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Title: Ventilation inhomogeneity (VI) and spirometry in response to intravenous antibiotics (IVab) in cystic fibrosis (CF)

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Body: Introduction: The value of Lung Clearance Index (LCI) in assessing CF lung disease is not established. One study found improvement in LCI and FEV₁ with IVab.¹ Another found improvement in FEV₁ only, after inhaled antibiotics.² Our aim was to compare changes in indices from multi-breath N₂ washout (MBNW), including VI in the lung periphery (S_{acin}, S_{cond}) with changes in FEV₁ after 2 weeks antibiotics. Method: Children did spirometry and MBNW in triplicate at start and end of routine IVab. Differences were analysed by paired t-test. Results: Eight children (9-17y) completed all tests. Overall there were no statistically significant changes.

Mean(SD) measurements pre(A) and post(B) antibiotics

	A	B	Mean%change	p
LCI	12.2(4.3)	12.5(4.1)	-3.8	0.31
Scond(L-1)	0.052(0.047)	0.065(0.053)	-58.7	0.12
Sacin(L-1)	0.115(0.104)	0.143(0.105)	-37.6	0.33
FEV1(L)	2.06(0.59)	2.03(0.51)	0.67	0.58
FEV1z-score	-1.53(1.1)	-1.60(1.2)	-12.6	0.67

No individual changes in FEV₁>10% were seen. Taking a change in LCI >5% as clinically significant¹, LCI worsened in 4 children and improved in 1. The clinical significance of change in S_{acin} and S_{cond} is unknown but both increased in 5 and decreased in 3, without concordance. When changes in FEV₁ were compared with those in VI indices there was no consistency in the direction or size of change. Conclusion: We found no concordance between FEV₁ and MBNW indices after IVab. The changes were small; bigger changes might have led to concordance. In contrast with others, our patients did not improve after antibiotics, perhaps because they were stable at the start and, being younger, had less advanced disease. Ref:1) Robinson P et

al 2009 PedPulm; 44:733. (2) Horsley, A. 2009. PhD thesis.