

Researchers identify specific cognitive deficits in individuals with spinal cord injury

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A multidisciplinary team of researchers has identified specific cognitive deficits in individuals with spinal cord injury (SCI). Their findings support the theory of accelerated aging after SCI, and have important implications for further research.

The article, "Patterns of cognitive deficits in persons with spinal cord [injury](#) as compared with both age-matched and [older individuals](#) without spinal cord injury", was epublished ahead of print on December 3, 2018 by the *Journal of Spinal Cord Medicine*. The authors are scientists with expertise in cognitive rehabilitation and SCI rehabilitation: Nancy D. Chiaravalloti, Ph.D., Erica Weber, Ph.D., Glenn Wylie, DPhil, and Trevor Dyson-Hudson, MD, from Kessler Foundation, and Jill M. Wecht, EdD, from the James J. Peters VA Medical Center.

Individuals with chronic SCI have an increased risk for cognitive impairment, which can adversely affect recovery and overall quality of life. Concomitant brain injury fails to account for the increased risk for cognitive deficits. Multiple factors contribute to the high incidence—up to 60 percent demonstrate some degree of [cognitive impairment](#).

Developing effective interventions is dependent on precise knowledge of the types of deficits. To explore this question, the team administered a battery of neuropsychological tests to 3 groups: 60 individuals with spinal cord injury (32 paraplegia, 28 tetraplegia), 30 age-matched controls, and 20 older healthy controls. None of the tests required motor ability; these included the WAIS-III Digit Span and Letter-Number

Sequencing; Symbol Digit Modalities Test (SDMT) - oral version; California Verbal Learning Test-II; Paced Auditory Serial Addition Test (PASAT); the Wechsler Abbreviated Scale of Intelligence (WASI); Delis-Kaplan Executive Function System; and the Verbal Fluency subtest.

Significant differences were found between the SCI group and the age-matched control group, according to Dr. Chiaravalloti, director of Traumatic Brain Injury (TBI) Research, and director of the Northern New Jersey TBI Model System. "The individuals with SCI had deficits in information processing speed, verbal fluency, and new learning and memory," noted Dr. Chiaravalloti, "while their attention and working memory were unaffected. As we had postulated, their neuropsychological profile more closely aligned with that of older healthy controls. This could be a sign of accelerated brain aging after SCI, a phenomenon that has been associated with other neurological conditions."

"People often focus on mobility impairments associated with SCI; however, addressing cognitive deficits in this population is also critically important," said co-author Dr. Dyson-Hudson, director of SCI Research, and director of the Northern New Jersey SCI Model System. "Future research needs to be based on broader measures of neuropsychological function. Identifying modifiable risk factors and developing targeted cognitive interventions will help restore maximal function, and support the efforts of individuals to participate in their communities and the workforce."

More information: Nancy D. Chiaravalloti et al, Patterns of cognitive deficits in persons with spinal cord injury as compared with both age-matched and older individuals without spinal cord injury, *The Journal of Spinal Cord Medicine* (2018). [DOI: 10.1080/10790268.2018.1543103](https://doi.org/10.1080/10790268.2018.1543103)

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