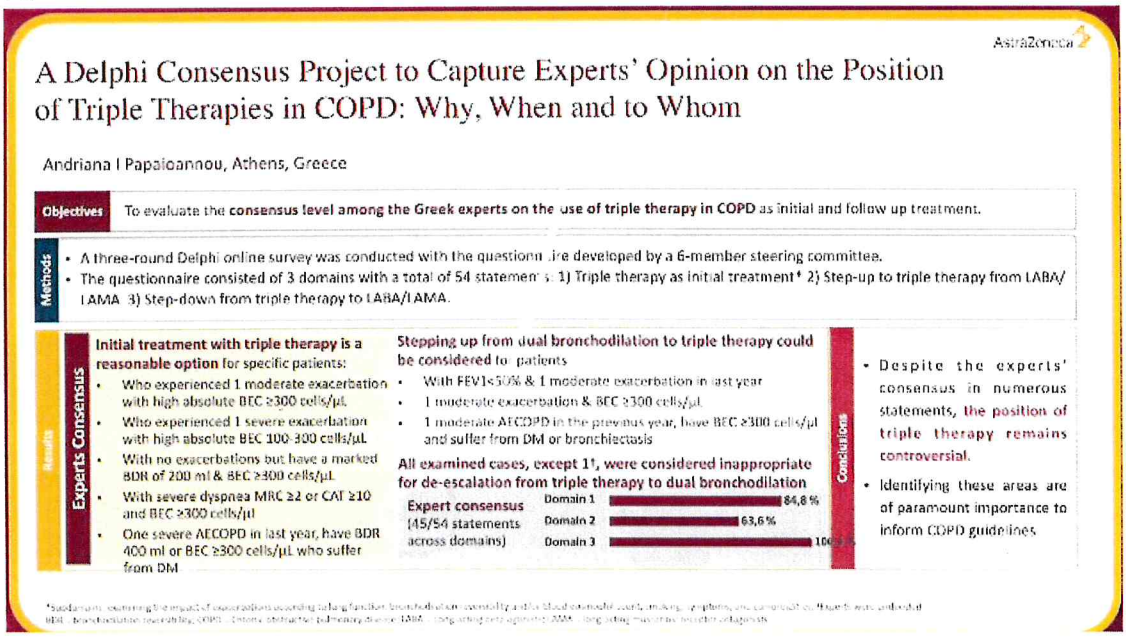
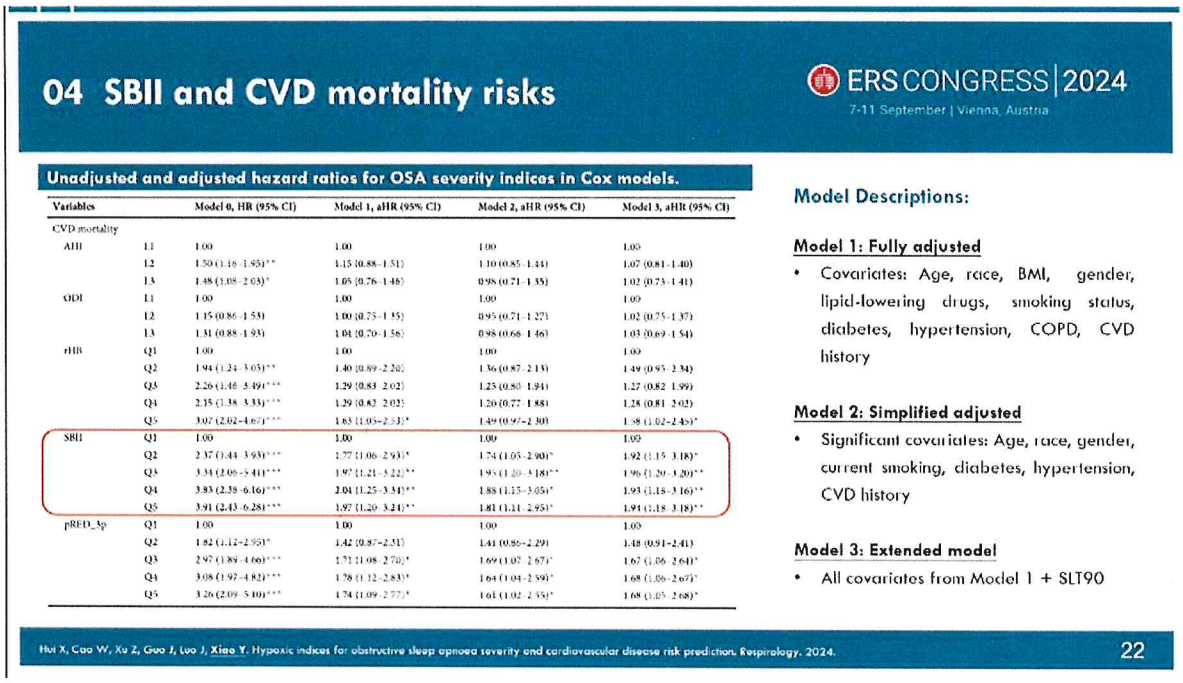

AstraZeneca
A Delphi Consensus Project to Capture Experts' Opinion on the Position of Triple Therapies in COPD: Why, When and to Whom
Andriana I Papaioannou, Athens, Greece
Objectives
To evaluate the consensus level among the Greek experts on the use of triple therapy in COPD as initial and follow up treatment.
Methods
• A three-round Delphi online survey was conducted with the questionnaire developed by a 6-member steering committee.
• The questionnaire consisted of 3 domains with a total of 54 statements: 1) Triple therapy as initial treatment* 2) Step-up to triple therapy from LABA/LAMA 3) Step-down from triple therapy to LABA/LAMA.
Results
Experts Consensus
Initial treatment with triple therapy is a reasonable option for specific patients:
• Who experienced 1 moderate exacerbation with high absolute BEC ≥300 cells/μl
• Who experienced 1 severe exacerbation with high absolute BEC 100-300 cells/μL
• With no exacerbations but have a marked BDR of 200 ml & BEC ≥300 cells/μL
• With severe dyspnea MRC ≥2 or CAT ≥10 and BEC ≥300 cells/μl
• One severe AECOPD in last year, have BDR 400 ml or BEC ≥300 cells/μL who suffer from DM
Stepping up from dual bronchodilation to triple therapy could be considered to patients
• With FEV1<50% & 1 moderate exacerbation in last year
• 1 moderate exacerbation & BEC ≥300 cells/μl
• 1 moderate AECOPD in the previous year, have BEC ≥300 cells/μl and suffer from DM or bronchiectasis
All examined cases, except 1*, were considered inappropriate for de-escalation from triple therapy to dual bronchodilation
Expert consensus (45/54 statements across domains)
Domain 1 84,8 %
Domain 2 63,6 %
Domain 3
Conclusions
• Despite the experts' consensus in numerous statements, the position of triple therapy remains controversial.
• Identifying these areas are of paramount importance to inform COPD guidelines

圖 20


04 SBII and CVD mortality risks
ERS CONGRESS 2024
7-11 September | Vienna, Austria
Unadjusted and adjusted hazard ratios for OSA severity indices in Cox models.
Variables | Model 0, HR (95% CI) | Model 1, aHR (95% CI) | Model 2, aHR (95% CI) | Model 3, aHR (95% CI)
CVD mortality
AHI L1 1.00 1.00 1.00 1.00
L2 1.50 (1.16–1.95)** 1.15 (0.88–1.51) 1.10 (0.85–1.44) 1.07 (0.81–1.40)
L3 1.48 (1.08–2.03)* 1.05 (0.76–1.46) 0.98 (0.71–1.35) 1.02 (0.73–1.41)
ODI L1 1.00 1.00 1.00 1.00
L2 1.15 (0.86–1.53) 1.00 (0.75–1.35) 0.95 (0.71–1.27) 1.02 (0.75–1.37)
L3 1.31 (0.88–1.93) 1.04 (0.70–1.56) 0.98 (0.66–1.46) 1.03 (0.69–1.54)
rHR Q1 1.00 1.00 1.00 1.00
Q2 1.94 (1.24–3.03)** 1.40 (0.89–2.20) 1.36 (0.87–2.13) 1.49 (0.95–2.34)
Q3 2.26 (1.46–3.49)*** 1.29 (0.83–2.02) 1.25 (0.80–1.94) 1.27 (0.82–1.99)
Q4 2.35 (1.38–3.33)*** 1.29 (0.82–2.02) 1.20 (0.77–1.88) 1.28 (0.81–2.02)
Q5 3.07 (2.02–4.67)*** 1.63 (1.03–2.53)* 1.49 (0.97–2.30) 1.58 (1.02–2.45)*
SBII Q1 1.00 1.00 1.00 1.00
Q2 2.37 (1.44–3.93)*** 1.77 (1.06–2.93)* 1.74 (1.05–2.90)* 1.92 (1.15–3.18)*
Q3 3.34 (2.09–5.41)*** 1.97 (1.21–3.22)** 1.95 (1.20–3.18)** 1.96 (1.20–3.20)**
Q4 3.83 (2.38–6.16)*** 2.04 (1.25–3.34)** 1.88 (1.15–3.05)* 1.93 (1.18–3.16)**
Q5 3.91 (2.43–6.28)*** 1.92 (1.20–3.24)** 1.81 (1.11–2.95)* 1.91 (1.18–3.18)**
pRED_Sp Q1 1.00 1.00 1.00 1.00
Q2 1.82 (1.12–2.95)* 1.42 (0.87–2.31) 1.41 (0.86–2.29) 1.48 (0.91–2.41)
Q3 2.97 (1.89–4.66)*** 1.71 (1.08–2.70)* 1.69 (1.07–2.67)* 1.67 (1.06–2.64)*
Q4 3.08 (1.97–4.82)*** 1.78 (1.12–2.83)* 1.64 (1.04–2.59)* 1.68 (1.06–2.67)*
Q5 3.26 (2.09–5.10)*** 1.74 (1.09–2.77)* 1.61 (1.02–2.55)* 1.68 (1.05–2.68)*
Model Descriptions:
Model 1: Fully adjusted
• Covariates: Age, race, BMI, gender, lipid-lowering drugs, smoking status, diabetes, hypertension, COPD, CVD history
Model 2: Simplified adjusted
• Significant covariates: Age, race, gender, current smoking, diabetes, hypertension, CVD history
Model 3: Extended model
• All covariates from Model 1 + SLT90
Hui X, Cao W, Xu Z, Guo J, Luo J, Xiao Y. Hypoxic indices for obstructive sleep apnoea severity and cardiovascular disease risk prediction. Respirology. 2024.
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