the Dyspnea Society 2026

Lund, Sweden

Dyspnea Society's 8th Conference

June 10 - 12, 2026, Lund

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Dear Colleague and Friend,

Warmly welcome to Lund for the Dyspnea Society's 8th International Conference, dedicated to the mechanisms, measurement and management of breathing problems. Thank you for taking of your time to come to Lund, meet and discuss these fundamentally important areas together. On behalf of the scientific committee I hope that we get a couple of days of state-of-the-art presentation and novel discoveries from experienced and emerging future leaders as well as brand new colleagues – let's discuss, think, share and have a good time. Collaboration, openness and helping each other out are important in these times, as in all times. Where Lund, peaceful as it may seem, stands today stood the bloodiest battle on Swedish soil (we tended to do our wars on the soil of others) against our arch enemies, the Danes. According to an old history teacher of mine, Swedes and Danes are the two countries that have warred the most times against each other, during more than 400 years, in European history. Quite impressive. But things changed, and slowly but securely, our countries got more and more integrated, and the (mostly imagined) differences got bridged, quite literally. Even if we are many that think that we should take Denmark for once and for all, the thriving integrated region and the Oresund Bridge show how things can become a bit better when we work together.

I would also like to extend warm thanks to all people contributing to making this meeting possible – Lund university, Region of Skane, the funders Swedish Heart Lung Foundation, AstraZeneca, Cyclomedica, MKON, and the international scientific commitee:
David Currow (Australia), Rachael Evans (UK), Dennis Jensen (Canada),
Andreas von Leupoldt (Belgium), Hayley Lewthwaite (Australia), Shakeeb Moosavi (UK),
Capucine Morelot-Panzini (France), Thomas Similowski (France),
and Marie Williams (Australia).

All the best,

Magnus Ekström
Lund University, Sweden
magnus.ekstrom@med.lu.se

On behalf of The Dyspnea Society, I would like to warmly welcome you to our 8th International Scientific Meeting.

In the 21 years since our first meeting, the Society has grown considerably in both membership and professional diversity, while remaining firmly grounded in our core research pillars: the mechanisms, measurement, and management of dyspnea. This continued growth reflects the strength of our interdisciplinary community and our shared commitment to advancing the science and clinical understanding of breathlessness.

I have every expectation that this meeting will continue that tradition and foster the thoughtful and collegial scientific exchange and collaboration that defines our Society. The program brings together leading researchers, clinicians and trainees from around the world to share their data and thoughts, to challenge ideas, and to inspire future directions in dyspnea research and care.

I would like to extend my sincere thanks to the organizing committee, speakers, sponsors, and attendees whose contributions make this meeting possible. I hope you find the meeting scientifically stimulating, professionally rewarding, and personally enjoyable.

Welcome, and thank you for being part of our community.

Andrew Binks, Ph.D.
President, The Dyspnea Society

Scientific Program

Wednesday, June 10th	
19:00-21:00	**Dyspnea 2026 – Welcome Reception** Grand Hotel, Lund
Thursday, June 11th	
08:15-09:00	**Registration**
09:00-09:10	**Dyspnea 2026 – Welcome & Opening Remarks** *Magnus Ekström & Andrew Binks*
Theme 1 – Mechanisms of Breathlessness	
09:10-09:55	**Respiratory Pathophysiology of Breathlessness** Keynote speaker: *Dennis Jensen, McGill University, Canada*
09:55-10:10	**Discussion**
10:10-10:25	**Breathlessness Without Bias: Sex Differences Disappear when Scaled to Inspiratory Neural Drive** Speaker: *Felix Girard, McGill University, Canada*
10:25-10:40	**Examining Whether Sex Influences Electrocortical Activity and Breathlessness Perception During Inspiratory Pressure Threshold Loading** Speaker: *Kyra Hodges, University of Winnipeg, Canada*
10:40-11:10	**Coffee Break & Networking**
11.10-11:55	**Neuroscience of Experiences** Keynote Speaker: *Micah Allen, Aarhus University, Denmark*
11:55-12:15	**The Neurobiological Model of Breathlessness** Plenary speaker: *Kyle Pattinson, Oxford University, UK*
12:15-12:35	**Discussion**
12:35-12:45	**Welcome address by Region Skane representative**
12:45-13:45	**Lunch & Networking**

Thursday, June 11th	
13:45-14:00	**Structural MRI study of COPD participants to assess volumetric differences in subcortical regions associated with breathlessness severity** Presenter: *Max Olsson, Oxford University, UK*
Theme 2 – Measurement of Breathlessness	
14:00-14:30	**Do we really need more dyspnea measures? Why? When?** Keynote Speaker: *Hayley Lewthwaite, University of Newcastle, Newcastle, Australia*
14:30-14:40	**Discussion**
14:40-14:55	**Multidimensional Dyspnea Profile and Dyspnea-12 in cardiorespiratory conditions** Presenter: *Anna Salomonsson, Örebro University, Sweden*
14:55-15:00	**Conclusion of talks** *Magnus Ekström*
15:00-17:00	**Scientific posters and snack**
19:00-	**Conference Dinner** Hypoteket

Friday, June 12th	
09:00-09:25	**Standardized Assessment of Exertional Breathlessness** Speaker: *Magnus Ekström, Lund University, Sweden*
09:25-09:30	**Discussion**
Theme 3 – Management of Breathlessness	
09:30-10:00	**L-Menthol to Alleviate Breathlessness** Keynote speaker: *Andreas von Leupoldt, University of Leuven, Belgium*
10:00-10:10	**Discussion**
10:10-10:30	**Effect and predictors of response of morphine for chronic breathlessness in COPD: pooled analysis of three large placebo-controlled RCTs** Speaker: *David Currow, Flinders University, Australia*
11:30-11:00	**Coffee Break & Networking**
11:00-11:30	**Breathlessness in Heart Failure – Mechanisms, Treatments and Knowledge Gaps** Keynote speaker: *Tony Babb, University of Texas, USA*
11:30-11:45	**Discussion**
11:45-12:00	**New treatments – next targets and steps [discussion point]**
12:00-13:00	**Lunch**

Friday, June 12th	
Theme 3 – Management of Breathlessness	
13:00-15:00	**Scientific posters**
15:00-15:20	**Global burden of breathlessness** Plenary Speaker: *Slavica Kochovska, Flinders University, Adelaide, Australia*
15:20-15:35	**Chronic Dyspnoea Profiling: A Cluster Analysis in the population-based CONSTANCES Cohort** Speaker: *Solène Valery, Université Paris-Saclay, France*
15:35-16:05	**Coffee Break**
16:05-16:20	**"They want to see you gasping for air": Perceptions of Breathlessness and Health-seeking Behaviours in Culturally Diverse Communities** Speaker: *Harini Sathanapally, University of Leicester, UK*
16:20-16:40	**The Dyspnea Society Business Meeting and Future Directions** *Andrew Binks, President*
16:40-16:55	**Dyspnea 2026 Presentation and Poster Awards** **The Sara Booth Breathlessness Research Prize** *Andrew Binks & Magnus Ekström*
16:55-17:00	**Dyspnea 2026 Closing Remarks** *Magnus Ekström*

Speakers

Andreas von Leupoldt, PhD

Andreas von Leupoldt studied psychology at the University of Hamburg, Germany, where he also received his PhD in 2003 and his Postdoctoral Lecture Qualification for psychology in 2007. He worked as a Research Fellow at the University of Florida, Gainesville, USA, and as a Principal Investigator/Research Fellow at the University of Hamburg and the University Medical Center Hamburg-Eppendorf. Since 2013, he is Research Professor for Health Psychology at KU Leuven, Belgium. Andreas von Leupoldt is Full Professor at KU Leuven and chair of the Research Group Health Psychology. He examines interactions between psychology and the respiratory system in healthy individuals and patients with respiratory disease, with a specific focus on bio-psycho-social aspects of breathlessness. In 2024, he received the ERS Mid-Career Gold Medal in Allied Respiratory Professionals award from the European Respiratory Society.

Tony G. Babb

Dr. Tony G. Babb is a Professor of Internal Medicine at UT Southwestern Medical Center and serves as the Director of the Pulmonary Physiology Laboratory at the Institute for Exercise and Environmental Medicine (IEEM). Holding the Effie and Wofford Cain Chair in Cardiopulmonary Research and the Susan Lay Chair for Pulmonary Research, his work focuses on respiratory exercise physiology, specifically examining the mechanisms of dyspnea and ventilatory limitations in populations including those with obesity, pulmonary disease, and the elderly. Dr. Babb earned his Ph.D. from Pennsylvania State University and completed a postdoctoral fellowship at the Mayo Clinic. A distinguished leader in his field, he is a Fellow of the American College of Sports Medicine (ACSM) and the American Thoracic Society, and he was recently honored with the 2023 ACSM Citation Award for his lifelong contributions to exercise science.

Speakers

Hayley Lewthwaite

Dr Hayley Lewthwaite is an accredited exercise physiologist and senior lecturer in clinical exercise physiology at the University of Newcastle, Australia. Her research focuses on optimising breathlessness assessment and management in chronic airways diseases.

Slavica Kochovska

Dr Slavica Kochovska is a Research Fellow in Palliative Care at Flinders University, Australia. Combining applied health research with an academic background in linguistics, Slavica leads a program of research that focuses on delineating the impacts of chronic breathlessness for people with life-limiting illnesses and their families and developing interventions to minimise those impacts through better recognition, assessment and response in clinical practice.

Speakers

Magnus Ekström

Magnus Ekström is a Senior Consultant, Associated Professor and Senior Lecturer in Respiratory Medicine at Lund University, Lund, Sweden. His main research focuses are the mechanisms, measurement and management of breathlessness. He also leads research in oxygen therapy and management in patients with chronic respiratory failure, and is the head of the Swedish National Registry for Respiratory Failure (Swedevox). He has authored more than 300 scientific publications and book chapters, and is involved in multiple multicenter trials and international research collaborations, including mechanistic, epidemiological and registry-based studies, clinical cohort studies, meta-analyses, and randomized controlled trials.

Micah Allen

Dr. Micah Allen is a computational neuroscientist whose research utilises interdisciplinary approaches to understand the mechanisms inter-linking brain-body interaction, interoception, and metacognition. He completed a BSc in experimental psychology at the University of Central Florida, an MA in philosophy and cognitive science at the University of Hertfordshire, and a PhD in health neuroscience at Aarhus University. Afterward, he was a post-doctoral research fellow at University College London and Cambridge Psychiatry. He currently holds a position as a Professor of Computational Psychiatry at the Institute of Clinical Medicine at Aarhus University in Denmark, and is also an Honorary Senior Research Fellow at Cambridge Psychiatry.

Speakers

Dennis Jensen

Prof. Dennis Jensen is a clinical exercise and respiratory physiologist, interested in studying the mechanisms, measurement and management of exertional breathlessness and exercise intolerance in health and disease. He is an Associate Professor of Kinesiology & Physical Education at McGill University in Montreal, QC,
Canada; Canada Research Chair in Clinical Exercise and Respiratory Physiology; and Director of the Clinical Exercise and Respiratory Physiology Laboratory at McGill University (www.mcgill.ca/cerpl/).

Kyle Pattinson

Kyle Pattinson is Associate Professor at the University of Oxford and Honorary Consultant
Anaesthetist at Oxford University Hospitals. His research focuses on the brain mechanisms of
breathlessness, integrating functional neuroimaging, virtual reality, respiratory physiology, and
experimental medicine to understand how breathlessness is perceived and modulated. He has led
studies of breathlessness in conditions including COPD, asthma, and long COVID, with particular
expertise in respiratory interoception and the neural circuitry of breathing.

Abstracts
Mechanisms of Breathlessness

11 June

Breathlessness without Bias: Sex Differences Disappear when Scaled to Inspiratory Neural Drive

Felix Girard[1], Dennis Jensen[2]

[1] Clinical Exercise and Respiratory Physiology Laboratory (CERPL), Department of Kinesiology and Physical Education, McGill University, Montreal, Canada, [2] Translational Research in Respiratory Diseases Program, Research Institute of the McGill University Health Center, Montreal, Canada

Background

Women report greater exertional breathlessness than men at a given absolute minute ventilation (V'E), commonly attributed to lower maximal ventilatory capacity. However, whether this sex difference reflects differences in inspiratory muscle recruitment, breathing mechanics, or inspiratory neural drive (IND) remains unclear.

Methods

Healthy, normal weight men (n=15) and women (n=14) performed 3-min bouts of constant-load semi-recumbent cycling at 30, 50, and 70% peak power output while breathing against graded elastic (ELA) and resistive (RES) inspiratory loads (unloaded, light, moderate, heavy). Breathlessness intensity (BI; Borg 0–10) was related to V'E and a composite EMG-derived index of IND (INDTOT%max; sum of diaphragm and extra-diaphragmatic inspiratory muscle EMG activity). Sex differences were assessed using linear mixed models, and BI–V'E and BI–INDTOT%max relationships using slope and permutation-based threshold analyses.

Results

ELA and RES elicited distinct breathing pattern adaptations in both sexes (faster, shallower breathing under ELA; not shown), while V'E and gas exchange were maintained (not shown). Women had lower absolute V'E under ELA and RES (Fig.1A), lower IRV under ELA with the sex difference varying with cycling intensity under RES (Fig.1B), and higher accessory muscle activation under RES (Fig.1C). In contrast, diaphragm activation (Fig.1D) and INDTOT%max (Fig.1E) were comparable between sexes (all p>.07). Women reported higher BI with the difference widening at higher exercise intensities under RES (EI x Sex: p=.048; Fig.1F). BI-V'E thresholds were lower in women, while slopes were similar (Fig.1G). Slopes and thresholds of the BI–INDTOT%max relationship did not differ between sexes (Fig.1H).

Conclusion

Sex differences in exertional breathlessness are evident when expressed relative to V'E, but disappear when scaled to INDTOT%max, despite distinct mechanical and respiratory muscle responses. These findings identify IND as the proximate physiological determinant of breathlessness, independent of mechanical perturbation magnitude, loading type, and sex.

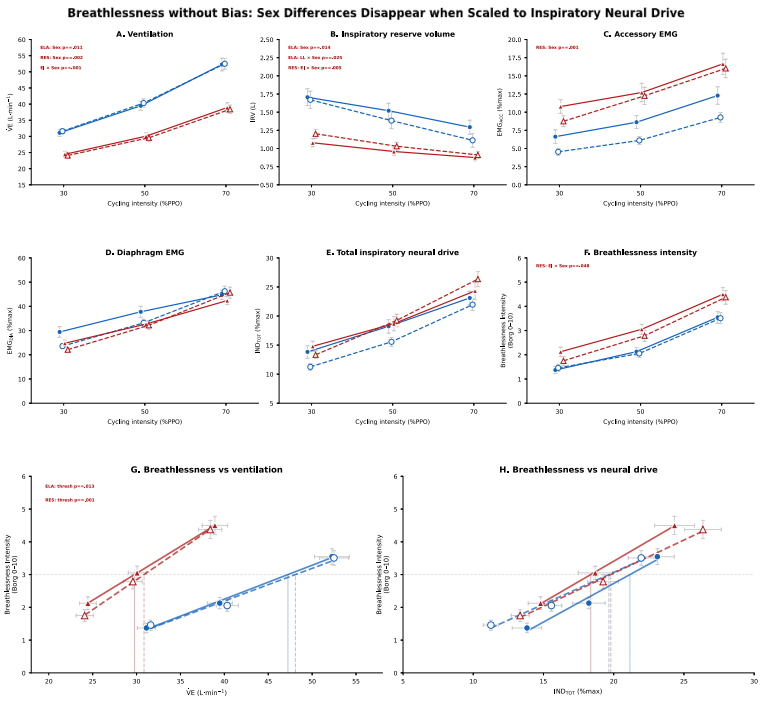


Figure 1. Sex differences in physiological and perceptual responses to graded elastic (ELA) and resistive (RES) inspiratory loading during exercise in 15 men and 14 women. A–F: Group means (± SE) at 30, 50, and 70% peak power output, averaged across load magnitudes. Sex effects were assessed using linear mixed models (load magnitude × exercise intensity × sex); only significant results ($p < .05$) are shown. G–H: Breathlessness intensity (BI; Borg 0–10) as a function of ventilation (G) or total inspiratory neural drive (H). Points are group means for each sex × loading type at each exercise intensity. Lines show ordinary least-squares regressions; vertical lines indicate the inverse-predicted threshold at BI = 3. Within each loading type, slope and threshold invariance between sexes was tested across four load magnitudes (unloaded, light, moderate, heavy); between loading types, only light, moderate, and heavy were compared. Threshold differences were tested using permutation (B = 10,000).

Abstracts
Mechanisms of Breathlessness

11 June

Examining whether sex influences electrocortical activity and dyspnea perception during inspiratory pressure threshold loading

Kyra Hodges[1], Jack Dunsford[2], Jan-Daryl Bantung[1], Jasvir Dhaliwal[1], Natalie Richer[1], Yannick Molgat-Seon[1]
[1] The University of Winnipeg, [2] University of Manitoba

Background: Females report higher levels of dyspnea during exercise and activities of daily living than males; however, the neurophysiological mechanisms remain unclear.

Purpose: To examine the influence of sex on the relationship between electrocortical activity and dyspnea during inspiratory pressure threshold loading (IPTL).

Methods: n=20 healthy adults (n=13 females, n=7 males) completed spirometry, the assessment of maximal inspiratory pressure (MIP), and an incremental IPTL test to task failure. Throughout IPTL, the inspiratory load was increased every 2 min as participants breathed at 30 breaths per min with an inspired duty cycle of 50%. Standard ventilatory parameters were assessed using open-circuit spirometry, electrocortical activity was measured using a 64-channel electroencephalography (EEG) system, and the perception of dyspnea was assessed using the Borg 0-10 category-ratio scale. Mixed effects modeling was used to compare the dyspnoea and EEG responses between the sexes and as a function relative inspiratory load (i.e., as a % of MIP), and the relationship EEG responses and dyspnoea perception in both sexes was determined using regression analysis.

Results: During IPTL, dyspnea intensity and unpleasantness increased with relative inspiratory load (both $p<0.05$) to a similar extent in both sexes (both $p>0.05$). EEG spectral power across the delta and theta frequency bands was greater in females than in males (both $p<0.05$), whereas EEG spectral power across the beta and gamma bands increased with relative inspiratory load (both $p<0.05$), regardless of sex (both $p>0.05$), and EEG spectral power across the alpha frequency band was unaffected by relative inspiratory load or sex (both $p>0.05$). Measures of EEG spectral power were not significantly associated with dyspnea perception (all $p>0.05$).

Conclusion: During ITPL at relative inspiratory loads, dyspnea perception is unaffected by sex and the patterns of electrocortical activity are largely similar between males and females.

Abstracts
Mechanisms of Breathlessness

11 June

Structural MRI study of COPD participants to assess volumetric differences in subcortical regions associated with breathlessness severity.

Max Olsson[1], Kyle Pattinson[1]
[1] Nuffield Department of Clinical Neurosciences, University of Oxford, Oxford, United Kingdom

The author has chosen not to publish the abstract.

Abstracts
Mechanisms of Breathlessness

11 June

Multidimensional Dyspnea profile and Dyspnea-12 in cardiorespiratory conditions

Anna Salomonsson[1], Josefin Sundh[1], Anders Blomberg[2], Christer Janson[3], Magnus Sköld[4], Gabriella Eliason[1], Ida Pesonen[4], Magnus Ekström[5]
[1] Örebro University, [2] Umeå University, [3] Uppsala University, [4] Karolinska Institutet, [5] Lund University

Background

The multidimensional nature of breathlessness can be assessed using the Multidimensional Dyspnea Profile (MDP) and Dyspnea-12 (D12). This study aimed to evaluated differences in these multidimensional scores between different cardiorespiratory conditions.

Materials and methods

Cross-sectional analysis within a multicenter study including 156 patients with persistent breathlessness due to asthma (n= 39; 22%), chronic obstructive pulmonary disease COPD (n =47; 30%), idiopathic pulmonary fibrosis (IPF) (n=35;25%), or heart failure (HF) (n =35; 22%). Associations between diagnosis and MDP or D12 scores were examined as score/MDP A1 ratios to account for differences between the included patient groups in the overall level of breathlessness. Associations with intensity scores and descriptors were examined using multivariable linear regression and logistic regression adjusted for sex, age, body mass index and over all breathing discomfort (MDP A1).

Results

Across diagnostic groups, no significant differences were observed in MDP immediate perception, MDP emotional response, D12 total, D12 physical or affective domains, nor in the intensity of MDP and D12 descriptors.

However, the sensation of muscle work/effort was more frequently reported in asthma compared with IPF (OR 8.8 [95%CI 1.8-42.4]) and in obstructive diseases (COPD and asthma) compared with IPF and HF (OR 3.1 [95% CI 1.2-7.9]). Furthermore, selecting chest tightness as predominant descriptor was strongly associated with asthma and obstructive disease (OR 7.6 [1.1-52.0] compared with IPF and OR 6.6 [2.4-18.6] compared with IPF and HF respectively).

Conclusion

Intensities of multidimensional dyspnea instruments did not systematically differ between patients with asthma, COPD, IPF and HF when accounting for the overall severity of breathlessness. Nevertheless, qualitative aspects of dyspnea varied: patients with obstructive diseases more frequently described sensations of muscle work/effort and chest tightness as key components of their breathlessness experience.

Abstracts
Mechanisms & epidemiology

11 June - Poster number 1

An observational study to understand the differences in breathing response to cardiopulmonary exercise testing in adults with and without breathlessness following hospitalisation with COVID-19

Jiaqing Xu[1], Saja Almulhim[1], Enya Daynes[2], Thomas Ward[1], Sam Winter[3], Rachael Evans[1]
[1] University of Leicester & NIHR Leicester Biomedical Research Centre (Respiratory), [2] University Hospitals of Leicester NHS Trust & NIHR Leicester Biomedical Research Centre (Respiratory), [3] Loughborough University

Background

Persistent dyspnoea is a common and disabling symptom following COVID-19 hospitalisation, frequently occurring despite normal spirometry and preserved gas exchange which may be caused by disordered breathing pattern.

Materials and Methods

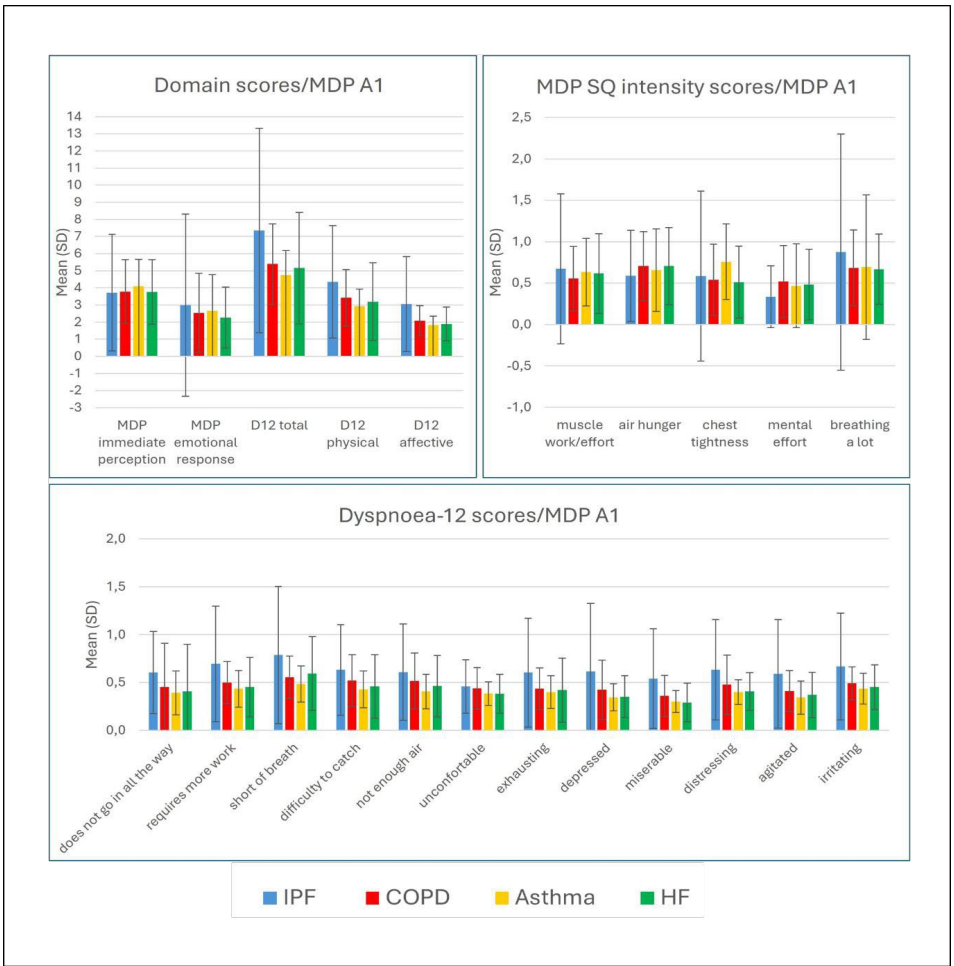
Thirteen previously hospitalised adults with long-COVID symptoms underwent cardiopulmonary exercise testing (CPET) combined with optoelectronic plethysmography (OEP), a three-dimensional motion capture technique that quantifies chest wall kinematics and thoracoabdominal coordination. Participants were classified as breathless (mMRC≥2) or non-breathless (mMRC=1). Chest-wall phase angles across compartments and regional compartmental volume contributions were analysed at rest and across progressive exercise stages.

Results

Breathless participants (n= 13) demonstrated reduced exercise capacity and earlier exercise termination compared with non-breathless participants, with lower peak VO_2 (mL/min/kg) (median[95%CI] 20 [14–12] vs. 25 [21–27], $p < 0.05$). While between-group differences in OEP-derived metrics did not reach statistical significance, thoracoabdominal asynchrony was markedly more prevalent in the breathless group at rest (83% vs. 20%), mid exercise (67% vs. 40%), and maximum exercise (83% vs. 40%). Importantly, the magnitude and frequency of asynchrony increased with exercise intensity, accompanied by altered ribcage and abdominal contributions to total chest wall volume (max intensity: ribcage contribution 67 vs. 64%; abdominal contribution 33% vs. 36%), suggesting impaired coordination rather than isolated ventilatory limitation.

Conclusion

These exploratory findings indicate that persistent dyspnoea after COVID-19 may be partly driven by altered chest wall mechanics and thoracoabdominal coordination during exercise. Integrating OEP with CPET provides mechanistic information beyond conventional pulmonary function testing and may help refine assessment and targeted rehabilitation strategies for long-COVID related breathlessness.



Abstracts
Mechanisms & epidemiology

11 June - Poster number 2

Assessing change in lung function and breathlessness in the Canadian Longitudinal Study on Aging

Rachelle Aucoin[1], Anna Jericho[1], Sanja Stanojevic[1]

[1] Respiratory Epidemiology Team, Department of Community Health & Epidemiology, Faculty of Medicine, Dalhousie University, Halifax, Nova Scotia, Canada

Background: Breathlessness affects approximately 25% of older adults and is associated with poor health-related quality of life (Smith et al., J Am Geriatr Soc, 2016). Although breathlessness is a complex subjective experience influenced by various psycho-physiological factors, it has been shown to correlate somewhat modestly with lung function (Müller et al., Pulm J, 2024). However, population-based longitudinal evidence examining changes in lung function to changes in breathlessness remains limited.

Purpose: Investigate whether changes in lung function are associated with changes in breathlessness in a large population-based study.

Methods: Data from the Canadian Longitudinal Study on Aging between the baseline and first follow-up visit (~3 years) were analyzed. Lung function was expressed as forced expiratory volume in 1 second percentage predicted (FEV1%pred). Breathlessness was assessed using a modified 4-point scale. Change (Δ) in breathlessness was grouped as no change, improved, or worsened. Linear mixed effects models were used to compare the Δ FEV1%pred between breathlessness groups.

Results: 12,888 participants were included (age 60.7 ± 9.5), 22.7% who reported breathlessness at baseline. Across the entire cohort at follow-up, 76% experienced no change, 11% improved, and 13% worsened. Those whose breathlessness improved (96.1 ± 16.6) or worsened (96.5 ± 16.5) had significantly lower baseline FEV1%pred than those with no change (101.7 ± 15.3). Relative to no change (Figure 1), worsening breathlessness was associated with a greater decline in FEV1%pred (β = -4.64, 95% CI -4.98, -4.30), while improving breathlessness was associated with an attenuated decrease in lung function (β = -2.87, 95% CI -3.24, -2.5).

Conclusion: Participants with worsening breathlessness had the steepest rate of lung function decline over a 3-year period. These findings are limited by the coarse assessment of breathlessness, highlighting the need for more rigorous and sensitive breathlessness measurements to better understand symptom trajectories in relation to lung function decline in older adults.

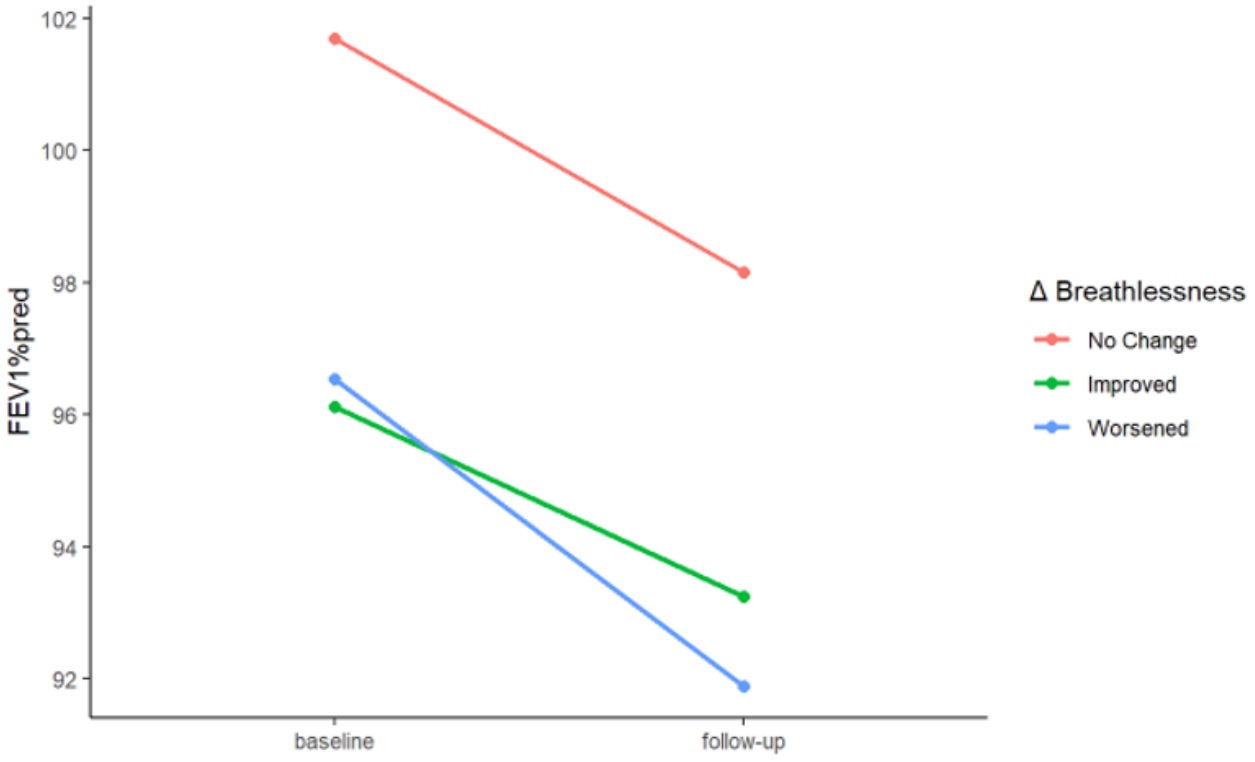


Figure 1. Baseline to follow-up (~3 years) changes in lung function ($FEV_{1\%pred}$) grouped by overall changes in breathlessness across 12,888 participants in the CLSA cohort. Abbreviations: $FEV_{1\%pred}$ = percent predicted forced expiratory volume in 1 second; CLSA = Canadian Longitudinal Study on Aging.

Abstracts
Mechanisms & epidemiology

11 June - Poster number 3

Association between income of country of birth and breathlessness – a study of 29,089 middle-aged men and women in the Swedish general population

Max Olsson[1], Sara Jesperson[2], Joseph Clark[3], David Currow[4], Össur Ingi Emilsson[5], Hanan Tanash[1], Magnus Ekström[1]
[1] Lund University, [2] Skåne University Hospital, [3] University of Hull, [4] Flinders University, [5] University of Iceland

Background

The purpose of this study was to evaluate associations between the per capita Gross Domestic Product (GDP) of the country of birth and breathlessness in mid-life in a high-income country.

Materials and methods

This was a cross-sectional, general population study of individuals aged 50–64 years living in Sweden. GDP per capita of the country of birth in the year of birth was derived from the Gapminder database. Breathlessness was self-reported using the modified Medical Research Council scale (mMRC), and a score of ≥2 was considered clinically significant. Participants were categorised into GDP per capita quartiles and described. To assess the association between income of country of birth and breathlessness, logistic regression analyses were performed, first unadjusted and then adjusted for age, sex, highest level of education, lung function, smoking status, body mass index (BMI), and comorbidities. We also evaluated whether age at immigration modified this association.

Results

A total of 29,089 individuals (52% women) were included, and breathlessness was present in 1,315 (5%). Individuals born in countries in GDP quartiles one or two were more often current or former smokers, overweight or obese, and exercised less compared with those born in GDP quartiles three or four. Higher GDP of country of birth was associated with a lower prevalence of breathlessness both in unadjusted analyses (odds ratio [OR] 0.90; 95% CI 0.89–0.91) and after adjustment for confounders (OR 0.92; 95% CI 0.91–0.94). Age at immigration did not modify this association.

Conclusion

In a high-income setting, the GDP of country of birth was associated with breathlessness even after adjustment for common confounders. To reduce respiratory symptoms globally, efforts should focus on reducing poverty-related factors such as unhealthy lifestyle patterns and adverse social and environmental conditions, and on providing high-quality health care to the entire population.

Abstracts
Mechanisms & epidemiology

11 June - Poster number 4

Association between sleep and health-related quality of life in people with and without dyspnoea in the Hong Kong general population

Ka Yan Ho[1], Kuan Liao[1]
[1] School of Nursing, The Hong Kong Polytechnic University, Hong Kong SAR, China

1. School of Nursing, The Hong Kong Polytechnic University, Hong Kong SAR, China
2. Woolcock Institute of Medical Research, Macquarie University, Australia
3. The Chinese University of Hong Kong, Hong Kong SAR, China
4. Flinders Ageing Alliance, Flinders University, South Australia, Australia
5. Department of Physiotherapy, King's College Hospital NHS Foundation Trust, London, the United Kingdom
6. Cicely Saunders Institute of Palliative Care, Policy & Rehabilitation, King's College London.

Background
Poor sleep quality is associated with reduced health-related quality of life (HRQOL). How dyspnoea moderates this association is currently unknown. We aimed to evaluate the moderating effect of dyspnoea on the association between sleep quality and HRQOL.
Methods
A cross-sectional survey using random-digit dialling was conducted from December 2024 to December 2025. Adults aged ≥18 years who could communicate in Chinese or English were recruited using age-stratified sampling based on census data. Dyspnoea was defined as the Modified Medical Research Council (mMRC) dyspnoea scale ≥2. Sleep quality was assessed by the brief version of Pittsburgh Sleep Quality Index (B-PSQI) and HROQL using the EQ-5D index. Linear regression with an interaction term between dyspnoea and sleep quality was applied to evaluate the association between sleep quality and HRQOL moderated by dyspnoea. Age, sex and monthly income were adjusted in the multivariable analysis. Missing data was imputed by multiple imputation.
Results
Among 2,003 participants, the mean (±standard deviation) age was 51 (±17) years; 69.7% were female, 56.5% had a monthly income of HK $10,001–20,000(US$1,280–2,560), and 19.5% had dyspnoea. Across all participants, one-point increase in B-PSQI (worse sleep quality) was associated with a 0.021 decrease in EQ-5D index (95% CI: 0.017 to 0.026). There was a significant interaction with dyspnoea in this association ($p<0.001$). Among participants without dyspnoea, one-point increase in B-PSQI score (worse sleep quality) was associated with a 0.007 decrease in EQ-5D index (95% CI: −0.0117 to −0.0026), whereas the association was substantially stronger among those with dyspnoea (coefficient: −0.0516; 95% CI:

−0.0607 to −0.0425) (Figure 1).
Conclusion
The negative association between sleep quality and HRQOL was stronger in people with dyspnoea than in those without. The findings suggest that monitoring sleep quality and implementing interventions to improve sleep may help mitigate poor HRQOL, especially in the dyspnoea population.
Word count: 300/300

Abstracts
Mechanisms & epidemiology

11 June - Poster number 5

Effect of sleep deprivation on breathlessness and exercise capacity in COPD: a randomized crossover trial

Lars Ekman[1,2], Henrik Mosén[3,4], Sara Jesperson[5], Magnus Ekström[2]

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Background: Sleep deprivation has been reported to impair respiratory endurance in young healthy males, however the effect on patients with chronic obstructive pulmonary disease (COPD) is unknown. We aimed to investigate the effect of sleep deprivation on exertional breathlessness and exercise capacity in individuals with COPD.

Materials and methods: In this crossover trial, we randomized 20 individuals with stable COPD and a self-reported average sleep duration ≥6hours/night, to a sleepless night (intervention; spent at the clinic supervised) or normal night's sleep (in the home, control) in random order (≥7 days apart). After each of these nights, physiological and perceptual responses were evaluated using constant-load cycle cardiopulmonary exercise test (CPET) at 75% of their maximum incremental work rate. Primary outcome was breathlessness (Borg 0-10) intensity at iso-time, and secondary outcomes were exercise endurance time (EET) in minutes and leg discomfort (Borg 0-10) at iso-time.

Results: The 20 COPD patients had an average age of 71±[standard deviation] 6 years, 25% women, forced expiratory volume in one second/forced vital capacity (FEV1/FVC) of 0.60±0.09 , FEV1 62±12%predicted, with a self-reported average sleeping time of 7.1±0.9 hours/night. Compared to control, sleep deprivation did not affect iso-time breathlessness intensity (5.7±2.7 vs 5.3±3.0; mean difference: 0.40 [95% confidence interval: -0.61–1.41]), nor leg discomfort (6.1±3.2 vs 5.6±3.3; mean difference: 0.53 [-0.60–1.65]) but decreased EET (6.6±4.3 vs 7.9±5.5; mean difference: -1.3 [-2.6–0.0] minutes). No statistically significant differences were seen in minute ventilation, tidal volumes, breathing frequency, respiratory exchange ratio, oxygen uptake, or carbon dioxide output.

Conclusion: A sleepless night did not affect exertional breathlessness or leg discomfort but decreased endurance time in individuals with COPD.

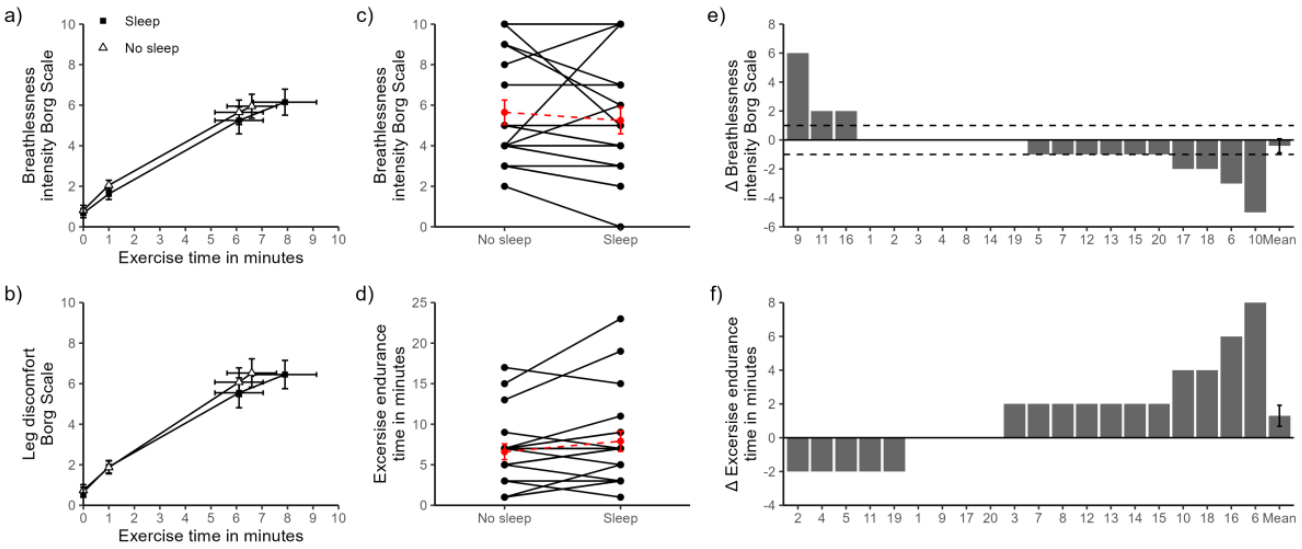

Figure 1: Effect of a sleepless night vs a normal night's sleep on breathlessness, exercise endurance and leg discomfort in individuals with chronic obstructive pulmonary disease (COPD). Mean±sem a) breathlessness intensity ratings and b) leg discomfort at rest, iso-time and peak exercise during constant load cycle exercise testing. Individual participant no-sleep vs sleep values and no-sleep vs sleep in c) and e) breathlessness intensity ratings during exercise at iso-time and d) and f) exercise endurance time, where red symbols with dashed horizontal lines in panels c and d denote mean±sem. Dashed horizontal line in panel e denote minimally clinically important difference for breathlessness. Δ: no-sleep vs sleep difference.

Abstracts
Mechanisms & epidemiology

11 June - Poster number 6

Inspiratory neural drive is the proximate cause of exertional breathlessness

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Background

Whether exertional breathlessness is determined primarily by inspiratory neural drive (IND), afferent feedback, or their interaction remains unresolved. We tested whether the relationship between breathlessness and IND is preserved across mechanically distinct inspiratory loading conditions during exercise.

Methods

In this randomized, counterbalanced, within-subject crossover study, 29 healthy adults (15 men; mean ± SD age 26 ± 5 years) performed 3-min bouts of constant-load semi-recumbent cycling at 30, 50, and 70% peak power output while breathing against graded elastic (ELA) and resistive (RES) inspiratory loads (unloaded, light, moderate, heavy) on separate visits. A composite EMG-derived index of IND (INDTOT%MAX; diaphragm and extra-diaphragmatic accessory muscles) was measured alongside ventilation (V'E) and inspiratory work of breathing (esophageal pressure-time product, PTPes). Breathlessness intensity (BI) was rated using the modified Borg 0-10 scale. Associations between BI and V'E, PTPes, and INDTOT %MAX were assessed using slope and threshold analyses across load magnitudes within each load type and between load types.

Results

Respiratory mechanical, muscular and breathing pattern responses varied with load magnitude and differed between load type, whereas V'E and gas exchange responses were broadly similar. BI-V'E thresholds shifted rightward, and slopes increased with increasing load magnitude within each load type (Fig.1A-B). BI-PTPes thresholds also shifted rightward as ELA and RES load magnitudes increased (Fig.1D-E). BI-V'E relationships were similar between load types (Fig.1C), whereas the BI-PTPes threshold was lower in ELA vs RES (Fig.1F). In contrast, slopes and thresholds of the BI-INDTOT%MAX relationship did not differ across load magnitudes within each load type or between load types (Fig.1G-I).

Conclusion

Differences in mechanical, muscular and breathing pattern responses to graded inspiratory loading breathing did not influence the key association between breathlessness and IND during exercise. These findings identify IND as the proximate neurophysiological determinant of breathlessness, independent of downstream mechanical consequences.

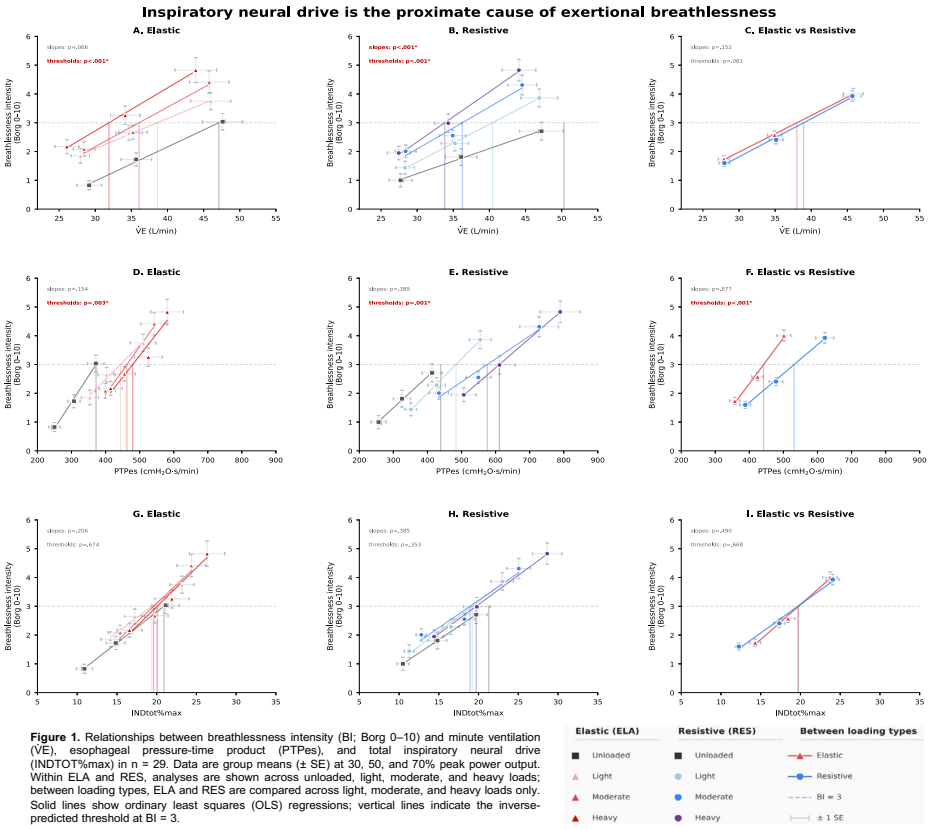

Figure 1. Relationships between breathlessness intensity (BI; Borg 0–10) and minute ventilation (V̇E), esophageal pressure-time product (PTPes), and total inspiratory neural drive (INDTOT%max) in n = 29. Data are group means (± SE) at 30, 50, and 70% peak power output. Within ELA and RES, analyses are shown across unloaded, light, moderate, and heavy loads; between loading types, ELA and RES are compared across light, moderate, and heavy loads only. Solid lines show ordinary least squares (OLS) regressions; vertical lines indicate the inverse-predicted threshold at BI = 3.

Abstracts
Mechanisms & epidemiology

11 June - Poster number 7

Lung volumes and sex-related differences in asthma control in children and teenagers

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Background: Asthma affects about 10% of the population causing significant morbidity worldwide. Uncontrolled asthma (UCA) becomes markedly more common in females than males from puberty and onwards, and the reasons for this sex-related difference is unknown. We tested the hypothesis that the increased UCA prevalence in female teenagers relate to their smaller lung volumes compared to males.

Methods: Population-based study of 636 younger children (aged 5-8 years; 36% female) and 552 teenagers (aged 14-17 years; 43% female) in the Swedish National Airway Register (SNAR), with validation in 308 teenagers (14-18 years; 49% female) in in the Obstructive Lung Disease in Northern Sweden (OLIN) studies with asthma. Data included demographics, spirometry (forced expired volume in 1 second [FEV1] and forced vital capacity [FVC]), and UCA (Asthma Control Test [ACT] score <20 in SNAR, or having day/nighttime asthma symptom(s) every week in OLIN). Associations were evaluated using logistic regression.

Results: In young children, there was no sex-related difference in FEV1 or ACT. However, among teenagers females had lower absolute FEV1 (3.09 ±0.50 versus 3.85±0.68 Liters, p<0.001) and twice the prevalence of UCA (40% versus 20%, p<0.001) compared with males in SNAR. Lower absolute FEV1 associated with having UCA, both overall and among female and male teenagers separately. Absolute FEV1 mediated 26% of the sex-related differences in UCA in SNAR and 96% in OLIN. Findings were similar when analysing FVC instead of FEV1. No significant mediation effects were seen for relative FEV1 (Z-score).

Conclusion: Smaller lung volumes (and airways) in females than males explains a substantial part of the increased risk of UAC in females emerging among teenagers.

Abstracts
Mechanisms & epidemiology

11 June - Poster number 8

Manifestations of stigma in chronic breathlessness: developing initial program theory

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Background:

Chronic breathlessness is a distressing symptom and common reason for accessing healthcare. It is associated with poor outcomes including delays to diagnosis, uncertainty and a negative healthcare experience. Experiences of health-related stigma have been shown to result in similar outcomes; however, the impact of stigma in chronic breathlessness is not well explored. We aim to conduct a realist review to develop and test explanatory theories exploring how stigma may create diagnostic delays and impact access to healthcare in chronic breathlessness, identifying who is at risk, in what circumstances and why.

Methods:

Using realist methods, initial program theories (IPT) were developed through consultation with stakeholders, including patients and carers with experience of living with breathlessness, multi-disciplinary clinicians and academics with an interest in breathlessness.

Literature searches will be conducted across six electronic databases (Medline, Embase, CINAHL, PsycINFO, Scopus and The Cochrane library) alongside citation tracking, expert solicitation and grey literature searches to test and refine the IPTs.

Results:

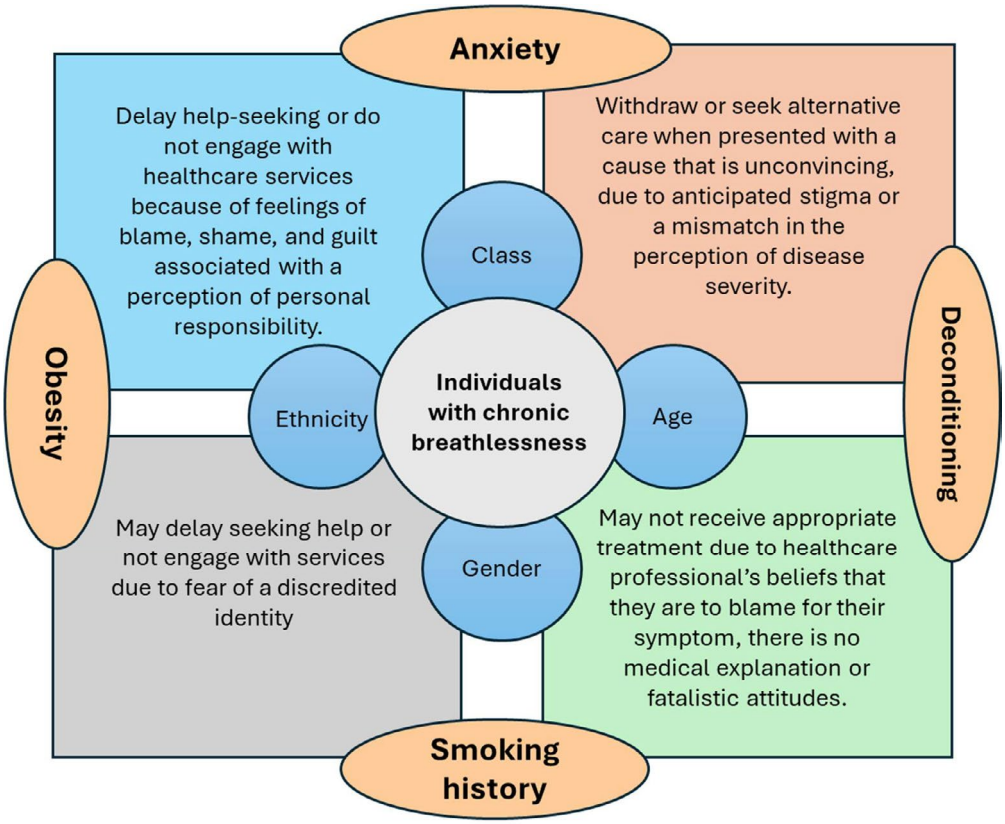
Four IPTs were developed, describing manifestations of stigma in patients with chronic breathlessness and the impact on healthcare service use (figure 1).

The IPTs describe internalised, enacted and anticipated stigma and how this intersects with characteristics such as gender, class, ethnicity and age. Additionally, societal stigma related to stereotypes associated with causes of breathlessness including anxiety, obesity, deconditioning and smoking may contribute to stigma in this population.

Conclusions:

The IPTs improve context specific understanding of stigma in chronic breathlessness, creating a foundation for the realist synthesis. Future research to overcome stigma in this population, may be most effective if focused on designing interventions aimed at individual, societal or healthcare system levels.

Figure 1: Initial program theories



Abstracts
Mechanisms & epidemiology

11 June - Poster number 9

Pre-inspiratory motor potentials during exercise-induced dyspnea in healthy individuals

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Background: Pre-inspiratory motor potentials (PIPs) reflect motor cortex involvement during inspiration. They are typically absent during quiet breathing in healthy individuals but present during dyspnea elicited by respiratory load compensation, where they are associated with dyspnea severity. Yet, it remains unclear whether these PIPs are present during exercise-induced dyspnea in healthy individuals, similar to load-induced dyspnea.

Materials and methods: Twenty healthy individuals (19 female, mean age = 20 yrs) performed five-minute blocks of cycling exercise at 10%, 40%, and 70% of their individual maximal work rate (Wmax), each block repeated twice in a counterbalanced order, while ventilation and electroencephalography (EEG) were continuously measured. Before the cycling exercise, a five-minute block of voluntary respiratory maneuvers (i.e.,deep inspirations) was included as a positive control for PIP detection. Dyspnea intensity and unpleasantness were assessed using the modified Borg Scale. PIPs were identified based on visual inspection of a negative slope in the -2500 to 0 ms interval prior to inspiration onset at fronto-central scalp sites, consistent with previous studies.

Results: Dyspnea ratings significantly increased with exercise intensity ($p < .001$), and reflected mild and strong dyspnea sensations at 40% and 70% of Wmax, respectively. Ventilation (i.e., breathing frequency, mean airflow, tidal volume, and minute ventilation) significantly increased with exercise intensity ($p < .001$), whereas inspiratory time significantly decreased ($p < .001$). Based on visual inspection of the individual EEG data, PIPs were present in 14 of the 20 individuals during voluntary respiratory maneuvers but in 0 of the 20 individuals at all exercise intensities.

Conclusion: PIPs were absent during cycling exercise despite the presence of progressive dyspnea, suggesting no involvement of motor cortices in inspiration during exercise. These results indicate that breathing control is predominantly maintained through automatic brainstem mechanisms during exercise-induced dyspnea in healthy, young individuals, in contrast to load-induced dyspnea.

Abstracts
Mechanisms & epidemiology

11 June - Poster number 10

Stability of habituation and sensitization to respiratory and auditory stimuli

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Decreases and increases in response to repeatedly presented stimuli are known as habituation and sensitization, respectively. The present study examined test-retest stability of habituation and sensitization to respiratory and auditory stimuli within sessions and between sessions using subjective ratings and event-related potentials (ERPs).

Eighty-five healthy participants completed two experimental sessions one week apart (respiratory: n=43, 25 females; auditory: n=42, 25 females). Each session consisted of ten blocks with ten identical trials of either inspiratory occlusions or white noise tones. Subjective intensity ratings were collected after each trial, and unpleasantness ratings after each block. Respiratory-related evoked potentials (RREPs) and auditory-evoked potentials (AEPs) were recorded using high-density electroencephalography. Linear mixed-effects models were used to examine changes in responses across trials and blocks, and stability of habituation and sensitization slopes was assessed using intra-class correlation coefficients (ICCs).

Average subjective intensity ratings increased over trials in both modalities, suggesting sensitization. This sensitization diminished in the second session in the auditory group. ICCs indicated moderate to good stability for the trial-level intensity sensitization in both modalities (respiratory: ICC=0.69; auditory: ICC=0.57). Average unpleasantness ratings decreased across sessions in both modalities, signaling habituation. Stability was moderate for across-block respiratory unpleasantness slopes (ICC=0.45) but poor for auditory unpleasantness slopes (ICC=0.17). Average RREP and AEP peak amplitudes decreased across blocks and sessions. The across-block decrease in peak AEP N1 amplitude showed good test-retest stability (ICC=0.63), whereas the across-block decreases in all RREP components showed poor stability (ICCs<0.1).

Trial-level intensity sensitization showed moderate within-session stability across both modalities, whereas between-session stability of block-level unpleasantness and ERP peak amplitude changes was modality- and component-specific. These findings indicate that within-individual stability of habituation and sensitization may depend on the response measure and modality examined.

Abstracts
Mechanisms & epidemiology

11 June - Poster number 11

Subthalamic nucleus deep brain stimulation modulates experimentally induced air hunger

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Functional brain imaging studies of breathlessness reveal increased activation in subcortical regions overlapping established deep brain stimulation (DBS) targets, positioning neurosurgical patients as a unique clinical model for investigating the central mechanisms of dyspnoea. A subset of patient's report worsening breathlessness following stimulation of the subthalamic nucleus (STN) (1). In this study, we systematically investigate the stimulation-induced effects of STN DBS on dyspnoea and pulmonary function.

Patients with STN DBS for motor symptoms of Parkinson's disease underwent experimentally induced air hunger (AH) and pulmonary function tests with DBS stimulation 'ON' and 'OFF'. AH was induced by raising inspired CO_2 whilst constraining ventilation to baseline levels. Patients provided discrete AH ratings on a visual analogue scale (VAS) every 15s. Local field potentials (LFPs) were recorded from patients implanted with the Medtronic Percept DBS system under AH and control conditions to characterise subthalamic neurophysiological correlates of dyspnoea processing.

Analysis of AH data in 10 participants revealed variable responses to STN stimulation. Seven participants reported worsened AH with DBS 'ON'. Mean ± SEM steady state AH intensity was 65.7mm ±6.0 VAS in the 'ON' condition versus 53.3mm ±7.1 VAS 'OFF', representing a change exceeding the established minimal clinically important difference of ±10mm for the VAS scale. No significant differences in pulmonary function tests were observed between stimulation conditions.

Preliminary findings indicate that STN stimulation modulates central processing of dyspnoea, with the effect potentially influenced by electrode location and subsequent network engagement. Ongoing work integrating connectivity and neurophysiological analyses aims to further elucidate the mechanisms underlying these differential respiratory responses.

References

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Abstracts
Mechanisms & epidemiology

11 June - Poster number 12

The prevalence of dyspnoea in the Hong Kong general population: a population-based study

Janelle Yorke[1], Kuan Liao[1], Eva HO[1], Helen Reddel[2], Leanne Poulos[2], Herbert Long[3], David Currow[4], Naomi Takemura[1], Charles Reily[5], Fanny W.S Ko[3]

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Background

Dyspnoea is a commonly reported symptom in the community. We aimed to estimate the prevalence of dyspnoea in the general population of Hong Kong.

Methods: A cross-sectional survey using random-digit dialing was conducted in 2024/2025. Adults aged ≥18 years who could communicate in Chinese or English were recruited using age-stratified sampling based on census data. Self-reported demographics (age, sex, marital status, education, monthly income), clinical characteristics (smoking, comorbidities, weight, height) were collected. Dyspnoea was assessed using the mMRC scale and defined as a score ≥2. Data were reweighted to census distributions to estimate the overall prevalence and by age, BMI, smoking status, and comorbidities.

Results: Among 2003 participants (mean age: 51 years; 69.7% female), 65.8% were married or living with a partner and 57.7% had upper secondary education or above. Age-stratified, sex-adjusted prevalence of dyspnoea was ≥mMRC 2: 20.4% (95%CI:18.5-22.3%) (Table 1). Most participants were 'never smokers' (76.4%) and had normal BMI (71%). Hypertension was the most common comorbidity, followed by diabetes, asthma, and chronic bronchitis. The prevalence of dyspnoea increased with age and BMI and varied by primary language (Figure 1). By smoking status, prevalence was 10.8% (95%CI:9.1%-12.4%) among never smokers, 54.1% (95%CI:48.8%-59.3%) among former smokers, and 42.6% (95%CI:29.4% -55.9%) among current smokers. People with cancer, pulmonary, cardiac, and metabolic diseases had significantly higher prevalence than the overall prevalence (50.9% [95%CI:44.9-56.9], 47.9% [95%CI:43.4-52.3], 49.0% [95% CI:42.5-55.5], and 74.7% [95%CI:62.4-87.1], respectively).

Conclusion: The prevalence of dyspnoea in the Hong Kong general population is substantially higher than reported in other high-income countries. It is strongly associated with older age, higher BMI, primary language, smoking, and comorbidities.

Table 1. Sex-adjusted prevalence of modified Medical Research Council (mMRC) dyspnoea severity thresholds.

mMRC	Prevalence (95% confidence interval)
≥1	45.4% (43.0% to 47.7%)
≥2	20.4% (18.5% to 22.3%)
≥3	9.6% (8.1% to 11.0%)
4	1.7% (1.0% to 2.3%)

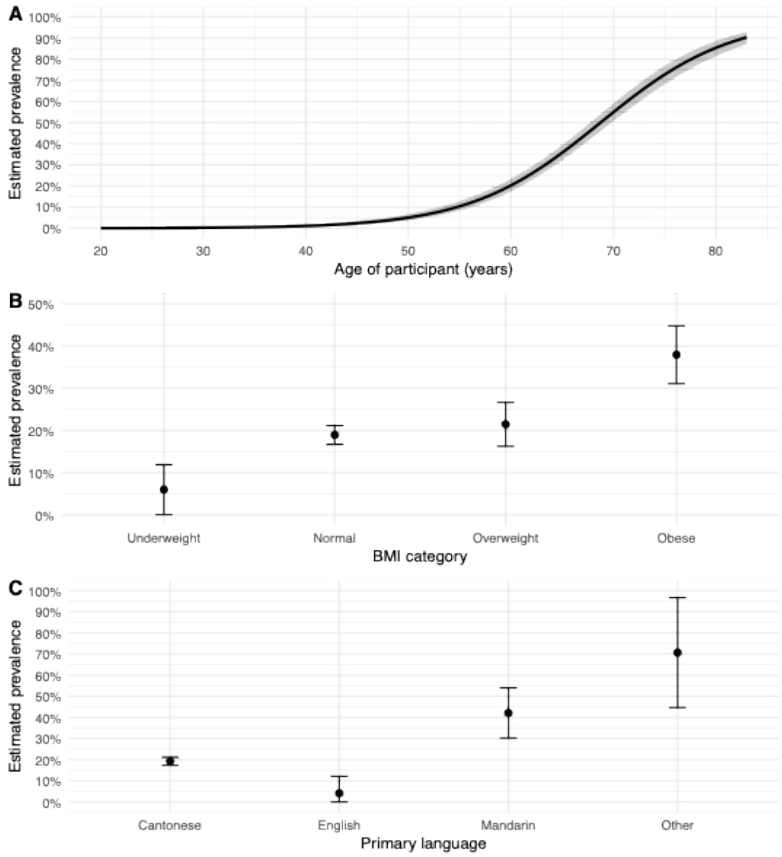

Figure 1. Estimated sex-adjusted prevalence of dyspnoea by age, BMI and primary language.

Abstracts
Measurement

11 June - Poster number 13

Abnormal breathlessness is associated with hospitalization and incident disease: a clinical longitudinal study

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Background: We aimed to examine the association between abnormally high exertional breathlessness and risk of future hospitalization and incident disease in a large clinical cohort.

Materials and methods: Longitudinal cohort study of 13,507 individuals undergoing incremental exercise testing (IET) at Kalmar County Hospital between 2005 and 2016. Abnormal exertional breathlessness was defined as a peak Borg 0-10 rating above the upper limit of normal according to published reference equations. Outcomes were assessed longitudinally using mandatory swedish national health registers, and were analyzed using Cox regression models, adjusted for age, sex, and body mass index (BMI). Further stepwise adjustments were performed for baseline exercise capacity and comorbidities.

Results: Of the 13,507 participants (46% female, mean age 63±15 years), 2,611 (19%) had abnormally high breathlessness on IET. No participant was lost to follow-up. The median potential follow-up time for the entire cohort was 6.8 years (IQR 4.0–9.6). Compared to those with normal breathlesness, and adjusting for age, sex, and BMI, abnormal breathlessness was associated with increased risk of all-cause hospitalization ([adjusted hazard ratio] 1.6 [95 percent confidence interval 1.5–1.7]), respiratory hospitalization (2.3 [2.1–2.6]) and cardiovascular hospitalization (1.6 [1.5–1.7]). For incident disease, abnormal breathlessness was most strongly associated with subsequent COPD (3.7 [3.2–4.3]) and heart failure (2.2 [1.9–2.5]). Significant associations were also found with incident ischemic heart disease (1.4 [1.2–1.5]) and cancer (1.3 [1.1–1.4]).

Conclusion: Abnormally high breathlessness on standardized exercise testing is a powerful prognostic marker for developing a wide range of future morbidities and hospitalizations, suggesting that its assessment should be integrated into routine clinical evaluation to identify high-risk individuals.

Abstracts
Measurement

11 June - Poster number 14

Breathlessness dimension scores and risk of hospitalization and death in cardiorespiratory disease: a longitudinal clinical study

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Background: Chronic breathlessness affects around 10-20% of adults in the community and is associated with worse quality of life, fatigue, and prognosis. Breathlessness consists of multiple dimensions, but it is unknown how dimension scores relate to risk of hospitalization and mortality.

Methods: This was a longitudinal, multicenter, cohort study of patients with cardiopulmonary disease. Breathlessness was assessed using the mMRC, Dyspnea-12 (D-12), and Multidimensional Dyspnea Profile (MDP) questionnaires. Outcomes were assessed longitudinally using mandatory Swedish National Patient Registry and Causes of Death Registry. Associations for breathlessness scores (standardized as z-scores for comparisons across scales) were analyzed using Cox regression for all-cause mortality, and Fine-Gray regression for hospitalizations and cardiac and respiratory mortality.

Results: 182 participants were included; 57% women. Main causes of breathlessness were chronic obstructive pulmonary disease (COPD; 28%), heart failure (28%), asthma (27%) and interstitial lung disease (ILD; 22%). Higher mMRC scores were associated with increased risks of hospitalization and respiratory mortality, with significantly higher risks observed for mMRC 4 compared with mMRC 2. For hospitalization, hazard ratios increased from 1.06 (95% CI, 0.64–1.77) at mMRC 2 to 1.61 (95% CI, 1.00–2.59) at mMRC 4; for respiratory mortality, they increased from 13.65 (95% CI, 2.92–63.7) to 24.2 (95% CI, 5.93–98.9). In contrast, D-12 and MDP scores were not associated with the outcomes.

Conclusion: Breathlessness in daily life assessed using mMRC predicted prognosis (risk of hospitalization and death) whereas D-12 and MDP multidimensional scores did not, possibly because they do not account for the level of exertion needed to experience the symptom level.

Abstracts
Measurement

11 June - Poster number 15

Consensus on assessment and terminology of disordered patterns of breathing

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Background

No clear assessment procedure has been proposed for diagnosis of disordered breathing patterns and nomenclature of this complex, heterogeneous condition is inconsistent, leading to frustration by clinicians and patients.

Objective

This study aimed to determine an assessment process that would measure all components and contributing factors of breathing pattern disorders, and to reach consensus on terminology that was acceptable to clinicians as well as patients. A SNOMED code could be proposed to capture data regarding this condition and enable further research and service evaluation.

Methods

Three separate focus groups or interviews explored the opinions and experiences of physiotherapists (n=10), non-physiotherapy clinicians (n=9) and patients (n=5) regarding the terminology of this condition. Framework analysis of data obtained was used to generate 6 domains that were utilised to generate discussion in the next stage of the study which used the nominal group technique.

A purposive sample of 10 physiotherapists highly experienced in assessing and treating this population was asked to reach consensus on the following questions using a nominal group technique (NGT):

1. What is your preferred term for this condition?

2. What are the most important assessment components to be included in all assessments (subjective and objective assessments, outcome measures)?

Results

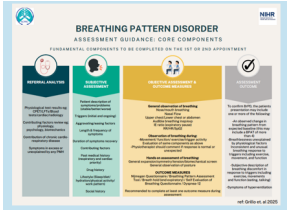
The term Breathing Pattern Disorder (BrPD) was reached by consensus (71%). The term Dysfunctional Breathing was also discussed at length by all groups and clinicians and patients reported negative connotations with it.

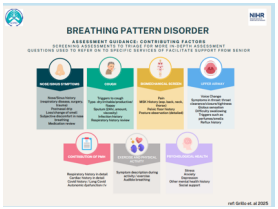
A detailed assessment guide was proposed following ranking of assessment components during the NGT which was endorsed by 10/11 highly experienced physiotherapists (see infographic).

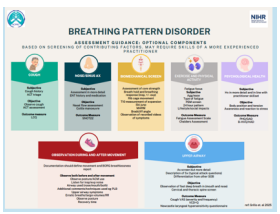
Conclusions

Consensus on terminology is important for ensuring consistency clinically and during research in describing this condition. Agreement on a detailed assessment ensures consistency with diagnosis, and will assist in service planning and development.

Details of infographic which would be presented (this detailed in depth assessment guide has not been published in a global journal, other than in the online Association of Chartered Physiotherapists in Respiratory Care Journal (a UK specialist interest group) The Nomenclature and Assessment of Breathing Pattern Disorder (BrPD): An Association of Chartered Physiotherapists in Respiratory Care (ACPRC) Positi - The Association of Chartered Physiotherapists in Respiratory Care (ACPRC)







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Abstracts
Measurement

11 June - Poster number 16

Cross-cultural adaptation and validation of the Oxford dyspnoea word cue set for stimulation of emotional processing in= patients with lung cancer

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The author has chosen not to publish the abstract.

Abstracts
Measurement

11 June - Poster number 17

Development of the mindfulness-oriented respiratory distress symptom intervention for patients with lung cancer

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The author has chosen not to publish the abstract.

Abstracts
Measurement

11 June - Poster number 18

Patient reported outcome measures for existential distress in people with persistent breathlessness associated with serious respiratory illness: A scoping review.

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Background: Persistent disabling breathlessness is a tangible reminder of mortality, yet we rarely explicitly consider its role in the multidimensional phenomenon of existential distress (Table 1). As part of a larger scoping review, this sub-analysis describes use of the term existential distress and instruments for its assessment in adults with serious respiratory illness or their caregivers.

Materials and methods: Nine electronic databases were systematically searched for primary studies (all designs/approaches) of adults with serious respiratory illness associated with disabling breathlessness or their caregivers which reported a construct of existential distress (lived experience or patient reported outcome measure). Screening, data extraction and appraisal was completed by two independent reviewers. Sub-analysis described use of the term existential distress (frequency/definition), instruments and constructs assessed by each instrument (based on developer recommendations, subdomain categories).

Results: Of the 5392 studies screened,119 were eligible for inclusion in the larger review (qualitative=89, quantitative=25, mixed methods=5). Most study participants were people living with chronic obstructive pulmonary disease (93 studies, 78%) or interstitial lung disease (12 studies, 10%) or carers/family members (27 studies). Approximately a third of studies included the term 'existential' (n=41, 34.5%), though fewer provided a definition (n=10, 8.4%). Twenty-four unique instruments were reported across 25 studies with five instruments common to two or more studies (Table 1). Across the 16 constructs, few instruments captured more than two constructs (mean 2, range 1 to 4). The most frequent constructs assessed by these 24 instruments were death anxiety (n=11, 46%) demoralisation (n=8, 33%), and absence of life meaning (n=4, 17%).

Conclusion: Use of the term existential distress was limited and rarely defined. A range of instruments were identified, though few captured multiple constructs. The next synthesis phase will map themes/verbatim quotes reported in qualitative studies across constructs to identify discrepancies between instruments and personal experiences.

References

• Philipp R, Kalender A, Härter M, et al. Existential distress in patients with advanced cancer and their caregivers: study protocol of a longitudinal cohort study. BMJ Open 2021; 11:e046351.

Table 1: Constructs of existential distress assessed with patient reported outcome measures in primary studies of people with serious respiratory illness and/or their caregivers

		Existential construct																
Patient reported outcome measures (PROMs)	Frequency of PROM use within studies	Death anxiety	Demoralisation	Absence of life meaning	Loneliness and isolation	Fear of disease progression	Dignity-related distress	Sense of uncertainty	Perceived relatedness	Existential needs / vacuum	Anticipatory grief	Sense of being a burden /insufficiency	End-of-life preparation	Grief / regret re missed opportunities	Changes in identity	Caregiver guilt	Fear of uncontrollable suffering
Death Anxiety Scale	3	■															
Multidimension Orientation toward Dying and Death Inventory	3	■															
Functional Assessment of Chronic Illness Therapy - Spiritual Well-Being 12 Item Scale	3			■													
Beck's Hopelessness Scale	2		■														
COPD Anxiety Questionnaire	2					■											
COPD Health Determinants Questionnaire	1	■	■														
Peritraumatic Distress Inventory	1	■	■														
Life Attitude Profile - Revised	1	■		■						■							
Supportive Care Needs Survey - Short Form 34	1	■				■		■	■								
Needs at the End-of-life Screening Tool	1	■							■		■						
Death Attitude Profile-Revised	1	■															
The Death Depression Scale	1	■															
Scale of Death Anxiety	1	■															
The Thorson-Powell Death Anxiety Scale	1	■															
McGill Quality of Life Questionnaire	1		■	■	■			■									
Bronchitis-Emphysema Symptom Checklist	1		■		■												
Structured Interview of Symptoms and Concerns	1		■				■										
Brief Scale of Demoralization	1		■														
General Health Questionnaire (GHQ-30)	1		■														
Spiritual Well-Being Scale	1			■													
De Jong Gierveld Loneliness Scale	1				■												
Palliative Patients' Dignity Scale (CED-PAL)	1						■										
Patient Dignity Inventory	1						■										
The Spiritual Needs Questionnaire	1									■							

Existential constructs drawn from Philipp et al. 2021's research model of existential distress, with the addition of 'existential needs/vacuum', 'fear of disease progression', and 'absence of life meaning'. Multiple listed constructs include close synonyms or components which often fall within the construct e.g. demoralisation includes hopelessness; absence of life meaning includes meaninglessness, purposelessness etc.

Abstracts
Measurement

11 June - Poster number 19

quantifying post-activity respiratory burden in long covid patients with chest-wearable respeck

Passara Chanchotisatien[1], Rachael Evans[2], DK Arvind[1]
[1] University of Edinburgh, [2] University of Leicester

Introduction

Long Covid (LC) is associated with persistent breathlessness and reduced exercise tolerance, yet conventional assessments inadequately capture how respiratory function recovers after everyday activity [1]. This study aims to explore post-activity respiratory rate (RR) recovery (RRR) in free-living conditions using chest-worn accelerometry, to identify patterns of delayed recovery and prolonged ventilatory load that may underlie persistent symptoms and functional limitation.

Methods

Twenty-two individuals with LC (mean age 62 years; BMI 34.9 ± 6.7 kg/m²) and thirty-one healthy controls (mean age 40 years; BMI 24.0 ± 3.9 kg/m²) wore a chest accelerometer (Respeck) for up to four weeks. Respiratory waveforms were reconstructed from 12.5 Hz accelerometer data, with a CNN–BiGRU model detecting stationary periods. Breaths were identified using a peak–trough method, and post-activity recovery was analysed across low, moderate, and high intensity bouts. RRR metrics included peak RR, total change, T25-75 (time for RR to decrease from 25% to 75% of peak), slope, and area under the curve (AUC).

Results

Post-activity analysis showed that LC subjects began recovery from higher RR and converged more slowly, with prolonged recovery particularly at low-to-moderate intensities (Table 1, Figure 1). Peak RR was consistently elevated across all intensities, and although total RR change was similar, LC exhibited slower slopes and higher AUC, reflecting sustained respiratory load. Recovery improved partially at higher intensity, narrowing differences with controls.

Conclusion

LC subjects exhibit singular post-activity respiratory dynamics—higher peak RR, slower recovery, and prolonged load—most pronounced at low-to-moderate intensities. However, differences may reflect age and BMI, and larger, more diverse datasets are needed to confirm these findings.

References

[1] G. Y. Lam et al., “Exertional intolerance and dyspnea with preserved lung function: an emerging long COVID phenotype?,” Respir Res, vol. 22, no. 1, p. 222, Dec. 2021, doi: 10.1186/s12931-021-01814-9.

Cohort	Intensity	Total Change	Peak RR (brpm)	*T(25–75)* (s)	Slope	AUC
LC	Low	-2.700	25.862	905.98	-0.0151	23.735
LC	Moderate	-3.602	26.148	909.70	-0.0201	23.465
LC	Higher	-3.031	26.246	379.17	-0.0169	23.672
Control	Low	-2.855	25.000	736.85	-0.0160	22.717
Control	Moderate	-3.011	25.319	313.69	-0.0168	22.728
Control	Higher	-3.358	25.417	310.45	-0.0188	22.800

Table 1. Respiratory recovery metrics for respiratory rate across cohorts and activity intensities. Values are derived from cohort-averaged recovery trajectories aligned to the end of activity. T25-75 denotes the time (in seconds) required for respiratory rate to reduce from 25% to 75% of peak respiratory rate, reflecting mid-phase recovery speed. Higher values indicate slower recovery. AUC represents the normalised area under the recovery curve, capturing cumulative respiratory burden.

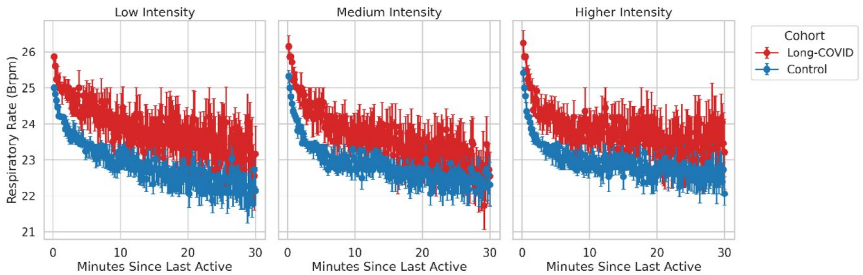

Figure 1. Cohort-averaged respiratory rate recovery trajectories following activity, stratified by intensity (low, medium, high). Respiratory rate (breaths per minute) is plotted against time since activity cessation (minutes), with error bars indicating variability across participants for Long Covid (red) and control (blue) cohorts.

Abstracts
Measurement

11 June - Poster number 20

Prediction of hypoxia and hypercapnia-induced dyspnea in free breathing men and women using non-invasive biomarkers

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Dyspnea is the subjective sensation of breathing discomfort. This symptom is highly prevalent in patients with chronic and critical illness, and its presence is associated with poor clinical outcomes and long-term psychological trauma. The multidimensional nature of the neurophysiological mechanisms underlying dyspnea, paired with individual variation in its presentation, makes identifying and monitoring this symptom difficult, particularly in non-communicative patients. Undetected and untreated dyspnea in critically ill patients is a significant problem contributing to patient suffering. Therefore, the objective of this study was to investigate the feasibility of machine learning methods for assessing and continuously monitoring dyspnea using easily obtained noninvasive biomarkers. We recruited healthy participants (N = 60, 35 women) and stimulated dyspnea using a forced end-tidal semi-rebreathing circuit to modulate arterial oxygen and carbon dioxide levels while collecting non-invasive biomarker data and continuous self-reported dyspnea severity scores. This data was used to train machine-learning models to predict the presence or absence of significant dyspnea (Numeric Rating Scale ≥ 3). We then compared the performance of our final model to observational estimates by trained healthcare providers. The final model (Random Forest) performed well (PR-AUC=0.822) and exceeded the accuracy of observation estimates made on the same participants using the Respiratory Distress Observational Scale (RDOS) (accuracy=54%). These results indicate that machine learning models can utilize non-invasive biomarker inputs to accurately predict carbon dioxide- and hypoxia-induced dyspnea in a healthy population during spontaneous breathing.

Abstracts
Measurement

11 June - Poster number 21

The differing experiences of people living with COPD during the Covid-19 pandemic: an interview study

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Introduction: The Covid-19 pandemic and its restrictions affected millions of people globally, including those living with chronic obstructive pulmonary disease (COPD). However, little is known about the views of people with COPD and their carers on how it affected their lives and their responses to symptom worsening.

Methods: Semi-structured interviews were conducted by phone in a multicentre qualitative study. Participants were recruited purposively in primary and secondary care. Interviews were audio-recorded and analysed using reflexive thematic analysis. Descriptive data are presented as mean [SD] unless stated.

Results: 40 patients with COPD were interviewed (21 female; 28 white; age 69 [8.1] years, COPD duration 11.3 [8.3] years, median [range] number of exacerbations in the past year 1.5 [0-9]). Seven carers (6 female, 6 white) were interviewed.

Two themes were identified: i) Lives interrupted: manageable for some, whilst very difficult for others, ii) Inequitable access to clinicians affects help-seeking for worsened symptoms. These experiences of people with COPD during the pandemic restrictions highlight how the ongoing inequity in living conditions and access to clinicians greatly affects the health and the response to exacerbations of those living with COPD.

The Breathing Space concept describes how well people can live with breathlessness, one of the key symptoms of COPD. These data suggest the importance of incorporating a further factor related to the context that people live in to the Breathing Space concept, so that it has greater explanatory power.

Discussion: The pandemic and its restrictions had a differential effect on people living with COPD and their carers. This was due to their degree of social support, their physical environment and their access to and relationship with their clinicians. All of these factors continue to affect the lives of people with COPD and affect their health and responses to exacerbations.

Breathing Space

Breathing Space Achieved		Limited Breathing Space
Help-seeking for symptoms before they have overwhelmed the person	Help-seeking	Help-seeking once the person is overwhelmed
Clinician focused on symptom management and underlying disease	Responding	Clinician focused only on underlying disease
Engaged coping (Acceptance, active, adaptation, seeking support, expressing emotion)	Coping	Disengaged coping (Avoidance, inactive, social withdrawal, self-criticism)
Supportive relationships and/or supportive physical environment	Environment	Lack of supportive relationships and/or unsupportive physical environment

Abstracts
Management of Breathlessness

12 June

Pooled effect and predictors of response of morphine for chronic breathlessness in COPD: pooled analysis of three large placebo-controlled RCTs

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Background

Managing chronic breathlessness in COPD is a difficult clinical problem, especially when reversible underlying causes have been optimally treated and non-pharmacological interventions are exhausted. Previous meta-analyses showed that opioids reduced breathlessness during laboratory exercise testing. However, there is currently no clear evidence that low-dose morphine reduces breathlessness in daily life.

Materials and methods

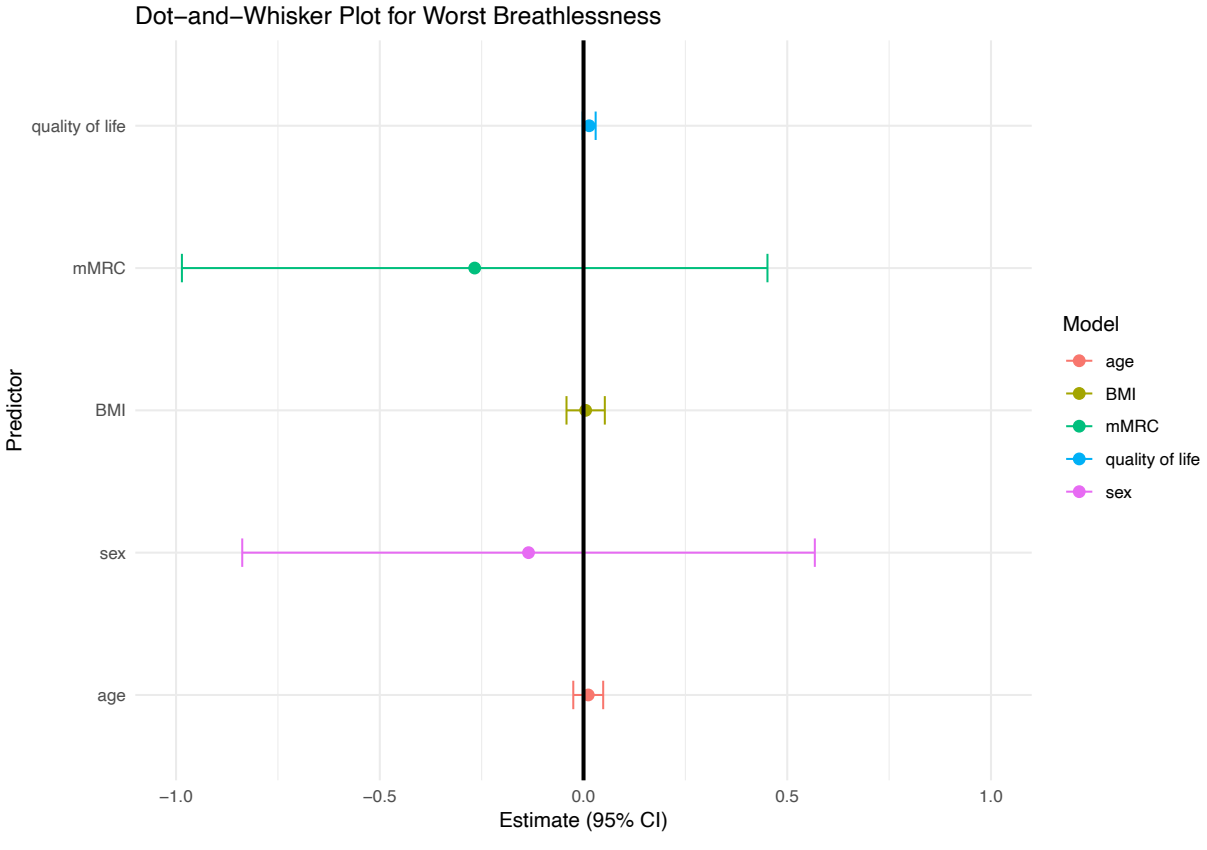
Pooled analysis of three double-blind, parallel-group RCTs of morphine for chronic breathlessness including only those with COPD and mMRC of 3 or 4: MOP (n=99), MORDYC (n=49), BEAMS (n=156). All participants had optimized management of their COPD, and were randomized to either 8 -30mg/day sustained-release morphine or placebo. Outcomes at day 7 included worst and mean breathlessness (on 0-10 numerical rating scale; NRS) during the last 24h, CAT-score (MORDYC, BEAMS), and quality of life (QoL) scores (MOP, BEAMS). Using linear mixed regression we explored improvement in outcomes, adjusted for age, sex, body mass index, CAT and QoL.

Results

Of 304 participants, 165 (54%) were male; median age was 72 (IQR 66-78); 200 (66%) experienced mMRC 3; 145 (48%) were on long-term oxygen; and worst breathlessness in the previous 24h at baseline was median 6.5 (IQR 5,0-8,0). A total of 181 (60%) participants were randomised to morphine and 123 (40%) to placebo. Worst breathlessness was the only outcome to decrease (improve) in the morphine group (mean -1,03 [SD 2,12]) versus placebo (-0,35 [SD 1,82]), p=0,006. On morphine, 52% had a clinically meaningful reduction in worst breathlessness (>1 unit) compared with 35% on placebo (p=0,003). In the main effect regression model, morphine decreased worst breathlessness by 0,72 (95% CI: 0,24 -1,21) units. No baseline characteristics significantly modified worst breathlessness (Figure) or other effect measures.

Conclusions

Pooling three recent RCTs, regular, low-dose morphine reduced worst breathlessness but not mean breathlessness over one week. No predictors of benefit could be identified.



Abstracts
Management of Breathlessness

12 June

Chronic Dyspnoea Profiling: A Cluster Analysis in the population-based CONSTANCES Cohort

Solène VALERY[1,2], Nicolas ROCHE[1,3], Marcel GOLDBERG[4], Céline RIBET[4], Marie ZINS[4,5], Bénédicte LEYNAERT[1], Mohamed NADIF[6], Laurent ORSI[1], Thierry PEREZ[7], Rachel NADIF[1]

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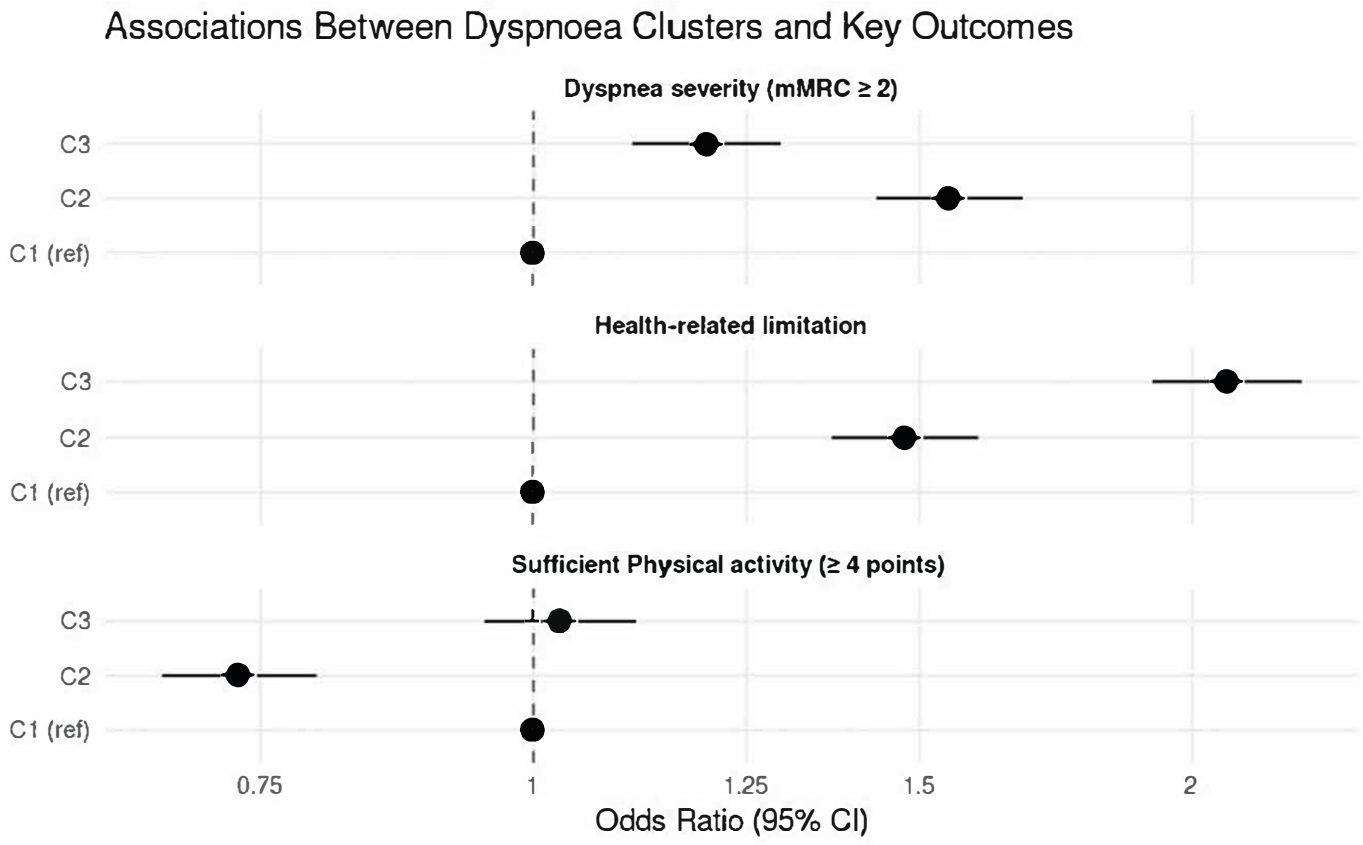
Chronic dyspnoea is a common condition, characterised by complex interactions between determinants. Therefore, we applied unsupervised methods among dyspnoeic adults to identify distinct profiles based on clinical, functional, and sociodemographic factors.

Data from the largest French population-based cohort CONSTANCES were used. A factorial analysis of mixed data (25 variables covering: demographic, socioeconomic, and clinical/functional characteristics, behavioural/environmental exposures, blood biomarkers) was followed by k-means clustering. Logistic models assessed associations between clusters and mMRC scale, health-related limitation and physical activity.

Among 114,346 participants with spirometry, mMRC dyspnoea grade, and smoking data, 24,165 (21.2%) reported chronic dyspnoea (mMRC ≥1). Among the 15,282 without missing data, three profiles were identified: C1 (n=6,951, 45.5%) characterised by middle-aged healthier women from higher socioeconomic backgrounds; C2 (n=4,207, 27.5%) characterised by younger socially disadvantaged women with multiple lifestyle-related risks, including smoking, at risk alcohol consumption, and obesity; and C3 (n=4,124, 27.0%) characterised by older men with multiple cardiovascular comorbidities, impaired lung function, and high environmental and occupational exposures.

Compared with C1, perceived dyspnoea severity (mMRC≥2) was more associated with C2 (OR 1.55 [1.43–1.67]) than with C3 (OR 1.20 [1.11–1.30]). Conversely, health-related limitation, was more associated with C3 (OR 2.07 [1.92–2.24]) than with C2 (OR 1.48 [1.37–1.60]). C2 had lower odds of achieving sufficient physical activity (defined as ≥4/6 on a composite scale of weekly manual tasks, sports, and active transportation) (OR 0.73 [0.68–0.80]), whereas C3 did not differ from C1.

Three distinct multifactorial profiles were identified, with characteristics highlighting the mismatch between perceived dyspnoea and functional limitation. Younger disadvantaged participants showed lower physical activity, suggesting that sedentary behaviour may contribute to chronic dyspnoea. A sex-stratified clustering analysis, incorporating dimensionality reduction techniques, is underway to refine the characterization of subpopulations.



Abstracts
Management of Breathlessness

12 June

"They want to see you gasping for air": Perceptions of breathlessness and health-seeking behaviours in culturally diverse communities

Harini Sathanapally[1], Jennifer Creese[1], Paul Bedford[1], Nasima Miah[1], Riya Patel[1], Rachael A Evans[1], Anvesha Singh[1]
[1] University of Leicester

Background

Breathlessness is a common presenting symptom of multiple cardiovascular diseases, including heart failure and valve disease. Using national UK primary care data, we previously identified higher rates of unplanned hospitalisation but lower likelihood of diagnosis following initial presentation with breathlessness in patients of South Asian and Black ethnicities compared to White ethnicity. To explore these trends in more depth a qualitative study was conducted to explore how breathlessness is experienced, interpreted and acted upon within culturally diverse communities.

Methods

Community-specific focus groups with members from Bangladeshi, Pakistani, Punjabi, Gujarati, Somali, African and Carribean backgrounds were conducted in the city of Leicester, with interpreter support where required. A topic guide was developed with input from our patient advisory group, with representatives from the target communities, and used to facilitate discussions. Focus groups were audio-recorded and transcribed verbatim and translated where applicable. Transcripts were coded and organised into themes using a thematic analysis approach, allowing patterns across groups to be identified.

Results

Eight focus groups with a total of 51 participants (5-8 participants per group) were conducted. Two overarching themes around conceptualising breathlessness and how decisions to seek healthcare are made were found. Breathlessness was frequently perceived as frightening and often framed in fatalistic terms, but also as an expected symptom as a part of ageing in the Punjabi community (Figure 1). When translated into other spoken languages by participants, it was commonly expressed using multi-word phrases rather than a single equivalent term, with Bangladeshi participants describing an overlap with the term used for Asthma ("hapani"). Across groups breathlessness was frequently experienced alongside sweatiness, fatigue and palpitations, with Punjabi, Bangladeshi and Pakistani communities emphasising heaviness or tightness in the chest, whilst heaviness or "choking" in the throat was reported in the African community. Severity, duration and worsening symptoms were described as cues to action across all groups. Delays were driven by lack of trust and low confidence in perceived benefits of from seeking healthcare among African and Caribbean groups, and lack of awareness in linking breathlessness to serious underlying disease in the Bangladeshi and Punjabi groups (Figure 1) .

Conclusion

The findings suggest the experience of breathlessness is influenced by cultural interpretations and healthcare-seeking behaviours are shaped by degree of confidence in healthcare and symptom awareness. These factors should be taken into account in healthcare delivery. There is a clear need to improve recognition of breathlessness as a potential marker of serious underlying disease within communities, in order to support timely and appropriate healthcare access.

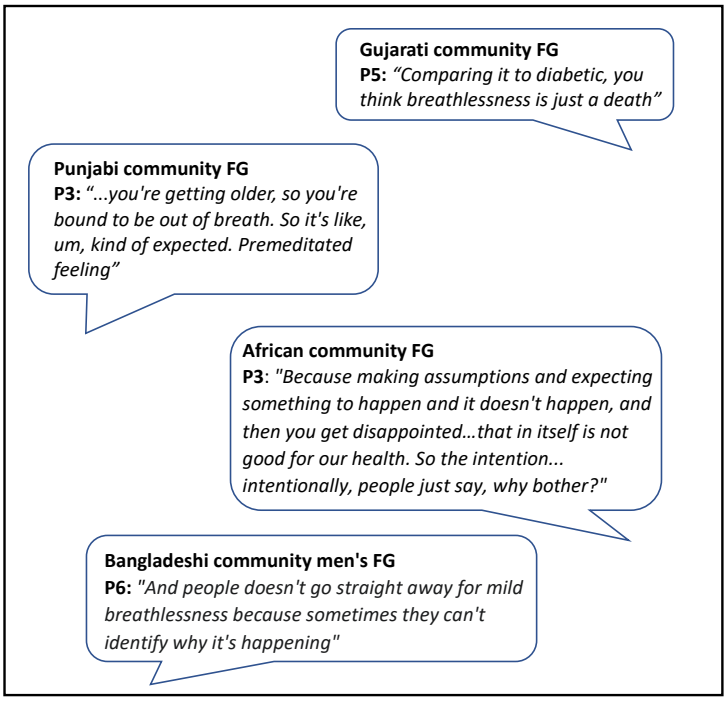


Figure 1 Participants quotes illustrating perceptions of breathlessness and health seeking behaviours

Abstracts
Management I

12 June - Poster number 1

A bespoke fatigue and breathlessness (FAB) programme for Interstitial Lung Disease: pilot study

Jessica Mandizha[1,2], Rebecca Davies[3], Charlotte Crook[3], Anna Duckworth[2,3], Michael Gibbons[2,3], Joseph Lanario[1], Sarah Lines[3], Jessica Moss[3], Pilar Rivera Ortega[3], Stefan Stanel[3], Kate Taylor[3], Anne-Marie Russell[1,2]

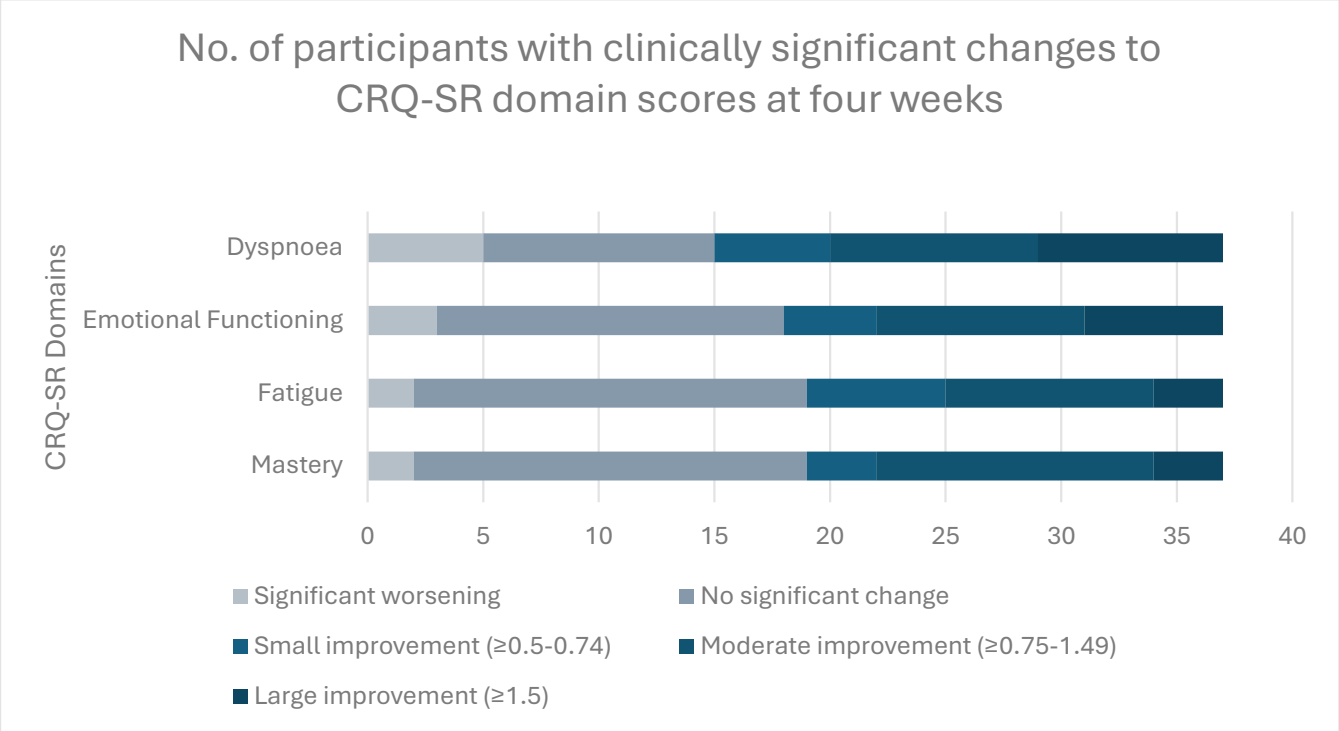
[1] University of Birmingham, [2] University of Exeter, [3] Royal Devon University Healthcare NHS Foundation Trust

Background
Breathlessness, fatigue and cough are cardinal symptoms of Interstitial Lung Disease (ILD); impacting psychological well-being and quality-of-life (QOL). The Fatigue and Breathlessness (FAB) programme supports symptom management for people with life-limiting conditions in the UK. We explored its utility for people living with ILD.

Materials and Methods.
ILD-FAB ran in four, two-hour sessions over consecutive weeks (4-6 participants per group). Led by an ILD Physiotherapist and Clinical Nurse Specialist, sessions offered teaching, practical exercises and group discussion focussed on managing symptoms and promoting wellbeing. Participants received a 1:1 session to set personalised goals and explore individual issues. Cognitive Behavioural Therapy techniques were selectively employed.
We report on the programme evaluation and outcome measures of ILD-FAB, March 2023-December 2024.

Results
Forty-nine patients participated (26 male; median age 76 years [IQR 14]; 21=Idiopathic Pulmonary Fibrosis/IPF, 17=progressive pulmonary fibrosis/PPF, 11=non-progressive pulmonary fibrosis of various aetiologies; FVC % predicted median: 70% [IQR=34]; DLCO % predicted median: 42% [IQR=30])
Thirty-seven (76%) participants attended all four sessions.
Thirty-seven participants completed the Chronic Respiratory Questionnaire (CRQ-SR) at baseline and Week 4. Twenty-two respondents (59%) demonstrated clinically significant improvements in dyspnoea scores; 19 (51%) in emotional functioning scores and 18 (49%) in fatigue and mastery scores.
Thirty-five respondents (95%) demonstrated a clinically significant improvement in at least one domain.
Forty-eight participants completed a feedback survey. Thematic analysis of qualitative data identified three main themes: 1) Increased optimism; 2) Significance of peer support; 3) Impact of facilitator characteristics.

Forty-nine participants (100%) would recommend ILD-FAB.



Abstracts
Management I

12 June - Poster number 2

Cannabis-based treatment for breathlessness in patients with severe COPD – considerations and expectations

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Background: The effect of cannabis-based medicine on persistent breathlessness in patients with severe Chronic Obstructive Pulmonary Disease (COPD) is being investigated in an ongoing randomized controlled trial.

Aim: To explore considerations for participation and expectations toward cannabis-based medicine for breathlessness among patients with severe COPD.

Materials and methods: Recruitment data (sex, age, participation status, and reasons for non-participation) were summarized. Semi-structured interviews were conducted at inclusion and analyzed using Braun and Clarke's thematic analysis.

Results: Sixty-nine patients (33 men, 36 women; mean age 72 years; mean forced expiratory volume in 1 second: 27.5 %) were screened and invited to participate. Sixteen patients (23%) agreed to participate, including 14 women and 2 men. The main reasons for declining participation were driving restrictions during the study period (40%), lack of interest in cannabis-based treatment or participation in research (25%), and the study was considered too extensive (21%). Seven included women participated in interviews. Preliminary analysis of motivations for participation included improved management of breathlessness and optimization of treatment, as well as contributing to research. Participants expressed no major concerns regarding daily cannabis use or side effects and generally felt supported by their social network.

Conclusion: Only a minority of eligible patients were willing to participate in a trial of cannabis-based medicine for breathlessness. Non-participation was driven by both practical barriers and limited interest in cannabis-based treatment. Participants were motivated by symptom relief and altruistic reasons. Exploring perspectives of patients declining participation may inform future studies.

Abstracts
Management I

12 June - Poster number 3

Assessing the consistency of menthol inhalation's dyspnea□relieving effects: preliminary results

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[1] Department of Chronic Disease, Metabolism and Aging, KU Leuven, [2] Department of Rehabilitation Sciences, Research Group for Rehabilitation in Internal Disorders, Leuven, [3] Research Group Health Psychology, KU Leuven

L-menthol inhalation effectively relieves acute dyspnea, yet its consistency across repeated administrations remains unclear. This study examined both the efficacy and consistency of menthol inhalation (MI) using a within-subject, counterbalanced cross-over design across two visits. Healthy participants completed constant-load cycling trials at 50% peak power output under MI and an active control condition (strawberry scent inhalation; SI) during the first testing visit and repeated the same procedure approximately one week later. Peak dyspnea was assessed using modified Borg ratings and the Multidimensional Dyspnea Profile (MDP), alongside breathing patterns, leg discomfort, affect, and physical activity levels as measured by the International Physical Activity Questionnaires – Short Form (IPAQ-SF).

Preliminary analyses (n=22, 24.59±6.72 years, 50% female) were conducted using linear mixed models, with condition, visit, and their interaction as fixed effects, and participant as a random intercept.

Results indicate that MI significantly reduced dyspnea unpleasantness ($p<.01$), as well as the MDP dimensions of muscle effort ($p<.01$), air hunger ($p < .01$), chest tightness ($p<.05$), and mental breathing effort ($p<.001$) compared to SI. No condition and visit interactions were observed, indicating that these effects were similar across visits. Secondary exploratory analyses controlling for breathing patterns (breathing frequency, inspiratory time, mean airflow, ventilation, tidal volume, and peak inspiratory mouth pressure) did not alter the condition effect on dyspnea, suggesting that this effect is not explained by breathing patterns. Moreover, these effects remained present even when controlling for individual physical activity levels. No condition or visit effects were observed for dyspnea intensity, leg discomfort, and affect (all $p>.05$), except for muscle effort ($p<.05$), with higher ratings at the first visit.

In summary, MI produced consistent reductions in several dimensions of dyspnea during exercise across repeated administrations, supporting its use as an effective intervention for dyspnea reduction.

Abstracts
Management I

12 June - Poster number 4

Hospital admissions in patients with severe COPD one year before and after completion of the Westmead Breathlessness Service.

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Background: Breathlessness intervention services (BIS) improve breathlessness-related outcomes, but impact on hospitalisations is unclear. We compare hospital admission data for the year prior to completing the Westmead Breathlessness Service (WBS) to the year after.

Materials and methods: The WBS is an 8-week BIS for people with advanced COPD (FEV1:FVC<0.7, FEV1<60% predicted) recently evaluated in a randomised controlled trial(RCT)1 which recruited from 3/2017-12/2022. Admission data for patients completing the RCT, and surviving 1 year after, were collected from local records. Admission data one year prior to WBS were compared to the year after completion concerning mean duration and number of hospital stays, respiratory-specific admissions and Emergency Department presentations. Data Pre/Post WBS were presented as mean±SD at a population level and compared using paired t-test. P values of <0.05 were regarded as significant.

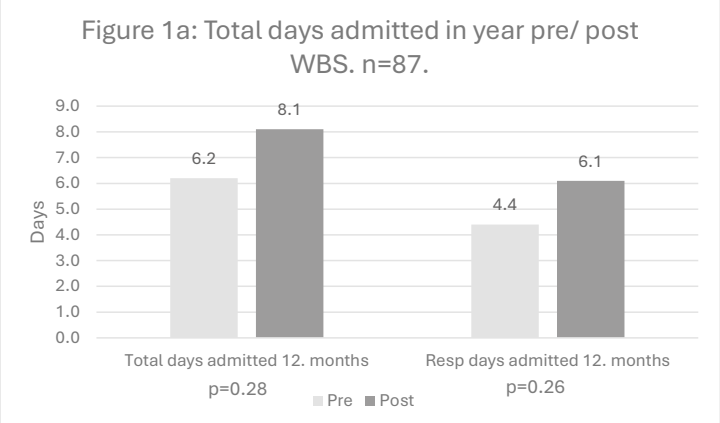
Results: Enrolled population (n-87) at baseline was older (mean age 70.7±7.8 years), 47% female, and had severe COPD (Forced Expiratory Volume in 1 second of 0.85±0.35L(mean 34.1% predicted)). As demonstrated in Figure 1a there was no change in the total duration of hospital admissions or respiratory admissions in the two time periods. Similarly, as in Figure 1b., there was no difference in the rate of respiratory hospital admissions, emergency department presentations or total hospital presentations when comparing the two time periods.

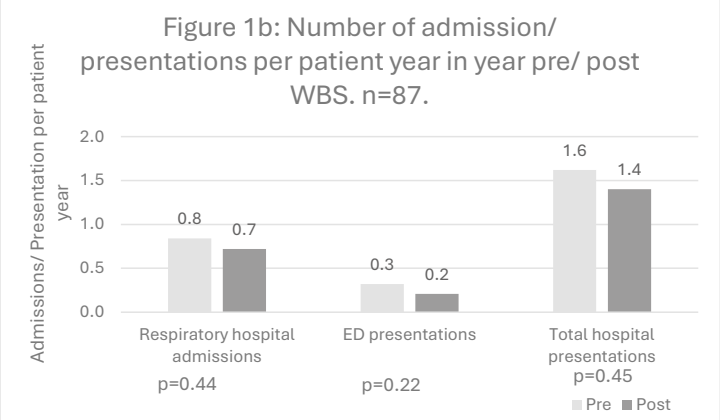
Conclusion: WBS completion was associated with stable rates of hospital utilisation the year after completion in patients with advanced COPD. Given COPD is an often progressive disease, stabilising admissions is an important achievement. These findings suggest that the relationship between multidisciplinary BIS involvement and hospitalisation patterns merits further investigation.

Reference: 1. Smith et al; Thorax 2025. Multidisciplinary, non-pharmacological breathlessness intervention service for patients with moderately severe to severe COPD: a randomised controlled trial (https:// doi.org/ 10.1136/ thorax- 2025-223457).

Figure 1a: Total days admitted pre/ post WBS. n=87.

Figure 1b: Number of admissions/ ED presentations pre/post WBS. n=87.





Legend: ED – Emergency Department.

Abstracts
Management I

12 June - Poster number 5

Co-design of a culturally specific digital self-guided dyspnea support platform for individuals with cancer-related dyspnea in Chinese population

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Background:

Dyspnea is a prevalent, multidimensional, and debilitating symptom affecting up to 70% of people living with cancer. Culturally tailored, self-guided support for Chinese populations remains scarce. Digital delivery offers a scalable option but requires co-design to align with patient and caregiver preferences. This study aimed to co-design and develop a culturally specific, digital, self-guided platform to strengthen self-management of cancer-related dyspnea in the Chinese population.

Materials and methods:

We conducted individual semi-structured interviews with adults experiencing cancer-related dyspnea and their family caregivers. The co-design process followed the Integrate, Design, Assess, and Share (IDEAS) framework and the Medical Research Council (MRC) guidance on complex interventions. Interviews were audio-recorded, transcribed verbatim, and analyzed thematically.

Results:

Nine patient–caregiver dyads participated. Patients included individuals with lung cancer (n = 8); median (range) age was 66 (38–72) years, with a median (range) modified MRC dyspnea score of 2 (2–4). Caregivers had a median (range) age of 59 (30–72) years. Content priorities included: practical self-management strategies with demonstrations (lifestyle, diet, pacing, social participation, mental health); cancer-specific education; moderated peer sharing and a question-and-answer function; and navigation of community resources. Functionality and accessibility features included larger adjustable fonts; Chinese-language content with Cantonese and Mandarin voiceovers and optional English; louder audio; and disability-inclusive elements (audio guidance, sign language). Participants emphasized concise, trustworthy, and professionally endorsed materials; exercise and breathing modules; and healthcare professional moderation to ensure safety.

Conclusion:

User insights support a culturally tailored, accuracy-focused digital intervention comprising brief multimedia self-management content, breathing and exercise modules, professionally moderated peer support, and resource navigation, delivered with multilingual and accessibility features. These findings directly inform prototype development and forthcoming feasibility and usability testing.

Abstracts
Management I

12 June - Poster number 6

Effect of L-menthol on breathlessness and exercise endurance in COPD: a randomized crossover trial

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Background and objective: Breathlessness is a leading cause of disability and reduced quality of life in individuals with chronic obstructive pulmonary disease (COPD). L-menthol inhalation may reduce breathlessness from loaded breathing in COPD and during exercise in healthy adults, but data are limited on the effect of L-menthol on exertional breathlessness in COPD. The primary objective of this study was to evaluate the effect of inhaled L-menthol on exertional breathlessness and exercise capacity in COPD patients

Methods: This was a randomized (ratio 1:1), double-blinded, crossover trial (RCT) of L-menthol inhalation vs placebo. Twenty individuals with COPD performed two constant-load cycle cardiopulmonary exercise tests (CPET) to exhaustion, with either L-menthol or placebo (strawberry) scented patch in the mask. The primary outcome was the difference in breathlessness intensity (Borg 0-10 scale) at isotime. Secondary outcomes were breathlessness unpleasantness, leg-fatigue, exercise endurance time (EET), physiological parameters and change in multidimensional breathlessness.

Results: Compared with placebo, L-menthol inhalation reduced breathlessness intensity at isotime, mean difference -0.8 ([95% confidence interval] -1.6, 0.0; p = 0.042), corresponding to a moderate effect size (Cohen's d= -0.49). Unpleasantness from breathlessness (-0.7; -1.7, 0.3) and leg discomfort (-0.5; -1 .3, 0.2) were numerically lower and exercise endurance time (EET) were longer (0.9 min; -0.7, 2.5) with L-menthol. Physiological responses during CPET were similar between L-menthol and placebo.

Conclusion: Inhalation of L-menthol reduced exertional breathlessness intensity and increased EET compared to placebo in people with COPD.

Abstracts
Management II

12 June - Poster number 7

Feasibility-testing a co-designed breathlessness episode recovery plan for people with COPD and their support persons
Tim Luckett, Mary Roberts, Muneeba Chaudhry, John Hancock, Lennette Ruttle, Marina Siemionow, Kate Smith, Jo River, Marie Williams, Kylie Johnston, Gerben Keijzers, Hancy Issac, Miriam J Johnson, Ann Hutchinson, Flavia Swan, Mark Pearson, Michael Crooks, Anna Keedwell, Slavica Kochovska, Joel Rhee, Eila Erfani, Ester Klimkeit, David Currow, Meera Agar, Tracy Smith

Background:

This study aimed to feasibility-test a non-pharmacological breathlessness episode recovery plan and implementation resources that were co-designed with people with COPD and their support persons in partnership with the Lung Foundation Australia. The plan is based around a mnemonic of 'do your 5': stop, think, position, breathe out slowly, and airflow/cool.

Materials and methods:

We report the first cycle of feasibility-testing and refinement in pulmonary rehabilitation. Clinicians were provided with paper-based versions of the plan and user guide, and clinician training videos. Audio-recordings were taken of clinician-led plan-related education sessions. Telephone interviews with patients were completed 1- and 4-weeks post-education. Focus groups canvassed clinician perspectives. Transcripts were subjected to qualitative analysis, coding against Sekhon et al's (2017) framework for acceptability.

Results:

Most patients (n=14) had previous experience of stop, position and breathe out slowly but welcomed the confirmation and structuring provided by the plan. Patients most commonly emphasised learning that breathlessness itself is neither harmful nor necessarily due to low oxygen levels. Patients struggled to recall all key messages, and many had mislaid the plan 1 week later. None had bought a hand-held fan despite encouragement to do so. Clinicians (n=2) found the intervention acceptable against most domains of Sekhon's framework, though identified opportunity costs vis-à-vis other PR tasks. The plan was revised to include a simplified option of 'do your 5' (Figure 1). A new clinician training video was added, emphasising the need to individualise the plan to each patient's current strategies and cognition. In future, hand-held fans will be provided alongside the plan, with a QR link to an online version of the plan and a video reinforcing key messages.

Conclusion:

Further testing will include community Palliative Care and an Emergency Department, to be completed by mid-2026.

FIGURE 1: REVISED BREATHLESSNESS EPISODE RECOVERY PLAN

Abstracts
Management II

12 June - Poster number 8

Does ethnicity influence the investigative pathway after presentation with breathlessness? – an epidemiological study using CPRD records

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Rationale We previously found that patients of South-Asian and Black ethnicities were less likely to receive an explanatory diagnosis after presentation with breathlessness. As part of further exploration of the underlying reasons for these findings, we investigated the influence of ethnicity on recorded investigations after the point of first presentation with breathlessness

Methods Using the Clinical Practice Research Datalink (CPRD) GOLD database, linked with Hospital Episode Statistics, we identified adults with a first-recorded presentation (index date) with breathlessness between 2007 and 2017. The proportions of patients with a recorded code for possible investigations recommended by NHS England after presentation with breathlessness, within 6 months and 24 months of the index date, were identified. The six most frequently recorded investigations across the whole cohort were identified, and logistic regression was used to estimate adjusted odds ratios for receiving each of these across different ethnic groups, during the above timeframes. All models were adjusted for age, sex, index of multiple deprivation (IMD) quintile and presence of underlying multiple long-term conditions (MLTC) (defined as 2 or more long-term conditions).

Results We included 88,857 patients, of whom 3,336 were of South-Asian ethnicity and 1,506 of Black ethnicity. Patients with ethnicity coding of Mixed/Other/Unknown (n=12,512) were excluded as we were unable to ascertain their ethnic group with available data. Blood haemoglobin (Hb) (47%), chest x-ray (26%), electrocardiogram (ECG) (20%), spirometry (11%), pulse oximetry (7%), and echocardiogram (7%) were the most frequently recorded investigations within both 6 months, and 24 months of the index date. Compared to patients of White ethnicity, patients of South-Asian and Black ethnicities were significantly more likely to be investigated for Hb. However, both groups were significantly less likely to undergo spirometry or pulse oximetry, compared to patients of White ethnicity (figure 1).

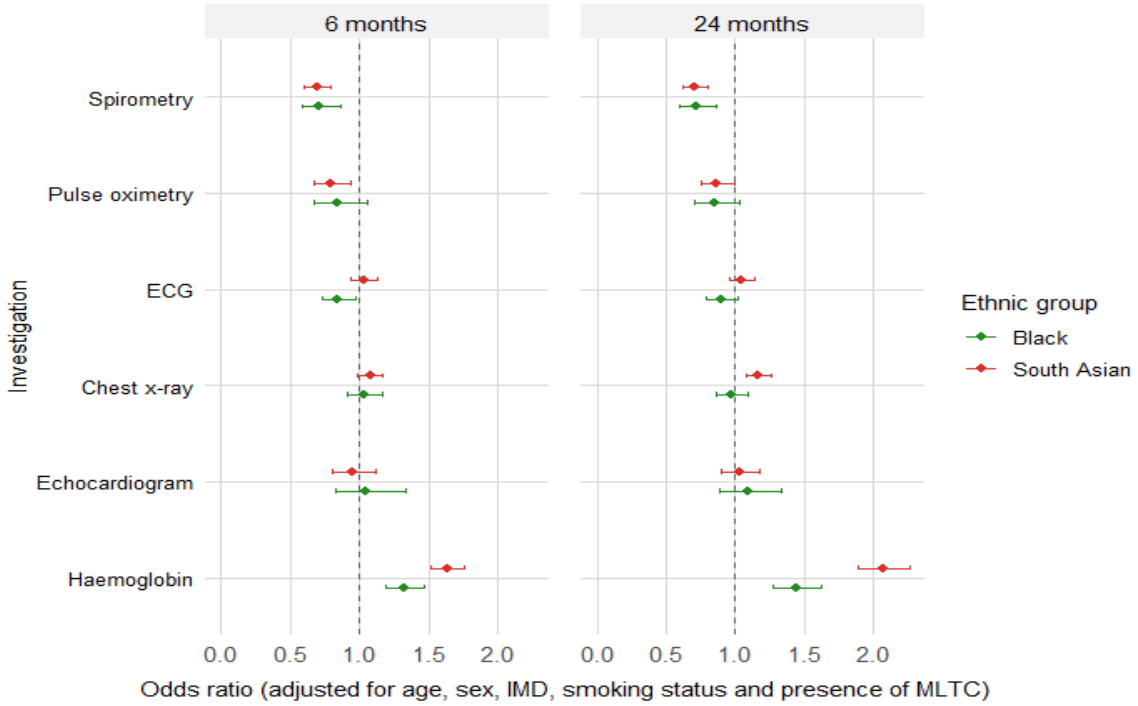

Figure 1 Forest plot of odds ratios from adjusted logistic regression models examining likelihood of investigation by ethnic group, with adjustment for age, sex, deprivation score and presence of underlying multiple long-term conditions

Abstracts
Management II

12 June - Poster number 9

Beyond Breathlessness: Shaping breathlessness research through community engagement with diverse ethnic communities

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Background

There are known delays in reaching an explanatory diagnosis for breathlessness, particularly among diverse ethnic communities. We therefore aimed to engage people from diverse ethnic communities to develop culturally appropriate recruitment resources for breathlessness research. This strategy will subsequently be tested in a qualitative study to understand help-seeking behaviours across diverse ethnic communities.

Materials and methods

The study team collaborated with the Centre for Ethnic Health Research (CEHR) and Biomedical Research Centre (BRC) networks to identify priority communities in Leicester, a plural city. Eleven community events and Patient and Public Involvement (PPI) activities were attended including International Women's Day, World Sickle Cell Day, Research Inclusion in action, Breathe: Speak Out event and Bangladeshi, African/Caribbean, South Asian and Black community meetings to identify people from diverse ethnicities with breathlessness experience.

A PPI event using a co-design approach was conducted with support from interpreters and community engagement teams, to review and refine recruitment strategies.

Results

Thirty-one adults with experience of breathlessness were engaged. Most participants were females (70%), with wide variation in ethnicity. African (Nigerian, Zimbabwean, Ghanaian, Somali), Caribbean, Asian (Indian, Pakistani, Bangladeshi), and Polish communities participated. The key considerations for effective research recruitment and engagement were: 1) the importance of using clear, simple language to describe breathlessness (difficulty in breathing); 2) recruiting through trusted community spaces such as community centres and faith-based organisations; and 3) offering flexible participation options that consider language and cultural preferences. The PPI members informed adaptation of study flyers and animations to be culturally appropriate (Figure 1).

Conclusion

Community engagement was central in shaping culturally responsive recruitment strategies for breathlessness research. Early integration of PPI strengthened trust, improved accessibility, and ensured recruitment strategies were clearly communicated across diverse ethnic communities promoting inclusive research that addresses health inequalities.

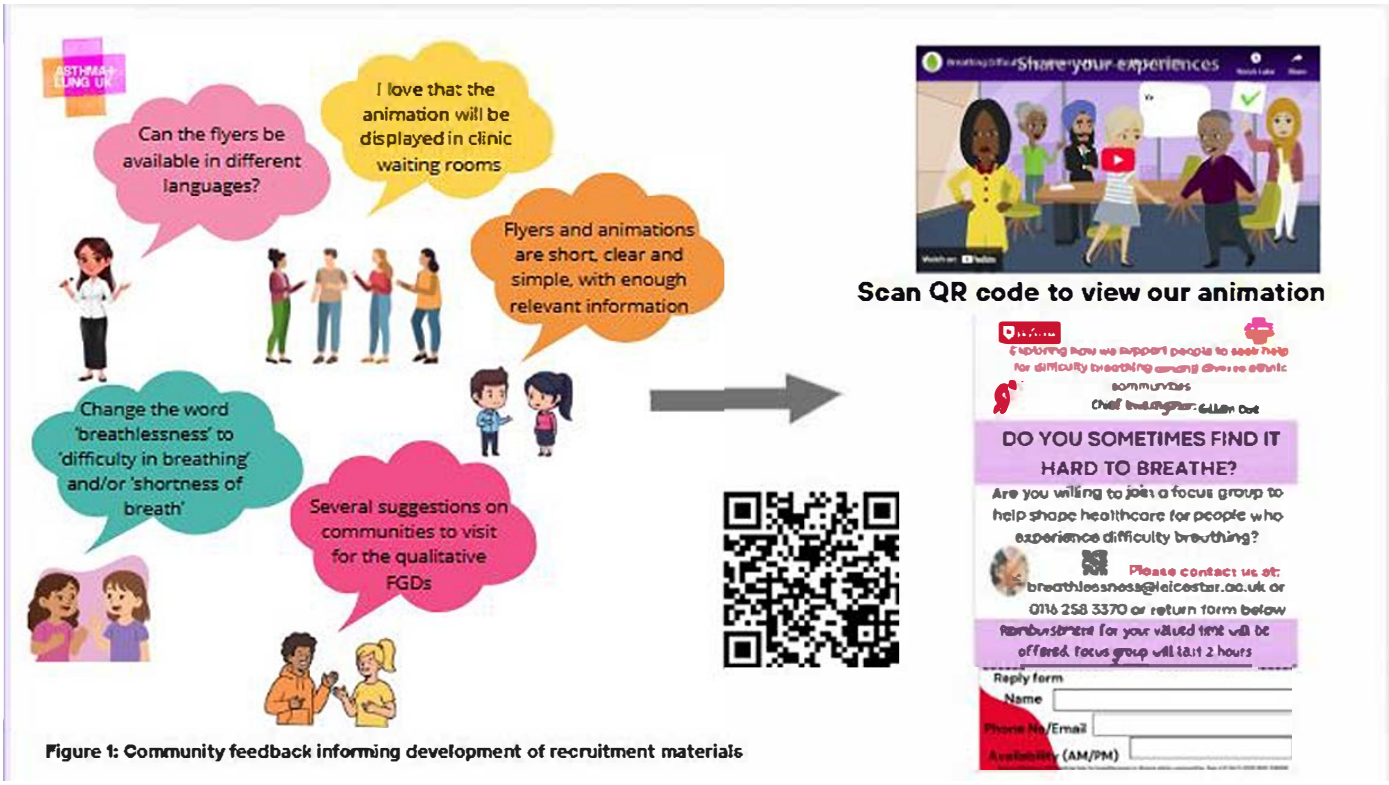

Figure 1: Community feedback informing development of recruitment materials

Abstracts
Management II

12 June - Poster number 10

"I want to know what to expect; even though it's not pleasant. I want to know what's going to happen and how to handle it when it does." The views of patients and carers on best care for people with COPD: an interview study

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Introduction: Chronic obstructive pulmonary disease (COPD) affects the lives of millions of people globally. However, little is known about the views of people with COPD and their carers on best care for the disease, including exacerbations.

Methods: Semi-structured interviews were conducted by phone in a multicentre qualitative study. Participants were recruited purposively in primary and secondary care. Interviews were audio-recorded and analysed using reflexive thematic analysis. Descriptive data are presented as mean [SD] unless stated.

Results: 40 patients with COPD were interviewed (21 female; 28 white; age 69 [8.1] years, COPD duration 11.3 [8.3] years, median [range] number of exacerbations in the past year 1.5 [0-9]). Seven carers (6 female, 6 white) were interviewed.

Four themes were identified: 1) Listen to your body–patients feel they should be encouraged to see a clinician when symptoms first develop, enabling early diagnosis and health behaviour change; 2) Preparedness–patients want clinicians to prepare them for symptom worsening; 3) Start at the beginning–patients want early education to support symptom management; 4) COPD care is a partnership–handling exacerbations is best done in partnership between patients, carers and clinicians.

Discussion: People delay presenting in primary care with breathlessness, consequently diagnosis and appropriate management of COPD can be delayed. Patients recommended that people be encouraged to present early with symptoms of COPD. Following diagnosis, they welcomed ongoing clinician support on how to be healthier and how to manage symptoms using non-pharmacological techniques. Patients valued knowing that their symptoms may worsen and being able to prepare with their clinicians how best to handle exacerbations. These recommendations are in line with NICE guidance that management should include smoking cessation, referral to pulmonary rehabilitation and co-development of a personalised self-management plan. Clinicians and patients value clarity and candour and educational efforts should consider this for both groups.

Abstracts
Management II

12 June - Poster number 11

A Breathlessness Service outreach project, providing education sessions to prisoners.

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Background:

This outreach project, delivered by the Norfolk and Norwich University Hospital Breathlessness Service, aimed to improve access to evidence-based breathlessness education for prisoners with chronic respiratory and cardiac disease. The initiative was informed by NHS England Ambitions for palliative and end of life care, particularly the principle that all individuals should receive fair access to care. Prisoners are frequently excluded from community-based Pulmonary Rehabilitation programmes recommended for people with chronic obstructive pulmonary disease (COPD) and chronic breathlessness.

Method:

A Specialist Palliative Care Advanced Clinical Practitioner delivered one-hour educational sessions to 24 prisoners diagnosed with COPD or heart failure, alongside four prison staff members. Sessions focused on the nature of chronic breathlessness and evidence-based non-pharmacological self-management strategies derived from the Breathing, Thinking, Functioning model. Interventions included pursed-lip breathing, energy conservation techniques, distraction strategies, and the use of handheld fans for facial cooling, which were donated by the local charity Breathe Easy.

Results:

Project outcomes were evaluated using the Dyspnoea-12 questionnaire administered before and eight weeks after the intervention. Participants reported reductions in the severity and emotional distress associated with breathlessness, alongside improved confidence in managing exertional dyspnoea. An additional outcome of the project was the development of plans for weekly prison-based exercise sessions led by an Occupational Therapist to address deconditioning and improve respiratory muscle strength.

Conclusion:

Although the sample size was small and findings were not statistically significant, the project demonstrated the feasibility and potential value of delivering low-cost, evidence-based breathlessness education within a prison setting. This initiative highlights the potential for collaborative, rehabilitative approaches to support marginalised populations with chronic breathlessness.

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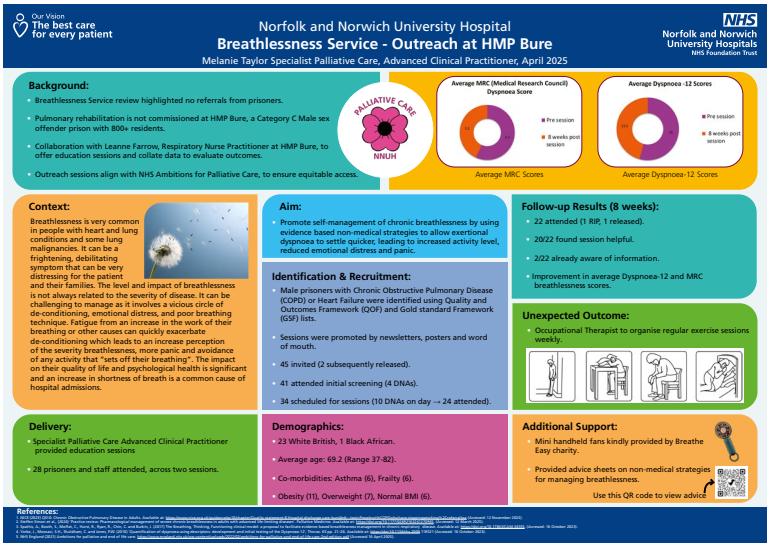

Abstracts
Management II

12 June - Poster number 12

Clinician practices and beliefs regarding dyspnoea assessment in adults with kidney failure

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Background: Dyspnoea is a common and disabling symptom in kidney failure, yet it is unclear how it is assessed and managed in clinical settings. This study describes clinician practices, attitudes and beliefs regarding dyspnoea assessment and management for people living with chronic kidney disease.

Materials and methods: This cross-sectional descriptive study used a purpose-developed 25-item electronic survey distributed via the Renal Society of Australasia communique and professional renal networks in Australia. Likert-scale items assessed attitudes and self-reported practices. Free-text responses were analysed using descriptive content analysis, and quantitative data were summarised using frequencies and percentages.

Results: 125 completed surveys were available for analysis (nurses: 80%, medical doctors: 14%, allied health 6%). Respondents indicated dyspnoea was an important symptom (79%) and central to management (77%). While most respondents (70%) agreed (somewhat or strongly) that patients would like to be asked about their dyspnoea, less than half (49%) agreed (somewhat or strongly) that patients can rate their own dyspnoea on a 0 -10 scale. Almost all respondents reported assessing dyspnoea (98%). Approaches ranged from asking about dyspnoea (rest or on exertion: 80% or presence of dyspnoea: 67%) to using categorical (33%) or numerical (9%) scales. Most respondents (78%) supported standardised assessment of dyspnoea. Management approaches prioritised physiological mechanisms (fluid overload) underpinning dyspnoea rather than the sensation itself. Concerns were raised regarding dyspnoea as being “too subjective” or burdensome to assess and manage.

Conclusions: In this small sample of Australian renal clinicians, (1) dyspnoea was an important symptom to routinely assess and manage, (2) there was no consistent approach to dyspnoea assessment, and (3) understandings of the nature of dyspnoea as a symptom varied. There appears to be little or no kidney-specific guidelines for dyspnoea assessment and management.