Title: Multi-breath Nitrogen Washout in Children: How does the breathing pattern impact on the measurements?

Application deadline: Applications accepted all year round

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Funding: Self-funding only

Summary (max 200 words)

Multi-breath nitrogen washout has been used for many years to measure Functional Residual Capacity (FRC), and as a test of ventilatory inhomogeneity. Ventilatory inhomogeneity is commonly expressed in terms of Lung Clearance Index, which is a robust index that is comparable across individuals of different age and size. More detailed analysis of the exhaled nitrogen signal permits inhomogeneities in conducting and acinar airways to be examined separately. This has been applied to adult patients and healthy volunteers and shown to differentiate between health and different clinical conditions. In adults it is straightforward to impose a consistent depth of breathing: the same is not true in children because of the large differences in lung size across the age range available for study. We have applied a strategy to standardise the test in children, but it is important to establish more precisely the impact of breathing pattern on outcomes, and if this is different in health and disease. Improved characterisation of the test will mean that it can be applied more effectively in assessing and monitoring lung disease in children.