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Title: Hand-held tidal breathing nasal nitric oxide measurement as a targeted case-finding tool for primary ciliary dyskinesia

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Body: BACKGROUND: Nasal Nitric Oxide (nNO) measurement is a sensitive supplementary tool in diagnosis of Primary Ciliary Dyskinesia (PCD). Tidal Breathing (TB) nNO requires minimal cooperation, has potential as more widespread targeted case-finding tool for PCD in all age groups, and discriminative capacity between PCD and non-PCD has been previously established using stationary nNO analyzer (Marthin JK and Nielsen KG. Eur Respir J 2011; 37: 559-565). AIM: Assess validity of hand-held TBnNO in a selected population. METHODS: TBnNO was measured in PCDs, cystic fibrosis (CF) patients and healthy subjects (HS) using both an electrochemical hand-held device, NIOX MINO® Nasal equipped with a nasal research application, and two chemiluminiscence stationary systems: NIOX® and ANALYZER CLD 88sp®. All systems allow passive nasal sampling at a flow rate of 5 ml/s during tidal breathing. 2 ml/s sampling is an additional option with NIOX MINO® Nasal. Data were analysed by ROCC and Bland-Altman plots. RESULTS: TBnNO values were compared in 41 subjects between 0.3 and 57 years: 15 PCDs, 13 CF patients, and 13 HS. MINO discriminated significantly between PCD and HS ($P<0.001$) and between CF and PCD ($P<0.001$).

	MINO5	MINO2	NIOX	ANALYZER CLD 88sp
Cut off, ppb (PCD vs HS)	142	363	202	175
Sensitivity, %	100	100	100	100
Specificity, %	100	92.3	100	100
CV% (all subjects)	10.5	19.4	13.8	13.7
LoA#, ppb (PCDs only)	-43.9 to 87.5	-120 to 89.5	-	-25.5 to 44.8

Limits of Agreement: NIOX as reference method

CONCLUSION: Hand-held TBnNO separated significantly between PCD and HS, and between PCD and CF, with cut off value and sensitivity/specificity comparable to those of stationary systems.