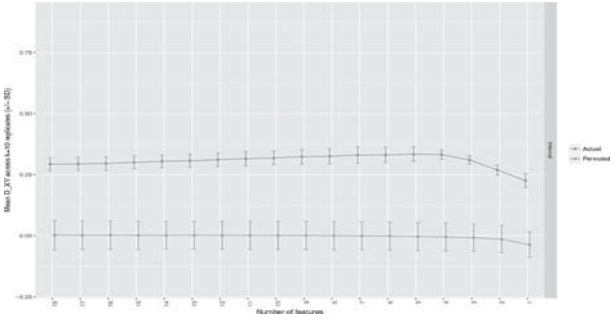
by Least Absolute Shrinkage and Selection Operator (Lasso) regression for Overall Survival (OS), OS<6 months and OS<12 months. OS prediction was quantified using Somers D_{XY} statistic, which varies from 0 to 1, with increasing concordance between observed and predicted outcomes. 6- and 12 month survival were described by area under the curve (AUC) scores.

Results Median OS was 270 (IQR 140–450) days. The primary OS model assigned high weights to 4 predictors: age, performance status, white cell count and serum albumin, and after cross-validation performed significantly better than would be expected by chance (mean D_{XY} 0.332 (+/-0.019) figure 1). However, validation set D_{XY} was only 0.221 (0.0935–0.346), equating to a 22% improvement in survival prediction than would be expected by chance. 6- and 12 month OS signatures included the same 4 predictors, in addition to epithelioid histology plus platelets and epithelioid histology plus C-reactive protein (mean AUC 0.758 (+/-0.022) and 0.737 (+/-0.012), respectively). The <6 month OS model demonstrated 74% sensitivity and 68% specificity. The <12 month OS model demonstrated 63% sensitivity and 79% specificity. Model content and performance were generally comparable with previous studies.

Discussion The prognostic value of the basic clinical information contained in these, and previously published models, is fundamentally of limited value in accurately predicting MPM prognosis. The methods described are suitable for expansion using emerging predictors, including tumour genomics and volumetric staging.



Abstract P243 Figure 1 Model performance as a function of the number of features for actual (red line) and permuted (blue line) data. Performance for Overall Survival (OS) is measured by D_{XY} for OS. Standard deviations from replicates of cross-validation are shown for each point as bars.

Clinical implications of cystic fibrosis

P244 EXTENDED CFTR SCREENING FOR PATIENTS WITH A CLINICAL DIAGNOSIS OF CF BUT ONLY ONE GENE ON INITIAL SCREENING

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Introduction Standard CF genotyping only identifies 94% of CF genes, resulting in the emergence of a "cystic fibrosis screen positive, inconclusive diagnosis" (CFSPID) designation. This, and the advent of genotype-specific CFTR directed therapies has highlighted the need for more comprehensive genotyping, particularly to identify rarer genes when only a single gene is found on initial screening. However, extended CFTR screening is an expensive investigation and we wished to assess its use and yield.

Methods Between 2014 and 2016 we identified 40 people with CF attending our large regional adult unit without two known pathogenic CFTR genes and offered them extended CFTR screening. We looked at the yield in terms of additional genes identified and their clinical significance in 37 of these (3 refused/did not attend).

Results A new molecular diagnosis (i.e., two pathogenic genes) was made in 18 (48.5%) people with CF. Genes associated with CFTR related disorders were found in a further 2 (5.5%), genes of uncertain pathogenicity were found in 3 (8.1%), and one or no genes were found in 14 (37.8%). Of the 18 people with CF with additional identified genes, 8 had those associated with responsiveness to the CFTR potentiator ivacaftor (4 × 3272–26 A≥G, 1 × 711+3 A≥G, 1 × R347H, 1 × 2789+5G≥A, 1 × S945L) and 2 of these (R347H and S945L) have recently been approved for ivacaftor use by the U.S. Food and Drug Administration.

Conclusions In people with a clinical diagnosis of CF but only one pathogenic gene on initial screen, extended CFTR screening identified a second gene in nearly half of cases. Furthermore, a significant proportion of the identified genes have been reported to respond to ivacaftor. It is therefore important that all people with CF without two known mutations undergo extended mutation screening in order to establish who may benefit should the current license for ivacaftor be expanded in the UK.

P245 INFLUENZA B OUTBREAK AT A LARGE ADULT CF CENTRE: CLINICAL CONSEQUENCES AND POTENTIAL CONTRIBUTING FACTORS

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Introduction In May 2016 an outbreak of influenza was declared on the adult cystic fibrosis (CF) ward at the Manchester Adult Cystic Fibrosis Centre (MACFC), where all patients are treated in individual rooms and strongly encouraged not to mix. The aim of this study was to investigate the outbreak, its clinical consequences, and potential contributing factors.

Method Notes of all patients admitted to the CF ward in May 2016 were retrospectively reviewed and data recorded included: patient location, respiratory viral PCR results, spirometry data (baseline measurements in the 6 month prior to onset, at onset of influenza, and at 3 months post infection), influenza vaccination status (all staff and patients), and measurements of ventilation in patient rooms.

Results Ten patients tested positive for influenza B; all were shown to have been infected with the same strain of the virus: B/Brisbane/60/2008. An outbreak timeline identified the likely index case (only patient admitted within the incubation period of influenza, first to develop symptoms and test positive for influenza B). Subsequently, 8 patients whose rooms

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were in close proximity on the ward to the index case became infected, as did 1 patient at other end of ward. Influenza B infection was followed by an average reduction in FEV_1 of 10.54% (SD 11.25) at the time of infection (p=0.0124). Follow-up data demonstrated a persistent FEV_1 reduction of 10.50% (SD 5.95) 3 months post infection (p=0.0034). 70% of patients on the ward and 62% of staff had received the seasonal influenza vaccine. Further investigation revealed this to be a trivalent influenza vaccine that did not cover the strain B/Brisbane/60/2008. A ward ventilation survey identified that ventilation measurements in affected patient rooms ranged from 1.75 to 2.10 air changes/hour, well below DOH recommendations of 6 air changes/hour for single patient rooms.

Conclusion The influenza B outbreak at the MACFC had a detrimental effect on patients' lung function, which was still present after 3 months. Inadequate ward ventilation and a lack of protection from the influenza vaccine given to patients and staff may have contributed to the spread of the virus.

P246 THE IMPACT THE INTRODUCTION OF A UNIVERSAL PAYMENT BY RESULTS ANNUAL TARIFF CF CENTRES UPON THE NORTH SOUTH DIVIDE IN ENGLAND

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Background Our preliminary work demonstrated inequalities in key demographic characteristics, clinical outcomes and medication use in Cystic Fibrosis (CF) patients between the relatively economically disadvantaged North of England compared to the South. The analyses presented here aimed to assess if this North-South divide has been closed following the introduction of a new and equal CF payment policy ("banding") in 2012.

Methods We compared the cross-sectional data from Annual Review Encounter in 2010 and 2015 for patients registered on the UK CF Registry. The data for each year were analysed separately and the North/South Results compared. We used Wilcoxon and t-tests to compare continuous outcomes, and the chi-squared test to compare proportions.

Results The 2010 and 2015 cohorts included 6417 and 8007 patients, respectively (Table 1). There were no significant gender differences. Mean age of the populations increased, the significantly higher age in the South in 2010 levelled out by 2015. A new gap in overall lung function emerged in 2015: 72.24% vs 73.5% (p=0.041), the significantly higher FEV_1 in children in the South remained, although the gap narrowed from 3.27% to 1.7%. The better FEV_1 in adults in the North disappeared post banding. More patients in the North were diagnosed before turning 3 months. Prescription of key medications (DNase and Hypertonic saline) increased overall between 2010 and 2015 but higher use in the South remained (p<0.001). Rates of chronic *Pseudomonas aeuginosa* fell but remain significantly higher in the North. Rates of MSSA and NTM remain higher in the South.

Conclusions There appears to be a closing of the North-South gap in some key areas such as FEV_1 and age, this may suggest improved outcomes although survival analysis is not possible on small cohorts such as these. The higher use in the South of the high cost drug DNase must now be down to clinician preference rather than funding problems. These markers of overall improvements (higher mean age, higher FEV_1, lower *Pseudomonas*) may be associated with the introduction of equality of funding in England but could equally represent improved care in general with similar improvements seen in other international registries.

Abstract P246 Table 1 Patient characteristics

	Pre Banding (2010 Annual Review Encounter)		Post Banding (2015 Annual Review Encounter)	
Outcome	**South of England/North of England (n=3017/3400)**		**South of England/North of England (n=3887/4120)**	
	Summary statistics	p-value	Summary statistics	p-value
Age: Mean±SD	19.71±13.24/18.81 ±12.52	0.0052	20.82±14.23/20.3 ±13.78	0.0967
Median	18/18		19/19	
Gender, n(%) Female	1423 (47.17)/1578 (46.41)		1870 (48.11)/1894 (45.97)	
Age at diagnosis, n (%)				
<3 months; n (%)	1280 (42.43)/1590 (46.76)	0.0052	1852 (47.65)/2121 (51.48)	<0.001
≥18 years; n (%)	188 (6.23)/191 (5.62)	0.2296	295 (7.59)/258 (6.26)	0.0216
FEV1 percent predicted				
(Overall) Mean±SD	70.98±24.66/71.23 ±24.23	0.7172	73.5±24.53/72.24 ±24.84	0.041
Age<16 Mean±SD	84.51±17.99/81.57 ±19.80	0.0022	87.78±17.37/86.08 ±17.66	0.0361
Age≥16 Mean±SD	64.69±24.81/66.73 ±24.61	0.0153	67.6±24.63/66.6 ±25.13	0.1754
Hypertonic Saline (n (%))	433 (14.35)/311 (9.15)	<0.001	1319 (33.93)/860 (20.87)	<0.001
Dornase Alfa (n(%))	1394 (46.2)/1393 (40.97)	<0.001	2572 (66.17)/2274 (55.19)	<0.001
Chronic macrolides (n (%))	1284 (42.56)/1445 (42.5)	0.9822	1498 (38.54)/1607 (39.00)	0.6856
Asthma (n(%))	534 (17.7)/393 (11.56)	<0.001	685 (17.62)/538 (13.06)	<0.001
CFRD (n(%))	528 (30.14)/623 (32.5)	0.1325	838 (53.51)/957 (57.34)	0.0389
NTM (n(%))	116 (3.84)/55 (1.62)	<0.001	297 (7.64)/193 (4.68)	0.001
Pseudomonas (n(%))	1058 (35.07)/1359 (39.97)	<0.001	1100 (28.3)/1332 (32.33)	0.0269

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