

Neurorehabilitation: management and outcomes in physical and rehabilitation network*

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Abstract

Rehabilitation involves the use of all means aimed to reduce the impact of disability and handicap pathologies and conditions in a global approach to solve the person's problems in order to achieve optimal social integration. Within a health context, rehabilitation is specifically defined as "a process of active change by which a person who has become disabled acquires the knowledge and skills needed for optimal physical, psychological and social function". As unique among others, specialists in physical and rehabilitation medicine have the holistic approach to people who are disabled or at risk of being in disabling conditions, and guarantee the competences and responsibility to face up and to understand all the clinical problems which are really the priority for the patient/individual. Physical and rehabilitation medicine specialists provide neurorehabilitation services in a number of settings, from departments in acute hospitals, rehabilitation centres, outpatient clinics and community facilities. Physical and rehabilitation medicine is the only medical specialty able to work across the different care pathways up to home and community. As the person is a unique individual, the rehabilitation plan must also be individualized and unique. The rehabilitation network should also be unique and unitary (different settings, from acute to community, different services and agencies from health to social, cultural and financial, many professionals and different competencies, different times in the natural history of illness, functioning and participation of the person).

Key words: neurorehabilitation, outcome, physical medicine

Neurorehabilitacija: liječenje i ishodi u mreži fizikalne i rehabilitacijske medicine

Sažetak

Rehabilitacija uključuje primjenu svih sredstava s ciljem smanjenja utjecaja patologija i stanja nesposobnosti i ometenosti u globalnom pristupu rješavanja individualnih problema kako bi se postigla optimalna socijalna integracija. U zdravstvenom smislu, rehabilitacija se specifično definira kao "proces aktivne promjene kojim onespособljena osoba stiče znanja i vještine potrebne za optimalno fizičko, psihološko i socijalno funkcioniranje". Kao jedinstveni među drugima, specijalisti fizikalne medicine i rehabilitacije imaju holistički pristup prema osobama s onespособljenošću ili s rizikom za istu i jamče sposobnost i odgovornost za suočavanje i razumijevanje svih kliničkih problema koji su pravi prioritet za individualnog bolesnika. Specijalisti fizikalne medicine i rehabilitacije pružaju neurorehabilitacijske usluge u različitim uvjetima, od odjela u akutnim bolnicama i rehabilitacijskim centrima do ambulanta i društvenih ustanova. Fizikalna i rehabilitacijska medicina je jedina medicinska specijalizacija s mogućnošću rada od doma do zajednice. Kako je svaka osoba jedna i jedinstvena, tako i rehabilitacijski plan treba biti individualiziran, a rehabilitacijska mreža jedna i jedinstvena (različiti uvjeti od akutnih do zajednice, različiti servisi i agencije od zdravstvenih do socijalnih, kulturnih i financijskih, brojni profesionalni i različite kompetencije, različita vremena u prirodnom tijeku bolesti, funkcioniranja i participacije).

Ključne riječi: neurorehabilitacija, ishod, fizikalna medicina

Introduction

Rehabilitation involves the use of all means aimed at reducing the impact of disabling and handicapping pathologies and conditions in a global approach to solve the person's problems in order to achieve optimal social integration. Within a health context, rehabilitation is specifically defined as "a process of active change by which a person who has become disabled acquires the knowledge and skills needed for optimal physical, psychological and social function" (1).

Rehabilitation includes social and sanitary interventions (evaluation of issues, possibilities and perspectives for person and context, through teamwork to maintain continuity, integration and synergy, following the individual rehabilitation plan up to better outcomes), many different structures, agencies and settings; so it is necessary to have a real network. Physical and rehabilitation medicine (PRM) is an independent medical specialty concerned with (related to) the promotion of physical and cognitive functioning, activities (including behaviour), participation (including quality of life) and modifying personal and environmental factors. So, it is responsible for the prevention, diagnosis, treatment and rehabilitation management of people with disabling medical conditions and co-morbidity across all ages. The five-year educational plan in PRM specialty guarantees the competencies and responsibility to face

up and to understand all these clinical problems; really, the priority for the patient/person is to involve and co-ordinate every aspect focusing all care to the main rehabilitation interventions and aims (2).

PRM doctors have (as unique among specialists) a holistic approach to people (disabled or at risk of being in disabling conditions), which is really necessary to this network management. They also work within the concept that the access to the full range of rehabilitation services is a fundamental human right and that patients within PRM services have complete autonomy in directing the aims of their rehabilitation programme through informed consent and choice. In many countries, the rehabilitation services started most part of their activities on disabled people related to neurological conditions (acute or chronic); very often many other colleagues (neurologists, geriatricians, neurosurgeons, general practitioners, internal medicine specialists, paediatricians ...) after having defined the "diagnosis" and first acute interventions could not follow the person (and not only patient) to solve the most important issues for his life (3,4). In some of these situations, in some countries and hospitals, many neurologists and other specialists have transformed themselves in rehabilitation doctors in order to complete their care for these patients and to follow them until individual outcome. In fact, their previous basic clinical competencies were not sufficient to work in rehabilitation and so, by experiences and educational activities, they have moved to cover many other fields and specific tools (functional evaluation, assessment, teaching, technology, behavioural and social aspects, occupational and vocational, ICF philosophy, etc.). The reason for this flow is also the rapidity of the growth of PRM network activities due to the increasing proportion of disabled people who need (and want) qualified interventions (and PRM numbers are not always sufficient).

This contribution was a kind of real synergy to enrich in many departments the PRM cultural and scientific capacities, as has already happened in other rehabilitation fields (paediatric, gerontologist, orthopaedic, etc.). The key point must be definitive involvement in rehabilitation activities (bringing the previous knowledge but leaving the previous cultural and professional aptitudes and activities) to maintain the clinical focus on rehabilitative global approach to the individual and subjective problems of the person. Also in acute hospitals, and more recently in relation to financial problems for each health national system to reduce costs in this phase, the rehabilitation interventions are requested very early: first going into intensive care unit (ICU) or other wards and as soon as possible transferring patients to specific PRM ward. In neurological and many

other conditions, researches and scientific literature show that PRM approach can reduce clinical and functional complications, and improve recovery and quality of individual outcome. The success of neurorehabilitation depends on a large number of professional skills. It also depends on the severity and complexity of neurological disability and its impact on the person's activity and participation (5). Access to rehabilitation differs across Europe and treatment may follow a number of pathways according to national and local priorities. Patient will reach rehabilitation by a number of routes and this depends on whether he has been treated by a neurologist, neurosurgeon, internist or general practitioner. Following diagnosis, treatment is initially directed at pathology and dealing with primary and secondary risk factors (such as complications). The next phase of treatment is tertiary prevention. Rehabilitation care and interventions must cover all these phases focusing and leading to functional recovery, although there may be a period when patients require neurological treatment at the same time as their rehabilitative needs present. It is the view of the specialty of PRM that, when rehabilitation (patients yet disabled or at risk) is a clinical priority, the most appropriate person to take charge of whole treatment is a competent specialist in physical and rehabilitation medicine. But, at the same time PRM doctor can offer, during and in synergy with rehabilitative treatments, as required by the individual plan, to the patient in care every (neurological or other) intervention, supported when necessary by other specialists as consultants (6).

Synthesis of Rehabilitation Activities

The overall aim of rehabilitation is to lead life avoiding any restriction for disabled people in relation to personal context. In practice, this task requires a combination of measures to overcome or to work around their clinical situations and to remove or reduce the barriers to participation in the person's chosen environments. The fundamental outcomes of rehabilitation are the person's wellbeing along with social and vocational participation. PRM specialists have a crucial responsibility for active engagement and learning process that the patient must go through; the principles of adaptation and plasticity are as necessary as (and together with) the clinical (surgical, pharmacological, technological, physical, psychotherapeutic) interventions. PRM specialists are able to use these principles, which help design the strategies to improve outcomes and avoid maladaptation (motor learning and recovery, inducing skill acquisition relevant to the patient's daily life, preventing the learned

non-use phenomenon to restore function improving activity and enabling participation) (7). Rehabilitation is a continuous and co-ordinated process, which starts with change of the person's conditions of functioning, health and participation (the onset of illness or injury, or their consequences), proceeds by team networking of many professionals and settings, closely together organised and goal-oriented, patient centred manner and goes through to the individual empowerment. PRM specialists use specific diagnostic assessment tools, taking into account the individual's personal, cultural, vocational and environmental context. PRM specialists are usually the leaders of these teams and are responsible for their patients' care at specialised PRM facilities. He/she is responsible for developing an individualised rehabilitation plan for each patient through specific assessment and through assessments of parents and caregivers. In fact, when PRM specialists carry out medical interventions (such as mobility enhancement, spasticity management, procedures to treat pain, etc.), the basic activity is to make clear rehabilitation objectives for the patient, in which the patient and surroundings should be full participants (8). Short- and long-term goals are adjusted over time, according to progress, are obviously patient/person-centred and are not set on a discipline-by-discipline basis. Only in this way, rehabilitation is able to enhance patient functioning and participation by providing a co-ordinated source of information, advice and treatment for the person with disabilities and the family, with the team acting as provider and catalyst. The most important part of the work must be thorough understanding of the natural history of acute and chronic disabling disease, of the consequences of impairments and their impact on functioning (activity and participation), in close relation to the natural history of life, wishes and actual possibilities of the person and of the context. The rehabilitation prognosis is to have a clear view on the issues of personal activities of daily living, care, return to work, studying, feelings, driving, etc. (9).

Neurorehabilitation

Clinical contents

Common neurological pathologies are causing different impairments, disability, and participation limitation:

Cerebral palsy

Neuromuscular disorders and myopathies

Congenital neurological conditions (for example, muscular dystrophy, spina bifida, etc.)

Stroke, brain haemorrhages

Chronic neurological conditions, e.g., multiple sclerosis (MS), amyotrophic lateral sclerosis (ALS), Parkinson's disease

Trauma and injury of the brain, spinal cord, brachial plexus

Central nervous system tumours, infections, abscesses, epilepsy

Peripheral nerve disorders (for example, Guillain-Barré, critical illness neuropathy, etc.)

Alzheimer's disease and other dementias (10).

Main impairments of body structures are motor, sensory, communication, cognition, behavioural, very often with major pain complications. So, there are many limited activities, i.e. posture, mobility, balance, reaching, grasping, vision, hearing, communication, swallowing, breathing and in particular every activity of daily living (eating, grooming, toileting, continence, transfers, bathing, etc.). There are many restrictions of participation, i.e. care issues, technology and equipment use, environmental controls, accommodation, driving and transportation means, finance, social integration, employment, learning, education, occupation, affectivity, human and social rights, etc. (11).

Neurological Rehabilitation Settings

PRM specialists provide neurorehabilitation services in a number of settings, which range from departments in acute hospitals and specialised rehabilitation centres to outpatient and community facilities. The principles of their activities are identical, no matter where the work is carried out, although the priorities and activities vary according to the needs of the treatment in particular settings. PRM is the only medical specialty in the field of rehabilitation that has arranged its work across different care pathways. It can thus also make considerable contribution to the planning of rehabilitation and health care by its expertise and experience of differing needs of patients over the time course of their rehabilitation programme. Acute rehabilitation is important in order to capitalise on plasticity as effectively and as early as possible and to reduce the potential of complications. This requires not only a peripatetic team of rehabilitation professionals able to give advice to all wards in a hospital, including intensive care, but also a sufficient number of dedicated rehabilitation beds, to guarantee timeliness, continuity and quality, both under the responsibility of a PRM specialist and closely connected (the same professionals, modalities, organisation, etc.). In the following phase, patients also require rehabilitation in dedicated comprehensive rehabilitation facilities (inpatient or outpatient

when useful) directed by PRM specialists, and those with longstanding, often progressive disabilities and disorders will need it in the community to ensure that fitness, health and abilities are maintained and their independence is necessary to support the participation (12).

Another Methodological Aspect

PRM specialists work in various facilities from acute care units to community settings. Unitary is the methodology (to guarantee the flow of information, patients and audits on scientific aims towards evidence) and is based on the use of specific diagnostic assessment tools and homogeneous carry out treatments including pharmacological, physical, technical, educational and vocational interventions. The competence of specialists (and at the same time the checklist of activities in this flow) in the field depends on their comprehensive education and training in:

- medical assessment in determining the underlying diagnosis
- assessment of functional capacity and the ability to change
- assessment of activity and participation as well as contextual factors
- devising a rehabilitation plan
- knowledge, experience and application of medical and physical treatments
- evaluation and measurement of outcome
- prevention and management of complications
- prognostication of disease/condition and rehabilitation outcomes
- knowledge and experience of using rehabilitation technologies to assist at impairment, activity and participation levels
- team dynamics and leadership skills
- teaching skills
- knowledge of the social system
- knowledge of legislation on disablement and of human rights of people with disabilities
- knowledge of how to get help for people with acquired and congenital disabilities due to illness or trauma (13).

In all these aspects, the cognitive, psycho-relational, learning, motor, attention and awareness patient issues are fundamental, even if the illness does not involve the nervous system. On the other hand, the involvement of activities and functioning based on nervous system (structure as ICF says) is necessary to evaluate the conditions and prognosis of the person, to carry out interventions, to support active engagement and adaptation of the person

and of the context (14). So, in the neurorehabilitation activities, since their initial implementation some time ago, PRM doctors and other professionals, observing and understanding the patients and their evolution, have processed the methodological basis of many of these points for the holistic approach. Therefore, we make use of this modality during rehabilitative treatments in relation to neurologic illness or not. As the person is an individual, equally individual must be the rehabilitation plan, and the rehabilitation network should be unique and unitary (different settings from acute to community, different services and agencies from health to social, cultural and financial, many professionals and different competencies, different times in the natural history of illness, functioning and participation of the person). The neurorehabilitation interventions, spread into different segments of the network, are only part of global activities, needing a unitary and synergistic interaction with all other aspects, to offer comprehensive treatment and to reach an optimal outcome (15,16).

Conclusions

Neurological rehabilitation is one of the main activities and competencies within PRM.

PRM specialist is focused on the rehabilitative elements of this work within the context of good knowledge of clinical neurology; he makes good use of his extensive knowledge of specialist medical rehabilitation across a wide range of contents to ensure that people with neurological conditions, as all others, receive optimal care providing a comprehensive service. Neurological rehabilitation is also a field in which an important part of the methods and skills for rehabilitation assessment, management and interventions were born and are continuously developed. Also, the other fields of PRM apply and make use of these methods (cognitive, learning, communications, psychological, vocational, etc.) and enrich their results by these modes of treatment. The rehabilitation network and the multi-professional team are the main tools to provide a timely, uninterrupted, comprehensive and global support to the patient care/person empowerment. This "mainstream" must be unitary as sole and individual is the person in the focus of every matter and neurorehabilitation is part of the clinical and methodological rehabilitation stream.

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