

Results 15 people were excluded from the analysis for both years. The cohort increased from n = 166 in 2013 to n = 170 in 2014, with a similar increase in the number of people with I-neb data for ≥ 3 months (n = 83 in 2013, n = 85 in 2014). Median nebuliser adherence improved from 40.5% in 2013 to 49.5% in 2014. The median FEV1 remained stable at 79% while BMI improved slightly from 22.0 in 2013 to 22.7 in 2014. The total IV days reduced by 657 from 3970 in 2013 to 3313 in 2014; a potential saving of around £156,000.

Conclusion Although adherence remains a challenging issue, these data suggest the potential of benefits of improved adherence. More work will be needed to examine the adherence data in more detail and to collect further longitudinal data to determine if there is a clear trend of improvement.

P275 PREVALENCE AND STRAIN TYPING RESULTS OF GRAM-NEGATIVE EMERGING BACTERIAL PATHOGENS IN PATIENTS ATTENDING A LARGE UK ADULT CF CENTRE

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Introduction In recent years Gram-negative bacterial emerging pathogens (EP) have been noted to infect the airways of patients with CF. Prevalence of EP is increasing but much remains unknown. This study aimed to determine prevalence of EP at a large adult UK centre and whether these organisms may be capable of cross infection.

Methods Prevalence of *Burkholderia multivorans*; *Stenotrophomonas maltophilia* and *Achromobacter*; *Ralstonia* and *Pandoraea* species was calculated in October 2013 and 2014. Strain typing was performed on EP isolated from patients from January 2008 to present using pulsed-field gel electrophoresis following restriction with *Xba*I. Epidemiology of patients with shared strains was analysed by reviewing patient addresses, outpatient appointments, admissions, paediatric centres and asking patients about their social behaviours.

Results In October 2013, 358 patients had at least 1 sputum culture result in the previous 12 months and were included in the prevalence calculation. This increased to 368 patients in October 2014. Prevalence of most EP increased between 2013 and 2014. EP prevalence in 2014 ranged from 1.9% (*Ralstonia* species) to 6.2% (*B. multivorans*) (Table 1). 96 patients had ≥ 1 isolation of an EP between January 2008 and July 2015. Of these, 20 (21%) have had >2 strains of EP isolated from their sputum within that timeframe. To date, strain typing has been performed on 97 of 115 identified isolates from 96 patients. Shared strains of EP in unrelated patients with epidemiological connexions other than place of home residence were found in cases of infection with *Achromobacter*, *Ralstonia* and *Pandoraea* species. Shared strains of *B. multivorans* were found in a sibling pair, an unrelated pair with no temporal overlap in positive cultures and in 4 patients with no clear opportunities for cross infection to have occurred.

Conclusions Prevalence of EP is low at our centre but is slowly increasing. History of EP infection appears to be a risk factor for infection with other EPs. Shared strains of *Achromobacter*, *Ralstonia* and *Pandoraea* species have been identified in our centre in patients with epidemiological connexions. Numbers are too small to establish whether cross infection or a common environmental source is responsible.

Abstract P275 Table 1 Prevalence of Gram-negative bacterial emerging pathogens at Manchester Adult Cystic Fibrosis Centre 2013 and 2014

Organism	Prevalence October 2013, % (number of patients)	Prevalence October 2014, % (number of patients)
<i>Burkholderia multivorans</i>	6.4 (23)	6.2 (23)
<i>Achromobacter</i> species	4.5 (16)	5.1 (19)
<i>Stenotrophomonas maltophilia</i>	3.4 (12)	4.6 (17)
<i>Pandoraea</i> species	2.2 (8)	2.4 (9)
<i>Ralstonia</i> species	1.4 (5)	1.9 (7)

P276 THE PREVALENCE OF TICARCILLIN HYPER-SUSCEPTIBLE PSEUDOMONAS AERUGINOSA ISOLATES FROM NON CYSTIC FIBROSIS BRONCHIECTASIS PATIENTS COMPARED TO PATIENTS WITH CYSTIC FIBROSIS AND CONTROLS

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Background and aims *Pseudomonas aeruginosa* (PsA) is associated with considerable morbidity and mortality in Non-Cystic Fibrosis bronchiectasis (NCFB) and Cystic Fibrosis (CF) patients. Ticarcillin, a carboxypenicillin, is occasionally used in NCFB and CF to treat pulmonary exacerbations. In CF, a subpopulation of PsA exists that is hypersusceptible to ticarcillin (Tichs) *in vitro*, (minimum inhibitory concentration [MIC] <4 μ g/ml). This phenotype, is associated with reduced MICs to β -lactams, fluoroquinolones, tetracyclines and a degree of resistance to aminoglycosides.

The aim of this study was to investigate whether this Tichs strain exists in NCFB patients and compare this to the prevalence rates from CF and control cohorts. We also assessed whether this strain correlated with enhanced susceptibility to temocillin and other anti-pseudomonal antibiotics.

Methods 18 isolates of PsA from NCFB patients, 23 PsA isolates from CF patients and 18 PsA isolates from controls with no chronic lung disease were analysed. MICs for each isolate were determined by agar dilution using ISO20776-1 for the antibiotics listed in Table 1 and interpreted using EUCAST breakpoints.

Results The NCFB isolates had the highest prevalence of the Tichs strain of the three cohorts we tested, with a prevalence of 76%, compared to a prevalence of 48% in the CF cohort and 0% in the controls. Resistant strains of PsA were more prevalent in the CF cohort compared to the NCFB and control cohorts, except for temocillin and ticarcillin where the CF and NCFB cohorts had lower MICs compared to the control cohort (Table 1).

The Tichs strain in NCFB and CF was associated with reduced MICs to all antibiotics apart from ciprofloxacin in comparison to the non-Tichs strain. In CF, the Tichs strain was also associated with increased MICs to gentamicin.

Conclusion Our data supports the existence of a Tichs strain of PsA in NCFB patients, which existed in greater prevalence compared to our CF cohort. This appears to correlate with reduced MICs to temocillin, to which PsA would normally be resistant.

Abstract P276 Table 1 MIC range, MIC 50, MIC 90 and % resistant *P.aeruginosa* isolates for Cystic Fibrosis (CF), Non Cystic Fibrosis Bronchiectasis (NCFB) and controls (C)

	Meropenem			Ceftazidime			Ticarcillin			Tetocillin			Ciprofloxacin			Gentamicin		
	CF	NCFB	C	CF	NCFB	C	CF	NCFB	C	CF	NCFB	C	CF	NCFB	C	CF	NCFB	C
MIC Range	0.008-16	0.008-32	0.008-8	0.25-128	0.125-64	2-16	0.125-128	0.125-16	16-128	0.5-128	0.064-128	8-128	0.03-16	0.032-32	0.03-4	1-64	0.032-4	0.25-4
MIC 50	0.5	0.125	0.125	4	1.5	4	8	1	32	8	4	128	1	0.25	0.06	2	0.25	1
MIC 90	4	4	1	128	8	16	128	128	128	128	128	128	4	32	0.5	64	2	2
% Resistant	21%	18%	6%	28%	12%	16%	36%	18%	74%	NA	NA	NA	63%	47%	7%	32%	0%	0%
% Sensitive	79%	82%	94%	72%	88%	84%	64%	82%	26%	NA	NA	NA	37%	53%	93%	68%	100%	100%
EUCAST BP	S≤ 2, R>8			S≤ 8, R>8			S≤ 16, R>16			NA			S≤ 0.5, R>1			S≤4, R>4		

Therefore, temocillin may provide a useful alternative to the current anti-pseudomonal antibiotics in treating NCFB and CF patients.

prognosis and 5 year mortality risk can be estimated from a lung function test widely available and frequently performed as opposed to CPET which is only available in specialist centres.

P277 **PHYSIOLOGICAL RESPONSE TO EXERCISE IN AN ADULT CYSTIC FIBROSIS POPULATION: INVESTIGATING THE RELATIONSHIP BETWEEN HRR AT ANAEROBIC THRESHOLD AND FEV1% PREDICTED**

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Introduction Cystic Fibrosis (CF) is an autosomal, recessive disease characterised by a mutation or dysfunction. Patients suffer a number of complications caused by poor sodium and chloride transport across cell membranes leading to viscous secretions. The disease is life limiting and around 85% of these early deaths are a result of respiratory failure with the most accurate prognosis marker being maximum volume of oxygen utilisation ($VO_{2\max}$). This parameter is affected by a number of factors and can be increased or preserved through correct exercise prescription. For maximal benefits exercise should be targeted around anaerobic threshold however this is not easily identifiable during regular activities.

Method 15 patients with CF underwent Cardiopulmonary exercise testing (CPET) to establish whether there was a significant correlation between Forced Expiratory Volume in one second percent predicted ($FEV_1\%$) and Heart Rate Reserve (HRR) at Anaerobic Threshold (AT) as a method of giving an easily monitored parameter (Heart Rate) as a target during exercise, for a given severity of lung disease, to gain maximal benefits from the activity.

Results The correlation between $FEV_1\%$ and HRR at AT was found to be very weak, $r(13) = 0.269$, $p > 0.05$ however there was a strong correlation between $FEV_1\%$ and Maximum volume of utilised oxygen percent Predicted ($VO_{2\max}\%$), $r(13) = 0.601$, $p < 0.05$.

Discussion This study shows that $FEV_1\%$ can not be used as a predictor of HRR at AT, however the lack of correlation does show a narrow window for HRR in which patients with CF should aim in order to exercise near AT and ultimately improve their fitness and prognosis. The strong correlation between $FEV_1\%$ and $VO_{2\max}\%$ serves a great purpose in the that

P278 **IS THERE A ROLE FOR TELEMEDICINE IN CYSTIC FIBROSIS? A SYSTEMATIC REVIEW**

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Background As a result of new medical advances people with CF are now able to live longer but still require frequent specialist care input and support. To cope with an ever increasing complex condition and demand for care, CF centres are having to rethink the way they work. Telemedicine is an evolving field which has the advantage of remote monitoring and real time review and may provide a solution.

Objectives To determine whether telemedicine has a role in the management of CF in terms of: 1) Feasibility and acceptability, 2) Early pulmonary exacerbation detection, and 3) Self-management and improving adherence to prescribed therapies.

Methods A systematic search was undertaken to identify relevant studies. This involved seven electronic databases, the top four peer reviewed journals reporting on CF and telemedicine, and the three major conference proceedings in CF and telemedicine. Clinical trial registers were searched to find ongoing studies as supplementary evidence. A mixed methods synthesis was performed to combine results from quantitative and qualitative studies.

Results 34 studies in total were included in the results synthesis. These consisted of mainly small pilot and feasibility studies. There were 7 RCTs largely reporting interim results rather than efficacy data. Rates of adherence to telemedicine varied between 10.16 to 59% but were generally poor with barriers including frequent measures being a burden, forgetting, and denial of results. There was a general consensus that pulmonary exacerbations can be detected early but no statistical tests of significance performed. There were also only 2 studies predominantly reporting qualitative evidence. After corroborating the results using thematic synthesis this led to 3 main themes (expectations, technical aspects, and impacts of telemedicine) linked to these were barriers and facilitators.