

LABORATORY CABIN SIMULATION TESTING ACCURATELY REPLICATES IN-FLIGHT OXYGENATION IN NORMALS

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Background: Investigating the normal oxygenation response to cabin simulation testing (CST) and air travel provides a comparative base for the interpretation of a response in passengers that might be considered ‘at risk’ to air travel.

Aim: Investigate the degree of de-saturation in normal individuals during CST and commercial air travel.

Methods: 15 healthy adults (age 23-57; 10 females) volunteered for this study. Baseline pre-flight measurements included; full lung function; arterial blood gas; SpO₂ and CST [FIO₂ 15%]. SpO₂ and cabin altitude was measured continuously on each participant during a commercial air flight. In-flight responses were compared to the pre-flight laboratory tests.

Results: Pre-flight lung function testing results were normal. Participants were exposed to a mean in-flight cruise cabin altitude of 2178 ± 197m (SD). Mean flight time was 2.03 ± 0.57 hours (SD). Oxygenation changes were highly significant during the CST and at cruising altitude compared to pre-measures. There was no significant difference between the CST SpO₂ and the in-flight SpO₂. No adverse events were reported during the CST and the flight.

	PaO₂ Lab (mmHg) Mean ± SD	SaO₂ Lab (%) Mean ± SD	SpO₂ lab (%) Mean ± SD	SpO₂ flight (%) Mean ± SD
Resting	89.0 ± 10.8	97.5 ± 0.8	98 ± 2	97 ± 1 (pre-flight)
CST	57.6* ± 4.0	92.3* ± 2.0	92* ± 2	92* ± 2 (cruise altitude)

*Compared to resting/pre-flight (P<0.0001)

Conclusion: Oxygen saturation decreases significantly during air travel in normal individuals. In this group of healthy volunteers, CST accurately replicates in-flight oxygenation. These results can be used to describe a normal response to CST and air-travel.

Key Words: Air travel, oxygenation, cabin simulation test.

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