Abstract M143 Table 1 Baseline characteristics of patients (expressed as mean ± SD)

	Progressors n = 97	Non-progressors n = 103	p=
Gender (male:female)	48:49	46:57	0.294
Age (years)	66.5 ± 7.5	66.9 ± 6.5	0.669
FEV_1 (L)	1.30 ± 0.59	1.33 ± 0.53	0.776
FVC (L)	2.53 ± 0.89	2.47 ± 0.75	0.614
FEV_1/FVC (L)	**0.49 ± 0.11**	**0.53 ± 0.12**	**0.044**
FEV% predicted	52 ± 17	57 ± 21	0.071
BMI (kg/m^2)	28 ± 6	28 ± 5	0.281
Systolic BP (mmHg)	144 ± 17	149 ± 18	0.091
Diastolic BP (mmHg)	81 ± 12	83 ± 9	0.168
Mean arterial pressure (mmHg)	**102 ± 12**	**106 ± 11**	**0.036**
aPWV (m/s)	**9.5 ± 2.2**	**10.4 ± 2.4**	**0.004**
Heart rate (bpm)	74 ± 11	76 ± 11	0.350
6MWT (m)	300 ± 98	309 ± 110	0.563

pressure (MAP), heart rate and 6 min walk distance (6MWT). Based on the change in PWV in hypertensive patients, progressors were defined as individuals with >0.5 m/s PWV increase, over 2 years.[2]

Results Thus far 200 patients with COPD have completed the 2 year follow-up assessment. At baseline the progressor and non-progressor were similar in age, gender, BMI, heart rate and 6 MWT. However the progressors had greater airways obstruction, and lower mean arterial pressure and aPWV (Table 1). After 2 years the mean [95% CI] PWV change in progressors was +1.7 [2.0–1.5]m/s while FEV_1 declined by 140 [76–206]ml ($p < 0.05$). In contrast the non-progressors had no change in lung function, while there was a decrease in aPWV 0.7 [0.5–0.9] m/s and MAP 5 [3–7] mmHg ($p < 0.05$).

Conclusions Almost half of the ARCADE subjects with COPD had a significant increase of PWV, the clinical relevance requires investigation using longer-term outcome data. The identification of CV risk phenotypes in COPD and the underlying pathophysiology may help identify novel therapeutic targets and improve CV outcomes for patients.

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M144 ACUTE DIETARY NITRATE SUPPLEMENTATION REDUCES THE OXYGEN COST OF SUBMAXIMAL EXERCISE IN COPD

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Introduction The recognised link between plasma nitrite levels and exercise performance suggests a role for the nitrate-nitrite-nitric oxide pathway in facilitating exercise. Research in healthy individuals has demonstrated a reduction in the oxygen cost of exercise at submaximal workloads following nitrate supplementation. Dietary nitrate administration has been associated with reductions in blood pressure and augmented exercise performance. The effect of acute nitrate dosing on performance and metabolic parameters during cardiopulmonary exercise testing in COPD has not previously been investigated.

Objectives To investigate the hypotheses that acute nitrate dosing would improve exercise performance, reduce the oxygen cost of submaximal exercise performance and lower arterial blood pressure in COPD patients (GOLD stage II-IV).

Methods We performed a randomised, double-blind, placebo-controlled cross-over study comparing the effect of 140 ml of beetroot juice (containing 12.9 mmol nitrate) with a matched placebo of nitrate-depleted beetroot juice in COPD patients not receiving oral nitrates. Subjects were randomised to consume beetroot juice (BR) or placebo (PL) 3 h prior to endurance cycle ergometry, performed at 70% maximal workload assessed by a baseline incremental maximal, symptom-limited test. Blood pressure measurements were taken at baseline and immediately prior to the exercise test. After a washout period of a minimum of 7 days the protocol was repeated with the crossover beverage.

Results 25 COPD patients were recruited of whom 21 successfully completed the study (age 68 ± 7 years; BMI 25.2 ± 5.5 kg/m^2; FEV_1 percentage predicted 50.1 ± 21.6%; peak VO_2 during incremental cycle ergometry 18.0 ± 5.9 ml/min/kg). Diastolic blood pressure was significantly lowered by nitrate supplementation (-6.9 ± 7.8 BR vs. –1.4 ± 8.4 mmHg PL, p = 0.008). Nitrate supplementation significantly reduced oxygen consumption during equivalent isotime exercise (60–70% isotime 16.6 ± 5.6 BR vs. 17.1 ± 5.9 ml/min/kg PL, p = 0.017; 70–80% isotime 16.7 ± 5.7 BR vs. 17.2 ± 5.5 ml/min/kg PL, p = 0.010; 80–90% isotime 16.8 ± 5.7 BR, vs. 17.5 ± 5.75 ml/min/kg PL, p = 0.004). The endurance time was not significantly different between the groups (5.65 (3.90–10.40) BR vs. 6.40 (4.01–9.67) minutes PL, p = 0.50).

Conclusion The acute administration of nitrate reduces oxygen consumption and diastolic blood pressure during equivalent exercise in COPD patients.

M145 PREVALENCE AND DETERMINANTS OF VITAMIN D DEFICIENCY IN PATIENTS WITH CHRONIC OBSTRUCTIVE PULMONARY DISEASE

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Background Vitamin D deficiency may be a risk factor for exacerbations of chronic obstructive pulmonary disease (COPD). Studies investigating the prevalence and determinants of vitamin D deficiency among COPD patients in the UK are lacking.

Methods We conducted a cross-sectional study in 278 COPD patients aged 40–85 years screened for eligibility to participate in a clinical trial of vitamin D supplementation. Lifestyle and demographic data were collected by questionnaire and a blood sample was collected for analysis of serum 25-hydroxyvitamin D (25[OH]D) concentration and DNA extraction. Serum 25(OH)D concentration was determined by liquid chromatography – tandem mass spectrometry. Thirty-seven single nucleotide polymorphisms (SNP) in 13 vitamin D-related genes (DBP, DHCR7, CUBN, LRP2, CRTAM, LTA4 H, CYP2R1, CYP3A4, CYP27A1, CYP27B1, CYP24A1, VDR, RXRA) were typed using Taqman allelic discrimination assays. Logistic regression was used to

identify environmental and genetic factors associated with risk of vitamin D deficiency (25[OH]D concentration < 50 nmol/L).

Results Mean serum 25(OH)D concentration was 45.4 nmol/L (SD 25.3); 171/278 (61.5%) participants were deficient. The following factors independently associated with increased risk of vitamin D deficiency: BMI >30 kg/m^2 (OR 1.87, p = 0.04) and blood draw during winter and spring seasons (OR 3.00, p < 0.01; OR 2.50, p < 0.01, respectively). The following factors independently associated with reduced risk of deficiency: consumption of a vitamin D supplement, 100–400 IU/day (OR 0.42, p < 0.01); and a sunny holiday abroad no more than 2 months prior to blood draw (OR 0.27, p = 0.02). None of the 37 SNP investigated independently associated with vitamin D deficiency.

Conclusions Vitamin D deficiency was highly prevalent among COPD patients in this study. Obesity and winter and spring sampling were risk factors for deficiency. Recent travel to a sunny country and consumption of vitamin D supplements were protective. Genetic variants in the vitamin D pathway that have previously been shown to associate with risk of vitamin D deficiency in healthy adult populations were not associated with deficiency in this patient group.

M146 VALIDATION OF FIVE NON-INVASIVE RESPIRATORY RATE MONITORS IN PATIENTS WITH COPD IN A LABORATORY SETTING

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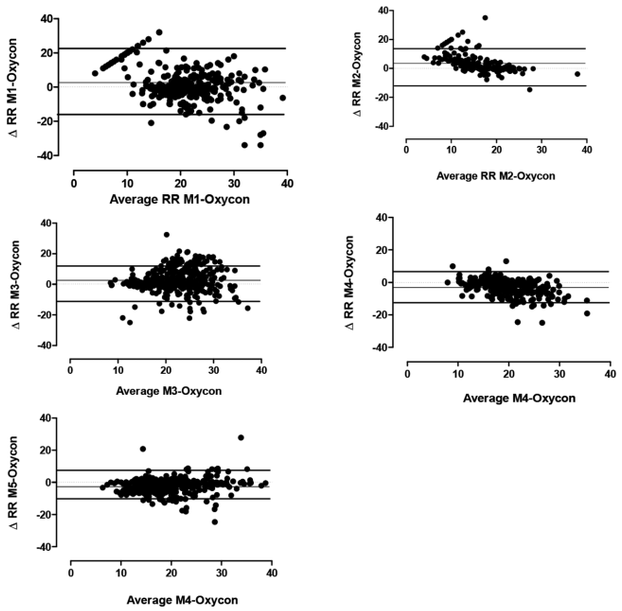
Introduction There is a need of innovative models of care for patients with severe COPD and frequent AECOPD, and Telehealth (TH) is part of these programs. But current systems are limited by the parameters feasibly monitored in a domestic setting and lack of a reliable method of predicting exacerbations. Evidence from hospital based studies show that breathlessness increases during exacerbations. If respiratory rate (RR) could be reliably monitored remotely it may provide a significant advance in predicting and identifying COPD exacerbations and monitoring recovery. The aim of this study is to validate five non-invasive RR monitors (M1 to M5) in patients with COPD in a laboratory setting against a gold standard measurement of RR.

Methods and results Five RR monitors identified in the literature were selected for validation against RR measured with a gold standard method (Oxycon mobile, Carefusion) in 23 patients with COPD (13 males, age 70 ± 8.3 years, FEV_1 58.3 ± 17.1%pred) during a 52 min protocol of a total of 19 activities of daily living (i.e sitting, standing, walking at different speeds, climbing stairs, lifting objects and sweeping the floor). Patients wore simultaneously the five monitors and the Oxycon mobile and RR was recorded breath by breath and averaged by minute. One minute of each activity was selected for analysis using Bland and Altman plots. Bias and limit of agreement (LoA) was established for each monitor (**Figure 1**). Bias and LoA for the five monitors were the following (M1 2.15 (-17.9 to 22.2), M2 3.1 (-8.7 to 14.9), M3 2.2 (-12.12 to 16.6), M4 -2.5 (-11.7 to 6.8) and M5 -1.9 (-10.8 to 6.9)). Patients were compliant with the use of the five monitors.



Abstract M146 Figure 1 Bland and Altman plots for RR between all five monitors and Oxycon Mobile

Conclusions Monitoring RR is feasible and non-intrusive in patients with COPD. We have identified two monitors (M4 and M5) with the lowest bias and the narrower LoA. These monitors will be further investigated in a home setting.

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M147 FEASIBILITY OF DELIVERING AN OCCUPATIONAL HEALTH INTERVENTION AIMED AT IMPROVING WORK PRODUCTIVITY, AMONG WORKING COPD PATIENTS

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Introduction There is evidence that workplace productivity may be impaired among working patients with COPD. Occupational health (OH) interventions have been effective in improving work productivity in other chronic conditions. However, little is known about the feasibility and acceptability of such interventions among those with COPD.

Aim To assess feasibility and acceptability of an OH intervention in working COPD patients.

Methods Nested within a primary care COPD cohort (n = 1870), the study included all those who were in work (n = 309). Eligible patients were invited for an interview and assessment with an OH practitioner. The aim was to explore and identify workplace factors that may contribute to their work performance or exacerbate their condition, and to suggest approaches to minimise any respiratory symptoms and improve work capability. Recommendations are sent to the patient, and with their permission, to their GP and employer. The acceptability of the intervention to employers will be explored as a separate part of the study.

Results Of those eligible, 43 (13.9%) agreed to take part and 107 (34.6%) declined. The most common reasons for declining