

**PHARYNGEAL OXYGEN CONCENTRATION IN NORMAL SUBJECTS WEARING HIGH FLOW NASAL CANNULA**

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**INTRODUCTION:** Nasal Cannulas (NC) are often used to deliver oxygen in the acute and chronic care settings. We measured the pharyngeal oxygen concentrations (OC) delivered by heated high flow NC (Vapotherm® Inc.) at 5, 10, 15, 20, 25, 30, and 35 liters (L) heated to 37° Celsius (C) in 10 normal subjects. **METHOD:** O<sub>2</sub> by NC was initiated at 5 L, with the subject at rest. Gas samples were aspirated from a nasal catheter positioned with the tip in the nasopharynx. Three samples were obtained while the subject was breathing with mouth open, and three with the mouth closed, and a final sample was obtained while the subject was breathing rapidly. This process was repeated at each L flow setting. **RESULTS:** The mean (SD) and range for OC at prescribed flow rates were:

Flow (L/min)	Pharyngeal Oxygen Concentration (%)		
	Resting Breathing		Hyperventilating
	Mouth Open	Mouth Closed	
	Mean (SD)	Mean (SD)	Mean (SD)
5	53 (18)	48 (19)	51 (24)
10	74 (15)	62 (13)	58 (16)
15	84 (11)	69 (15)	69 (15)
20	83 (8)	88 (11)	81 (13)
25	90 (6)	85 (7)	86 (9)
30	92 (5)	91 (5)	89 (7)
35	93 (5)	92 (4)	88 (6)

Statistical significance was found for a higher OC breathing with mouth open vs. mouth closed (p < 0.00057) and a higher OC breathing with mouth open vs. rapid breathing (p < 0.0028).

**CONCLUSION:** OC delivered by High flow NC varied widely between subjects. The data shows increasing flow does increase OC and that high flow NC are capable of providing high OC. Our data supports an OC ≥ 80% on flows of ≥ 20 L/min in most cases. A statistical significant (p<0.05) higher OC was attained breathing with mouth open vs. mouth closed.

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