

# Intermittent Inhalations of Concentrated Oxygen have a Transient Effect on Blood Oxygen Saturation at Very High Altitude: An Observational Study

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## *Introduction*

Canned oxygen products are widely available for consumer purchase and are often marketed towards individuals recreating at high altitude. Little investigation has been done to evaluate any physiologic effect of intermittent inhalations of concentrated oxygen on individuals at altitude.

## *Methods*

50 individuals were enrolled in a convenience sample at the summit of Mount Blue Sky in Colorado, USA (elevation 4307 meters). Pulse oximetry was monitored while participants self-administered one and three stacked breaths of 95% canned oxygen. Baseline and peak oxygen saturation (SpO<sub>2</sub>) after both 1 and 3 breaths were recorded. Paired t-test analyses were completed to compare baseline vs peak SpO<sub>2</sub>.

## *Results*

Mean baseline oxygen saturation at rest was 83.9% (SD 5.52). A single breath resulted in an increase in blood oxygen saturation (mean absolute increase 9.3%,  $p < 0.0001$ ), and three breaths resulted in a similar effect (mean absolute increase 8.2%,  $p < 0.0001$ ). There was no difference between the magnitude of change in SpO<sub>2</sub> following one vs three breaths ( $p = 0.11$ ). This effect was transient, with an average time to peak of 65.4s (SD 28.1) followed by an immediate downtrend. 17 individuals returned to baseline (defined as  $\pm 2\%$  absolute difference) within 2 minutes (Mean absolute difference 3.8%,  $p < 0.0001$ ).

## *Conclusions*

These data show an increase in blood oxygen saturation following intermittent oxygen administration among healthy individuals at altitude. This effect was not sustained. All participants downtrended immediately and many returned to near-baseline in a short period of time. More research is needed to characterize the therapeutic significance of this physiologic change.