

Box 2. Agreed, expert-based definition of motor rehabilitation after stroke.

Motor rehabilitation is a process that engages people with stroke in order to benefit their motor function, activity capacity and performance in daily life. It is necessary for all people with residual motor disability whose goal is to enhance their functioning, independence and participation.

Motor rehabilitation strives to reduce motor impairments and improve functioning in activities through learning- and use-dependent mechanisms. The trajectory of motor and functional recovery varies between patients and stages of recovery. At early stages, behavioral restitution of motor function depends on the underlying mechanisms of spontaneous neurological recovery. At later stages, further functional improvements can be achieved by compensations.

Motor rehabilitation is guided by regular assessment of motor function and activity using consensus-based measures, including patient-reported outcomes. Results are discussed with the patient and their carers in order to set personal goals.

The core element of motor rehabilitation incorporates principles of motor control in which patients learn to optimize and adapt their motor, sensory and cognitive functioning through appropriately dosed, repetitive, goal-oriented, progressive, task- and context-specific training.

Motor rehabilitation supports people with stroke to maximize health, well-being and quality of life.

clinical practice and research. We addressed this by developing a framework that elaborates on each component of the definition. This framework is presented below to contextualize the motor rehabilitation definition.

Motor rehabilitation after stroke framework

Overarching concept: The International Classification of Functioning, Disability and Health

The first sentence of the definition positions it with respect to the International Classification of Functioning, Disability and Health (ICF). The ICF conceptualizes interactions between body functions and structures, activities, and participation in relation to environmental and personal factors (Figure 1).⁸ Body functions can be impaired, activities can be limited, and participation can be restricted. Assessments in the body functions domain evaluate physiological functions of body systems, such as muscle strength and synergies, coordination, pain, and muscle tone. Assessments in the activity domain evaluate the execution of tasks such as reaching and grasping, self-care, mobility and walking. The primary goal for many patients is to return to participation in their home environment and life roles. Therefore, assessments in the participation domain evaluate involvement in everyday life situations such as shopping, working, and socializing. Capacity and performance are two constructs used in the activity and participation domains. Capacity relates to what an individual can do in a standardized environment or test situation, while performance relates to what a person actually does in their habitual environment.⁸ Environmental and personal factors can be barriers or facilitators of the person's functioning. Figure 1 illustrates the ICF in the context of motor rehabilitation after stroke.

Regaining motor function is critical for independence in activities of daily living,⁹ which is associated with satisfactory quality of life. The concept of "Quality of Life" was not originally part of the ICF framework, however it has been defined by the World Health Organization¹⁰ Quality of Life Group as an "individual's perception of their position in life in the context of the culture and value systems in which they live, and in relation to their goals, expectations, standards and concerns" (p. 11). It can be thought of as an overarching concept related to all domains of the ICF.¹¹

It is important to note that the components of the ICF are interrelated in a non-linear way. An impairment in body function, such as leg muscle weakness, does not necessarily produce a limitation in walking or a restriction in participation. Furthermore, motor functions are closely related to and influenced by other body functions such as sensation, pain, cognition, mood and fatigue. All these aspects of functioning need to be considered in post-stroke motor rehabilitation.

Motor recovery

The second section of the definition reflects the biology of recovery and distinguishes between improvements at early versus later stages after stroke. Motor recovery probably occurs through a combination of spontaneous biological processes and "use-dependent" processes that include motor learning and skill acquisition.^{12,13} The interactions between spontaneous biological processes at molecular, cellular, and physiological levels and the mechanisms of learning in the first months post-stroke are still poorly understood.¹³

Most stroke rehabilitation studies use the term "recovery" as a general expression of "change" or "improvement," without distinguishing between behavioral restitution or compensation.^{12,14,15} In general, the term "motor recovery" indicates restitution of behavior after stroke, where