

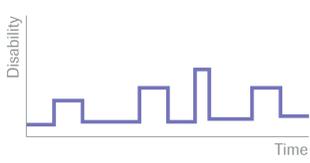
# Disease progression in multiple sclerosis

Multiple sclerosis (MS) is a complicated neurodegenerative disease. Although each person with MS experiences different symptoms and course of the disease, the underlying biology and the ways the disease can be measured are the same for everyone.



## Disability progression

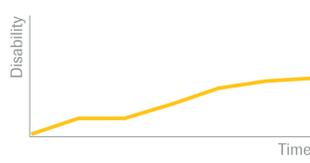
Most people with multiple sclerosis (MS) experience an increase in physical disability at some point in time.<sup>1</sup> When it happens, what kind of disability it is and how much it changes differs for everybody. The graphs below show how disability progression can vary between individuals.



Disability worsening related to relapse, with or without complete recovery



Disability worsening related to relapse without complete recovery, followed by disability progression independent of relapses



Disability progression independent of relapse

## Disease activity

In MS, the immune system attacks nerve cells in the brain, spinal cord and optic nerves.<sup>2</sup> This disease activity can cause symptoms and disability.

There are two main types of disease activity:

### Visible

Such as a relapse



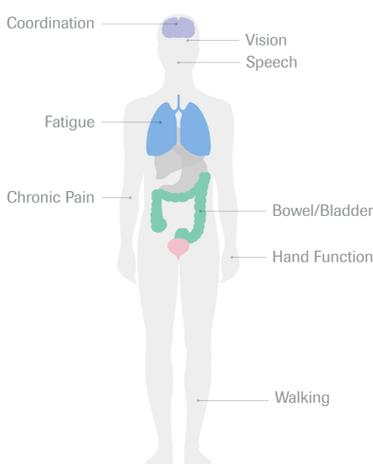
### Underlying

Detected with MRI brain scans



## Types of disability

Physical disability gets worse (progression) when disease activity causes more and more nerve cells to die (neurodegeneration).<sup>3</sup>



People may experience disability in different ways, depending on what part of the brain, spinal cord or optic nerves is affected.<sup>4</sup>

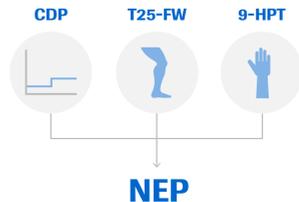
## Measuring disability

Disability is measured in different ways.



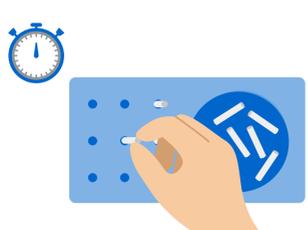
### Expanded Disability Status Scale (EDSS)

Measures the degree of physical disability based on a neurological exam of seven functional systems throughout the body, plus a person's walking ability. The EDSS and its predecessor DSS have been used in nearly every MS clinical trial in the last 40 years.<sup>5</sup>



### No Evidence of Progression (NEP)

A composite endpoint that measures the proportion of people with no confirmed progression of disability status (EDSS), walking speed (T25-FW) and upper extremity function (9-HPT) and may represent a new outcome for people with PPMS.



### Nine-Hole Peg Test (9-HPT)

Measures arm, wrist and hand function by timing the speed in which a person can move nine pegs into nine holes and then remove them, using one hand at a time.<sup>6</sup>



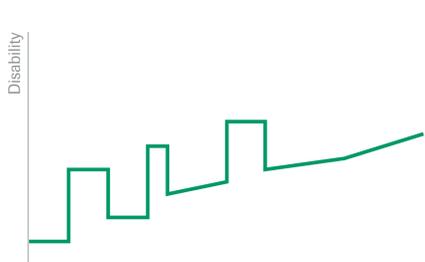
### Timed 25-Foot Walk (T25-FW)

Determines walking speed by measuring how fast a person with MS can walk 25 feet.<sup>7</sup>

## Disease-modifying treatment

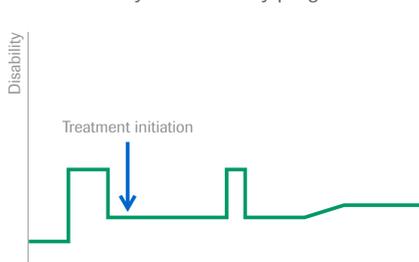
Disease activity and disability progression can occur at the earliest stage of the disease.<sup>8</sup> So one of the goals of MS treatment is to control disease activity as early as possible.

### Disability progression without treatment



### Disability progression with DMT

Early treatment with an effective DMT may reduce disease activity and disability progression<sup>9</sup>



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