

# TORAKS

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## FENO VALUES IN OTHER DISEASES EXCEPT ASTHMA

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In asthma, fractional exhaled nitric oxide (FeNO) is a well-established, non-invasive method for the assessment of active, mainly T-helper 2 (Th2) -driven airway inflammation, often associated with airway eosinophilia, which is sensitive to treatment with inhaled corticosteroids (ICSs). Consequently, for more than a decade, FeNO has been implicated as a valued tool in the diagnosis and monitoring of corticosteroid-sensitive asthma. More recently, FeNO has been evaluated in several other respiratory, allergic, infectious, and/or immunological conditions. In this short review, we provide an overview of applying FeNO measurements in several clinical conditions.

### INCREASED FeNO values:

- 1) Acute viral infections ("Rhinovirus") - viral infections are strong inducers of eosinophilic inflammation.
- 2) Cardiac insufficiency - tissue hypoxia is strong inducer of NO synthesis.
- 3) Hypersensitive pneumonitis - mainly because of strong eosinophilic inflammation.
- 4) Psoriasis - large concentrations of fibroblasts, keratinocytes and melanocytes in psoriatic areas produce large amounts of NO.
- 5) Sex-related differences - after controlling for all of the significant factors affecting FeNO, the sex-related differences in FeNO remained significant - FeNO is on average 25% higher in males than females.
- 6) BOS (bronchiolitis obliterans syndrome) in lung transplants - there is significant increase of NO values in the early phases of BOS due to increased activity of iNOS

### DECREASED FeNO values:

- 1) Pulmonary artery hypertension - there is decreased activity of endothelial NOS due to endothelial destruction.

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- 2) Cystic fibrosis - increased diffusion barrier due to intraluminal mucus impactions
- 3) Active smoking - decreased activity of endothelial NOS
- 4) Stable COPD (without acute infection) - presence of the competitive NOS inhibitor ADMA in COPD sputum and accumulation of ADMA in the airways of COPD patients results in a shunt of L-arginine away from NO synthases towards the arginase pathway. Increased arginase activity leads to degradation of NO.

Still today, the majority of clinical decision making is being based on symptom control and lung function parameters. For the future, we will need reliable and simply measurable biomarkers that can guide our clinical and treatment decisions and help us to monitor treatment effects as well as predicting future deteriorations. In asthma, the clinical importance of FeNO as a marker of Th2-driven inflammation that is likely to respond to ICSs is well-established. In other respiratory conditions, such as CF, PCD, and PAH, low NO levels (FeNO) may be valuable diagnostic or disease monitoring tools.