

Community Ambulation: Clinical Criteria for Therapists' Reasoning and Decision-making in Stroke Rehabilitation

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In stroke rehabilitation, walking function is critical to maintaining functional independence and improving daily activity levels, and is strongly associated with the quality of life post-stroke. Functional improvement should be prioritized when establishing the therapeutic strategy and selecting the means of treatment for patients with post-stroke hemiparesis. Accordingly, most clinicians recognize the recovery of walking function as the main goal in stroke rehabilitation [1]. This may be the essential criterion in the decision to discharge a patient from the initial care clinic or hospital to return to home life [2]. In general, the walking function of stroke patients has been assessed using clinic-based measurements. However, as environmental structures within clinics and hospitals are designed with functionally impaired patients in mind, this may not accurately reflect their ability for community ambulation. Although most patients can walk independently after a rehabilitation course for post-stroke functional problems, they have difficulty in returning to pre-morbid life [3], and only a few patients can perform community ambulation without any trouble [4]. In general, patients with post-stroke hemiparesis use aids such as a cane or walker to compensate their impaired walking function. However, increased dependency on walking aids aggravates body asymmetry and functional problems over time.

Community ambulation includes various outdoor activities such as visiting convenience stores, shopping malls, banks, and parks, as well as enjoying leisure activities [5]. Decreased walking function may be the main source of frustration to patients with functional impairments as this can prevent them from being able to cross a road in a limited time or walk around with people for a long time. Furthermore, they may not be able to participate in a variety of social activities and tend to avoid walking in crowded places. This can result in social isolation that exacerbates their feeling of disability and contributes to a decreased quality of life and psychosocial status [6].

For successful community ambulation, walking function must be good enough for a patient to cross a road safely. Patients are assessed as being able to walk safely in the community if they can walk at a velocity of 0.8 m/s [3]; however, in reality, the walking pace in the community environment is actually slower than this [7]. Walking function is associated with cardiorespiratory fitness and muscle strength [8]. Muscle weakness contributes to reduced physical function and impaired mobility, thus leading to reduced walking velocity and step number [9]. Cardiorespiratory fitness influences walking endurance—the ability to walk for a longer time and for a greater distance during daily activities—and may, therefore, be another assessment criterion for determining community ambulation ability. A minimum criterion to achieve successful community ambulation is the ability to walk a distance of 300 m without a rest [10]. However, this is probably very difficult for stroke patients, especially those with a slow walking speed.

In addition to walking function, patients must be able to adapt physically and cognitively to sudden disturbances in body movement when they encounter environmental barriers and unexpected events during community ambulation [3]. In addition, the assessment of self-efficacy and attention ability, which enable patients to cope with rather than avoid environmental demands and obstacles, may be important alternatives for assessing a patient's ability for community ambulation.

Fall fear, fatigue level, and depression are contributing factors to decreased self-efficacy [11,12].

Individual response to disease course and the patient attitude towards community participation are important considerations in a clinician's decision-making process. During stroke rehabilitation, a consideration of the environmental barriers likely to be encountered by a patient in the community may be essential for determining the likelihood of successful community ambulation [13]. In the past, a therapist-centered approach was considered to be important in guiding the various therapeutic activities facilitating normal movement. However, the treatment paradigm in stroke rehabilitation has shifted to a more patient-centered approach that involves establishing a problem-solving strategy whereby patients are actively involved in the decision-making process. Such a concept has been shown to be beneficial in improving physical and cognitive function [14], demonstrating how this approach could have a direct impact on community ambulation ability. The general change in approach to therapeutic strategy has seen modifications in walking training and alterations to the goal setting and planning in stroke rehabilitation. In general, intensive treadmill training—either with or without the use of body weight support, for which evidence of clinical benefit is limited—has been used clinically as an efficient tool for improving both walking function and rehabilitation motivation [15]. However, treadmill training involves simple repeated motion of the legs that is induced by the sustained movement of a treadmill belt rather than by self-control in response to physical and cognitive demands from complex environmental stimuli. Combining exposure to elements of the community environment with treadmill training may reinforce the effects of its application. Yang et al. [16] have reported that the virtual reality-based treadmill training, with simulation of the community environment during treadmill walking, improves walking velocity and community walking time in stroke patients.

Community ambulation represents an ability to negotiate various situations in community, and the training should reflect this (i. e. , a task-oriented approach). Several studies have examined the effects of modified walking training, including tasks such as going up and down stairs or navigating through obstacles in the path, both of which are situations that the patients may encounter while walking in the community [17,18]. On the basis of the results, the authors of these studies suggest that this sort of modification to the walking function training be more widely used in order to avoid the decline in

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walking function seen in stroke patients on their return to community ambulation. The general conclusion drawn from these studies is the necessity of walking training in a real-world setting, providing opportunities to experience actual conditions and places. Lord et al. [19] investigated the effects of the community-based walking training by comparing this with the motor learning approach. In their study, the community-based walking training involved practicing walking patterns and functional activities in community environments. The findings demonstrate that community-based walking training is clinically feasible and is, therefore, a practicable alternative to routine walking training. Park et al. [20] also report the importance of walking training in real environments in their study in which the level of difficulty of walking training was increased each week. Although these studies focus on walking function and the challenges of independent community ambulation in stroke rehabilitation, they also provide valuable information to support clinical reasoning and decision-making with regard to the ultimate rehabilitation goal.

Although it may be difficult to plan and implement a long-term rehabilitation service aimed at improving community ambulation, this must be thought of as an integral part of stroke rehabilitation. Community activities greatly influence physical function and quality of life after a stroke. Good clinical practice requires a good understanding of the basic factors affecting community ambulation in order to guide the use of effective training to facilitate the successful rehabilitation of stroke patients. Research efforts should also focus on exploring alternatives to existing training methods to achieve one of the greatest challenges in stroke rehabilitation.

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