Skills for the Job of Recovery: Final Report

A study on the feasibility of an online worker empowerment program in Ontario

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Abstract: Skills for the Job of Recovery

Recovery and return to work after an injury, perhaps in particular a work-related injury, requires more than just physiological recovery from pain and limitations. Previous studies with injured workers have shown challenges to recovery including poor understanding of the "systems" around their injury (WSIB, Medical, Workplace), poor or weakened support systems around the worker, or needs to negotiate with people involved in their claim for return to work job accommodations. The result can be distressing for the worker in the life role that characterizes their sense of well being as much as meeting their financial needs.

Research Question: Is it feasible to conduct a web-based support and education program (Skills for the Job of Recovery) that aims to empower injured workers attending WSIB specialty clinics in the successful navigation of their work recovery journeys (specifically improved self-efficacy for RTW, lower health distress, lower illness intrusiveness, improved knowledge of skills)?

Objectives: In this study we addressed the research question through four objectives.

Objective 1: *To determine the behaviours and/or beliefs injured workers need to learn in order to move them towards successful return to work (needs identification).*

Objective 2: *To assess the level of internet access specialty clinic attendees have to the internet and their sense of confidence interacting with a web-based information system (internet access and literacy).*

Objective 3: *To test the potential outcomes that would be used in a study of the development of skills for the job of recovery.*

Objective 4: *To review the platforms available for this type of learning system and determine the feasibility and cost related to its development.*

Methods: We conducted focus groups and undertook a qualitative analysis of the results to describe the process, barriers and enablers of recovery (Objective 1). Key issues were then fielded to 209 injured workers in a survey format to test their relevance to a broader population (Objective 1) as well as testing level of internet access and literacy (Objective 2). In the same survey we also fielded potential outcomes – health distress, self efficacy with managing occupational roles, and health education impact. Our work was conducted at the WSIB shoulder and elbow specialty clinic at the Holland Orthopaedic and Arthritic Centre, Work Conditioning Program. All workers had accepted claims through the WSIB.

Results:

Workers described a journey to recovery that was a balancing act, characterized as a teeter totter – first being suspended helplessly in the air with the other end weighed down by the injury, loss of income, loss of meaningful role and routine along with any previously tense relationships at work or at home. Tipping the balance, shedding the burden of the injury or the weight of the relationships OR developing new skills to counter balance the teeter totter were described. Whether the person returned to previous level of functioning or set off on a course of a new level of functioning, issues greater than health and concrete job tasks needed to be considered. The survey of 209 injured workers confirmed several skills that could help to improve the course and path to recovery. These workers, on average 11.9 months after their injury, agreed with focus group participants and prioritized the potential content. Outcomes were tested and psychometrically reflected good scaling properties showing their potential value for comparative studies.

Conclusions:

Injured workers may benefit from a self-management type of program addressing skills in the areas of communication, negotiation, fostering positive relations and knowledge of the systems involved in managing a claim. Such a program could be offered online, as a facilitated education and discussion forum to overcome the geographic dispersion of these workers with longer term injuries. Over half the surveyed workers agreed that they would likely try this type of progam.

Plain Language Summary.

Workers injured on the job are faced with shifting relationships with their workplace and families and new relationships with the WSIB. They are in fact juggling three parties around one health issue: their health care, the WSIB and their employers. At the same time they are managing their social roles outside of work. It is a complex situation that demands skills a worker may not have. Skills like negotiating or communicating your needs, budgeting, knowing how to manage pain – something we have labelled "Skills for the job of recovery".

In this study we conducted qualitative focus or discussion groups to get an understanding of the skills that workers need to have to negotiate their recovery. We also conducted a survey of 209 injured workers to determine their ability to do health learning over the internet, and to seek their advice on the skills that would help them. We also asked them about some of the outcomes we were considering if we were to evaluate a program to improve their skills for recovery. We found that workers described skills that they could develop for the job of recovery from their work-related disorder. Knowledge of WSIB systems and of their injury; negotiating skills, communication and relationship building skills all came up as things that would help them in the non-medical parts of their recovery. Injured workers in our study had enough access to, and knowledge of computers to allow for training for these types of skills to take place on the internetr. Outcomes that could be used to judge whether a program like this would help were also tested and found to be of good quality and ready for future studies. These included feeling of confidence in ability to manage the work related injury and questions on the impact of the educational program. The majority of the respondents felt positive about a program like this, saying that they would likely or definitely participate.

Conclusion: Workers recovering from a work-related injury of longer duration identified needs for self-management training potentially through an internet based teaching system. Future work should be done to formally evaluate if this can help improve self-efficacy and reduce any distress workers are feeling as they recover.

1.0 Review of relevant research.

In their return-to-work (RTW) study, Parsons et al (2008) asked cancer patients when they expected to be back at work. The surprised patients replied that they were at work; they were working very hard at a new job: recovery. The patients affirmed that working towards recovery was just as hard as working at their paid job. Many studies have identified barriers and obstacles that workers with musculoskeletal injuries face within the RTW process (MacEachen, 2006; 2007; Tarasuk, 1995 Beaton, 2001; Baril, 2003; Steenstra, 2001). We believe that injured workers face a similar job to the job reported by the cancer patients - the Job of Recovery – and that injured workers may not have the skills needed for this new job within the context of a work-related injury.

Varekamp (2009) used qualitative methods to distinguish the tasks required for their concept of empowerment, something close to the Job of Recovery. They determined the characteristics of potential empowerment interventions that would assist workers acquire skills for these tasks. Empowerment was defined as "a process to help patients develop knowledge, skills, and a heightened awareness of values and needs". Many of the skills described by Varekamp (2009) are similar to those described in chronic disease self-management programs. These skills - which include communication, job satisfaction preparation, and negotiation - help workers face and move through their RTW journey. In other health research studies have found that higher levels of empowerment and self-efficacy are associated with better problem solving, better communication skills within workplace and health care settings, and higher levels of autonomy and self-management (Feste, 1995; Bandura, 1997). These findings have been supported by other studies (Lacaille, 2007; Korzycki, 2008).

Problem-based self-management education programs encourage individuals to actively participate and share in the responsibility of everyday illness management (Lorig 2003). These programs are "designed to help people gain self-confidence in their ability to control their symptoms and understand how their health problems affect their lives" (http://patienteducation.stanford.edu/). Program content is focused on individual's concerns and problems (Lorig, 2003). Self-management education programs can be facilitated by lay leaders (usually with their own health problems), health professionals, or a combination of the two. A recent Cochrane systematic review of lay-led self-management education programs for persons with chronic conditions identified 17 randomized controlled trials (RCTs) (Foster 2007). The clinical conditions addressed in these RCTs included arthritis, diabetes, human immunodeficiency virus, cardiovascular disorders, chronic lung disease, and chronic low back pain; however, none of the RCTs addressed injuries in workers. The systematic review found that lay-led self-management education programs resulted in improved self-efficacy (confidence

to manage their chronic condition) and self-rated health, reduced health distress, and increased use of cognitive symptom management strategies by participants. There were no differences associated with lay-led versus health professional-led program interventions (Foster 2007).

Delivery of a program to address these self-management type skills in injured workers encounters two key issues. First, a large proportion of injured workers may not need this type of program as their claim could resolve in short order – the longer term claimants are therefore a key target but to date are difficult to identify early in their course. Second, injured workers will be found across the province so a centralized program delivery would be ideal. Lorig's online self management model might approach this (Lorig, 2002). These three issues led us to review more flexible models of self management or empowerment training.

Why new research was needed to address the problem.

A clinical trial (Lorig, 2002) demonstrated the effectiveness (for improving health and role functioning, and reducing health care utilization) of a moderated e-mail support and education program for working persons with low back pain; however worker compensation claimants were specifically excluded from that trial. The rationale for excluding these workers was the recognition that there are different social contexts of injury within the workers compensation system, that these contexts likely impact learning needs (Lorig, 2002). A similar model was used by Lorig in a workers compensation population but was not successful largely due to logistical challenges in recruitment and retention (Matthews, 2004). Health care workers were used to recruit workers and recruitment rates were low (Matthews, 2004). Drop-outs were high and attributed to RTW after short term injuries (Matthews, 2004). We believe our approach of recruiting through WSIB Specialty Clinics will direct the program to injured workers who specifically need the skills the program would offer (empowerment for communication, self awareness), in a setting with the highest concentration of longer-term claimants. Also, we believe that focusing on this sample of workers who are slightly later in the course of their recovery phase will overcome the issues raised by sampling at very early stages, where the natural history of the injury is already moving towards recovery (Franche, 2002; Frank 1998).

Use of Specialty Clinics as Source of Participants.

The WSIB specialty clinic programs will be used as the source of longer term injured workers for our study. These clinics are likely to represent the setting which holds the highest concentration of workers with longer term claims. These clinics are also where these workers are at, or near, decision points in their recovery process. Often these workers are struggling with these decision-making and appraisal points, partially because they receive mixed messages

across their RTW contacts at the workplace, in the health care setting and at the WSIB. We propose using the Shoulder and Elbow Clinic (Holland Orthopaedic and Arthritic Centre) where we had infrastructure in place in order to minimize our operational costs for this early appraisal. At the Holland site, approximately 1000 injured workers are assessed per year. Both genders are well-represented (male=52%, female=48%) and the average age is 46.2 years (sd 9.4, range 19-76). Fifty-four percent will be working in some capacity at time of our study, with 80% of these working in some form of accommodation (either modified duties or reduced hours or both). We found a number of these (29%) were feeling high levels of instability at their jobs (WIS>17). Workers had significant amounts of pain (SPADI pain mean=32.4/50 (sd=11.7) and disability (QuickDASH mean=59.5/100 (sd=20.5)) and difficulty doing tasks at work (Work Module of DASH ~ 75/100, 100 = unable) at an average of 9 months post- accident date.

By their attendance at these clinics, these workers are either off work or are at work but experiencing a difficulty. Many are experiencing variable levels of supervisory or organizational support. It is reasonable to assume that given longer-term pain and its effect, and negotiating return to work will be skills required of these workers. It also must be sensitive to working and off-work participants from different areas ni the province.

Lorig's group migrated their moderated e-mail program to a password protected web-based platform with sequentially released learning modules, discussion forum, and moderated chat rooms for patients with chronic diseases (Expert Patients Programme), in part to allow more consistency with the self-efficacy social cognitive models for behaviour change literature (Lorig, 2008). It has been demonstrated to be successful in groups that do not include compensated injured workers (Lorig 2006; Lorig, 2008). We believe this approach towards program delivery holds more promise, but it has not been evaluated in injured workers.

Therefore, new research is needed to identify the correct content, mode of delivery and anticipated outcomes of a web-based education and support program to improve empowerment and self-efficacy in longer term injured workers within a workers' compensation system. The first step is to identify the learning needs in injured workers migrating through the system, and the feasibility of using web-based media for delivery. Qualitative research is best suited to address this issue when the extent or area of need is unknown (Beaton, 2009; Pope, 1995). However, we will build on previous work conducted in this area that has examined effective delivery in other disease groups. To this end, we are joined by Dr. Lorig for this grant in order to make use of her extensive expertise in this area. Delivery which allows the greatest reach to those workers in need of improved skills for the 'Job of Recovery' is our goal. The current project will lay the foundation for future evaluation of the effectiveness of this type of self-management program.

2.0 Objectives of the Skills for the Job of Recovery Project.

Research Question: Is it feasible to conduct a web-based support and education program (Skills for the Job of Recovery) that aims to empower injured workers attending WSIB specialty clinics in the successful navigation of their work recovery journeys (specifically improved self-efficacy for RTW, lower health distress, lower illness intrusiveness, improved knowledge of skills)?

To answer this research question, we addressed the following objectives:

Objective 1: *To determine the behaviours and/or beliefs injured workers need to learn in order to move them towards successful return to work (needs identification).*

Objective 2: *To assess the level of internet access specialty clinic attendees have to the internet and their sense of confidence interacting with a web-based information system (internet access and literacy).*

Objective 3: *To test the potential outcomes that would be used in a study of the development of skills for the job of recovery.*

Objective 4: *To review the platforms available for this type of learning system and determine the feasibility and cost related to its development.*

Due to the sequential nature of these objectives, we will move through the methods and results related to each objective. Each objective will therefore be presented as separate sections of the final report.

Objective 1: To determine the behaviours and/or beliefs injured workers need to learn in order to move them towards successful return to work (needs identification).

3.0 Methods:

3.1. Research Design.

This study will involve two separate sets of focus groups: (1) injured workers attending the WSIB Shoulder and Elbow Specialty Clinic at the Holland Centre, Toronto and (2) clinic staff working at this specialty clinic (i.e., physiotherapists, return-to-work coordinators). Participants will only attend one focus group in total, and will be asked to complete a short demographic questionnaire. The total time commitment will be about 1-1.5 hours. A total of 5 to 7 focus groups will be held, totaling approximately 42 participants.

3.2.Research Methods

3.2.1. Inclusion/Exclusion Criteria.

Injured worker participants: Injured workers over the age of 18 and feeling comfortable expressing themselves in English (able to read/understand the informed consent form and able to participate in focus group discussions) were recruited for this study. The only exclusion criterion was refusal to sign the informed consent form after having had time to consider participation.

Clinic staff participants: All clinic staff were eligible for participation (physiotherapists, RTW coordinators) if they had over 6 months experience in assessing injured workers at the clinic.

3.2.2. Recruitment.

Injured worker participants: Injured workers were recruited from those attending the WSIB Shoulder and Elbow Specialty Clinic. A study pamphlet and informed consent form (see Appendix 3) was sent to workers ahead of their clinic attendance inviting them to participate in the focus group on the day of their clinic visit. Usual practice for the clinic staff includes preparing an information package for workers regarding their upcoming clinic visit, and study-related materials were included in this mailing that would have arrived to the workers about 2 weeks prior to their clinic visit. There are about 20 potentially eligible workers each clinic day. Clinic staff will document which workers have been sent study-related materials

in a recruitment log which will alert the research coordinator to the workers who have received study-related materials.

Injured workers were provided with the phone number for the research office and if they do NOT wish to talk to anyone about participating in the study. One week prior to the focus group, all remaining workers who have not self-identified as not wishing to participate were called to confirm their interest in the study and to answer any study related questions they have about the research project or the consent form. We also used this opportunity to confirm the workers' gift card preference.

Clinic staff participants: Clinic staff will be provided individual letters of invitation along with copies of the Informed Consent form at least a week prior to a potential focus group The clinic staff will be encouraged to contact the study coordinator if they have questions and to confirm their participation in the study via a response card which will be attached to their information letter. Clinic staff will be asked to return the response card to the research office or another secure location (i.e., drop box). The card will ask for their preferred contact information (i.e., phone number and/or email address) along with their ideal time and choice of dates for the focus group. The drop box was used to allow them confidential response to their decision re study participation.

3.2.3.Consent.

Injured workers and clinicians were provided with the informed consent form ahead of the focus group and signed it at the beginning of the session. Additional copies were available in case of misplaced copies. Two forms were signed, one retained by the participant.

3.2.4. Focus Group Session Conduct

Five focus groups (three with injured workers, two with clinic staff) were conducted with a trained facilitator and co-facilitator. The focus group facilitator had experience in return to work issues (e.g., knowledge transfer associate from the Institute for Work & Health).

As is typical for focus group work, an interview guide will be used regarding topics to be covered, but the flow of the group will depend on the discussions and topics that arise and the skill of the facilitator (Krueger & Casey, 2009) and as is typical for a grounded theory approach, the guide will be adapted to meet the topics and themes brought up by the participants (Krueger & Casey, 2009; Strauss & Corbin, 1990). The focus group questions were developed to get the workers to think of tasks and needs they have in the RTW process. The clinic staff participants will be asked to reflect on the obstacles they sense for workers moving through the system. The focus in both cases is on factors that workers have, or perceive, some control over – hence things that are potentially modifiable. One of

the moderators will record the list of needs that the workers and/or clinic staff identify on a flipchart and the groups will also rank order these needs in order of importance.

Focus groups were held at a time of maximum convenience for participants. For injured workers this was over the lunch hour, and a light lunch was provided to all participants. Groups were held outside of the clinic area to ensure that workers could feel more confident about the separation of focus group discussions from their clinic assessment. We aimed for about 6 participants per group (Morgan, 1998). Participants received a $25 gift card from a major retailer of their choice for their participation. This will be provided at the end of the focus group.

Immediately following the focus groups the team and investigator had a debrief session. Notes were taken on the key concepts, relationships between concepts and things to follow up on in the subsequent groups (Miles, 1994; Creswell, 1998).. Key themes were identified and discussed. Questions or lines of questioning modified as necessary. These field notes were consulted regularly during the coding and interpretation process.

3.2.5 Confidentiality.

Over the course of this study we were sensitive to the confidentiality needed for participants and the results. All paper files with identifiable information (recruitment lists and consent forms) will be locked in a filing cabinet in a locked office environment (research office at the specialty clinic). All other study-related files will be identified by a study-ID number only. Digital recordings of the focus groups will be downloaded onto a secure hospital network drive and erased from the encrypted digital recording device. The digital file was transferred via secure file transfer protocol to an REB approved medical dictation service. The transcription company manually deletes all audio recordings from their system after 30 days/once payment has been received and transcripts approved for accuracy. All personal names/identifiers are removed at the time of transcription. We replaced names with fictitious names. All persons in the first group were assigned a pseudonym starting with "A", the next group starting with "B" etc..

3.3. Analysis.

Transcriptions were revised while listening to the audiotape to ensure the accuracy of the transcription. Interviews will be transcribed and transferred into NVivo (Qualitative Solutions and Research, 2008) to facilitated coding and retrieval of related text.

Content-based analyses proceeded according to the methods described by Strauss and others (Strauss, 1990; Morgan, 1998; Charmaz, 1988). The first stage (open coding) was

performed as data were collected (Strauss, 1990; Charmaz, 1988). In this way, both field notes and open coding could influence subsequent focus groups and the theoretical sensitivity of both data collection and analytic processes. The first two focus groups were coded by three persons and shared with the investigative team for review and discussion to ensure a broad array of codes with shared meanings. The investigative team also reviewed the coding manual (name, definitions) and agreed with the content and comprehensiveness. The remaining groups were coded by the main coordinator (SC), and also coded by the lead investigator (DB). Discrepancies or missed codes were discussed at monthly meetings between coders. Investigators were updated at regular intervals. Finally, earlier transcripts were re-coded using the final set of codes to identify themes that may have been missed. Axial coding, aided by memos, concept maps, diagrams and links within the database was conducted. This provided links between the concepts in open coding and an overall sense of the context surrounding certain findings (when and why did workers feel this, was it found in all workers, in what situations). Meetings with the investigative team continued as we worked to present and build a model to support the understanding of the situations of workers in their Job of Recovery. Care was taken to attend to causal factors versus indicators of factors influencing work transition. Particular attention was paid to obstacles to RTW and skills sets needed or described to overcome them. Presentations of the emerging theory were made to investigators and to clinic staff. Emerging results were revised with the help of our knowledge translation associates to improve their clarity, and re-checked against participant data. Finally, transcripts were once again reviewed at the end of the process to ensure the final depiction of our finding was a good fit with participants' voices.

3.4 Results

3.4.1 Description of participants.

18 workers (seven males, 11 females) and 14 staff (two were male, 12 female) participated in a total of five focus groups. The average age of participants in the injured workers focus group was 47.8 years with an average of 14.9 months since date of injury. 27.7% of the workers were working at the time of clinic attendance, but half on modified or reduced duties. The staff were all physiotherapists and occupational therapists working in the specialty clinic.

3.4.2 Core finding: The journey towards RTW/work role functioning

Injured workers describe their journey towards RTW or work role functioning as a dynamic process that integrates their pre-injury life and relationships with the disruption of a work-

related injury and the realities it brings to bear on what the worker needs to deal with in their life. As one injured worker described, life after a workplace injury felt like one was left hanging, not sure about what to do: "*my future is completely up in the air" (Deanna).* Essentially, their balance in life, perhaps perturbed in the past by slight disruptions like a temporary illness (e.g. the flu) or a particularly stressful month on the job, is now feeling completely off balanced. The concept of balancing – rebalancing one's life, tipping the balance towards recovery, balancing work and home roles, balancing tensions between players in the claim – was pervasive in our study. In this study, the fulcrum (pivot point) upon which this balancing act occurred was composed of elements related to workplace injury that injured workers had little to no control over (i.e. one's age, one's physical condition following an injury, the speed at which one heals, discordant views about the nature of one's injury or the best course of treatment, the WSIB system). However, there were things that they did have control over. These elements led us to a synthesis of the findings that reflected this act of balancing – almost like being tipped out of balance on a teeter totter and needing to gather the weight or off load the counterweights in order to tip the balance in favour of recovery.

In each section we will place a piece of the journey in a text box followed by the supporting findings from the qualitative interviews supporting that part of the journey

Box.1: Recognizing pre-injury context.

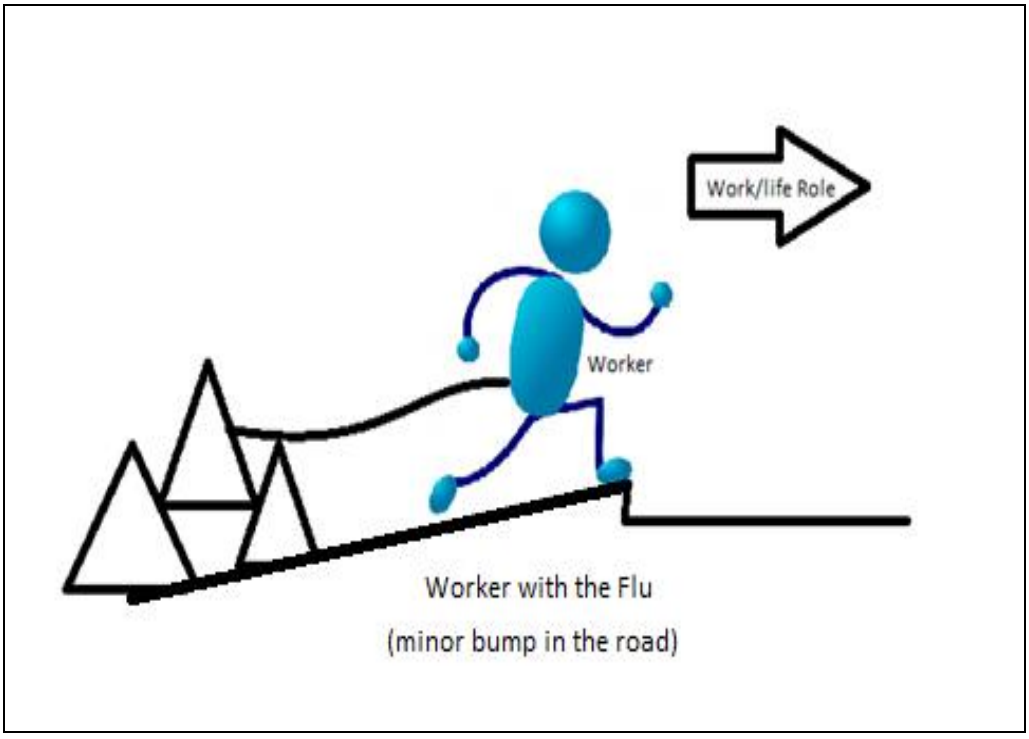
In the workplace, all workers (injured and uninjured) face a variety of challenges as they traverse their work/life road. For some, these challenges may be the physical demands that a job can place on one's body. For others, work-related stress or disagreements with co-workers may be challenging. Still others may find the management of a long commute or the creation of a healthy work/life balance to be particularly tricky. Fortunately, most workers also possess certain skills that aid in their ability to manage such challenges (i.e. negotiating skills, positive attitudes, effective outlets for stress, social supports). Each worker, however, will likely possess a different set of skills and, thus, a different capacity to manage everyday work-related challenges and stress. The injured worker, pre-injury was able to manage these stresses and continue working. But they did note that pre-injury was not always perfect, and those imperfections might continue in the post-injury situation.

Figure 1: The day-to-day challenges of work. Recognition was given by the injured workers that even before their injury they had challenges and things they had to pull along in their work role journey. Job stress, co-worker issues. But they managed, and achieved or excelled at their work.

Box 2: The little blips….described often by the current injury being much different than….

Periodically, small challenges may arise in the lives of workers that can make the everyday management of work/life challenges more difficult, as these challenges must be added to the challenges already being shouldered. For example, if a worker comes down with the flu (a small, temporary bump in one's overall work/life road), they may find an increased level of challenge associated with their work (i.e. concentrating on tasks may be difficult, completing physical tasks may be uncomfortable, keeping up with tasks on a busy day may prove impossible). In order to help tip the balance and get them over this bump in the road, workers must draw more heavily on their skills or make changes in their work or home lives that allow these challenges to be managed more easily (e.g. workers who come down with the flu might consider asking their co-workers for assistance until they recover or may use medication to help make their symptoms more manageable).

Figure 2: Everyday bumps in the road at work.



Box 3: Tipping the balance: the complexity of the workplace injury experience

If a worker sustains a chronic injury at work (a large bump in their work/life road that may not be quickly resolvable), they may find themselves extremely overwhelmed with new challenges (MacEachen, 2006; 2007; Tarasuk, 1995; Beaton, 2001; Baril, 2003; Steenstra, 2001). The realities which help to set the scene for their experience as injured workers (i.e. their physical condition, the speed at which they are able to heal, the reality of the WSIB system, discordant views between their health care providers, their employers and the WSIB) can accumulate and cause significant disruptions in their lives. These realities of a workplace injury combine to increase the size of the fulcrum upon which the worker must balance, and can make a 'bump' in the road caused by an injury seem more like a cliff. As a result, injured workers may begin to feel as though they are trapped high in the air, staring down at the chaos and confusion of their lives following a work-related injury.

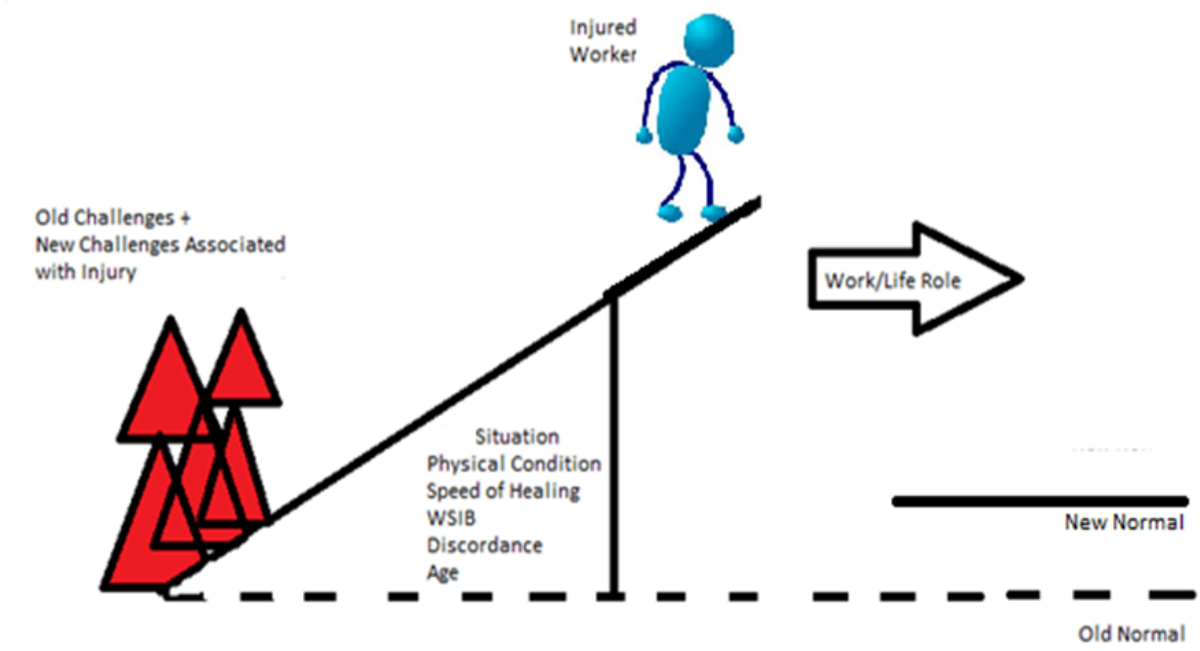


Figure 3: The realities of a workplace injury, a larger fulcrum pushes and sustains the injured worker up in the air: "my future is completely up in the air" in a helpless state.

Realities that Shape Experiences of Injured Workers (Fulcrum)

The injured workers in this study not only described dealing with the physical effects of their injuries, but also some of the factual realities of their new injured status. These elements combined to increase the fulcrum upon which their workplace injury was experienced and needed to be balanced. In this study, realities can be understood as the unchangeable parts of a workers' injury experience that they needed to work around or cope with in the context of their return-to-work. Injured workers described the following realities exacerbated or arising post injury : i) conflicting/competing perspectives on individual workplace injuries from employers, adjudicators and clinicians, ii) financial concerns associated with being off work and, iii) the physical realities associated with age and, iv) the WSIB system

Discordant Views of the Employer, the Health Care System and the WSIB

The fact that the individuals in this study were injured at work requires that their recovery is of particular interest to three parties: i) the health care system (including their health care providers) ii) the WSIB as the insurer who manages their claims, administrates their return to work, and pays them while they are off, and iii) the employer (supervisor and workplace) who manages the injured worker's job while they are absent. The injured workers described often experiencing competing and discordant views of their situation, fuelled in some cases by the competing desires of these groups: "*Well, my employer was actually supportive but my WSIB co-ordinator [adjudicator] was not supportive. Some people they support and some people they don't support" (Beatrice).*

For example, workplaces might want a worker to return to work quickly in order to avoid productivity losses or penalties, but might also want the worker to stay off work longer in order to be sure that they are '100%' recovered and, presumably, safe to be on the job:

> *I just found that, you know, dealing with all these people in this network that people just seemed to have different opinions about it than I did. You know, I mean I knew the facts and, you know, it's just like basically, you know, why don't they see it from my point of view?...And just for instance, I mean when I went to my doctor and then told my employer the first thing she said was she wanted me to have a clean bill of health before I went back to work. And the doctor said they can't do that, they have to take you back on light duty* (Albert, off work for 16 months).

Conversely, family physicians can often have a different set of needs than the WSIB or employers, and may operate in large blocks of time (i.e., three months between visits, meaning that a worker may not return to work during this time period). Consequently, workers can face delays in their return-to-work and experience frustration with discordant views of their capabilities:

> *…you have to make sure you have everything together, documented, and make sure that your doctors know exactly what your problems are, and make sure WSIB and your workplace get together so they know the situation, because they have two different answers, and one is arguing with the other. So they have to get together. And as far as doctors and all that, it's so hard to get an appointment to get in to see him. Like my doctor takes at least a month or so to get in. Then you see him and then you book for an MRI or something, which takes three months to get in unless you know somebody or you can work your way in. That's what takes so long in these processes, and then work kind of questions what's taking so long. And so you just tell them basically it's taking this long to get in to see everybody.* (Arthur, working modified duties for two years)

Discordant views between clinicians themselves also proved to be detrimental to the physical recovery and subsequent return-to-work of the injured workers.

> *Darla:* *I find having the right doctor would help too but I don't have the right doctor. My doctor, with the injury I have, told me to take my shoulder and go like this with it and exercise because otherwise, it's going to freeze up on me but I'm going, no!*
>
> *Deanna:* *That's what they told me in Emergency too.*
>
> *Darla:* *You can't do that! You take your arm the way mine is and go like that in circles. She didn't understand my situation.*

This type of conflict was also mentioned in the focus groups conducted with the clinicians:

> *"I think the family doctor is very frustrated because this person keeps coming back every week, complaining, and powerless, they can't do anything. Specialist appointments are pending, or whatever. Or they've already seen a specialist who said, just keep going to therapy. So then the script from the doctor is going to say,*

'off for another …' and our system is set up, well, your specialist said you could go and now your family doctor says you can't go." (Clinician)

Financial Realities of a Workplace Injury

Not surprisingly, the injured worker focus groups revealed individuals experiencing the financial realities of a workplace injury. While the workers understood that the WSIB might provide some compensation, they still worried about how they would survive financially on a reduced monthly income: "*How you're going to pay your bills? Because WSIB doesn't fully assist everybody, or anybody, they only give you a portion of your money".* (Dustin)

Several of the participants discussed their fears that they would not be able to subsist on the compensation they received from the WSIB and discussed strategies they were using to survive financially:

Corrine: *I would agree with her on that one because maybe that's why I've been as stubborn as I have been because, you know I think you kind of hit on it a bit, where, you know, I haven't stopped working and I'm getting worse and I keep thinking to myself am I doing myself more harm, you know. And I think the way she does that you need money to survive, everybody's not rich, you need money to survive, so that goes through people's heads; and I think that's probably what I've done. (working full time regular duties since injury 8 years ago)*

Cindy: *Well that's what I keep thinking is I'm going to have to go back to because I can't manage without money.*

Celeste: *There is an appeal process but it can take years.*

Cindy: *Well, and that's it, I have to work now.*

Carol: *Or borrow money from people, I've been borrowing money from, I've maxed out my credit cards, everything. And even my car I'm thinking of selling it, and that's, I've got to go to Mississauga from Scarborough.*

Discussions about finances caused intense emotions to surface for one study participant. For Cindy, a modified worker who had been injured for 3.5 months, the stress of trying to manage financially on a decreased income was palpable:

Well you see it was seven weeks and I've not heard anything from anybody about whether I qualify for benefits. And I had to actually take money from my husband, something I had never had to do in 26 years, and I had to take money from my husband this week. I'm not a happy girl (respondent very emotional, crying).

Advanced Age and a Workplace Injury

The workers described needing to come to terms with the realities of their age and roles in life, and how each influenced their injury recovery and return-to-work. For example, a few of the injured workers described their recognition that their age could contribute to an increased chance of being injured at work:

Deanna: *But how many times in your job because you're very physically active that you do little things? The same thing, I'm teaching all the time so yeah, you go home quite often with a muscle strain or a pulled muscle and you limp for a couple of days. But you don't tell anybody because you figure okay, so I did that.*

Dustin: *I'm getting old.*

Deanna: *Yeah, exactly and that's the other thing. I told my Supervisor, you know, we're going to start getting little injuries because of this.*

Darla: *I agree with that 100% too that as you get older you're not as strong as you used to be and things like that so you've got to watch what you're doing.*

Deanna: *Absolutely.*

Darla: *I have no problem turning around and saying to my bosses, I'm 54 years old. What do you want me to do? No problem because my boss is 50 too.*

Deanna (on part-time, modified duties for 5.5 months) went on to describe how she felt that her age could decrease the likelihood of a speedy recovery following an injury: "*I'm 53 in a couple of days. You're getting older and when you do get injured now, I've found that you don't heal like when you're 30, 20 or 40."*

Injured workers who were approaching retirement age expressed concern that their increased age could decrease the potential of them being re-trained by their employers for another job:

> *Now I'm in a position where I only work for a small employer. There is no light duty or stuff like that. They don't have another job. And where they want me is back doing my job. Not that they don't want me there, they want me there for that specific job, and probably because of the 40 years that I have been employed there and so on. And it's the same thing that you say about getting hurt, it was just a fluke thing. I did that job every day for 40 years, but it was just that particular day the way I rolled it, and I injured myself. So you end up with … you know, you're kind of, okay, what do you do? So you can't go back to do light duty or anything, they don't have any work for that. I'm sitting at 60 years old, so what do you do? (Austin)*

The thought of losing a pension plan if one could not return to work also proved to be a harsh reality for workers:

> *If it wasn't for the injury and seeing that I'm going to re-injure it because of the way my job is, I'm definitely not going to stay [at my current employment] but then, here you go! I'm 50 something years old, I have a pension plan and my wife [to think about] (Dustin)*

Pension plans also proved to be an important motivator to return-to-work and attempt to stay at work following an injury:

> *Darla:* *You've got to watch with your pension and everything else so you start weighing the facts in your head. Then you go no, I can't personally walk out. Now I'm going in 5-½ years then I can retire so I hang on.*
>
> *Dustin:* *That's probably got a lot to do with me too though, my age because I do have a pension plan and if I walked away from the company, I would lose that. That's probably the reason why I didn't just quit the job but my injury is still there. It's still fully a factor in my life day-to-day and not just at work.*

The WSIB System

Finally, it seems important to acknowledge that the injured workers described their individual experiences with workplace injury within the context of the WSIB insurance system. Workers described not knowing about this system, therefore it was foreign and large. They were not sure who they should be speaking to, and why that person might change. Workers emphasized the importance of an early and good relationship with the WSIB liaison with their claim. Some workers described the experience as depersonalizing and complex. There was a perception on the workers part of a certain degree of suspicion regarding the legitimacy of their injury.

For the injured workers, the WSIB was a complex system with policies and processes that they felt they did not fully understand. For example, Deanna, a part-time worker who had been injured for about six months, described feeling uncertain about what to expect from the WSIB *"You don't know. You have no clue what should be coming".* For another worker, the challenge of understanding the WSIB system was made harder by her perceived inability to have her questions effectively answered:

> *...I actually found it very difficult to return [to work], I had to ask [the WSIB] a lot of questions. And nothing was actually forthcoming, so I had to ask, ask, ask, ask, until finally I was instructed that if I fill in something that states my restrictions, I mean an FAE, the functional abilities, was not even given to me as what had to be done to fill in, it was just you go back [to work], that's it. So I wish that [the WSIB] had explained about the functional abilities to assist me better. I had to do a lot of questioning before I could get answers.* (Celeste, time since injury and employment status unknown)

Celeste went on to describe her feelings about the responsibility of the WSIB to inform workers about what they could expect with their claims process in order to better prepare workers for the realities of their return-to-work process:

> *Moderator:* *Who do you think would be the best person or that you would like explaining those things to you? Would there be a preference of someone?*
>
> *Celeste:* *I think it should come from Workers Compensation because at my workplace I was never contacted, I wasn't contacted until I made numerous efforts to contact my workplace, so there was no information coming from my workplace. So I do believe that the WSIB should be there to assist the employee. I think so.*

Dustin, a worker who had been off work for approximately 11 months, described his frustration with a compensation system that he felt could be made simpler for workers:

"*Why do I have to go to my mailbox and wait for my cheque, which is already below what I'd earn if I was at work, when I got hurt at work? Why don't you automatically put it in my bank account like other things do? "*

The injured workers also described encountering suspicion related to their claims or the extent of their injuries when dealing with the WSIB:

> *I've dealt with a lot of people from WSIB, and question after question after question, and it seems like they're … how would you put it? It's almost like you're stealing from them. That's what it felt like to me. Like the questions were over and over and over again. So they're waiting for you to say, "Oh, I did this", and then the next time you say here's what I was doing, "Oh, but you said this before." So you know they're checking everything and they put you on the spot for … you know, you don't want to answer any more questions.* (Austin, off work 11 months)

Workers sometimes felt harassed in their encounters with the WSIB staff and process, although in a different relationship with their liaison at the WSIB, they could otherwise feel supported.

> *I'm dragging myself around eight hours a day when I could just sit home and milk it. I am injured, you know. It's legitimate but I want to work so don't treat me like I don't want to work. The treatment I got [from the WSIB] was harassment. That's what it is. Are the adjudicators trained to be hard to start?* (Dustin)

Box: Injured workers feelings and tensions (weights and counterweights)

Not only must injured workers continue to balance the weight of their old work/life challenges within the realities of their injury situation, but they must also attempt to balance feelings specifically related to their injury and being off work/working in a modified capacity (e.g. suspicion from other workers, social stigma related to being off work, financial stresses, pressure from family to get back to work) as well as tensions associated with their situation. For the purposes of this study, we viewed 'tensions' as the potential positive and negative influences from the same source (i.e. co-workers, family/friends), which can cause extension for the injured workers. While the feelings associated with workplace injuries appeared to weigh workers down, making this balancing act much more difficult, sources of tension had the capacity to act as balances or counter-balances, depending on the worker and situation.

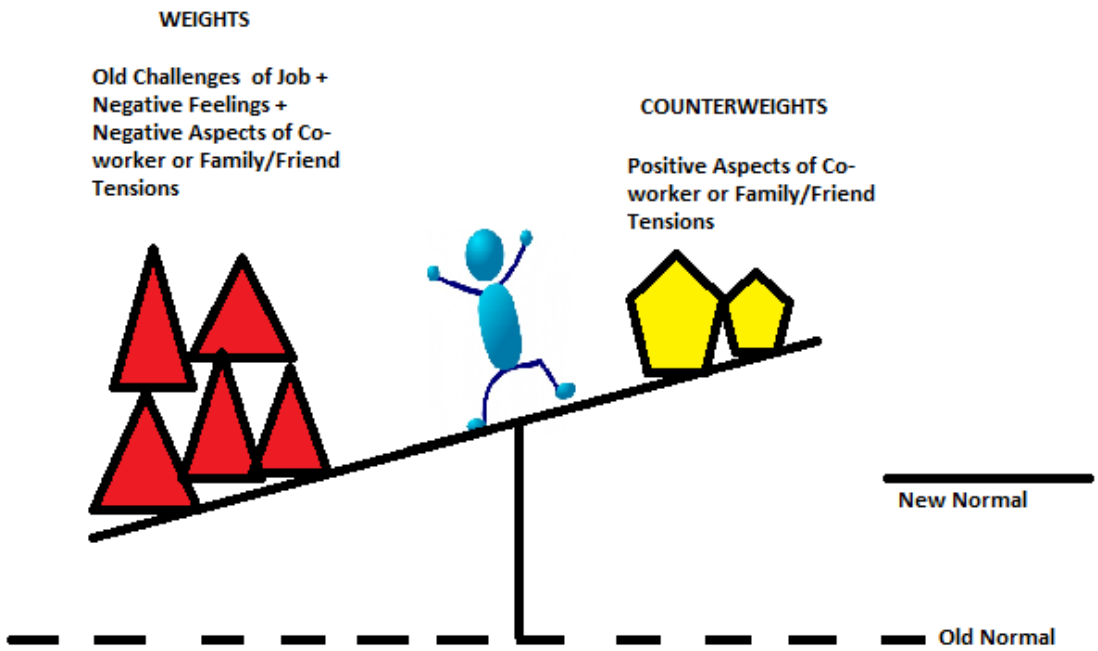


Figure 4. Depicting efforts to counterbalance the recognized weight of the injury. New skills, support of family/friends. Also note that recognition is now given to a "new normal" that one might not return to pre-injury level or not right away, and that life can move forward at a less than pre-injury state. It is not the ultimate goal, but it is showing that things can move forward.

Feelings (Weights)

Given the realities of their circumstances following their injuries, it seems logical to assume that the elements that created challenge for the injured workers could also cause strong emotional reactions and feelings. Such feelings had the potential to negatively affect the ability of injured workers to balance their work/life roles following an injury. Within the context of this study, these feelings were found to fall into a few broad categories: i) feelings related to the experience of suspicion, guilt, and stigma from others and, ii) living in a state of unknowing (i.e. not knowing what would happen in the future with regard to recovery, retraining, interactions with co-workers).

Suspicion

Several of the workers described experiencing others feeling suspicious about them. This came either from employers, co-workers or the WSIB following a workplace injury. This perceived suspicion appeared to cause the injured workers to feel distrusted and vulnerable:

> *…I think it makes a difference whether you injured yourself or someone else injured you. As I say, supposedly the latter case was with me, someone injured me at work. And supposedly I didn't have a witness, and that made all the difference because it was just my word against his. And, you know, it's a terrible position to be in, because I know what happened and he denied it. So where does that leave me? So, I mean I guess that's my biggest lesson is if anything ever happens at work again, try to have a witness because otherwise … I mean, sure, they believed me to some extent, but they also believed him, and as I said, I mean [the situation] didn't bend to me. (Albert)*

> *In my case I needed surgery and the back to work specialist came on the job to assess what I was doing and she was not helpful at all. She just looked at me and didn't really want to understand what I was saying and she told me right there and then on the shop floor that I'm going to recommend that they disqualify you. At the same time too I noticed my employer was there mocking and saying, oh, even a guy with a broken arm could do this job. Well I had, I needed surgery, you know, the MRI showed two days later, you know, that I would need the surgery. (Conrad, off work for 19 months)*

These feelings of suspicion from others also appeared to illicit a bit of worry about being watched on the part of the workers. Beatrice, for example, worried that her employer might be spying on her following her workplace injury:

Beatrice: *Watch out what you're doing outside because many companies hire detectives and they have tapes, pictures and everything.*

Becky: *That's crazy!*

Beatrice: *Yes, they do if you're a long, long time on restrictions. If you have a long time and you have a restriction that's pretty hard, they will hire detectives to make sure what you're doing. They'll make reports to the company so make sure you don't do something when you're out. Some people pretend they have a back problem but then they're laying bricks outside.*

Guilt

A few of the injured workers described experiencing feelings of guilt related to their workplace injury. This guilt was often related to being injured at work in the first place, not being able to keep up with their fellow workers or feeling as though one's co-workers or family needed 'pick up their slack'. For example, for one injured worker, Becky, reporting her injury to the WSIB churned up feelings of guilt, as she felt it was betraying her employer: *"Well because they don't want you to claim. That's sort of the next thing. I feel a bit bad claiming against my employer because I feel that I like them and they've treated me well."*

Other injured workers described feelings of guilt related to their fellow workers sustaining a similar workplace injury in their absence.

Chelsea: *I just, put in situations that if, to be able to do your job but also you're unable to do it, are you putting your colleagues at danger (on full time modified duties for 4 months)*

Cindy: *Yeah.*

Chelsea: *Or in my case patients in danger, because I work with patients and my patients, you know. So I'm concerned because, you know, you're put in situations, say well yeah you can work in this area here and everything is hunkey dorey but I cannot do a full load, I know I can't, so what happens is the other nurse or, will actually have to …*

Cindy: *Pick up the slack.*

Chelsea: *Yeah. Will she be injured, you know, because either, with lifting, pulling, stretching, and all that.*

.

In one focus group, several men discussed the guilt they felt with regard to their masculinity following a workplace injury. For example, Adam and Austin expressed feelings of guilt related to their inability to carry out traditionally male tasks at home following their injuries:

Adam: *I think initially it's definitely a huge factor having everybody understand. But your pride kicks in and you're tired of asking for help. And I mean menial things, you know, like carrying the groceries. You know, I'm a big strapping guy, I don't want my wife carrying a bag of groceries because I can't carry it in my right hand. So, you know, pride does kick in and you stop asking for help.*

Austin: *So you say pride. Do you feel guilty …*

Adam: *Oh, absolutely.*

Austin: *… when she turns to you in the grocery store and says, "Here, I'll take that"?*

Adam: *You know what, she doesn't do that. I'll try and grab the bags first and then I get the look. Okay, okay.*

Austin: *But I mean that's the kind of stuff you get. Or anywhere, "Oh, here, I'll get that." Well, you know what? She can't lift that kind of weight. Who can?*

Stigma

The workers also described their experiences with stigma that is often attached to injured workers. For example, Bernice described others perceiving her as a drain on the WSIB system following her workplace injury: *"Yeah, you used to feel sorry for everybody, you know? Then when you get hurt and everybody looks at you like you're a leech or they're thinking you're pretending because you don't want to work, then you have to learn the hard way."*

Another worker, Adam, echoed these feeling of ostracism following his workplace injury by questioning how others would treat him:

> *Are they going to treat me, I mean it's not politically correct, but as "a leper"? You know, don't go near him, he's already hurt. He shouldn't be doing certain things. Kid gloves kind of thing. And, you know, obviously you don't want that. You know, you want to be able to step back in to as if it never happened to begin with. So that's always been on my mind, thinking what's going to happen?*

Adam went on to specifically describe his perceptions of the stigma attached to injured workers:

> *I think in my case it was based on frustration…you assume WSIB will do A, B, C for you. And you assume that your employer will do the same thing. But in hindsight you kind of feel like you're on your own. You kind of feel like because you're an injured worker there's a stigmatism with it. You know? Your employers look at you a little differently and wonder, come on, it's just a shoulder injury, what's taking so long; right?*

Another worker, Connie, described her negative perceptions of injured workers prior to her workplace injury. Now that she too was injured, Connie struggled with thoughts that these perceptions were now also attached to her as the 'modified guy':

> *Moderator:* *Yeah, so you would want to learn how to get over feelings of guilt or were there things that you did that you got past guilt?*
>
> *Connie:* *No, it's just a matter of, you know, somebody's going to pick up your slack. And I don't, I've been bitching about this my whole life, about the modified guy, and I'm doing one and a half persons job, so now I'm going to be the modified guy. Absolutely. And I*

swear, I've done it my whole life. Why should I, you know. But now I'm on the other end of that and I'm thinking oh my god.

Celeste: *Yeah, I completely understand.*

Connie: *Now you know why they've got the modified guy*

Fear of the Unknown

In their focus groups, the workers mentioned the anxiety they felt over the uncertainty of their futures following a workplace injury: "s*omething that is brought to mind is it's also the fear of the unknown"* (Adam). For some workers, this uncertainty began when doctors failed to make a diagnosis for their injury:

> *To some extent it's true with me also. Because the day it happened with me I went to Great Lakes Hospital (pseudonum) and they just assess me, give me some pills. But I was not happy, because what is the further course of action [with regard to my injury]? I was not sure. (Andy)*

> *I got injured in January 2007 and then I went through a period while they were trying to figure out what it was. The doctors were consulting with each other because nobody really knew what it was. The doctor at work was saying I had tennis elbow. The other doctor said I had tendonitis (knock on door). My doctor said I don't know what you have. (Beatrice)*

Having an injury is "all new" and people don't know where to turn. Participants expressed uncertainty about the roles played by the different parties involved (i.e. the employer, clinicians and the WSIB) and their ability to agree on a course of action. For Albert, not necessarily knowing what would happen with his injury and claim in the future created feelings of vulnerability:

> *Well, you know, [a workplace injury] has never happened to me before, and there's no place to go to find out what to do. You know, I mean you trust your employers, that they will tell you what to do and will lead you down the right path. You trust WSIB, and supposedly they are between us and your employers. And then of course the doctors and … you know, it's just a real learning curve.*

You know, you hope that you're going down the right path to get better because nothing other than your health matters. And, you know, once it affects your work and everything that that entails, you know, you just realize how, as you say, vulnerable you are. (Albert)

Deanna described similar feelings of vulnerability and anxiety associated with the uncertainty of her future following her injury:

Moderator:	*What sorts of things are you doing to help yourself feel satisfied at work more long-term?*
Deanna:	*Right now, my future is completely up in the air. I have no idea.*
Dustin:	*I think we all are, right because mine is too.*
Deanna:	*It's scary. It's very scary.*
Dustin:	*With this injury, I don't know if I'm going to be able to do my job again without pain*

Tensions Associated with a Workplace Injury (Weights and Counterbalances)

Within the focus groups, the injured workers described elements in their work and home lives that created complicated dynamics with regard to their ability to return-to-work. These elements could be seen, in some cases, to impede the injured workers' abilities to balance their work/life worlds following an injury. Interestingly, in other situations, such elements could be seen to be helpful to injured workers and aid in their ability to balance, thus they were labeled as sources of 'tension'. Two of the largest sources of tension specifically mentioned by the injured workers were co-workers and family/friends and each were seen to have the potential to act as both as weights or counterbalances.

Co-workers

Co-workers proved to be the most frequently mentioned source of tension for the workers, as they were seen as being individuals who could be both positive and negative forces at varying times. Interestingly, co-workers appeared to leave a much stronger impression on the injured workers than their supervisors/employers as a whole. Negative co-worker support was often described by the injured workers as manifesting in perceptions that their colleagues might regard their treatment following an injury as 'special treatment' on the part of employers:

I mean I don't know whether we're supposed to just carry on as if nothing happened, but that's impossible. I mean, you know, we will never be the same again as a result of this, and it's just trying to get past that and just trying to do your job. But, as you say, it's usually modified duty and then, you know, well, so-and-so is getting special treatment and … you know. People don't realize the burden put on us in this position. (Albert)

Other injured workers discussed colleagues who expressed disbelief that an injury could be sustained in a particular job:

Corrine: *Right. And then they come up and they'll just say so like how'd you get injured, we do the same job.*

Cindy: *Right.*

Corrine: *And then they make you feel guilty about getting injured when you're doing the exact same work as they are.*

Cindy: *Yes, yes.*

Corrine: *Yeah, so it's not a very nice atmosphere to be in right now.*

In some cases, workers were able to provide tangible examples of animosity on the part of their co-workers. Injured worker Dustin, for example, described open harassment in his workplace following his injury:

"*Well, you've got your good, your bad and your ugly. I've been harassed openly and harassed behind my back. You know what's going on so that's the sad part…Yeah, if they would have put me in a different department with my company after I came back I think it would have probably been better for me in the beginning because the harassment I received was open, like open just like we're talking now, just spit right in my face. Why are you here if you can't do all the jobs?*

Beatrice described feeling as though their co-workers thought of her as expendable and anonymous when injured:

That's how the co-workers in your company see you. In my company, if you are not on the line and put this part on, you're nobody. You could have a heart attack

over there and they would pull you from the site, put another person on the job and then would call the ambulance. As long as there is production, you're only a number. You don't have no name, no nothing. You're just a number. (Beatrice)

Alternatively, Carol felt that her workplace wanted her to simply medicate her pain so she could return to her job and make things easier for her fellow workers:

I work with all guys. Me and one other guy we are the only two people that can move trailers, the other guys don't know how, and so they want me there. And when I'm there I'm not allowed to operate the truck so then they suffer with one guy. And then not only that, like with the mechanics and stuff, some people are trained some aren't. I can do like emissions and that stuff, I'm qualified, the other guy isn't. So they're down with me, so with me they're always on my back all the time "go just use pain killers, you should be fine". (Carol)

When asked about these types of negative interactions with co-workers, one clinician proposed that injured workers likely experience tension between wanting to stay safe at work and wanting to maintain a good working relationship with their colleagues:

Maybe they face a lot of challenges with their co-workers, because often they may have a bit more of a prime job than someone else. I'm thinking of in a long term care facility. Someone else is doing more heavy lifting of patients because that person is not, so there are issues around fitting in the long term. On one side they want their friends to like them and on the other side they don't want to go back to lifting, so there's a bit more back and forth

In other cases, the injured workers could not necessarily provide definitive evidence of negative feelings on the part of their co-workers, thus these were interpreted as perceptions on the part of injured workers. Indeed, it can be speculated that the injured workers could have been projecting their feelings/perceptions of injured workers prior to their own injury onto their co-workers (i.e. in the past they might have been suspicious of other injured workers or resentful of the extra work they might have to do). One worker, for example, expressed feeling as though his co-workers would assume that he was lazy or a burden when he did return to work:

I haven't personally returned to work yet, but in the back of my mind when I do is, how my employees and my fellow co-workers are going to treat me… I find that part of the human condition, too, is that you're apt to help somebody, but only for so long. So your co-workers, when you come back, they say, "Hey, it's good to

have you back." And then after a couple of months of you not doing your full duties, they're going to start saying, "I can't believe I'm still doing this for this guy. He's lazy." Or, "There must be something wrong", or "I'm being taken advantage of." (Adam, off work for 5 months)

Two workers from two separate focus groups (Adam and Becky) also described their perception that they would be treated as a 'leper' when they did return to work following their injury: *"Are [co-workers] going to treat me, I mean it's not politically correct, but as "a leper"? You know, don't go near him, he's already hurt. He shouldn't be doing certain things"* (Adam).

Beatrice: *You don't have friends at work. You have co-workers because friends at work are not friends. As soon as you're hurt you are outside of them.*

Becky: *They don't care. It's like you have leprosy.*

Beatrice: *Yeah and somebody wants your job so you don't have no friends at work.*

The attitudes of co-workers, however, were not universally described as negative by the injured workers. Interestingly, workers described ways that co-workers could be strong positive forces that were both helpful and kind. Within this positive context, an ideal co-worker was seen as someone who could act as a sounding board and serve as an important social resource following a fellow worker's injury. For example, Becky described her gratitude for the co-worker who made a point of checking up on her when she was off work due to her injury:

Yeah, mostly it came down to, not when I went back but when I was away, people who actually called me to inquire how I was or actually genuinely cared, you realized that there aren't too many people that genuinely care. Even now, there's this one lady that I still work with and she was around when I hurt my shoulder. I always appreciated the fact that she seemed to want to help me as opposed to just treating me like I'm part of a machine and if I'm broken, I'm broken (Becky)

For Carol, having co-workers who offered assistance when she was injured helped her to see them in a positive light*: "Work-wise, like the workers they try to help out as much as they can, like my co-workers are pretty alright, they're not bad".* Conversely, Darla described the role her co-workers played as a sounding board for her to confide in

regarding her injury*: "I found just working with my co-workers, talking to them and talking to people that understood helped me a lot. There are quite a few injured people at work".*

Alternatively, Becky discussed how being around her co-workers offered a certain degree of stability and continuity in her work life following her injury:

> *I never left work this time because the last time I left, I felt it derailed my life so much that I didn't really want to leave again. You know, it's really isolating, stopping work. You lose your friends and you lose your career path. You lose all kinds of things so I didn't really want to go through that again,*

Co-workers and supervisors who helped to facilitate return to work in a modified capacity also served as a supportive element for injured workers:

> *I have a new Supervisor who will turn around and say how are you doing, Darla? How is your shoulder? She inquires about it and she says as soon as the toy department is in, you're going back there because it's one of the lightest departments. It's easy on me, no problem so she's putting me in there next week hopefully. It's not saying that the injury is gone. It's just that she's trying to adjust with me here. (Darla)*

Assuming modified roles in different departments where one was not necessarily known to be injured also appeared to help workers view their co-workers as supportive:

> *Actually, I think that the fact that they put me in a completely different department was a good thing because the job that I was at, well I'm a lifeguard and if you can't do a rescue, you're no good to anybody so it's the same thing. I have a supervisor and I have co-workers who believe well, what do you mean? You're trying to get out of work. So the fact that I was completely moved to a different department and, of course, now I'm doing secretarial work inputting stuff into the computer where I can fully actually do the job required, so I don't have any of those issues. I've actually been really, really lucky with the department that I'm*

in where if I say I'm sorry I can't do that, they just go okay, we'll get somebody else so I've been very, very fortunate that way. (Deanna)

Finally, injured workers found that modified employment where they could work towards preventing their injury from happening to their fellow co-workers to be a positive experience:

Connie: *Well all I can say is the accident that happened to me no longer exists because of me. It will never happen again. So I've done that.*

Moderator: *Has that kind of helped you, like to, emotionally it's kind of helped you?*

Connie: *Yeah, a little bit, to know that, you know, I helped somebody else not to get injured the same way.*

If anything, by being there in a modified capacity full-time in the home department which I was injured in, I'm educating fellow workers to expect the same kind of treatment when their turn comes, if it comes. I guess now it's more I'm pushing the safety aspect end to get the company to smarten up and fix your equipment so it isn't a recurrent type of thing. (Dustin)

Family

The injured workers also described challenges related to their workplace injuries that overflowed into their home lives and relationships. While family and friends could be seen as an important source of support and meaning for the injured workers, they could influence workers to return to work before they might be physically ready to do so. Consequently, family could be seen as a source of tension for the workers.

For example, Dustin described that his family was an excellent motivator for him to get back to work: "*I think it's because I need the money so because of my family, I want to provide for them and I want to work."* Dustin went describe that his desire to return to work and keep working was motivated by a desire to set a good example for his family with regard to his work ethic:

Moderator: *So you mentioned your wife. What about your other social support at home? Did you find that they were helpful and provided support or was that something that made a difference?*

Dustin: *Oh, it made a difference for me. They all wanted me to work on getting better but I was working on no, I need to go to work because I need to make some money.*

Moderator: *Okay and that was helpful for them to ...*

Dustin: *Yeah, to see that I've got that, I'll keep going. Even though I'm dragging my ass there, I'll keep going. I don't know but I hope it rubs off.*

Though injured workers may have wanted to get back to work as quickly as possible following their injuries, the care and concern of family members was incentive to be patient and wait until they were fully healed before returning:

> *I found that most people I came in contact with after injuring myself, once they heard my scenario, they're like well what are you doing at work? You shouldn't be at work yet. I find most people that truly are family and love you, they don't want you there. They don't think you should be pushing yourself to do it. That's what I've found.*

Family was also seen to be involved in helping workers to feel included in family activities:

> *Within the family everybody understand that something has gone wrong with someone, so they are always trying to avoid doing that type of work regularly. So, other members will help, or friends will help. For example, this year I have gone for some camping, so all my tents were put up by my friends (laughter in the room), because they knew that I cannot do too much of lifting and raising my hand beyond shoulder level. So my tent was set up by my friends. (Andy, on full time modified duties for 4 months)*

The desire to stay involved with the family also appeared to motivate workers to adapt and find new ways of achieving physical tasks:

Darla: *My daughter even, I have two grandchildren and she says oh Grandma, can't pick you up. Her arm is sore. I say well, put her in this arm or put him on this side. I'm going to hold my grandchildren, okay?*

Moderator: *So you find a different way of doing things?*

Darla: *Oh yeah, I have to find a different way.*

Deanna: *Yeah, you adapt.*

Darla: *How can you not want to hold children? I mean they bring so many smiles to my face you forget about the pain when you're busy playing with them on the floor or something*.

While most of the workers who described family mentioned them in terms of support, a few participants discussed the pressure that family placed on workers to get back to work as quickly as possible. Indeed, for spouses in particular, having a family member off work appeared to create tension:

> *Also something that is brought to mind is it's also the fear of the unknown. You obviously want to go back to work because you think your job is at risk; right? I mean every day I think, well, if I don't go back to work, and my wife thinks the same thing, they're going to fire you. And I understand there is legislation that's supposed to protect you, but that means nothing. No one is holding a gun to their head and saying you've got to bring him back. So in your mind you're thinking "I have to go back, I have to go back". (Adam)*

Workers also described feeling as though they were an emotional burden to family members following an injury, in that family just wanted them to be 'better':

> *You know, sometimes you can't see an injury and you think, oh, the person looks fine. And, you know, what you were saying about family life. In a way they're tired of hearing about it, they just want you to get better, or if they do ask you how you are, you tell them this is how I am, and they don't really want to hear it. And it's just the same old thing, and oh, aren't you better yet? You know, I know it's not easy for anybody to accept that this happened. (Albert)*

Though an important social resource, family relations appeared to change after an injury, and could serve as a reminder of one's physical limitations. Arthur, for example,

discussed the activities that he was no longer able to do with his children following his shoulder injury:

> *It does affect your relationship of some sort with your family and friends. For example, like I couldn't go swimming. Every year we go swimming all the time. And, golfing, or riding a bike, or anything you want to do. You know, playing catch with my kids, you know, I haven't done that in two years. I can't throw a ball. So you kind of miss all of that, right? And the kids miss it, so you try to think of other things to do, but it's just not quite the same.*

Box: Recognizing skills that could be useful in the job of recovery

While injured workers might feel as though they are perched atop a seemingly insurmountable cliff following an injury, they can also choose to recognize that there are skills that could help to tip the balance and bring their new work/life path within reach (Varekamp, 2009). Such skills can help injured workers to name and, perhaps, shed light on tensions that they might feel (i.e. relationships they have with co-workers and their family), as well as help to diffuse some of the chaos that they experience. These skills may also allow injured workers to achieve some distance from these challenges, provide them with the ability to deconstruct situations, and, perhaps, understand the elements in one's life that can and cannot be changed. While it is true that injured workers must function within the WSIB, they also have the ability to build skills that will help them to deal with the challenges that their new situation involves. The key, it would appear, is for injured workers to take the power out of the fear and deal with the realities, tensions and feelings associated with their situations in realistic and achievable ways. While they may not be continuing in the work/life role that they had always thought that they would, their new path can still be fulfilling and meaningful. While injured workers may no longer be able to return to the 'normal' working life that they once knew, a 'new normal' may be within sight if they can only find something to counter the weight of their challenges and tip the balance in a positive direction.

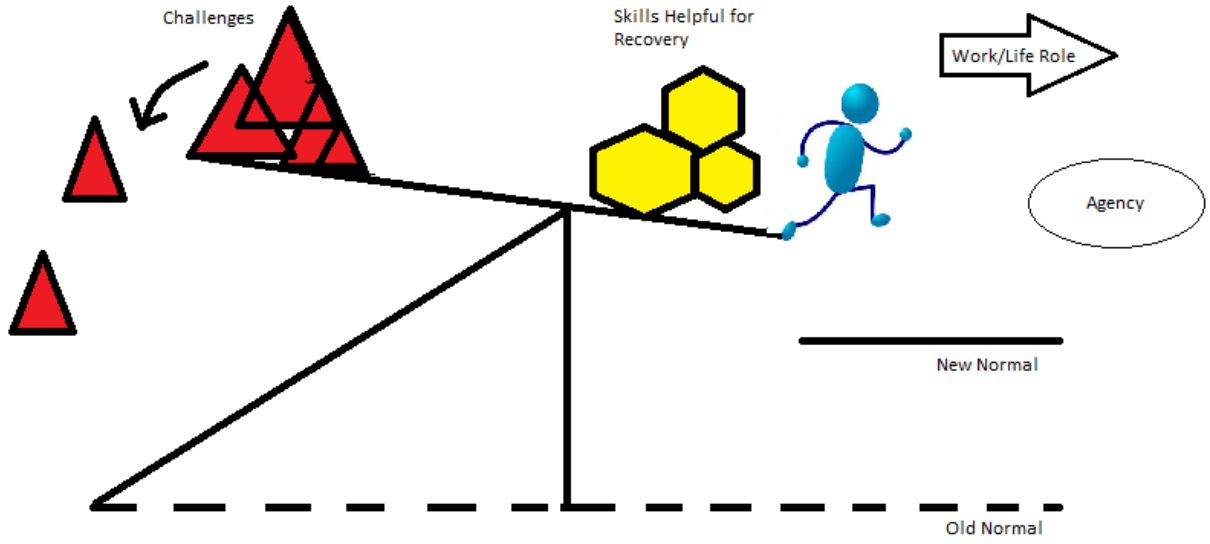


Figure 5: Tipping the balance. Shedding burdens or developing new skills to counterbalance them is part of the "Job of Recovery" for participants. Recovery did not necessarily mean previous state, but a new normal. Agency was placed in the domain of the worker to facilitate this role and the onward journey in work/life roles.

Focus group participants described the elements of what would work to help "tip the scale" towards moving forward in their life, and their work role. They realized that this might involve things they have never been taught before. Things like needing to negotiate and in particular negotiate or mediate information exchange between three parties – the health care system (physician, therapist), the workplace, and their insurer. Injured workers were able to articulate means that they found helpful, or would find helpful in getting a support team together at work

"I found just working with my co-workers, talking to them and talking to people that understood helped me a lot. There are quite a few injured people at work".

Feeling understood was paramount. Figuring out practical skills for working within the system they are in with their work-related injury was another. In told, the following table lists skills that might help off load the weights, and develop new skills for the skills that perhaps were not within the activities and skills they needed before their injury.

Skills for the old stuff…	Developing new skills
☐ Co-workers, home relationship ☐ Financial stresses ☐ Life goals ☐ Age/health attitudes, healthy living ☐ Activate skills, interests, social supports	☐ Knowledge of the WSIB process, one's rights ☐ Outside support (i.e. support team, counselor) ☐ Negotiating skills ☐ Asking for help ☐ Awareness of one's body - injury ☐ Setting boundaries at work and home ☐ Being organized – check lists, tracking forms, keeping files

Conclusions related to this objective:

These focus groups and their analysis spoke to the modifiable factors impacting a workers journey to recovery. Picking up on the expression of feeling stuck, or hanging and unable to effectively navigate back to normal, we created a story line consistent with these experiences.

While injured worker likely faces individual challenge, each appears to share common realities, tensions, and feelings associated with their injuries and return-to-work. While realities are largely unchangeable, tensions constantly in flux and emotions often unavoidable, workers can choose to arm themselves with skills for the job of recovery that can help them deal with the obstacles or experiences they are likely to encounter. For example, while the individuals in this study cannot change the reality of the workers compensation system or the competing interests and requirements of multiple parties (i.e. employers, clinicians, and the WSIB) (Franche, 2002), they can seek to empower themselves in by properly understanding their options, rights, and duties (Varekamp, 2009; Lorig, 2002).

Within the literature, co-workers have been found to play a complicated role in the lives of injured workers, serving both a supportive and adversarial capacity for these individuals (Chiaburu & Harrison, 2008). The injured workers in this study also discussed the complexity of this relationship, conveying that it was challenging to manage co-workers that could be supportive (i.e. checking up on workers, acting as confidants, assisting with tasks), but also potentially detetrimenal to one's return-to-work (i.e. open or perceived harassment, rushing a co-workers recovery). Learning how to manage and maintain these co-worker relationships following a workplace injury, however, remains a task workers must learn to foster a successful return to work (Varekamp, 2009; MacEachen, 2009).

Family has not always considered in the context of workplace injury, however, these individuals proved to be crucial figures in the recovery and return-to-work process for the workers in this study. While families will likely want what is best for the well-being of their loved ones (i.e. for them to return to work when they are properly healed and in a capacity that minimizes the risk of re-injury), they may also fall victim to the fear surrounding an injured workers' uncertain future (i.e. financial strain while a workers is off work, fear that a worker may never be able to return to work). Consequently, learning effective communication strategies for dealing with family members appears to be an important skill for injured workers to acquire (Lorig, 2002). Maintaining and even enriching that relationship could make it a positive balancing force for recovery.

The feelings associated with a workplace injury proved, at times, to be difficult for the injured workers in this study to manage. Dealing with the suspicion, guilt, and stigma often attached to a chronic workplace injury or the uncertainty of their physical health and successful return-to-work was uncomfortable and potentially overwhelming for the workers,

suggesting that learning how to manage these emotions could be beneficial to success in the future (Lorig, 2002).

Workers and clinicians were able to identify skills that could be learned to help cope with an injury and become the agent for movement towards better work and life role functioning. Our scope and questions were deliberately outside of the medical rehabilitation, and we do not wish to diminish this need. We focussed on addition skills that might help with the job of recovery.

Objective 2: To assess the level of internet access specialty clinic attendees have to the internet and their sense of confidence interacting with a web-based information system *(internet access and literacy).*

Research Design: Cross sectional survey of 200 injured workers attending the Shoulder and Elbow Specialty Clinic.

4.1 Methods:

4.1.1. Inclusion/Exclusion Criteria.

Injured workers recruited for this study were over the age of 18 and able to read and understand the informed consent form and survey questionnaire in English.

4.1.2 Recruitment and consent.

A convenience sample of 200 injured workers was recruited from those attending the WSIB Shoulder and Elbow Specialty Clinic for their first appointment. Information regarding the study, the consent form and the survey itself was mailed out to the workers in a routine clinic mail-out before their clinic appointment. We asked participants to complete their surveys at home before their clinic attendance and return them at the clinic. Their completion of the survey was considered to be "implied consent".

4.1.3. Measures

The survey included self-report measures of standard injury and demographic information, questions on internet access (e.g., type of access, convenience of access, number of hours spent on internet in a typical week), a computer literacy scale (Herczeg, 2008; Sengpiel, 2008), and a scale that measures understanding of electronic health information (eHEALS; Norman, 2006) and the HeLMS (health literacy management scale). These scales had acceptable evidence of their reliability and validity, though some groups have questioned the validity of the eHEALS.

Demographic information. Information to describe the nature of the injury, the worker and their work status was gathered. This included age, gender, education and marital status, job title at time of injury, duration of pain, time off work in total, current work status and estimation of the quality and quantity of work in those currently working. Indicators of pain level, pain interference with daily activities were gathered.

Specific scales will be discussed briefly their results are summarized using descriptive statistics.

4.1.4. Procedure

The survey was administered in a paper and pencil format using mailed survey techniques. Surveys arrived about two weeks prior to the clinic visit allowing workers to consider and if desired complete the survey before their arrival at the clinic. Questionnaires were identified by study number only. No link was made between patient name/hospital number/WSIB number and study number. Nor was identifying information gathered on the survey. We have tried our best to anonymize the responses or at least de-identify them. Coordinators were stationed at the research office in order to be present for clinics where attendees had been premailed a survey. A small token of a $5 Tim Horton's gift card was be provided to each person returning a survey. Because of the anonymous nature of this survey we did not know if the survey was returned blank or completed, and trusted workers to collect a gift card only when they completed the survey.

The data from the surveys was entered into a access database by a trained coordinator. All decisions were flagged for verification by the lead investigator and decisions noted on the hard copy of the survey.

4.1.5 Confidentiality.

Clinic staff mailed out packages to all eligible attenders. The surveys were dropped off in a seal envelope we provided upon arrival at clinic or at the research office. The survey was anonymous and did not require us to call the workers or to store any identifiers.

4.2. Analysis.

Scores were calculated for each scale and described using univariate statistics. Scores were then compared to published data as available.

4.3 Results:

A sample of 209 workers had complete data in their returned survey. 57.4% were male and the average age was 49.7 years. The majority (75%) were living in a marital or common law relationship. Education was bimodal with 38% have high school or less education and 40% have graduated college or university.

The average number of painful sites was 2.9 per worker. On average, workers rated their pain as 6.2/10, where 10=worst pain possible and pain's interference with daily activities was rated as 6.4/10, where 10=unable to carry out daily activities.

Table 1: Sample Description of the 209 respondents to the survey.

	Full Sample n=209
Gender	
Female	n= 85(40.7%)
Male	n= 120(57.4%)
Missing	n= 4(1.9%)
Mean Age	49.7 years
(range, standard deviation)	(24-69,9.6)
missing	n=5
Marital Status	
Married/Common Law	n= 156(74.6%)
Single	n= 15(7.2%)
Separated/Divorced	n= 28(13.4%)
Widowed	n= 7(3.4%)
Missing	n= 3(1.4%)
Educational Attainment	
High School or less	n= 81(38.8%)
Some College/University	n= 36(17.2%)
Graduated College/University	n= 83(39.7%)
Other	n= 3(1.4%)
Missing	n= 6(2.9%)
Self-Reported Time Since injury	
Mean (months)	11.9
(range, standard deviation	(1.5-212,18.8)
missing	n=8
Self-Reported Time Off Work	
Mean (months)	3.3
(range, standard deviation)	(0-212-,15.8)
missing	n=9
Self-Reported Currently Working	n=147
mean QQ score	3.1
(range, Standard deviation)	(0.0-8.0,2.4)
Current Duties	23.3% Full-time/Reg Duties 60.3% Full-time/Mod Duties 0.7% Part-time/Reg Duties 15.8% Part-time/Mod Duties
Work in Same Job	67.8%

Injury Description	
mean number of painful sites	2.9
(range, standard deviation)	(1-13,2.2)
missing	n=8
Elbow only	n=11(5.5%)
Shoulder only	n=58 (28.9%)
Elbow and Shoulder only	n=1
Whole Extremity	n=18 (9%)
(shoulder, elbow, wrist, hand)	(note, one patient has bilateral whole extremity involvement)
Pain	
Mean "Amount of Pain"	6.2
(range, standard deviation)	(0-10, 2.5)
Mean "Pain interference with daily activities")	6.4
(range, standard deviation)	(0-10, 2.6)

Computer literacy.

Computer literacy was gathered using the computer literacy scale (v 14) (Herczeg 2008). This includes an overview of what computers are used for, awareness and knowledge of symbols, and the ability to express how they would navigate through the system. The Computer Literacy Scale (Sengpiel, 2008). It also included a description of the way that people used the computer and their self-reported time use. The most common uses in our group was for email use and internet surfing. The next most frequent use was looking for information on the internet and internet banking. Detailed word processing, spreadsheet application etc was not a common activity on the computer.

Computer Literacy Scale (CLS) Whole Sample (n=209)

Item	Missing	Responses:				Mean, (std dev)	Item to Score correlation
		Never	Seldom	Sometimes	Often		
Part A: Diversity Score **α=0.84** **Mean (std dev)10.61 (6.35)** **Scale Range 0 -29/33 = frequent computer use in diverse applications** **Missing Scale Score: n=40**							
Word Processing	42	81	32	35	19	0.9 (1.1)	0.63
Spreadsheet Analysis	42	115	26	17	9	0.5 (0.9)	0.57
Presentations	43	122	32	5	7	0.4 (0.8)	0.63
Image Editing	43	110	32	18	6	0.5 (0.8)	0.62
Computer Games	42	77	38	38	14	0.9 (1.0)	0.33
Programming	43	146	11	7	2	0.2 (0.5)	0.25
E-mail	40	23	17	48	81	2.1 (1.0)	0.63
Internet Surfing	42	18	34	65	50	1.9 (1.0)	0.55
Systematic information seeking	45	45	34	57	28	1.4 (1.1)	0.56
Online shopping	41	92	47	24	5	0.7 (0.8)	0.52
Online banking	41	77	23	28	40	1.2 (1.2)	0.42
Part A: **Items not included in Diversity Score**							
For how many years have you been using computers	12	10.4 (8.7) 0-35 years					N/A
How many hours per week do you typically use a computer	35	8.9 (13.6) 0-80 hours					N/A

Part B: Computer Literacy Score **Mean (std dev) 20.6 (6.3)** **Range 0 -26 = good computer literacy** **Missing Scale Score: n=44**			
Item	**Missing**	**Correct Response**	**Incorrect Response**
[power symbol]	57	n=152	n=11
[play symbol]	56	n=150	n=3
[eject symbol]	66	n=133	n=10
[fast forward symbol]	57	n=152	n=0
[attachment symbol]	66	n=134	n=9
[save symbol]	65	n=132	n=12
[trash symbol]	67	n=133	n=9
[OK/confirm symbol]	65	n=143	n=1
[undo symbol]	82	n=118	n=9
[help symbol]	60	n=149	n=0
[escape key symbol]	51	n=158	n=0
[tab key symbol]	78	n=127	n=4
[backspace key symbol]	58	n=140	n=11
[delete key symbol]	51	n=158	n=0
[standard cursor symbol]	79	n=123	n=7
[background activity/please wait symbol]	68	n=134	n=7
[resize symbol]	84	n=116	n=9
[checkboxes symbol]	84	n=119	n=6
[file tabs symbol]	96	n=107	n=6
[OK symbol]	101	n=95	n=13
[scrollbar symbol]	62	n=142	n=5
File	77	n=126	n=6
Cancel	76	n=131	n=2
Tooltip	107	n=92	n=10

Browser	72	n=131	n=6
Hyperlink	82	n=112	n=15

Recognition of the symbols used on a computer was very strong.

Electronic Health Literacy Scale (eHEALS).

The eHEALS was used to assess the workers current use of the internet as a source of health related information. Norman (2006) tries to capture the confidence of navigation through health information on the internet in a person's search for the information they need for their own health needs. It was specifically designed to help users understand a patient's ability to use the internet in order to plan for educational programs using it. Skills are diverse including being able to find information, make sure it is of good quality and comfort with doing so. This brief scale was developed by Norman and Skinner (2006) in order to first get a global impression of the internet for electronic health information. Items are scored on a 5 point scale for usefulness and importance (not useful - very useful; not important at all – very important). In our sample, the mean of these two items was 2.9 and 3.3 respectively with a mode of 3.0 and 3.0. A mode of being "unsure" suggests a level of uncertainty about seeking health information on the internet in this sample.

The next section is a summative scale of eight items with 5 point likert style response sets ranging from strongly disagree to strongly agree which ask about knowledge of and use of the internet for health information. Workers in our sample scored in the mid-range of all the items, though slightly lower averages are noted on items dealing confidence using internet based information to make health decisions and discriminating between high and low quality information on the internet. Cronbach's alpha is high, at 0.95 (0.88 reported by developers, 0.93 reported by van der Vaart, 2011) and item to total correlations in our analysis are also higher than those of Norman, 2006. Mean values of the van der Vaart 2011 sample were higher, above 3.1-3.6 range where as ours are in the 2.6-3.1 range. Below are the results of these eight items in our sample:

The electronic-Health Literacy Scale – eHEALS. Whole Sample (n=209)

Item	Missing	Response: 1 = not useful/important at all, 5=very useful/important					Mean (1-5 scale)	Item to Scale correlation
		1	2	3	4	5		
Not included in scale score								
How useful do you feel the Internet is in helping you in making decisions about your injury?	48	25	26	**65**	31	14	2.89	N/A
How important is it for you to be able to access health resources on the Internet?	48	14	21	**50**	50	26	3.33	N/A

Item	Missing	Response: 1 = strongly disagree 5=strongly agree					Mean (1-5 scale	Item to Scale correlation
		1	2	3	4	5		
eHEALS Score α=0.95 **mean (std dev) = 23.47(7.43) (8-40 scale, higher score = higher self-perceived literacy)** **Missing Scale score: n=51**								
a) I know **what** health resources are available on the Internet	50	16	28	62	49	4	2.98	0.75
b) I know **where** to find helpful health resources on the Internet	50	20	31	46	58	4	2.97	0.84
c) I know **how** to find helpful health resources on the Internet	50	18	32	32	71	6	3.10	0.88
d) I know **how to use** the Internet to answer my questions about health	50	18	32	27	74	8	3.14	0.88
e) I know how to use **the health information** that I find on the Internet to help me	50	17	21	59	56	6	3.08	0.84

f) I have the skills I need to **evaluate** the health resources I find on the Internet	50	20	32	50	53	4	2.93	0.79
g) I can tell **high quality** health resources from **low quality** health resources on the Internet	50	27	44	55	30	3	2.61	0.80
h) I feel **confident** in using information from the Internet to make health decisions	50	29	45	45	35	5	2.64	0.78

Although a tool that could offer insight into confidence with finding, evaluating and using health information on the internet would be important for injured workers and a program like we are suggesting, we were aware of the concerns raised by Van der Vaart in 2011 regarding its validity. We assessed this again using similar constructs to van der Vaart and report them in the following table. Age was still not related however level of education and quantity of internet use (years of internet use) was correlated as the Van der Vaart team suggested. Although we did not do the predictive validity, our construct validity appears to be stronger than their findings. The correlation with age in a working aged population might be less than in previous generations as the baby boomers reach the upper age groups in the workforce.

Construct validity of the eHeals scale. Relationship of overall score to constructs suggested to be relevant comparators by van der Vaart, 2011.

Concept/Construct	**Hypothesis**	**Observed relationship in study**	
		Van der Vaart, 2011	**Current study**
Age	Older age would be negatively correlated with health literacy	R = -0.08 P = 0.49	R = -0.087 P=0.278 n=157
Education	Those with higher levels of education should have higher levels of ehealth literacy	R= 0.09 (correlation) P=0.24	ANOVA F test: 2.70 P value: 0.0117
Quantity of internet use	Years of internet experience should correlate positively with e health literacy (r>0.4)	R = .24 P=0.02	R=0.422 P=<0.0001 N=153

Health Literacy Management Scale (HeLMS).

In contrast to the eHEALS, we also fielded a measure of health literacy – not necessarily electronic sources of information.

The HeLMS was developed by Jordan, Buchbinder and Osborne as a person's ability to manage health information from finding it to making use of it in their situation. In their full tool eight domains are covered including individual abilities and access to primary care, but also attitudes towards health and social support. Each of 29 items is scored on a five point scale of degree of difficulty with certain items. In this study three domains were fielded from the full instrument. The decision was based on the content largely with some of the items being inappropriately focussed on lifestyle changes of making it to medical appointments which were less important for our injured workers. The domains we retained were *communication with health professionals*, being *proactive about seeking alternative care* and *using health information*. Of note, two items were dropped due to overlap with others. "Get a second opinion about your health" was kept but "Look for a second opinion about your health" was considered redundant and was dropped. The other item "Follow instructions that a doctor gives you" was retained and "carry out instructions that a doctor gives you" again due to redundancy.

The main comparison available for the HeLMS is the work by Briggs et al in 2011. In this group the comparable domains had much higher means in persons with low back pain (range 4.53-4.84) as compared to our group 3.32 to 4.33. The lowest score in our group was in being proactive domain.

The results for the HeLMS are as follows.

Selected Portions of the Health Literacy Management Scale (HeLMS) Whole Sample (n=209)

Item	SAS Variable	Missing	Response: 1 = without any difficulty, 5=unable to do					Mean (1-5 scale) **	Item to Domain correlation
			1	2	3	4	5		
Proactive About Seeking Alternative Care Domain* **α=0.66 mean (std dev) = 3.32 (1.18) (1-5 scale, <3=red flag, pt requires assistance)** HeLMsPro missing =33									
2. Get a second opinion about your health from a health professional	able2op	26	68	42	38	27	8	3.74	0.5
21. Change to a different doctor to get better care	ablechange	30	54	21	28	44	32	3.11	0.5

Utilizing Health Information Domain* **α=0.73 mean (std dev) = 4.45 (0.66) (1-5 scale, <3=red flag, pt requires assistance)** HeLMsUtil missing= 25									
5. Use information from a doctor to make decisions about your health	ableuseinfo	23	89	59	22	13	3	4.20	0.42
12. Follow instructions that a doctor gives you	ablefollow	23	134	36	12	3	1	4.60	0.64
15. Use advice from a doctor to make decisions about your health	ableuseadvice	24	120	51	10	2	2	4.54	0.65
Communication with Health Professionals Domain **α=0.91 mean (std dev) = 4.33 (0.84) (1-5 scale, <3=red flag, pt requires assistance)** HeLMsComm missing: 23									
7. Ask a doctor questions to help you understand health information	ableask	23	106	45	22	12	1	4.31	0.85
9. Follow up with a doctor to understand information about your health	ablefu	23	105	46	25	10	0	4.32	0.82
18. Get the information you need when seeing a doctor	ablegetinfo	23	103	58	15	8	2	4.35	0.79

***We removed an item from the domain due to repetitive nature of the questions, therefore no missing allowed in the calculation of the domains**

**** Original Tool has 8 Domains and is scored with a higher score = less difficulty.**

Skills needs for the Job of Recovery.

In the survey we also fielded a list of skills derived from the qualitative study as things the workers might benefit from in their journey to recovery and RTW. The workers were asked to rank the importance of each to them. They were also asked to select the top five skills that they would like to learn. Some chose greater than five skills, but of those who chose five or less, we provide a summary. The skills were sorted into broad areas such as communication, maintaining relationships, or keeping informed, dealing with uncertainty and taking care of oneself. Findings are summarized in the table below, but highlight the most common domains for highly valued or highly ranked skills were in keeping informed (understanding WSIB as a system, learning about your injury), taking care of oneself (maintaining relationships, goal setting) and communication (communicating effectively with health professionals, learning how to negotiate with

supervisor). Dealing with stress was less commonly affirmed, with the exception of relaxation skills and financial stresses.

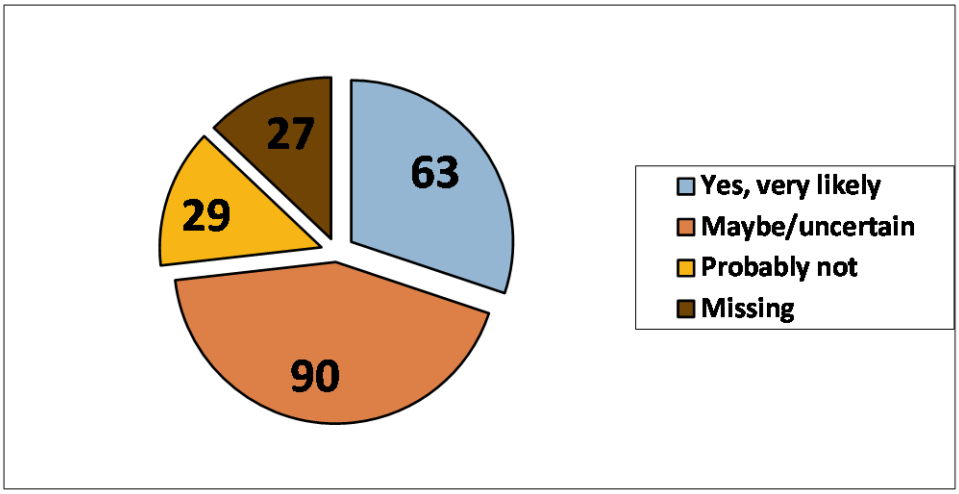
Communication How helpful would it be for you to develop skills or learn more about…	***Missing***	**Not helpful**	**A little helpful**	**Very helpful**	**'Top 5' skills**
a) Communicating effectively with health professionals	*30*	**16**	**44**	**119**	**18.9%**
b) Communicating effectively with workplace parties (i.e. Human Resources)	*31*	**22**	**57**	**99**	**11.7%**
c) Communicating effectively with family and friends	*31*	**26**	**59**	**93**	7.2%
d) Learning how to negotiate with your supervisor or the WSIB regarding job modifications/return to work plans	*29*	**20**	**37**	**123**	**26.1%**
e) Being more assertive	*36*	**25**	**62**	**86**	11.1%
Maintaining Relationships How helpful would it be for you to develop skills or learn more about…	***Missing***	**Not helpful**	**A little helpful**	**Very helpful**	**'Top 5' skills**
f) Maintaining healthy relationships outside of work (e.g. with family, friends, your community)	*37*	**35**	**53**	**84**	10.6%
g) Maintaining healthy relationships at work (e.g. with co-workers, your supervisor)	*33*	**24**	**71**	**81**	10.0%
h) Learning to set up a support system	*38*	**32**	**66**	**73**	3.3%
i) Having information available for family/friends about living with an injury	*35*	**30**	**69**	**75**	3.9%
j) Finding a mentor; someone to listen or help	*35*	**45**	**66**	**63**	7.2%
Keeping Informed How helpful would it be for you to develop skills or learn more about…	***Missing***	**Not helpful**	**A little helpful**	**Very helpful**	**'Top 5' skills**

k) Understanding the WSIB system	*34*	**9**	**41**	**125**	**17.8%**
l) Being on top of things	*38*	**20**	**53**	**98**	2.8%
m) Knowing how to keep track of information	*35*	**23**	**63**	**88**	2.8%
n) Learning about your injury, the time it takes to heal, treatments	*33*	**6**	**32**	**138**	**23.9%**
o) Knowing your rights	*36*	**4**	**22**	**147**	**26.7%**
p) Learning how to deal with conflicting information	*34*	**5**	**33**	**137**	**11.7%**
Dealing with Stresses and Uncertainties How helpful would it be for you to develop skills or learn more about…	***Missing***	**Not helpful**	**A little helpful**	**Very helpful**	**'Top 5' skills**
q) Learning relaxation or stress reduction skills	*33*	**20**	**53**	**103**	**12.2%**
r) Learning how to deal with frustration and/or anger	*34*	**24**	**60**	**91**	5.6%
s) Learning to deal with things you do not have control over	*36*	**14**	**67**	**92**	6.1%
t) Learning to be patient with your claim	*35*	**27**	**67**	**80**	1.1%
u) Managing financial stresses	*34*	**24**	**47**	**104**	**15.6%**
Taking Care of Yourself How helpful would it be for you to develop skills or learn more about…	***Missing***	**Not helpful**	**A little helpful**	**Very helpful**	**'Top 5' skills**
v) Learning problem solving skills and how to create a plan of action	*41*	**22**	**67**	**79**	2.8%
w) Being confident about managing your claim	*40*	**9**	**56**	**104**	7.2%

x) Keeping engaged in some things that have meaning for you (i.e. hobbies, projects, relationships, things that make you feel productive)	*37*	**13**	**47**	**112**	**12.2%**
y) Goal setting for getting better	*40*	**12**	**44**	**113**	10.6%

Workers willingness to participate in program.

The majority of workers participating in this survey felt, as shown on pie chart to right, that they would be likely or possibly willing to participate in an online program to help with their skills.



Strengths and Weaknesses

This study had several strengths. It was conducted in the context of longer term work related injuries, a target of special interest to all stakeholders because of the prolonged personal, social and workplace impact of the disorder. We had a strong sample size at 209. A weakness of this study comes from its anonymous nature. We wanted workers to feel free to complete the survey and feel no impediment to expressing concerns regarding their workplace, health providers or insurer. That same strength also means that we have no way of comparing respondents to non respondents, and to assess the generalizability of these findings. We offered a comparison to the clinic population in general which showed comparability. But will be unable to describe those who declined to participate. We are pleased to see some overlap with the work of Lorig (2006; 2002) and Varekamp (2006; 2009) in terms of issues raised, though see a slightly different balance in our workers.

Conclusions re survey results (Objective 2):

This sample of 209 workers that represented the clinic population in terms of gender, age and type of injury, described good level of computer literacy, with 78% have access to the internet in their homes. They were a group of internet users (average 8.9 hours per week on a computer and average experience of 10 years) who accessed the internet for health related information in general. Health literacy was comparable to persons with arthritis for eHealth literacy and slightly lower than low back pain patients (not necessarily work related) based on the HeLMS.

Needs were identified, and although they varied across people certain needs predominated, including a desire to better be able to communicate with parties outside one's familiar relationships, keeping informed about one's injury, the WSIB system and one's rights.

Most importantly, the majority of injured workers would be willing to consider participating in the implementation of a study like this in an online format.

Objective 3: *To test the potential outcomes that would be used in a study of the development of skills for the job of recovery.*

5.1 Methods:

Cross sectional survey. The outcome questions were fielded in the same survey described in objective 2. The methods are described above.

Outcome items (e.g., self-efficacy, health distress, job satisfaction) were examined for their response distribution and their correlation with the total score. Multi item scores will be subject examination of their internal structure in this sample using measures of internal consistency. Correlations between related constructs (i.e., health distress vs. disability level) checked as indicators of the validity of these scales.

5.2 Description of outcomes and results in survey.

Self-efficacy: managing occupational difficulty (SEMOD). The outcomes considered in this study for potential inclusion in a clinical trial included the Return to Work Self-Efficacy Scale by MacDermid et al (in press). This six item scale assesses level of confidence the worker has in terms managing each of the following activities. A 10 point numeric rating scale is offered with only the anchors labeled (1=not at all confident, 10 = very confident). The Cronbach alpha coefficient for this scale is suggesting a precise measure of the underlying concept. The tool itself is new and undergoing validation with the developers (personal communication). The mean scores in our group suggest very low levels of confidence in ability to manage return to work activities such as managing pain or in particular do your usual job (70 people said not at all confident). This suggests the risk of a floor effect, that people would not be able to have worsening self-efficacy measured using this scale, however for most interventions we would hope to increase the self efficacy so the only concern with this more extreme distribution would be regression to the mean and misinterpreting that as real change.

This scale is used with permission of co-investigators and developers Dr. Joy MacDermid and Ben Amick (2003).

Self-Efficacy: Managing occupational difficulties (SEMOD) Scale. Item level descriptive (whole sample (n=209))

Item	Missing	Response: 1 = not at all confident, 10 = very confident										Mean (1-10 scale)	Item to Scale correlation
		1	2	3	4	5	6	7	8	9	10		
	18	**α=0.90 mean (std dev) = 26.92 (13.61) Range 6-60, 60=most confident**											
Manage your hand/arm symptoms so that you can do the things you enjoy doing	8	41	19	30	26	26	17	18	12	6	6	4.18	0.78
Pace you daily activities so that you can get things done without aggravating your hand/arm symptoms	8	30	17	32	28	28	15	19	17	6	9	1.56	0.80
Deal with the frustration of your hand/arm symptoms	8	27	23	32	18	32	15	13	21	14	6	4.66	0.73
Keep your hand/arm symptoms from getting any worse	8	38	14	27	17	27	15	17	16	15	15	4.84	0.69
Work at you usual job with your usual schedule	8	72	20	16	16	22	10	9	14	10	12	3.88	0.72
Work at your job, but with change in work tasks to make it easier on your hands/arms.	8	40	17	17	15	22	12	19	30	12	17	5.06	0.73

Stanford Health Distress Scale. The Stanford health distress scale is a 4 item scale quantifying the amount of time workers are finding their shoulder/elbow problem distressing. Distress includes frustration, fear, worry and discouragement. Few missing values were found across the scale (Stewart, 1996). The overall Cronbach's alpha coefficient was acceptable (alpha = 0.88), the same as was reported by the developers on their website (alpha of 0.87). The Worry item had the most unique distribution of scale. With 17 of the sample saying that their health (specifically

shoulder/elbow problem) was not a worry in the context of their life despite feelings of being discouraged or fearful about their future. The health distress scale had ongoing room for change, with a low score of 0 rarely endorsed and modes being the highest level of distress in all but one item (discouraged).

Results of responses to the Stanford Health Distress Scale.

Whole Sample (n=209) Item	Missing	Response: 1 = none of the time, 5=all the time						Mean (0-5 scale)	Item to Scale correlation
		0	1	2	3	4	5		
Summed score α=0.88, mean (std dev) =3.66 (1.18) Range 0-5,=more distress, N missing = 7.									
Were you discouraged by your health problems	3	3	10	32	42	69	50	3.52	0.72
Were you fearful about your future health	3	5	12	24	24	62	79	3.76	0.82
Was your health a worry in your life	3	17	12	29	17	64	67	3.46	0.63
Were you frustrated by your health problems	3	5	9	19	20	72	81	3.88	0.81

Health Education Impact Questionnaire (HEIQ)

The HEIQ Version 3 was developed to assess the effect of educational programs to enhance self management, and knowledge about a disease. The original scale has nine domains. In this study we fielded five of the nine domains: Self monitoring and insight, Social integration and support, Skill and technical integration, Health services navigation and Constructive attitudes and approaches domains. The results from our sample (n=209) are shown below. Each item was scored on a four point likert scale (omitting middle neutral category).

Selected Portions of the Health Education Impact Questionnaire (HeiQ v.3) in survey sample (n=209). Numbers of items reflect location in the survey as items are presented in a mixed fashion in the HeiQ rather than by domain.

Item	Missing	Response: 1 = strongly disagree, 4=strongly agree				Mean (1-4 scale)	Item to Domain correlation
		1	2	3	4		
Self Monitoring and Insight Domain **α=0.84** **mean (std dev) = 3.16 (0.46), Range 1 - 4 = good** Missing scale score: n=19							
3. As well as seeing my doctor, I regularly monitor changes in my health	16	5	17	128	43	3.08	0.51
6. I know what things can trigger my health problems and make them worse	16	3	15	131	44	3.12	0.65
11. I have a very good understanding of when and why I am supposed to take my medication	16	4	3	409	77	3.34	0.64
16. When I have health problems, I have a clear understanding of what I need to do to control them	16	3	20	119	51	3.13	0.73
17. I carefully watch my health and do what is necessary to keep as healthy as possible	16	2	15	135	41	3.11	0.61
20. With my health in mind, I have realistic expectations of what I can and cannot do.	16	2	13	133	45	3.15	0.61
Social Integration and Support Domain **α=0.83** **mean (std dev) = 2.75 (0.58), Range 1 - 4 = good** Missing scale score: n= 21							
22. If I need help, I have plenty of people I can rely on	17	14	54	90	34	2.75	0.79
28. I have enough friends who help me cope with my problems	17	12	68	93	19	2.62	0.78
31. When I feel ill, my family and carers really understand what I am going through	17	11	49	102	30	2.79	0.82

35. Overall, I feel well looked after by friends or family	17	8	44	112	28	2.84	0.78
37. I get enough chances to talk about my health problems with people who understand	17	5	67	101	19	2.70	0.80
Skill and Technique Acquisition Domain **α=0.80** **mean (std dev) = 2.64 (0.56) Range 1 - 4 = good** Missing scale score: n= 29							
23.I have effective ways to prevent my symptoms (e.g., discomfort, pain, and stress) from limiting what I can do in my life	23	21	72	78	15	2.46	0.60
25. I have a very good understanding of equipment that could make my life easier	17	3	43	126	20	2.86	0.65
26. When I have symptoms, I have skills that help me cope	21	7	57	111	13	2.69	0.68
30. I have a good understanding of equipment that could make my life easier	24	11	78	82	14	2.54	0.55
Health Services Navigation Domain **α=0.84** **mean (std dev) = 3.06 (0.52) Range 1 - 4 = good** Missing scale score: n=23							
24. I have very positive relationships with my healthcare providers	18	3	22	114	52	3.13	0.69
29. I communicate very confidently with my doctor about my healthcare needs	18	5	19	116	51	3.12	0.70
32. I confidently give healthcare professionals the information they need to help me	18	1	7	124	59	3.26	0.64
33. I get my needs met from available healthcare resources (e.g., doctors, hospitals, and community services)	18	7	42	109	33	2.88	0.57

38. I work in a team with my doctors and other healthcare professionals.	18	6	42	112	31	2.88	0.65
Constructive Attitudes and Approaches Domain α=0.87 mean (std dev) = 2.71 (0.63) Range 1 - 4 = good Missing scale score: n=24							
27. I try not to let my health problems stop me from enjoying life	18	10	41	107	33	2.85	0.86
34. My health problems do not ruin my life	18	19	66	86	20	2.56	0.84
36. I feel I have a very good life even when I have health problems	18	17	54	97	23	2.66	0.87
39. I do not let my health problems control my life	18	10	65	93	23	2.67	0.83
40. I others can cope with problems like mine, I can too	18	13	37	110	31	2.83	0.84
Overall summed score across five domainsα=0.80 Domains Correlation to Total: HeiQ Self Monitoring and Impact = 0.48 HeiQ Social Integration and Support = 0.66 HeiQ Skill and Technique Acquisition = 0.70 HeiQ Health Services Navigation = 0.61 HeiQ Constructive Attitudes & Approaches = 0.49**							

**** Original Tool has 9 Domains**

Summary of outcome evaluation.

Any of the outcomes fielded had adequate distributions and psychometric properties to provide for an informed choice for an outcome in an evaluation of an intervention related to developing skills.

The HeiQ had the greatest uniformity in responses (mode) in the "Agree" category although had enough variability to allow for adequate Cronbach alpha's and logical correlations between domains. The self efficacy and the health distress scales seemed somewhat skewed towards a lower level of self efficacy and higher health distress. Although this is "good" to know there is

room to improve, caution must be applied to avoid regression towards the mean when baseline values are skewed. Comparisons groups, particularly if randomly assigned would deal with this.

Objective 4: *To evaluate potential platforms for the administration of an online version of this type of educational program.*

The investigative team worked with vendors and developers of learning management systems to see which would offer a reasonable (flexible, consistent with self-directed module based learning, ability to manage video audio and text, self-testing, adaptability to the WSIB website, and reasonable cost) platform for developing this intervention. Priority was given to those who have already used this. Lorig's group has a platform operating for the Chronic Disease Expert Patients' Programme (Lorig, 2006; Lorig, 2008). The WSIB has an active learning management system for health and safety training. We will plan that, if found to be effective, this training platform could be used by the WSIB to reach workers in need across the various workplaces and across the province. For this stage of the study, we will engage representatives from health services at the WSIB as well as the team who worked on the health and safety training platform. This will aid in the uptake of the results of our study.

Guidelines for the appraisal of computer platforms and the quality and useability of websites were used in the appraisal of potential platforms and to establish guidelines for the next phase of development. Levels of computer and internet literacy obtained through the computer literacy scale and the eHealth literacy scale were used to define the target level of difficulty that should be used.

While the main focus of this project has been the identification and development of content for a self-directed eLearning (or course, or virtual learning, or web-based learning), we also considered how to best deliver the eLearning. A priori we decided that the eLearning should also be developed considering the principles of adult learning and instructional design (Kirkpatrick 1979; Kirkpatrick 1996) while complying with instructional and design standards (http://www.instructionaldesign.org/ ; http://www.adlnet.gov/capabilities/scorm).

The key criterion for considering an eLearning approach for the content we were developing was the variation in geographical locations of the potential recipients. While individuals could be identified for the eLearning through WSIB speciality clinics they may not live near clinic locations and would likely not be able to attend multiple in-person or classroom sessions. In addition, the concept of flexibility in delivering the content of the eLearning was considered important as recipients may be at different stages in their recovery and return to work/function. As we considered the content for the eLearning it became clear that the patients who participated in focus groups felt that the communication with others in similar recovery situations was of value. This led to our consideration of the additional criteria of allowing for eLearning participants to communicate with one-another as they went through the eLearning. This aspect of peer-support was considered important by the participants we engaged with.

We sought to better understand the needs regarding eLearning development and hosting through an informal conversation with an eLearning developer who was working with one of our team on another project. This conversation revealed that there are many possible platforms which can be used to develop and host the type of eLearning we desired to develop. The conversation also revealed additional criteria that we will have to explore as we move forward in the development and administration of the eLearning. Our conversation revealed the importance of working with an experienced eLearning developer. Such a person can help to ensure the content is delivered using sound instructional design principles. In addition a developer can provide guidance and options about how to structure the peer support aspects of the eLearning such as "chat" capabilities and/or discussion forums etc.

The conversation with the eLearning developer also highlighted our need to consider how the eLearning will be hosted. A host website will require the space and tools to manage the eLearning system as well as the data entered by participants. There are issues of security and anonymity to consider in the choice of host as well as cost.

The evolution of eLearning has resulted in a variety of learning management systems with functionality covering the key aspects that we as an investigative team identified. Therefore the choice of which learning management systems meet our design requirements is relatively easy on one hand as many systems appear to address the learning development as well as the peer support aspects we consider important. However given that there are many design aspects to consider along with hosting demands (including ongoing support/maintenance and data management/security) as well as cost, there are some challenges in the selection process ahead.

The criteria we propose to use and adapt are from commercial websites (Joomla : http://www.joomlalms.com/ ; SABA: http://www.saba.com/lms-learning-management-system/ ; EduTools CMS http://www.edutools.info/static.jsp?pj=4&page=HOME). The main criteria we will consider are installation type (hosting), content creation, platform and integration possibilities (related to hosting). Depending on the LMS solution we may also have to consider licensing and fee types as well as source code availability and programming language. Many of these criteria will require the input of an experienced eLearning course developer. Preliminary comparisons (using CMS: http://www.edutools.info/compare.jsp?pj=4&i=627,616,625) indicate that there are a variety of LMS options that could be used to develop and host our proposed eLearning. This comparison suggests that following LMS products: Moodle 1.9, SharePointLMS v.2, and Desire2Learn Learning Environment 8.4.2 could be used to develop the eLearning according to the criteria we have considered to date (click on the link to see full comparison).

We propose to work with a developer(s) from the WSIB as a partner in the development of the eLearning. It is our understanding that the WSIB uses SABA learning management system (http://www.saba.com/lms-learning-management-system/). It appears that this system has the

development functionality we feel required for the design of an effective self-directed eLearning to improve skills for recovery and return to function of injured workers. Depending on the level of partnership we recognise there may be need to hire (or payout) an eLearning developer. We anticipate the cost to hire an eLearning developer to range from $58,946 - $102,186 per year, based on experience. This range is consistent with job postings in Ontario and Alberta.

The costs of the LMS and hosting will be determined as part of the selection process. It has not been possible to proceed with more complete cost assessments until the full set of requirements are evaluated. A priority for next steps in the development is to establish whether this will be a partnership with someone like the WSIB with an existing LMS or whether the project would stand alone. The requirements will be different in these two scenarios.

Table 1 Learning management system comparison chart (adapted from JoomlaLMS.com) Note the content of this table is from http://www.joomlalms.com/compare/ .

Installation type	
Hosted (Software as a Service)	Own
Hosted solution means that the LMS is hosted on the vendor's servers and installed on the vendor's site. Customers can purchase access to separate LMS parts, manage their own content and students. It's a good quick solution if you don't have a website, or wish to avoid spending time and resources on administering the system.	Own installation means you get the LMS application which you can install on your site or local network. It allows having a completely individual solution tuned to meet your specific needs. Plus it provides you with full control over your LMS and all the related processes.

Content creation possibilities		
Integrated tools for native courses creation	Separate tools for native courses creation	Possibility to use reusable content only
Some LMSs provide special internal tools for creating native course content based on your learning materials.	Some LMSs don't have integrated tools for course content creation, but vendors provide such tools as separate products compliant with their	Some LMSs do not provide possibilities for creating native course content, you can only use standard packages (SCORM/AICC/IMS/other) in such LMSs.

LMS.

Platform	
Stand-alone solution	Integrated solution
This solution allows installing the LMS as a stand-alone application. You can integrate it with your business platform as a custom project.	Some LMSs require certain platforms to be installed on. This LMS-platform integration gives you a possibility to use your platform capabilities together with the LMS functionality to enhance your eLearning process.

Integration possibilities		
Open source	Documented API (SDK)	Integration via bridges
Applications with open source code provide the widest range of integration possibilities, as you can edit any part of the LMS to integrate smoothly with any other application.	API (application programming interface) provides a possibility to use functions of one application by another application. API allows integrating applications with encrypted source code and facilitates integration process for open source applications.	Bridges are special plugins which allow integrating applications of different types. Bridges are especially useful if you want to integrate applications with encrypted source code or applications with no API.

Programming Language
Though not evident, programming language the LMS is written in is one of the important criteria which you should pay your attention to when selecting the suitable LMS. You will probably need a specific language depending on many factors, e.g. what language your server can handle, what language your team is most proficient in, or (if you outsource technical work) what language is more popular and what language programming costs less.

Fee type

Free	Commercial
Free LMS is an LMS which is distributed free of charge. It's good for technicians or companies with internal tech staff who can take care of implementation and administration of the software. Some of free software distributors don't provide support for their products, some provide paid support and services, other have free support (usually via forum). Most of the free products have open source code, which gives you a freedom to customize the system yourself in any way you need.	Commercial software is distributed on paid basis. As a rule, the price for the software includes technical support which makes the software easy to implement and use for non-technicians and non-tech companies. Vendors do not normally provide source code for commercial software, but sometimes provide customization services.

Source code availability

Open source	Proprietary software
In open source software all the files which make up the system are free for modifying, which allows customizing the system in the necessary way. Moreover, the usage of the LMS (number of users, courses, usage period) is not limited.	For proprietary software vendors do not provide the source code. Along with commercial purposes, encrypting the source code serves as a security guarantee, as it prevents using the software for malicious code distribution (viruses, trojans etc.). Some vendors offer customization services, and can provide compatibility with future releases on request.

Licensing models

Per number of registered/enrolled users	Per number of concurrently connected users	Per license validity period	Per number of courses
Limitation by the general number of users who use the LMS (the license can limit either students or staff or both).	Limitation by the number of users who are simultaneously connected to the LMS.	Time limitation of LMS license validity. As a rule, license subscriptions are annual or monthly.	Limitation by the number of courses you can create in your LMS.

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