

# Rehabilitation Services Provision and Payment

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**Abstract:** Persons with spinal cord injury (SCI) experience disability and have significant need for rehabilitation. To deliver appropriate rehabilitation, interventions and programs suitable services must exist. A prerequisite for system improvement is a description of rehabilitation services. The aim of this paper was to develop a rehabilitation service framework for SCI. Additionally, principles and models of payment of rehabilitation services will be discussed. Health-related rehabilitation services should be available along the continuum of care and implemented at all levels of health care. The three most important types of services are acute, postacute, and long-term rehabilitation services. Health-related rehabilitation services for patients with SCI must be able to provide high-quality equipment and a well-trained, highly specialized and multiprofessional team of rehabilitation workers. The principles of payment for SCI rehabilitation services vary according to the organization of health care systems, which primarily depends on the sources of money (eg, from national health care systems, other health insurances, or out of pocket). Funding systems and payment criteria may influence service provision and justice in service delivery. It is important to analyze the provision of rehabilitation services and the related funding system using uniform assessment and evaluation tools.

**Key Words:** Spinal Cord Injury, Rehabilitation Services, Service Organisation, Payment Systems

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There is no doubt that persons with spinal cord injury (SCI) experience disability and have significant need for rehabilitation.<sup>1</sup> It has been shown that an early onset of rehabilitation leads to better outcomes<sup>2,3</sup> and that postacute rehabilitation interventions are crucial for persons with disabilities to achieve maximum independence.<sup>4,5</sup> It is also obvious that persons with SCI have a need for long-term rehabilitation care (including assistive devices) that should be delivered near their place of residence (ie, in the community).<sup>6</sup> Consequently, the report *International Perspectives of Spinal Cord Injury* recommends that “access to rehabilitation should be as early as possible, i.e. during the acute phase of injury, and provided on a continuum to maximize functional outcomes and facilitate transition to community living” and “access to a range of assistive technologies will help accommodate changes in function and will maximize independence”.<sup>1</sup>

As functioning problems in patients with SCI concern all aspects and determinants of functioning (body structures and functions, activities, participation, and environmental and personal factors), rehabilitation must target all these domains.<sup>7,8</sup> This requires a team of well-trained and specialized rehabilitation professionals (including physical and rehabilitation medicine doctors (PRM doctors), physiotherapists (PTs), occupational therapists (OTs), psychotherapists (PSTs), social workers (SWs), and others),<sup>9,10</sup> and demonstrates that rehabilitation services are in need of highly specialized professionals working in an

efficient team. This also applies to technical resources (eg, equipment for therapies) and an appropriate barrier-free environment.<sup>11</sup> Standardized rehabilitation programs and rehabilitation guidelines clearly reflect these requirements.<sup>3,12</sup>

To deliver appropriate rehabilitation interventions and programs to persons in need, suitable services must exist. In many countries, in particular, high-resource countries, highly specialized acute, postacute, and long-term services are available; yet the standards of care vary considerably between and, in some cases, also within countries.<sup>13</sup> In many low and lower middle-income countries, such services are absent, and an appropriate infrastructure must be built up to deliver high-quality rehabilitation.<sup>14</sup>

A prerequisite for system improvement is a description of rehabilitation services and service models (optimally based on existing services).<sup>15</sup> Thus, the aim of this paper was to develop a rehabilitation service framework for SCI based on the *International Classification of Functioning, Disability and Health* conceptual description of rehabilitation services<sup>16</sup> and the proposed classification of service organization in rehabilitation.<sup>17</sup> Additionally, principles and models of payment of rehabilitation services will be discussed.

## Types of Rehabilitation Services

Rehabilitation services are conceptually described as “personal and non-personal intangible products offered to persons with a health condition experiencing or likely to experience disability or to their informal care-givers within an organizational setting in interaction between provider and person addressing individual functioning needs that aim at enabling persons to achieve and maintain optimal functioning considering the integration of other services addressing the individual’s needs including health, social, labor and educational services and delivered by rehabilitation professionals, other health professionals, or appropriately trained community-based workers”.<sup>16</sup> According to the World Health Organization (WHO) *Global Disability Action Plan 2014-2021* “Better Health

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for all People with Disability” health-related rehabilitation services should be available along the continuum of care and implemented at all levels of health care.<sup>14</sup> The three most important types of services are:

- A. *Acute rehabilitation services:* Acute rehabilitation services are delivered in hospitals at the secondary and tertiary levels. The target group is composed of patients with severe disease or injury in risk of long-term disability. Acute rehabilitation services should start even during intensive care and should be performed in multiprofessional teams (including PRM doctors, PTs, OTs, and other rehabilitation professionals). Acute rehabilitation services may be delivered in specialized acute rehabilitation wards or in mobile acute rehabilitation teams.<sup>18</sup>
- B. *Postacute rehabilitation services:* Postacute rehabilitation services should be delivered immediately or shortly after discharge from acute care hospitals. The target groups are patients with persisting impairment activity limitations and participation restrictions after acute care or trauma.<sup>19</sup> Postacute rehabilitation services improve functioning (including participation) and can contribute to an earlier discharge from hospital. For more severe cases (with limitations in mobility and activities of daily living) postacute rehabilitation should be done in in-patient postacute rehabilitation units. Patients with fewer restrictions can also be referred to outpatient postacute rehabilitation units. For patients with minor deficits single intervention services may be sufficient. Postacute rehabilitation services should be specialized for the specific disease or trauma and also must have a multiprofessional rehabilitation team.
- C. *Long-term rehabilitation services:* Long-term rehabilitation services aim to improve functioning for persons with long-term disability including congenital disability, acquired disability, and chronic diseases. They also are the main entrance point for more specialized rehabilitation if needed. Long-term rehabilitation can be performed by rehabilitation professionals (eg, PRM doctors, PTs, OTs). In many cases, primary health care professionals (eg, family doctors, primary health care rehabilitation workers) may take an important role in long-term rehabilitation. Long-term rehabilitation can be delivered in primary care rehabilitation centers and as monoprofessional long-term rehabilitation services.<sup>11,20</sup> If no specialized rehabilitation exists, community-based rehabilitation (CBR) is a model to provide some rehabilitation service to persons in need.<sup>21</sup> Community-based rehabilitation should be closely connected to an inclusive community development policy (CBD). Intermittent in-patient rehabilitation services can be used to induce and boost rehabilitation effects in patients with chronic health conditions, in particular, if they are related to psychosocial stress and vocational problems.

To classify rehabilitation services, Gutenbrunner et al.<sup>17</sup> proposed a framework (*International Classification System for Service Organization in Health-related Rehabilitation [ICSO-R]*) that uses the following dimensions<sup>17</sup>: provider (location, organization, context, facility, human resources, technical resources and equipment, quality assurance, profit-orientation,

and other categories of provider), funding (source of money, criteria of cost refund, and other criteria of funding), and service delivery (strategy, target groups, service goals, aspects of time, intensity, team structure, mode of production, and other categories of service delivery). These dimensions can be used as a framework to describe rehabilitation services for patients with SCI. The most relevant services are described in Table 1.

Generally speaking, health-related rehabilitation services for patients with SCI must be able to provide high-quality equipment and a well-trained, highly specialized, and multiprofessional team of rehabilitation workers. At the level of medical doctors, a close collaboration between different specialists (neurosurgeons, neurologists, physical and rehabilitation specialists, urologists, and others) is required to manage the complex health condition.<sup>22,23</sup> Therapists must have a wide range of qualification and must be trained in treatment methods for SCI. Multiple specializations are required (physiotherapy, occupational therapy, speech and language therapy, bowel and bladder management, prosthetics and orthotics, and others). Nurses must be specialized in rehabilitation issues and familiar with the problems of patients with SCI. As mental problems often occur and integration into social life (including labor and education) is one major goal of rehabilitation, psychotherapists and social workers should be part of the rehabilitation team. It is crucial that all these professionals work in patient-centered teams and include the relatives of the patient into the rehabilitation process. Ideally, adaptations of the home of the patients and return-to-work issues should be addressed as early as possible (the latest in the postacute rehabilitation phase). Thus, rehabilitation teams must have capacity to reach out into the community or collaborate with community-based services.<sup>23</sup>

Rehabilitation after SCI must start immediately after onset of the SCI and needs lifelong continuation.<sup>23</sup> The acute and postacute rehabilitation phase can be organized within one center, and the long-term rehabilitation services will be delivered by several service providers.

This heterogeneity must be managed by coordinating structures, which could be done by case managers, family doctors, or personnel in the specialized rehabilitation centers. Case management should include information to the care providers (eg, family doctors, physiotherapists, and occupational therapists working at primary care level) on special knowledge for the treatment and management of SCI. Patient organizations can take a central role here, too. Case management should also link to other services, such as vocational rehabilitation and training, education, adaptation of the living environment, and assistive technologies. Most assistive devices should be directly chosen by the rehabilitation team, and training to handle and use of them must be an integrated part of the rehabilitation service.

Despite these basic principles, variations of care provision are possible. For example, the ownership of services (states, insurance companies, private sector, and nongovernmental organizations) may vary, as may payment systems (per diem, per intervention, per case, or for the entire service), the specialization and role of the single team members, and the referral and case management system. Because systematic comparative studies on the service provision for patients with SCI in different countries are missing, only a few points from narrative descriptions can demonstrate some principles.

**TABLE 1.** Most relevant types of health-related rehabilitation services classified within the framework of the ICSO-R<sup>17</sup>

Phase Service ICSO-R Dimension	Acute Care		Postacute Care		Long-Term Care		
	A. Acute (Early) Rehabilitation Unit	B. In-Patient Post Acute Rehabilitation Unit	C.1 Primary Care Health Services	C.2 Community-Based Rehabilitation Service	C.3 Intermittent In-Patient Rehabilitation Service		
Provider							
1.1. Location	Centralized (within hospital)	Centralized (may be in other community than hospital)	Decentralized	Decentralized, community based	Centralized or decentralized (can be provided in same units as postacute services)	Depends on health system and local situation	
1.2. Organization	Integrated in hospital services	Integrated in hospital services or independent organization with structure referral system	Health care centers or single practices	Community			
1.3. Context	Within hospital	Stand alone in-patient center or within hospital	Stand alone primary health care center or within community	Within community	Specialized units (in-patient clinics)		
1.4. Facility	Hospital ward and mobile rehabilitation team (eg, for very early interventions on ICU's)	In-patient service structure	Facilities for single treatments	Facilities for single treatments and/or home-based interventions	In-patient service structure		
1.5. Human resources	PRM doctor, neurosurgeon, nurses, physiotherapists, occupational therapists, speech and language therapist, dysphagia therapist, rehabilitation nurse, psychologist, social worker. Other medical specialists (eg, neurologists, urologists, internal medicine specialists) should be in reach (same hospital)	PRM doctor, nurses, physiotherapists, occupational therapists, speech and language therapist, dysphagia therapist, rehabilitation nurse, psychologist, social worker. Other medical specialists (eg, neurologists, urologists, internal medicine specialists) should be in reach (same center)	PRM doctor, other specialist, or primary care physician, nurses, therapists	Therapists, nurses, community workers	PRM doctor, nurses, physiotherapists, occupational therapists, speech and language therapist, dysphagia therapist, rehabilitation nurse, psychologist, social worker. Other medical specialists (eg neurologists, urologists, internal medicine specialists) should be in reach (optimally in same center)		
1.6. Technical resources and equipment	Barrier-free ward structure (feasible also for wheel chair users), therapy room, devices for early mobilization, activities of daily living, splinting, and material for other therapies. (Diagnostic equipment of hospital also required)	Diagnostic equipment (including MRI, neurophysiology, urodynamic unit, clinical laboratory) for patients follow-up, comprehensive specialized treatment facilities, medical training, return to normal life arc, vocational training, gym, pool and others	Specialized treatment facilities and basic diagnostics	Room, basic treatment facilities	Comprehensive specialized treatment facilities and diagnostic equipment (including MRI, neurophysiology, urodynamic unit, clinical laboratory) for patients follow-up		
1.7. Quality assurance	Rehabilitation assessment, regular documented team meetings on the patients' functioning	Rehabilitation assessment, regular documented team meetings on the patients' functioning	Monoprofessional assessment	Basic assessment	Rehabilitation assessment, regular documented team meetings on the patients' functioning		
1.8. Profit orientation	Depending on health system and ownership	Depending on health system and ownership	Depending on health system and ownership	Depending on health system and ownership	Depending on health system and ownership		
1.9. Other categories of provider							
Funding							
2.1. Source of money	Depends on health funding system	Depends on health funding system	Depends on health funding system	Depends on health funding system (or in many cases funded by communities and/or NGOs)	Depends on health funding system	Depends on health funding system	

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TABLE 1. (Continued)

Phase Service ICSO-R Dimension	Acute Care		Postacute Care		Long-Term Care		
	A. Acute (Early) Rehabilitation Unit	B. In-Patient Post Acute Rehabilitation Unit	C.1 Primary Care Health Services	C.2 Community-Based Rehabilitation Service	C.3 Intermittent In-Patient Rehabilitation Service		
2.2. Criteria of cost refund	Depends on health funding system	Per-day or single therapies refund or other funding systems	Single therapies refund	Depends on 2.1	Per-day or single therapies refund or other funding systems	In some countries funded by pension insurance	
2.3. Other criteria of funding	—	—	—	—	—	—	
3.1. Strategy	Early rehabilitation (mainly training body functions and activities, preparing for participation, support coping with disease), prevention of complications of treatments and immobilization, maintenance of body functions. In cases with unclear prognosis overlap with palliation	Postacute rehabilitation (treatment of impaired functions and activities, independent living, return to normal life and/or ob, empowerment)	Treatment of functions and training of activities, rehabilitation (independent living)	Independent living	Rehabilitation, health promotion, return-to-work, independent living		
3.2. Target	SCI patients in the acute phase (with severe impairment and at risk of long-term disability). Patients must have capacity for active treatments	SCI patients with persisting complex rehabilitation needs (mostly with need of more than two therapies), and need of medical supervision and nursing	SCI patients experiencing long-term disability and other health conditions	SCI patients experiencing long-term disability	SCI patients experiencing disability (including incapability for work)		
3.3. Service goals	Basic mobility (indoor) and independent self-care. Patients at discharge must be medically stable and meet admission criteria for postacute rehabilitation or treatment in nursing home	Independent living, optimal functioning, ability to work	Improvement and maintenance of functions and activities (and participation), treatment of diseases	Maintenance (or improvement) of functions and activities (and participation), treatment of diseases	Achieve optimal functioning		
3.4. Aspects of time	Acute and early postacute phase	(Immediately) after discharge from hospital (or maximum one to 2 weeks later), mostly for several weeks or months of treatment	3 to 6 weeks or (in complex cases) long-term treatments per week or single visits	Very variable	3 to 6 weeks, treatment 5 days per week, mostly more than 2 treatments per day		
3.5. Intensity	High intensity (two or more types of treatment, treatments 7 days per week, mostly more than two treatments per day)	More than two treatments per day, mostly 5 days a week	Low intensity (single treatments or visits)	Low intensity, service on demand	More than two treatments per day, mostly 5 days a week		
3.6. Team structure	Interdisciplinary team structure with all professions involved in treatment process (see 1.5)	Interdisciplinary team structure with all professions involved in treatment process (see 1.5)	One or more professions	Single workers or team of community workers	Interdisciplinary team structure with all professions involved in treatment process (see 1.5)		
3.7. Mode of production	In-patient service in specially dedicated wards (Acute Rehabilitation Unit; ARU) as well as within ICUs and intermediate care units	In-patient service in specialized units	Out patient	Outpatient or home based	In-patient service		
3.8. Other categories of service delivery	Depending on technical equipment and team structure SCI patients with mechanical ventilation can be treated too	Services must be specialized for SCI	Referral systems to more specialized rehabilitation interventions needed	Referral systems to outpatient health services and more specialized rehabilitation interventions needed	Should be linked to primary care and vocational medicine		
MRI, magnetic resonance imaging.							

The number of rehabilitation centers specialized in SCI ranges from approximately 0.007/1 million inhabitants (Indonesia) to 0.8/1 million inhabitants (Portugal).<sup>24,25</sup> In some countries, these specialized centers are exclusively run by the private sector (eg, Greece),<sup>26</sup> whereas in other countries, they are state owned (eg, Thailand or Portugal)<sup>24,27</sup> or run by public insurance (eg, Norway).<sup>28</sup> There are also countries that have mixed systems of service funding and ownership (eg, Germany).<sup>29</sup> However, in some countries there are no specialized rehabilitation centers for SCI patients (eg, Korea or Israel).<sup>30,31</sup> Often, the rehabilitation of SCI patients takes place in universal rehabilitation departments or in hospitals that are specialized in all phases of SCI care (eg, Poland or Italy).<sup>32,33</sup>

Furthermore, it might be reasonably assumed that the length of stay in hospitals and postacute rehabilitation centers or units and the number of physicians specialized in SCI also vary to a great extent. Unfortunately, evidence-based data do not exist.

With regard to long-term care, the differences are also enormous. Whereas in Germany long-term care is mainly coordinated by family doctors with frequent referrals to specialists (eg, neurologists, PRM physicians) and prescription of PT and OT,<sup>29</sup> in Thailand, long-term care is mainly delivered by nurses and nonmedical volunteers.<sup>27</sup> In many countries, nongovernmental organizations play an important role in long-term care, too (eg, Indonesia or Israel).<sup>25,31</sup>

In some countries, professionals who are seen important as part of a multiprofessional rehabilitation team are not trained or accredited. This occurs in particular in occupational therapy, which is not established in the education system in some countries (eg, in Egypt). The availability of vocational training for persons with SCI in some countries is well developed (eg, in Germany)<sup>29</sup> but is almost missing in others (eg, in Greece).<sup>26</sup>

Thus, it can be assumed that care provision is highly dependent on the country in which a person lives. In general, owing to a different structure of health care systems and gaps in data collection, there is still a lack of useful information for a systematic comparison of national rehabilitation systems. For this reason, the need for collection of comparable data is of major importance to assess the differences in health and rehabilitation care for persons with SCI and to develop concepts of good practice.

## Payment Systems

As mentioned before, the principles of payment for SCI rehabilitation services may vary according to the organization of health care systems. The sources of money could be as follows:

- Tax based (eg, national health care systems, regional governments, and communities)
- Contribution based (eg, health insurance, accident insurance, pension insurance, and others)
- Transfer payment (eg, in case of work accidents)
- Out of pocket (eg, by patients or families; as in Morocco)

The most frequent criteria or factors of payment can be as follows:

- Payment for the whole service
- Payment per case
- Per diem payment
- Payment per intervention

Of course, combinations of sources of money and payment criteria can be used; and in some countries, for different cases, different payment systems are applied. Furthermore, in some countries, unofficial payment systems are a reality, for example, paying cash for access to services or for single interventions.

Funding systems and payment criteria may influence service provision and the equity of service delivery. State payment systems in most cases lead to equal services for all patients. However, even here, inequalities are frequently observed (eg, different or no services for ex-patriots of migrants).<sup>34</sup> The same applies to insurance that, for example, can cover the whole service (needs oriented) or only parts of it. Additionally, there is variation in insurance status and cause of injury (eg, in accident insurances). The criteria of payment can also influence service provision. Payment in lump sums, for example, may decrease outcome orientations and intensity of care, whereas per-case payments may lead to shorter length of stay and services.<sup>35</sup>

As another article in this series on service delivery has shown, comparable data on funding are missing. However, narrative descriptions of the rehabilitation care financing systems obviously show huge differences. For instance, in some countries, all inhabitants who reside in the country will be automatically registered to the single public health insurance (eg, in Sweden).<sup>36</sup> In other countries, the system of health insurance is very heterogenous. In the United States, 64% have contracts with private health insurance, and 13% do not have any health insurance at all.<sup>37</sup> These differences have considerable influence on health care provision, as many doctors only accept insured patients in their practice. Furthermore, the catalog of interventions and the health-related outcomes (such as life expectancy after SCI) vary according to the insurance covering.<sup>38</sup> With regard to cost-reward system, different systems might be applicable even within the same country. For example, in Germany, in acute care, a diagnosis-related payment system is applied; in rehabilitation, the principle of per diem payment is used; and in long-term and outpatient care, the payment is given per intervention.<sup>21,39,40</sup> Lack of public funding of rehabilitation may also lead to insufficient care provision. In Greece, for instance, owing to the present crisis of state finance, only approximately 25% of existing rehabilitation beds are in use.<sup>26</sup> However, it can be assumed that the variety of funding principles has effects on health care provision.

## DISCUSSION

In the WHO documents and experts consensus papers, a strong consensus exists that for patients with SCI, in addition to timely and highly qualified first interventions, rehabilitation services must be provided for all patients. These services must be provided in the acute, postacute, and long-term phases and should be delivered by well-trained health professionals working in multiprofessional teams. These services can be described according to the setting, technical and human resources, service goals, and other parameters. For comparison and service planning, the use of a matrix with the dimensions “acute, postacute, and long-term care” and “primary, secondary, and tertiary levels of health care” is applicable and suitable. The proposal of an International Classification of Service Organisation on Rehabilitation (ICSO-R) may be a useful tool

to systematically describe rehabilitation services.<sup>15,17</sup> It can be also used to describe model services that should be implemented if these services do not yet exist.

Narrative descriptions of rehabilitation services in different countries suggest that the variety of service provision for persons with SCI is huge. The variety involves the number of specialized services and personnel, the length of stay in rehabilitation units, and the payment system as well as the coverage of costs for the individuals in need. However, in most countries, at least some acute rehabilitation services exist in tertiary level hospitals, and postacute services are implemented at the secondary level. A large variety of options can be seen in the provision of long-term rehabilitation services that are not well defined in many countries. The spectrum of service models ranges from community-based services to primary health care centers to specialized rehabilitation units delivering intermittent in-patient rehabilitation services.

This variety shows the need for a normative approach to describe model services that can be used as references for comparison and as good practice examples for service planning and implementation. Definitions are a precondition for the evaluation of outcomes of rehabilitation services, and research on this is vital for the development of rehabilitation services guidelines.

To address these issues, a systematic analysis of the provision rehabilitation services and the related funding system is required using uniform assessment and evaluation tools. The International SCI Survey (InSCI) and the Learning Health System for SCI will provide data that can contribute to a clearer picture on factors for a good rehabilitation service provision for SCI.<sup>41,42</sup> Additionally, it is recommended to apply the International Classification of Service Organisation in Rehabilitation (ICSO-R) in a stakeholder dialog or similar approach to evaluate its applicability and to develop model services.

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