June 16 - 17, 2016
Serris, France

www.dyspnea2016inparis.fr

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It is endorsed by the European Respiratory Society
and by the Société de Pneumologie de Langue Française

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Bob BANZETT
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Janelle YORKE

Invited speakers
Metin BASOGLU (Istanbul, Turkey)
David CURROW (Adelaïde, Australia)
Olaf BLANKE (Geneva, Switzerland)
Marie-Elisabeth FAYMONVILLE (Liège, Belgium)

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June 15, 2016

- arrival of the participants
- 19:00 pm : welcome cocktail and dinner

June 16, 2016

08:45-09:00: welcome and introduction

09:00-10:30: oral communication 1: *pathophysiology of respiratory sensations (session facilitated by Pierantonio Laveneziana)*

10:30-10:45: pause

10:45-11:45: poster session 1: *pathophysiology of respiratory sensations*

11:45-12:30: invited conference *(session facilitated by Robert Banzett)*
"*Asphyxiation torture and its psychological consequences : the dark side of respiratory psychophysiology*"
Pr Metin BASOGLU, Istanbul, Turkey

12:30-14:00: lunch

14:15-15:00: invited conference *(session facilitated by Thomas Similowski)*
"The management of refractory dyspnea as a human right"
Pr David CURROW, Adelaide, Australia

15:00-16:30: oral communications 2: *from ICU to advanced cancer: epidemiology and treatment of dyspnea (session facilitated by Dennis Jensen)*

16:30-17:00: pause

17:00-18:00: poster session 2: *from ICU to advanced cancer: epidemiology and treatment of dyspnea*

18:00-19:00: Dyspnea Society and Dyspnea 2019 (Pr Banzett, Dr Jensen)

19:00-22:00: dinner

June 17, 2016

08:15-09:00: Delphi session: "Chronic breathlessness: a new clinical syndrome" (Pr Johnson, Pr Currow)

09:00-11:45 (with a pause from 10:30 to 10:45): **poster session 3:** *Evaluation of dyspnea: feasibility and multidimensional assessment*

11:45-12:30: invited conference *(session facilitated by Capucine Morélot-Panzini)*
"The neurophysiological basis of hypnosis"
Pr Marie-Elisabeth FAYMONVILLE, Liège, Belgium-

12:30-14:00: lunch

14:15-15:00: invited conference *(session facilitated by Dan Adler)*
"Bodily self-consciousness and its manipulations"
Pr Olaf BLANKE, Geneva, Switzerland

15:00-16:30: oral communications 3: *Evaluation of dyspnea: feasibility and multidimensional assessment (session facilitated by Sara Booth)*

16:30-16h45: farewell

16:45-17:45: Post-conference business meeting: ERS Collaborative Research Network in Respiratory Neuroimaging (Pr Pattinson)

Invited conference 1 *(June 16, 11:45 - 12:30)*

Professor Basoglu will speak during "Dyspnea 2016" ***on "Asphyxiation torture and its psychological consequences: the dark side of respiratory psychophysiology",*** *with Professor Bob Banzett as the session chairperson and discussant.*

Biography: Professor Metin Basoglu, MD, PhD, is founder and former Head of Trauma Studies at King's College London and founder of the Istanbul Center for Behavior Research and Therapy in Turkey. He is internationally known for his research on mental effects of wars, torture, and earthquakes and their treatment. He brought a scientific perspective over the debate on what constitutes torture by publishing research evidence showing no distinction between torture and cruel, inhuman, and degrading treatment in terms of their immediate and long-term mental impacts.

Dyspnea 2016 message: ***"Asphyxiation is one of the most distressing forms of torture and even more traumatic in the long-term than physical torture involving excruciation pain"***

Selected readings:

• Basoglu M, Livanou M, Crnobaric C (2007). Torture versus other cruel inhuman and degrading treatment: Is the distinction real or apparent? Archives of General Psychiatry, 64, 1-9

• Basoglu M (2009). A multivariate contextual analysis of torture and cruel, inhuman, and degrading treatments: Implications for an evidence-based definition of torture. American Journal of Orthopsychiatry, 79, 2, 135-145

• Basoglu (2012). Waterboarding is severe torture: Research findings.

• Basoglu (2012). Zero Dark Thirty: The unbearable lightness of the torture debate.

• Basoglu (2015. Definition of torture in United States law: Does it provide legal cover for "enhanced interrogation techniques"?

Invited conference 2 *(June 16, 14:15 - 15:00)*

Professor Currow will speak during "Dyspnea 2016", on ***"The management of clinical refractory dyspnea as a human right"****, with Pr Thomas Similowski as the session chairperson and discussant.*

Biography : David Currow is Professor of Palliative & Supportive Services, Flinders University, Adelaide, South Australia.He has published more than 350 peer-reviewed articles, editorials and books and is an internationally recognized expert in palliative care research and in improving its delivery. He directs a busy research program which includes phase III and IV clinical trials, population-based studies using existing data bases, population-based surveys and codifying the evidence base underpinning palliative care. The unit he leads has more than 350 distance students around the world studying at post graduate level in palliative care. He is senior Associate Editor of Journal of Palliative Medicine and on the Editorial Boards of BMJ Supportive and Palliative Care, Journal of Pain and Symptom Management and the Journal of Oncology Practice. David is a former president of Palliative Care Australia and the Clinical Oncological Society of Australia.

Dyspnea 2016 message: ***"Every clinician has a responsibility to adequately assess and treat chronic refractory breathlessness. This is highly prevalent in our community and there is a strong evidence base for its safe, symptomatic treatment."***

Selected readings:

• Laviolette L, Laveneziana P. Dyspnoea: a multidimensional and multidisciplinary approach. Eur Respir J 2014 Jun;43(6):1750-62

• Currow DC, McDonald C, Oaten S, Kenny B, Allcroft P, Frith P, Briffa M, Johnson MJ, Abernethy AP. Once-daily opioids for chronic dyspnoea: a dose increment and pharmacovigilance study. J Pain Symptom Manage 2011;42(3):388-399

• Parshall MB, et al. An Official American Thoracic Society Statement: Update on the Mechanisms, Assessment, and Management of Dyspnea. Am J Respir Crit Care Med 2012; 185(4):435–452

• Abernethy AP, Currow DC, Frith P, Fazekas BS, McHugh A, Bui C. Randomised double-blind placebo-controlled crossover trial of sustained-release morphine for the management of refractory dyspnoea. Br Med J 2003; 327(7414):523-8

• Johnson MJ, Bland JM, Oxberry SG, Abernethy AP, Currow DC. Clinically important differences in the intensity of chronic refractory breathlessness. J Pain Symptom Manage 2013;46(6):957-63

Invited conference 3 *(June 17, 11:45 - 12:30)*

Professor Faymonville will speak during "Dyspnea 2016" on ***"The neurophysiological basis of hypnosis"****, with Dr Capucine Morélot-Panzini as the session chairperson and discussant.*

Biography: Professor Marie-Elisabeth Faymonville, Doctor of Medicine with PhD thesis in Anesthesiology, is the director of the Pain Clinic and Palliative Care in the University Hospital of Liege (Belgium). Since 1992, she introduced hypnosis as a new anesthetic technique and, since 2008, she teaches groups of patients (oncologic or chronic pain patients) selfhypnosis and selfcare. In collaboration with the Coma Science Group (www.coma.ulg.ac.be), she publishes about the neurophysiological correlates during different modified or altered conscious states. She is author and co-author of over 200 peer-reviewed publications.

Dyspnea 2016 message: ***"Hypnosis has been used to decrease pain and discomfort but what is hypnosis? What are the neurophysiological correlates of hypnosis and how can we use hypnosis with palliative care patients? Could it be used to alleviate dyspnea?"***

Selected readings:

• Maquet P, Faymonville ME, Degueldre C, Del Fiore G, Franck G, Luxen A, Lamy M.Functional neuroanatomy of the hypnotic state. Biological Psychiatry, 1999, 45 : 327-33.

• Faymonville ME, Laureys S, Degueldre C, Del Fiore G, Luxen A, Franck G, Lamy M, Maquet P Neural mechanisms of antinociceptive effects of hypnosis. Anesthesiology, 2000, 92 : 1257-67

• Demertzi A, Soddu A, Faymonville ME, Bahri MA, Gosseries O, Vanhaudenhuyse A, Phillips C, Maquet P, Noirhomme Q, Luxen A, Laurey S Hypnotic modulation of resting state fMRI default mode and extrinsic network connectivity. Progress in Brain Research, 2011, 193 : 309-22

• Mc Bride JJ, Vlieger AM, Anbar RD. Hypnosis in paediatric respiratory medicine. Paediatric Respiratory Review, 2014, 15(1) : 82-5

• Vanhaudenhuyse A, Gillet A, Malaise N, Salamun I, Barsics C, Grosdent S, Maquet D, Nyssen AS, Faymonville ME. Efficacy and cost-effectiveness: a study of different approaches in a tertiary pain center. European Journal of Pain, 2014, In press

Invited conference 4 *(June 17, 14:15 - 15:00)*

Professor Blanke will speak during "Dyspnea 2016" on ***"Bodily self-consciousness and its manipulations",*** *with Dr Dan Adler as the session chairperson and discussant.*

Biography: Professor Olaf BLANKE is founding director of the Center for Neuroprosthetics, Bertarelli Foundation Chair in Cognitive Neuroprosthetics at the Swiss Federal Institute of Technology (Ecole Polytechnique Fédérale de Lausanne, EPFL). He founded the Laboratory of Cognitive Neuroscience at EPFL and is Professor of Neurology at the Department of Neurology at the University Hospital of Geneva. Pr Blanke pioneered the neuroscientific study of multisensory body perception and its relevance for the self and consciousness by using a broad range of methods such as the brain imaging, cognitive psychology, as well as intracranial and non-invasive electrophysiology. Most recently he has pioneered the use of engineering techniques such as robotics/haptics and augmented/virtual reality with techniques from cognitive neuroscience. Pr Blanke's main interests are the development of a data-driven neuroscientific theory of consciousness and the application of these neuroscientific insights in cognitive neuroprosthetics and neuro-rehabilitation.

Dyspnea 2016 message: ***"In the first part of my talk I am going to start by introducing the processing of multisensory, cardiac, and respiratory signals in the parietal and insular cortex and in the second part will propose the development of neuroprosthetic systems to improve breathing comfort in dyspnea."***

Selected readings:

• Lenggenhager B, Tadi T, Metzinger T, Blanke O. Video ergo sum. Manipulating bodily self-consciousness. Science 2007; 317: 1096-1099.
• Ionta S, Heydrich L, Lenggenhager B, Mouthon M, Gassert R, Blanke O. Temporo-parietal cortex encodes self-location and first-person perspective. Neuron 2011; 70:363-374.
• Blanke O Multisensory brain mechanisms of bodily self-consciousness. Nature Reviews Neuroscience 2012; 13: 556-571.
• Adler, D., Herbelin, B., Similowski, T., Blanke, O. Breathing and sense of self: Visuo-respiratory conflicts alter bodily self-consciousness. Respiratory Physiology & Neurobiology 2014; 203: 68-74.
• Aspell, JE, Heydrich L, Blanke O. Turning body and self inside out: Visualized heartbeats alter bodily self-consciousness and tactile perception. Psychological Science 2013; 24: 2445-2453.

ABSTRACTS

1. D2016P00028

Sensations associated with experimentally-evoked cough in healthy volunteers

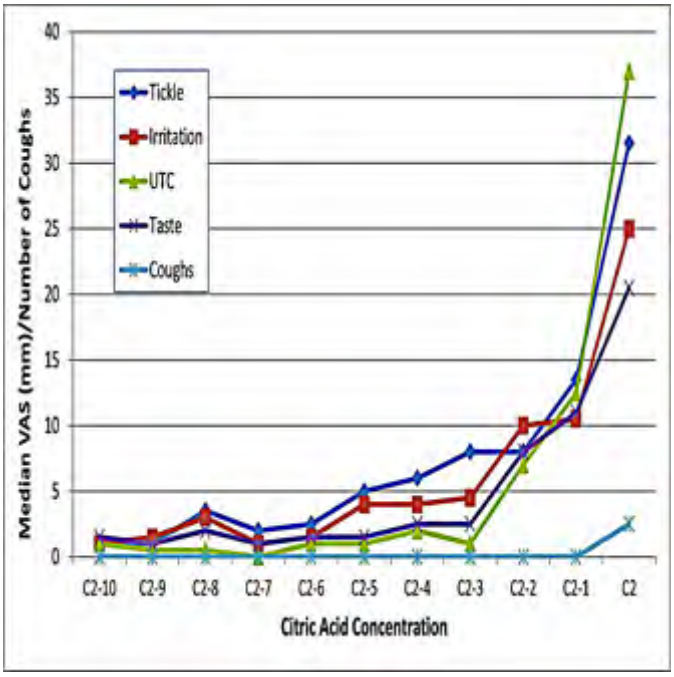
J. Smith, B. Issa, J. Mitchell, D. Corfiled.
University of Manchester - Manchester (United kingdom).

RATIONALE: Cough is generally considered a protective airway reflex; however emerging evidence suggests that the debilitating symptom of chronic cough in respiratory diseases, is unrelated to airways protection, and is provoked by sensations from the airway. We have shown that patients with chronic cough identify irritation, tickle and the urge to cough (UTC) as important sensations. This study explored these sensations in healthy controls using citric acid, an irritant known to activate the key airway sensory afferents in human and animal models.

METHODS: 10 healthy controls inhaled increasing concentrations of citric acid from a dosimeter [0.001-4M], rating the sensations of irritation, tickle, UTC and taste on 100mm visual analogue scales (VAS; 0mm=none, 100mm=worst) after each inhalation. The experiment continued until participants coughed at least twice on any concentration of citric acid (C2). For the analysis, data were aligned by the C2 concentration and general estimating equations (GEE) analysed the ability of the sensations to predict the numbers of coughs evoked.

RESULTS: The median C2 was 0.5M citric acid and the VAS scores for each sensation are shown in the figure below for the C2 and 10 preceding concentrations. At low concentrations associated with little UTC (C2-10 to C2-3), sensations of tickle and irritation are rated most highly. UTC then steeply increases from C2-2 to the C2, ranking as the highest rated sensation as coughing starts. GEE modelling suggests the intensity of the UTC ($p<0.01$) and possibly irritation ($p=0.10$) are more important predictors of coughing than tickle ($p=0.84$ or taste $p=0.22$).

CONCLUSIONS: These data show that evoked cough models can be used to study the sensations provoking cough, and suggest that UTC and irritation are most important. Interestingly, there is a de-coupling of these sensations from the initiation of coughing, an observation that will be interest in patients with chronic cough.



2. D2016P00024

Salivary diurnal cortisol profiles in patients with advanced disease and chronic refractory breathlessness: a cross-sectional study

R. Ryan [1], A. Clow [2], A. Spathis [1], N. Smyth [2], S. Booth [1].

[1]Cambridge University Hospitals NHS Foundation Trust, Cambridge (United kingdom), [2]University of Westminster - London (United kingdom).

BACKGROUND/AIMS: Cortisol secretion has a marked circadian rhythm, characterised by high morning and low evening levels. Reduced diurnal variation, represented by a flatter rate in the decline in cortisol across the day (´slope´), is indicative of hypothalamic-pituitary-adrenal (HPA) axis dysregulation, and has been found to be associated with frailty, poor physical performance and shorter survival in a range of populations. Its presence and meaning in patients with chronic refractory breathlessness has not been established. This cross-sectional study aimed to explore HPA axis function in patients with advanced disease, most of whom had chronic refractory breathlessness.

METHODS: Patients were compared against an age-matched healthy control group. Those on systemic steroids in the preceding 4 weeks were excluded. Saliva samples were collected over 2 consecutive days at 3, 6 and 12 hours after waking. Diurnal slopes were calculated by regressing log-transformed cortisol values on collection time. Measures of breathlessness included intensity (numerical rating scale, average over past 24 hours), mastery (domain of Chronic Respiratory Questionnaire), and MRC Dyspnoea grade.

RESULTS: 61 patients with malignant (n=23) and non-malignant (n=38) disease (mean age ±SD: 73.1±9.1 years, males=34) were compared against 50 healthy controls (mean age±SD: 74±7 years, males=16). In a one-way ANCOVA, controlling for age, gender and socioeconomic status, the mean diurnal slope was significantly flatter in the patient group relative to the healthy group [adjusted mean slopes: -0.07 versus -0.16, $p < 0.001$]. Patients with a MRC Dyspnoea grade ≥3 (n=50) had significantly flatter slopes than those with grade ≤2 (n=11) [p=0.001]. There was no significant correlation between the diurnal slope and other breathlessness measures.

CONCLUSION: Patients with chronic refractory breathlessness have evidence of HPA axis dysregulation, which may be related to disability due to breathlessness.

3. D2016P00014

Modulation of dyspnea perception during walking exercise using visual distraction strategies in patients with COPD: a pilot study

L. Laviolette [1], P. Gagnon [1], D. Saey [1], M. Martin [1], É. Allard [2], T. Similowski [2], F. Maltais [1].

[1]Centre de recherche, Institut Universitaire de cardiologie et de pneumologie de Québec, Université Laval, Québec (Canada)

[3]Sorbonne Universités, UPMC Univ Paris 06, INSERM, UMRS1158. - Paris (France),

INTRODUCTION: Dyspnea is the most incapacitating symptom of COPD. This study aims at using emotionally charged visual cues to distract patients and improve symptoms of exercise intolerance and dyspnea during exercise.

METHODS: Ten patients with COPD completed three experimental visits (V2-V3-V4). Randomized visual distraction strategies (positive, negative or neutral, from the International Affective Picture System [IAPS]) were applied during an endurance walking exercise test (EWT, at 85% of VO2 peak) at each visits. During the EWT, affective dimension of dyspnea was quantified using the A1 scale from the multidimensional dyspnea profile (MDP A1) while sensory intensity was quantified using a 10-points Borg scale. Anxiety was measured before and after each EWT using the State-Trait Anxiety Inventory state-from (STAI-S).

RESULTS: The EWT time (423 ± 210s; 415 ± 198s; 484 ± 230s, mean ± SD, for positive, neutral and negative conditions respectively) and concomitant physiological parameters were not significantly different among the three visual conditions. Dyspnea was the limiting EWT symptom for the majority of patients in each conditions. The MDP A1 score was significantly higher in the negative condition (9.15 ± 0.88) when compared with the neutral (8.85 ± 0.88) and positive conditions (8.65 ± 1.16, $p = 0.045$). Borg dyspnea intensity scores were not different between visual conditions at any time during EWT. The STAI-S scores at peak exercise were increased for the positive condition only ($p = 0.04$).

CONCLUSIONS: The affective dimension of exertional dyspnea was significantly increased when exposed to negative visual distraction. However, these findings were not paralleled by changes in the intensity of dyspnea, exercise tolerance or in the physiological parameters during exercise.

4. D2016P00021

Breathing and bodily self-consciousness: evidence for reciprocal interferences between experimental dyspnea and visuo-respiratory induced full body illusion.

E. Allard [1], E. Canzoneri [2], D. Adler [3], C. Morélot-Panzini [1], B. Herbelin [2], O. Blanke [2], T. Similowski [1]

[1]UMRS1158, Paris (France)

[2]Laboratory of Cognitive Neuroscience, Center for Neuroprosthetics, Ecole Polytechnique de Lausanne, Genève (Switzerland)

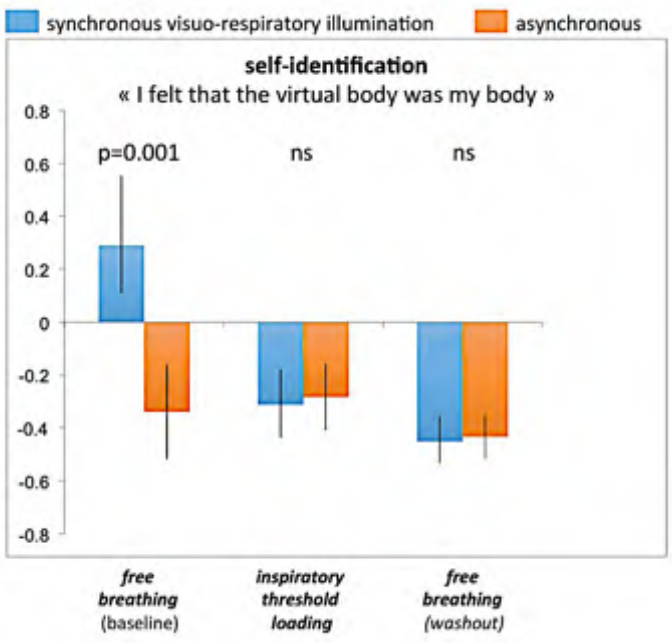
[3]Division of Pulmonary Diseases, Geneva University Hospital, Genève (Switzerland).

INTRODUCTION: Bodily self-consciousness (BSC) is the feeling of being located within a body that we own and control (self-identification) and that has a given location within the environment (self-location). BSC depends on brain multisensory processing of proprioceptive, interoceptive and exteroceptive signals. They can be manipulated to create illusory states of BSC. Breathing contributes to BSC: normal humans exposed to a virtual body flashing synchronously with their breathing experience changes in self-experience", "breathing location", and breathing control. This does not occur during asynchronous visuo-respiratory stimulation. Inspiratory threshold loading (ITL) induces dyspnea and engages motor cortical networks: we hypothesized that this could interfere with BSC.

METHODS: 26 volunteers (6 men; mean age 26) were exposed to sync and async visuo-respiratory stimulations during free breathing (FB) and while breathing against an inspiratory threshold load (62±11% of maximal inspiratory pressure; LB). Dyspnea was assessed with a visual analog scale (D-VAS; median 65% of full scale -FS-, [IQR 42.5-80%]) and the multidimensional dyspnea profile (MDP; sensory perception S, emotional response A).

RESULTS: During FB, visuo-respiratory conflicts altered self-identification and breathing agency assessed by a specific questionnaire (synch vs asynch, p=0.001 and 0.01). LB abolished these effects (p=0.84 and 0.92), in a remanent manner. Of note, D-VAS was lower during asynch than during sync visuo-respiratory illumination (60% FS [52.5-80] vs 80% [50-80], p=0.04), as were MDP-S (32 [25.5-40] vs 28.5 [25.25-38.5], p=0.03) and MDP-A2 (14 [5.75-20.75] vs.12 [5.25-17.5], p=0.03).

CONCLUSIONS: ITL cancels the effects of synchronous visuo-respiratory stimulation on BSC, whereas asynchronous visuo-respiratory stimulation reduces ITL-induced dyspnea. These results fuel the notion that disordered breathing can have cognitive impacts, and pave the way to novel non-pharmacological approaches of dyspnea treatment.



5. D2016P00010

The anticipation of dyspnea: neural, genetic and emotional aspects in health and COPD

R. Esser [1], M. Gamer [2], C. Büchel [1], C. Stoeckel [1].
[1]*University of Hamburg - Hamburg (Germany)*
[2]*University of Würzburg - Würzburg (Germany)*.

INTRODUCTION: Already the anticipation of dyspnea is thought to elicit fear in patients suffering from dyspnea and to result in a less favorable course of their disease. However, little is known about the neural processing of dyspnea anticipation and its associations with genetic, emotional and clinical aspects.

METHODS: In different studies, we examined the brain mechanisms underlying the anticipation of dyspnea in healthy subjects and patients with COPD by using resistive load breathing during functional magnetic resonance imaging. Blocks of severe dyspnea alternated with blocks of mild dyspnea, each preceded by a visually cued anticipation period. Moreover, associations with an emotion-related genetic polymorphism in the serotonin-transporter linked promoter region (5-HTTLPR), fear/anxiety and clinical patient characteristics were studied.

RESULTS: Healthy individuals demonstrated increased activation during the anticipation of dyspnea in insula, operculum and cerebellum. These areas showed enhanced anticipatory connectivity with amygdala and anterior cingulum (ACC). Anticipatory fear was correlated with increased anticipatory activation in insula and ACC, while the risk variant in 5-HTTLPR was associated with higher anticipatory amygdala activation.
Patients with COPD showed greater activation than controls in amygdala and hippocampus during dyspnea anticipation. These activations were associated with reduced exercise capacity and quality of life and increased dyspnea and anxiety.

CONCLUSIONS: Our results demonstrate a strong involvement of emotion-related brain areas such as insula, ACC and amygdala during the anticipation of dyspnea. These activations were associated with genetic and emotional risk factors and less favorable clinical characteristics in patients with COPD. Taken together, the findings suggest that the fearful anticipation of dyspnea might be related to a more negative course of disease in affected patients.

6. D2016P00011

Respiratory Event-Related Potentials in Patients with Spinal Cord Injury: Introduction and Overview

A. Harver [1], J. Lieberman [2].
[1]UNC Charlotte - Charlotte (United States of America), [2]Carolinas Rehabilitation - Charlotte (United States of America).

BACKGROUND: Dyspnea is "a subjective experience of breathing discomfort that consists of qualitatively distinct sensations that vary in intensity." Previous research demonstrates that sensory information from the respiratory system activates regions of the cerebral cortex; and afferent pathways that transmit somatosensory signals to the central nervous system are well described. Event-related potentials (ERPs) have been used to measure respiratory somatosensation with high temporal resolution. The goal of the proposed project is to examine neurophysiological mechanisms underlying respiratory sensations. We will evaluate the extent of sensory loss evident in persons with increasingly severe spinal cord injury on respiratory ERPs to test the hypothesis that respiratory sensations vary systematically as a function of somatosensory input from chest wall and intercostal muscle mechanoreceptors.

METHODS: Participants include 20 adults with motor complete spinal cord injuries between the levels of C3 and T12 recruited from a registry of approximately 200 individuals with spinal cord injury who have received rehabilitative services through Carolinas Rehabilitation. To examine the differential effects of spinal cord injury on the perception of breathing sensations, subjects will be equally distributed among four categories of injury including: high tetraplegia (lesions between C3 - C5), low tetraplegia (lesions between C6-C8), high paraplegia (lesions between T1-T6), and low paraplegia (lesions between T7-T12). For comparative purposes, 20 age-matched healthy volunteers will participate in the project.

RESULTS and CONCLUSIONS: We have piloted our procedures in both spinal cord injury and age-matched control participants and enlisted nearly a third of our target sample. Analyses of the differential effects of spinal cord injury level on respiratory-related ERPs are forthcoming.

7. D2016P00025

Investigating variability in breathlessness in severe COPD patients to personalise management

C. Chin

Cambridge University Hospitals NHS Foundation Trust - Cambridge (United kingdom).

BACKGROUND:
Dyspnea is a common and important symptom frequently reported in COPD. It negatively impacts on quality of life for both patients and carers, and causes considerable strain to health services.
Therapies aim to improve lung function but poor correlation between this and dyspnea exists - patients are not always less breathless afterwards. Predicting which patients will benefit from therapies offered is difficult - no studies have established any predictive factors.
Variability in dyspnea in patients with identical lung function is not fully understood but due to the central processing of dyspnea, psychological influences are likely to be important. Depression and anxiety are associated with breathlessness but we hypothesise that factors such as emotional intelligence, self-management and systemic inflammation are important.

AIMS:
1) To increase understanding of the factors contributing to variability in breathlessness severity.
2) To identify factors that predict response to treatment.
3) To develop a preliminary predictive tool to personalise treatments.

PLAN OF INVESTIGATION:
1) Systematic review to identify factors associated with dyspnea severity or predictive of improvement after treatment. This will inform the subsequent studies by highlighting important factors to investigate.
2) Cross-sectional study of severe COPD patients to investigate these factors and their contribution to dyspnea variability.
3) Prospective longitudinal cohort study of severe COPD patients having lung volume reduction (LVR) or a complex breathlessness intervention (Cambridge Breathlessness Intervention Service, CBIS) to identify factors predictive of improvement in dyspnea following treatment. LVR provides a model for investigation as it purely improves lung function. Changes in the factors in this cohort will be compared with the CBIS cohort which uses education and self-management to improve the symptom. A preliminary predictive tool will be developed from these factors.

8. D2016P00032
Dyspnea in Pulmonary Hypertension

N. Burki, R. Foley
University of Connecticut health Center - Farmington (United States of America).

INTRODUCTION: The primary presenting symptom in pulmonary arterial hypertension (PAH) is dyspnea, noted initially on exercise. Indeed, the clinical course of PAH is monitored by the level of dyspnea. However, the mechanism of this dyspnea is unknown: many of these patients have no pulmonary parenchymal abnormalities. It is possible that one mechanism may be the stimulation of pulmonary vagal C fibers, by the pulmonary vascular defect associated with the pulmonary hypertension; pulmonary C fibers are known to be dyspnogenic when stimulated (Burki NK, Lee LY: Pulm Pharmacol Ther. 2010;23(4):279-82;Chest 2010;138(5):1196-201).

METHODS: We studied exercise capacity and dyspnea in 6 patients (mean age 56.8±5.6yrs, 4 females) with documented PAH, normal spirometry, and without parenchymal lung disease. Subjects were studied at baseline and after pulmonary C fiber blockade with lidocaine or theophylline. Subjects attended the laboratory on two separate days; on each day, the subjects underwent baseline cycle ergometry: the subjects were exercised at 10 or 25 watt increments for 1 minute at each work load, until limitation by dyspnea or to 80% predicted maximum heart rate. During the last 30 secs of exercise at each level the subject indicated the degree of breathlessness on a Borg scale. Following the baseline exercise study, on one visit day the subject inhaled 4% lidocaine, in a set breathing pattern to ensure alveolar deposition of the aerosol and the exercise study was immediately repeated; on the second visit day the subject received an oral solution of 500mg theophylline, and the exercise study was repeated after 90 minutes.

RESULTS AND CONCLUSIONS: On both study days, exercise time increased significantly (range 0.23 - 0.91 mins, $p<0.028$) and the Borg score decreased with theophylline, with similar but lesser changes with lidocaine. These preliminary data suggest that pulmonary vagal fibers may be involved in the dyspnea seen in pulmonary hypertension.

9. D2016P00034

The impact of prenatal exposure to maternal anxiety on the perception of dyspnea in adulthood

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INTRODUCTION: Over the past years, various physiological and psychological factors have been demonstrated to impact the perception of dyspnea. However, little is known about respective effects of adverse early life experiences. For example, prenatal exposure to maternal stress has been shown to be related to the development of health- and behavioral problems later in life. Therefore, this study investigated the relationship between prenatal exposure to maternal anxiety and the perception of dyspnea in adulthood 28 years later.

METHODS: Forty healthy adults were studied and grouped into a low prenatal anxiety group and a high prenatal anxiety group, based on state anxiety ratings of their mothers during the 12th to 22nd week of pregnancy. Their perception of dyspnea was examined in two magnitude estimation tasks (MET), during which four inspiratory threshold loads of different magnitudes were repeatedly being presented. In the first MET, the subjects breathed through the loads for one inspiration and rated the intensity of dyspnea on a Borg-scale. In the second MET, they breathed for five subsequent inspirations through the loads and rated both the intensity and unpleasantness of dyspnea.

RESULTS: In both tasks, the high prenatal anxiety group showed a significantly steeper increase in perceived intensity and unpleasantness of dyspnea with increasing load magnitudes as compared to the low prenatal anxiety group.

CONCLUSIONS: The present results suggest that prenatal exposure to maternal anxiety is associated with increased perception of dyspnea in adulthood. The results will be discussed with regard to potential physiological and psychological mechanisms, which might underlie this association.

10. D2016P00031

Conditioned respiratory threat in the subdivisions of the human periaqueductal gray.

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INTRODUCTION: The sensation of breathlessness is the most threatening symptom of respiratory disease. The different subdivisions of the midbrain periaqueductal gray (PAG) are intricately (and differentially) involved in integrating behavioural responses to threat in animals, while the PAG has previously only been considered as a single entity in human research. Here we investigate how these individual PAG columns are differently involved with respiratory threat.

METHODS: Eighteen healthy subjects were conditioned to associate shapes with certain or uncertain impending respiratory load, and scanned the following day during anticipation and application of inspiratory loading using 7 T functional MRI.

RESULTS: We showed activity in the ventrolateral PAG (vlPAG) during anticipation of resistive loading, with activity in the lateral PAG (lPAG) during resistive loading, showing spatially and temporally distinct functions within this structure.

CONCLUSIONS: We propose that lPAG is involved with sensorimotor responses to breathlessness, while the vlPAG operates within the threat perception network for impending breathlessness.

(Full paper published in March 2016: http://dx.doi.org/10.7554/eLife.12047)

11. D2016P00038

Repetitive, intense hyperpnea does not change perception of bronchoconstriction despite reduced bronchial reactivity in asthmatics – a pilot study

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INTRODUCTION: Exercise training was shown to have positive effects on bronchial hyperresponsiveness and symptoms (Eichenberger et al., Sports Med, 2013). The underlying mechanisms are not yet fully elucidated. One aspect may be repetitive airway stretching with increased ventilation during exercise. Isolated repetitive, intense hyperpnea would be a training option but concern exists that an asthma attack would be recognised too late due to reduced perception of air hunger (AH) and respiratory exertion (RE). The aim of the present pilot was therefore to test whether isolated repetitive, intense hyperpnea would positively affect bronchial hyperreactivity and reduce perception of AH and RE during a Mannitol challenge.

METHODS: Seven subjects (age: 24±4 years; FEV1: 91±12% pred.) with mild-moderate (but no seasonal or uncontrolled) asthma participated in this study. Prior to and after an 11-week intervention, lung function and the bronchial response to a Mannitol challenge (PD15 and RDR FEV1) with assessment of perception of AH and RE (assessed after each dose) were performed after withdrawal of medication. The intervention included fourty 30-min sessions of normocapnic hyperpnea with warm and humid air (4-5x/wk) at 60-81% of maximal voluntary ventilation.

RESULTS: After the intervention, bronchial hyperresponsiveness (PD15, p=0.063; reduction in all subjects; FEV1-decrease at isodose, p=0.021, reduction in all subjects; RDR FEV1, p=0.016; reduction in all subjects) was reduced. However, changes in perception of AH and RE in relation to changes in FEV1 did not change significantly.

CONCLUSIONS: This data indicates that repetitive airway stretching and respiratory muscle work may partially contribute to the positive effects of exercise in asthmatics and that isolated breathing training is safe as the sensitivity of the perception of bronchoconstriction remains unchanged.

Oral communications 2 (June 16, 2016 ; 15h00-16h30)
From ICU to advanced cancer : epidemiology and treatment of dyspnea
Chair : Dennis Jensen

1. D2016P00006

Dyspnea is an independent predictor of poor outcome in COPD patients surviving acute hypercapnic respiratory failure.

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BACKGROUND: COPD patients surviving acute hypercapnic respiratory failure (AHRF) have poor outcome. Exacerbations become more frequent as FEV1 decreases, but prediction of subsequent risk is now better appreciated by combining FEV1 values, history of previous exacerbations and comorbidities. Dyspnea is associated with poor outcome in the general population, most probably because it is a proxy for important diseases of heart and lungs. Whether dyspnea is per se an independent predictor of poor outcome in COPD patients surviving AHRF remains unknown.

METHODS: Consecutive COPD patients surviving AHRF in the ICU were included between 2012 and 2014 in this prospective study. Pulmonary function tests and transthoracic echocardiography were obtained 15 days after ICU discharge. Dyspnea was assessed with NYHA scale on day of hospital discharge. Hospital readmission, ICU readmission and death were recorded at regular intervals for 6 months.

RESULTS: 38 COPD patients were included (figure1). Among 17 patients with NYHA III-IV, 14 (82%, CI95: 57-96) were readmitted or died during the observation period. Among 21 patients with NYHA I-II, 9 patients (43%, CI95: 22-66) were readmitted or died during the same observation period. The probability of event-free survival was lower for patients with NYHA III or IV than for patients with NYHA I or II (figure 1, p=0.03 on log-rank test). After adjustment for age, BMI, FEV1 and cardiac dysfunction, only NYHA III-IV remained associated with adverse outcome (HR=2.8, CI95: 1.1-7.0, p =0.032).

CONCLUSION: Our data suggest that dyspnea, as evaluated upon discharge from ICU, is an independent prognostic factor in COPD patients surviving AHRF. If confirmed in a larger sample, these findings could facilitate risk stratification and patient's information at ICU discharge.

2. D2016P00020

Daily Measure of Quality and Intensity of Dyspnea Throughout Hospitalizations

J. Stevens, K. Baker, C. O'donnell, R. Lansing, R. Schwartzstein, R. Banzett.
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RATIONALE: Dyspnea is an uncomfortable sensation largely undocumented by clinicians even though common and treatable among hospitalized patients. We describe the multidimensional and time course of dyspnea throughout the hospital stay.

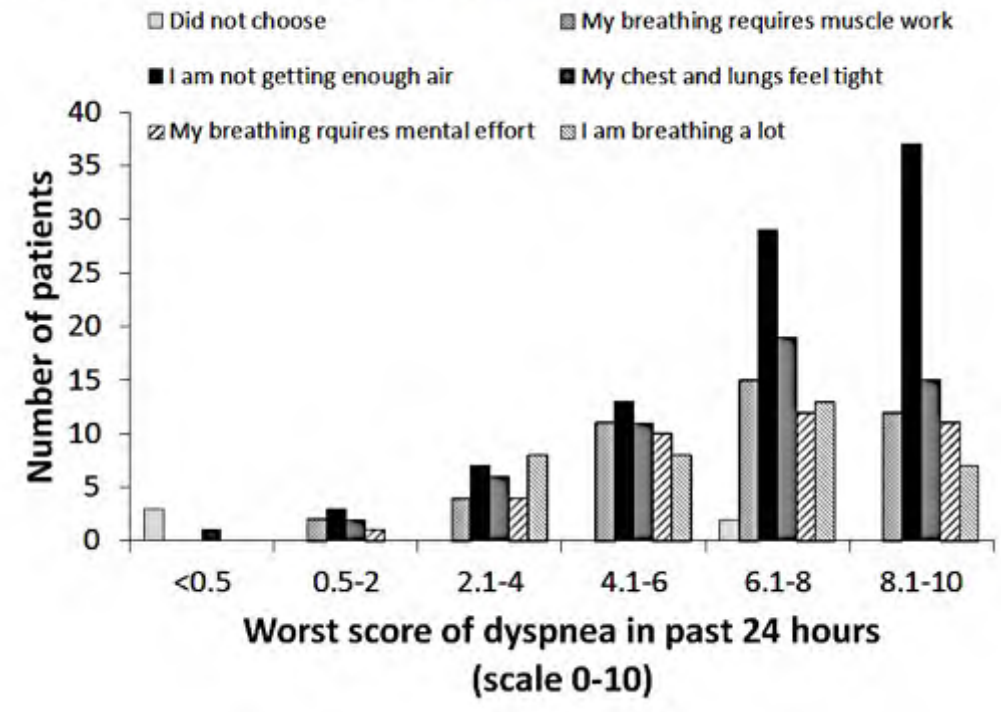
METHODS: Patients who reported uncomfortable dyspnea (≥4/10) at admission to medical/surgical floors in a tertiary care hospital were followed. Research staff interviewed patients once each day during a median hospitalization of 2 days at which time patients completed dyspnea assessments using the Multidimensional Dyspnea Profile (MDP; Eur. Resp. J, 46:1681-91). Of 158 patients who consented, 8 patients withdrew before discharge. Each patient reported daily ratings for 2 separate time frames: 1) current dyspnea, and 2) the worst dyspnea experienced in the last 24 hours. Univariable comparisons were made based on the underlying structure of the data and accounting for the clustering of individual responses within patients.

RESULTS: There was a large difference between dyspnea at the time of the daily interview and the worst dyspnea in the past 24 hours. At the time of interview, most patients reported none to moderate dyspnea, but most patients reported having experienced severe dyspnea in the past 24 hours. On Day 1, 56% of patients reported a current score less than 5. In contrast, 56% of patients reported a score 8 or greater in the past 24 hours ($p<0.0001$). When patients were asked to choose phrase groups that best described the intensity of their symptoms, patients with severe dyspnea (> 6) in the past 24 hours were significantly more likely to describe their symptoms as air hunger ("I am not getting enough air or I am smothering or I feel hunger for air") than any other phrase (Figure 1, $p<0.001$).

CONCLUSIONS: Discreet assessment of current dyspnea underestimates symptom burden. Findings indicate the opportunity for improved symptom management.

Supported by NIH Grant NR10006

Figure 1. Descriptors chosen for worst dyspnea in past 24 hours



3. D2016P00009

Who Experiences Higher and Increasing Breathlessness In Advanced Cancer?

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[4]European Palliative Care Research Centre (PRC), Department of Cancer Research and Molecular Medicine, Faculty of Medicine, Norwegian University of Science and Technology - Trondheim (Norway).

BACKGROUND: Breathlessness is a major cause of suffering in advanced cancer. We aimed to determine the symptom trajectory and to identify who is at increased risk of experiencing higher or increasing breathlessness over time in advanced cancer.

PATIENTS AND METHODS: Analysis of the multinational, prospective, longitudinal European Palliative Care Cancer Symptom (EPCCS) study. We included adults with confirmed incurable cancer enrolled in palliative care, with prospective monthly assessments for up to six months, withdrawal or death, whichever came first. Symptom severity (0-10 numerical rating scales; NRS) was analyzed using multivariable random coefficients regression.

RESULTS: A total of 1,689 patients (50% women; mean age 65.7 ± [standard deviation; SD] 12.4 years) were included. Main diagnoses were digestive (31%), lung (20%), and breast (17%) cancer. During a median follow-up of 62 (interquartile range, 0 to 133) days, 65% were breathlessness at some point and 36% reported moderate/severe breathlessness. The group mean (1.6 points; SD, 2.4) was unchanged over time, but the severity varied markedly between patients and over time. Independent predictors for higher breathlessness were COPD, lung cancer, living alone, lung metastasis, anxiety, pain, depression, and lower performance status. Predictors of increasing breathlessness over time were low performance status (p=0.039) and moderate to severe pain (p=0.012).

CONCLUSION: In the largest longitudinal clinical study to date, patients with advancing cancer frequently experienced breathlessness, particularly patients with COPD, lung cancer, living alone, lung metastasis, higher anxiety, pain, depression, and lower performance status. Increase in severity over time was predicted by performance status and pain.

4. D2016P00004

The impact of early palliative assessment on hospitalized patients with severe dyspnea on symptom severity and length of stay

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BACKGROUND: Dyspnea is distressing and associated with poor quality of life. Effective control of dyspnea is a core competency for palliative care (PC) teams. The objective of this study was to examine the impact of an early PC assessment (within 24 hours of hospital admission) on the care of patients with severe dyspnea.

METHODS: 24 PC teams in the Palliative Care Quality Network entered data from 1st July 2014 to 30th June 2015. Symptoms were assessed using a 4-point scale (none, mild, moderate, severe). Improvement was defined as a decrease in symptom severity by at least one category. We examined characteristics of patients with severe dyspnea and associations between PC assessment within 24 hours of admission and improvement in dyspnea by a 2nd assessment [A2] (within 72 hours of 1st assessment [A1]) and at the last assessment.

RESULTS: Of the 9,515 patients assessed by PC teams, 4,668 (49%) were able to self-rate their dyspnea. Overall 155 (3%) had severe dyspnea at first PC assessment, of which 42% (n=65) of patients were assessed within 24 hours of admission. Patients were 3.9 (95%CI: 1.2, 12.5) times more likely to report improved dyspnea from A1 to A2 if seen by PC within 24 hours of admission. Patients with non-pulmonary diseases were 4.2 (95%CI: 1.1,16.7) times more likely to receive an early PC referral than patients with pulmonary disease. The overall hospital length of stay (LOS) was shorter for those seen by PC within 24 hours (4.9 days vs.13.2 days, p=0.0001). Improved dyspnea from A1 to A2 was associated with improvements in pain (OR= 8.0, 95%CI: 2.3, 27.8) and anxiety (OR=16.6, 95%CI: 4.4, 61.7).

CONCLUSIONS: Early PC results in greater improvements in severe dyspnea and shorter LOS. Improvement in severe dyspnea is associated with improvements in pain and anxiety.

5. D2016P00023

Controlled-Delivery of High Dose Aerosol Furosemide Does Not Improve Consistency of Dyspnea Relief

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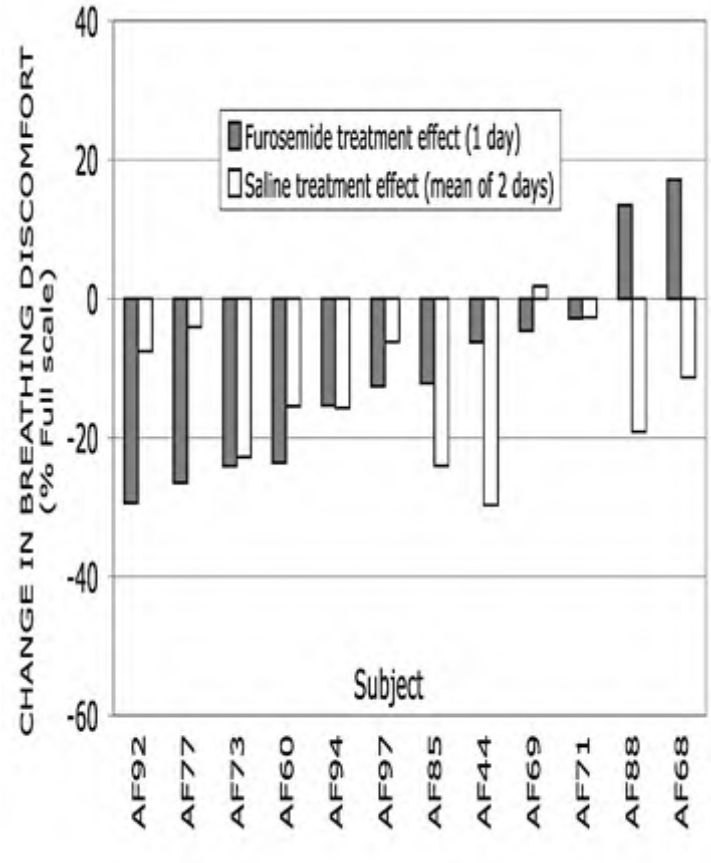
INTRODUCTION: Prior studies of aerosolized furosemide to palliate dyspnea have used a nebulized dose ≤ 40 mg. All studies have shown great variability in response; none has reported worsening of dyspnea. We hypothesized that better controlled aerosol administration and a higher dose would produce more consistent relief.

METHODS: To optimize deposition we used a clinical ventilator to control inspiratory flow rate (300-500 ml/s) and tidal volume. Ultrasonic screen nebulizers produced 2–micron aerosol of either saline or furosemide (80mg). We induced dyspnea in healthy subjects before and after drug administration by varying inspired PCO2 while restricting minute ventilation to 0.13 liters•min-1•kg-1 using a ventilator. Subjects rated "Breathing Discomfort" on a VAS (BDVAS; 0=comfortable, 100% = intolerable). Subjects participated on 3 days and were informed that they would receive furosemide, saline, and albuterol in random order; they actually received furosemide once and saline twice; the protocol was double blinded. Regression determined the PETCO2 at which VAS=60% Full Scale (%FS) prior to treatment. The difference in BDVAS at the same PETCO2 after treatment was defined as "treatment effect".

RESULTS: Mean treatment effect was a BDVAS reduction of 11%FS for Furosemide and 13%FS for saline; treatments did not differ statistically, but both showed significant reduction of BDVAS ($p<.05$). Individual response to Furosemide did not correlate with response to Saline ($r2= .004$). Individual response varied widely, but worsening of Breathing Discomfort following aerosol was observed in only 2 of 35 trials. Both saline and furosemide produced clinically relevant reduction of Breathing Discomfort (≥20% full scale) in 1/3 of the subjects tested. There were no adverse events.

CONCLUSION: Higher furosemide dose and controlled delivery did not improve treatment effect. Supported by NIH-NR12009.



6. D2016P00003

Restricting dyspnea in older people: last year of life

M. Johnson [1], J. Bland [2], E. Gahbauer [3], M. Ekström [4], A. Sinnarajah [5], T. Gill [3], D. Currow [6].

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[2]*University of York - York (United kingdom)*
[3]*Yale University School of Medicine - New Haven (United States of America)*
[4]*Lund University - Lund (Sweden)*
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[6]*Flinders University - Adelaide (Australia).*

INTRODUCTION: Dyspnea is prevalent in older people. Symptom control at the end of life is important. This study investigated relationships between age, clinical characteristics and dyspnea sufficient to have people spend at least one half a day in that month in bed or cut down on their usual activities (restricting dyspnea) during the last year of life.

METHODS: A secondary analysis of data from a cohort of 754 non-disabled, general community dwelling people, aged 70 and older. The cohort was recruited during 1989-90 and follow up is ongoing. Monthly telephone interviews were conducted to determine the occurrence of restricting dyspnea. The primary outcome was the percentage of months with restricting dyspnea reported during the last year of life.

RESULTS: 589 had died by June 2013. Data regarding dyspnea were available for 548/589 (93.0%); mean age 86.7 years (range 71 to 106; males 38.8%). 311/548 (56.8%) reported restricting dyspnea at some time-point during the last year of life but no-one reported this every month. Frequency increased in the months closer to death irrespective of cause (see Fig 1). Restricting dyspnea was associated with anxiety, (0.25 percentage point increase in months dyspnea per percentage point months reported anxiety, 95% CI 0.16 to 0.34, P<0.001), depression (0.14, 0.05 to 0.24, P=0.002) and mobility problems (0.07, 0.03 to 0.1, P=0.001). Percentage months of restricting dyspnea increased if chronic lung disease was noted at the most recent comprehensive assessment (6.62 percentage points, 95% CI 4.31 to 8.94, P<0.001), heart failure (3.34, 0.71 to 5.97, P<0.01), and ex-smoker status (3.01, 0.94 to 5.07, P=0.002), but decreased with older age (—0.19, —0.37 to —0.02, P=0.03).

CONCLUSION: Restricting dyspnea increased in this elderly population in the months preceding death from any cause. Dyspnea should be assessed and managed in the context of poor prognosis.

7. D2016P00005

Emergency department presentations: acute-on-chronic dyspnoea

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BACKGROUND: Targeted crisis plans may prevent avoidable hospital attendance/admission for people with dyspnoea.
We measured the prevalence of Emergency Department (ED) presentations due to acute-on-chronic dyspnoea, and patients' clinical characteristics.

METHODS: A patient survey and case note review of consecutive attendees arriving by ambulance to a UK ED to find prevalence of presentations (sample 1,191; +/-1% error) by those: i) with chronic dyspnoea ii) due to dyspnoea. Measures included: diagnosis, destination post ED, days admitted, duration of chronic dyspnoea, mMRC, if dyspnoea was recorded. Descriptive statistics are used.

RESULTS: 1345/2041 (66%) attendees were eligible. 1212 completed surveys (90% response). The prevalence of presentations i) with chronic dyspnoea was 35% (424/1212, 95% CI; 32-38%) ii) due to dyspnoea was 20% (245/1212, 95% CI; 18-22%) (Table 1). 112/237 (47%) had chronic dyspnoea for over 2 years. 159/236 (67%) had mMRC dyspnoea 3 or 4.
There were 4,692 presentations to all ED areas; dyspnoea bad enough for an ambulance was at least 5% (245/4,692, 95% CI;4-6%) of all ED presentations.
Dyspnoea was recorded 113/187 (60%) of the clinical notes reviewed, 59 (32%) were discharged and 128 (68%) were admitted. Median length of stay was 3 days (range=1-44; IQR=1-7); 40/128 (31%) were admitted for 1 day.

CONCLUSIONS: The ED may be a stressful experience and inappropriate for many with chronic dyspnoea. This high prevalence of acute-on-chronic dyspnoea represents a large burden for EDs and ambulance services. About half (99/187; 53%) were either not admitted or only admitted for 1 day and may be those for whom improved dyspnoea care planning between primary and secondary care may reduce avoidable attendances.

8. D2016P00007

Absolute dynamic lung volume explains the gender difference in activity-related breathlessness: the population-based ECRHS III study

M. Ekström [1], L. Schiöler [2], R. Grønseth [3], A. Johannessen [4], C. Janson [5], C. Svanes [6], B. Leynaert [7], D. Jarvis [8], K. Torén [2].

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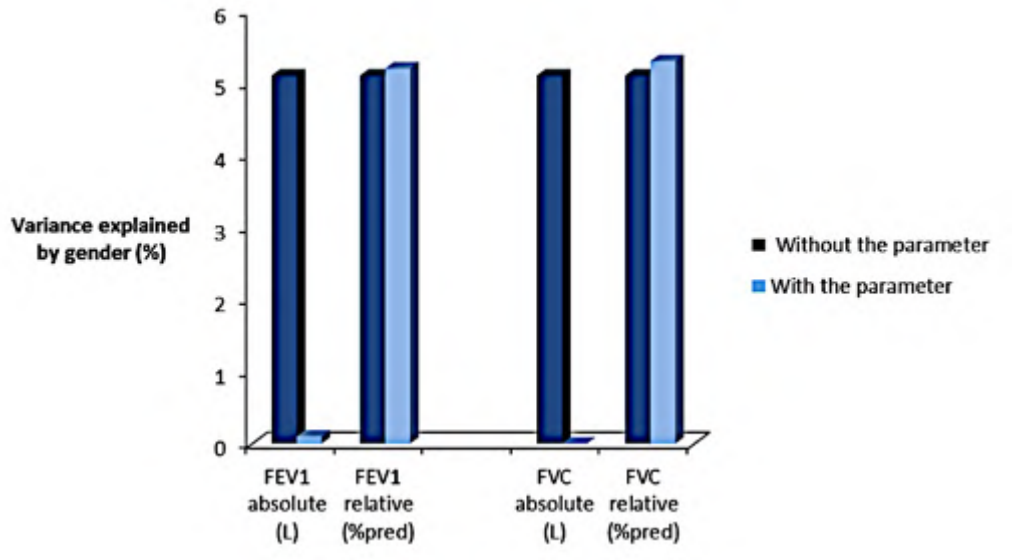
BACKGROUND: Activity-related breathlessness is twice as prevalent among women than men in the general population and associated with adverse health outcomes. The cause of the gender difference is unknown and not related to the level of lung function impairment.
OBJECTIVE: To test the hypothesis that absolute lung volume as measured by forced expiratory volume in 1 second (FEV_1) explains the gender difference in activity-related breathlessness.

METHODS: Cross-sectional analysis of the third population-based multicenter European Community Respiratory Health Survey (ECRHS III). Activity-related breathlessness was measured using the Modified Medical Research Council (mMRC) scale. Associations with mMRC were analyzed using multivariate ordered logistic regression clustering on country. Variables included post-bronchodilator spirometry, body mass index, pack-years smoking, morbidities, and level of exercise.

RESULTS: We included 3,305 people (51% women) aged 38 to 67 years across 13 countries. Activity-related breathlessness (mMRC ≥ 1) was twice as common in women (27%) than in men (14%); odds ratio (OR) 2.25 ([95% confidence interval] 1.83 to 2.78).The gender difference was not reduced when controlling for FEV_1%predicted (OR 2.36) but disappeared when controlling for absolute FEV_1 (OR 0.92; 0.72 to 1.18) as shown in Figure 1. Absolute FEV_1 explained 98–100% of the gender difference, controlling for potential confounders. In joint analysis, absolute FEV1 was independently related to breathlessness, whereas %predicted was not. Findings were similar for forced vital capacity (FVC), and in healthy never-smokers.

CONCLUSIONS: Absolute lung volume (FEV_1 or FVC) largely explained the higher activity-related breathlessness among women in the population.



9. D2016P00008

Breathlessness during the last week of life in palliative care

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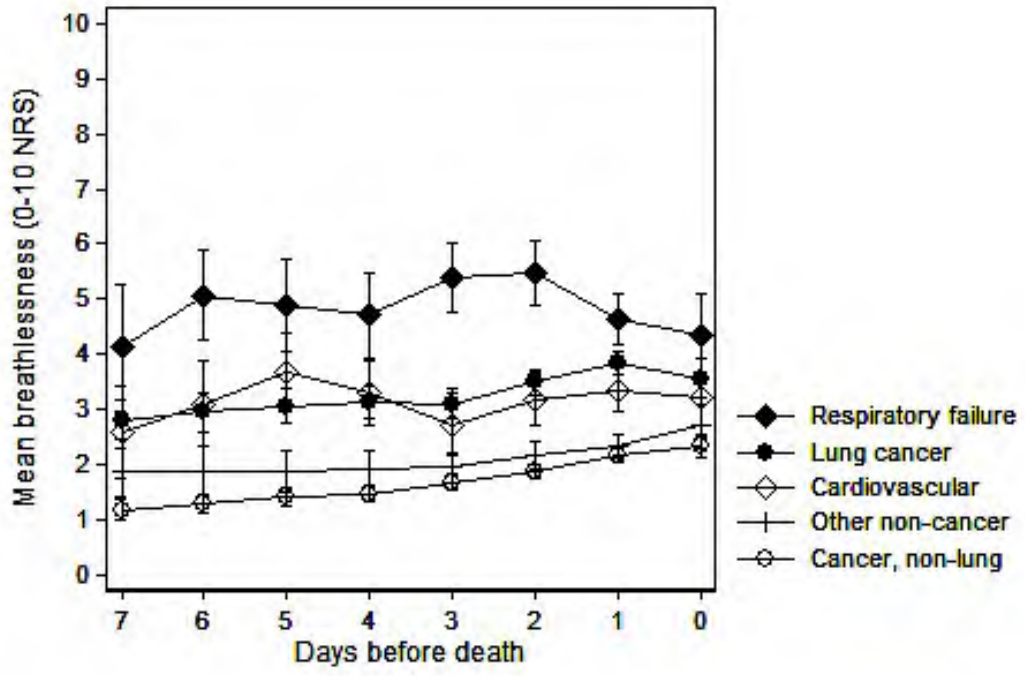
BACKGROUND: Breathlessness is a major cause of suffering and distress and little is known about the trajectory of breathlessness near death.

OBJECTIVE: To determine the trajectory and clinical predictors of breathlessness in the last week of life.

METHODS: Prospective, longitudinal cohort study using national data in specialist palliative care from the Australian Palliative Care Outcomes Collaboration (PCOC). We included patients in PCOC who died between 1 July 2013 and 30 June 2014 with at least one measurement of breathlessness distress on a 0-10 numerical rating scale (NRS) in the week before death. The trajectory and predictors of breathlessness were analyzed using multivariate random effects linear regression.

RESULTS: A total 12,778 patients from 87 services (33,404 data points) were analyzed. The average observed breathlessness distress was 2.1 points and remained constant over time. Thirty-five percent reported moderate to severe distress (NRS ≥ 4) at some time in their last week. Higher breathlessness distress was predicted by younger age, male gender, cardiopulmonary involvement, concurrent fatigue, nausea, pain, sleeping problems, better functional status, and clinical instability in the multivariate analysis. Respiratory failure was associated with significantly higher breeathlessness (mean adjusted difference 3.1 points; 95% confidence interval, 2.8 to 3.4), as shown in Figure 1.

CONCLUSION: Although breathlessness is known to worsen in the last months, it remained relatively stable in the final week of life. Despite palliative care, one in three people experienced significant distressing breathlessness especially in respiratory disease.



10. D2016P00017

Treatment of acute dyspnea with Morphine to avert respiratory failure

R. Schwartzstein.

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INTRODUCTION: Treatment of acute dyspnea with Morphine to avert respiratory failure
In patients with flow limitation, tachypnea worsens dynamic lung hyperinflation (DLH), and may cause respiratory distress and the perceived need for endotracheal intubation. In this case, Morphine was used to reduce dyspnea in a patient with acute bronchospasm resulting in DLH, avoiding the need for urgent endotracheal intubation.

CASE REPORT: A 70 year-old female presented with abdominal pain, anorexia and fever. Imaging revealed a liver mass. Ultrasound guided liver biopsy was planned to determine the etiology of the mass. Immediately post biopsy, she developed respiratory distress and fever. Oxygen saturation dropped. A code was called; when the team arrived, the patient's oxygen saturation was 96% with supplemental oxygen and she was in respiratory distress. On exam she was anxious, breathing at 24 breaths/minute with diffuse wheezes. Despite a call for intubation, 2 mg of Morphine was administered IV and inhaled bronchodilators were started with improvement in the patient's respiratory status. Intubation was averted.

DISCUSSION: In DLH, inspiratory capacity decreases and inspiratory muscles are shortened causing mechanical disadvantage and decreased compliance of the respiratory system, leading to increased work of breathing. Mismatch between efferent output (drive to breathe) and afferent feedback signifying diminished effect (decreased tidal volume), increases dyspnea intensity. Morphine may decrease breathlessness by altering central processing of sensory input and decreasing respiratory drive. Both decrease respiratory rate, resulting in greater expiratory time via alteration in the duty cycle and reduction in DLH. Treating dyspnea from DLH with Morphine may improve gas exchange, mechanics of the respiratory muscles and the sense of effort to breathe, while also reducing anxiety and the cycle of worsening DLH. At doses effective in reducing dyspnea, adverse consequences are unlikely.

11. D2016P00018

Twenty years of measuring the affective dimension of dyspnea: Cautions and considerations

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[1]UCSF - San Francisco (United States of America), [2]University of Technology - Sydney (Australia).

RATIONALE: Our group has studied the effect of clinical interventions on the affective dimension of dyspnea in 6 RCTs over 20 years. Four studies reported a significant improvement in distress related to dyspnea in the intervention group; two studies showed improvements that did not reach statistical significance.

PURPOSE: The purpose of this secondary analysis is to present the sensory and affective dimension of dyspnea during exercise in the most recent RCT within the context of a retrospective examination of our program of research.

METHODS: Participants with COPD were randomized to internet-based dyspnea self-management (eDSMP; n=43), in-person DSMP (n=41) or general health education (n=41). Dyspnea-related distress (DD) and dyspnea intensity (DI) were measured with the modified Borg Scale at 0, 3, 6, and 12 months during a six minute walk test (6MW) and incremental treadmill test (ITT).

RESULTS: There were no significant differences across groups in DD or DI ($p>.05$) at the end of the 6MW. The trend was for the eDSMP group to improve DD by 0.5 points during 6MW at 3 and 6 months; other groups remained unchanged. Although there was no significant difference between groups, the eDSMP group significantly improved DD and DI during ITT from baseline to 12 months (DD: 3.2 ± 0.4 to 2.3 ± 0.4, $p=0.01$; DI: 5.4 ± 0.3 to 4.5 ± 0.3; $p=0.01$).

CONCLUSIONS: Although not powered adequately, these results indicate an affective response to dyspnea and support the importance of evaluating the affective response to clinical interventions. Reasons for the equivocal results across our program of research may include individual rating behavior (37% of patients rated DD 0 at baseline 6MW), "response shift", treatment fidelity, nature of control group, group contamination, symptom self-report with no multi-measure validation, and underpowered to evaluate the effect of moderator variables. Future dyspnea research requires attention to these and other design and measurement concerns.

12. D2016P00037

Regional blood flow responses to morphine-mediated relief of laboratory-induced dyspnea in healthy subjects

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BACKGROUND Acute dyspnea is associated with activation of cortico-limbic circuitry (e.g., insular/opercular, cingulate and prefrontal cortices). Although morphine is known to relieve dyspnea, its influence on the cortico-limbic response to dyspnea is unknown. We characterized regional cerebral blood flow (rCBF; an indirect measure of neural activity) associated with morphine-mediated dyspnea relief.

METHODS Arterial spin labeled fMRI scans were acquired in 12 healthy subjects on 2 separate days in a single-blind, randomized, sham-controlled cross-over study. Dyspnea epochs were induced via hypercapnia and reduced ventilation during mechanical ventilation. Intravenous drug (morphine 0.07 mg/kg) or sham (lorazepam 0.001 mg/kg) was administered on alternate days. Dyspnea ratings were acquired during and following each scan. A priori small volume corrected (anterior insula) and secondary whole brain voxel-wise fMRI analyses (SPM8) tested for drug and sham effects. Visual stimulus scans were also acquired to test for non-specific drug effects on CBF.

RESULTS Significantly lower dyspnea ratings were associated with the morphine condition compared to the sham and baseline conditions. The left anterior insula had significantly reduced rCBF during the sham but not during the drug condition. Secondary analyses revealed significantly greater rCBF in the ventral medial prefrontal cortex (PFC) during the drug condition compared to sham and baseline conditions and the rCBF increases were inversely correlated with the reduction in dyspnea across subjects. No significant drug effects on CBF were observed in visual stimulus scans.

CONCLUSIONS The findings converge with other emerging evidence that support medial PFC involvement in opioid-medicated dyspnea relief and may inform the development of novel dyspnea therapeutics.

SUPPORT Pfizer, RO1HL46690, K23MH086619, F32AG042228. K Evans and D McLaren are employees of Biogen and Biospective, respectively (data here reflect no conflicts)

13. D2016P00039

Immediate Release Oral Morphine Relieves Breathlessness and Improves Exercise Endurance in Advanced COPD

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INTRODUCTION AND METHODS: In a randomized double-blind crossover study, 20 patients (15 men) aged 63.6±1.6 yrs (mean±SE) with GOLD stage III-IV COPD (FEV1 = 32±2 %predicted) and breathlessness refractory to optimal guideline-based pharmacotherapy (mMRC = 2.9±0.1) underwent symptom-limited constant load cycle exercise testing at 75% of their peak incremental power output 30-min after single-dose oral administration of placebo (PL) or immediate release (IR) morphine sulfate (MOR, 0.1 mg/kg; group mean±SE dose = 7.2±3.2 mg). Opioid-related side effects and arterialized capillary PCO2 (PacCO2) were evaluated pre- and 30-min post-treatment. Exercise endurance time (EET), and breathlessness intensity (Borg 0-10 scale), ventilation (VE), breathing frequency (fR), tidal volume (VT), diaphragmatic EMG (EMGdi; n=8) and the behavior of dynamic operating lung volumes (OLVs) were compared between PL and MOR during exercise at isotime.

RESULTS: Compared to CTRL, MOR decreased breathlessness by 1.2±0.4 Borg units at isotime, and improved EET by 2.5±0.9 min (both p£0.01). At isotime after treatment with MOR vs. PL, fR was lower ($p<0.01$), while no differences were observed in VT, VE, OLVs, O2 uptake, CO2 output (VCO2), heart rate, end-tidal PCO2 or VE/VCO2 (all $p>0.05$). Opioid-related side effects and PacCO2 were similar after treatment with PL vs. MOR. In summary, administration of IR oral MOR is associated with clinically meaningful relief of breathlessness and improvements in EET in advanced COPD. With the exception of a reduced fR at isotime, the effect of MOR on breathlessness and EET could not be easily explained by changes in VE, EMGdi, OLVs and/or exercise ventilatory efficiency.

CONCLUSIONS: These findings support the use of IR oral MOR as a safe and effective therapy for the management of chronic refractory breathlessness and exercise intolerance in advanced COPD.

14. D2016P00033

A phase III, multi-site, randomised, double blind, placebo controlled parallel arm study of daily extended release (ER) morphine for chronic breathlessness

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INTRODUCTION: Phase II studies and meta-analyses support using regular low-dose oral morphine to safely reduce chronic breathlessness when underlying causes are treated optimally.

AIM**:** To determine efficacy and safety of ER morphine for relieving chronic breathlessness and predictors of response.

METHODS: Opioid-naïve participants with modified Medical Research Council scores (mMRC) 2-4 despite optimal treatment of the underlying cause(s) were randomised to double-blinded placebo or 20mg ER morphine daily for 7 days. The primary outcome was reduction in breathlessness intensity (0-100mm visual analogue scale; a clinically meaningful reduction is >5.5mm.). Secondary endpoints were adverse events.

RESULTS: 282 participants (mean age 73.7, SD 9.5; 162 (57%) with COPD) were randomised in 12 sites in Australia. There was no difference in average breathlessness over the previous 24 hours, but worst breathlessness in people with COPD and mMRC 3 or 4 was significantly reduced in the intervention arm (response rate 54% vs 33%; p=0.035). Using an adjusted mixed model with daily scores, worst breathlessness improved on morphine compared to placebo (4.57mm; 95% CI, 0.31 to 8.83; p=0.036); in patients with COPD (6.30 mm; 95% CI, 1.36 to 11.24; p=0.012); and COPD with mMRC 3,4 (11.47mm; 95%CI, 5.21 to 17.73; p <0.001). Withdrawals were similar between arms (time to event, event rate). Constipation and drowsiness were more frequent on morphine. There were no treatment-emergent episodes of respiratory depression.

CONCLUSION**:** People with COPD and more severe chronic breathlessness gain symptomatic benefit safely from daily ER morphine.

15. D2016P00022

Controlled-delivery of aerosol furosemide (40 mg) does not improve consistency of treatment effect on laboratory-induced dyspnea.

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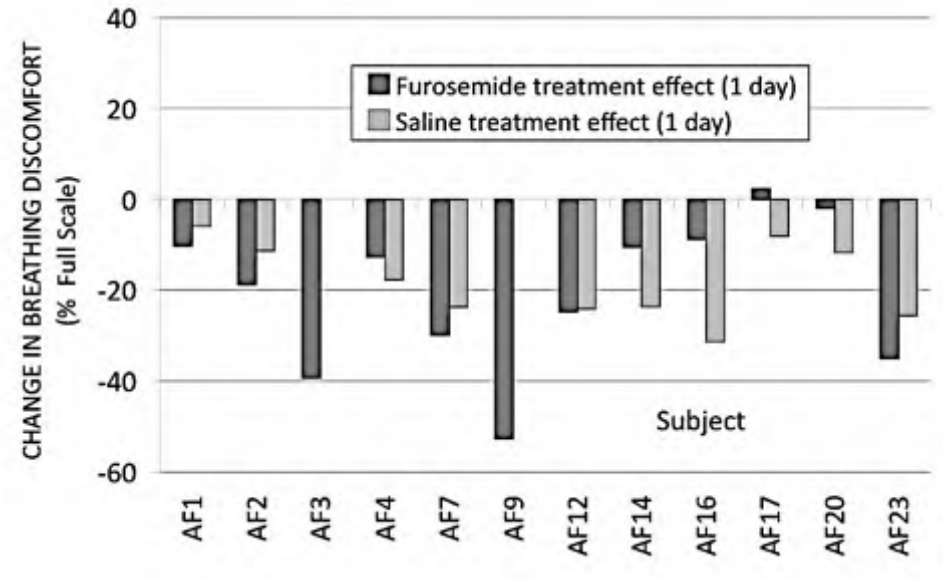
RATIONALE. Aerosolized furosemide has been tested as a palliative treatment for dyspnea in controlled laboratory studies and small clinical studies. Furosemide has been shown to stimulate pulmonary stretch receptors, simulating larger tidal inflations. Although aerosol furosemide (20 to 40 mg) has worked well in many individuals, large variation in response among individual subjects is evident. We hypothesized that better control over aerosol administration would produce more consistent dyspnea relief.

METHODS. To optimize deposition we controlled inspiratory flow rate (300-500 ml/s) and tidal volume (15% predicted vital capacity). We utilized ultrasonic screen nebulizers (Aeroneb) producing 2 micron aerosol from either saline (8ml) or furosemide (40mg). We induced dyspnea in healthy subjects before and after drug administration by varying inspired PCO2 while restricting minute ventilation to 0.13 liters•min-1•kg-1. Subjects rated "Breathing Discomfort" (BD) on a VAS (0=comfortable, 100% = intolerable). Subjects participated on 2 days and were informed that they would receive furosemide or albuterol in random order; they actually received furosemide or saline; the protocol was double blinded. Using linear regression we found the PETCO2 at which BD=60%full scale (%FS). We then determined BD at the same PETCO2 after treatment. The difference in BD at this PETCO2 was used to estimate "treatment effect".

RESULTS : Both treatments reduced BD; mean effect -20%FS for Furosemide and -17%FS for saline; both treatments showed significant reduction of BD ($p<.05$), but responses did not differ statistically between treatments. There was wide variation in individual response. Individual response to Furosemide did not correlate with individual response to Saline ($r2= .009$).

CONCLUSIONS: Controlled delivery did not improve treatment effect compared to prior studies. The response to saline may be due to placebo effect or to a physiological effect of aerosol administration.



Delphi session (June 17, 2016 ; 8h15-9h00)
Chronic breathlessness : a new clinical syndrome
Presented by Miriam Johnson and David Currow

D2016P00026

A new clinical syndrome for breathlessness that persists despite treatment of the underlying condition: a Delphi consultation.

M. Johnson [1], D. Currow [2].
[1]University of Hull - Hull (United kingdom), [2]Flinders University - Adelaide (Australia).

BACKGROUND: A clinical syndrome is a constellation of clinical findings caused by an underlying disease(s) and be recognisable in the clinical and research settings.

METHODS: A Delphi process is ongoing. 1. Experts from a variety of disciplines: respiratory medicine, cardiovascular medicine, primary care, medical, nursing, respiratory physiology, neuroimaging, intensive care, oncology and palliative care were consulted. Areas of consensus were noted along with areas identified for wider consultation through survey rounds. 2. Wider consultation through Delphi survey rounds is ongoing. One has been completed (n = 34), and the second is still active. An a priori agreement of 80% for questions has been set.

RESULTS:
1. 17 experts from the US, UK, Europe, Australia & Canada were consulted by MJ and DC. There was agreement that i) breathlessness which persists despite treatment for the cause, with negative consequences would constitute a syndrome; ii) recognition would influence clinical practice, service provision and policy, researchers and research funding; iii) suggestions for the name and definition were put forward for survey rounds.
2. Survey consultation is ongoing for all aspects of the name and definition except for whether "chronic" required clarification in terms of duration. After survey 1, there was 80% agreement that this was not needed, but that each case be assessed on its own merits.

CONCLUSIONS: There is expert consensus that a new clinical syndrome in this area is valid, relevant and important for clinical practice and research. The surveys are ongoing to clarify the name and specific definitions and will be completed by Dyspnea 2016.

Poster session 3 (June 17, 2016 ; 9h00-11h45)
Evaluation of dyspnea : feasibility and multidimensional assessment
Chair : Sara Booth

1. D2016P00002

Mild, Moderate, and Severe Intensity Cut-points for the Respiratory Distress Observation Scale: A Receiver Operating Characteristics Curve Analysis

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BACKGROUND: The RDOS© is a solution to assessment of dyspnea when a self-report cannot be elicited as typifies patients near death. Previous cut-point determination with cognitively intact proxies for the intended RDOS population revealed 3 as an indicator of any distress ($p<.01$). Subsequent testing with dying patients was needed to distinguish mild-moderate from severe distress.

METHODS: Receiver Operating Characteristic (ROC) curve analysis was conducted with patients ranked by expert palliative care nurse practitioners (NP) into levels of respiratory distress – none, mild, moderate or severe. A research assistant measured the RDOS blinded to NP rating. Patients were near death and had one or more of heart failure, COPD, lung cancer or pneumonia.

RESULTS: Participants were 84 adult inpatients; mean age 72.6 (SD = 15.2), 78% African American, 54% male, with mean Palliative Performance Scale 12 (SD = 4.6). Nurse-practitioner ranking was distributed: none = 25 (30%), mild = 22 (26%), moderate = 26 (31%) and severe = 11 (13%). RDOS scores ranged 0 – 13, mean = 4.84 (SD = 3.1). A strong, significant correlation between NP ranking and RDOS was found (rho =.91, $p<.01$). ROC curve analysis determined clinically meaningful cut-points. (Table).

DISCUSSION: In accordance with our aim we identified RDOS cut-points distinguishing none vs. any distress and mild-moderate vs. severe. Furthermore, we validated our previous identification of RDOS 3 signifying any distress.

CONCLUSIONS: The additional psychometrics to identify intensity cut-points enhances the clinical utility of the RDOS. Clinician users of the RDOS may benefit from applying these cut-points into dyspnea treatment regimens. Establishing intensity cut-points increases the clinical utility as users can distinguish none from mild, moderate, or severe distress.

2. D2016P00016

Differences in perceptual experiences of breathlessness and impairment between people with moderate-severe COPD in Australia and the United Kingdom

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INTRODUCTION: Dyspnoea is multidimensional perceptual experience modulated by multiple physiological, psychological, social and environmental factors. Few studies compare perception of breathlessness between countries. This study compared the perception of breathlessness between people with COPD residing in UK and Australia.

METHODS: Participants with at least moderate COPD (FEV1%pred< 80) referred to pulmonary rehabilitation (PR) in South Australia or attending a routine clinical visit in north-western England recalled breathlessness in daily life using the Dyspnoea-12 (D-12) questionnaire. Demographic, lung function and self-reported measures of impairment (D-12 scores, Hospital Anxiety and Depression Scale (HADS) and modified Medical Research Council Dyspnoea Scale (mMRC) were compared in Australian and UK samples (independent t-tests or chi sq tests, $p<0.05$ significant). Factors contributing to variation in D-12 scores were examined using stepwise linear regression.

RESULTS: Participants in both countries were similar in age (Australia vs UK 70±9 vs 68±10yrs), gender (54% vs 60%men) and FEV1%pred (48±17 vs 44±15). Australian participants had lower values for all self-reported measures of impairment: D-12 score (mean diff = -10, 95%CI -12.6 to -7.5, p<.001), HADS anxiety (-2.0, -3.4 to -.5, p=.008) and depression (-1.7, -2.9 to -.5, p=.007) and mMRC (chi sq=35, p<.001). Three factors explained 50% of the variability in D-12 total scores, the largest variability explained by mMRC (R^2=26%, HADS anxiety R^2 =+17% and country [UK/Australia] R^2 =+8%, all p<.001).

CONCLUSION: In samples of people with COPD similar in age and FEV1%pred, large variation was observed in degree of respiratory impairment between Australia and UK. The contribution of sample location (Australia/UK) to variability of D-12 scores was small but significant. 'Active' referral to PR programmes vs routine care and socio-cultural-economic factors may impact on self-report of breathlessness severity.

3. D2016P00027

The benefit of doubt: The role of subjective certainty in the perception of dyspnea and pain

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KU Leuven - Leuven (Belgium).

BACKGROUND. The decision whether a sensation such as dypsnea or pain is still tolerable or a symptom that warrants immediate action is not always clear-cut. Sensations can be perceived as ambiguous with regard to interpretation and choice of coping behaviour. Little is known, however, on subjective strategies for disambiguation and their relationship with fear of bodily sensations and interoceptive bias.

METHODS. We present results from two studies on the perception of respiratory resistance (N=60) and heat pain (N=62). In both studies, a number of different stimuli were presented repeatedly in random order. In the experimental condition, participants were asked to assign stimuli to one of two intensity categories and rank stimuli within categories. In the control condition, participants received no categorization information and were asked to rank stimuli according to magnitude. Participants rated subjective certainty for each classification/ranking decision and completed questionnaires on anxiety, fear of bodily sensations, and intolerance of ambiguity.

RESULTS. Higher fear of bodily sensations was positively related to intolerance of ambiguity as well as to higher subjective certainty for classification/ranking decisions. In the categorization condition, participants accentuated subjectively between stimuli at the shared category border (compared to the ranking condition). Furthermore, higher fear of bodily sensations was related to higher bias, but only under high subjective certainty.

DISCUSSION. Also aversive sensations such as dyspnea and pain can be ambiguous with regard to their interpretation. Subjective disambiguation strategies in deciding how to interpret sensations and symptoms are a pathway linking anxiety and bias in interocception.

4. D2016P00030

The Breath of Life. Patients' Experiences of Breathing During and After Mechanical Ventilation – a Qualitatively-Driven Mixed Method Study

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INTRODUCTION: Even though the purpose of mechanical ventilation (MV) is to relieve the patients' effort of breathing, breathlessness is one of the most prevalent and distressing physical symptoms experienced by intensive care patients. The symptoms of dyspnea vary between patients and are not fully explained by differences in disease severity. In a recent prospective multicenter study we found that moderate or severe breathlessness was reported by 62% of patients whereas about half of the nurses and physicians underestimated breathlessness compared to the patients' self-reports. This indicates that breathlessness has different meaning for patients and health care personnel. The patients may tell us something about the phenomenon of breathing that we yet do not really understand.

OBJECTIVES: To explore the relationship between breathlessness rating data and the lived experience of breathing during and after MV, and how a period of needing help to breathe was experienced by former ICU patients.

METHODS: We used a qualitatively driven sequential mixed method design that incorporate a core qualitative project complemented by a supplemental quantitative component. 11 patients with either high or low self-reported breathlessness Numerical Rating Scale score were interviewed between 5 and 14 months after MV.

RESULTS: Four out of six who had reported breathlessness at ICU did not remember being breathless. We identified four themes illuminating the phenomenon of breathing during and after MV; Breath was connected to the experience of an Existential threath, Heaviness, an Unbounded body and Getting through.

CONCLUSIONS: Breathing is a complex experience. The mixed method gave new insight in the phenomenon of breathing during and after MV as there were contradictory findings between quantitative and qualitative data.

Ref: Haugdahl HS et.al (2015) Underestimation of Patient Breathlessness by Nurses and Physicians during a Spontaneous Breathing Trial. Am J Respir Crit Care Med

D2016P00036

A preliminary study shows ICU clinicians under-estimate breathing discomfort in ventilated patients

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[2]Maine Medical Center - Portland (United States of America).

INTRODUCTION: Breathing discomfort (dyspnea) during mechanical ventilation in the ICU may contribute to patient distress and complicate care. Assessment of non-verbal cues may allow caregivers to estimate patient breathing discomfort (BD). This study assesses the accuracy of those caregiver estimates.

METHODS: Thirty ventilated, hemodynamically stable patients were identified in the Special Care Unit of Maine Medical Center. Patients with impaired neurological function or too unstable to waken were excluded. Patients provided a subjective score of BD (0-10) during daily wake-up from sedation (mean SAS score 3.6 ± 0.5). Clinicians (physicians, respiratory therapists and nurses) then provided a blinded estimate of patient BD (0-10) through observation of the patient and inspection of ventilator parameters alone. Patient scores and caregiver estimates were compared.

RESULTS: All patients reported BD (range 3-10/10, mean 5.0 ± 1.9). Caregiver estimates of BD were 1.43 ± 2.0 points lower ($p<0.05$) than patient scores (physicians 1.09 ± 1.67 lower, respiratory therapists 1.2 ± 2.1 lower, nurses 1.9 ± 2.19 lower). There was a positive correlation between patient BD and degree of underestimation, i.e. the degree of underestimation increased as patient scores rose. The three most commonly used cues were patient's facial expression, use of accessory muscles and nasal flaring.

CONCLUSIONS: Significant BD is prevalent in mechanically ventilated ICU patients and is underestimated by caregivers, regardless of profession. The increasing disparity in caregiver estimate as BD rises may expose patients to levels of dyspnea that promote anxiety and fear. This study demonstrates the need for further development and standardization of methods to assess dyspnea in non-verbal patients.

5. D2016P00013

Comparison of the Dyspnea-12 and Multidimensional Dyspnea Profile in people with COPD

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INTRODUCTION: Few direct comparisons exist for sensory-perceptual assessments of dyspnea. We compared the Dyspnea-12 and Multidimensional Dyspnea Profile (MDP) in people with chronic obstructive pulmonary disease (COPD).

MATERIALS, PATIENTS AND METHODS**:** People with at least moderate airflow obstruction (≥GOLD stage 2) completed the D-12 and MDP for two focal periods: recalled over the past two weeks (daily life) and at the end of a six minute walk test (6MWT). Clinical variables included spirometry, 6MWT, modified Medical Research Council score (mMRC), Chronic Respiratory Questionnaire (CRQ) and Hospital Anxiety and Depression scale (HADs). Confirmatory factor analysis assessed instrument structure. Differences between associations (coefficient of determination R^2) were calculated between D-12 and MDP scores (Total and subdomains) and clinical variables using post hoc z-tests.

RESULTS: 106 participants (mean age 70 ± 9, 55 males, FEV_1 % pred 49 ± 17) provided data for breathlessness in daily life (n= 88 exertional breathlessness). Instrument structure was comparable to original development studies. For both focal periods, similar patterns of associations were evident: variance (R^2) in total or subdomains scores was explained by < 8% for FEV_1% pred, $^{FEV1}/_{FVC}$ or 6MWT, < 16% for mMRC, < 32% for HADs, and up to 42% for CRQ (Dyspnoea < 30%, Fatigue < 23%, Emotion < 35%, Mastery < 42%). Associations with clinical variables were generally higher for MDP compared to D-12 scores but with the exception of HADS-D and D-12 / MDP total scores ($p = 0.001$) for daily breathlessness, there were no significant differences ($p < 0.002$) between associations for daily or exertional breathlessness.

CONCLUSION**:** Instrument structure was confirmed for the focal periods. The D-12 and MDP share conceptual similarities and items but differ in intent, scale of measurement and scoring, which may produce subtle variations in associations with clinical variables.
NHMRC Project 1010309

6. D2016P00015

Dyspnoea-12 scores reported "these days" are greater than those reported "today" when completed at clinic attendance versus home in people with asthma, COPD and ILD

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INTRODUCTION: Dyspnoea assessments commonly rely on recall of symptom sensation, impact or burden. This study aimed to determine whether differences existed in dyspnoea recalled "these days" compared with "today"; and in different settings (self-completion at clinic visit compared with home).

METHODS: During a routine clinical visit to health services in the UK and at home follow-up one week later, people with asthma, COPD or interstitial lung disease (ILD) self-completed two versions of the Dyspnoea-12 questionnaire (D-12) in randomised order. The focal period differed between versions ("these days" or "today"). The D-12 is comprised of 12 items and two sub-domains (physical = 7; affective = 5). Participants were instructed to indicate how much each item "troubled you" (score 0-3). Differences in D-12 scores for the two focal periods were compared between settings (paired t-tests) and analysed by lung condition (ANCOVA accounting for MRC score).

RESULTS: At the clinic visit (n=305, asthma=103, COPD =101, ILD=101) D-12 scores were significantly greater when reported for "these days" compared with "today"; D-12 total (mean difference = 4.1, 95% CI 3.3 to 5.0; p<0.001), physical subdomain (2.6, 2.1 to 3.2) and affective subdomain (1.5, 1.1 to 2.0). Differences between the two focal periods were significant for all three lung conditions (p<.001 to .02). In contrast, when completed at home (n=142, all 3 groups) D-12 scores did not differ significantly between focal periods, except for participants with asthma where affective subdomain score for "these days" was higher than "today" (.35, .02 to .69, p=.04). People with asthma and COPD scored "these days" sensations higher in the clinic than at home follow-up; by comparison all scores for "today" sensations were similar across settings.

CONCLUSION: Psychological, environmental and/or relational factors differ between settings and may influence dyspnoea reporting especially when sensations are recalled retrospectively.

7. D2016P00012

Dyspnea upon admission in the intensive care unit (ICU): patients' characteristics, verbal descriptors, and association with prognostic.

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INTRODUCTION: Dyspnea has an intrinsic prognostic value in chronic respiratory diseases, chronic heart diseases, and in the general population in certain contexts. This also true in mechanically ventilated patients.

METHODS: In the present study, we asked 120 consecutive patients admitted to a medical ICU (median age 61 [36-99]; 60% men; respiratory admission 61%; mechanical ventilation 17%; supplemental oxygen 67%; median SAPS2 33 [6-99]) and who were able to communicate with caregivers (median RASS 0 [-1-1] to identify dyspnea (yes/no), rate its intensity on a visual analog scale (D-VAS), and identify sensory and affective descriptors extracted from the multidimensional dyspnea profile (MDP)(yes/no).

RESULTS: Dyspnea was reported by 69 patients (58%)(median D-VAS 45% of full scale [10-92%]). Dyspneic patients were significantly more likely to have been admitted for a respiratory cause, to receive supplemental oxygen, and to report anxiety (73 vs 22%). They had higher heart and breathing frequency, lower SpO2, but similar SAPS2. ICU length of stay and duration of non-invasive ventilation were significantly longer, without differences in lengths of ICU and hospital stay or in mortality. Unsupervised hierarchical clustering analysis grouped dyspneic patients in two categories. "Cat1" used multiple sensory and emotional descriptors while "Cat2" used no more than 1 sensory and 1 emotional descriptor if any at all. Cat1 patients reported more intense dyspnea on D-VAS but had similar respiratory distress observation scores (RDOS); they were significantly younger and more likely to receive oxygen. There was no difference in clinical outcomes.

CONCLUSIONS: In this cohort, being dyspneic upon ICU was associated with longer ICU stay and NIV duration. The semantic richness of dyspnea description separated two groups of patients, but this not associated with differences in outcomes. These preliminary results justify studying the impact of dyspnea on ICU outcomes on a larger, multicentric scale.

8. D2016P00019

Routine Dyspnea Assessment: Feasibility and Acceptance of by Nurses

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RATIONALE: Assessing dyspnea in patients is the first step in managing this distressing symptom. Nurses on medical surgical units at our institution assess and document dyspnea in all patients upon admission and at least once per shift through the hospital stay.

METHODS: We ascertained nurses' perception of the importance of routine measurement; patient response to and comprehension of assessment questions; and burden of dyspnea assessment. Our three part assessment of practice included a time-motion study, focus group sessions, and an on-line survey, selected randomly.

RESULTS: When surveyed after implementing routine documentation, 84% of nurses responded that it is important or very important to assess dyspnea upon admission; 90% felt that it was important or very important to use a uniform tool to assess dyspnea and to document dyspnea every shift. Time-motion studies showed that nurses average 20.5 seconds to assess and document dyspnea using a 0-10 point scale. Nearly all nurses (94%) reported that it was easy or very easy to administer the dyspnea assessment. Most nurses (58%) reported that the addition of dyspnea assessment had no effect on workflow, while 42% reported a positive effect. Nurses had slightly less confidence in patient-reported ratings for dyspnea than in patient-reported ratings for pain. Many nurses reported using the patient reported rating in conjunction with observed signs to determine or modify the dyspnea score either because the patient was unresponsive or seemed unable to use a number scale. Some nurses reported using observed signs because they believed the patient was under- or over-reporting dyspnea.

CONCLUSIONS: Routine assessment of dyspnea in inpatients is feasible and easily incorporated into normal nursing workflow. Routine assessment can lead to early detection of clinical deterioration and improve management of these patients.

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9. D2016P00029

Development of a Dyspnoea Challenge: Reliability and Comparison with the six minute walk test

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AIM: Exertional dyspnoea, particularly during short bouts of uphill exercise, are a hallmark of chronic lung disease. The six minute walk test (6MWT) remains the clinical measure of exercise capacity in this group. However, this test is performed on the flat and measures of exertional dyspnoea remain secondary. The aim of this study was to report the end exercise responses to a two minute dyspnoea challenge, performed on an incline, and compare these to end exercise responses to the 6MWT and to to determine the test-retest reliability of the dyspnoea challenge.

METHODS: Eight chronic lung disease patients (5 female, age: 68-77 yr, mean FEV_1: 71±16%) completed two baseline 6MWTs and two dyspnoea challenge tests on separate days. The challenge consisted of walking on the treadmill at 80% of the best 6MWT speed (4.0±0.6 km.hr-1) at either a low (dys_low: 6±2%) or high incline (dys_high: 10±2%). During each challenge, dyspnoea (0-10 scale), heart rate (HR) and oxygen saturation (SpO_2) were recorded continuously.

RESULTS: The mean 6MWT distance was 487±66 m; end exercise dyspnoea 5.3±1.7; HR 119±20 beats.min-1 and SpO_2 94+4%. For the dyspn_low, end exercise dyspnoea was 4.4±2.3; HR 120±10 beats.min^{-1} and SpO2 95±3%. For the dyspn_high, end exercise dyspnoea was 6.0±2.4; HR 126±9 beats.min^{-1} and S_pO_2 96±2%. When compared to the two dyspnoea challenges, the 6MWT produced similar end exercise dyspnoea, HR and S_pO_2. However, the dyspnoea and HR achieved in the dysp_high were higher ($p<0.05$) than the dyspn_low. The intraclass correlation coefficient for dyspnea for both dyspn_low and dys_high were r=0.89 and 0.92 (both $p<0.01$), respectively.

CONCLUSION: We found the dyspnoea challenge to be feasible, reliable and simple to perform in a group of chronic lung disease patients. End exercise responses to the dyspnoea challenge during both high and low grades were similar to those achieved during the 6MWT, with the harder challenge producing a greater dyspnoea and HR response.

Personal notes

International Dyspnea Society

If you can't get your breath, nothing else matters. We know dyspnea is an extremely unpleasant, frightening sensation that causes suffering in hundreds of millions of patients. Yet few scientists spend their time trying to understand this sensation. We founded the Dyspnea Society to organize periodic 2-day international meetings bringing dyspnea scientists together in a collegial atmosphere with plenty of time to converse. Andrew Binks and I organized Dyspnea 2005, 2009, & 2013 in the US. We have been delighted to turn over the responsibility for Dyspnea 2016 to new organizers on a different continent!

Thanks to all for attending the 2016 meeting and sharing your data, thoughts and convictions.

The conversation will continue in 2019 in Montréal, Québec, Canada.

See you there!

Bob Banzett