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**Title:** Utility of an electronic nose in discriminating obstructive sleep apnea and COPD by breath fingerprints analysis

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**Body:** Introduction: the diagnosis of two major respiratory causes of sleep disturbances, Obstructive Sleep Apnea Syndrome (OSAS) and Chronic Obstructive Pulmonary Disease (COPD), is technically demanding, cost-intensive and time consuming. The measurement of volatile organic compounds (VOCs) by an electronic nose device is an innovative method to determine distinct molecular patterns of exhaled breath in different patient groups, and its potential use in OSAS and COPD, distinctly, has recently been evaluated (1,2). We assessed whether breath fingerprints analysis can effectively distinguish OSAS from COPD. Methods: we included 19 OSAS patients and 20 COPD (6 hypoxemic). Exhaled breath of all participants was analyzed using an e-Nose, based on an array of eight Quartz Micro Balance covered with biomaterial as non-selective sensing materials. Partial Discriminant Analysis was employed to test our hypothesis. Results: we identified a discriminant function separating OSAS from COPD. The electronic nose percentage of correct classification was 93% (36/39). Conclusions: the electronic nose is highly efficient in distinguishing OSAS from COPD. This technology could be employed in large screenings to address, in a simple and not expensive way, patients with suspected respiratory disorders to the adequate test without delays and waste of resources. References Incalzi RA, Pennazza G, Scarlata S, et al. Reproducibility and respiratory function correlates of exhaled breath fingerprint in chronic obstructive pulmonary disease. PLoS One. 2012;7:e45396. doi:10.1371/Greulich T, Hattesoehl A, Grabisch A et al. Detection of obstructive sleep apnoea by an electronic nose. Eur Respir J 2012[Epub Ahead of print]. PMID: 23100503.