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THE EFFECTS OF HYPOXIA AND EXERCISE ON PHYSIOLOGICAL AND
COGNITIVE PERFORMANCE (98 PP.)

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PURPOSE: The purpose of the current investigation was to determine the effects of hypoxia (12.5% O₂) and low intensity exercise (50% of hypoxic VO₂max) on physiological and cognitive performance in a middle-aged group. **METHODS:** Eight physically active (35.9 ± 5.7 ml·kg⁻¹·min⁻¹), middle-aged (40.5 ± 2 yr) males volunteered to participate in the present investigation. Prior to experimental testing, participants underwent a graded exercise test (Excalibur 1300W cycle ergometer) to estimate VO₂max in hypoxia. Following pre-experimental testing participants underwent three 5h trials [hypoxia (H), hypoxia with exercise (H+E) and normoxia with exercise (N+E)] consisting of 2h baseline, 1h cycling, 2h recovery. All testing was conducted in a simulated hypoxia chamber (Colorado Altitude Training, Louisville, CO), and oxygen was maintained at 12.5%. Minute Ventilation (VE), Oxygen Consumption (VO₂), Heart Rate (HR), Mean Arterial Pressure (MAP), Arterial Oxygen Saturation (SaO₂) and Cerebral Oxygenation (rSO₂) were measured prior to entering the chamber and every 30 min. In addition, Mood State (POMS), Acute Mountain Sickness (AMS) and Trail Making Tests (TMT) were measured prior to entering the chamber and measured at five different time points (at 30min and every hr). **RESULTS:** VE and HR significantly increased during hypoxia and hypoxic exercise ($p < 0.05$). SaO₂ and rSO₂ decreased

significantly during hypoxia ($p < 0.05$), and decreased further during hypoxic exercise ($p < 0.05$). Cognitive function declined during hypoxia ($P < 0.05$), but hypoxic exercise did not alter cognitive function ($p > 0.05$). Moreover, mood state was not changed significantly during pre- and post-exercise during hypoxia ($p > 0.05$). **CONCLUSION:** These data suggest that normobaric hypoxia induces physiological changes, and in turn results in cognitive dysfunction. Low intensity exercise during normobaric hypoxia leads to further physiological changes, but does not impact cognitive performance.