

## 9 RECOMMENDATIONS FOR ORGANISATION OF POST-ACUTE MUSCULOSKELETAL AND NEUROLOGICAL REHABILITATION IN BELGIUM

### 9.1 INTRODUCTION

#### 9.1.1 Synthesis of the key points formulated during the study of the organisation and financing of musculoskeletal and neurological rehabilitation

The principal goal of this project is an assessment of the conventions 7.71 and 9.50. The analysis of the conventions 7.71 and 9.50 which include the financing of rehabilitation activities in a limited number of rehabilitation facilities, was extended with an analysis of K-nomenclature which includes a separate part of financing of rehabilitation activity. As for musculoskeletal and neurological rehabilitation specific facilities exist for hospitalised patients, an analysis of the financing of a hospital stay (Specialised beds for musculoskeletal S2 and neurological disorders S3) completed the study.

The current organisation of musculoskeletal and neurological rehabilitation in Belgium lacks transparency and clinical coherence. Several parallel payment systems exist which are mostly based on historical factors instead of criteria concerning patients' rehabilitation needs and goals.

One system is linked to hospital stay in specialised beds (Sp beds) for diagnosis and treatment of musculoskeletal (S2) and neurological disorders (S3). This financing system covers basic care needs and limited rehabilitation services.

Other systems are specifically linked to rehabilitation activities and concern mainly nomenclature (K, M and R) and rehabilitation agreements (also called conventions). These systems are fee for service systems. The different payment systems overlap significantly and can be combined. Price setting for each unit of payment, as well as per hour of therapy depends on the system and is mainly based on historical facts. There are no clear criteria for patient referral to the different types of rehabilitation organisations and the only characteristic on the limitative lists is the medical diagnosis. Patients' rehabilitation needs and goals are not formally assessed, neither are there criteria justifying an inpatient treatment.

The rehabilitation trajectory is often driven by the access of the different organisations to the different payment systems.

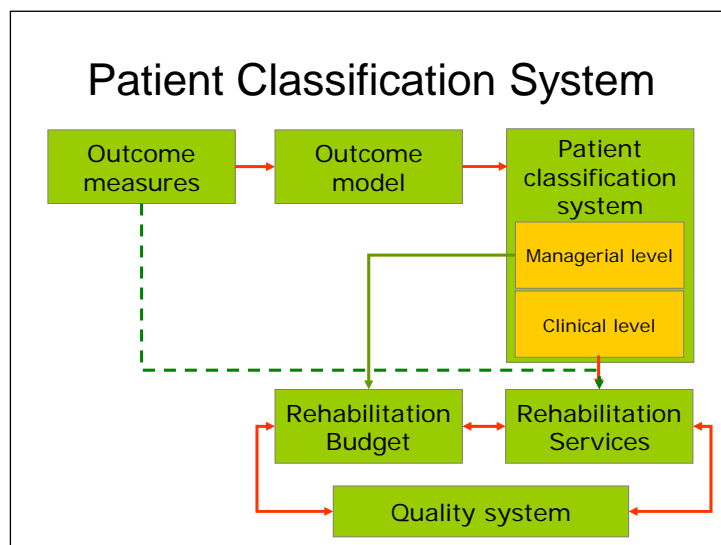
There is no systematic central and detailed registration of data concerning the performed rehabilitation activities. There is no accreditation system and only very limited formal quality control.

Current rehabilitation practice in Belgium shows a large variability concerning duration of the rehabilitation programmes (expressed as a number of treatment sessions), type of therapy (mono- versus multidisciplinary) as well as payment system (M- or K-nomenclature, 9.50 or 7.71 convention), at least for the five studied pathologies (LEA, MS, SCI, stroke and THR). The variability in rehabilitation programmes might be rather explained by the type of organisation regionally available and by the related payment system than by patient's rehabilitation needs and goals, because except for medical diagnosis, no patient referral criteria are available. The study of clinical pathways for these pathologies, yielding only limited information (see chapter 7), could confirm nor reject the variability in clinical practice.

A definition of rehabilitation was developed within the conceptual framework of the WHO International Classification of Functioning, Disability and Health (ICF). This conceptual definition has to be made operational in due time, by means of a patient

classification system (Figure 9.1). ICF can already be used as a conceptual framework for an outcome model but the application of ICF in clinical practice and for financing purposes only fits long term vision.

**Figure 9.1: Principles of an ideal Patient Classification System**



Outcome measures, outcome models and patient classification systems exist but are not explicitly linked.

The implementation of ICF as an outcome model depends on its compatibility with measures used in rehabilitation and the improvement of its applicability.

FIM and Barthel Index are tools measuring level of dependence related to activities of daily living. The results of this measurement can be used to estimate workload, but neither FIM nor Barthel Index measure rehabilitation needs.

In Belgium only MVG-RIM2 includes functional items. It could be considered to use the MVG-RIM2 as an intermediate profiling tool of post-acute rehabilitation, using the "fingerprints". However, the necessary reluctance is needed: MVG-RIM is not a tool enabling to score for paramedical (occupational therapy, physical therapy, psychology,...) activities, neither to monitor or assess the effectiveness of therapy or different aspects of rehabilitation activities. It could be an option to validate MVG-RIM2 with other instruments currently tested in other countries even though MVG-RIM2 will at the earliest be implemented in Belgium in 2008.

Organisation and financing of rehabilitation was analysed in five countries. All countries are struggling with these issues and developing new solutions.

In The Netherlands rehabilitation is organised within 4 levels and patients need an indication setting. There is basic set of performance indicators as well as a rehabilitation treatment framework, intended as quality and accreditation instrument.

In France rehabilitation is conceptually organised around three levels of care and has a clear regional orientation. There is no systematic model of indication setting.

Medical post-acute rehabilitation in Germany is mainly offered in specialised rehabilitation clinics, although outpatient and part-time inpatient care grows considerably. Approvals by the insurance companies for admission to rehabilitation facilities are needed. Quality assurance programs intend to impact on the allocation of patients as well as the financing of the rehabilitation services.

In Sweden rehabilitation is organised at county level, taking into account the level of specialisation and the population's needs. The rehabilitation has a clear orientation on home and ambulatory care, but a differentiation is made between at least two levels of facilities. The quality assessment is stimulated by both national health care agencies and

rehabilitation professionals. Registers are an important support tool in this quality approach.

In the US different facilities provide post-acute care rehabilitation services. A preadmission screening process is needed within Medicare as stays in a Medicare inpatient rehabilitation facilities (IRF) are funded by a prospective payment system. The unit-of-payment is a Medicare covered hospital stay. Patients are classified with a patient assessment instrument (IRF PAI). Quality of care is not uniformly assessed, although efforts are made to develop a quality approach based on registration. Services can be accredited by the Commission on Accreditation of Rehabilitation Facilities (CARF) based on preset standards.

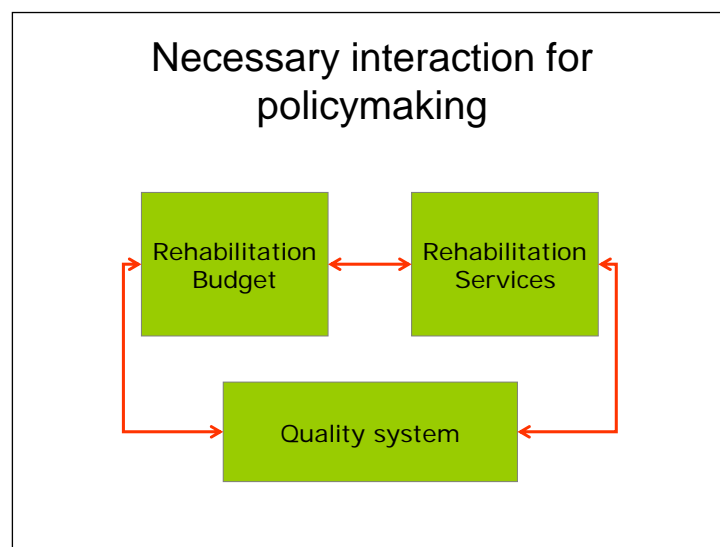
In this and the following chapters the organisation and financing of musculoskeletal and neurological rehabilitation in Belgium is discussed. This discussion is based on the input of national experts and elements from literature described in previous parts. Several models are proposed and recommendations applicable to the Belgian context are made.

### 9.1.2 Optimising the organisation and financing of post-acute musculoskeletal and neurological rehabilitation in Belgium

The current organisation and financing of musculoskeletal and neurological rehabilitation in Belgium requires an important revision. The conventions 9.50 and 7.71 have to be revised and elaborated in the context of an overall strategic vision on rehabilitation in the Belgian health care approach. In their current form the conventions do not differentiate enough from, or offer added value to K-nomenclature.

Belgian health care services are in general characterised by a wide accessibility and affordability by a universal social security system. The development of a vision on the organisation and financing of rehabilitation services and facilities should fit in this tradition. The new conceptual approach of rehabilitation should be built on the interaction between financing, organisation and quality of rehabilitation services (Figure 9.2). A line of reasoning developed in this chapter, takes these issues into account.

**Figure 9.2: Interaction in policy making**



Similar to international debates, Belgium needs to develop an explicit conceptual framework for the organisation of musculoskeletal and neurological rehabilitation. It is proposed to develop a stratified rehabilitation model in which the roles of rehabilitation organisations can be identified, taking into account characteristics of patients' needs, disease trajectories, rehabilitation goals and epidemiological and geographical needs. Resource allocation must become more transparent and related to the effective service delivery for particular patient characteristics.

## 9.2 ORGANISATION OF POST-ACUTE MUSCULOSKELETAL AND NEUROLOGICAL REHABILITATION

### 9.2.1 An organizational model for post-acute musculoskeletal and neurological rehabilitation in Belgium: different options.

Four dimensions are important when developing an organisational model for musculoskeletal and neurological rehabilitation:

- the *phase* (parts of the disease trajectory): acute, post-acute and chronic. We stick to a generalised division in three phases. For each particular pathology more detailed schemes can be developed (examples were given in the chapter international comparison phased model neurology, Dobkins model for stroke)
- the *setting*: inpatient versus ambulatory.
- the idea of a mono- or multidisciplinary approach is related to *human resources* issues
- the *complexity* of the rehabilitation needs and goals and thus of the required rehabilitation activities: simple or complex.

Since the study of other countries (see chapter 8) yielded no single organizational model, and since each model has advantages as well as disadvantages, several options will be given for the organization of musculoskeletal and neurological rehabilitation in Belgium. The policy options discussed in this chapter only consider the post-acute phase. Post-acute rehabilitation cannot be isolated from rehabilitation in the acute and chronic phase. The organisation and financing issues there are particular, and to far from the initial goal of this project.

#### 9.2.1.1 A Stratified Rehabilitation Model

The conceptual stratified rehabilitation model for the post-acute phase is developed as a support tool for organising rehabilitation. Moreover, it tries to translate and optimise the existing informal organisation of musculoskeletal and neurological rehabilitation in Belgium.

Figure 9.3 visualises the ideas underlying this conceptual model.

This rehabilitation model is organised around three differentiated types of rehabilitation services, taking into account patients' rehabilitation needs and goals:

- General rehabilitation services
- Specific rehabilitation services
- Highly specific rehabilitation services.

The services of the different rehabilitation levels function in a collaborative way through a clearly structured network. Between the different centres can be referred depending on the phase of the trajectory and when necessary considering geographical factors.

Two criteria are used for separating the levels in this structure:

- complexity of rehabilitation needs and goals
- incidence and prevalence of consequences of health conditions.

The implementation of this model thus requires a systematic assessment of patients' rehabilitation needs in the acute phase of the disease trajectory. It is recommended to keep in mind the framework of the International Classification of Functioning, disability and health (ICF) while performing this assessment. The value of this framework is generally accepted in rehabilitation medicine from a clinical point of view. However, it should be noted that ICF currently is not ready yet to be used as an organizational and managerial tool. The assessment should be based on diagnosis, required intensity of

care, rehabilitation needs and goals as well as on personal and environmental criteria. The assessment has to be repeated periodically and can result in a transfer of an individual to another type of organisation within the network.

This assessment is a crucial tool to assign a patient to a rehabilitation programme, which in turn is decisive for the referral to a certain type of rehabilitation organisation. Each rehabilitation facility offering rehabilitation programmes, will receive an adapted funding. Budget allocations can be more transparent and logic, and adapted to the resources required to offer a rehabilitation programme.

Of course, the assessment has to be performed by an objective but specialised professional. Several options exist. This assessor could either be the treating rehabilitation specialist in the acute phase, the rehabilitation specialist in the post-acute phase, a representative of the insurance organism, a completely independent party, or a collaboration between two or three of these parties. In chapter 8 several examples will be given in the studied countries. The better the PCS is conceived, the better chance there is for objectivity in the assessment.

The rehabilitation needs and goals will lead to a mono- or a multidisciplinary approach as is mentioned in the comments on the definition of musculoskeletal and neurological rehabilitation.

Another dimension is the complexity of the rehabilitation needs and goals.

Short-term (or temporary) rehabilitation needs and goals are considered as simple.

*For example:* rehabilitation in case of simple sport injuries, or after total hip, knee or shoulder replacement.

Long-term (or permanent) rehabilitation needs and goals are considered as complex.

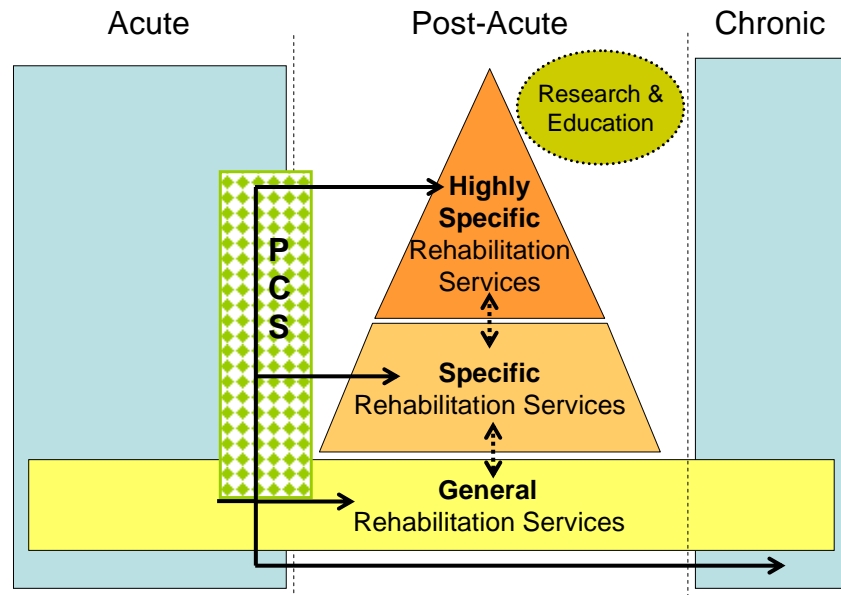
*For example:* rehabilitation in case of spinal cord injury or multiple sclerosis. Rehabilitation needs and goals in case of a health condition which often causes important long-term functional impairments but can partially recover such as stroke, Guillain-Barré syndrome and multiple trauma, are also considered as complex.

The model also takes into account options for hospitalised (inpatient) or ambulatory (outpatient) rehabilitation services. However, it is not clear yet neither in literature (See chapter 3), nor among experts in what conditions one can choose for hospitalised or ambulatory settings. This dimension is not visualised in the model.

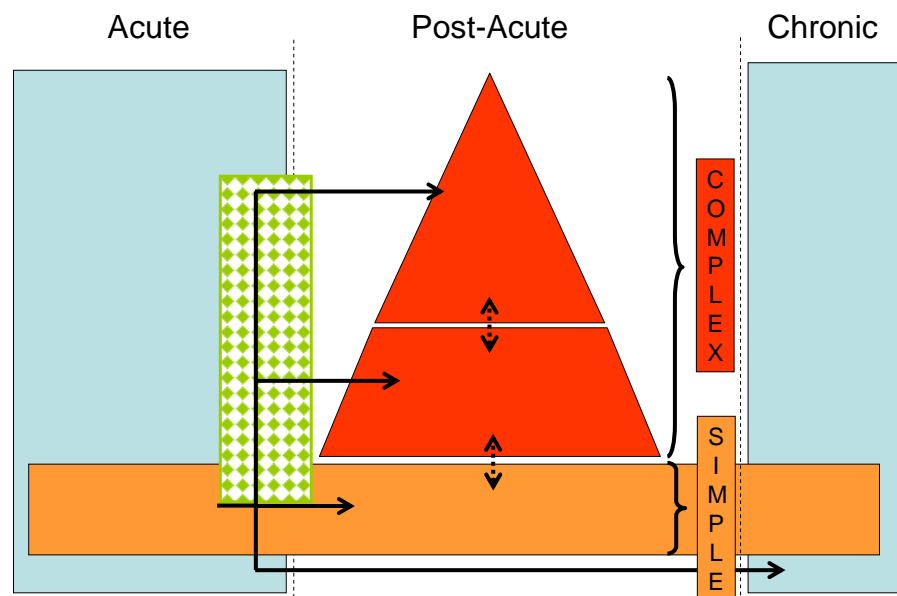
The implementation of this model will require the implementation of an elaborated quality or performance assessment instrument, measuring at least the clinical patient outcomes of the rehabilitation process. An accreditation system could be an alternative (see CARF in the US).

Figure 9.3: a) Stratified Rehabilitation Model: Post-acute Phase; b) Visualisation of the dimension complexity of rehabilitation needs and aims; c) Visualisation of the dimension mono-disciplinary and multidisciplinary rehabilitation. Note: the dimension “hospitalized and ambulatory” is not visualized

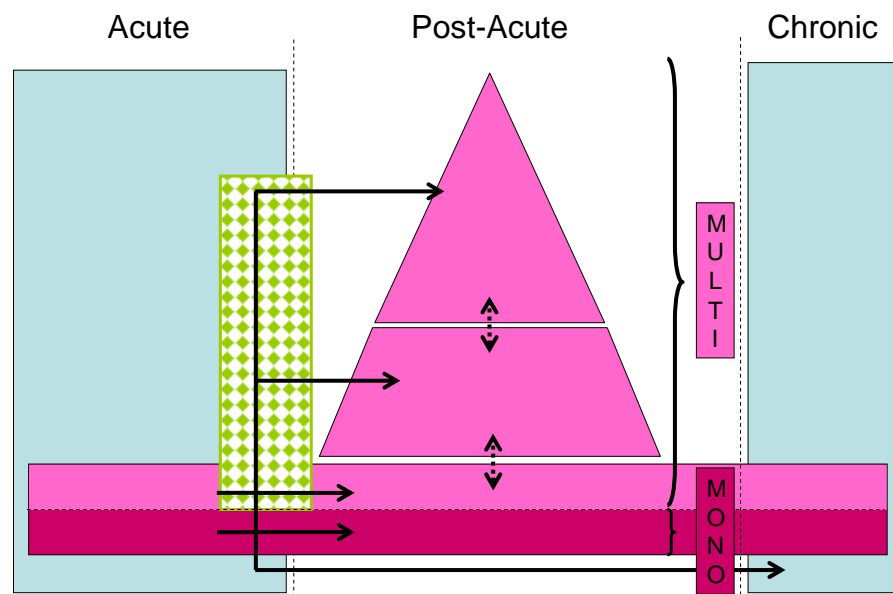
a) Stratified Rehabilitation Model: Post-acute



b) Stratified Rehabilitation Model: Post-acute



### c) Stratified Rehabilitation Model: Post-acute



#### GENERAL REHABILITATION SERVICES

As demonstrated in Figure 9.3: general rehabilitation services can be provided in the acute phase of the disease trajectory, in the post-acute phase after medical stabilisation, as well as in the chronic phase for maintenance rehabilitation or follow-up activities. All these organisations deliver services to patients with simple rehabilitation needs and goals. Besides, acute organisations assess patients with complex rehabilitation needs. Based on this assessment, patients can be referred to specific or highly specific rehabilitation services.

The final referral decision is made by the assessor as described above.

The general services can offer both mono- as well as a simple multidisciplinary rehabilitation. Mono-disciplinary rehabilitation services can be delivered by one or more ('multi-mono' or 'simple multi') individual therapists (working independently of each other), but belonging to a multidisciplinary team, part of a multidisciplinary organisation. This contrasts with multidisciplinary rehabilitation, which is offered by an interdisciplinary collaborative team.<sup>bbb</sup> In the general level, this multidisciplinary rehabilitation is less complex than in the specific and highly specific level.

These services will be provided in an ambulatory, outpatient setting. In case of a preceding acute care phase, inpatient services can be provided too (at the start of the rehabilitation process).

#### SPECIFIC OR HIGHLY SPECIFIC REHABILITATION SERVICES

Patients selected on clearly defined criteria for complex rehabilitation needs and goals, are only referred to specific or highly specific rehabilitation services. Patients affected by consequences of health conditions with a high incidence or prevalence, have access to specific rehabilitation services (e.g. stroke), whereas patients affected by consequences

<sup>bbb</sup> Note that therapy at home, delivered by an individual therapist, is called "home therapy" and is monodisciplinary. Post-acute rehabilitation is offered in a rehabilitation organisation, where a multidisciplinary team offers therapy in a coordinated way. In the post-acute phase, the team can offer multidisciplinary therapy, or one of the team members can offer monodisciplinary therapy, depending on the needs and goals for an individual patient.

of health conditions with a low incidence or prevalence have access to highly specific rehabilitation services (e.g. spinal cord injury).

(Highly) specific rehabilitation services are always provided by a multidisciplinary team at least composed of a physician specialised in rehabilitation and one type of therapist. These services can be provided in a hospitalised or ambulatory setting.

Referral between organisations providing specific and highly specific rehabilitation is possible and is based on a re-assessment with the same tools as used for the assessment at the start of the post-acute phase.

Facilities offering specific and highly specific services need more resources, because they will offer more intense and complex rehabilitation programmes. A prospective payment system with a closed-end budget is preferred, calculated on different components, and allowing a transparent price setting considering different elements needed for providing rehabilitation services. The budget allocation has to be supported by the use of performance or quality monitoring (see next paragraphs on financing and quality).

Research and/or academic functions can be integrated at all levels as long as the necessary academic support is available or can be organised separately. Anyway, funding of research should be clearly separated from the funding of the rehabilitation process.

The critical condition to use a stratified rehabilitation model in the post-acute phase, is the availability of (an) assessment tool(s) to support patient referral (patient classification system). Clear criteria to distinguish the different types of organisations are essential. The advantages of this model are that a differentiation of rehabilitation supply is possible. Patients with complex needs and goals, will receive tailored specialised care which would be an excess utilisation of services for patients with simple needs and goals.

### 9.2.1.2 *Variants of the post-acute stratified rehabilitation model*

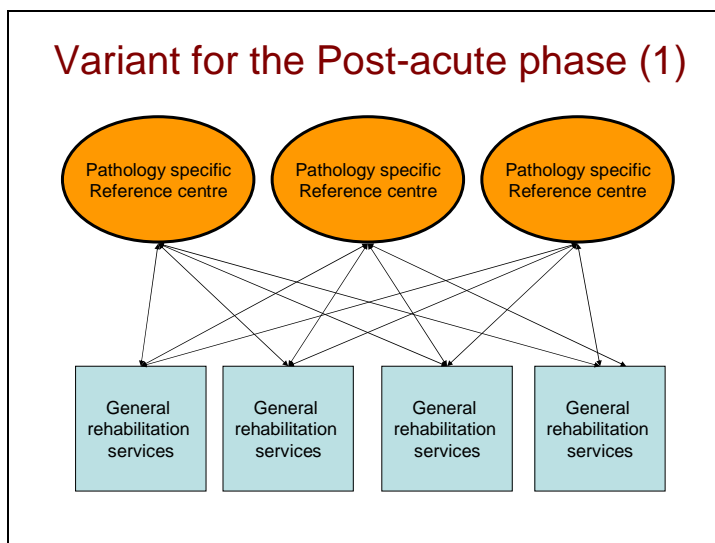
A first variant of the previously described model focuses on target populations or pathology groups (Figure 9.4). In this model a distinction can be made between:

- General rehabilitation services for simple rehabilitation needs and goals
- Reference rehabilitation services for complex rehabilitation needs and goals as a consequence of one specific health condition .

Elements of this variant can be found in some countries (e.g. the USA), where separate rehabilitation facilities are created exclusively for Spinal Cord Injuries. However, none of the countries studied, organise their services model exclusively on target groups. Probably because this would require an exponential growth in resources (facilities, infrastructure, equipment, human resources) allocated to rehabilitation. In our basic model these groups would be treated in highly specific centres.

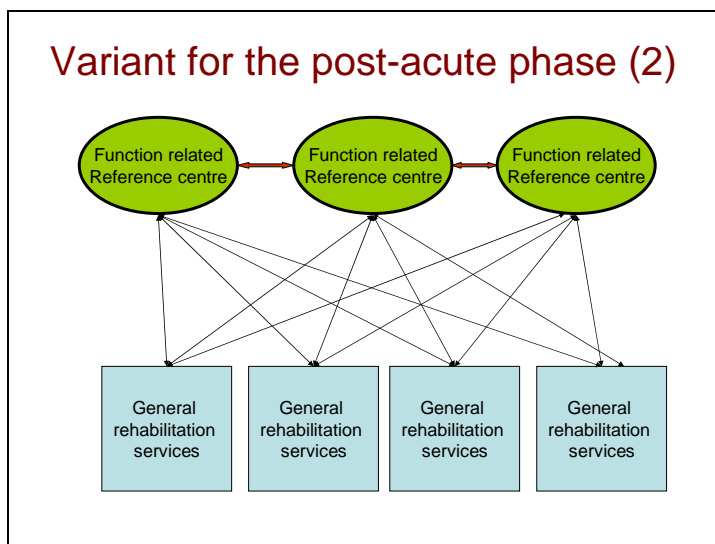


Figure 9.4: pathology specific variant I



A second alternative conceptual model differentiates reference centres based on “functional” impairment (motor, cognitive,...) rather than a specific health condition (Figure 9.5). This model fits into the logic of e.g. centres for “vocational” or “cognitive” rehabilitation. This model of post-acute rehabilitation was not found in any of the countries studied, although one could argue that Sweden is paying a lot of attention to vocational reintegration.

Figure 9.5: Function specific variant

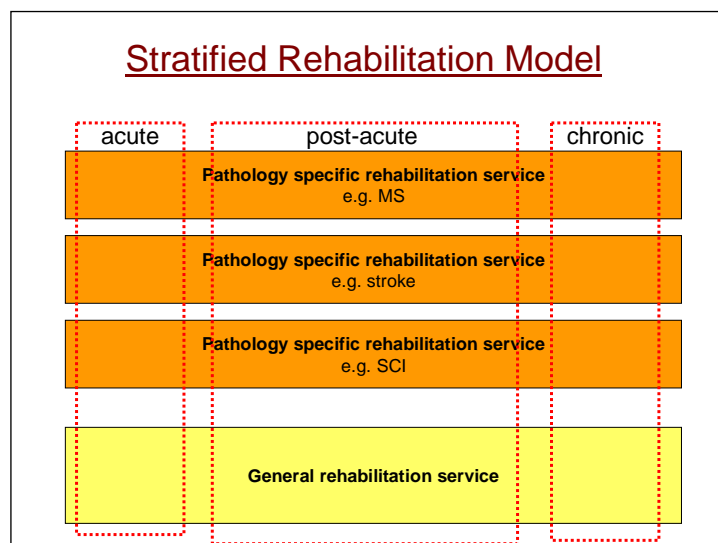


### 9.2.1.3 Pathology specific trajectory based rehabilitation model

Another variant of a health services model would be a pathology based approach for all phases of the disease trajectory (Figure 9.6). The referral to different strata of services is based on the assessment of (rehabilitation) needs and goals. This model is implemented in Belgium for patients with Multiple Sclerosis. In the U.S., the U.K., and in one Belgian and Swiss centre this is the organisation model for spinal cord injuries. Trauma centres in Germany can be compared to this model as well as the Dutch stroke networks.

As is the case in the basic variant, both mono- and multidisciplinary approaches can be organised, and services can be offered in inpatient or ambulatory settings.

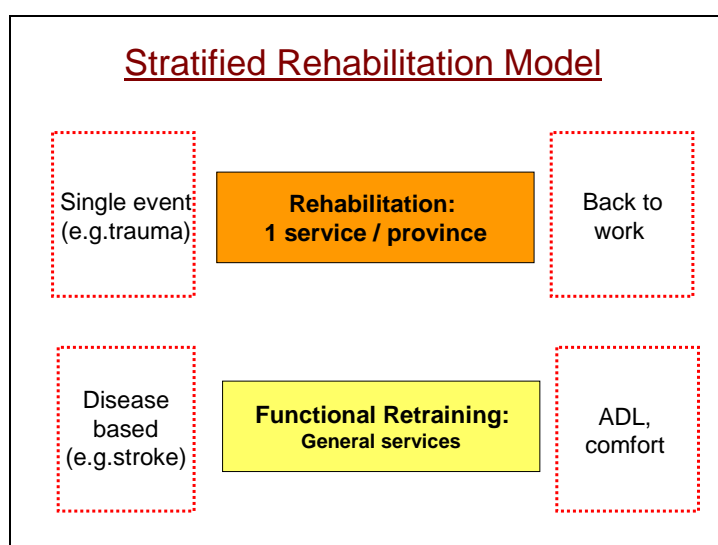
**Figure 9.6: Pathology specific trajectory based**



#### 9.2.1.4 Stratified rehabilitation model: Goal oriented

Another option is to consider several organizational levels according to the final goal of the rehabilitation: back to work or not (Figure 9.7). It actually refers to one of the principles used in Belgium in the federal “Rijksfonds voor Sociale Reclassering van de Mindervaliden” or former “Fonds Maron”. (see chapter 5) Within the Fund a main distinction was made whether the person to take in charge would be able after the treatment to restart work or not.

**Figure 9.7: Goal oriented model I**



Some elements of this model can be found in the German geriatric rehabilitation model, and –also for the older age groups, in the somatic nursing homes in the Netherlands.

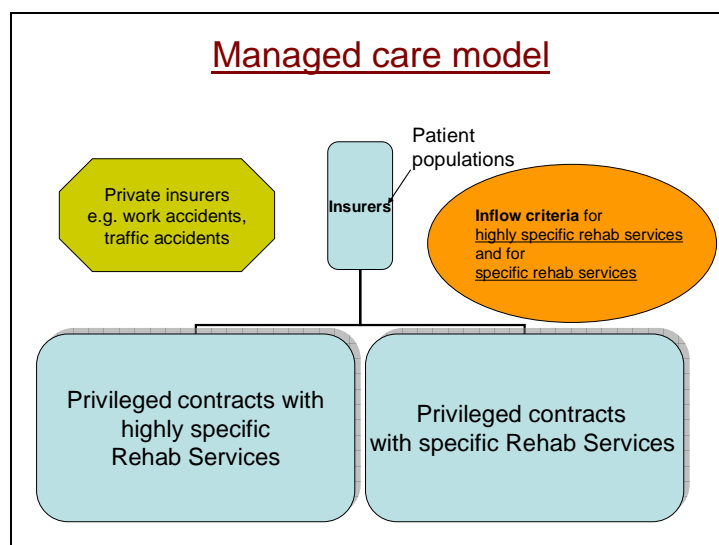
However, one can certainly not say that countries are exclusively orienting their post-acute rehabilitation on goal oriented models.

### 9.2.1.5 Managed Care Rehabilitation Model

In a managed care model (Figure 9.8) as currently applied in the U.S., a patient's health care services utilization is managed by the insurance company. Insurance authorization is needed for some services. The highest level of coverage is only guaranteed for services from providers affiliated with their managed care plan. Some ideas of this model can be found in the German and the Dutch models. Germans are members of sickness funds buying in services and the Dutch model of insurance is also based on a provider-purchaser model. In these countries this managed model is much more embedded in a welfare state logic than in the U.S. (See chapter 8).

The principle of contracting health care providers is not applied yet in Belgium and would require a fundamental shift in the health services approach. However, the principles of managed care could also be implemented in Belgium for example by insurers of working accidents or traffic accidents.

**Figure 9.8: Managed care model for rehabilitation**



### 9.2.1.6 Recommended conceptual rehabilitation model

The first proposed stratified rehabilitation model in the post-acute phase is considered as the best option. It would require an optimisation of the current informal organisation model of musculoskeletal and neurological rehabilitation in Belgium.

Moreover, the principles are comparable to rehabilitation models in the Netherlands, Germany, France and Sweden.

The model presented in Figure 9.3 fits best. First, the existing rehabilitation organizations apply for a payment system according to one of the three levels (general, specific, highly specific). Compared to the current Belgian reality we assume that most organisations with a convention 7.71 are comparable to highly specific rehabilitation services.

The current situation is far less clear for the specific level. The differentiation between organisations with a convention 9.50 and organisations only reimbursed via K-nomenclature is very confuse, due to the important overlap in the patient target groups as well as in the price for the item-of-service. Organisations with a 9.50 convention come closest to the concept of a specific centre, those with nomenclature to general

rehabilitation. However, some of these might be competitive as a specific or even highly specific organisation.

Clear requirements have to be set at the specific and highly specific levels on expected performances and on human resources, infrastructure and equipment. Patient target groups need to be redefined in order to avoid overlap.

The number of specific and highly specific organisations needs to be based on epidemiologic and geographical data. Follow up through systematic central registration will be necessary in order to avoid eventual under- or oversupply.

### 9.2.2 A Patient Classification System (PCS) to support the referral process

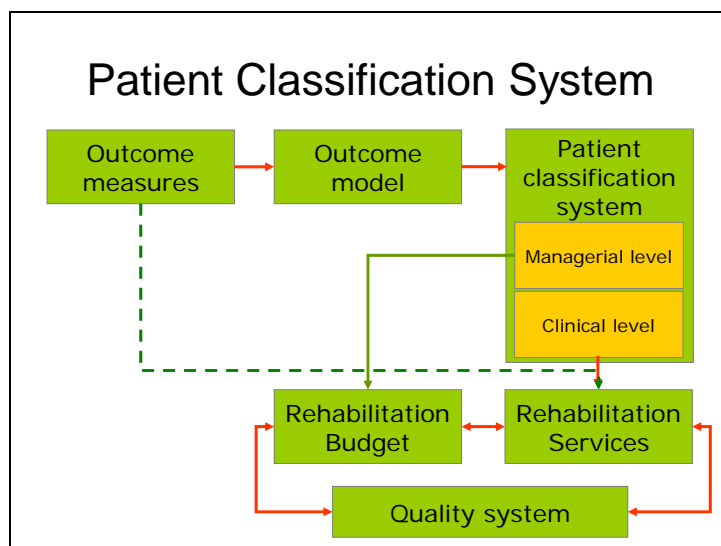
The conceptual stratified rehabilitation model should be supported by a patient classification system.

Criteria related to diagnosis, required intensity of care, rehabilitation needs and goals as well as personal and environmental factors, are needed to refer patients to a certain type of organisation in a stratified rehabilitation network (see chapter 3).

Ideally one should strive for a PCS supporting patient referral (clinical decision making) as well as resource allocation and quality assessment <sup>100</sup> (see chapter 3).

- One common tool for both purposes makes it easier to respect the desired interaction between the resource allocation process and the rehabilitation services;
- Only one registration is required;
- Technical and financial efforts will result in benefits on both domains.

**Figure 9.9: Principles of an ideal Patient Classification System (for detailed information on this figure see chapter 3)**



The comments of consulted international experts (chapter 3) illustrate both the potential value of such a PCS but also the doubts on the compatibility of both goals (clinical and managerial) when looking at the existing scales.

Some observations on existing PCS:

- ICF can serve in the mapping of the results of technical, clinical and health-status measurement tools. However, the scope of ICF is much broader than the areas relevant for clinical use, and it does not assist the clinician in selecting the most salient aspects of functioning to

assess, or the specific instruments to use in that assessment for a given individual. The ICF Core Sets are expected to offer a solution for this problem but problems are still remaining<sup>234, 96, 235, 236, 117</sup>. Moreover, ICF does not meet a number of basic requirements for scientific classification due to a lack of a clear definition for all the components. It is not clear yet how researchers will handle this obstacle. ICF can currently be used as a conceptual framework but the operational application of ICF is still experimental.

- Most other patient classification systems that were found only support resource allocation (see *infra*).

The PCS currently used for resource allocation in some countries (For example: IRF-PAI, AN-SNAP, CRAFT) were extensively discussed in chapter 3.

They typically include 3 parts:

- medical diagnosis (impairment category)
- estimation of functional disability
- registration of additional factors that typically influence the rehabilitation process like co-morbidities, age or social factors.

FIM-FRG (developed in the USA; led to IRF-PAI, AN-SNAP and to some principles in the German classification system etc.) uses FIM to estimate functional disability for inpatient post-acute rehabilitation and explains 30 % of variance of costs within the American Inpatient rehabilitation system<sup>23, 22</sup>. Although only covering some aspects of ICF, this is a first step in predicting and controlling resource allocation for in-hospital post-acute rehabilitation. As additional factors in this system, impairment codes, age and co-morbidities are used.

The already existing PCS for managerial purposes have some disadvantages.

Some PCS like IRF-PAI are only applicable for inpatient or for outpatient rehabilitation and do not cover the whole continuum of rehabilitation care. AN-SNAP (developed in Australia based on FIM-FRG) is an exception (see chapter 3); moreover it is specifically developed for smaller countries in order to avoid that some PCS-classes contain only few patients.

PCS for hospitalised patients include the results of tools which measure level of independence concerning ADL (FIM). These results are rather an indicator for burden of general nursing care and do not indicate rehabilitation needs. Patient groups within these PCS are homogeneous for resource needs during a hospital stay (e.g. Length Of Stay (LOS)) but not for resource needs for rehabilitation. During the development of FIM-FRG (and subsequently IRF-PAI and AN-SNAP), these “mistakes” were made voluntarily, because no other measurement tool except FIM had been sufficiently validated for almost all diagnostic categories in rehabilitation care (which is necessary for financial purposes). The option to use LOS (and not therapy intensity) as an indicator for resource allocation was taken because regarding therapy needs, practices and opinions among rehabilitation specialists are divergent (as we also demonstrated in chapter 6 and 7) and evidence in the literature is still scarce<sup>23, 22</sup>.

The countries currently using these PCS systems are aware of the difficulties mentioned, and research is going on to develop a managerial system based on ICF. Moreover, efforts are made to make sure that this new system will fit with the financing systems already in use.

These PCS are often expensive tools and require investments in software applications and probably also in hardware. Even an existing PCS should first be validated in the Belgian context and no Belgian data are available till now.

As already outlined in chapter 4, the validation of a PCS available in other countries could go hand in hand with a validating exercise of the existing Belgian registration system MVG-RIM2, which also includes some measures of level of independence concerning ADL, for inpatient rehabilitation managerial purposes.

## 9.2.3 Planning of rehabilitation services

### 9.2.3.1 *General rehabilitation (mono-disciplinary and simple multidisciplinary): bottom-up*

To ensure accessibility at this level, no restrictions should be set on the number of organisations. General rehabilitation services should be provided geographically widespread (bottom-up approach). It could be considered to allow these organisations to admit patients with complex needs in the chronic phase, as these people do not always have easy access to adapted temporary intensive rehabilitation (e.g. in nursing homes). These services can be delivered by the departments of Physical Medicine and Rehabilitation, present in most of the acute hospitals.

### 9.2.3.2 *Complex multidisciplinary rehabilitation: top-down*

Decision-makers should define the number of organisations needed based on epidemiological data and evidence about intensity, content and duration of rehabilitation therapy. As this information is not yet available in Belgium, it is currently not possible to plan in such a way. An epidemiological monitoring of musculoskeletal and neurological disorders and a follow up of the developments in rehabilitation sciences is necessary. For this last purpose, an international research collaboration is recommended.

Planning of rehabilitation services requires a central database in which data of delivered services and activities as well as patients' profiles are registered, in order to dispose of relevant information concerning musculoskeletal and neurological rehabilitation in Belgium.

Besides musculoskeletal and neurological rehabilitation, other types of rehabilitation (e.g. cardiac and pulmonary rehabilitation) should be considered while planning rehabilitation services in order to increase efficiency. These types of rehabilitation might be offered in a comparable administrative framework with similar infrastructure and equipment.

### 9.2.3.3 *Estimation of the number of needed rehabilitation services for the five selected pathologies*

As mentioned earlier, in Belgium there is no central registration of rehabilitation activities or patient profiles.

In order to estimate the need for rehabilitation services an attempt is made to define the number of patients needed to be treated within these facilities, at least for the five selected pathologies in this study.

These data need to be interpreted with very great caution as they are based on incidence and prevalence figures obtained by extrapolation of other countries (Chapter 2), completed by Belgian expert opinion and some RIZIV/INAMI data.

There are some specific aspects in the Belgian context making that a model of services supply cannot be merely copied in Belgium. Here is referred to Belgium as a federal state with different regions and communities. Distances are small but the population density is very high as compared to other European countries.

The aim of this estimation is merely to give an idea on how to start, and the services supply should be corrected where necessary in the future, based on exact data once they are available.

This estimation is based on the incidence/prevalence as developed in Chapter 10, Figure 10.5.

The report of the Ministerial subgroup for locomotor and neurological rehabilitation<sup>131</sup> is also taken into account as this is the result of a reflection process and dialogue between different Belgian stakeholders, during more than a year of discussion and dialogue.

## TOTAL HIP REPLACEMENT

The assumption is that 85% of the patients with THR have only temporary and simple rehabilitation needs, which can usually be covered by monodisciplinary treatment. About 15 % of the patients are considered as fragile (mostly after traumatic hip fracture) or present with polyopathy (e.g. rheumatoid arthritis, stroke or polyneuropathy). These patients may need a simple multidisciplinary approach.

The required rehabilitation activities in patients with THR can be provided by general rehabilitation services, present in most of the acute hospitals. The overall incidence of patients with THR in Belgium was 16.599 in 2004<sup>46</sup>. In the Study of prof. Closon of the Sp facilities they account for 26% of the hospital stays<sup>24</sup>.

## LOWER EXTREMITY AMPUTATION

The incidence of LEA is difficult to estimate in Belgium as in literature it is not always specified which amputation levels are included. In the Sp-study by prof. Closon LEA accounts for only 3 % of the hospital stays<sup>24</sup>. The majority of LEA is due to vascular disease (82%), mostly in diabetic patients. A minority are traumatic (9%) or oncological (9%)<sup>237</sup>. In other studies the percentages of vascular causes are often even higher. About half of the patients with LEA are fitted with a prosthesis<sup>66</sup>. Patients who are not fitted with a prosthesis can usually be treated in general rehabilitation services (except e.g. for bilateral above knee amputation).

Based on literature, expert opinion and RIZIV/INAMI data the assumption is that in Belgium there are about 600 new prosthesis patients each year. Of these prostheses, the proportion above knee/below knee is approximately 50/50%.

The majority of the LEA needing a prosthesis can be treated in specific services. In order to admit 30 new LEA patients per centre per year maximum 20 specific centres are needed.

The patients with above knee amputation, associated problems (traumatic or oncological etiology) and younger age, with broader rehabilitation goals, can even need highly specific services. Technology has become very specialised and the indication for expensive knee mechanisms such as microprocessor knees should depend on the decision of a highly specialised multidisciplinary team. For the small number of patients (maximum 10 %) with highly specific needs (associated problems, high technology needs, pelvic level of amputation for traumatic or oncological reasons), 2 to 3 centres are sufficient which need to collaborate with the specific centres in the network. For reasons of efficiency the highly specific centres could combine the specific function for the own region.

## SPINAL CORD INJURY

The incidence of spinal cord injury in Belgium is estimated between 1 and 3/ 100.000 / year. Nearly all present with complex rehabilitation needs. These patients need treatment in highly specific services.

This means that there are about 200 new SCI patients per year in Belgium (100-300). Considering, as is defined in the report of "the Ministerial subgroup for locomotor and neurological rehabilitation", that a total critical mass of minimum 30 patients/day and 30 new patients per year is needed this brings us to a total of three or four centres for Belgium. This still means 1 centre for 2.500.000 inhabitants whereas abroad there usually is one centre for 4 to 6.000.000 inhabitants (e.g. UK and France 12 centres, Denmark 2 centres).

These highly specific centres need to work in collaboration with a network of specific centres, for instance if the distance to the highly specific centre would be too important for ambulatory treatment.

## STROKE

In Belgium there are about 19 000 new stroke patients per year (incidence 185/100 000/year). Half of these occur after the age of 75 and only 25 % before the age of 65. According to the gold fist rule of Fortune and Wenn<sup>238</sup> approximately 1/3 dies, 1/3 recovers and 1/3 presents with permanent disability (n= 6300). Of these about half is younger than 75, and even less are younger than 70. A considerable number of the elderly patients can be treated in general services or in geriatric services.

About 15 % of stroke patients need rehabilitation services in order to obtain the predefined rehabilitation goals (n= 2860). As the incidence of this pathology is quite high, these services can be provided by specific services in function of the complexity of the rehabilitation needs and goals. In chapter 10 is described how protocols for standard patients within the different pathology groups were developed. The mean length of stay was estimated at 16 weeks. A specific subgroup needs highly specific services: the (mostly hemorrhagic) younger patients whose clinical profile is rather comparable with that of TBI patients than with ischemic stroke patients.

In the Sp-study of Prof. Closon<sup>24</sup> stroke patients account for 28 % of the inpatients. In chapter 5, 16 % of K nomenclature cases is coded I01A (cerebral lesions with neurological deficit) and 64 % of the cases of the 9.50 conventions concerns the group A2 (Acquired para- or tetraplegia or Brain injury that causes severe neuromotor impairments or speech- and language impairments or other severe neuropsychological impairments).

The report of "the Ministerial working group for locomotor and neurological rehabilitation"<sup>131</sup> states that 'locoregional rehabilitation centres', where stroke patients ought to be treated in the model they propose, minimum 60 new patients should be admitted yearly and 30 patients should be treated daily. The assumption is that a very important part of these patients will be stroke patients.

Based on all these data the estimated number of specific facilities for stroke is between 25 and 30. However, these data are based on minimum numbers of patients. Of course a larger critical mass creates opportunities for a better cost/benefit relation and increased efficiency. For the estimation of the needed number of highly specific services for stroke patients, data on the incidence of other acquired brain injuries such as traumatic brain injury (TBI) are needed, as the patients in this small stroke subgroup will probably be partly comparable to this pathology group.

## MULTIPLE SCLEROSIS

The crude incidence for MS in Belgium is estimated at 4/100 000/year, meaning 400 new patients per year. The prevalence is about 10 000 patients. The assumption was made that 10 % of these patients need a hospitalisation during 4 weeks and 1/6 of the patients need ambulatory rehabilitation. The first part should be organised in a highly specific service. The ambulatory treatment can additionally be provided in specific services organised in a network around the highly specific services.

It is assumed that 2 to 3 highly specific services are needed, as well as about 25 to 30 specific services. As a reference, in Denmark there are 2 centres for about 7000 MS patients.

## CONCLUSION

Most of these estimations need to be interpreted with extreme caution, due to the lack of real data and the many assumptions and extrapolations that have been made.

Registration of data should be started as soon as possible by means of a patient classification system as described in chapter 3 and in a second phase the estimation can be corrected where necessary.

The planning of the different levels of services supposes the organisation of a network through which the patient can be transferred in function of the rehabilitation phase and his rehabilitation needs and goals.



Summarised, at the level of general rehabilitation planning is not necessary as it is assumed that these services can be delivered by the departments of PM&R, present in most of the acute hospitals.

At the level of specific rehabilitation, the number of needed services is between 20 and maximum 30. Of course, these specific centres can deliver service to the different pathologies. The geographical repartition should take into account the population density which varies to an important extent in Belgium. In The Netherlands there are for instance 24 centres spread over the country for a population that is 1/3 higher than in Belgium.

Due to low incidence of some pathologies, the highly specific centres should combine different pathology groups (for instance SCI, complex amputations, multiple trauma, burns and TBI). Some specialised and expensive functions, equipment and infrastructure can be shared by different patient groups, for instance a driving simulator, a treadmill with body weight support or equipment for functional electrostimulation. The estimated number for Belgium is between 3 and 5 centres.

#### 9.2.4 Evidence based practice: need for research

Another important issue is the principle of good clinical practice in terms of intensity, content and duration of a rehabilitation programme. Unfortunately, up to date only little evidence is available concerning these factors. Rehabilitation interventions must be evidence based and have a proven added value to achieve the defined goals.

The variability in clinical practice and clinical pathways (see Chapters 6 and 7), is related to a lack of scientific evidence to support clinical decisions in rehabilitation. This is the main weakness of rehabilitation.

For this reason a research program, preferably in an international collaboration, is needed in rehabilitation lining up with studies on the effectiveness and quality of rehabilitation activities. Similar programmes are being launched in The Netherlands, Germany and North-European countries.

### 9.3 **MEASURING QUALITY: A REQUIREMENT FOR POST-ACUTE REHABILITATION.**

One of the important issues for the near future is developing tools to assess and support the appropriateness of payment and coverage policies. For rehabilitation, a specific agenda will be needed on the development of quality systems. It is recommended to reflect on and develop quality (and/or accreditation) systems in rehabilitation for the different phases in the disease/illness trajectory. These phases have particular characteristics and different purposes. As mentioned earlier: acute care is a rather discrete event with a clear beginning and end. Post-acute care refers to the period of care that follows an acute event. Chronic care is defined by long-term, ongoing treatment. Patients needing post-acute care may require ongoing, chronic care, because of pre-existing conditions or as a result of the severity of the acute event. The integration of the phases is relevant when developing quality systems for the rehabilitation sector as a whole. Developing quality indicators and quality measures for post-acute rehabilitation should therefore be done against the background of the rehabilitation trajectory.

At first, considerations have to be made about outcome measures, as these measures can have a place in clinical practice, in research or in policy questions. This distinction has to be kept in mind when developing a system, especially since many instruments are available. The different purposes should however be built on a common trunk. When developing a useful quality measurement system the measures ("what?") should be aligned to the purposes ("why?"). Policy issues (and needs) are not the same, even necessarily in line with, clinical or research issues. This conceptual quality framework should have primarily a policy relevance.

The lack of evidence about the effectiveness of post-acute care use is a particular problem for developing quality indicators or measures. The measurement of 'added

value' or outcome of a rehabilitation process is rather difficult because a lot of independent variables influence this outcome. Besides the identification of rehabilitation needs and goals other factors need to be taken into account to select appropriate intervention strategies:

- Patient and environment related factors, such as age, motivation, social situation or profession (contextual factors)
- Disease related factors, such as nature and course of the disease, individual variability throughout the disease course, age at disease onset, availability of disease modifying agents, disease stage.

Some fundamental work still has to be done, also because of the lack of uniform outcome measures in rehabilitation. It is currently almost impossible to assess systematically the outcomes of rehabilitation as existing instruments measure functional status in different ways. The available patient assessment instruments make it difficult to identify whether similar patients are treated across different settings.

The reflection on outcome measures within a quality approach should as much as possible line up with the current efforts being done to use and implement the ICF framework (as is the case internationally). It is recommended to choose as much as possible those instruments falling within one of the dimensions of ICF. Outcome elements not covered by the ICF framework (e.g. quality of life, satisfaction) and end points such as mortality should not be forgotten. These other dimensions have to be developed at longer time notice and international collaboration is needed on this issue.

Moreover, many of the measures identified as potentially important in understanding quality of post-acute care, are not included in existing administrative data. It lacks objective and other (e.g. quality of life, integration) measures as well as global and disease specific process measures. Existing data sets may serve a variety of purposes, but currently do not include information needed to measure post-acute care quality and outcomes. They do not contain information needed to adequately measure the quality of care within and across post-acute care settings.

Several countries are currently trying to develop and implement quality and performance measurement and try to connect it (at least the outcome measures) to the financing of the post-acute and long term rehabilitation. It is recommended to analyse these efforts and make an assessment on how performance and quality measurement could be integrated in the Belgian (post-acute) rehabilitation model. An analysis of their methods to develop quality systems for daily practice, in a context of limited scientific evidence would offer an added value.

At short notice, it will not be possible to develop a quality system able to determine whether post-acute care has successfully maximized a patient's function, allowing return to the most independent living environment, and reintegration into prior activities and lifestyle. This question should be dealt with on middle term. In a first stage, a model "light version" for a quality measurement system could be prepared, at least to compare activities, patient profiles and maybe some functional outcomes. The tool should enable a comparative analysis of post-acute facilities as a "benchmark". It will offer a basis to debate profiles and (in due time) outcomes of activities of post-acute facilities.

The "light" instrument should at least measure functional level, (some) pathology-specific elements, some additional measures for risk adjustment (social characteristics, co-morbidity, ...), and some items concerning patient's perception. A longitudinal method would be ideal using an admission instrument and a follow up instrument for each patient, in order to compare base-line functioning and follow up function of each patient in different phases of the rehabilitation process (compare the Swedish registers). At short notice a cross sectional approach (e.g. an adapted MVG-RIM2) might be the most feasible approach to get some basic quality indicators.

### Key Points

- **Belgium needs to develop an explicit conceptual framework for the organisation of post-acute musculoskeletal and neurological rehabilitation.**
- **It is proposed to develop a stratified rehabilitation model in which the roles of rehabilitation organisations can be identified, taking into account characteristics of patients' needs, disease trajectories, rehabilitation goals and epidemiological and geographical needs.**
- **The stratified rehabilitation model rehabilitation is organised around three differentiated types of rehabilitation services, taking into account patients' rehabilitation needs and goals: general rehabilitation services, specific rehabilitation services, highly specific rehabilitation services.**
- **The conceptual stratified rehabilitation model should be supported by a patient classification system: a systematic assessment of patients' rehabilitation needs in the acute phase of the disease trajectory (PCS), within the framework of an outcome model as ICF.**
- **Two criteria are used for separating the levels in this structure: complexity of rehabilitation needs and goals, and incidence and prevalence of consequences of health conditions.**
- **An equitable geographical distribution of general rehabilitation services should be pursued (bottom-up).**
- **A maximum of 20 to 30 rehabilitation centres are estimated to be necessary at the specific level; and 3 to 5 at the highly specific level.**
- **Alternative options for the stratified rehabilitation model are given.**
- **An epidemiological monitoring of musculoskeletal and neurological disorders and a follow up of the developments in rehabilitation sciences is important. Central registration of delivered services and activities is necessary. Based on these data, the proposed estimation of centres and services can be refined in the future if necessary.**
- **Quality evaluation is an important part of every organisational/financial structure. Basic data registration is a first step to evaluate the rehabilitation process. In the Netherlands and Germany, quality and performance indicators are used, even without the use of a formal patient classification system (PCS). In the US, an accreditation system is available (CARF); according to experts a European accreditation system is under development.**