

## News Articles Related to MS

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### Multiple sclerosis damage found in 'normal' brain tissue

The areas of demyelination, or lesions, in patients with MS can be visualized with magnetic resonance imaging (MRI). However, the volume of lesions visible at MRI only correlates moderately with clinical disability measurements. This may be due to disease activity outside the visible lesions.

To gain a better understanding of the effects of MS on the whole brain the researchers investigated T1 changes in 67 patients with MS and 24 healthy control volunteers. T1 graphs of normal appearing white and gray matter were significantly different for patients with MS than for controls. Moreover, these graphs differed among patients with MS based on the type of disease: secondary progressive (SP), relapsing-remitting (RR) or primary progressive (PP). The results were most pronounced in patients with SP disease, where at least 31 percent of normal-appearing white matter and 20 percent of cortical normal-appearing gray matter were affected. In RR disease, 16 percent of normal-appearing white matter and 9 percent of cortical normal-appearing gray matter were affected. In PP disease, the normal-appearing white and gray matter affected were 11 percent and 8 percent, respectively. These changes were found throughout the brain, including areas remote from localized lesions that are typically associated with MS.

These findings demonstrate that in MS, disease processes outside MR-visible lesions are not limited to a few sites but act throughout the brain and affect large fractions of normal-appearing white and gray matter. The results suggest that the damage to normal-appearing brain tissue plays a larger role in the progression of atrophy and clinical disability than do the visible lesions.

### DIRECT-MS Comments

These are very important findings and explain why visible lesion load does not correlate very well with disability. It also suggests the emphasis placed on lesions for disease characterization and for determining the success or failure of a given therapy should be reassessed. This invisible, immune-mediated damage needs to be taken into account for understanding the MS disease process. It appears that immune activity and consequent inflammation and damage are widespread in the CNS in MS and likely characterize the long interval between the start of the MS disease process in childhood and the eventual diagnosis with the appearance of visible lesions in early adulthood (20- 30 years)

