



Driving After Concussion: Is it Safe to Drive After Symptoms Resolve?

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Abstract Category: Post-Injury Assessment

Title: Driving After Concussion: Is it Safe to Drive After Symptoms Resolve?

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Objective: To compare simulated driving performance between concussed and control participants.

Design: Cross-sectional.

Setting: Laboratory.

Participants: Fourteen concussed participants and 14 non-concussed age and driving experience matched controls with no neurological disorders, medications causing drowsiness, or heavy drugs/alcohol use (Age:20.3years, 95%CI:19.9,20.7).

Interventions (or Assessment of Risk Factors): Participants completed a 7.6 minute, 20.5km driving simulation task containing curves, crosswalks, accidents, rural/urban areas, pedestrians, overtaking, and evasion. Concussed participants completed driving simulation within 48 hours of becoming asymptomatic (15.9 days post-concussion, 95%CI:10.7,21.0) and were deemed clinically recovered by a medical professional using a multifaceted concussion evaluation.

Outcome measures: We compared total number of accidents, tickets, and lane excursions between groups. We also compared average velocity (km/hr), standard deviation of velocity, lateral lane position (m), and lateral lane position standard deviation throughout simulation subsections. One-way ANOVAs were used ($\alpha=0.05$).

Main Results: Concussed participants committed more frequent lane excursions compared to controls (concussed: 10.9, 95%CI:8.3,13.5; controls: 7.4, 95%CI:6.0,8.8; $p=0.02$). Concussed participants exhibited greater lateral lane position standard deviation compared to controls during the first (concussed: 1.1m, 95%CI: 0.8,1.5; controls:0.7m, 95%CI:0.6, 0.9; $p=0.02$) and final curve (concussed: 1.2m, 95%CI:1.1,1.3; controls: 1.0m, 95%CI:0.9,1.1; $p=0.04$).

Conclusions: Despite being considered clinically recovered, concussed participants were less able to center the vehicle in the lane and entered the shoulder more frequently, especially when navigating curves. A concussion may impair visual, motor, and/or cognitive skills necessary to safely drive. Further research is needed to determine when it is safe to return to driving following concussion.