The only certain measure of the effectiveness of multiple sclerosis therapy is serum neurofilament level: host

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Neuroaxonal damage is a hallmark of multiple sclerosis (MS) leading to brain atrophy, translating into progressive disability. Magnetic resonance imaging (MRI) is the current standard to quantitate brain atrophy, but is retrospective by nature. There is a need for a real-time, easy to perform and less costly biomarkers to monitor disease course and drug response, both in clinical trials and in routine clinical practice. Neurofilament light chain (NfL) is a structural protein specific to neurons. Earlier studies were done in cerebrospinal fluid (CSF) and demonstraetd that NfL levels are increased in MS and several neurological conditions that affect neuronal integrity. The recent advancement of assay sensitivity has now allowed measurement of NfL in serum and plasma to a degree that physiological levels in healthy subjects can be quantified, and a linear correlation between levels in serum and CSF has been demonstrated. In MS, a number of studies have shown that elevated NfL correlate with relapse activity and long-term disability worsening. Moreover, NfL has been established as drug response marker. However, these results are derived from cross-sectional comparison between patient cohorts in clinical trials, and longitudinal evaluation in retrospective studies. The question is now whether a) normative data bases can be established, b) the pharmakokinetics in CSF and blood can be elucidated and c) cut-off values can be established as a premise for the use of NfL for evaluation of disease activity and therapeutic decision making in individual patients.