A demyelinating disease is any disease of the nervous system in which the myelin sheath of neurons is damaged.

This damage impairs the conduction of signals in the affected nerves. In turn, the reduction in conduction ability causes deficiency in sensation, movement, cognition, or other functions depending on which nerves are involved.

Some demyelinating diseases are caused by genetics, some by infectious agents, some by autoimmune reactions, and some by unknown factors. Organophosphates, a class of chemicals which are the active ingredients in commercial insecticides such as sheep dip, weed-killers, and flea treatment preparations for pets, etc., will also demyelinate nerves. Neuroleptics can also cause demyelination.

Demyelinating diseases are traditionally classified in two kinds: demyelinating myelinoclastic diseases and demyelinating leukodystrophic diseases. In the first group a normal and healthy myelin is destroyed by a toxic, chemical or autoimmune substance. In the second group, myelin is abnormal and degenerates.

The second group was denominated dysmyelinating diseases by Poser.

In the most known example, multiple sclerosis, there is good evidence that the body's own immune system is at least partially responsible. Acquired immune system cells called T-cells are known to be present at the site of lesions. Other immune system cells called macrophages (and possibly mast cells) also contribute to the damage.