

# Reproducibility of the Vivatmopro measurements for exhaled nitric oxide values

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## Abstract

Portable monitoring devices allow fraction exhaled nitric oxide (FeNO) measurements outside clinical settings. However, the reproducibility of the new portable device Vivatmo pro is not yet fully established. In this study, we aimed to assess the reproducibility of this device for FeNO measurements.

Paired FeNO measurements were obtained from 7 adult subjects (27–48 y; 5 females), in accordance with the ATS/ERS guidelines, at two sessions throughout 45 days. FeNO values were logarithmically transformed. Intra-class correlation coefficients (ICC) were calculated and Bland–Altman plots created to illustrate the 95% limits of agreement (LOA). Furthermore, comparisons between FeNO values obtained with a new or a previously-used mouthpiece were performed.

A total of 299 paired FeNO values were collected, ranging from 0 to 102 ppb. ICCs ranged from 0.83 to 0.95 for paired measures and the mean (sd) difference was –1.1 (1.2) ppb (LOA ranging –5.8 to 7.4 ppb). Also, FeNO values were significantly lower when using a new mouthpiece ( $p < .001$ ). Regarding within-day reproducibility, ICCs were lower (0.31 to 0.89) and a higher degree of variability was observed (mean (sd) –1.4 (3.1) ppb; LOA ranging –8.4 to 11.3 ppb). Considering only FeNO values >50 ppb, similar findings were seen for both reproducibility measures.

Our findings indicate an acceptable reproducibility between measures and a within-day reproducibility with high variability, when measuring FeNO using Vivatmo pro, in adult subjects.

Within-day changes must, therefore, be interpreted with caution. Our data reinforces the need to use a new mouthpiece for each measurement.