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.

Results: No significant changes were noted at 3-Mo for all variables. Mucus plugging score (MPS) and QAT A1 & A2 demonstrated significant changes at 1- and 2-yrs. Significant changes in the air trapping score (ATS), bronchiectasis score (BS), and total score (TS) were noted at 2-yrs, with change occurring for the BS and TS between Yr-1 and Yr-2. Non-parametric log-rank testing for evaluating significant trends between baseline, 3-mo, 1-yr, and 2-yrs revealed significant progression for all CT variables (Brody scoring, & QAT) except for bronchial wall thickness score and % predicted FEV_1 and $FEF_{25-75\%}$. Spearman correlation coefficients between longitudinally measured variables revealed higher overall correlations between QAT A1, A2, & A3 and Brody BS, BWTS, & MPS as well as % pred. FEV_1 and $FEF_{25-75\%}$ than the ATS. For predicting 2-year change in the TS by multiple linear regression, 1-yr changes in QAT A2 and A3 were statistically significant, and MPS nearly significant (QAT A2 & A3: P = 0.022 & 0.019; MPS: p = 0.079), whereas ATS at baseline or 1-yr change in ATS were not statistically significant (p = 0.279 & p = 0.626).
Conclusion: Changes in QAT and MPS over a 1-yr time interval have meaningful associations with overall 2-yr changes in TS, and correlate more strongly with BS than either the ATS or spirometric measurements.

EPS4.4
Correlation between long-term changes in LCI, FEV_1 and CFCT score in children with cystic fibrosis

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Introduction: While cross-sectional correlations are described between Lung Clearance Index (LCI) and FEV_1, FEV_1 and chest CT score, and LCI and chest CT score, it is not known how the long term changes in these markers of lung disease in CF correlate.
Methods: In this prospective monocentric observational cohort study, 36 patients with CF were followed during 3.1 ± 1.3 years. LCI was measured using nitrogen multiple breath washout (Exhalyzer D). For each patient, yearly change in chest CT score was calculated (change in CFCT score/duration of follow-up), as well as the slope for LCI and for FEV_1%pred (coefficient of the regression line through all LCI or through the simultaneous FEV_1%pred, with a median of 6 tests per patient (range 2–19)). The Spearman rank correlation was used to assess correlations between parameters.
Results: At the start of the follow-up (age 11.4 ± 3.6 years), LCI was 9.1 ± 2.8, FEV_1%pred 91.8 ± 15.3 and CFCT score (% of max score) 15 ± 11. Of the 36 patients, 19 had a normal LCI (<8.3), 31 a normal FEV_1%pred (>=80%), and 8 a normal CFCT-score (<5%). Cross-sectional correlations were found between LCI and FEV_1%pred (R = 0.548, p < 0.001), LCI and CFCT score (R = 0.749, p < 0.001), and FEV_1%pred and CFCT score (R = 0.492, p = 0.003). Over a mean follow-up of 3.1 ± 1.3 years, LCI increased with a mean slope of +0.5/year (95%CI +0.2 +1.3, p = 0.002), and LCI increased in 28/36 patients. FEV_1%pred declined (−1.9%/year, 95%CI −0.1 −3.6, p = 0.023), with a decline in 24/36 patients. CFCT score increased (+0.9%/year, 95%CI +0.3 +1.6, p = 0.006), 26/36 patients having an increase in CFCT.
There was a correlation between the slopes for LCI and FEV_1%pred (R = −0.608, p < 0.001), LCI and CFCT score (R = 0.537, p = 0.001) and FEV_1%pred and CFCT score (R = −0.458, p = 0.006).
Conclusion: Long term changes in LCI, FEV_1%pred and CFCT scores were correlated in children with CF.

EPS4.5
Epidemiology of viral respiratory tract infections in a paediatric CF centre

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Background: The exact mechanism resulting in pulmonary exacerbations of CF is poorly understood. Viral respiratory tract infections may contribute by enhancing inflammation and favouring infection by bacterial pathogens. It is unclear whether this is secondary to acquiring new bacteria or the clonal expansion of existing strains.
Objectives: To evaluate the epidemiology of viral respiratory tract infections in paediatric CF and review the isolation of associated new bacterial pathogens.
Methods: A 12 month retrospective observational study involving paediatric patients with CF who had extended virology PCR testing at the time of pulmonary exacerbation.
Results: 56 children (29 male, 32 female) with a mean age of 8 years (range 6 months–17 years) had a total of 279 nasal swabs for extended virology over a 12 month period. 68% of swabs were positive for at least 1 virus. Rhinovirus was the commonest isolate (60%). Other predominant viruses in children ≤5 years included adenovirus (14%) and parainfluenza 3 (8%). In children ≥6 years, this included coronavirus HKU1 (7%) and parainfluenza 3 (5%). Bocavirus and metapneumovirus were commoner in younger children. A new positive bacterial isolate was seen mostly with rhinovirus infections and included, *Haemophilus influenzae* (n = 4), *Staphylococcus aureus* (n = 4), *Pseudomonas aeruginosa* (n = 4) and *Stenotrophomonas maltophilia* (n = 4). Males were most at risk of recurrent positive virology isolates (n = 20). 98% did not warrant hospital admission. 1 case required hospitalisation secondary to Influenza A and H1N1. Positive isolates were highest between September to December across all age groups.
Conclusion: Viral respiratory infections contribute to pulmonary exacerbations in paediatric CF. The majority of cases do not require hospitalisation. Rhinovirus is common across all age groups and can be associated with new bacterial isolates.

EPS4.6
Inherent differences in multiple breath washout (MBW) using N_2 and SF_6 demonstrated by simultaneous analysis with respiratory mass spectrometry (RMS)

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Background: We have previously reported that MBW using N_2 and SF_6 produce different lung clearance index (LCI) results, higher for N_2, even when washouts are simultaneous. These discrepancies reflect both the differences in hardware and analysis algorithms as well as true differences in the lung washout of SF_6 and N_2. RMS allows direct measurement of N_2 and SF_6 simultaneously. We have used this to explore the intrinsic differences between N_2 and SF_6 washout.
Methods: 10 healthy controls completed MBW tests in duplicate. Exhalyzer D (ExD/N_2) and modified Innocor (Inn/SF_6) were attached in series (as previously described); with an RMS sample line placed between. RMS was tuned to measure 1% SF_6 and washout was conducted using 100% O_2. End tidal gas concentrations of SF_6 and N_2 were used to track and compare washout progression to $1/40^{th}$ of tracer gas starting concentration.
Results: In RMS, N_2 MBW took significantly longer than SF_6 (total washout breaths 45.8 ± 19 vs 34.5 ± 12.4, p = 0.005). Total washout breath number did not differ between RMS & ExD for N_2 or RMS & Inn for SF_6. Direct comparison between Inn and ExD in this set up requires adjustment for different deadspaces.
Conclusion: N_2 is slower to washout, and requires more breaths to do so, than SF_6. When gases are analysed simultaneously on the RMS, it is related to intrinsic differences in the gases rather than equipment differences. Results obtained with N_2 and SF_6 are not interchangeable. We propose that indices derived from MBW should be reported together with the technique used as is conventional for FRC measurements.

EPS4.7
Cytokine dynamics in upper airway epithelial lining fluid of CF patients in relation to the status of colonization with *Pseudomonas aeruginosa*

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