

**DETERMINANTS OF PERFORMANCE ON SPECIFIC ON-ROAD SKILLS  
IN MULTIPLE SCLEROSIS**

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ABSTRACT

**Summary:** In this prospective cross-sectional study, we investigated the cognitive, visual, and motor deficits underlying poor performance during on-road driving in 102 individuals with multiple sclerosis (MS). Thirteen specific skills categorized into hierarchic clusters of operational, tactical, visuo-integrative, and mixed driving were assessed during the on-road evaluation. Stepwise regression analysis identified the off-road skills that influenced overall performance on the on-road test and in each cluster. Study results showed that visuospatial function ( $p=0.002$ ), inhibition ( $p=0.008$ ), binocular acuity ( $p=0.04$ ), vertical visual field ( $p=0.02$ ), and stereopsis ( $p=0.03$ ) together accounted for the highest variance in total on-road score ( $R^2=0.37$ ). Attentional shift ( $p=0.0004$ ), stereopsis ( $p=0.007$ ), glare recovery ( $p=0.047$ ), and use of assistive devices ( $p=0.03$ ) best predicted the operational cluster ( $R^2=0.28$ ). Visuospatial function ( $p=0.002$ ), inhibition ( $p=0.002$ ), reasoning ( $p=0.003$ ), binocular acuity ( $p=0.04$ ), and stereopsis ( $p=0.005$ ) best determined the tactical cluster ( $R^2=0.41$ ). The visuo-integrative model ( $R^2=0.12$ ) comprised binocular acuity ( $p=0.007$ ) and stereopsis ( $p=0.045$ ). Inhibition ( $p=0.0001$ ) and binocular acuity ( $p=0.001$ ) provided the best model of the mixed cluster ( $R^2=0.25$ ). These results provide more insights into the specific impairments that influence different dimensions of on-road driving and may be used as a framework for targeted driving intervention programs in MS.

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