Value and application of the ICF in rehabilitation medicine

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Abstract
Rehabilitation medicine may be defined as the multi- and interdisciplinary management of a person's functioning and health. Rehabilitation medicine defines itself with respect to concepts of functioning, disability and health. Assessment and intervention management rely on this concept.
The current framework of disability—the WHO International Classification of Functioning, Disability and Health (ICF)—providing a coherent view of health from a biological, individual and social perspective.
However, ICF success will depend on its compatibility with measures used in rehabilitation and on the improvement of its practicability. Thus, it is expected to see the development of the ICF based on versions of currently used instruments and on the development of ICF Core Sets.
The new language ICF is an exciting landmark event for rehabilitation. It may lead to a stronger position of rehabilitation within the medical community, change multi-professional communication and improve communication between patients and rehabilitation professionals.

Principles of rehabilitation
Rehabilitation medicine may be defined as the multi- and interdisciplinary management of a person's functioning and health. Its goals are to minimize symptoms and disability. Rehabilitation options are to:

- treat impaired body structures and functions (a treatment strategy),
- overcome impaired body functions, activity limitations and participation restrictions (a rehabilitative strategy) and to,
- prevent further symptoms and disability (a preventive strategy).

Attention is given to potentially disabling behaviours and environmental factors that increase disablement. At the same time, attention is given to potentially beneficial behaviours and environmental factors that help to minimize symptoms and disability. Although an underlying condition may not be cured or prevented, rehabilitation can minimize symptoms, disability and possibly health care costs, making it successful for both the individual and society.1

Rehabilitation is a continuous process and involves the identification of problems and needs, the relation of problems to impaired body functions and structures and factors of the person and the environment, and the management of rehabilitation interventions (figure 1).1

Patients typically suffer from an array of problems, including pain, fatigue, depression, difficulties with activities of daily living and restrictions in life involvement. It is thus necessary to set priorities by selecting target problems and to define goals and a realistic time frame for achieving them.

In acute and subacute settings, problems are typically identified by an interview with the patient, the nursing staff and proxy persons. Standardized assessment instruments, such as the FIM2 may additionally be used to assess the individual problems, to set goals, and to evaluate effects.

In non-acute settings patients’ problems are being taken by an interview. In addition, information may be taken from standardized patient-oriented assessment instruments. E.g. in patients with osteoarthritis of the lower extremity problems could be identified from a comprehensive health status measure such as the SF-363 and a condition-specific measure.

Key to a successful rehabilitation management is the understanding of the relationship between selected target problems and impaired body functions and structures and psychosocial and environmental factors which exacerbate or help to minimize them (figure 2).

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However, not all impaired body functions and structures and contextual factors may be relevant for the target problem. Furthermore, not all body functions and structures and contextual factors relevant to the problem are modifiable or of equal importance. When planning the rehabilitation intervention, it is thus necessary to identify and address the factors with the greatest potential for improvement.

FUNCTIONING, DISABILITY AND HEALTH IN THE REHABILITATION VERSUS THE MEDICAL PERSPECTIVE

The perspective of functioning and health is different when viewed from the medical and the rehabilitation perspective.

Medical interventions are targeted towards the disease process. The measurement of functioning and health is required to evaluate the patient-relevant outcomes of an intervention. From the medical perspective, functioning and health are seen primarily as a consequence of a disease or condition. Measures are thus typically disease-specific. The interpretation of these measures is generally based on scales and scores and not on individual items.

Instead, rehabilitation interventions are targeted towards a person’s functioning and health. As with medical interventions, the measurement of functioning and health is required to evaluate the patient-relevant outcomes of an intervention. However, in rehabilitation, the measurement of functioning and health is not only relevant to evaluate intervention outcomes but for the diagnosis (assessment) and interventional management, as well. Thus, measures of functioning and health are examined much more closely both at the level of individual problems and also at the level of instrument scales.

From the rehabilitation perspective, patients’ functioning and health are associated with, but not merely a consequence of, a condition or disease. Furthermore, functioning and health are not only seen in association with a condition but also in association with personal and environmental factors and the rehabilitation context. Many rehabilitation-specific measures therefore are both condition- and context-oriented, e.g. the FIM used in the rehabilitation of the stroke patient in acute and subacute settings.

CONCEPTUAL FRAMEWORKS FOR DISABILITY USED IN REHABILITATION MEDICINE

From the outlined principles of rehabilitation and the rehabilitation perspective it becomes clear that concepts of functioning, disability and health are at the core of rehabilitation medicine. Rehabilitation medicine defines itself in respect to them and rehabilitation assessment and intervention management rely on them.

There have been two major conceptual frameworks in the field of disability: the International Classification of Impairment, Disability and Handicap (ICIDH) and the ‘functional limitation’, or Nagi, framework. In the ICIDH the four concepts were disease, impairment, disability and handicap. In the Nagi framework the four concepts are pathology, impairment, functional limitation, and disability. Different from the ICIDH the Nagi framework was not accompanied by a classification.

Both frameworks have received both positive and negative reviews and have been compared extensively. They have stimulated discussions of disability concepts in rehabilitation medicine and have been used widely around the world as frameworks in rehabilitation medicine.

Building on the conceptual frameworks of the ICIDH and Nagi, the US Committee on a National Agenda for the Prevention of Disabilities developed a model emphasizing the interaction between the disabling process, quality of life and individual risk factors. Since the interaction between the components of disability with risk factors including the environment (physical and social), lifestyle and behaviour and biology is representing the rehabilitation perspective, this framework has gained some attention in rehabilitation medicine. However, while the interaction of contextual factors in the disabling process was addressed, the framework was again unidirectional with respect to the disabling process from impairment to disability.
The current framework of disability—the WHO International Classification of Functioning, Disability and Health (ICF)—attempts to achieve a synthesis, thereby providing a coherent view of different perspectives of health from a biological, individual and social perspective. It emphasizes ‘building blocks’ to form specific models, focussing on more detailed aspects. The relation between the components is now bidirectional. The ICF has addressed many of the criticisms of prior conceptual frameworks and it has been developed in a worldwide comprehensive consensus process over the few last years. For all these reasons the ICF is likely to become the generally accepted conceptual framework to describe persons’ level of function and health in rehabilitation. Thus, the approval of the new International Classification of Functioning, Disability and Health or ICF (formerly: International Classification of Impairment, Disability and Handicap or ICIDH) in May 2001 marks an exciting step for our specialty.

However, while it is likely that the ICF framework will become the universal for functioning, disability and health in rehabilitation medicine it unclear at this point whether the classification will be adopted as well.

The success of the classification will depend on several factors. Most importantly, the classification needs to be put in perspective of other, potentially competing measurement approaches currently used in rehabilitation medicine. Secondly, the success of the ICF to serve as a globally agreed language to describe, classify and measure people’s functioning and health in rehabilitation medicine will largely depend on its acceptance with rehabilitation medicine practitioners. Among many considerations, the comprehensiveness of the ICF in covering relevant domains encountered in patients in
need of rehabilitation, the compatibility with current measures used in rehabilitation medicine and its feasibility will all be critical. We will examine these issues in the next paragraphs.

CURRENT APPROACHES TO THE MEASUREMENT OF FUNCTIONING, DISABILITY AND HEALTH

There are three conceptual approaches to describe and measure ‘functioning and health’: health status measurements, classifications and valuation methods.

Valuation methods such as ‘standard gamble’, utility, and willingness-to-pay are typically used for research purposes only and are generally not relevant for rehabilitation practice. Instead, both classification and health status measures are potentially useful for rehabilitation practice. Both approaches have evolved separately and have hardly been linked.

Different from the conceptual framework ICIDH, the classification accompanying the ICIDH has not been widely used in rehabilitation practice and research purposes in most countries. It is important to remember, that the classification has only been approved for field trials.

Instead, the many health status measures developed over the last two decades are now widely used both in research and clinical practice. In some fields such as neurorehabilitation, function-oriented health status measures including the FIM and Barthel index have been specifically developed for rehabilitation and are widely used for assessment, intervention management and outcome evaluation. In other fields such as musculoskeletal medicine, currently used measures have generally been developed from a ‘condition’ and not a ‘function-oriented’ perspective. These latter measures may thus not be ideal for rehabilitation.

Among other aspects, the success of the ICF will depend on the compatibility with current measures used in rehabilitation medicine. The compatibility of the ICF with current measures can be studied easily by comparing corresponding items. Let’s look at the FIM items to provide an example. When mapping the FIM items with the ICF, we find many items to be identical, e.g. toileting. Other items are somewhat different, e.g. the FIM uses ‘dressing upper body’ and ‘dressing lower body’ while the ICF uses ‘putting on/taking off clothes’ and ‘putting on/taking off footwear’. The FIM uses ‘bladder management’ and ‘bowel management’ while the ICF uses ‘urinary continence’ and ‘fecal continence’. A slight discrepancy in constructs can be seen with ‘eating’ used in the FIM as opposed to ‘eating’ and ‘drinking’ in the ICF. While the FIM examines ‘stairs’, the best corresponding item of the ICF examines ‘climbing’. Both instruments examine ‘problem-solving’. However, as a consequence of the different dimensions of the ICF, ‘problem-solving’ can be examined either in terms of a body function or an activity/participation domain. As a body function ‘problem-solving’ is defined as mental functions of identifying, analysing and integrating incongruent or conflicting information into a solution. The activity ‘solving problems’ refers to finding solutions to questions or situations by identifying and analysing issues, developing options and solutions, evaluating potential effects of solutions, and executing a chosen solution, such as in resolving a dispute between two people.

Due to the prolific development of health status measures, we are now faced with ‘competing’ instruments in many areas. They often disagree about important domains and how to measure these domains. For example, in ankylosing spondylitis, one instrument examines whether a patient has difficulties ‘putting on your shoes’ and ‘pulling on your trousers’, and another widely used instruments examines the difficulties with ‘putting on your socks or tights without help or aids’. In the ICF the corresponding domains are ‘putting on/taking off clothes’ and ‘putting on/taking off footwear’.

These examples illustrate that it will probably be possible to link items of assessment instruments used in rehabilitation medicine to ICF domains. However, the ‘role’ of the ICF and ‘corresponding’ assessment instruments will have to be worked out. Most importantly, it will be important how scores from a specific assessment instrument can be mapped to the qualifiers used in the ICF to specify the extent or the magnitude of a problem in each component or the extent to which an environmental factor is a facilitator or barrier. When mapping scores the conceptual differences between the qualifiers needs to be addressed. The ICF measures either the ‘performance’ in real life or ‘capacity’ (with or without assistance), typically in a rehabilitation test-situation. With most of the self-administered instruments there will be no conceptual problem because they typically focus on performance. However, the most widely used instruments in acute and subacute rehabilitation including the FIM, measure assistance. It will need to be resolved how the grading of assistance relates to performance and capacity.

The resolution of these ‘mapping issues’ is an important prerequisite to get rehabilitation specialists interested in using only the conceptual framework but also the classification. In fact, the mapping to the ICF may help to overcome the currently seen ‘competition’ between assessment instruments and how to measure specific domains.
As illustrated by the example in ankylosing spondylitis, we are currently faced with ‘competing’ instruments in many areas. These often do not coincide on important domains and how to measure them. No direct comparison of instrument scores is possible, which hampers research in rehabilitation. Consequently, there is clearly a need for an internationally-accepted framework for describing functioning, disability, and health. The mapping of items of competing instruments to the currently available universal ICF is like converting numerous foreign currencies to one universally accepted currency. We may also expect to see the development of ICF based on versions of currently used instruments, thereby making comparisons of data possible.

COMPREHENSIVENESS AND FEASIBILITY OF THE ICF IN REHABILITATION SETTINGS

In a formal workshop testing the comprehensiveness of the ICF-checklist, experts from the three societies for physical medicine and rehabilitation of Germany, Austria and Switzerland did not identify any missing domains for the three examined indicator conditions stroke, back pain and osteoporosis.

Unfortunately, the ICF in its original form is hardly practical. It may take much more than an hour to describe and classify a person’s functioning and health using the original long or short version. Even the checklist with 12 pages typically takes longer than half an hour.

It becomes obvious, that the classification seems comprehensive with relevant domains being represented but that it lacks feasibility as it now stands. We thus need to develop approaches that are both comprehensive and feasible. A possible solution is to link the ICF to ICD 10 conditions or contextual situations and to define short lists or core-sets of domains relevant for specific conditions (e.g. stroke) or health care situations (e.g. subacute care). To allow for comparisons across health across conditions, a generic core-set with domains representing the most relevant domains may complement the condition-oriented or context-oriented core-sets.

ICF-CORE-SETS: A POSSIBLE APPROACH TO IMPLEMENTING THE ICF IN REHABILITATION PRACTICE

Condition-specific core-sets need to include the least number of domains possible to be practical but as many as required to sufficiently comprehensive cover the prototypical spectrum of limitations in functioning and health encountered in a specific condition. The generic core-set again needs to include the least number of domains possible to be practical but as many as required to be sufficiently comprehensive to cover the general spectrum of limitations in functioning and health encountered in most conditions. The generic core-set will tend to focus on domains in the component ‘Activity and Participation’ as well as in the environmental component. Only the generic core-set allows for comparisons of the burden of disease across conditions.

Since both types of core-sets use the same language they can overlap and therefore reduce the total number of domains to be required. In the case of co-morbid conditions more than one condition-specific core-set may be applied. Core-sets with a defined number of domains to be rated have the important advantage to be practical and not to take hours to complete when using the ICF in its original form.

However, a ‘condition-‘ or ‘setting-oriented’ approach begs the question whether this is possible at all and whether this is not contradictory to the new understanding of functioning and health to be associated but not a consequence of a condition.

There are, however, several arguments that support the concept of condition-oriented core-sets. While functioning and health is indeed not a mere consequence of a condition, it is, after all, associated with the condition. This association has been the basis for the development of numerous condition-specific health status instruments. This association has also been implicitly assumed with the definition of sets of important variables to be recorded for every patient in clinical practice, research or clinical record keeping by international initiatives like the OMERACT (outcome measures in rheumatology). The widespread use and performance of the FIM also supports the notion that it should be possible to define short lists or core-sets. Indeed, the FIM may be considered an example of a possible core-set for rehabilitation in subacute care settings. First experiences with the development of condition-specific core-sets gathered at a workshop of the three societies for physical medicine and rehabilitation of Germany, Austria and Switzerland also support the feasibility to develop core-sets of domains for specific conditions or care settings.

Scientifically based condition-specific core-sets are currently developed in a collaboration project of the University of Munich with the Classification, Assessment, Surveys and Terminology Group (CAS) of the WHO funded by the German Ministry of Education and Research and the German Indemnity Insurance Association. Based on preliminary studies using empiric data, Delphi-surveys and systematic reviews, the spectrum of prototypical domains in a variety of musculo-
skeletal, neurological, internal medicine and pain-conditions will be derived. The suggested domains will then be presented, discussed and defined in a nominal group process by a panel of international experts including patients, health professionals and physicians. These core-sets will then be tested in a multi-center cohort study with 3000 patients for its feasibility, reliability, validity, and sensitivity. A description of the project is being published in this Journal.11

THE ICF AND THE FUTURE OF REHABILITATION MEDICINE

For the first time in the history of rehabilitation medicine, we can now rely on a universally agreed conceptual framework and classification for functioning, disability and health. The approval of the ICF by the world health assembly in May 2001 is a landmark event that will trigger many developments related to the field of rehabilitation. It is likely that not only the conceptual framework, but also the classification, will be adopted by rehabilitation professionals and researchers, health authorities and health insurances in the near future.

The new common language ICF may empower rehabilitation professionals not only in their daily work with patients, but also when dealing with other medical disciplines, hospital and other health care administrations, health authorities and policy makers. The ICF may indeed trigger a new common identity among rehabilitation professionals and lead to a stronger position of rehabilitation within the medical community.

Any language influences the way people think. Since the ICF now includes contextual factors interacting with the components body, activity and participation it is likely that rehabilitation professionals will increasingly consider these factors and interactions. Also, the now neutral terms body (-functions and -structures), activity and participation as compared to the prior ‘negative’ impairment, disability and handicap may stimulate a more positive view.

A common language and identity among rehabilitation professionals will change multi-professional communication. More specifically, the ICF will become the basis for multi-professional patient assessment, goal setting, intervention management and evaluation. Since rehabilitation is part of the continuum of care from acute to community care, the ICF may be a new meaningful way to communicate across the continuum. E.g. the ICF could be the basis for communicating a comprehensive view on the current state of a patient when transferring the patient from one health care setting to another, e.g. to a nursing facility.

Accordingly the ICF will become an important part for the education of rehabilitation doctors and nurses, physical, occupational and speech therapists, psychologists, social workers and other rehabilitation professionals.

The ICF may also improve communication between patients and rehabilitation professionals. It will be easier for patients to understand their functioning and health, rehabilitation goals and an intervention plan based on a language they and their proxies can understand.

The ICF will greatly influence research in rehabilitation. Current assessment instruments will be rethought or modified to be ICF compatible. While many of the currently used instruments have been developed from a condition-oriented perspective, we may now see a proliferation of functioning-oriented assessment instruments for specific conditions, health care situations, age groups, performance levels etc. The components of the ICF are the basis for research into their interactions and will lead to a better understanding of functioning, disability and health. Most importantly, the components are a practical framework for designing longitudinal prognostic studies on the negative and positive factors related to functioning and health in persons with a specific condition or within a specific context.

Finally, the ICF will be used by health agencies and insurances in many ways. It will, for example, be used for expert opinion, case-management, health reporting and health statistics, quality assurance and benchmarking, health care planning and case management. The ICF may also be used for the development of prospective payment systems. While current systems such as the FRGs (functional related groups) are based on the FIM, future concepts may prefer to base their predictive models on more comprehensive and condition or context-oriented ICF-based sets of domains.

Conclusion

In conclusion, the new ICF is an exciting landmark event for rehabilitation medicine. It is likely to influence virtually all aspects of rehabilitation practice, research and policy. We are looking forward to face the many challenges when applying the ICF in our specialty.

References


