Spinal Cord (2006) 44, 567–575

www.nature.com/sc

Original Article

Cross-cultural differences in preference for recovery of mobility among spinal cord injury rehabilitation professionals

PL Ditunno*[,1], M Patrick[1], M Stineman[2], B Morganti[3], AF Townson[4] and JF Ditunno[1]

[1]*Department of Rehabilitation Medicine, Thomas Jefferson University, Philadelphia, PA, USA;* [2]*Department of Physical Medicine and Rehabilitation, Hospital of the University of Pennsylvania, Philadelphia, PA, USA;* [3]*Spinal Unit, IRCCS Fondazione S Lucia, Rome, Italy;* [4]*Spinal Cord Injury Rehab Program, GF Strong Rehab Centre, Vancouver, Canada*

Study design: Direct observation of a constrained consensus-building process in three culturally independent five-person panels of rehabilitation professionals from the US, Italy and Canada.
Objectives: To illustrate cultural differences in belief among rehabilitation professionals about the relative importance of alternative functional goals during spinal cord injury (SCI) rehabilitation.
Setting: Spinal Cord Injury Units in Philadelphia-USA, Rome-Italy and Vancouver-Canada.
Methods: Each of the three panels came to independent consensus about recovery priorities in SCI utilizing the features resource trade-off game. The procedure involves trading imagined levels of independence (resources) across different functional items (features) assuming different stages of recovery.
Results: Sphincter management was of primary importance to all three groups. The Italian and Canadian rehabilitation professionals, however, showed preference for walking over wheelchair mobility at lower stages of assumed recovery, whereas the US professionals set wheelchair independence at a higher priority than walking.
Conclusions: These preliminary results suggest cross-cultural recovery priority differences among SCI rehabilitation professionals. These dissimilarities in preference may reflect disparities in values, cultural expectations and health care policies.
Spinal Cord (2006) **44,** 567–575. doi:10.1038/sj.sc.3101876; published online 29 November 2005

Keywords: cross-cultural; spinal cord injury; preferences; walking; consensus building; rehabilitation

Introduction

The annual incidence of spinal cord injury (SCI) worldwide has been reported to be between 11.5 and 57.8 cases per million population.[1] Those patients fortunate enough to survive their injury and be admitted for rehabilitation often learn to regain function and adapt to their disability. In order to ensure the quality of the rehabilitation stay, patients, family and professional staff plan, implement and continuously revise an individually tailored course of treatment with the goal of returning the SCI individual to the highest level of independence possible. In the US, the Commission on Accreditation of Rehabilitation Facilities (CARF)[2] requires rehabilitation facilities to document consumer satisfaction with services provided. A major emphasis is that service plans are designed by teams that include the consumer to meet their unique needs and preferences, and that service plans are individualized to meet consumer needs as a distinctive person, etc. In the UK, a new clinical Needs Assessment Checklist (NAC)[3] has been applied as an outcomes measure to address the issue of quality of service and to ensure that rehabilitation services are geared towards each patient's individual needs.[4] This checklist and Goal Planning Programme has been found to be effective in planning SCI rehabilitation and effective as a system that reflects individual need. Each patient is involved in goal planning meetings interacting with multidisciplinary rehabilitation professional staff from time of mobilization out of bed to time of discharge. Duff *et al*[4] reports

*Correspondence: PL Ditunno, Department of Rehabilitation Medicine, Regional Spinal Cord Injury Center of the Delaware Valley, Thomas Jefferson University, 132 South 10th Street, Suite 375 Main Building, Philadelphia, PA 19107, USA

that across the 65 patients she studied, positive correlations were found between the number of goals set and achievement, as measured by the NAC (the highest correlations were within the activities of daily living and skin management, the lowest correlations in the discharge and community issues domains). Other research has reported that active client involvement in the rehabilitation process is a good predictor of a positive outcome[5] and that addressing client wishes increases compliance.[6] Thus, involvement of consumers in design and implementation of the course of rehabilitation appears to enhance the quality of care and outcome.[4]

Consumer preferences for functional outcomes, however, often differ from family, and staff. Steinman *et al*[7] report similarities and differences in preferences for functional goals between consumers with disabilities and clinicians. In general, both clinicians and consumers value early improvements in cognitive skills over physical skills. Sphincter management was also deemed most important for both groups. However, there were differences between clinicians and consumers in preferences for recovery when assessing other physical activities of daily living such as dressing, eating, mobility, etc. Lack of patient–staff agreement has also been reported within differing diagnostic groups, including SCI. SCI rehabilitation professions tend to overrate patients' emotional distress compared to patient self-report, and SCI staff often prejudges how a patient should react or adjust to SCI.[8–10] Patient–staff discordance can negatively impact the rehabilitation process.[11] Therefore, continuous assessment of these differences is necessary for effective problem solving and rehabilitation planning.[4]

Preferences for functional outcomes can also reflect cultural differences. Governmental policies from different nations/cultures which modify the direction of health care could be viewed as environmental barriers[12] and can influence life satisfaction outcomes. For example, in some countries, the guidelines of third party payers need to be followed rigorously and often these financial constraints influence the rehabilitation length of stay and rehabilitation plan.[13] If international clinical trial designs are to be standardized for functional goals, cross-cultural differences in preference for recovery must be addressed. The International Campaign for Cures of spinal cord injury Paralysis (ICCP) is a group of affiliate not for profit organizations that has stated that one of its objectives is to 'encourage the development of strategies and priorities for the international field of spinal cord injury research'. ICCP has begun the development of the SCI Clinical Trials Guidelines Initiative[14] to foster international standardization within clinical trials design; reviewing current literature and assessing outcomes measures that are reliable and valid for use cross-culturally.

While numerous studies[15–17] have addressed the life satisfaction among persons with SCI, only a few studies[18–20] have directly asked consumers with SCI to indicate what specific improvements in physical function are most meaningful to their quality of life. Anderson[18] utilized a survey which requires clients to rank seven physical functions in order of priority. She reports that regaining arm/hand function is of most importance to persons with quadriplegia, and regaining sexual function is most important to persons with paraplegia, but bowel and bladder and walking movement were of shared importance to both groups. Donnelly *et al*,[19] utilizing retrospective review, report that self-care goals were identified most frequently and functional mobility was among the top three goals identified on the Canadian Occupational Performance Measure. Estores,[20] in a review of six studies, identifies bowel and bladder function, sexual function, pain and mobility as issues of most importance to persons with SCI. These studies were based on traditional methodologies: inventories, questionnaires, telephone and postal surveys, focus groups and interviews. Estores[20] recommends that new research needs to address the concerns and needs of persons with SCI utilizing newer methods – such as trade-off models.

Stineman *et al*[7] has introduced such a model to assess preferences for rehabilitation outcomes among different groups of patients and staff. Utilizing items from the Functional Independence Measure (FIM),[21] she developed the Feature-Resource Trade-off Game (FG) and recently reported a discrepancy between American consumers with disabilities' ratings and American clinicians' ratings of imagined preferences for recovery of general dimensions of disability. Using a modified version of the Features-Resource Trade-off Game (MFG), Patrick *et al*[22] has shown differences for mobility between American consumers and American SCI rehabilitation professional staff preferences for recovery.

The purpose of this study was to apply this model to determine if there is evidence for cross-cultural differences in preferences for recovery among SCI professional staff. Based on our investigative interest in walking assessment of subjects for clinical trials, we became interested in staff preferences for recovery of mobility. In the development of the Walking Index for Spinal Cord (WISCI),[23,24] we utilized input from rehabilitation staff, clinicians and clinical investigators at eight international spinal cord centers. The WISCI is currently used in several countries to document walking progress during rehabilitation, to assess walking function in research protocols, and has currently been proposed as a measure of walking function by the European Clinical Network.[25] During the course of this research, questions of cross-cultural differences in consumer and staff perceptions of importance to mobility issues have surfaced and need to be addressed. The present study aims to apply a new methodology to investigate and document disparity in the relative importance of preferences for recovery among SCI professional from three populations. The following specific questions will be addressed:

Is there a difference across cultures in staff preference for recovery of walking/wheelchair mobility?

Is there a difference across cultures in staff preference for recovery of other physical functions within the domains of self-care and sphincter control?

Methods

In order to quantify cross-cultural differences, panels of SCI rehabilitation professionals from the US, Italy and Canada were directly observed engaging in a constrained consensus building process (for more detail, see Stineman *et al*[7]) using the MFG. The objective of the MFG is to establish the relative value of alternative functional status states. Resource trade-off is the imagined level of independence achieved among the features. The features being traded for this study were 14 modified FIM items (MFIM) – including six activities of self-care (eating, grooming, bathing, dressing upper body, dressing lower body, toileting), two items of sphincter control (bladder management, bowel management) and six items of mobility (bed/chair transfers, tub transfers, toilet transfers, wheelchair locomotion, walking, stairs). Although walking and wheelchair mobility in the FIM are combined as a single item of locomotion, we split these functions into two variables because we see them as separate skills with distinct implications. Walking with a device (cane) and using a wheelchair both allow one to get around in space without assistance. On the FIM both are given the same numeric score (modified independence-6) with the implication of equality of value. In actuality, they are not equal and have vastly differing sociological and practical implications. Wheeled mobility is more likely hindered by environmental barriers and often more stigmatizing.

The levels of independence through which panelists imagined recovery were the seven performance levels of the FIM: (1) total assistance, (2) maximal assistance, (3) moderate assistance, (4) minimal assistance, (5) supervision, (6) modified independence and (7) complete independence.

Clinical panels

Five United States Rehabilitation Professionals (USRP) constituted the first panel (two Physical Therapists, one Social Worker, one Psychologist, one Rehabilitation Administrative Assistant); five Italian Rehabilitation professionals (IRP) constituted the second panel (two Physical Therapists, one Psychologist and two Physiatrists) and five Canadian Rehabilitation Professionals (CRP) constituted the third panel (one Physical Therapist, one Occupational Therapist, one Nurse, one Social Worker and one Recreational Therapist).

The feature resource trade-off game

The game involves a continuous two-step process of building imagined recovery patterns until seven stages are completed. A large game board (Figure 1) with the 14 MFIM items listed down the left side of the board and the seven performance levels listed across the top is placed at the front of the room with two trained examiners present (one directs the game, the other records the responses).

The stage one board is presented with all items denoted as dependent (Figure 1). One examiner gives the following instructions to the panel.

'Imagine you are lying on a floor unable to eat, groom, dress, bathe, control your bladder and bowel, transfer to a bed, chair, toilet or tub, use a wheelchair, walk or climb stairs.' What single MFIM task (or self-care task) would you want to recover first.'

a. The panel then performs step 1: each person is allowed to move any one marker forward going around the room until 14 moves are made. This will define the first preliminary stage across the 14 MFIM items. There is no discussion allowed.
b. The panel then performs step 2: each person is now allowed the option of moving one item forward at the expense of moving a different item back. After that the examiner states, 'This time each of you are encouraged to briefly provide support for your proposed change'. Panel members not proposing the specific change will then each have the opportunity to comment. After each member has had this opportunity, the individual who make the proposal will summarize and the group will then vote. The change is accepted if the majority accepts it.
c. Steps 1 and 2 are repeated until five interim stages (stages 2–6) are defined.
d. As each interim stage is completed, the data are recorded and participants are told that they cannot move a marker back to a previous stage.
e. At stage 7, all items are denoted as independent.

Graphics

Raw data for each stage is illustrated in concentric pie charts; the innermost circle signifies total dependence and the outer circle signifies complete independence.

Discrepancy scores

Pair wise discrepancy scores between the panels were calculated as follows (for more detail, see Stineman *et al*[7]).

1. The arithmetic differences in performance scores at each stage were determined for each MFIM item between each set of two panels being compared.
2. These differences for each item were squared to produce item-level discrepancy scores.
3. The item-level discrepancy scores were summed across domains and all 14 items to produce total discrepancy scores for each stage.
4. Cumulative discrepancy scores were computed by summing the total discrepancy scores across all stages.

	Helper					No Helper	
	Complete Dependence		Modified Dependence			Modified Independence (Device)	Complete Independence
	Total Assistance	Maximum Assistance	Moderate Assistance	Minimal Assistance	Supervision		
	1	2	3	4	5	6	7
Eating							
Grooming							
Bathing							
Dressing Upper Body							
Dressing Lower Body							
Toileting							
Bladder Management							
Bowel Management							
Bed, Chair, Wheelchair Tranfer							
Toilet Transfer							
Tub Transfer							
Wheelchair							
Walking							
Stairs							

Figure 1 Modified features game board

Results

Pie charts

The following graphic representation of the panels' response to the features game is shown in pie charts.

Figures 2–4 show the concentric pie charts depicting preference stages 2–6 for the US, Italian and Canadian clinician panels. Each MFIM item appears around the periphery. The concentric circles indicate the seven imagined performance levels beginning with total

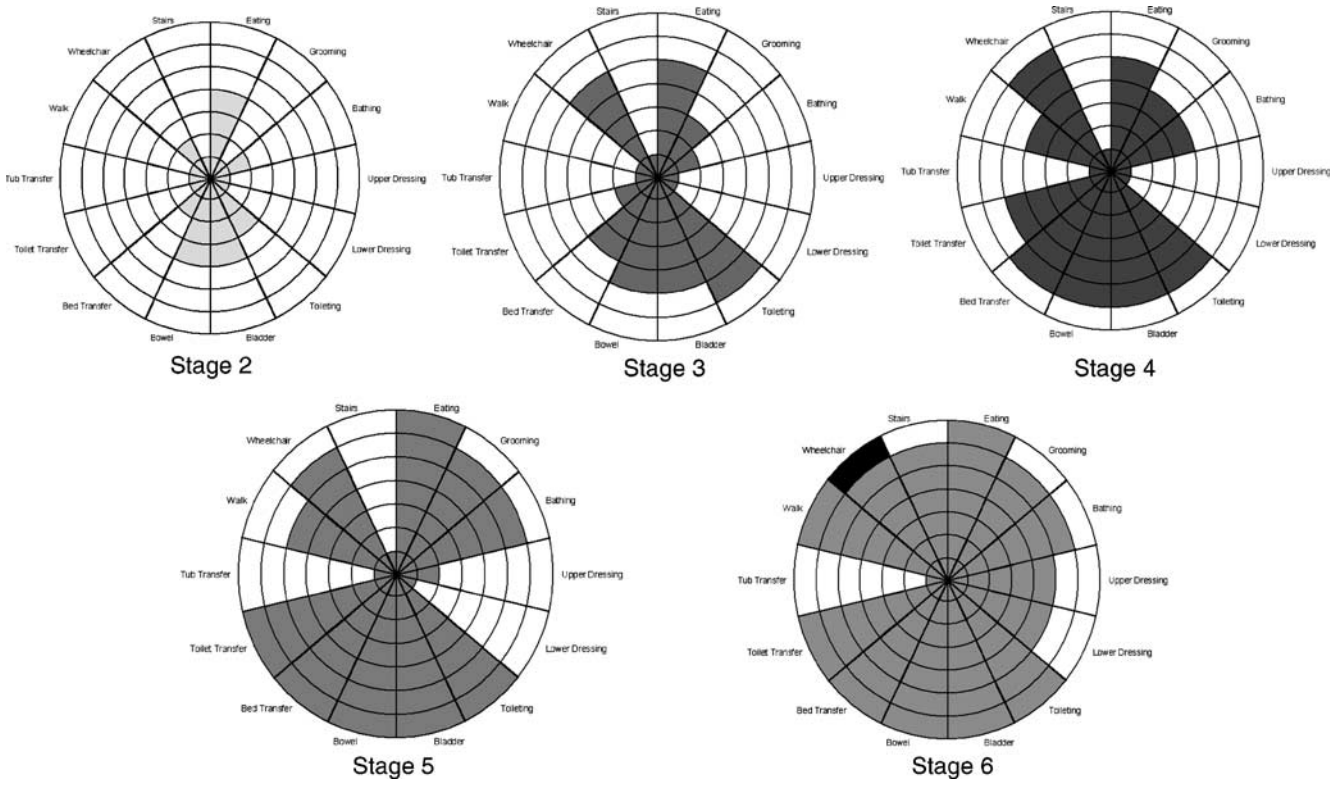

Figure 2 Concentric pie chart depicting interim stages 2–6 for the USRP

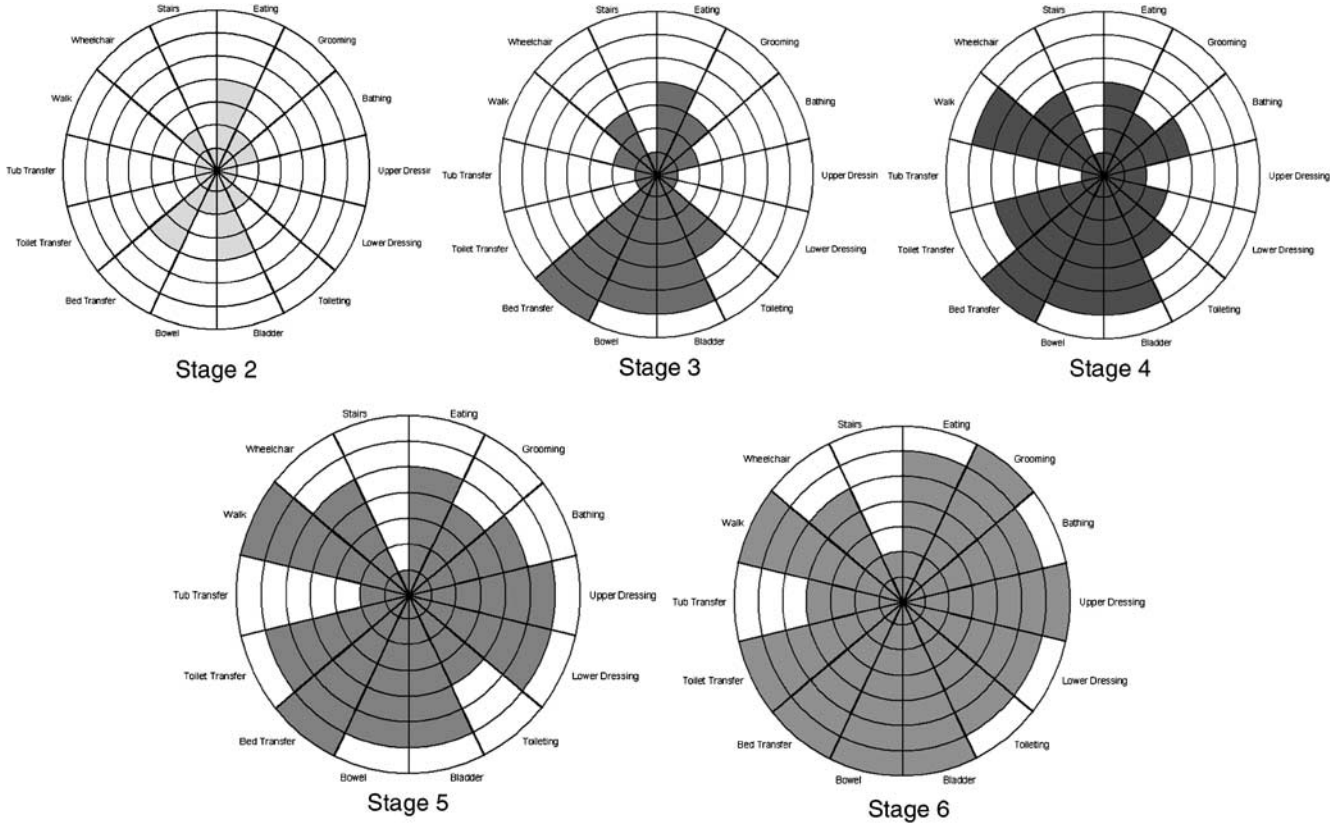

Figure 3 Concentric pie chart depicting interim stages 2–6 for the IRP

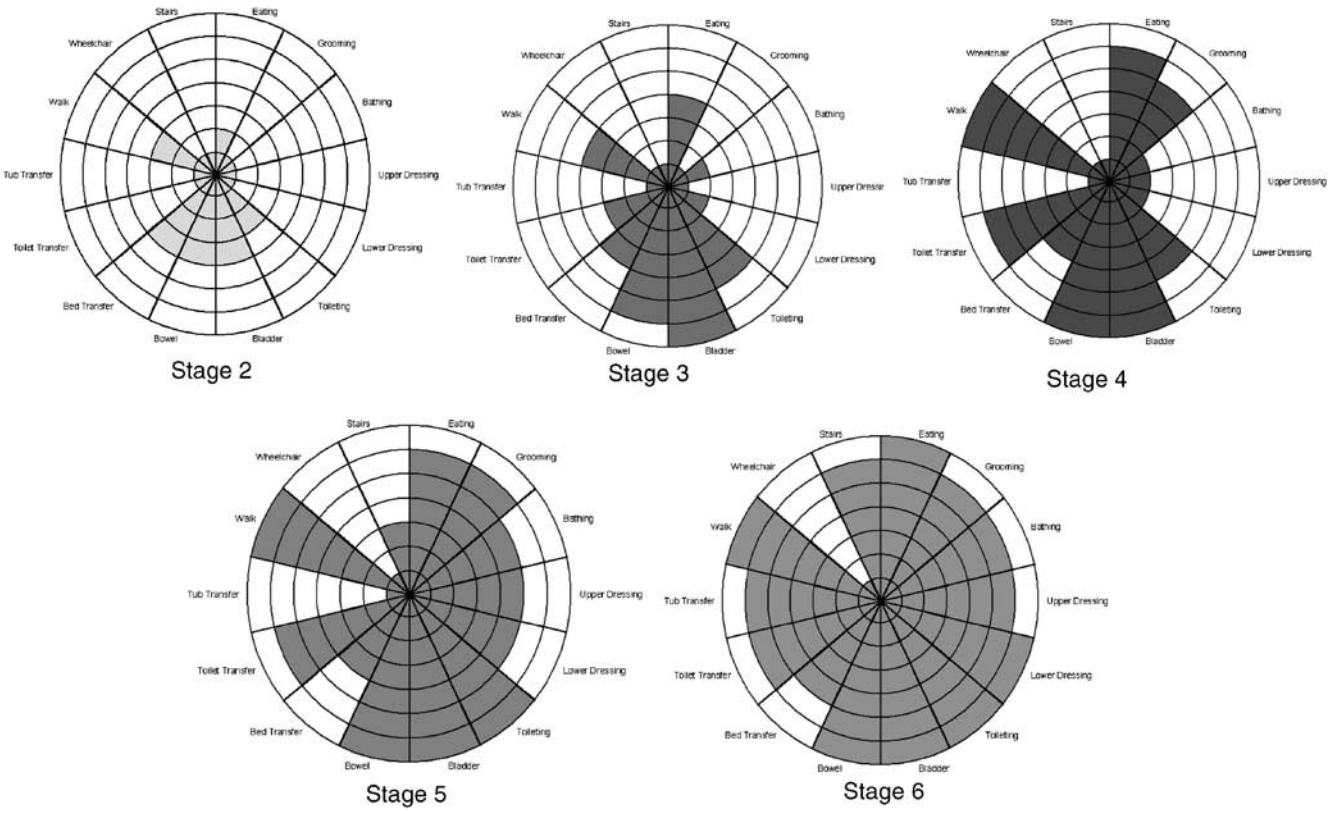

Figure 4 Concentric pie chart depicting interim stages 2–6 for the CRP

assistance (FIM = 1) at the innermost circle and ending with complete independence (FIM = 7) at the outer circle. The patterns show relative recovery preferences for the three panels. For example, the patterns show that the ability to manage one's bowel and bladder functions following SCI was selected as most important by all three panels of rehabilitation professionals. In contrast, tub transfer was one of the relatively least-valued skills.

Greatest agreement: sphincter control (bowel and bladder) Bowel and bladder were moved toward independence early in the game. By stage 3, all groups had moved bowel and bladder to level 5, 6 or 7 (level 5 is modified dependence with supervision; level 6 is modified independence with a device; level 7 is complete independence). By stage 5, all three groups had moved bowel and bladder to stage 6 or 7 (modified independence with a device or complete independence).

Greatest differential: locomotion (walking versus wheelchair) These results suggest that prioritization of walking preference shows cross-cultural differences in SCI rehabilitation professionals/staff. As early as stage 4, the USRP advanced the wheelchair feature to level 6 (modified independence with a device – the highest level for the wheelchair feature) and the walking feature to level 4 (requiring minimal assistance of one); the IRP advanced the walking feature to a level 6 (modified independence with a device, for example, cane, crutch, etc.) and the wheelchair feature to a level of 4; the CRP has moved the walking feature to a level 7 (complete independence) and the wheelchair feature remained at level one (complete dependence).

Table 1 Cumulative discrepancy scores at each stage

	Stage				
	Two	*Three*	*Four*	*Five*	*Six*
Panel comparison					
US *versus* Italy	10	32	52	120	154
US *versus* Canada	14	52	102	172	232
Italy *versus* Canada	16	44	80	128	174

Discrepancy scores

Greatest overall agreement across all items and all stages is between panels United States and Italy (Table 1). Greatest Differential across all items and all stages is between US and Canada. This appeared at stage 4: Canada had not moved wheelchair at all whereas the US had moved wheelchair to a level 6, which resulted in an

Table 2 Cumulative item level discrepancy scores

Dimensions	*Items*	*USA/ Italy*	*USA/ Canada*	*Italy/ Canada*
Self-care	Eating	7	7	10
	Grooming	7	5	14
	Bathing	1	6	5
	Dressing UE	21	11	2
	Dressing LE	30	22	4
	Toileting	19	2	13
Spinchter Control	Bladder	2	5	3
	Bowel	6	2	6
Transfers	Bed/chair	14	21	31
	Toilet	2	4	6
	Tub	10	25	5
Locomotion	Walking	9	26	9
	Wheelchair	10	92	46
	Stairs	16	4	20

item level discrepancy score of 25, thus amplifying the cumulative differences between these two cultures at an early stage.

Greatest agreement across all groups (small numbers with little variance): Bowel and Bladder Control, Toilet Transfer, and Bathing (Table 2).

Greatest differential across all groups (large numbers and large variance): locomotion – wheelchair. Here, we again report that using the wheelchair as a means of locomotion shows the greatest item discrepancy across groups.

Discussion

Our study reveals a marked discrepancy between the US panel and both the Italian and Canadian panels on the dimension of mobility. The greatest overall disagreement across all panels was within this dimension. In an early pilot study utilizing the MFG methodology, Patrick *et al*[22] reported a discrepancy between US consumers and US SCI rehabilitation professional staff preferences for walking. In that study, professional staff placed greater value in wheelchair independence than did acute SCI subjects who showed a greater preference for walking. Further inquiry of these SCI staff members by Patrick *et al*[22] suggested that their preference for wheelchair independence was based on their practical experience of having to discharge patients early due to restrictions on the number of rehabilitation days allowed for reimbursement by third party payers.

This raises an important question: how is the rehabilitation strategy influenced by the medical culture within which it functions? In the US, length of stay and consequently rehabilitation goals are mostly determined by third party payer requirements for discharge. Patients must be discharged as soon as they achieve a minimally acceptable level of mobility. For example, with SCI patients for whom walking is feasible, independent wheelchair mobility can typically be achieved before independence in walking, therefore the patient is discharged at the level of independent wheelchair mobility. One hopes that this drive for health economy is not affecting patient outcomes. This is obviously an area of great concern and needs conscientious and rigorous investigation. In Italy and Canada, length of stay in rehabilitation is primarily based on patients achieving the highest level of independence feasible. As was the case in the past in the US, the health care systems in other nations may allow continued rehabilitation (inpatient or outpatient) until patients reach a mobility plateau or maximal mobility independence, such as walking (Scivoletto G, Personal communication, 2004) (Townson A, personal communication, 2003).

Since governmental policy can be viewed as an environmental barrier,[12] it may be that in the US where the Americans with Disabilities Act (ADA)[26] mandates environmental accessibility, wheelchair mobility might be seen as a relatively more acceptable goal. However, the implementation of the ADA should not influence individual goal planning. In fact, its purpose was to enhance the community mobility of those functionally unable to move from wheelchair mobility to walking, not implicitly foster a redirection of goals. Obviously it is desirable to rely on a goal planning strategy which addresses individual consumer abilities and needs[4] rather than third party payee criteria or misinterpretation of governmental policies. The Canadian legislature has recently addressed this issue of accessibility in their Employment Equity Act.[27] However, in other contexts or cultures (Italy) where older historical buildings are more the norm, environment (contextual drivers of functional value[7]) may influence preferences for recovery. For example, even within the US, when comparing Philadelphia and Houston consumers with disabilities to clinician preferences for recovery, it was found that stair climbing was more valuable to Philadelphians. The authors[7] postulated that in Houston, public buildings and houses may be less likely to have stairs than in Philadelphia, which is an older city, originally built on a European model.

It is interesting to note that the greatest overall agreement across all panels of rehabilitations professionals as well as consumers is within the domain of sphincter control. Management of bowel and bladder function is seen as essential to independence. This is supported both by our study and by reports in previous literature.[22,28,29] Loss of control of these primary functions can adversely affect physical and psychological quality of life, and may be less environmentally/culturally dependent than mobility.

In light of ICCP's objective to 'encourage the development of strategies and priorities for the international field of SCI research',[14] it is important to document evidence of cross-cultural differences in preference for recovery among professionals providing SCI rehabilitation. Previous research has reported that

cross-cultural differences in psychological profile, health and disability-related problems are seen between American, British and Canadian populations in addressing aging with a SCI.[30] In our study, we used the features resource trade-off game to focus on the relative value of being able to perform various types of physical activities from the vantage points of rehabilitation professionals cross culturally. This endeavor may offer some insight into how different cultural values and attitudes toward persons with disabilities drive therapeutic goals and ultimately influence functional outcomes. Our findings suggest that rehabilitation professionals' feelings about the experience of disability, and its treatment, are culturally dependent. Owing to these cultural variations and differences in the availability of health care resources, it becomes essential to establish ways of addressing how preferred outcomes vary across people from different part of the world.[30–32]

The features resource trade-off game was designed to show how groups of individuals sharing some common problems vary with regard to feelings about the relative consequences of different types of functional loss and recovery. The technique is an approach to utility measurement and consensus building.[33] In our application, the highest utility would be that particular sequence of imagined physical recovery is seen as most optimal by each clinician group comparing all other potential recovery sequences. The first step of the game, 'free growth' allows each group member to contribute equally to the imagined recovery without any constraints. The second step, 'zero-sum' is intended to encourage consensus by allowing each group member to adjust the emerging recovery profile at each stage by moving a single activity forward one performance level at the expense of moving one activity back. The approach to eliciting preferences was derived from concepts of 'scarce resources', a concept used in economic utility analyses where one derives information on marginal rates of substitution.[34,35] In the game procedure, recovery points are analogous to dollars spent and the physical activities selected preferably at each stage analogous to products chosen. As the number of recovery points allowed to be spent at each stage is fixed, the alternative selections among activities and levels reflects utility or value differences among the clinician groups from the three different nations.

Some methodological issues need to be clarified. Critics could question the validity of a methodology that utilizes rehabilitation professional imaginations concerning the reality of living with a disability. While there are concerns with this methodology, there is the perspective that 'with imagination, reality becomes an object of awareness'.[36] And, there is literature suggesting that 'quasi-disability' experiences using simulation can enhance presimulation attitudes towards persons with a disability[37] and even if simulation exercises run the risk of provoking negative responses from participants, they have merit as constructive educational tools.[38,39] Steinman *et al*[7] originally developed the Features Resource Trade Off game as a methodology to assess differences between groups and as a means to facilitate a convergence between the consumer and medical rehabilitation perspectives on viewing rehabilitation outcomes. Divergence between the independent living movement perspective and the medical rehabilitation perspective is addressed in depth by Steinman *et al*.[7] She makes a plea and a justification for convergence stating that a combined perspective allows 'persons with disabilities the right to control their life and to work toward functional goals that would most enhance personal options'. Medical expertise is a tool to be used to maximize health and individual functional abilities. On the other hand, the rehabilitation process is a learning experience for clinicians, staff, and consumers, which encompasses performance both within the physical and social environment. Therapists understanding of how consumers play the game, consumers understanding of how therapists play the game and the playing of the game by mixed groups (consumers and rehabilitation professions) may facilitate the goal of enhancing communication between and among consumers and staff, and in addition, foster education.

The findings of our study reflect differences across three heterogeneous groups of rehabilitation professionals from three different cultures; with only one group from each rehabilitation center assessed. Since these findings are preliminary, they will need to be demonstrated in other samples within and across cultures. This is necessary to address questions of sample representativeness, institutional bias, environmental contextual drivers and cultural bias.

References

1 Ackery A, Tator C, Krassioukov A. A global perspective on spinal cord injury epidemiology. *J Neurotrauma* 2004; **21:** 1355–1370.
2 The Rehabilitation Accreditation Commission. http//www.carf.org/consumer.aspx?Content = Content/ConsumerServices/cs03en.html&ID. Accessed July 26, 2005.
3 Kennedy P, Hamilton LR. The needs assessment checklist: a clinical approach to measuring outcome. *Spinal Cord* 1999; **37:** 136–139.
4 Duff J, Evans MJ, Kennedy P. Goal planning: a retrospective audit of rehabilitation processes and outcome. *Clin Rehabil* 2004; **18:** 275–286.
5 Norris-Baker C, Stephens MA, Rintala DA, Willems EP. Patient behavior as a predictor of outcomes in spinal cord injury. *Arch Phys Med Rehabil* 1981; **62:** 602–608.
6 McGrath JR, Adams L. Patient-centered goal planning: a systematic psychology therapy? *Top Stroke Rehabil* 1999; **6:** 43–50.
7 Stineman MG, Maislin G, Nosek M, Fiedler R, Granger CV. Comparing consumer and clinician values for alternative functional states: application of a new feature trade-off consensus-building tool. *Arch Phys Med Rehabil* 1998; **79:** 1522–1529.
8 Siosteen A, Kreuter M, Lampic C, Persson LO. Patient–staff agreement in the perception of spinal cord leisoned patients' problems, emotional well-being, and coping pattern. *Spinal Cord* 2005; **43:** 179–186.

9 Ernst F. Contrasting perceptions of distress by research personnel and their spinal cord injured persons. *Am J Phys Med* 1987; **66:** 12–15.
10 Cushman L, Dijkers M. Depressed mood in spinal cord injured patients: staff perceptions and patient realities. *Arch Phys Med Rehabil* 1990; **71:** 191–196.
11 Trieschmann RB. Spinal cord injuries. *Psychological, Social and Vocational Rehabilitation*. Demos Publ: New York 1988.
12 Whiteneck G, Meade MA, Dijkers M, Tate DG, Bushnik T, Forchheimer MB. Environmental factors and their role in participation and life satisfaction after spinal cord injury. *Arch Phys Med Rehabil* 2004; **85:** 1793–1803.
13 Fiedler IG, Laud PW, Maiman DJ, Apple DF. Economics of managed care in spinal cord injury. *Arch Phys Med Rehabil* 1999; **80:** 1441–1449.
14 International Campaign for Cures of spinal cord injury paralysis. http://www.icord.org/iccp.html. Accessed July 24, 2005.
15 Tate DG, Kalpakjian CZA, Forchheimer MB. Quality of life in individuals with spinal cord injury. *Arch Phys Med Rehabil* 2002; **83**(2 Suppl)**:** S18–S25.
16 Manns PJ, Chad KE. Components of quality of life for persons with a quadriplegic and paraplegic spinal cord injury. *Qual health Res* 2001; **11:** 795–811.
17 Dijkers MPJM, Whiteneck G, El-Jaroudi R. Measures of social outcomes in disability *research*. *Arch Phys Med Rehabil* 2000; **81**(Suppl 2)**:** S63–S80.
18 Anderson K. Targeting recovery: priorities of the spinal cord-injured population. *J Neurotrauma* 2004; **21:** 1371–1383.
19 Donnelly C *et al*. Client-centered assessment and the identification of meaningful treatment goals for individuals with a spinal cord injury. *Spinal Cord* 2004; **42:** 302–307.
20 Estores IM. The consumer's perspective and the professional literature: what do persons with spinal cord injury want? *J Rehabil Res Dev* 2003; **40:** 93–98.
21 Keith RA, Granger CV, Hamilton BB, Sherwin FS. The functional independence measure: a new tool for rehabilitation. *Adv Clin Rehabil* 1987; **1:** 6–18.
22 Patrick M, Ditunno PL, Ditunno JF. A comparison of spinal cord injury (SCI) consumers/staff preference for walking: a pilot study. *J Spinal Cord Med* 2003; **26:** S41.
23 Ditunno Jr JF *et al*. Walking Index for spinal cord injury (WISCI): an international multi-center validity and reliability study. *Spinal Cord* 2000; **38:** 234–243.
24 Ditunno PL, Ditunno Jr JF. Walking index for spinal cord injury (WISCI II): scale revision. *Spinal Cord* 2001; **39:** 654–656.
25 Curt A, Schwab ME, Dietz V. Providing the clinical basis for new international therapies: refined diagnosis and assessment of recovery after spinal cord injury. *Spinal Cord* 2004; **42:** 1–6.
26 Americans with Disability Act. 1990. http://www.dol.gov/esa/regs/statutes/ofccp/ada.htm, accessed June 6, 2005.
27 Canadian Employment Equity Act. http://commissiondelafonctionpubliqueducanada.com/research/world_ps/canada_e.htm#5. Accessed June 6, 2005.
28 Glickman S, Kamm MA. Bowel dysfunction in spinal cord injury patients. *Lancet* 1996; **347:** 1651–1653.
29 Hicken BL, Putzke JD, Richards JS. Bladder management and quality of life after spinal cord injury. *Am J Phys Med Rehabil* 2001; **80:** 916–922.
30 McColl MA, Charlifue S, Glass C, Savic G, Meehan M. International differences in ageing and spinal cord injury. *Spinal Cord* 2002; **40:** 128–136.
31 Asplund K, Asburner S, Cargill K, Hux M, Lees K, Drummond M, GAIN International Investigators. Health care resource use and stroke outcome. Multinational comparisons within the GAIN International trial. *Int J Technol Assess Health Care* 2003; **19:** 267–277.
32 Martikainen P, Lahelma E, Marmot M, Sekine M, Nishi N, Kagamimori S. A comparison of socioeconomic differences in physical functioning and perceived health among male and female employees in Britain, Finland, and Japan. *Soc Sci Med* 2004; **59:** 1287–1295.
33 Sox HC *et al*. *Medical Decision Making*. Butterworth Publishers: Boston 1988.
34 Samuelson PA. *Foundations of Economic Analysis*. Harvard University Press: Cambridge (MA) 1947.
35 Nicholson W. Comparative statistics analyses of individual demand. In: Heinz M (ed). *Microeconomic Theory: Basic Principles and Extensions* 1985, The Dryden Press: Philadelphia (PA), pp 119–166.
36 Beres D. Perception, imagination and reality. *Int J Psyc-Analy* 1960; **41:** 327–334.
37 Goddard L, Jordan L. Changing attitudes about persons with disabilities: effects of a simulation. *J Neurosci Nurs* 1998; **30:** 307–313.
38 Crotty M, Finucane P, Ahern M. Teaching medical students about disability and rehabilitation: methods and student feedback. *Med Educ* 2000; **34:** 659–664.
39 Grayson E, Marini I. Simulated disability exercises and their impact on attitudes toward persons with disabilities. *Int J Rehabil Res* 1996; **19:** 123–131.