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**Title:** High-flow oxygen therapy in COPD patients: Optimised oxygen delivery

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**Body:** Introduction COPD is a leading cause of death and is often related to chronic hypoxemia. Long-term oxygen therapy (LTOT) is a well established treatment. High-Flow oxygen treatment (HFOT), the nasal insufflation of warm, humidified air at a high flow rate, is a new and simplified method in not-invasive ventilation. Until now, no data concerning HFOT in COPD patients are available. Aim Our studies were designed to assess the safety and efficacy of HFOT in COPD patients compared to conventional oxygen therapy and to examine possible changes in oxygenation. Methods Inclusion criteria: COPD °IV, indication for LTOT, 30-80 yr, clinical stable and Hb > 8.5 g/l. Oxygen (O<sub>2</sub>) supplementation was performed with a TNI® 20s oxy-system (15 L/min) or with a standard oxygen delivering system. O<sub>2</sub> adaptation was performed in 10 min intervals until a paO<sub>2</sub> ≥ 60mmHg was achieved. Blood gas analyses were performed from the hyperaemic earlobe. Results 60 patients were enrolled: 45 male, 15 female, mean age: 66.3 yr, FEV<sub>1</sub> (pred): 12-49 %. HFOT was well tolerated and was sensed as comfortable. A significant decrease of paCO<sub>2</sub> could be measured (-1.45 mmHg; p = 0.018) when compared to conventional oxygen administration. Oxygen delivery trends to be lower with HFOT (-0.23 L/min). By using the high-flow system with 15 L/min the delivered mean FiO<sub>2</sub> was 31.7 % compared to the FiO<sub>2</sub> of 100 % delivered by conventional oxygen treatment (p = 0.0001). Conclusion In conclusion, treatment with high-flow nasal insufflation is safe in patients with severe COPD on LTOT treatment. Lower amounts of delivered O<sub>2</sub> seem to be necessary to oxygenate the patient. Trials for longer periods are planned to further prove efficiency of HFOT.