



# Title Registration for a Systematic Review: Employment Interventions for Return to Work in Working Aged Adults Following Traumatic Brain Injury

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<input type="checkbox"/>	Yes	<input type="checkbox"/> Cochrane	<input type="checkbox"/> Other
<input type="checkbox"/>	Maybe		

Date Submitted: 3 February 2012

Date Revision Submitted: 31 May 2012

Approval Date: 10 June 2012

Publication Date: 1 September 2012

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## TITLE OF THE REVIEW

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Employment Interventions for Return to Work in Working Aged Adults Following Traumatic Brain Injury

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## BACKGROUND

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### *The Problem*

Traumatic brain injury (TBI) is of global concern with incidence rates of 453 per 100,000 in the United Kingdom, 360 per 100,000 in parts of Brazil, 322 per 100,000 in Southern Australia, 219 per 100,000 in Yemen, and 160 per 100,000 in India and Pakistan (Hyder, Wunderlich, Puvanachandra, Gururaj, & Kobusingye, 2007). In the United States, every year approximately 1.7 million people sustain TBI (Faul, et al., 2010). More than 3.2 million people live with the consequences of TBI (Selassie, et al., 2008). In addition, over a decade of combat operations in Iraq and Afghanistan has resulted in approximately 28,000 U.S. service members sustaining TBI as of July 2007 (Cifu et al., 2010). The severity of TBI can range from mild to severe. It can cause a wide range of symptoms affecting sensation, language, emotion, and cognition (National Institute of Neurological Disorders and Stroke, 2002). Approximately 43% of those hospitalized after sustaining TBI experienced TBI-related disability at one year post-injury (Selassie, et al., 2008). The economic and personal costs extend to families and society (Selassie, et al., 2008) and, from lost productivity, to employers (Cifu et al., 2010).

### *The Intervention*

The Return to Work (RTW) outcome that will be used for this study is competitive employment. Competitive employment refers to jobs within the community that pay at least minimum wage that are open to all people to apply, congruent with job seekers preference and competence, and does not require lengthy prevocational preparation (Bond et al., 2001). There are numerous interventions to assist individuals with TBI to obtain and retain competitive employment.

RTW interventions include comprehensive/holistic programs (Ben-Yishay et al., 1985), case coordination systems (Malec et al., 2000; Malec, 2001), supported employment (Wehman et al, 1990; Wehman, et al., 2003; Wehman, et al., 2005), cognitive retraining (Prigatano, 1994; Klonoff, et al., 2007), clubhouse models, (Jacobs, 1997), technology (Inge&Targett, 2007), and telework (West & Anderson, 2005). Basic components of most of these interventions generally include diagnosis and vocational assessment, counseling, training, provision of accommodations, job placement and post-employment services (World Health Organization, 2004; International Labour Organization; 1998; Stensrud & Gilbride, 2004; Waddell, Burton, & Kendall, 2008).

The intent of this review is to identify and assess the evidence related to employment interventions for individuals with TBI. Thus, for the purposes of this review, employment intervention will be broadly defined as any strategy, activity, or device that is intended to increase the capacity or the likelihood that an individual with TBI will either (a) return to their pre-injury competitive employment position, (b) obtain a new competitive employment position, or (c) retain an existing competitive employment position. Some examples of interventions would include:

- Employer disability management practices, such as modified duty and gradual return to work,
- Specific employment training and support services such as internships and job coaching,
- Specific types of job accommodations such as flexible scheduling and telework,
- Adaptive devices such as memory aids and applications for mobile devices, and
- Therapeutic interventions such as cognitive retraining insofar as they are used to promote employment.

Because of the broad array of employment interventions that will be reviewed, each will be assessed separately as to the provider, duration, and intensity of the intervention.

### ***How the Intervention Might Work***

Employment barriers and interventions may be broadly classified as either supply-side or demand-side (Chan, Strauser, Maher, Lee, Jones, & Johnson, 2010). Supply-side barriers are those that related to the individual with disabilities, such as deficits in skills, interfering behaviors, functional limitations related to the disability, and accommodation needs.

Supply-side interventions address those issues via skill or behavioral training, accommodations, and provision of other needed support to the individual with disabilities and his or her family members. Supply-side interventions may be delivered by therapists, educators, employment specialists, and Vocational Rehabilitation Counselors, with durations from days to years depending on the nature of the intervention. For example, an individual in a supported employment program may theoretically receive ongoing support throughout his or her working history.

Alternatively, demand-side barriers are those that are related to the employer and the place of business. Examples of these barriers might include limited experience with employees with disabilities, high turnover or absentee rates, high production demands, and high costs related to injured workers. Demand-side interventions may include disability management practices such as gradual return to full duty following injury, employer training and technical assistance related to disability and accommodation, coworker and supervisor support and assistance, and employer-provided internships, skills training, or support programs. Demand-side interventions are typically delivered by either Vocational Rehabilitation agencies or employers/businesses themselves.

The Logic Model provided in Appendix A shows the connections between supply- and demand-side interventions, recipients of those interventions, and anticipated outcomes. For this review, we will include both types of interventions with individuals with TBI.

### ***Why it is Important to do the Review***

Returning to work after sustaining TBI is important for a number of reasons. Traumatic brain injury affects a large number of working age adults who have long been earning incomes for their households and, therefore, experience significant financial burden with being unemployed after sustaining TBI (Yasuda, et al., 2001). Additionally, being employed has been associated with better quality of life among those with TBI (O'Neill, et al., 1998; Steadman-Pare, et al., 2001). However, individuals with TBI often experience difficulties in becoming competitively employed as well as maintaining employment after sustaining TBI. Reported return to work (RTW) rates vary depending on the methodology used, but estimates of percentages of people employed pre-injury range between 61 and 75%, compared to between 10 and 70% of people employed post-injury (Johnson et al., 2003; Yasuda, et al., 2001).

Previous systematic reviews have examined the effectiveness of specific interventions on persons with TBI regarding their community integration (Kim & Colantonio, 2010), cognitive rehabilitation (Cicerone, et al., 2011), and quality of life, functional independence, physical, psychological, social functioning, and community participation (Evans & Brewis, 2008). There have also been systematic reviews that have examined the effectiveness of interventions on vocational outcomes of those with acquired brain injury (Turner-Stokes, et al., 2005). A recent Campbell Collaboration title registration by Braathen et al. (2011) proposes to examine the effectiveness of comprehensive occupational rehabilitation programs for RTW among people on long-term sickness absence. Their review will include people with mental disorders and or musculoskeletal disorders. Fadyl and McPherson (2009) reviewed and evaluated the evidence for effectiveness, strengths and weaknesses of vocational interventions for persons with TBI. Unlike the broad information retrieval of this proposed review, Fadyl and McPherson's (2009) electronic database search focused on articles available in English from January 1990 to July 2007 in Ovid Journals database, which includes MEDLINE, PsycInfo, CINAHL, AMED, Health and Psychosocial Instruments, Evidence -Based Medicine databases, and Web of Science. Similarly, a recent systematic review protocol that addresses the effectiveness of multidisciplinary post-acute rehabilitation for adults with moderate to severe TBI (Agency for Healthcare Research Quality, 2011) limits its electronic database search to MEDLINE, the Cochrane Central Register of Controlled Trials, PEDro, and PsycINFO. This proposed study will search a wider range of databases, focusing on RTW employment outcomes that are competitive in nature among persons with TBI regardless of injury severity. By including all competitive employment, supply- and demand – side, evidence-based research interventions for persons with TBI, this systematic review will provide clarity on the effectiveness of these employment

intervention programs. Further, this analysis will provide information concerning the direction for future research.

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## **OBJECTIVES**

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This systematic review will examine the effectiveness of interventions on RTW outcomes of adults with TBI. The goal of this project is to provide information that will benefit people with TBI, employers, and vocational professionals by informing these audiences of the effectiveness of employment interventions. The information we obtain from this analysis may indicate research gaps that provides direction future research.

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## **METHODS**

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### ***Criteria for Including Studies in the Review***

1. Study Inclusion Criteria:
  - a. Types of Study Designs: Studies that use randomized controlled trials (RCTs), quasi-experimental, and single subject experimental designs. Comparison group conditions will involve treatment as usual, other appropriate interventions, or no intervention.
  - b. Types of Participants: Studies that include participants who are of working age (18 to 65 years of age), have a closed TBI diagnosis regardless of severity, are engaged in full- or part-time competitive employment at the time of injury, injured either on the job or off the job, are unemployed or are on medically related leave through the employer at the time of intervention receipt. Participants must not be enrolled in secondary educational programs such as high school or post-secondary institutions at the time of service receipt. Participants can be injured either on or off the job and subgroup analysis will be conducted for those injured on the job as opposed to those that were not. Studies that have samples with mixed disability groups as well as samples made exclusively of individuals with TBI will be included, provided data for the TBI participants are included in the study results. Although there is a risk of overestimating the effect of the intervention (Torgerson & Torgerson, 2008), data from mixed samples will be analyzed with moderator subgroup analyses to identify trends and inform future studies.
  - c. Types of Interventions: Studies that use interventions that assist working age adults with TBI return to competitive employment including self-employment (with competitive employment as the outcome). The intensity of the intervention can vary widely. Interventions implemented in any country will be eligible for inclusion.

- d. **Outcome Measures:** The RTW outcome must be continuous competitive employment of 45 days or more. This measure is consistent with that used by many insurance companies that determine short-term disability eligibility and so enhances the relevance of the review to employers. Both full – and part – time employment will be included. Employment would be considered full-time when an individual works more than 35 hours per week and considered part-time when working less than 35 hours a week, consistent with the Current Population Survey measure. The U.S. federal government administers the CPS to collect data on the labor force characteristics in the United States.
  - e. Studies in English that were published between 1973 and 2011 in order to maintain external validity of the findings to the present day.
2. **Study Design Exclusion Criteria:**
- a. Studies that do not examine the effectiveness of interventions for individuals with TBI disabilities that support RTW and/or retention of competitive employment.
  - b. Studies where participants' are students.
  - c. Studies that are not RCTs, quasi-experimental designs, or single subjects design.
  - d. Studies that do not use interventions.
  - e. Studies that do not report competitive employment as outcomes.

### ***Search Strategy***

*Study Search.* All relevant studies that meet the inclusion criteria will be identified and retrieved. A number of strategies will be used to obtain both published and unpublished studies that (a) identify interventions that assist persons with TBI to return to competitive work, and (b) assess the strength of the evidence of the empirical evidence for them. Computerized database searches relevant to rehabilitation health care, social sciences, and business will be conducted, such as Academic Search Complete, Article First, Business Source Complete, CINAHL Plus with full text, CIRRIE (Center for International Rehabilitation Research Information and Exchange Database), Dissertations and Theses Full Text (Proquest), ERIC, Lexis-Nexus Academic, MEDLINE, NARIC REHABDATA, PsychINFO, Social Sciences Abstracts and Web of Science. Databases from other countries, such as Australia Education Index, British Educational Index, Canadian Research Index, and FRANCIS, will also be used. Where available, database thesauri will be consulted to ensure that appropriate synonyms have been included in the intervention, population, and outcome search categories. Search strings (keywords and Boolean operators) will be created so that the search strategy is transparent and replicable. The search strategy will be tailored for each database, as each database will require slightly different strategy and not all terms will be used in each search. The search will be conducted for studies published between 1973 and

2011. Based on Humphrey and Oddy's 1980 review of RTW in TBI populations from 1954 to 1978, it is very unlikely that we will retrieve any studies of vocational intervention in the form of experimental, quasi-experimental, and single-subject experimental designs published before 1980. Most of the studies addressed prognosis of RTW. However in order to ensure that we are able to retrieve all appropriate studies for our systematic review we have used as our starting point the year 1973, when the Rehabilitation Act was passed which prohibited discrimination due to disability by federal agencies and entities receiving federal financial assistance.

In addition to the computerized database searches, gray literature will be located and retrieved by searching websites maintained by state, federal, and international organizations that have conducted research related to the topic. These include government agencies, research organizations, foundations, clearinghouses and archives. Conference Proceedings Citation Index will also be searched for leads to potential studies. Reference lists of included studies and related systematic reviews on the topic will be examined to locate unpublished studies. Gray literature will undergo the same inclusion criteria as other studies identified through the electronic database searches.

*Screening Procedures.* Determination of inclusion and exclusion of studies will be conducted in two stages. In the first stage, the title and the abstract of all the references of the studies that have been identified will be obtained and screened by two reviewers to determine whether they meet the inclusion and exclusion criteria of this review. If both reviewers agree that the study meets the inclusion criteria, the full-text of the study will be obtained. If the reviewers are unsure, the citation will proceed to the full-text eligibility screening stage for a final inclusion decision.

In the full-text eligibility screening stage, two reviewers will independently code the full-texts of each study that proceeded to the full-text stage, using the coding form that will be developed for this review, to determine whether the study will be included or excluded from the review. Reasons for the decision will be noted for each study. Notes for each study of both coders will be compared. If both coders agree on the eligibility decision for a study, the study will be included in the review. The reviewers will independently record all excluded studies along with the reasons for exclusion. Multiple studies that use the same sample or data will be treated as a single study and information from these studies will be combined so that any data that is relevant will be used in this project. From these, the most rigorous study that focuses on the desired outcome will be selected for inclusion.

*Coding Procedures.* The coding form will track publication source, research design, subject characteristics, sample source, employment setting, intervention characteristics (e.g., type and duration of services provided), and outcome measurements (e.g., type of employment obtained, work supports provided after RTW, duration of continued employment). Eligible studies will be coded for methodological qualities; for example group assignment, attrition, blinding, randomization, and statistical analysis methodology. While blinding is challenging

and not always feasible in rehabilitation and behavioral studies (Friedberg, Lipsitz & Natarajan, 2010), it will be coded if blinding occurred. Coding forms of the two reviewers will be compared, and any differences in the coding for each study will be discussed. If a consensus cannot be reached between the two reviewers, a third reviewer will be consulted to make the final inclusion or exclusion decision. If either of the reviewers was involved in any of the studies, a third reviewer will code that study to minimize bias. Inter-rater reliability will be established prior to coding in order to minimize coding disagreements.

### ***Data Extraction and Synthesis***

*Meta-Analysis.* A meta-analysis will be conducted. Hence effect sizes, odds ratios, and correlation coefficients will be extracted. Since a number of articles will not have this information, statistical information that will assist in computing effect size estimates will also be extracted where appropriate, such as sample size, variance, standard deviation, mean, mean difference, and proportions. Heterogeneity test will be conducted. If significant heterogeneity is found, then moderating analyses will also be conducted.

*Quality Assessment.* Two project reviewers (one with methodological expertise and one with content expertise) will code studies for methodological quality. These coders will pilot test the coding protocol to establish inter-rater agreement before coding studies for this project.

*Assessing Risk of Bias.* Nonrandomized (quasi-experimental) studies may be biased (Heinsman & Shadish, 1996). Differences between randomized and nonrandomized studies will be examined (Heinsman & Shadish, 1996; Shadish & Haddock, 2009). Data from published studies are believed to produce larger effect sizes compared to unpublished studies (Stern, Gavaghan, & Egger, 2000). Publication bias will be assessed for published and unpublished studies by using a funnel plot, fail safe N, and trim and fill procedures.

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## **ROLES AND RESPONSIBILITIES**

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- **Content:** West has expertise in the field of vocational rehabilitation, including RTW of individuals with TBI.
- **Systematic review methods:** Graham has conducted, presented, and published meta-analyses. We will also seek guidance from Dr. John Westbrook from SEDL as necessary.
- **Statistical analysis:** Graham is a research methodologist involved in designing studies, conducting power analyses, and collection and analyzing data for rehabilitation/disability studies across a number of disciplines such as medicine, education, rehabilitation counseling, psychology, and bio-engineering. Her skills in conducting quantitative research include conducting meta-analyses. She has over 16 years of experience in teaching research methods, statistics, and qualitative research.
- **Information retrieval:** We will seek guidance as necessary from a SEDL librarian in locating publications catalogued in US databases. For international literature retrieval, the team will seek assistance from the ECG.

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## **POTENTIAL CONFLICTS OF INTEREST**

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None

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## **FUNDING**

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The review will be conducted by SEDL's Center on Knowledge Translation for Employment Research (KTER), funded by the National Institute on Disability and Rehabilitation Research (NIDRR) of the U.S. Dept. of Education.

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## **SUPPORT**

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The reviewers will seek guidance and assistance in systematic searches of international databases. Only those studies written in English will be included.

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## **PRELIMINARY TIMEFRAME**

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Approximate date for submission of Draft Protocol is tentatively June 2012.

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## DECLARATION

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### **Authors' responsibilities**

By completing this form, you accept responsibility for preparing, maintaining, and updating the review in accordance with Campbell Collaboration policy. The Coordinating Group will provide as much support as possible to assist with the preparation of the review.

A draft protocol must be submitted to the Coordinating Group within six months of title acceptance. If drafts are not submitted before the agreed deadlines, or if we are unable to contact you for an extended period, the Coordinating Group has the right to de-register the title or transfer the title to alternative authors. The Coordinating Group also has the right to de-register or transfer the title if it does not meet the standards of the Coordinating Group and/or the Campbell Collaboration.

You accept responsibility for maintaining the review in light of new evidence, comments and criticisms, and other developments, and updating the review at least once every three years, or, if requested, transferring responsibility for maintaining the review to others as agreed with the Coordinating Group.

### **Publication in the Campbell Library**

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**I understand the commitment required to undertake a Campbell review, and agree to publish in the Campbell Library. Signed on behalf of the authors:**

**Form completed by: Carolyn Graham**

**Date: 31 May 2012**

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