investigators assigned patients to the MRC dyspnoea scale, grading dyspnoea on strenuous exertion only (normal, Grade 1); on incline/stairs (2); and on the level (3–5 according to severity). Individuals undertaking regular/intense sport were reclassified as Grade '0'. Four separate SpO₂ measurements, after standing for 7, 8, 9 and 10 min, were used for statistical calculations using GraphPad software. Interim analyses were performed on the first 88 patients.

Results In the absence of severe pulmonary hypertension or emphysema, only 18% of patients were dyspnoeic (Abstract P38 Table 1). To determine which factors might influence dyspnoea, single variables were examined. There was considerable overlap in the SpO₂ values between the three groups of Grade '0', 1 and 2, and no relationship between dyspnoea grade and SpO₂ demonstrated by Spearman's rank correlation coefficient ($r=0.09$; $p=0.39$). The patients however, ranged in age from 17 to 87 years, and older patients were more dyspnoeic (Spearman $r=0.33$; $p=0.0016$). Multiple regression analyses were therefore performed to determine whether there was a relationship between SpO₂ and dyspnoea that was masked by differences in age. These suggested SpO₂ may make an independent contribution to dyspnoea ($p=0.064$), although age was still more strongly associated ($p=0.0044$). However, these factors alone did not account for most of the population variation in dyspnoea grade (overall model: $r^2=11.37\%$, $p=0.0073$).

Abstract P38 Table 1 Population stratification by dyspnoea grade: *Quartile distribution (Q1, Q2, Q3) where Q2 represents the median value

MRC grade	Number of cases	SpO ₂ (%) range	SpO ₂ (%) quartiles*	Corrected* number (%)
"0"	19	78.5–99	90.7, 94.5, 96.2	19 (22)
1	51	83.5–98	93.6, 95.5, 96.5	51 (60)
2	15	80.8–98	85.6, 90.5, 93.1	15 (18)
3	2	89–92.5	89.1, 89.2, 90.8	0
4	1	95–95	95.0, 95.0, 95.0	0
5	0	—	—	0

*Excludes patients with severe pulmonary hypertension ($n=2$), or severe emphysema ($n=1$).

Summary These data imply that it is unusual for PAVMs alone to account for moderate to severe dyspnoea, and that there is less of an influence of SpO₂ than expected. Further study is warranted.

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P39 PULMONARY HYPERTENSION (PH) ASSOCIATED WITH LUNG DISEASE/ HYPOXIA

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Background Mild elevation in pulmonary artery pressure (PAP) is common in patients with lung disease. In COPD, 2 groups are defined; PH proportionate to degree of underlying lung disease and PH out of proportion (mPAP ≥ 40 mm Hg) occurring in a minority. **Aim** To characterise survival and prognostic factors in patients with PH associated with lung disease.

Methods Single centre retrospective review of cardiac catheters performed 2001–2010 identified incident cases of PH associated with lung disease.

Results 155 patients had a primary diagnosis of PH associated with lung disease, 96 with COPD (57 PH out of proportion to COPD, 39

PH proportionate to COPD), 31 PH in interstitial lung disease (PH-ILD) and 28 PH with sleep disordered breathing / alveolar hypoventilation. Survival is shown in Abstract P39 Figure 1. Right heart pressures were most raised in patients with PH out of proportion to COPD compared to PH-ILD and PH in proportion to COPD with mRAP 12.3, 8.5 and 8.2 mm Hg ($p<0.05$) and mPAP 49.4, 38.6 and 32.3 mm Hg ($p<0.01$) respectively. In patients with PH associated with sleep disordered breathing/alveolar hypoventilation mRAP was 11.6 and mPAP 37.8 mm Hg. Cardiac index and PVR were similar in PH out of proportion to COPD and PH-ILD but markedly reduced in both groups when compared to PH in proportion to COPD ($p<0.01$). Baseline shuttle walking distance was most reduced in PH out of proportion to COPD with mean 67 m compared to 133 m in PH-ILD and 156 m in PH in proportion to COPD ($p<0.05$). In COPD, airflow obstruction was less severe in patients with out of proportion PH than COPD with proportionate PH (FEV₁ 63% vs 51% respectively) but TLCO was more severely affected (26% vs 38%).

Abstract P39 Figure 1 Cumulative survival from diagnosis in patients with pulmonary hypertension associated with respiratory disease.

Conclusions The survival of patients with PH in association with lung disease is dependent on the underlying aetiology. Whereas patients with PH associated with sleep disordered breathing/alveolar hypoventilation have a good prognosis, patients with PH in the setting of ILD and PH out of proportion to COPD have a poor prognosis.

P40

A COMPARISON OF THE VALUE OF OXYGEN SHUNT STUDIES AND CARDIAC BUBBLE ECHO AS SCREENING TOOLS FOR PULMONARY ARTERIOVENOUS MALFORMATIONS IN PATIENTS WITH SUSPECTED HEREDITARY HAEMORRHAGIC TELANGIECTASIA

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Hereditary haemorrhagic telangiectasia (HHT) is an autosomal dominant genetic disorder associated with recurrent spontaneous epistaxis, mucocutaneous telangiectasia and visceral arteriovenous malformations (AVMs). Up to 30% of patients with HHT have pulmonary AVMs (PAVMs) which are associated with an increased