Development of a new tool to evaluate work support needs and guide vocational rehabilitation: The Work-ability Support Scale (WSS)

Authors

Joanna K Fadyl [1]

Kathryn M McPherson [1]

Philip J Schlüter [4,5,6]

Lynne Turner-Stokes, DM FRCP [2,3]

1. Centre for Person Centred Research, Health and Rehabilitation Research Institute, AUT University, Auckland, New Zealand
2. King's College London, School of Medicine, Department of Palliative Care, Policy and Rehabilitation, London
3. Regional Rehabilitation Unit, Northwick Park Hospital, London
4. School of Health Sciences, University of Canterbury, Christchurch, New Zealand
5. School of Public Health and Psychosocial Studies, AUT University, Auckland, New Zealand
6. School of Nursing and Midwifery, University of Queensland, Brisbane, Australia

Corresponding author

Joanna K Fadyl

Centre for Person Centred Research, Health and Rehabilitation Research Institute, AUT University, Private Bag 92006, Auckland, New Zealand

Email: jfadyl@aut.ac.nz

Phone: +64 9 921 9999 x7675

Fax: +64 9 921 9620

Publisher's version available:
http://informahealthcare.com/doi/full/10.3109/09638288.2014.914586

Abstract

Purpose: This paper outlines our overall approach, qualitative work, and pilot testing to develop a tool to facilitate identification of level of support needs and assist in planning for vocational rehabilitation interventions.

Methods: A set of foundation principles drawn from literature and previous critiques of work-ability assessment tools were used to guide a set of studies to develop a new tool. A review of the literature regarding factors that influence work-ability, qualitative interviews and focus groups with a range of stakeholders in the return-to-work process, and pilot testing in different settings were used to develop the Workability Support Scale (WSS) to a stage where it had face validity, usability and acceptability for a range of key stakeholders and was ready for further testing.

Results: Qualitative work and pilot testing enhanced the proposed tool with a series of changes and refinements to the content, structure and scoring framework. The current version of the tool is presented. Inter-rater reliability is presented elsewhere.

Conclusion: Core principles and stakeholders' views (injured or sick workers, employers, case managers and health professionals) support current tool design. Although further testing is required, the WSS appears to hold potential for use in the assessment of vocational rehabilitation needs.

Key words: rehabilitation planning, Work-ability, assessment, tool development

Word counts: Abstract: 200. Main text: 7,385

Introduction and background

In most societies, considerable importance is attributed to the ability to work. Work—particularly paid work—carries value as a means of contribution, participation and self-development as well as the usual means by which people are able to support themselves and their families. Arguably as a result of this, work and employment has also become a factor affecting individual wellbeing, with studies showing that unemployment is associated with poorer physical and psychological health [1-3]. Thus, when people are unable to work, it not only affects their income but is also likely to negatively affect their participation and quality of life [4, 5]. In recent years studies have attempted to calculate the direct and indirect costs of work disability in terms of compensation and health care costs, lost earnings, and lost productivity, and estimates are astounding [6]. For example, an Australian report estimated that for the 2008-9 financial year the cost of work disability was 60.6 billion dollars, which was 4.8 per cent of the nation's gross domestic product for the same period [7].

When people become unable to work due to an event such as an injury or illness that alters their physical and/or cognitive functioning, in many jurisdictions they will receive some form of vocational rehabilitation to assist them to overcome the disabling effects so they are able to resume work. This would usually include physical and/or cognitive rehabilitation and assessment of the barriers to work, and may also involve assessment and possibly modification of the workplace and/or work role [e.g. see 8, 9, 10]. Work-disability and its inverse work-ability is inherently linked with the actual role and tasks that a person is required to perform in their work, as an impairment can affect different types of tasks in different ways. For example, the inability to move quickly on foot may render a person unable to do one job (e.g. restaurant wait staff), but may have no effect at all on ability to do a different job (e.g. where the person is seated all day at a desk). Thus, work-ability is necessarily considered *in the context of a particular job*. It is possible for rehabilitation to help people (even with significant impairment) regain sufficient functional ability to return to their job, gain the skills required to do a modified job, or have transferrable skills for a different job [11]. However, there

are constraints and judgement involved on the part of stakeholders concerning how long rehabilitation may take, what resources are available and when decisions need to be made about alternatives and adaptations [12]. Further difficulties are encountered where the disability experienced by an individual is such that work-ability can be achieved for few or no available jobs and, depending on their circumstances, a planned and supported withdrawal from work may be an appropriate pathway to consider.

Vocational rehabilitation planning is a complex process and recent work around the development of an International Classification of Functioning, Disability and Health (ICF) core set have shown that there are a large number of different aspects involved [see 13]. Furthermore, the difficulties encountered in attempts to meaningfully classify the various aspects highlight how much the actual practice of vocational rehabilitation involves situated, real-world processes of assessing and juggling resources, competing demands, interpersonal negotiations and the various other issues that arise in part because work carries such a significance for individuals and society [14]. This complexity is also problematic in the assessment of work-ability, as existing measures tend to be focused on *generalities* in the relationship between impairment and functioning rather than the specifics of the individual situation, despite these being very important [15]. Meaningful and robustly-developed standardised tools are essential because they enable useful comparisons between individuals, populations and programmes, as well as constituting resources that help practitioners such as health professionals collect relevant information that can enhance decision-making and actions [16, 17]. Such tools can also be useful for other stakeholders, including employers, funders, and the individual themselves to communicate the reasons for rehabilitation planning decisions or monitor progress [12].

The work we present in this article was a response to the issues described above, and in particular it was prompted by a number of experiences of the authors leading up to the initiation of the work in 2008. The motivation for the development of a new measure was prompted by frustrations with the

lack of an appropriate work-ability measure for use in rehabilitation research and practice. During a 2006 study evaluating vocational rehabilitation practice in New Zealand [18], the outcome measure we selected, the Personal Capacities Questionnaire (PCQ), did not sufficiently address the current work-ability of participants [19]. Subseqeuntly, a review of return to work (RTW) outcome measures in collaboration with other authors who attended a conference on improving RTW research showed no existing measures of RTW were comprehensive enough to meaningfully capture the dimensions that are important for rehabilitation [20]. Alongside this, experiences in vocational rehabilitation practice and conversations with other practitioners had highlighted that although assessments were routinely undertaken in vocational rehabilitation practice, very often they were not standardised, largely because no appropriate standardised measures were available.

This perspective has been supported in research by Innes and Straker [16], who highlighted a concern among therapists who do workplace and vocational rehabilitation assessments that there was a lack of consistency in terms of content and quality. Therapists reasoned that this problem may be due to lack of appropriate standardised tools available for these assessments; limited reliability and validity of tools that *are* available; and limited flexibility of these tools to address referrer concerns (such as assessing overall work-ability) while also being meaningful for the worker and workplace [16]. Another related concern was that in situations where a person has an event that profoundly changes their functioning—such as a very severe brain injury—vocational rehabilitation should be considered even in early rehabilitation so as to enable appropriate expectation-setting and prioritisation of rehabilitation goals, as well as communication with other stakeholders such as employers [21]. However, staff in inpatient rehabilitation facilities (as well as many other medically-focused health care facilities) are often lacking experience and are ill-equipped when it comes to thinking about vocational options, as it falls outside of their normal training [22].

Two further tenets of rehabilitation also underpinned the design of the tool. First, that vocational rehabilitation is best begun early, and second, that to support a person-centred focus, approaches

(including tools and frameworks) should show continuity across the various service settings that a person may encounter in their rehabilitation journey [23]. Our process for this work was driven by an understanding that vocational concerns are relevant to people across all stages of health care management in chronic and disabling conditions. While impairment and function continue to be the predominant focus of acute or early rehabilitation, vocational outcomes are also important to many people, and likely to be meaningful and relevant for rehabilitation [22]. As such, vocational rehabilitation should arguably be considered in the acute inpatient context as well as the community context, even though the specific issues that arise and they ways in which these are addressed may be quite different. We were also aware that although a primary focus on 'the individual' with regard to work-ability for a job role is necessary and appropriate, many other stakeholders (for example clinicians, employers, case managers and funders) shape the process and the outcomes for people in vocational rehabilitation [15, 21]. As a result, we considered it crucial that any measure development both drew on the expertise and perspectives of the range of stakeholders, and was informed and developed in close consultation with the people who are the end users of vocational rehabilitation.

Vocational rehabilitation necessarily requires consideration of multiple factors. This includes impairments/functional limitations directly related to a person's injury or illness, limitations resulting from the primary condition or existing prior to them, the person's prior training and experience as well as personal circumstances, and contextual factors including the labour market, financial matters and employment relationships [15]. This complexity is recognised by practitioners and researchers alike but is largely not reflected in the assessment tools available to them [12, 16, 17]. Our review of the concept of work-ability and the available tools for measuring work-ability published in 2010 [15] identified that although there were a vast range of factors that research had shown to affect work-ability and rehabilitation planning, there were no tools available that measured all of those factors. Nor were any tools appropriate to measure work-ability for the purpose of facilitating rehabilitation planning. We set out to develop a theoretically and conceptually sound, stakeholder informed,

psychometrically robust tool that could be used to identify the level of support someone might need to carry out a job following injury or illness. Our two specific purposes for the development of the tool were: a) to facilitate assessment of an individual's ability to work and their support needs in the context of their usual (or expected) work environment; and b) to support decision-making and planning in vocational rehabilitation. We aim here to provide a transparent explanation of the process we undertook in keeping with recommendations for measurement development [24-27].

Development of the tool: Design of the research programme

The research programme that we employed to develop the design of the Work-ability Support Scale (WSS) was multi-stage. This paper describes the principles and foundations of the work, and the initial phases that we undertook to get the WSS to a stage where it had face validity, usability and acceptability for a range of key stakeholders and was ready to be tested for inter-rater reliability (described in a separate paper [28]). The description of the design of the development work is divided into three sub-sections: foundations of development, qualitative work and pilot testing.

Foundations of development

The overall organisation of the series of studies to develop the WSS was based on a set of four key drivers, which were grounded in both published guidelines and the importance of acceptability and usability for stakeholders. Figure 1 provides an overview of the foundations of development we used for the WSS.

Figure 1 about here please

Foundation: Published recommendations

There are a number of texts that propose key steps in measure development. We primarily drew on work by McDowell and Newell [27, 29]. Following their recommendations, we were able to derive a framework by which we could track progress and ensure that key steps for developing a robust

measure were included in our programme of research. The specifics of this framework, along with the details of the tracking of the development of the WSS to date, are given in table 1.

Table 1 about here please

Foundation: Underpinning principles

In addition to the steps in measurement development described above, our previous work and that of others described above highlighted specific limitations to existing vocational rehabilitation measures that we wanted to consider explicitly. To that end, we developed a set of specific principles against which the WSS development process could be compared and evaluated. These principles stated that the measure should:

1. Relate to established predictors of successful return to work in the populations of interest;
2. Be developed in light of key stakeholder perspectives (injured workers, employers as well as health professionals and case managers);
3. Be acceptable to the key stakeholders;
4. Act as a guide to rehabilitation management;
5. Identify the type and level of support required for successful work placement;
6. Clearly focus on the degree of fit/difficulty between the person's ability and work demands or tasks (rather than degree of impairment);
7. Be comprehensive, including the range of factors influencing successful return to work (rather than just physical capacity);
8. Be feasible in the real world setting;
9. Be designed in a way that would facilitate clinician uptake;

10. At all times connect back to the research evidence concerning barriers and facilitators of work-ability.

Focusing on the key purpose and principles, along with the identification that vocational rehabilitation was a concern in both the inpatient and the community rehabilitation settings, we decided it was important to develop and test the tool in both of these settings. This necessitated an inter-disciplinary and collaborative approach both in terms of the make-up of the research team, and also the way in which the development and testing was carried out.

Foundation: Collaborative approach

Initial discussions about a potential measure had arisen due to the very practical need for a better tool in our own research and clinical practice (as described above). These discussions took place in 2007 between LTS and KM regarding what such a tool might look like with these ideas then discussed more widely in KM's research team, a multidisciplinary group including an emerging academic who had previously been a job coach (JF). Having included a biostatistician in our team (PS), we undertook a conceptual review [15] confirming the need for better tools and giving rise to the development work leading to the WSS.

The ongoing development and testing work has been undertaken in two centres (New Zealand (NZ) and United Kingdom (UK)), in two settings (community vocational rehabilitation and acute inpatient rehabilitation respectively) with two populations (acquired disability from injury and illness). Both teams have liaised throughout the five years leading to this point. Our original team came together with a shared interest in vocational rehabilitation service and research, and a range of skills and expertise. The team then grew to include additional clinicians interested in vocational rehabilitation and a range of methodologists and statisticians as we worked to refine the tool to be robust, but clearly focused on its clinical utility as the prime driver for development. Throughout the stages of development, the core team has remained stable but had substantial engagement with other academic, clinical, and policy colleagues regarding the WSS (at in-house team discussions,

conferences, and presentations) with feedback, both formal and informal, consistently being integrated into refinements to the tool.

Foundation: Iterative development

The final key driver was that we recognised any tool takes many years of development work, and many iterations are required before a definitive version results [27]. We have undertaken several stages of development work for the WSS, and this work is ongoing. The initial work is described in this paper, and we also have a forthcoming paper outlining the inter-rater reliability testing [28]. Because it represented the most complex context, and the point at which people are returning to work, the qualitative development work was carried out in a community RTW setting. The pilot testing was carried out in both an inpatient (UK) and community context (NZ), to reflect the variety of settings where the WSS may be useful. A focus was put on involving key stakeholder groups in the development research, in order to maximize the likelihood that the resulting measure (which would be further tested) would be relevant and useable for the people who would be most likely to utilise the WSS.

Ethical approval for the community-based phases of the research was granted by the New Zealand Northern X Regional Health and Disability Ethics Committee. In the UK site, iterative development took the form of clinical application and feedback in the course of routine clinical practice. The centre has ethical approval for use of data gathered in the course of clinical practice for the purposes of research (REC reference number 04/0405/47).

Qualitative work

Obtaining a tool that was designed to facilitate rehabilitation planning was one of the primary drivers of the work, and the review of the literature had provided an extensive discussion about the various aspects that affect work-ability from a range of stakeholder perspectives. Therefore the main purpose of the qualitative work was to get feedback on whether a proposal on a design and content for the WSS tool reflected what key stakeholders knew to be important to work-ability and the sort

of information they could feel able to either give or collect. This was achieved through a series of qualitative focus groups and interviews conducted with a range of stakeholders involved in the RTW process. They provided two types of information. Initially, we aimed simply to elicit their experiences and perspectives as to the important elements of work-ability. Following this, we presented a proposed structure and content for the tool drawn up based on the review of the literature on work-ability, the underpinning principles noted above, and initial discussions within the team about designs that would most effectively facilitate rehabilitation planning. The proposed tool contained a suggested list of items based on clinical experience and the literature review, and a suggested scoring structure to help participants imagine what sort of information they would be gathering. A scoring structure that focused on the level of support and intervention required seemed appropriate for a measure intended to inform rehabilitation planning. Therefore this scoring structure was based on the Functional Independence Measure (FIM) [30]. This is further explained later when we describe the tool.

Procedures

This phase of the research was carried out in New Zealand in a community RTW setting for injured workers. This setting was chosen because participants from this context were directly involved in a RTW situation and the related assessment of work-ability, and we could access a range of experiences in terms of level and type of disability in the workplace. Four types of stakeholders took part in focus groups and interviews for phase one of the research. These were injured workers; employers; vocationally trained health professionals (occupational therapists and physiotherapists working as workplace assessors); and New Zealand Accident Compensation Corporation (ACC) case managers. Accident Compensation Corporation or ACC is a no-fault government-owned scheme that covers treatment and rehabilitation of injures in New Zealand.

In accordance with established methods in qualitative research, the sampling strategy involved purposive selection of a diverse but small number participants, allowing collection of rich, detailed

data in interview and focus group format, while capturing diversity in the characteristics that may affect views and experiences of work-ability [31]. Therefore, each participant group was sampled according to specific criteria and recruited in different ways. Injured workers were sampled for diversity in occupational demands, gender, age, condition and ethnicity. Employer representatives varied according to size of company and type of industry. Health professionals and ACC case managers were from two categories according to the client populations they normally work with—either general injury or neurological injury. Injured workers were recruited through a postal invitation letter with participant information sheet sent out through ACC. Worker interest was registered through an opt-in procedure when completed consent form were returned to the research team. The letters also gave the option to contact the researchers directly to ask questions. From the consent forms received, people were chosen based on the sampling criteria described above and contacted for participation in the study.

Health professionals and employers were recruited via professional and employer networks and websites, and contacted directly by a researcher to enquire about participation in the study. ACC case managers were recruited via management, who recommended people who had worked in case management for two years or more and were considered knowledgeable about issues of RTW and work disability. Details of participant characteristics are given in table 2, and details of the questioning format are provided in table 3.

Tables 2 and 3 about here please

Analysis

Analysis of the focus groups and interviews was carried out using techniques of descriptive analysis [32]. Since the findings relating to the discussions about work-ability in general were found to confirm that the information gathered from the literature review had been comprehensive and appropriate, comments were coded around feedback for the proposed WSS framework. These were grouped according to whether they related to a) acceptability of the tool; b) uses of the tool; c)

feedback about the existing version of the tool; or d) factors people considered important for successful reintegration into the workplace. The structure and content of the measure was then adapted based on the findings (presented in the results section of this paper) before proceeding to the pilot testing stage.

Pilot testing

The community context pilot test was designed to test the WSS alongside a regular workplace assessment aiming to assess a client's ability to return to a job or workplace. The inpatient context pilot testing was designed to test the WSS in an environment where complex assessments may have to be made about work goals early on in a patient's rehabilitation. The purpose of the pilot test design was to ensure the WSS testing was conducted in a situation that was as close as possible to the intended application of the measure, and was carried out by experienced workplace assessors (community) or experienced members of a multi-disciplinary specialist team (inpatient). The aims were to test the feasibility of using the measure; to test the acceptability of the measure to assessors and injured workers; and to revise the measure and training procedures based on findings.

Procedures – community context testing (New Zealand)

Experienced workplace assessors were subcontracted and trained by the researchers to carry out the pilot testing. The participants for this phase were workers who were undergoing a usual-care workplace assessment and they were recruited through the trained assessors. The assessors included information about the research into their routine pre-assessment contact with their client, and if they were interested gave them the participant information sheet from the researchers to read in advance (at least 24 hours before their assessment), then gained written consent from them if they wanted to participate in the research. The aim was to recruit participants who varied in age and type of occupation, and who were likely to have different types of difficulties due to injury. Some assessors who worked specifically with brain injury clients were recruited to ensure the people

who were likely to experience cognitive or behavioral difficulties would be included in the pilot test participants.

Assessor Training

A two-and-a-half hour group training session was conducted with the assessors. During this session, assessors were given training in procedures for administering the WSS, and collecting feedback required by the researchers for pilot testing. Additionally, training in procedures for facilitating recruitment of participants, gaining informed consent, and ethical considerations with carrying out the research alongside the usual workplace assessment was provided.

Testing the Measure

Once consent was obtained, a WSS assessment was carried out with the participant at the end of the usual workplace assessment, and the WSS measure and feedback was completed by the assessor. In addition, each participant completed a feedback questionnaire about acceptability of the WSS and relevance to their work situation. In total, five pilot-test assessments were carried out by four different assessors. The characteristics of the participants are given in table 4.

Table 4 about here please

Procedures – inpatient context testing (UK)

The Regional Rehabilitation Unit (RRU) at Northwick Park is a tertiary in-patient service providing specialist rehabilitation for adults of predominantly working age (16-65 years) with complex neurological disabilities. Return to their former employment is frequently an unlikely option for patients with complex neurological disabilities, so people in this situation may apply to retire on medical grounds, and long-term income may be adversely affected if there is a delay in application for this retirement. Early decision-making is therefore often required to consider the potential for RTW or the need for assistance with work withdrawal. The WSS was initially introduced on the RRU as a clinical decision-making tool. Iterative testing in this setting took the form of clinical application

to gather information and augment assessment. Informal feedback from staff, as well as patient and their families, was incorporated.

Findings: Qualitative work and pilot testing

Qualitative findings

The discussion within the focus groups about the factors that influence work-ability confirmed that the information gathered from the literature review had been comprehensive and appropriate. Therefore the main findings were around the feedback on the proposed WSS. Findings indicated that the proposed WSS structure and items covered relevant RTW issues, and all aspects of work functioning that the stakeholders would expect to see in a measure of work-ability were included. They also noted that although each item was potentially relevant for any person, some of these (for example problem-solving items) were currently not routinely considered except in specific populations (for example brain injury). This expanded focus was welcomed by all stakeholder groups including injured workers. Specific areas of feedback are discussed below with relevant quotes.

Acceptability of the WSS as a Rehabilitation Tool

All participants supported the general structure of the WSS, and feedback was very similar from each of the stakeholder groups. They commented that it was inclusive, holistic, and easy to understand. There was also a strong feeling among all of the stakeholder groups that contextual factors (such as supports outside the workplace, financial and legal factors, feelings towards work) greatly affect work-ability and should be included in a tool.

Participants suggested that application of the WSS might assist with rehabilitation planning in terms of providing a standardised way of discussing current work limitations in communication between stakeholders. They also commented that they thought the WSS could be useful in other ways: as a means of communication between employee, employer, health professional and funder about limitations and needs; as a document that could be updated over time as supports are put in place

(to track progress); and as a standard approach to assessing work needs and expectations. Health professionals also indicated that they thought the WSS could potentially be incorporated into current assessment systems.

I don't want them [employer] to have access to my medical records because that's too much detail but I think that they should know what's going on but at the same time they don't understand it either … despite having been provided with literature about [injury] so having a specific scale like what you're talking about would be definitely really helpful. [Injured worker]

It's good because it gives you like a guideline – this is where we're talking, this is where you're sitting at the moment, you know? [Employer]

I think it's a good way because it's a scoring that a lot of assessors already know, it gives you a fair bit of scope, and at the same stage it is fairly concrete [Health professional]

Cultural appropriateness of the Tool

New Zealand, the context in which the community pilot testing was carried out, is a bi-cultural country and a multicultural society, and as such it was important to seek feedback on the cultural appropriateness of the WSS for RTW assessments. Feedback indicated that all stakeholders felt that the WSS was appropriate for the New Zealand context and culturally sensitive. Two aspects were specifically mentioned as allowing for cultural differences. Firstly, the option to have a support person attend the assessment; and secondly the fact that the WSS inherently considers the match between the specific work environment and the individual worker, rather than making assumptions about 'standard' abilities and job requirements.

Given New Zealand is a multicultural society and we have all these measures in place it's appropriate to ask the question ... I guess the only thing for me because I'm Māori is that everything with us from a cultural perspective is a collaborative thing … the measure's a brilliant place which is a facility for an additional support person to be present because that's the Māori way it seems. [Injured worker]

Revisions to the measure

All the feedback about the WSS from the qualitative focus groups and interviews was compiled according to four broad categories:

1) Points to *clarify* either because they were ambiguous or because they had not yet been defined;

2) Items or points within items to *modify* to make the tool more in line with their experience of work-ability or disability;

3) Items or points within items to *add* to make the tool more in line with their experience of work-ability or disability;

4) Points or questions to *incorporate* to make the tool more reflective of their experience of work-ability or disability.

Revisions were made to the WSS before beginning pilot testing. In addition, feedback from stakeholders regarding the best approach to administering the WSS informed the design for the pilot phase.

Pilot test findings

Overall, the assessment process was found to be acceptable to injured workers and assessors, and the WSS feasible to use. The majority of revisions in response to findings of this phase were made to increase clarity and ensure that future assessor training addresses the areas where there were discrepancies in scoring.

Injured Worker Feedback (community context)

All the injured workers involved in pilot testing the WSS said it was relevant to their work situation, and nobody said they felt uncomfortable about giving information for any of the items. All participants said they thought they themselves and the workplace assessor should be involved in the

assessment, and all but one participant thought that their employer or workplace should be consulted for information to score the WSS. The reason for not suggesting involvement of the employer or workplace for this one participant related to feeling uncomfortable about employer involvement in their rehabilitation.

Assessor Feedback (community context)

Assessors reported they found the WSS scoring easy to learn, especially given its similarity to the structure of the FIM [30]. Assessors found assessment and scoring of items was generally straightforward, although sometimes items were difficult to score if the worker had been back at work for less than a month, and was returning with significant changes in ability, returning to a new job, or to a similar job but after several weeks or months off work. In these cases it was difficult to determine the level of functioning because the worker may not have been doing the job long enough post-injury to accurately assess their support needs on this aspect of work functioning. This finding concurred with feedback from participants in the qualitative focus groups and interviews, confirming that appropriate timing of assessment for the WSS in a RTW context was crucial to ensure particular items could be scored as intended.

Feedback from assessors indicated that the scoring system was appropriate. There were no items that assessors felt should not be there, and no missing items were identified. Assessors were generally positive about the WSS and found it acceptable to use. Feedback from assessors on the administration of the WSS is summarised in table 5.

One concern raised in consultation with clinicians during this phase was whether the WSS would be conducted in such a way that it was seen as an *enabling* process (as intended), or if there was a risk that it would be used to challenge to someone's ability to do the job or their entitlement to compensation. Involvement of injured workers themselves when making decisions regarding methods of assessing, disseminating and using the information from the WSS is therefore important to ensure its acceptability usability.

Assessor Feedback (inpatient context)

Feedback from early usage in the inpatient setting identified some concerns amongst staff that the information was hard to collect. Less experienced staff found it hard to conceptualize job content and were concerned that this may mean that decision-making that could have significant long-term consequences was made on the basis of incomplete information. However, with growing familiarity and the introduction of supplementary tools these concerns gradually diminished. The supplementary tools developed included a work questionnaire to gather information about the work role and environment, a job-matching tool to identify the type of skills required to do the job, and software for the collation of WSS scores and generation of a graphic display of WSS scores in Microsoft Excel produced to assist with interpretation. Examples of these are available on the website accessible via www.pcrc.aut.ac.nz/resources or www.csi.kcl.ac.uk/tools.html. The structured approach to assessment and information gathering was seen as a valuable addition to clinical evaluation. Use of the graphical display as a basis for providing explanation and feedback patients and their families on work-related issues was particularly valued. Staff reported that this offered to welcome platform for raising difficult topics for discussion in a matter of fact way—for example issues such as self-presentation, safety awareness and relationships with clients/colleague—that may have been hard to bring up otherwise.

Time Taken to Complete the WSS (community context)

It was found that the time needed to complete the WSS after the workplace assessment was variable. The shortest time taken for completion was 25 minutes, the longest was 60 minutes, and the average was 38 minutes. Assessors reported that the variation was due to the fatigue levels and information processing capacity of the injured worker. Furthermore, the better the assessor knew the worker and the workplace, the quicker the WSS was to complete. It should be noted that the context of these pilot test assessments was that they were conducted at the end of a usual workplace assessment, and the tool itself was being used for the first time by the assessors.

Completion time for a WSS assessment conducted alone may be quite different and further field-testing would be advantageous.

Table 5 about here please

Revising the WSS

Following pilot testing, the measure and procedures were revised based on the information collected during pilot testing. In addition to feedback collected, a few minor discrepancies were noted between the way the WSS was scored by assessors and the way the researchers would have expected it to be scored. These related to the interpretation of item descriptions. Following pilot testing, the WSS and procedures were revised based on this information and on the feedback from the assessors and injured workers, aiming for clarity and minimum ambiguity in item descriptions.

The Work-ability Support Scale resulting from the development work

The WSS is designed to address the complex physical, cognitive and behavioural challenges known to influence successful work placement as identified in our conceptual review and as informed by the iterative development. Although cognitive and behavioural challenges are most typically associated with neurological impairments, these factors are increasingly recognised as influential factors in successful work placement across multiple populations [33].

Scoring framework

The structure utilises a scoring framework similar to that of the FIM [30]. This was selected for a number of reasons. First, it is the most widely used measure for rehabilitation internationally and clinicians are already broadly familiar with the structure and organisation of scoring. The scoring principles from the FIM have also been applied to wider areas of functional assessment, for example of psychosocial function [34] and extended activities of daily living [35], which are incorporated into the UK Functional Assessment Measure (UK FIM+FAM) [36]. Second, the focus that the FIM has on 'level of support' required intuitively fitted the purpose of the WSS (identification of level of support

that might be needed for rehabilitation and support planning). Finally, existing software from the UK National Database [37] could be applied to highlight areas for possible progress or attainment related to work-ability (to set 'goal scores' in relation to baseline assessment). The development work indicated that users supported the FIM scoring structure, and clinicians who had worked in inpatient settings found that the familiarity with the scoring structure helped in learning and applying the WSS.

Item structure and content

The WSS is divided into two parts. The version we present here is mainly a result of the work discussed in this article, however a few refinements to the item breakdown and scoring instructions and were also made based on our inter-rater reliability testing studies [28]. The version described and presented is the most current version, incorporating these few small refinements.

Part A is a 16-item scale divided into three domains of work-related function (see Appendix 1):

- Physical function (five items)
- Thinking and communicating (five items)
- Social/behavioural function within the workplace (six items).

While earlier versions of the WSS had more items, the final 16 were selected across the three domains in response to the feedback gained from the development work described in this article and from the inter-rater reliability studies. Furthermore, the language/terminology used in the current version was similarly influenced.

Each of these items is rated on a standardised ordinal 7-level scoring system ranging from 7 (completely independent) to 1 (totally unable), with the levels between reflecting an increasing requirement for help or support and the consequent decrease in work productivity (also in Appendix 1).

Part B is the 12-item scale of divided into three domains of 'contextual factors', relating to personal and environmental/support factors that may influence return to work (see Appendix 1):

- Personal factors
- Environmental factors
- Barriers to return to work.

The first round of inter-rater testing [28] showed that a simple 3-point scale indicating the overall effect of the contextual factor was most appropriate (positive effect = +1, neutral or unknown effect = 0, negative effect = -1).

Application in different settings

During its development, the WSS has been used in a range of clinical contexts. As outlined earlier, this has included both community and inpatient settings. Although the content and structure of the WSS measure has been the same for both contexts, unsurprisingly the application has been shown to take quite different foci.

In the community vocational rehabilitation setting, the application of the WSS measure was carried out subsequent to the to a 'usual care' workplace assessment done by experienced vocational rehabilitation assessors. In this setting, the qualitative data indicated that the tool guided them to consider factors they did not previously consider with feedback influencing item definition and scoring instructions to enhance clarity.

In the acute inpatient rehabilitation unit, the WSS was used to guide individual assessment of work potential and inform team/patient/employer discussions around return to work or future employment. In this setting, the use of the measure appeared to support the inpatient team's consideration of employment in more depth than was 'usual care' inpatient rehabilitation with consideration of early contact with employers and insurers. Because this process was an extension

of what would normally occur in the inpatient setting, and there was not access to the same information as might be available in a community rehabilitation setting (such as workplace assessment and work trials), the team that were involved in the testing also developed a range of supporting tools. In this way, the WSS has been used as a structure for feedback and discussion with the patient and their family to support informed decision-making about return to work, but also to aid discussion when having to consider the possibility of work withdrawal.

The beta or user version of the WSS (16 Work Function items and 12 Contextual Factors) and its support materials can be found at www.pcrc.aut.ac.nz/resources or www.csi.kcl.ac.uk/tools.html. Further revisions are likely to occur as a result of on-going refinement and testing, and these will also be uploaded here.

Discussion

This paper has described the overall approach of a multicentre project aiming to enhance the assessment of an individual's ability to fulfil a work role, to guide the supports that might be needed to sustain that work role and to support decision-making with regard to vocational rehabilitation. Our intention has been to make transparent our approach, particularly concerning the history of development and how the tool's structure, sub-components, items and scoring method have been selected given the critique that such things can frequently be hard to determine [27]. Although further testing is recommended, we would suggest that the beta-version of WSS is now in a form that could advance the assessment of vocational rehabilitation and support needs. Further development of the tool is inevitable as research advances our understanding of the factors that should be considered.

In order to develop the WSS, we found it particularly useful to articulate two sets of clear criteria. The first related to overall measurement development drawing on McDowell [27] and others [26]. This highlights that we have met a number of key criteria (1-7 in table 1) but that further testing is

recommended (8-13 in table 1), and makes it clear what development still needs to be done. The second set of criteria related specifically to ensuring we addressed criticisms of previous measures of work-ability and vocational rehabilitation that we and others had made. To some degree, the set of principles operationalised steps concerning construct validity and clinical utility, but we would suggest they go further. In particular, it identified stakeholders who have potential to influence work outcomes could and should be key contributors to such a tool's development and also their role could and should be reflected in scale items. Despite calls for employers to be more involved in vocational rehabilitation [2], their views have rarely formally influenced assessments of work-ability [15]. Employers and other stakeholders (out-of-work clients, case managers, vocational assessors) valued being involved in the process of development of the WSS and made valuable contributions about its structure and language but also around its potential uses, particularly workers highlighting that they saw it to be a very useful facilitator for communication about plans for return to work with their employer focusing on the work issues, not their diagnosis.

The principles also made clear that the WSS is not intended to be a measure of all things related to work and employment but to measure an important area of participation in accord with the ICF framework [38]. This is not to say other factors within the ICF are unimportant here. Indeed, the nature and level of impairment and functional deficit can be key to ensuring appropriate rehabilitation interventions to assist someone into work are provided. We also do not suggest a purely 'ability' paradigm which risks ignoring potential effects of ongoing medical issues and impairment as barriers to successful employment, as highlighted recently in Ontario [39]. In fact the WSS expressly encompasses environmental and contextual barriers to relation to specific work tasks relevant to that individual and to the individual job under consideration.

Work-ability is a specific construct that has been defined and operationalised and, as such, measures addressing this construct are important for advance in the field. The iterative development of the WSS removed items that blurred into other constructs (such as level of functional limitation or

impairment) not because they were unimportant but because they were not part of the same construct. It is possible for multiple people to have the same impairment and/or functional limitation but with very different impacts on their ability to fulfil their work role. This further substantiates our argument that assessment of impairment and function should be extended or complimented by work-ability assessment. Indeed, one might suggest that where vocational rehabilitation is concerned, driving other assessment by first considering work-ability could be an important shift in thinking and in rehabilitation planning. We are mindful that further testing (such as Rasch Analysis [40]) may highlight that the WSS actually comprises multiple dimensions rather than being uni-dimensional, and currently we suggest scores are shown as a set of profile scores rather than a total.

On the basis of the work carried out to date, we would recommend that the current version of the tool could enhance assessment of work-ability in two contexts. Firstly, in inpatient rehabilitation where 'work' is at times considered a future goal in the face of more pressing impairments and disablement. An increased focus on employment and return to work issues early on in rehabilitation seems increasingly warranted in view of persuasive data that early work expectations influence outcome [e.g. see 41]. Secondly, the tool appears to have a place in vocational rehabilitation and community vocational assessment prompting both assessors and the client to consider remediable factors they may not identify as being related to their diagnosis (for example thinking and problem solving in musculoskeletal conditions even though this has been shown to be a major concern to people with such conditions [42]. In addition, all stakeholders in our development and evaluation of the WSS to date were looking for a guide to their communication that protects the medical confidentiality of the client whilst realistically considering the work accommodations and supports that might be necessary for sustained work placement.

Acknowledgements

We would like to thank all the individuals and organisations who contributed to the qualitative focus groups and interviews, and the workplace assessors and injured workers who took part in the pilot testing in New Zealand. We also thank the staff of the Regional Rehabilitation Unit in the UK who took part in extensive pilot work in the UK, and all who contributed ideas and debate towards the development and refinement of the WSS.

Declaration of interests

Funding for the New Zealand-based research, funding was provided by New Zealand Accident Compensation Corporation (ACC) through their 2008 contestable funding round. Views and/or conclusions are those of the authors and may not reflect the position of ACC. JF also had support in the form of an award from the Kate Edger Educational Charitable Trust. In the UK, work was undertaken as part of an independent research programme commissioned by the National Institute for Health Research (NIHR) under its Programme Grants for Applied Research funding scheme (RP-PG-0407-10185). The views expressed in this article are those of the authors and not necessarily those of the NHS, the NIHR or the Department of Health.

Appendix 1: The Work-ability Support Scale (WSS)

Part A: 16 items - Each item is rated on 7 level scoring system

PHYSICAL	
1. Physical & motor	Physical and motor skills required to do the job (e.g. lifting, dexterity, coordination, balance)
2. Sensory & perceptual	Sensory and perceptual skills required to do the job. Includes both sensory (e.g. vision) and perceptual (e.g. perception of differences between objects)
3. Mobility & access	Ability to move around in the work environment and access areas, facilities and equipment for the job
4. Community mobility	Moving around the community for work requirements , travelling to and from work and community mobility
5. Stamina & pacing	Ability to manage fatigue, and stamina to work through a normal working day
THINKING AND COMMUNICATING	
6. Cognitive	Ability to manage memory, attention, concentration, etc requirements of the job
7. Planning & organising	Ability to initiate, plan and organise as required for the job.
8. Problem solving	Ability to deal with non-routine or unexpected events in the workplace such as interruptions, problem solve and work to own initiative when things change
9. Communication (verbal)	Verbal communication ability including production and understanding of verbal communications
10. Communication (written)	Reading, writing and understanding of written material as required for the job
SOCIAL / BEHAVIOURAL	
11. Self presentation	Time keeping, appropriate dress and self presentation for the

	particular job role
12. Maintaining safety	Ability to maintain safety of themselves and others in the work environment
13. Interpersonal (clients)	Interpersonal skills, professional and social interaction with clients / customers
14. Interpersonal (colleagues)	Interpersonal skills, professional and social interaction with work colleagues
15. Interpersonal (managers)	Interpersonal skills, professional interaction with management
16. Instruction & change	Appropriate reaction to supervisory instruction and/or correction regarding work activities. Ability to correct errors, accept changes in work tasks, etc

Scoring levels: Part A

Independent	
Level 7	**Independence without modification** No problem at any level with managing the requirements of the job
Level 6	**Independence with modification** Some consideration for time or effort * Or requires adaptation / strategies / equipment above the ordinary provided for the job in order to function independently. Able to self-prompt / correct or to structure their own environment. Minimal reduction in work productivity
Supported working	
Level 5	**Supervision / set-up** Requires someone else to set-up equipment or prompt on strategies Or externally structured work environment. Monitoring – with only occasional prompting / correction
Level 4	**Minimal support** Able to manage >75% of the time in that aspect of the job Regular planned intervention or support only Work productivity only mildly affected
Level 3	**Moderate support** Able to manage more than half the time in that aspect of the job Infrequent** unplanned intervention on top of regular monitoring Work productivity moderately affected
Level 2	**Maximal support** Able to manage less than half the time in that aspect of the job Frequent unplanned intervention on top of regular monitoring Work productivity severely affected

Level 1	**Constant support – or effectively unable** Effectively unable or manages less than 25% of the time Unplanned intervention many times a day
Unable to score	Unable to score due to insufficient information. More information required.

Part B Contextual factors

Item	Contents
Personal factors	
1. Desire to work	Does N want to return to / remain in work?
2. Confidence	Does N feel confident in their ability to cope with work?
3. Realistic expectations	Does N have realistic expectations with respect to their working ability and return to work?
4. Personal support	Is there support from friends and family for N to return to work?
Environmental factors (within the work place)	
5. Peer support in work	Is there support from N's workmates colleagues for N to return to work?
6. Employer contact	Is there contact with N's employers with respect to return to work?
7. Employer flexibility	Is the employer willing to take positive steps to facilitate N's return to work? (eg making adaptations to the job, the workplace etc)
8. Vocational support / rehabilitation	Is there formal support from external services to coordinate return to work? (eg vocational rehab, disability employment service , case manager etc)
Barriers to return to work **(NB: score *+1 for positive* and *-1 for negative* effect)**	
9. Competing demands	Are there issues outside of work that potentially conflict with work commitment?
10. Financial disincentives	Are there any financial barriers to return to work? (eg insurance / unemployment benefits)
11. Legal	Are their any legal issues which present a barrier to N returning to work? (eg ongoing litigation)
12. Other factors	Are there any other factors (positive or negative) affecting N's ability to return to /remain in work?

Scoring levels: Part B

Scoring	Description	Not scored
+1	Positive effect	
0	Neutral / not sure / not applicable	□ More information needed
-1	Negative effect	

References

[1] Blustein DL. The role of work in psychological health and well-being: A conceptual, historical and public policy perspective. Am Psychol 2008:68(4): 228-240.
[2] Ross J. The current state of vocational rehabilitation. In: Vickerstaff S, Phillipson C and Wilkie R editors. The current state of vocational rehabilitation. Work, Health and Well-Being: The Challenges of Managing Health at Work; Bristol: The Policy Press; 2012.
[3] Steadman-Pare D, Colantonio A, Ratcliff G, Chase S, Vernich L. Factors associated with perceived quality of life many years after traumatic brain injury. J Head Trauma Rehabil 2001:16(4): 330-342.
[4] Hammell K. Quality of life after spinal cord injury: A meta-synthesis of qualitative findings Spinal Cord 2007:45: 124-139.
[5] Grint K. The Sociology of Work: Introduction. 3rd ed. Cambridge: Polity Press.
[6] Tompa E. Measuring the burden of work disability: A review of methods, measurement issues and evidence. In: Loisel P and Amena JR editors. Measuring the burden of work disability: A review of methods, measurement issues and evidence. Handbook of Work Disability: Prevention and Management; New York: Springer; 2013.
[7] Safe Work Australia. The cost of work-related injury and illness for Australian employers, workers, and the community, 2008-9. In. The cost of work-related injury and illness for Australian employers, workers, and the community, 2008-9; Canberra: Safe Work Australia; 2012.
[8] Bootes K, Chapparo CJ. Cognitive and behavioural assessment of people with traumatic brain injury in the work place: Occupational therapists' perspectives. Work 2002:19: 255-268.
[9] Jones T, Kumar S. Functional capacity evaluation of manual materials handlers: a review. Disabil Rehabil 2003:25(4/5): 179-192.
[10] McFadden S, MacDonald A, Fogarty A, Le S, Merritt B. Vocational assessment: a review of the literature from an occupation-based perspective. Scand J Occup Ther 2010:17(1): 43-48.
[11] Kendall E, Muenchberger H, Gee T. Vocational rehabilitation following traumatic brain injury: A quantitative synthesis of outcome studies. Journal of Vocational Rehabilitation 2006:25: 149-160.
[12] Young A, Radoslaw W, Roessler R, McPherson K, Anema J, van Poppel M. Return-to-work outcomes following work disability: Stakeholder motivations, interests and concerns. J Occup Rehabil 2005:15: 543-556.
[13] Escorpizo R, Ekholm J, Gmunder HP, Cieza A, Kostanjsek N, Stucki G. Developing a core set to describe functioning in vocational rehabilitation using the International Classification of Functioning, Disability, and Health (ICF) J Occup Rehabil 2010:20(4): 502-511.
[14] Glassel A, Finger ME, Cieza A, Treitler C, Coenen M, Escorpizo R. Vocational rehabilitation from the client's perspective using the International Classification of Functioning, Disability and Health (ICF) as a reference. J Occup Rehabil 2011:21(2): 167-178.
[15] Fadyl JK, McPherson KM, Schlüter PJ, Turner-Stokes L. Factors contributing to work-ability for injured workers: Literature review and comparison with available measures. Disabil Rehabil 2010:32: 1173-1183.
[16] Innes E, Straker L. Strategies used when conducting work-related assessments. Work 2002:19: 149-165.
[17] Strong S, Baptiste S, Cole D, Clarke J, Costa M, Shannon H, Reardon R, Sinclair S. Functional assessment of injured workers: A profile of assessor practices. Can J Occup Ther 2004:71(1): 13-23.
[18] McPherson KM, Diesfeld K, Schluter P, Travalglia S, Ryan B, DeSouza R, Boocock M, Harwood M, LaGrow S, Callaghan K et al. Evaluation of Vocational Rehabilitation under the Injury Prevention Rehabilitation and Compensation (IPRC) Act 2001 In. Evaluation of Vocational Rehabilitation under the Injury Prevention Rehabilitation and Compensation (IPRC) Act 2001 Auckland: AUT University (report commissioned by Accident Compensation Corporation, New Zealand); 2007.
[19] Crewe NM, Athelstan GT. Functional assessment in vocational rehabilitation: A systematic approach to diagnosis and goal-setting. Arch Phys Med Rehabil 1981:62(7): 299-305.
[20] Wasiak R, Young AE, Roessler RT, McPherson KM, van Poppel MNM, Anema JR. Measuring return to work. J Occup Rehabil 2007:17(4): 766-781.

[21] Hulshof C, Pransky G. The role and influence of care providers on work disability. In: Loisel P and Anema JR editors. The role and influence of care providers on work disability. Handbook of Work Disability: Prevention and Management; New York: Springer; 2013.
[22] Loisel P, Côté P. The work disability paradigm and its public health implications. New York: Springer. Handbook of Work Disability: Prevention and Management.
[23] Kuipers P, Foster M, Smith S, Fleming J. Using ICF-Environment factors to enhance the continuum of outpatient ABI rehabilitation: An exploratory study. Disabil Rehabil 2009:31(2): 144-151.
[24] Bergner M, Rothman ML. Health status measures: an overview and guide for selection. Annu Rev Public Health 1987:8: 191-210.
[25] DeVellis RF. Scale development : theory and applications. 3rd ed. Newbury Park, CA: Sage. Applied Social Research Series.
[26] Kucukdeveci AA, Tennant A, Grimby G, Franchignoni F. Strategies for assessment and outcome measurement in physical and rehabilitation medicine: an educational review. J Rehabil Med 2011:43(8): 661-672.
[27] McDowell I. Measuring health: a guide to rating scales and questionnaires. 3rd ed. Oxford: Oxford University Press.
[28] Turner-Stokes L, Fadyl JK, Rose H, Williams H, Schlüter P, McPherson KM. The Work-ability Support Scale: Evaluation of scoring accuracy and rater reliability. J Occup Rehabil In press.
[29] McDowell I, C N. Measuring Health: A Guide to Rating Scales. Oxford: Oxford University Press.
[30] Keith RA, Granger CV, Hamilton BB, Sherwin FS. The functional independence measure: a new tool for rehabilitation. Adv Clin Rehabil 1987:1: 6-18.
[31] Patton MQ. Qualitative research and evaluation methods. 3rd ed. California: Sage publications.
[32] Ritchie J, Spencer L, O'Connor W. Carrying out qualitative analysis. In: Ritchie J and Lewis J editors. Carrying out qualitative analysis. Qualitative research practice: A guide for social science students and researchers; London: Sage; 2003.
[33] Young AE. Return to work following disabling occupational injury - facilitators of employment continuation. Scand J Occup Ther 2010:36(3): 473-483.
[34] Hall KM, Hamilton BB, Gordon WA, Zasler ND. Characteristics and comparisons of functional assessment indices: Disability Rating Scale, Functional Independence Measure and Functional Assessment Measure. J Head Trauma Rehabil 1993:8(2): 60-71.
[35] Law J, Fielding B, Jackson D, Turner-Stokes L. The UK FIM+FAM Extended Activities of Daily Living module: evaluation of scoring accuracy and reliability. Disabil Rehabil 2009:31(10): 825-830.
[36] Turner-Stokes L, Nyein K, Turner-Stokes T, Gatehouse C. The UK FIM+FAM : Development and evaluation. Clin Rehabil 1999:13: 277-287.
[37] Turner-Stokes L, Williams H, Sephton K, Rose H, Harris S, Thu A. Engaging the hearts and minds of clinicians in outcome measurement - the UK rehabilitation outcomes collaborative approach. Disabil Rehabil 2012:34(22-23): 1871-1879.
[38] World Health Organisation. International classification of functioning, disability and health : ICF. Geneva: World Health Organisation.
[39] MacEachen E, Kosny A, Ferrier S, Lippel K, Neilson C, Franche RL, Pugliese D. The 'ability' paradigm in vocational rehabilitation: Challenges in an Ontario injured worker retraining program. J Occup Rehabil 2012:22: 105-117.
[40] Tesio L, Simone A, Bernardinello M. Rehabilitation and outcome measurement: where is Rasch analysis-going? Europa Medicophysica 2007:43(3): 417-426.
[41] Hallegraeff JM, Krijnen WP, van der Schans CP, de Greef M. Expectations about recovery from acute non-specific low back pain predict absence from usual work due to chronic low back pain: a systematic review. J Physiotherapy 2012:58(3): 165-172.
[42] Beale M, Cella M, Williams AC. Comparing patients' and clinician-researchers' outcome choice for psychological treatment of chronic pain. Pain 2011:153(10): 2283-2286.

Table 1: Application of the key stages in WSS development advocated by McDowell [27]

Recommendations by McDowell
1. Full description of the purpose including populations for which it is designed, populations on which it has been tested and intended use of data collected
2. Make the instrument easily available albeit with controls in place to ensure the 'standard' version is used
3. A name that conveys the content
4. A sound rationale for design and clear conceptual definition
5. The process for selecting items and subcomponents
6. Revisions should be clearly explained and the latest version of the tool presented
7. Clear instructions
8. Reference scores or standards proposed (based on different population data or anticipated change)
9. Validity and reliability data related to external criteria
10. Formal analysis on standard error, sensitivity to change and reliable change
11. Comparison head to head with other scales
12. Measures should be used by others as the original authors are likely to achieve higher validity figures than subsequent users
13. The originators take responsibility for further refinements of the tool as few if any are perfect when first developed.

Table 2: Participant characteristics—qualitative focus groups and interviews

Type of participant	Data collection method	Gender	Age range (years)	Ethnic identities (self-identified)	Type of condition
Injured workers (6)	Individual interviews (6)	4 Female, 2 Male	25–65	Māori [a] (2) Pākehā [b] (5) Asian (1)	Musculoskeletal (4) Brain injury (1) Pain condition (1)
Vocationally trained health professionals (6)	Focus groups (2)	5 Female, 1 Male	25-45	Pākehā (3) European (1) Canadian (1) New Zealander (1)	Musculoskeletal and pain (3) Brain injury specialist (3)
ACC case managers (5)	Individual interview (1) Focus group (1)	3 Female, 2 Male	25-55	Pākehā (4) Asian (1) Pacific (1)	General (4) Serious injury specialist (1)
					Type of industry
Employers (5)	Individual interviews (2) Focus groups (1)	3 Female, 2 Male	25-55	Pākehā (4) Australian (1)	Education (1) Retail (2) Air travel, freight, engineering (1) Wholesale (1)

[a] Indigenous population of Aotearoa / New Zealand

[b] New Zealanders of European descent

Table 3: Structure of questions for focus groups and interviews

1. Initial exploration of experiences and knowledge concerning factors that affect work-ability	What things do you consider to be important for successful re-integration into the workplace? Barriers / facilitators?
2. Specific questions relating to the proposed framework and content for the tool	▪ Is there anything missing from the current version of the measure? ▪ Is there anything that is in the measure that shouldn't be? ▪ How feasible is it to obtain the information required to complete the measure? • If not now, could it be, and how? ▪ Which professionals are best to complete the measure? ▪ Is it better to have different people filling in different parts? ▪ Who could use the information? ▪ How would or should the information be used? What is the best format? ▪ How culturally appropriate is the measure?

Table 4: Summary of injured worker characteristics—community pilot testing

Gender	Age (years)	Occupation type	Condition
Male	45–55	Professional	Musculoskeletal
Female	25–35	Administrative	Brain Injury
Female	45–55	Managerial	Brain Injury
Female	25–35	Trades	Musculoskeletal
Female	25–35	Professional	Brain Injury

Table 5: Assessor feedback—community pilot testing

Participant ID	Assessor	Time to complete measure (min)	Items which were difficult to score?	Items which were hard to get enough information for?	Reasons for difficulties scoring / getting information?
P1	1	45	Stamina & Pacing Instruction & Change	Instruction & Change	Client has not been in job long enough to judge functioning
P2	3	25	None	None	n/a
P3	2	60	Stamina & Pacing Problem solving	Stamina & Pacing	Stamina: Client has not been in job long enough to judge functioning Problem solving and multi-tasking are quite different skills but are together in one item.
P4	4	30	Stamina & Pacing	Stamina & Pacing	Client has not been in job long enough to judge functioning
P5	1	30	Stamina & Pacing	Stamina & Pacing	Client has not been in job long enough to judge functioning