

The extent of neuronal loss in the brain during MS

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Demyelination by MS. The CD68 colored tissue shows several macrophages in the area of the lesion. Original scale 1:100. Credit: [CC BY-SA 3.0](https://creativecommons.org/licenses/by-sa/3.0/) Marvin 101/Wikipedia

A study by researchers from Queen Mary University of London establishes for the first time the extent of neuronal loss in the brain of a person with MS over their life, and finds that demyelination may not be

as good an indicator of disease progression as previously thought.

By dissecting and analysing brains from nine people with MS and seven healthy controls using gold standard techniques, they found that the mean number of neurons was 14.9 billion in MS versus 24.4 billion in controls - a 39% difference.

The density of neurons in MS was smaller by 28%, and cortical volume by 26%, and they found that the whole brain was affected equally.

Importantly, the number of [neurons](#) was strongly associated with the thickness of the cortex, which is something that can be measured by MRI. The decline in volume of the cortex could therefore be detected in vivo and be used to predict neuronal loss in patients or measure neurodegeneration during [clinical trials](#).

Lead researcher Klaus Schmierer said: "Given that we found no association between neuronal loss and demyelination, trying to detect demyelinating lesions in the cortex - an area of research strongly driven by the availability of high field MRI systems - may be of lesser importance than measuring cortical volume and getting on with early active treatment."

As cortical [neuronal loss](#) is responsible for cognitive and other functions, which occur early in MS, the researchers say that to avoid neurodegeneration, early treatment is key.

More information: D Carassiti et al, Neuronal loss, demyelination and volume change in the multiple sclerosis neocortex, *Neuropathology and Applied Neurobiology* (2017). [DOI: 10.1111/nan.12405](https://doi.org/10.1111/nan.12405)

Provided by Queen Mary, University of London

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