

Title: The Interface of Sensory, Motor and Cognitive Aging: Baseline Data from the CLSA

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**Purpose:** For aging adults with one sensory impairment, everyday functioning often relies on the compensatory use of other senses. Multiple sensory impairments compromise such strategies and may increase cognitive demands during everyday functioning. The purpose of the present study was to examine the interface among age-related declines in hearing, vision, and balance and their associations with cognitive, social, and health measures.

**Method:** The prevalence of mild and moderate sensory impairment was determined for hearing, vision and balance using data from 30,097 participants (45-85 years of age) in the comprehensive cohort in the first wave of the Canadian Longitudinal Study on Aging (CLSA: Raina et al., 2009). Mild or worse hearing loss was defined as a better-ear pure-tone average > 25 dB HL (1, 2, 3, 4 kHz) and moderate or worse hearing loss as > 40 dB HL. Mild or worse vision loss was defined as a visual acuity of logMAR < 0.2 and moderate or worse vision as logMAR < 0.03. Balance loss was considered to be mild if participants could maintain static standing balance on one foot for < 5 seconds and the number who could not stand on one foot at all were also described. Multivariable regression was performed to determine the risk of co-occurrence of different types of sensory loss, and to determine the degree to which having 1, 2 or 3 types of sensory losses was associated with poorer cognitive, social and health outcomes. Analyses were stratified by sex.

**Results:** The overall prevalence of having 1, 2, or 3 mild impairments was 32.1%, 12.7%, and 3.1%, respectively. The prevalence of having just one impairment increased with age to approximately 40% at 72 years, then started to decline. Above 72 years of age, the proportion of those with multiple impairments surpassed the proportion with only one. Sensory impairments co-existed in individuals at rates higher than expected by chance. More impairments were associated with lower social participation, loneliness, poorer cognition, falls, slower gait and home care use.

**Conclusions:** Multiple sensory losses are highly prevalent among older Canadians and are associated with poorer physical, cognitive and social health, and greater use of health care. Future longitudinal research may illuminate the causes and consequences of age-related sensory declines. Directions for future practice include developing new screening approaches, improving inter-professional person-centered care, and designing age-friendly services and communities for those who multiple sensory declines and other comorbidities.

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**COI:** The authors have no conflicts of interest to declare.