



**HAL**  
open science

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

Julianne Schmidt, Hannes Devos, Nicole Hoffman, Maud Ranchet, Abiodun Emmanuel Akinwuntan, L. Stephen Miller

► **To cite this version:**

Julianne Schmidt, Hannes Devos, Nicole Hoffman, Maud Ranchet, Abiodun Emmanuel Akinwuntan, et al.. Driving After Concussion: Is it Safe to Drive After Symptoms Resolve?. Concussion in Sport 5th International Consensus Conference, Oct 2016, BERLIN, Germany. 1 p. hal-01458163v1

**HAL Id: hal-01458163**

**<https://hal.science/hal-01458163v1>**

Submitted on 6 Feb 2017 (v1), last revised 28 Feb 2017 (v2)

**HAL** is a multi-disciplinary open access archive for the deposit and dissemination of scientific research documents, whether they are published or not. The documents may come from teaching and research institutions in France or abroad, or from public or private research centers.

L'archive ouverte pluridisciplinaire **HAL**, est destinée au dépôt et à la diffusion de documents scientifiques de niveau recherche, publiés ou non, émanant des établissements d'enseignement et de recherche français ou étrangers, des laboratoires publics ou privés.

**Abstract Category:** Post-Injury Assessment

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

**Authors:**

Julianne D. Schmidt, PhD, ATC; University of Georgia, Athens, GA

Hannes Devos, PhD, DRS; Augusta University, Augusta, GA

Nicole Hoffman, MS, ATC; University of Georgia, Athens, GA

Maud Ranchet, PhD; Augusta University, Augusta, GA

Abiodun E. Akinwuntan, PhD, MPH, MBA; University of Kansas Medical Center, Kansas City, KS

L. Stephen Miller, PhD; University of Georgia, Athens, GA

**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.