Leukodystrophy is one of a group of disorders characterized by degeneration of the white matter in the brain.

The word leukodystrophy comes from the Greek roots leuko, white, dys, lack of, and troph, growth. The leukodystrophies are caused by imperfect growth or development of the myelin sheath, the fatty covering that acts as an insulator around nerve fibers.

When damage occurs to white matter, immune responses can lead to inflammation in the CNS, along with loss of myelin. The degeneration of white matter can be seen in a MRI and used to diagnose leukodystrophy. Leukodystrophy is characterized by specific symptoms including decreased motor function, muscle rigidity, and eventually degeneration of sight and hearing. While the disease is fatal, the age of onset is a key factor as infants are given a lifespan of 2-8 years (sometimes longer), while adults typically live more than a decade after onset. There is a great lack of treatment, although cord blood and hematopoietic stem cell transplantation (bone marrow transplant) seem to help in certain types while further research is being done.

The majority of types involve the inheritance of a recessive, dominant, or X-linked trait, while others, although involving a defective gene, are the result of spontaneous mutation rather than genetic inheritance.