Abstract
Movement disorders, including Parkinson's disease, Huntington's disease, and cerebellar ataxia, cause movement abnormalities that differ from other neurologic disorders, such as stroke and neuropathy, because they do not include weakness. These motor symptoms are quite varied, in part due to the involvement of multiple brain structures. Some of this variation, however, may be reduced if we identify how specific motor control processes are affected. A reduction of motor command amplitude in Parkinson's disease, for example, could explain slowing of limb movements and reduction of speech volume. Our research attempts to identify the specific motor control processes that are disrupted by movement disorders and that are the basis of disparate motor symptoms. Understanding motor symptoms in terms of their motor control nature is crucial to designing rational physical interventions, device-based therapies, and—in the future—neural prostheses to replace basal ganglia and cerebellar function.