Title: Humidification of inspired oxygen is increased with a pre-nasal cannula compared to intranasal cannula

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Body: Background: Oxygen can be given pre- or intra-nasally ± humidification. How this impacts intra-nasal humidity has not been investigated. Objective: To investigate nasal humidity during pre-nasal and intra-nasal oxygen administration with and without humidification. Method: We first developed and validated a sampling and analysis system.

By means of this system we measured nasal humidity in 12 individuals who received nasal oxygen with an intra-nasal and pre-nasal cannula at different flows ± humidification. Results In our subjects intranasal humidity dropped significantly from 40.3 ± 8.7 % to 35.3 ± 5.8 %, 32 ± 6.6 % and 29.0 ± 6.8 % at a flow of one, two and three litres respectively when oxygen was given intra-nasally without humidification (p=0.001, p<0.001 and p<0.001 respectively).

We observed no significant change in airway humidity when oxygen was given pre-nasally without humidification. Conclusion: Pre-nasal administration of dry oxygen achieves similar levels of intranasal humidity as intranasal administration in combination with a bubble through humidifier. Pre-nasal oxygen simplifies application and may reduce therapy cost.