

## "Attentional and saccadic deficits following concussion"

Jeanne Langan, Erika Rodríguez, Lou Osternig, Li-Shan Chou, and Paul van Donkelaar

Concussion can lead to a number of cognitive, attentional, and sensorimotor deficits. However, these deficits are typically examined in isolation. The goal of the present research was to characterize the relationship between attentional and oculomotor dysfunctions following concussion and examine how this relationship evolved during the first month following the insult. Subjects with concussion were tested on the Attentional Network Test (ANT) and gap saccade paradigm 2 days, 5 days, 2 weeks, and 1 month post-injury. Control subjects were also tested at equivalent time periods over the course of a month. The results of the ANT demonstrated deficits following concussion, most notably during the first testing session. In particular, subjects with concussion have greater difficulties resolving visual conflict and are more reliant on cueing for orientation to the target. The attentional deficits revealed in the concussion subjects by the ANT also appear to contribute to difficulties in the generation of saccadic eye movements during the gap paradigm. In particular, within 2 days post-injury subjects with concussion displayed increased saccadic latencies when there was no temporal gap between fixation target offset and peripheral target onset. By contrast, they benefited to the same degree as controls with a 200ms gap period. We propose that this difficulty disengaging attention in the 0ms gap condition may be related to the deficits concussion subjects face when attempting to resolve visual conflict. Taken together, our results indicate that attentional and oculomotor functions are negatively affected following concussion and the impact is greatest within the first 48 hours.