and 4 (4.2%) had a percentage $\geq 50\%$. Eosinophil count was $\geq 5\%$ in 17 (17.9%), and $\geq 25\%$ in 2 (2.1%). When assessing quality of samples as per guidelines the percentage of other cells (epithelial/columnar cells) at analysis was more than 5% in 57 (60%) patients. In 37 (38.9%) patients the volume instilled was more than 100 ml. In only 13 (13.7%) patients the volume of fluid retained back was $\geq 30\%$ of instilled volume. Despite this 76 (80%) patients the volume of fluid obtained for analysis was more than 10 ml. There were no immediate complications reported. 50 (52.6%) of the operators were consultants, 30 (31.6%) were registrars, and in 15 (15.8%) operator was not recorded.

Conclusion The quality of BAL sample is very important for diagnostic accuracy in ILD. Our data shows that BAL performed by general respiratory physicians can be of poor quality. We would advocate adequate training in BAL plus investment in dedicated ILD lists may improve engagement and quality. This data supports the BTS bronchoscopy guidelines in performing regular audit to ensure quality is maintained.

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P152

THE ASSOCIATION BETWEEN ADULT HEIGHT, SOCIOECONOMIC STATUS AND IDIOPATHIC PULMONARY FIBROSIS: A POPULATION BASED CASE-CONTROL STUDY

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Background Idiopathic pulmonary fibrosis (IPF) is an increasingly important public health issue worldwide, but the underlying aetiology is still unknown. The aim of this study was to investigate whether adult height or socioeconomic status are associated with the lifetime risk of developing IPF.

Methods We used data from The Health Improvement Network (THIN), an electronic longitudinal UK primary care database to conduct a matched case-control study to investigate if adult height and socioeconomic status are associated with IPF. Incident cases of IPF were identified using previously published Read Codes. General population controls were identified as a 4:1 incident density sample, matched by age, gender and general practice. Our exposures were adult height and socio-economic index as measured by Townsend Index recorded before the date of diagnosis. We used conditional logistic regression to estimate odds ratios for the associations between each exposure and IPF. Adult height was modelled as quintiles and as a continuous variable.

Results The final study population consisted of 1699 incident cases of IPF and 5339 matched general population controls. Mean age of cases was 74.6 years (Standard Deviation [SD] 9.6) and 64.2% were male. Mean height in men and women were 1.73 (SD 0.07) and 1.59 (SD 0.6) metres respectively. There was no association between adult height quintiles and IPF after adjusting for socio-economic status (see Table 1). However, when modelled as a continuous variable, we found

a weak inverse association between every metre increase in adult height and IPF, after controlling for socio-economic status. (OR 0.46, 95% CI 0.19–1.07; $p=0.07$). There was also strong evidence of effect modification between adult height and sex ($p=0.03$), such that the effect of increasing height quintile was stronger in women (OR 0.93, 95% CI 0.87 to 0.99) and weaker in men (OR 0.99, 95% CI 0.94 to 1.04). We found no association between socio-economic status and IPF (see Table 1).

Conclusions Our findings raise the possibility that early life exposures may influence the lifetime risk of developing idiopathic pulmonary fibrosis. We also demonstrated that unlike many respiratory diseases, IPF is spread evenly through all sections of society.

Abstract P152 Table 1 Odds ratios for the association between IPF, height quintile and Townsend score

	Univariate analysis		Multivariate analysis*	
	Odds ratio	95% confidence interval	Odds ratio	95% confidence interval
Quintile of Height				
1 (shortest)	1.00		1.00	
2	0.94	0.78–1.14	0.94	0.78–1.14
3	0.92	0.74–1.15	0.93	0.74–1.15
4	0.86	0.65–1.05	0.87	0.65–1.06
5 (tallest)	0.83	0.67–1.10	0.85	0.68–1.11
Quintile of Townsend Score				
1 (most disadvantaged)	1.00		1.00	
2	1.02	0.86–1.21	1.02	0.86–1.21
3	0.93	0.77–1.11	0.92	0.76–1.11
4	1.05	0.86–1.27	1.04	0.86–1.27
5 (least disadvantaged)	1.07	0.86–1.35	1.07	0.85–1.34

*Adjusted for all other variables in the table

P153

CLINICAL FRAILTY SCORE BUT NOT AGE IS ASSOCIATED WITH EARLY TREATMENT DISCONTINUATION WITH ANTIFIBROTIC MEDICATION IN IDIOPATHIC PULMONARY FIBROSIS

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Introduction Antifibrotic medication (AFM) is indicated for the treatment of idiopathic pulmonary fibrosis (IPF), but medication related side effects can lead to early discontinuation of therapy in some patients. Factors that may predict intolerance of AFM are poorly described

Methods Retrospective data from all patients from a single District General Hospital that had received AFM for IPF between January 2014 and March 2017 were analysed. Patients were defined at four months as either tolerant or intolerant of AFM determined by either continuation of treatment, or discontinuation of treatment because of medication related side effects respectively. Fisher's exact test was used to compare age, body mass index (BMI) and Clinical Frailty Score (CFS) between the two groups. Frailty was defined as a

CFS of ≥ 6 (scale 1–9 with a high score indicating greater frailty)

Results 35 patients received AFM and 10 (29.4%) were intolerant of treatment at 4 months. Patients without frailty were more likely to be tolerant of treatment than those with frailty (86.4% *versus* 33.3%, $p=0.0074$). Patients with a BMI in the upper three quartiles of the sample were more likely to be tolerant of treatment than those in the lowest quartile, but this trend did not reach statistical significance (80.7% *versus* 44.4%, $p=0.081$), and there was no difference in tolerance between patients over 80 years of age and younger patients (77.8% *versus* 75.0%, $p\geq 0.99$).

Conclusions Frailty and low BMI may predict treatment intolerance with AFM in IPF, whereas age does not appear to influence this outcome. Clinicians should consider a patient's frailty when considering this therapy. Further analysis of a larger dataset and a prospective study are warranted.

P154 GENDER AND HEIGHT DRIVE VARIATION BETWEEN FORCED VITAL CAPACITY REFERENCE EQUATIONS: IMPLICATIONS FOR IPF TREATMENT

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Introduction NICE guidance mandates that anti-fibrotic therapy for interstitial pulmonary fibrosis (IPF) is only recommended as an option for people with a forced vital capacity (FVC) between 50%–80% predicted. The guidance recognises different reference values are used across the UK to calculate predicted FVC but does not specify which should be utilised. We were interested to see how different formulas impacted on eligibility for these treatments.

Methods We reviewed all patients with a diagnosis of IPF or possible IPF attending our ILD clinic for the time period 2016–2017. Baseline demographics were recorded and % predicted FVC (ppFVC) was calculated using both the European Society for Coal and Steel (ESCS) and Global Lung Initiative 2012 (GLI) formulas.

Results We identified 97 patients from our database and complete data was available for 96 (median age [range] 71.2 years (42–89), 62.5% male, median FVC 2.39 L). Overall the ESCS formula resulted in a higher ppFVC compared to GLI (+6.2% FVC, $p<0.001$). There was considerably less difference between the formulas in males than females (+3.7% *vs.* +11.6%, $p<0.0001$). We observed a strong inverse correlation between variation in ppFVC and height ($Rho -0.7$, $p<0.0001$). No relationship was observed between age and variation. For the 24 patients with GLI ppFVC within 10% of the upper and lower thresholds for treatment, 15 (62.5%) would have their eligibility for anti-fibrotic treatments changed by use of the ESCS formula.

Conclusions Females and those with shorter height saw the greatest variation between the two formulas. A significant proportion of patients with borderline eligibility for anti-fibrotic treatments have their status changed by the use of a different formula. Clinicians must be aware of their local reference values and how this may affect patients' eligibility for IPF treatment.

P155 USE OF MYCOPHENOLATE MOFETIL AND AZATHIOPRINE IN PATIENTS WITH CHRONIC HYPERSENSITIVITY PNEUMONITIS

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Background The optimal pharmacological management of chronic hypersensitivity pneumonitis (cHP) is unknown. Corticosteroids are often used as first line therapy but can be associated with side effects. There is a paucity of data examining the role of DLCO but not FVC (Morisset J *et al.* *Chest*. 2017). We aimed to determine the effect of steroid-sparing agents in cHP. A recent retrospective study demonstrated that treatment with either mycophenolate mofetil (MMF) or azathioprine (AZA) was associated with improvements in FVC of MMF and AZA on lung function and prednisolone dose in cHP patients. **Methods** Patients initiated on either MMF or AZA following a MDT diagnosis of cHP were retrospectively identified from the ILD service Papworth Hospital, Cambridge. Changes in lung function in the 9–12 months before and after treatment initiation were analysed. Daily prednisolone dose at initiation and 9–12 months treatment was recorded.

Results Twenty eight patients were identified between 2008 and 2016; 20 were treated with MMF (1–2 g daily) and 8 with AZA (25–150 mg daily). The mean age at drug initiation was 59.6 ± 1.7 years and 61% were female. The mean duration from diagnosis to commencing MMF or AZA was 30.9 ± 5.5 months. Twenty patients remained on either drug at 9–12 months and were included in the effectiveness analysis (FVC and TLCO data were available for 20 and 13 patients respectively). Five patients discontinued treatment due to drug side effects. Treatment with either MMF or AZA resulted in a significant reduction in prednisolone dose from 16.1 ± 2.1 mg to 8.0 ± 0.8 mg ($p<0.001$). MMF or AZA treatment for 9–12 months was associated with a significant improvement in TLCO (-0.62 ± 0.3 *vs.* $+0.32\pm 0.17$ mmol/kPa/min, $p<0.05$). Although treatment reduced rate of FVC decline (-100 ± 65 *vs.* -30 ± 66 mls), it was not significant ($p=0.4$).

Conclusions In our cohort of cHP, treatment with either MMF or AZA was associated with an improvement in TLCO consistent with findings of a previous retrospective study. Moreover, the addition of MMF or AZA enabled a significant reduction in prednisolone dose.

P156 MAINTAINING PATIENTS WITH IDIOPATHIC PULMONARY FIBROSIS (IPF) ON ANTIFIBROTIC THERAPY; THE NURSES' CHALLENGE

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Pirfenidone and nintedanib are the first licensed drugs for IPF. Both reduce the rate of disease progression but have significant intolerance issues limiting long-term use. This study aims to identify areas where changes in practice might improve outcomes. We compared baseline characteristics of disease severity with the reasons for stopping treatment and the proportion stopping treatment within the first 4 weeks,