

24) compared to the NGT group (n = 58). No change in  $VO_{2peak}$  was identified over time, however, a significant decrease was discovered for  $FEV_1$  (%pred) in the NGT group between T0 and T1 (p = 0.02).

**Conclusions** Patients with CFRD have a reduced aerobic and ventilatory function compared to non-CFRD counterparts. Whilst a decrease in lung function was observed longitudinally, no change in  $VO_{2peak}$  was found, thus alluding to how aerobic and ventilatory functions provide different clinical organ and systemic outcomes in CF. Future research building upon these findings should assist with future management strategies to increase the longevity and quality of life of those with CFRD.

**P128 THE USE OF THORACIC CT TO DETERMINE BONE MINERAL DENSITY IN ADULTS AND CHILDREN WITH CYSTIC FIBROSIS**

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10.1136/thorax-2020-BTSAbstracts.273

**Introduction** Cystic fibrosis (CF) related bone disease is a common extra-pulmonary complication associated with low bone mineral density (BMD). It is common practice to undertake routine assessment of BMD using dual-energy x-ray absorptiometry (DXA). Andrade *et al.* Eur Respir J. 2019;53(6):1900066 showed a significant positive correlation (r 0.74, p<0.001) between the Hounsfield score (HU), an attenuation coefficient measured on standardised computerised tomography (CT), with BMD from DXA in 18 CF children. This could potentially reduce the burden of DXA scanning for patients who have undergone a clinically indicated CT chest. We aimed to confirm this in a larger population of children and adults with CF.

**Methods** Retrospective cross-sectional study of patients with CF who underwent thoracic CT and lumbar DXA scan within a 12-month interval. HU score was measured in thoracic vertebrae 10–12. Z-scores and BMD ( $g/cm^2$ ) were recorded for lumbar vertebrae 1–4. Data were tested with Pearson correlation coefficient after normality testing with Kolmogorov-Smirnov. Data is reported as mean (SD).

**Results** 37 paired scans from 36 patients were evaluated (Table 1). Mean BMD by DXA was  $1.10 g/cm^2$  (0.19) and by CT 234.89 HU (56.26). No significant correlation was observed between these methods in this group (r 0.24, p0.15). A subgroup analysis of paired scans from 27 patients who all

underwent CT using identical parameters (120 kV, automatic mA modulation, CT kernel B70f) showed a moderate but significant, correlation (r 0.55, p0.003).

**Discussion** The difference in correlation compared with Andrade *et al.* may be influenced by discrepancies in patient characteristics, with the pilot study reporting a mean age 16 years and median DXA z-score of 0.65. Andrade *et al.* set a shorter interval between DXA and CT at 3 months, whilst our study allowed 12 months.

**Conclusion** The data presented here from an interim analysis of 36 patients does not support the use of HU as a measurement of bone density in CF. However, when standardised CT protocols are examined there is evidence of a moderate correlation. At the time of Congress we expect to share results from a five-year period, including longitudinal data for individual patients.

**P129 RADIATION EXPOSURE AMONG ADULTS WITH CYSTIC FIBROSIS: TRENDS AND THEMES**

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10.1136/thorax-2020-BTSAbstracts.274

**Introduction** Although the average UK dose from medical ionising radiation is 0.44 mSv (PHE-CRCE-026, 2011), people with CF (pwCF) undergo many such investigations for the management of their disease. With improving survival their life-time exposure, a risk factor for the development of malignancy, may be important. We therefore monitored this radiation exposure in our adult CF center and wished to look for any trends over time.

**Methods** We calculated the estimated effective dose (EED) of ionising radiation using standard reference values (HPA-CRCE-034, 2011; PHE-CRCE-013, 2010), and applied this to all procedures carried out in pwCF at our centre 2017–19, comparing it to that in 2010.

**Results** There were 2,630 investigations in 327 pwCF 2017–19 and 693 in 253 in 2010 (mean [SD] yearly EED  $1.49 \pm 3.85$  mSv, versus  $1.66 \pm 3.76$  mSv respectively [p=0.56]): 217 pwCF in 2017–19 had an average yearly EED <0.44 mSv.

A similar number of examinations were carried out in each time period (2.7 versus 2.8 per person), predominantly thoracic (76% versus 84%), of which most was CT imaging (89% versus 80% respectively).

In 2017–19, EED was higher in those with chronic *Pseudomonas aeruginosa* infection ( $1.56 \pm 3.90$  mSv versus  $1.27 \pm 3.68$  mSv; p<0.001), non-tuberculous mycobacterium (NTM) ( $1.52 \pm 2.57$  mSv versus  $1.49 \pm 4.05$  mSv, p<0.001) and CF-related diabetes ( $1.56 \pm 4.04$  mSv versus  $1.14 \pm 3.65$  mSv; p<0.001). Thirteen pwCF (4%) had a yearly average EED of  $\geq 10$  mSv ( $16.33 m \pm 13.07$  Sv in those 7 with malignancy).

**Conclusions** Although radiation exposure remains high amongst pwCF, in keeping with other published reports (Plant *et al.*), there was no upward trend in EED over time, and a similar number of procedures were performed per person.

As expected, pwCF with more complications had higher radiation exposure, underlining the need to maintain vigilance for comorbidities in this complex chronic disease.

**Abstract P128 Table 1** Table of demographic data for 36 patients (37 comparisons between DXA and CT)

Patient Characteristic	Number of DXA and CT comparisons (n = 37)
Median Age in years (IQR)	23 (17; 28)
Gender	9 M : 28 F (24% : 76%)
Pancreatic Insufficiency	28 (76%)
Homozygous <i>F508del</i>	12 (32%)
Median BMI (IQR)	20.9 (19.6; 24)
Mean z-score DXA (SD)	-0.18 (1.14)