View metadata, citation and similar papers at core.ac.uk

brought to you by CORE

provided by Plymouth Electronic Archive and Research Library

For a link to this paper follow: doi:10.1038/sc.2015.155

To be cited as: Spinal Cord. 2016 Apr;54(4):324-8. doi: 10.1038/sc.2015.155. Epub 2015 Sep 8. Rehabilitation goals of people with spinal cord injuries can be classified against the International Classification of Functioning, Disability and Health Core Set for spinal cord injuries. Haas B, Playford ED, Ahmad AQ, Yildiran T, Gibbon AJ, Freeman JA.

Rehabilitation goals of people with spinal cord injuries can be classified against the International Classification of Functioning, Disability and Health Core Set for spinal cord injuries

Bernhard Haas[1]* MSc BA MCSP FHEA, E Diane Playford[2,3] MD FRCP, Arshia Q Ahmad[4] MD MRCP MSc, Tansel Yildiran[3] MSc, Angela J Gibbon[5] MSc BSc MCSP, Jennifer A Freeman[1] PhD B App Sci FCSP

*Corresponding author

School of Health Professions

Plymouth University

Peninsula Allied Health Centre

Derriford Rd

Plymouth

PL6 8BH

bernhard.haas@plymouth.ac.uk

Tel: +44 (0)1752 588815

Fax: +44 (0)1752 588874

[1]School of Health Professions, Plymouth University, Plymouth, U.K.

[2]National Hospital for Neurology and Neurosurgery, Queen Square, London, U.K.

[3]University College London Institute of Neurology, London, U.K.

[4]Rehabilitation Hospital Indiana, Indiana University, Purdue University Indianapolis , USA

[5]North Bristol NHS Trust, Southmead Hospital, Bristol

Rehabilitation goals of people with spinal cord injuries can be classified against the International Classification of Functioning, Disability and Health Core Set for spinal cord injuries

Abstract

Study design: Cross-sectional study

Objectives: To establish if inter-professional rehabilitation goals from people with non-traumatic spinal cord injury (SCI) can be classified against the International Classification of Functioning, Disability and Health (ICF) SCI comprehensive and brief Core Sets early post-acute situation

Setting: Neurological rehabilitation unit

Methods: Rehabilitation goals of 119 patients with mainly incomplete and non traumatic spinal cord injuries were classified against the ICF SCI Core Sets following established linking rules

Results: 119 patients generated 1509 goals with a mean (and Standatd Deviation, SD) of 10.5 (9.1) goals per patient during the course of their inpatient rehabilitation stay. Classifying the 1509 rehabilitation goals against the Comprehensive ICF Core Set generated 2909 ICF codes. Only 69 goals (4.6%) were classified as 'Not definable (ND)'. Classifying the 1509 goals against the Brief ICF Core Set generated 2076 ICF codes. However, 751(49.8%) of these goals were classified as 'Not definable (ND)'. In the majority of goals (95.7%) the ICF code description was not comprehensive

enough to fully express the goals set in rehabilitation. In particular the notion of quality of movement or specificity and measurability aspects of a goal (usually described with the criteria and acronyms SMART) could not be expressed through the ICF codes.

Conclusions: Inter-professional rehabilitation goals can be broadly described by the ICF comprehensive Core Set for SCI but not the Brief Core Set.

Key words

Spinal Cord injury, International Classification of Functioning Disability and Health, ICF, rehabilitation, goal setting

Introduction

Spinal cord injuries may have profound effects on the physical functioning of an individual and cause activity limitations and participation restrictions [1]. The level of lesion and degree of neurological completeness/incompleteness influences the physical ability following a spinal lesion, but quality of life in SCI is largely determined by activity and participation issues such as personal care, community transportation and stable relationships [2]. The ability to describe, classify and code information and measurements on such a broad range of health issues requires a common framework and language. The Word Health Organisation endorsed the ICF as a member of the family of international classifications and was designed to provide such a framework; it aimed to 'establish a common language for describing health related states in order to improve communication[3 (p3)]. The ICF understands human functioning to be the result of complex interactions between health conditions and environmental and personal factors.

Whilst the ICF is intended to be a document for use in clinical practice, its length and complexity make this a practical challenge. Tailored useful applications have therefore emerged and continue to be under development; the ICF should therefore be seen as a living tool [4]. The need for such tailoring has led to the creation of condition specific Core Sets [5] which aim to contain a practically

useful number of ICF codes which are comprehensive enough to cover the range of health issues relevant to a particular condition.

Core Comprehensive and Brief Sets for individuals with SCI have been developed for the early post-acute [6] and the long-term situations [7]. The Comprehensive early post-acute Core Set consists of 162 ICF codes of which 63 are from 'body functions', 14 from 'body structures', 53 from 'activities and participation' and 32 from 'environmental factors'. The Brief Set consists of 26 codes with 8 from 'body functions', 3 from 'body structures', 9 from 'activities and participation' and 5 from 'environmental factors'. The Comprehensive Core Set has been validated for use by physiotherapists as well as occupational therapists who found that this Set covered the majority of patient problems they encountered [8 9]. More recently Chen et al. [10] developed an alternative Core Set as they felt that the existing ones were too influenced by western values and were not fully applicable to people from Asia who were seen as being more conservative and having closer family relationships.

Goal setting, defined as 'the formal process whereby a rehabilitation professional or team together with the patient and/or their family negotiate goals' [11] is widely practiced in rehabilitation settings even though its effectiveness has so far eluded formal unequivocal confirmation [12]. The process of goal setting has been described as complex and frequently dominated by the professionals in the team [13].

Challenging and yet achievable goals, frequently described with the acronym SMART (Specific, Measurable, Achievable, Relevent and Timed), have the potential to maximise the goal setting process [14]. Attempts to classify patient goals against the ICF within the acute and post-acute general rehabilitation settings have concluded that they broadly map against ICF domains [15,16]. Wallace et al. [17] found that the goals of people with SCI are represented by the ICF, although they did not actually classify these goals against the Core SCI Sets. The aim of this study was therefore to specifically classify inter-professional rehabilitation goals from people with mostly non-traumatic and incomplete SCI against the ICF SCI comprehensive and brief Core Sets.

Methods

This study utilised anonymised data from a clinical database of 1458 patients admitted to an inpatient neuro-rehabilitation unit. The database [18] contained diagnostic information, gender, age, length of stay, admission and discharge destination, rehabilitation goals and standardised clinical outcome measures (Barthel Index, Functional Independence Measure) of 1458 patients with a variety of neurological conditions admitted consecutively over a 13 year period.

From this database we extracted the information of all 119 patients with a diagnosis of 'spinal cord injury' and classified their rehabilitation goals against the ICF SCI comprehensive and brief Core Sets. The rehabilitation goals are developed by the multi-disciplinary team in partnership with the patient, at weekly meetings. The process of goal planning broadly follows the principles described previously by others [19,20] and involve the agreement of relevant goals which are measureable, achievable, and can be expressed in behavioural terms. These short and long term goals are reviewedon a two or three weekly basis and the outcome of a goal is documented as either 'Achieved', 'Not achieved', 'Ongoing', 'Goal revised' or 'Goal abandoned'.

Classification of the goals followed the linking rules recommended by Cieza et al. [21] involving the following steps:

- Prior to classification the researchers developed good knowledge of the conceptual and taxonomical fundaments of the ICF, as well as of the chapters, domains, and categories of the detailed classification, including definitions.
- Each individual goal was carefully inspected and analysed to ascertain the overall goal and divide the overall goal into a primary goal, a secondary goal aspect and a tertiary goal aspect as appropriate. For example the overall goal ''To walk to local shop, to purchase a newspaper' was divided into the

primary goal ‘To walk to local shop’, and the secondary goal aspect ‘to purchase a newspaper’.

- Each primary, secondary and tertiary goal was then classified against the Comprehensive ICF Core Set for SCI – early post-acute situation as well as the Brief ICF Core Set for SCI – early post-acute situation

  This classification was conducted by two researchers (BH, JF) who independently classified a sub-sample of 40 goals. These were then compared and discussed to ensure a common interpretation. The remaining goals were then analysed independently, and any uncertainties or discrepancies resolved by discussion.
- The use of any assistive devices, orthoses, standing frames etc. described within a goal was identified by applying the ICF code ‘e115 – Products and technology for personal use in daily living’.
- Some goals required the support or assistance of another person, either for direct physical assistance, facilitation, supervision or for giving prompts. In these cases we added the ICF codes ‘e340 – Personal care providers and personal assistants’ or ‘e355 – Health Professionals’ where this support was specifically provided by a health professional.
- Where the content of a goal was more specific or precise than any of the available categories from a Core Set we initially allocated the category which most closely matched the overall

196 sentiment of the goal and then recorded that the precise
197 nature of the goal could not be classified.
198 • Where the content of a goal could not be matched against any
199 of the available ICF codes from the Core Sets it was allocated
200 'ND – Not Definable'.
201
202 Data analyses utilised descriptive statistics, providing frequency data
203 of the goals against ICF domains of the components body functions,
204 activities and participation and environmental factors from the SCI
205 Core Sets. The frequency of goals which could not be classified
206 according to the existing codes was also determined.
207
208 **Results**
209
210 The sample comprised 119 patients with a SCI diagnosis; 46 (38.7%)
211 of whom were female. For the vast majority (114 or 95.8%) the
212 underlying cause of their spinal cord injury was of a non-traumatic
213 nature, and included spinal tumours, cord compression and
214 inflammation. In 45 patients (37.8%) the lesion was in the cervical
215 area and in 62 (52.1%) it was in the thoracic/lumbar area. For 12
216 (10.1%) patients the database information was not clear enough to
217 ascertain the precise level of lesion. 102 (86.7%) patients had an
218 incomplete lesion and 8 (6.7%) had a complete lesion. For 9 patients
219 the database information was not clear on their level of completeness.
220 The mean (SD, median, range) age on admission was 53.3 (16.4,

54.5, 67) and their mean (SD, median, range) length of stay was 43.6 (38.4, 36.0, 368) days. The median (interquartile Range) FIM score on admission was 93.0 (34) and on discharge it was 113.0 (21). The median Barthel Index score on admission was 12.0 (9) and on discharge it was 18.0 (7).

These 119 patients generated 1509 goals with a mean (SD) of 10.5 (9.1) goals per patient during the course of their inpatient rehabilitation stay. 95 of these goals had a secondary aspect and 5 also had a tertiary aspect. By the end of their stay 1279 (77.7%) of these goals had been achieved, 154 (9.4%) had not been achieved, 45 (2.7%) were still ongoing, 13 (0.8%) had been revised and 18 (1.1%) were abandoned as they were inappropriate.

The majority of goals were multifaceted and were expressed through more than one ICF code; e.g. the goal *'to be transferring with minimal assistance from a nurse using a sliding board'* would have been expressed by three ICF codes (d420 for the transferring activity, e355 for the assistance provided by a health professional and e115 for the use of a product of personal use). Classifying the 1509 rehabilitation goals against the Comprehensive ICF Core set therefore generated 2909 ICF codes. Only 69 goals (4.6%) were classified as 'Not definable (ND)'. In all but 65 goals (95.7%) the ICF SCI Core Sets were not specific enough to fully express the goals set in rehabilitation; e.g. the goal *'To transfer from sitting to standing, using my arms to push up and taking weight through my feet before*

taking hold of Carter Rollator' (walking appliance) was classified as d420 (transferring oneself) and e120 (products and technology for personal indoor and outdoor mobility and transportation). However, the detailed description goes much beyond this simple code and expresses the notion of quality of achieving this transfer and the exact nature/type/brand of equipment to be used.

Classifying the goals against the Brief ICF Core set generated 2076 ICF codes. However, 751(49.8%) of these goals were classified as 'ND'.

Table 1 provides a frequency breakdown of codes from the SCI core sets used against the 1509 rehabilitation goals from our sample.

Table 1 about here

When viewed against the major ICF categories then our results showed that the rehabilitation goals set by the patients in our sample were mostly related to mobility (62.6%) or self-care (35.2%). In 510 (33.8%) goals products and technology were used and health professionals or other personal assistants played a significant role in achieving in 603 (40.0%) goals . Table 2 summarises the frequency (and percentage) of codes from the comprehensive ICF SCI Core Set against the major ICF domains.

Table 2 about here

Discussion

This study aimed to determine if it was possible to classify rehabilitation goals against the ICF Core Sets for SCI. It enabled us to ascertain how many of these goals could be classified onto the ICF SCI Core Data Sets and therefore give an indication of how these Core Sets may reflect inpatient rehabilitation practice. Our findings suggest that for the vast the majority of goals an appropriate code from the comprehensive Core Set could be identified. This supports the findings by Herrmann et al. [8 9] who investigated the applicability of the ICF Core Sets for SCI to physiotherapy and occupational therapy practice and also Mittrach et al. [22] who concluded that goals of physiotherapy can be described with the language of the ICF.

Classification of goals against the Brief Core Set proved much more difficult because there was no equivalent code for almost half of the goals. The usefulness of the Brief Core Set therefore seems limited within the context of rehabilitation goal setting. Others have also suggested that the Brief Core Sets for SCI reflect relevant areas of activity and participation in only a limited way and may require revision[23]; alternatively categories from the comprehensive set could substitute insufficient Brief Core Set categories[6]. Even though we were able to identify appropriate codes for the majority of goals we found that in most cases the goal description was more extensive or more specific than the ICF codes permitted. In many cases an ICF

code ending in ‘8’ or ‘9’ (‘other specified’ or ‘unspecified’) could have been used. However, the use of these codes ending in 8/9 has been specifically discouraged in the ICF linking rules[21]. Additional elements, beyond the broad goal topic (such as transferring, walking or dressing), were embedded in the goal. These elements would contribute to making the goals SMART[14], by adding specificity on the activity, any support or equipment needed, the timeframe and quantification of the performance. In line with the aims of clinical practice, goals also focused on enhancing the ‘quality’ of movement, making reference to good posture, expected movement sequence or appropriate weight bearing. This supports the notion that rehabilitation goals are often educational in nature, making explicit to the patient ‘how to’ achieve particular tasks. Barnard et al. [13] described the process of goal setting as being heavily influenced by members of the rehabilitation team, particularly when describing the quality standards of a goal. This quality element seems less important to the developers of the ICF; it is possible that it represents a unique priority for therapists involved in rehabilitation, although this has yet to be investigated.

The focus of the vast majority of goals was related to activity and participation issues of mobility (62.6%), self-care (35.2%) and domestic life (13.9%). These were similar priorities as found by some[24,25] but not to others[26,27]. In particular, goals relating to employment, leisure activity and personal relationships were infrequent in our sample. Patients at a later stage of their

rehabilitation journey, or following return to the community may well have a greater interest in these areas.

Very few goals (0.5%) focused on the impairment level, which aims at improving individual body structures or individual body functions. Wallace et al. [17] also found that activity and participation goals were a key focus for individuals with SCI at the transition from hospital to home.

Most of the patients in our sample had an incomplete SCI of non-traumatic origin. Therefore our findings may not generalise to individuals with complete lesions of traumatic origin. They may therefore also not generalise to patients who undergo rehabilitation in a specialist SCI centre [28]. Our investigation was based on a retrospective analysis of rehabilitation goals against the language of the ICF. The goals in our sample were not necessarily written with a full knowledge of the ICF or desire to use the language of the ICF by either the patients or the multi-disciplinary team members. Therefore, goals set with the specific intent to utilise the language of the ICF may have produced a much better match. There seems merit in a more standardised use of the ICF language when setting goals as this may facilitate better comparisons of outcomes. However, using a standardised language should not limit the content of goal setting, particularly relating to the specificity of such goals.

Acknowledgements

345 Dr Diane Playford was supported by the National Institute for Health
346 Research University College London Hospitals Biomedical Research
347 Centre.

348 **Conflict of interest**

349 The authors declare no conflict of interest.

350

References

1 Carpenter C, Forwell SJ, Jongbloed LE, Backman CL. Community participation after spinal cord injury. *Arch Phys Med Rehabil* 2007; **88**: 427–33.

2 Chang F-H, Wang Y-H, Jang Y, Wang C-W. Factors associated with quality of life among people with spinal cord injury: application of the International Classification of Functioning, Disability and Health model. *Arch Phys Med Rehabil* 2012; **93**: 2264–70.

3 WHO. *International Classification of Functioning, Disability and Health (ICF)*. World Health Organisation: Geneva, 2001.

4 Kostanjsek N. Use of The International Classification of Functioning, Disability and Health (ICF) as a conceptual framework and common language for disability statistics and health information systems. *BMC Public Health* 2011; **11 Suppl 4**: S3.

5 Stucki G, A. C, Ewert T, N. K, Chatterji S, Bedirhan T. Application of the International Classification of Functioning , Disability and Health (ICF) in clinical practice. *Disabil Rehabil* 2002; **24**: 281–282.

6 Kirchberger I, Cieza A, Biering-Sørensen F, Baumberger M, Charlifue S, Post MW *et al.* ICF core sets for individuals with spinal cord injury in the early post-acute context. *Spinal Cord* 2010; **48**: 297–304.

7 Cieza A, Kirchberger I, Biering-Sørensen F, Baumberger M, Charlifue S, Post MW *et al.* ICF Core Sets for individuals with spinal cord injury in the long-term context. *Spinal Cord* 2010; **48**: 305–312.

8 Herrmann KH, Kirchberger I, Stucki G, Cieza A. The Comprehensive ICF core sets for spinal cord injury from the perspective of physical therapists: a worldwide validation study using the Delphi technique. *Spinal Cord* 2011; **49**: 502–514.

9 Herrmann KH, Kirchberger I, Stucki G, Cieza A. The comprehensive ICF core sets for spinal cord injury from the perspective of occupational therapists: a worldwide validation study using the Delphi technique. *Spinal Cord* 2011; **49**: 600–613.

10 Chen H-C, Yen T-H, Chang K-H, Lin Y-N, Wang Y-H, Liou T-H *et al.* Developing an ICF core set for sub-acute stages of spinal

Formatted: French (France)

cord injury in Taiwan: a preliminary study. *Disabil Rehabil* 2015; **37**: 51–55.

11 Wade DT. Goal setting in rehabilitation: an overview of what, why and how. *Clin Rehabil* 2009; **23**: 291–5.

12 Levack WMM, Taylor K, Siegert RJ, Dean SG, McPherson KM, Weatherall M. Is goal planning in rehabilitation effective? A systematic review. *Clin Rehabil* 2006; **20**: 739–55.

13 Barnard R a, Cruice MN, Playford ED. Strategies used in the pursuit of achievability during goal setting in rehabilitation. *Qual Health Res* 2010; **20**: 239–50.

14 Bovend'Eerdt TJH, Botell RE, Wade DT. Writing SMART rehabilitation goals and achieving goal attainment scaling: a practical guide. *Clin Rehabil* 2009; **23**: 352–61.

15 Lohmann S, Decker J, Müller M, Strobl R, Grill E. The ICF forms a useful framework for classifying individual patient goals in post-acute rehabilitation. *J Rehabil Med* 2011; **43**: 151–5.

16 Huber EO, Tobler A, Gloor-Juzi T, Grill E, Gubler-Gut B. The ICF as a way to specify goals and to assess the outcome of physiotherapeutic interventions in the acute hospital. *J Rehabil Med* 2011; **43**: 174–7.

17 Wallace MA, Kendall MB. Transitional rehabilitation goals for people with spinal cord injury. *Disabil Rehabil* 2014; **36**: 642–650.

18 Freeman J a, Hobart JC, Playford ED, Undy B, Thompson a J. Evaluating neurorehabilitation: lessons from routine data collection. *J Neurol Neurosurg Psychiatry* 2005; **76**: 723–8.

19 Schut HA, Stam HJ. Goals in Rehabilitation Teamwork. *Disabil Rehabil* 1994; **16**: 223–226.

20 Holliday RC, Cano S, Freeman J a, Playford ED. Should patients participate in clinical decision making? An optimised balance block design controlled study of goal setting in a rehabilitation unit. *J Neurol Neurosurg Psychiatry* 2007; **78**: 576–80.

21 Cieza A, Geyh S, Chatterji S, Kostanjsek N, Ustün B, Stucki G. ICF linking rules: an update based on lessons learned. *J Rehabil Med* 2005; **37**: 212–8.

22 Mittrach R, Grill E, Walchner-Bonjean M, Scheuringer M, Boldt C, Huber EO *et al.* Goals of physiotherapy interventions can be

described using the International Classification of Functioning, Disability and Health. *Physiotherapy* 2008; **94**: 150–157.

23 Ballert C, Oberhauser C, Biering-Sørensen F, Stucki G, Cieza a. Explanatory power does not equal clinical importance: study of the use of the Brief ICF Core Sets for Spinal Cord Injury with a purely statistical approach. *Spinal Cord* 2012; **50**: 734–9.

24 Byrnes M, Beilby J, Ray P, McLennan R, Ker J, Schug S. Patient-focused goal planning process and outcome after spinal cord injury rehabilitation: quantitative and qualitative audit. *Clin Rehabil* 2012; **26**: 1141–1149.

25 Hosseini SM, Oyster ML, Kirby RL, Harrington AL, Boninger ML. Manual Wheelchair Skills Capacity Predicts Quality of Life and Community Integration in Persons With Spinal Cord Injury. *Arch Phys Med Rehabil* 2012; **93**: 2237–2243.

26 Simpson LA, Eng JJ, Hsieh JTC, Wolfe DL. The health and life priorities of individuals with spinal cord injury: A systematic review. *J Neurotrauma* 2012; **29**: 1548–1555.

27 Hammell KW. Quality of life among people with high spinal cord injury living in the community. *Spinal Cord* 2004; **42**: 607–20.

28 Van der Putten J, Stevenson V, Playford E, Thompson A. Factors affecting functional outcome in patients with nontraumatic spinal cord lesions after inpatient rehabilitation. 2001; : 99–104.