Since January 2020 Elsevier has created a COVID-19 resource centre with free information in English and Mandarin on the novel coronavirus COVID-19. The COVID-19 resource centre is hosted on Elsevier Connect, the company's public news and information website.

Elsevier hereby grants permission to make all its COVID-19-related research that is available on the COVID-19 resource centre - including this research content - immediately available in PubMed Central and other publicly funded repositories, such as the WHO COVID database with rights for unrestricted research re-use and analyses in any form or by any means with acknowledgement of the original source. These permissions are granted for free by Elsevier for as long as the COVID-19 resource centre remains active.
P137
COVID-19 in cystic fibrosis patients with and without lung transplantation: the Zurich cohort
C. Steinack1, R. Hage1, F. Gautschi1, M.M. Schuermans1, 1Zuerich, Pulmonology, Zuerich, Switzerland

Objectives: Reports on short- and long-term presentations of COVID-19 in CF patients is limited. We aimed to describe clinical features and outcomes of all our CF patients with laboratory confirmed COVID-19 between March 2020 and January 2021 (ongoing observation).

Methods: Retrospective review of clinical data and treatment of CF patients with COVID-19 confirmed by RT-PCR or serological evidence (n = 11).

Results: Mean age at presentation was 32 (23–48) years, 27% (n = 3) were female. Six patients (55%) had a previous lung transplantation (post-Ltx). Two patients were on modulator therapy (Trikafta® and Symdeco®). The most common presenting symptoms were cough (36%), fever (27%), headache (27%) and dyspnea (18%). Nine patients (82%) had mild disease and were treated as outpatients. Two patients (18%) were post-LTx and were hospitalised with severe disease (1 on the normal ward, 1 in the intensive care unit). The most notable laboratory findings were lymphopenia, and elevated levels of C-reactive protein. In the two hospitalised patients, computed tomography of the chest showed ground-glass opacities with consolidations; 1 patient additionally had a small pleural effusion. These 2 patients were treated with remdesivir, as well as broad-spectrum antibiotics (meropenem). The patients with mild disease were treated with co-amoxicillin (n = 3, 27%). Dexamethasone was given in selected cases. Mechanical ventilation was not necessary for any of these patients. The hospitalised patients received oxygen by nasal cannula and high-flow oxygen therapy. All patients recovered. Residual symptoms are being monitored.

Conclusion: This is the first study of an adult CF-COVID-19 cohort in Switzerland, which included patients who underwent lung transplantation. Cough, fever, headache and dyspnea were the most common symptoms. Two patients (27%) had severe disease. The majority had a benign course and long-term symptoms are still under investigation.

P138
Rapid implementation of virtual clinics during the COVID-19 pandemic
D. Nazareth1, C. Summer1, M. Walshaw1, 1Liverpool Heart and Chest Hospital, Adult CF Unit, Liverpool, United Kingdom

Introduction: At the start of the UK COVID-19 pandemic, people with cystic fibrosis (pwCF) were designated “extremely clinically vulnerable,” underwent shielding, with face-to-face clinical contact postponed. Prior to lockdown, we had cancelled routine CF clinics and used this unique opportunity to rapidly redesign outpatient services providing remote video-assisted consultations (VAC) with digital technology. VAC also enabled vulnerable shielding MDT members or those self-isolating to provide care. We describe our experience in rolling out VAC.

Methods and results: We initially used AccurX®, a healthcare provider (HCP) text message-initiated video call service. From March 20th–April 17th 2020, 192 physician-led VACs were completed to support pwCF with the lowest FEV1% in our clinic. From April 18th we moved to the NHS England and NHS Improvement supported secure Attend Anywhere service with pre-arranged appointment times, constructing 10 bespoke MDT waiting areas to replicate the in-person clinic format. From October 2020, attendance was higher at FTF appointments than telemedicine-naive centre: clinical challenges, outcomes, and user experience in the first 6 months of a global pandemic

D. Morrissey1, T. Vagg1, M. McCarthy1, J. Dorgan1, C. Fleming1, C. Howlett1, J.A. Eustace2, B.J. Plant1, 1Cork University Hospital, Cork Adult Cystic Fibrosis Centre, Cork, Ireland; 2University College Cork, HRB Clinical Research Facility-Cork, Cork, Ireland

Background: COVID-19 made it necessary to establish telemedicine as a first default for reviews in a previously telemedicine-naive clinic.

Conclusions: The telemedicine service is generally popular with pwCF, and engagement with the service has been good. Clinicians need to be aware that technology issues may hamper appointment attendance and interaction for some users.

P140
TeCC (TeleMedicine, Cystic Fibrosis, Corona-Virus) study in a previous telemedicine-naive centre: clinical challenges, outcomes, and user experience in the first six months of a global pandemic
D. Morrissey1, T. Vagg1, M. McCarthy1, J. Dorgan1, C. Fleming1, C. Howlett1, J.A. Eustace2, B.J. Plant1, 1Cork University Hospital, Cork Adult Cystic Fibrosis Centre, Cork, Ireland; 2University College Cork, HRB Clinical Research Facility-Cork, Cork, Ireland

Background: COVID-19 made it necessary to establish telemedicine as a first default for reviews in a previously telemedicine-naive clinic.

Methods: Utilising a multidisciplinary team (MDT) approach, we established a ‘Covid Pack’ of medical equipment (sent to each patient) and a suitable video conference platform to replicate the in-person clinic format. The virtual clinic was then rolled out (94 patients reviewed in the first 6
months). A retrospective chart review comparing patients’ clinical metrics pre- and post-rollout was then conducted. Usability and Acceptance were also measured with patients (p) and staff (s) via a number of standardised surveys: System Usability Scale (SUS), TeleHealth Usability Questionnaire (TUQ), IT Familiarity, and our own quality-survey.

**Results:** The Covid Pack permits adequate spirometric assessment of patients (mean bias ~2.5%). Preliminary data collected from 52 patients and 11 staff members show an overall positive response to our remote-clinics. The SUS received a median score of 90 (p) and 87.5 (s) out of 100. The TUQ received a total score of 6.52 (p) and 6.1 (s) out of 7, with ease of Use and Learnability as the highest-ranked category in the TUQ (median 7, range 3.6–7) and Reliability as the lowest-ranked category (median 5.33, range 2–7). The IT Familiarity questionnaire received an average median score of 1 (very familiar) from both groups. Qualitative data collected via a custom survey show that while patients and staff are positive to the convenience of the remote clinic, the facility for an in-person, face-to-face review remains important, as does good WiFi connection.

**Conclusion:** Initial 6-month data are positive for the remote clinic as a first default during the pandemic. Preliminary data shows a positive trend for the usability and acceptance by all stakeholders, but it is not a replacement for physical clinics.

### P141

**Has the COVID-19 pandemic affected medication adherence to inhaled nebulised therapy for patients at a large adult cystic fibrosis centre?**

N. Iqbal1, Z. Nadat1, J.E. Vessey1, J.K. Martin1, A.L. Brennan1,2, R.J. Bright-Thomas1,2, H.D. Green1,2, A.M. Jones1,2, P.J. Barry1,2.

**Manchester University Foundation Trust Wythenshawe, Manchester Adult Cystic Fibrosis Centre, Manchester, United Kingdom;2University of Manchester, Respiratory Research Group, Division of Infection, Immunity & Respiratory Medicine, Manchester, United Kingdom**

**Objectives:** The COVID-19 pandemic has led to immense challenges for healthcare systems worldwide. People with cystic fibrosis (CF) were included in the clinically extremely vulnerable group for complications of coronavirus by the UK government and advised to shield during a national lockdown. Data suggests that pandemic-related restrictions have been linked to a reduction in pulmonary exacerbation events (PEx). We sought to explore whether an increase in medicine possession ratio and potentially adherence may be a factor in this finding.

**Methods:** 50 patients who received medication through a homecare delivery system at a single large adult centre were randomly selected. Data from 12 months ‘pre-lockdown’ was compared to data for 9 months following start of shielding in March 2020. MPR was calculated and capped at 100%. Medications that were started or stopped during the pandemic were not included. Wilcoxon signed rank test was used to compare pre- and post-values.

**Results:** 91 prescription medications were valid for analysis (45 nebulised antibiotics, 34 mucolytics and 12 CFTR modulators). MPR increased for 41 prescriptions (45.1%), decreased for 21 medications (23.1%) and remained unchanged for 29 medications (31.9%). Median MPR increased from 83% [57–100%] to 89% [66–100%], p = 0.037. MPR for nebulised antibiotics significantly increased (median 75% [54–100%] vs 89% [61–100%], p = 0.027); Median MPR for CFTR modulators was 100% throughout and did not change for mucolytics (75% [42–100%]) vs 78% [53–100%], p = 0.419.

**Conclusion:** We report a significant change in medication possession in adults with CF during the coronavirus pandemic in the UK. It is unclear whether this change translated to an increase in adherence but may be one factor in the reported decrease in PEx events described during this time. It is notable that increases were largely driven by inhaled antibiotics and this may represent a concerted effort to achieve maximal protection from infection.

### Microbiology/Antibiotics

**P142**

**Lung and gut microbiota signatures in cystic fibrosis mice challenged with Pseudomonas aeruginosa**

A. Revizuo1, G. Bacis2, A. Rossu3, F. Armanioni3, L. Cangiotti3, N. Segata4, A. Mengoni5, A. Bragonzi6, 7Enea, Italian National Agency for New Technologies, Energy and Sustainable Economic Development, Sustainability, Rome, Italy;2Università di Firenze, BioBio, Sesto Fiorentino, Firenze, Italy;3IRCCS San Raffaele Scientific Institute, Infections and Cystic Fibrosis Unit, Division of Immunology, Transplantation and Infectious Diseases, Milan, Italy;4University of Trento, CIBIO, Trento, Italy

**Objectives:** Among the many facets of cystic fibrosis (CF), the microbiological status of patients is of great interest due to the recurrent, chronic microbial infection of the airways. In addition to airway microbiome alteration, CF patients show altered faecal microbiomes as well, correlated with gastrointestinal inflammation and nutrient malabsorption. However, whether this dysbiosis is directly caused by mutations in the CFTR gene is not fully clarified. The aim of this work was to evaluate the response of the lung and gut microbiota in wild type and CF mice in the naïve state and after *Pseudomonas aeruginosa* chronic infection.

**Methods:** We focused our analysis on lung, stool, and gut microbiota targeting the 16S ribosomal RNA gene aiming to shed light on the comparative response of lung and gut microbiota following infection by *P. aeruginosa* in wild-type and gut-corrected CF mice.

**Results:** Alpha diversity indices showed in WT mice higher values than in KO mice for stool and gut, while lung microbiota was similar. In CF mice, infection with *P. aeruginosa* did not affect the microbiota diversity in both stool and gut, while a drop of lung microbiota occurred with respect to the control, as would be expected as a consequence of the massive colonisation by the *P. aeruginosa* strain. We found that *P. aeruginosa* infection affected the gut microbiota of CF mice, while no effect was found in wild-type mice. This finding indicates that the pulmonary chronic infection in CF mice may lead to intestinal mucosa not directly related to CFTR lack of expression in the gut.

**Conclusion:** Overall our results reinforce the hypothesis of an indirect correlation between the lung and gut microbiota in the presence of CF lung colonisation by *P. aeruginosa*.

**Acknowledgements:** This work was supported by the Italian Cystic Fibrosis Research Foundation (FFC), Research Project Number FFC#19/17/2017.

**P143**

**Microevolution of Pseudomonas aeruginosa in the lungs of patients with cystic fibrosis**

L. Avetisyan1, M. Chernukha1, E. Sivanyova1, O. Medvedeva1, E. Burmistrov1, E. Rusakova1, E. Kondrateva1, A. Voronkova1, S. Krasovski1, E. Zhekayte2, N. Kashirskaya2, A. Ginzburg1, 1N. F. Gamaleya National Research Centre of Epidemiology and Microbiology, Moscow, Russian Federation;2Research Centre for Medical Genetic, Moscow, Russian Federation;3Scientific Research Institute of Pulmonology, Moscow, Russian Federation

**Objectives:** Bacteria undergo evolution during chronic infection in the CF lung. The study aimed to investigate molecular mechanisms of microevolution of *P. aeruginosa* in the lungs.

**Methods:** The whole genome of 3 *P. aeruginosa* strains isolated from a patient with CF in 2006 (70L), 2012 (203–2) and 2016 (159B) were sequenced. For genome analysis, we used BLAST, RAST, ResFinder, Provean programs.

**Results:** BLAST analysis showed that strains were of clonal origin: they have a common ancestor. Genome analysis showed microevolution of strains during persistence for 10 years. The evolutionary process was because of genetic changes: 1. horizontal gene transfer, for example, the strain 203–2 had aac(3)-Ia and blaTEM genes obtained with plasmid; 2. mutations in