Jorik Nonnekes works as a resident in rehabilitation medicine and as a post-doctoral researcher. He started to study medicine at the Radboud University Nijmegen in 2004. Jorik graduated in 2010, and obtained both his bachelor and master certificate cum laude. After graduating, he participated in a PhD-competition for talented master students at the Radboud University Medical Centre. Via this competition he obtained a personal PhD-grant in 2011, and was able to start with his PhD-project. In 2015, he obtained his PhD degree (cum laude) with his thesis entitled: ‘Balance and gait in neurodegenerative disease: what startle tells us about motor control’.

In his thesis entitled ‘Balance and gait in neurodegenerative disease: what startle tells us about motor control’, Jorik Nonnekes studied balance and gait in three different groups: healthy subjects, people with hereditary spastic paraplegia (HSP), and people with Parkinson’s disease. Studies in healthy subjects were essential to investigate unaffected control of balance and gait. Studies in HSP and Parkinson’s disease were performed to study balance and gait in two different neurodegenerative disorders that both develop slowly, but that affect different neural structures. In HSP, the corticospinal (pyramidal) tract is affected bilaterally. HSP is therefore termed a pyramidal disease. In contrast, Parkinson’s disease is a typical example of an extrapyramidal disease. In particular, the thesis focuses on the role of the brainstem reticular formation in impaired motor control. An important method that was used to study the brainstem reticular formation was the startle reflex and the StartReact paradigm, in which reaction times can be accelerated by a startling stimulus. The results of the performed studies suggest that dysfunction of the reticular formation likely contributes to gait deficits in extrapyramidal neurodegenerative diseases, but that the reticular formation plays a compensatory role in gait and balance impairments in patients with pyramidal diseases.

Last but not least, Jorik Nonnekes presents a treatment algorithm for freezing of gait, a gait disorder that is frequently seen in Parkinson’s disease. In his treatment algorithm, which is published in the Lancet Neurology, Jorik highlights the important role of combined pharmaceutical and non-pharmaceutical treatment strategies in the management of freezing of gait.