ERABI
EVIDENCE-BASED REVIEW
of moderate to severe
ACQUIRED BRAIN INJURY

Clinical Guidebook

11. Community Reintegration Following Acquired Brain Injury

Shannon Janzen MSc, Amber Harnett MSc, Robert Teasell MD FRCPC, Heather MacKenzie MD FRCPC

Ontario Neurotrauma Foundation
Fondation ontarienne de neurotraumatologie
LAWSON
HEALTH RESEARCH INSTITUTE
Western
ST JOSEPH's
HEALTH CARE
LONDON

Table of Contents

Community Reintegration Following Acquired Brain Injury

By the end of this chapter you should be able to:

1. Outline the different domains that comprise community integration post ABI.
2. Select an appropriate outcome measure for clinical care or research.
3. Demonstrate an understanding of the factors that influence independence, participation and adjustment following ABI.
4. Participate in the development of individualized treatment plans that will promote community integration post ABI for both patients and caregivers.

11.1 Introduction to Community Reintegration

Community reintegration is the ultimate goal of acquired brain injury (ABI) rehabilitation. ABI often results in significant disability of an otherwise healthy, young, and productive portion of the population. In this sense, returning to independence and productivity is of utmost importance. Prior to injury, individuals may not have been living autonomously and habilitation, rather than rehabilitation is often the primary focus. However, the transition back into the community from acute care or post-acute rehabilitation requires diverse supports within the community, often for extended periods of time. Individuals may need to learn or relearn basic activities of daily living and appropriate social behaviours, as well as complete primary or secondary schooling before considering vocational options. ABI also has a significant impact on interpersonal relationships and leisure roles.

The INESSS-ONF Guidelines recommend that those with ongoing disability post TBI should have timely access to specialized outpatient or community-based rehabilitation to facilitate continued progress and successful community reintegration (INESSS-ONF, 2015).

Many individuals post injury experience physical, service, social or environmental barriers that are correlated with severity of injury and time since injury (Bier et al., 2009; Fleming et al., 2014b). As healthcare providers, a key component of integrating individuals into the community is ensuring that they are aware of available resources/services and have assistance, if necessary, to access them. Services should target motor, cognitive, communication and psychosocial concerns of individuals when reintegrating into the community.

The INESSS-ONF Guidelines recommend that access to interval care, re-entry to care or intensification of services, should be allowed so that individuals with TBI can access treatments as their impairments, ability and participation goals change or new challenges/transitions create a renewed need for services (INESSS-ONF, 2015).

The purpose of this clinical guidebook is to serve as a learning resource for residents and medical students. The content is based on the available research literature, clinical practice guidelines and other clinical resources. This Guidebook is not intended as a prescriptive or exhaustive list of treatment options. Clinical judgment should always be used when deciding the best course of treatment for a patient. We encourage the reader to access and read the resources referenced, as well as the clinical guidelines cited, in more detail.

Click here to access the full ERABI Module for Community Reintegration following ABI

11.2 Outcome Measures and Clinical Assessments

There are numerous outcome measures that are used to determine the degree to which a person has reintegrated within their community following ABI. Five specific outcome measures are outlined in the following sections and summarized in Table 1.

Table 1: Common Outcome Measures for the Assessment of Community Reintegration

Scale Author, Year	Initial Population	Time Frame	Community Reintegration Subscales	Purpose	Score Interpretation
Community Integration Questionnaire (CIQ; Willer et al., 1993)	TBI	Not stated	Home integration Social integration Productivity	Measures various aspects of community reintegration following TBI.	Score range: 0-29 Higher score=higher levels of community reintegration
Mayo-Portland Adaptability Inventory (MPAI-4; Malec & Lezak, 2003)	ABI	Post-acute	Abilities Adjustment Social participation	Measures severity and impact of ABI on community reintegration.	Score range: 0-111 Higher score=poor community reintegration
Craig Handicap Assessment and Reporting Technique (CHART; Brooks et al., 1997)	SCI	Not stated	Physical independence Mobility Occupation Social integration Economic self-sufficiency Cognitive independence	Measures various aspects of community reintegration following ABI.	Score range: 0-100 Higher score=higher levels of community reintegration
Participation Objective, Participation Subjective (POPS; Brown et al., 2004)	TBI	Not stated	Domestic life Major life activities Transportation Interpersonal interactions and relationships Community, recreational and civic life	Measures participation and satisfaction with participation following TBI.	Score range: -4 - +4 Higher score=greater participation and satisfaction
Participation Assessment and Recombined Tools-Objective (PART-O; Whiteneck et al., 2011)	TBI	Chronic	Out and about Productivity Social relations	Measures participation following TBI.	Score range: 0-5 Higher score=greater participation

11.2.1 Community Integration Questionnaire

The Community Integration Questionnaire (CIQ; Willer et al., 1993) was intended as a brief assessment of community integration or the degree to which an individual is able to perform appropriate roles within the home and community post TBI. The CIQ uses behavioural indicators of integration and does not include items focused on feelings or emotional status (Dijkers, 1997; Willer et al., 1994). The CIQ is comprised of 15 items in three corresponding subscales: home Integration (i.e. active participation in the operation of the home or household; 5 items), social Integration (i.e. participation in social activities outside the home; 6 items) and productivity (i.e. regular performance of work, school and/or volunteer activities; 4 items) (Willer et al., 1993). Scores from each of the subscales are summed to provide an overall CIQ score. The maximum possible score is 29, which reflects complete community integration (Hall et al., 1996). The CIQ may be completed individually, face-to-face, or through telephone interviews (Hall et al., 1996). If the individual with TBI is unable to complete the assessment, the questionnaire may be completed by proxy (Willer et al., 1994). The CIQ requires approximately 15 minutes to complete (Hall et al., 1996; Zhang et al., 2002).

The CIQ-II is a more recent, comprehensive version of the original questionnaire designed to address concerns over the reliability and validity of the original. In addition to more items, each item is supplemented by three additional questions pertaining to how satisfied they are with the activity, if they would like to change this, and how important that change would be to them (Johnston et al., 2005).

Download the manual and rating forms for the CIQ from the COMBI website HERE

11.2.2 Mayo-Portland Adaptability Inventory

The Mayo-Portland Adaptability Inventory (MPAI-4) is based on the Portland Adaptability Inventory (Lezak, 1987). The MPAI-4 is designed to evaluate individuals during the post-acute period following ABI, to provide a representation of the sequelae of ABI through indicators of abilities, activities and social participation (Malec, 2004). Assessment with the MPAI is intended to yield information applicable to the development and ongoing evaluation of rehabilitation services within this population (Malec et al., 2003).

The MPAI-4 consists of 29 items in 3 subscales (the Ability Index, the Adjustment Index and the Participation Index), plus an additional 6 items that are not included in the MPAI-4 score. The first 29 items are intended to reflect the current status of the individual with brain injury without attempting to determine whether their status might be influenced by factors other than ABI. The additional six unscored items are intended to identify the presence of other factors that may be contributing to the individual's current status (Malec & Lezak, 2003). Items are rated on a 5-point scale from 0 (no problem or independence) to 4 (presence of severe problems) based on physical, cognitive, emotional, behavioural or social problems. Scores range from 0-111, with lower scores indicating greater integration. A worksheet is provided that guides the user through the scoring and re-scoring of items.

The measure can be completed by rehabilitation professionals, the individual with ABI or a caregiver. When administered by professional staff, the ratings should be completed by team consensus. The MPAI-4 is free of charge. The authors of the outcome measure do not recommend the MPAI-4 for use in the assessment of individuals with very severe ABI (Malec & Lezak, 2003).

Download the manual and rating forms for the MPAI-4 from the COMBI website HERE

11.2.3. Craig Handicap Assessment and Reporting Technique

The original Craig Handicap Assessment and Reporting Technique (CHART) was developed in 1992 (Whiteneck, 1992). It consists of 27 questions to assess five World Health Organization dimensions of handicap: 1) physical independence, 2) mobility, 3) occupation, 4) social integration, and 5) economic self-sufficiency. Later, a new domain titled "cognitive independence" was added including five additional questions. Each domain can be scored up to a maximum of 100 points, which reflects the functional level of a person without disability. Higher scores reflect higher levels of community participation. This instrument is intended to be administered by interview in person or over the telephone and takes approximately 15 minutes to complete; however, it can be completed as a self-administered questionnaire or by proxy. This instrument was initially developed for use in the spinal cord injury population but it has been studied in other populations including TBI (Brooks et al., 1997).

Download the manual and rating forms for the CHART from the COMBI website HERE

11.2.4. Participation Objective, Participation Subjective

The Participation Objective, Participation Subjective (POPS) consists of 26 items that reflect five different categories of participation: 1) domestic life, 2) major life activities, 3) transportation, 4) interpersonal interactions and relationships, and 5) community, recreational and civic life. For each item, one objective question and two subjective questions are asked. This instrument focuses solely on activity indicators of participation and does not include non-activity indicators, such as income. When it is scored, it generates two measures of participation: 1) participation objective (PO) and 2) participation subjective (PS). The PO is an indicator of one's level of participation, such as the frequency or duration of engagement in a particular activity. The PS reflects the individual's satisfaction with his/her level of participation and is weighted according to his/her rating of the activity's importance. The POPS takes 10-20 minutes to complete. The POPS instrument and scoring algorithm are available for download from the COMBI website (http://www.tbims.org/pops/popssyl.html). The POPS has been evaluated in a population of community-based individuals with TBI (Brown et al., 2004).

Download the manual and rating forms for the POPS from the COMBI website HERE

11.2.5. Participation Assessment with Recombined Tools-Objective

The Participation Assessment with Recombined Tools-Objective (PART-O) is comprised of a combination of items from three self-report measures of participation (CIQ-2, CHART and POPS). It was developed in a community-based population of adults with TBI ranging from 1-15 years post injury (Whiteneck et al., 2011). This instrument can be completed in writing or via interview by the affected individual or by a proxy. While it originally consisted of 24 items, the measure was later reduced to 17 items (PART-O-17; Bogner et al., 2011). These items were further classified into three domain subscales: 1) Out and About, 2) Productivity, and 3) Social Relations (Bogner et al., 2011). Individual items are rated using a 0-5 scale reflecting frequency or hours spent engaged in a particular activity over the past week or month. Subscale scores reflect the average item rating within each domain. The Averaged Total Score is an average of the three domain subscale scores. The Balanced Total Score was created based on the idea that ideal participation requires balance across the three domains; this is calculated by subtracting the standard deviation of the three domain subscale scores from the Averaged Total Score.

Download the manual and rating forms for the PART-O from the COMBI website HERE

11.3 Life Satisfaction and Quality of Life

Life satisfaction and quality of life (QoL) are frequently regarded as key outcomes in the field of rehabilitation medicine (Carlsson et al., 2007). Having social support is an important component in improving an individual's life satisfaction post injury (Atay et al., 2016; Jacobsson & Lexell, 2013b; Vandiver & Christofero-Snider, 2000). QoL is a subjective measure that takes many factors into account, including but not restricted to: health and functioning, psychological and material well-being, and social functioning (Mailhan et al., 2005). Other factors such as cognitive functioning, physical functioning, sexual functioning, vocational outcomes, and perception have also been related to QoL outcomes in individuals after ABI (Esbjörnsson et al., 2013; Forslund et al., 2013b; Jacobsson & Lexell, 2013a; Sander et al., 2013).

Following ABI, overall QoL has been shown to decrease (Gregório et al., 2014), however, it may continue to fluctuate for years following injury (Anke et al., 2015; Forslund et al., 2013b; Hu et al., 2012). Several factors have been found to influence QoL including: severity of post-injury symptoms (Anke et al., 2015; Forslund et al., 2013b; Soberg et al., 2013), levels of depression and anxiety (Anke et al., 2015; Forslund et al., 2013b; Soberg et al., 2013) and self-esteem and self-awareness (Downing et al., 2013; Goverover & Chiaravalloti, 2014; Ponsford & Spitz, 2015).

Q1. What factors influence quality of life following injury?

1. Severity of post-injury symptoms
2. Depression and anxiety
3. Self-esteem and self-awareness

A variety of interventions such as, coping skills training, support-based interventions and multi-faceted rehabilitation may improve self-efficacy and/or perceived quality of life post ABI.

For a full review of the literature, access the ERABI Module for Community Reintegration following ABI HERE

11.4 Independence and Social Integration

Independence is a broad category that includes the ability to satisfy personal needs and carry out basic activities of daily living. While, social integration includes a broad group of experiences related to social interaction and perception. Individuals with ABI often face isolation, lack social support and report lower self-esteem (Johnson & Davis, 1998; Kreuter et al., 1998; Kreutzer & Zasler, 1989). Individuals capable of living more independently following ABI, compared to those requiring assistance with physical functioning, have been shown to have greater social functioning and physical health (Forslund et al., 2013b). Independence, participation, and adjustment in relationships, vocation, leisure, and social life are often influenced by functional outcomes post injury, including motor function (Perry et al., 2014), cognitive function, dysexecutive syndrome (Buunk et al., 2015) and self-awareness (Schönberger et al., 2014). Therefore, individuals with less independence as a result of their physical and cognitive impairments are at particular risk of experiencing difficulty with community participation and thus require special attention.

Q2. What factors influence independence, participation and adjustment post injury?

1. Motor function
2. Cognitive function
3. Dysexecutive syndrome
4. Level of self-awareness

11.4.1 Mentorship Interventions

One option for individuals post injury is peer-to-peer support, where an individual who has experienced a brain injury previously, offers support to an individual going through a similar experience. These programs differ greatly in the amount of structure provided. One study looking at peer-to-peer support found that 82% of participants reported an improvement in their ability to cope and knowledge of TBI, although few perceived an improvement in social support (Hibbard et al., 2002). Importantly, this program was unstructured and based on the needs/wants of the partnership. Other programs studied have been more regulated, providing benchmarks on the frequency of contact and guided content. A study by Hanks et al. (2012) looked at a mentorship program that focused on emotional well-being, post-TBI QoL, and community reintegration with a focus on social support and connection to resources. Those who received mentorship showed less emotion-focused coping and less avoidance coping than controls; however, the mentored group did not show better task-oriented coping compared to controls (Hanks et al., 2012).

Clinical Tip!

Considerations for mentorship programs:

- Careful selection of mentors and proper pairing to mentees
- Proper education of mentors
- Consideration as to the type of interaction within the partnership (e.g., technology, in-person, both)

Struchen et al. (2011) recruited individuals with TBI who had achieved good social integration after their injuries to be peer mentors; these individuals had personally overcome barriers and were felt to be better able to understand and assist the mentees in adapting post injury. This study reported a significant improvement in perceived social support in individuals who received mentorship compared to those who did not; however, no significant differences were found between groups in terms of social integration, social network size, or social activity level (Struchen et al., 2011). Unexpectedly, the authors noted an increase in self-reported depressive symptoms after the conclusion of the 3-month mentoring intervention; it is possible that the mentor-mentee interactions led to an increased awareness of TBI-related issues (Struchen et al., 2011). The use of healthy mentors is also an option but the research on this type of partnership is limited.

11.4.2 Group-Based Interventions

Group-based therapy provides an opportunity for individuals to undergo rehabilitation while also integrating the individual into a social setting; thus, increasing one's sense of belonging and reducing feelings of isolation. Further, social interaction within the treatment group can help prepare the individual with an ABI for social settings outside of a treatment environment.

Social support groups, consisting of psychoeducational presentations/discussions, coping approaches and skill building, as well as goal setting have been shown to result in positive changes in hopelessness which can lead to increased sense of control and empowerment (Armengol, 1999). Self-efficacy can also be improved through cognitive-behavioural treatment groups (Backhaus et al., 2010) and social clubs (Vandiver & Christofero-Snider, 2000). Such groups provide the opportunity for group affiliation, acceptance and provide awareness of learning opportunities/skill development (Vandiver & Christofero-Snider, 2000).

Q3. What are the common elements of group-based social programs to increase self-efficacy?

1. Psychoeducation
2. Coping skills training

Clinical Practice Guideline for the Rehabilitation of Adults with Moderate to Severe TBI (INESSS-ONF, 2015)

- A peer-supported relationship model of intervention within a community-based program should be available to individuals with traumatic brain injury in order to promote social integration, coping and psychological functioning (Level B).

11.4.3 Cognitive Interventions

Cognitive impairment following ABI can contribute to chronic disability (Cicerone et al., 2004). Fortunately, cognitive rehabilitation has been shown to reduce functional disability and recovery time (Barman et al., 2016) and may increase independence by re-establishing pre-injury behaviours. Two studied interventions that may positively influence independence and social integration are self-awareness training and Intensive Cognitive Rehabilitation.

Self-awareness Training

Self-awareness training, is meant to increase an individual's ability to gain control over cognitive symptoms. By understanding personal weaknesses, one can better anticipate when compensatory strategies should be used. Based on a single study, self-awareness training did not improve social integration compared to conventional therapy (Goverover et al., 2007); however, it did improve participants' awareness of disability, motor and process skills, as well as self-regulation skills (Goverover et al., 2007).

Intensive Cognitive Rehabilitation

Cicerone et al. (2004) found that Intensive cognitive rehabilitation was associated with significantly greater improvements in community reintegration, client-reported satisfaction, and neurological outcomes than standard multidisciplinary rehabilitation. Although both interventions improved community re-integration, the intensive group was over twice as likely to show clinical benefit on the CIQ (Cicerone et al., 2004). It should be noted that the intense treatment group had a greater time post injury; therefore, it could be argued that these individuals may have had greater incentive for success due to their heightened awareness of loss.

Examples of components of the Intensive Cognitive Rehabilitation Program (Cicerone et al. 2004): Intensity: 16 weeks, 4 days/week, 5 hours/day

- Cognitive group (3 days/week, 2 hours/day): functional activities focused on executive functioning (e.g., planning, problem solving, adapting to unexpected situations), metacognitive functioning (e.g., self-monitoring, cognitive self-appraisal, affect regulation), and interpersonal group process (e.g., giving and receiving feedback, achieving consensual agreement).
- Individual cognitive remediation (3 days/week, 1 hour/day): therapy targeting impaired cognitive functioning
- Communication and interpersonal skills group (3 hours/week): focus was on pragmatic language skills, interpersonal communication style, perspective taking, and social behaviour. Role play, videotaped feedback, and analysis of interactions were used.
- Therapeutic work trials (1 day/week): vocational counsellor led activities focused on return to work/school
- Additional therapy services were available if needed throughout the program.

The INESSS-ONF guidelines do not make any recommendations regarding self-awareness training or intensive cognitive rehabilitation for the rehabilitation of social integration following TBI (INESSS-ONF, 2015).

11.4.4 Community and Multidisciplinary Rehabilitation

There are several different approaches to community rehabilitation. Based on the scientific literature transitional living, brain injury drop-in clinics and community-based life skills training have been researched. Using the CIQ, the studies found that transitional living compared to community-based rehabilitation, attending a brain injury drop-in clinic compared to not attending, and community-based intensive life skill training, compared to no training, improved outcomes (social integration and productivity subscales) on the questionnaire (Hopman et al., 2012; McLean et al., 2012; Wheeler et al., 2007). While transitional living may improve community integration compared to community-based rehabilitation, Hopman et al. (2012) found that community-based rehabilitation was more effective for improving independence with performing activities than transitional-living.

Multidisciplinary rehabilitation was found to be effective for improving home integration, but not social integration or independence with performing activities, compared to those not receiving the intervention (Goranson et al., 2003). Multidisciplinary rehabilitation has also been shown to increase ADL performance (Powell et al., 2002; Waehrens & Fisher, 2007).

While there is limited research on the role of therapeutic recreation specialists and rehabilitation therapists, they may be beneficial in helping individuals integrate, particularly in re-establishing involvement in leisure activities. Case managers may also assist. A study has shown that case management increased the number of individuals with severe head injury who were put in contact with services (inpatient services, outpatient services and day centers); however, the service provided was similar whether contact was made with or without the assistance of a case manager and the provision of services appeared to have a limited impact on functional ability, return to work or reduced family distress (Greenwood et al., 1994).

11.5 Return to Driving

The inability to drive is one of the most challenging consequences of a brain injury; it is seen as a key determinant of an individual's level of social engagement and general independence (Lane & Benoit, 2011), as well as a predictor of workforce participation. Across several studies, approximately 32% to 75% of individuals return to driving following an ABI (Fleming et al., 2014a; Formisano et al., 2005; Hawley, 2001; Leon-Carrion et al., 2005; Liddle et al., 2012; Perumparaichallai et al., 2014; Pietrapiana et al., 2005). However, people often return to driving in an effort to feel independent before they are ready (Leon-Carrion et al., 2005; Liddle et al., 2011, 2012). Driving a motor vehicle requires good function

Table 2. Skills Required for Good Driving and Warning Signs (adapted from Novack & Lopez, 2015).

Skills Required for Good Driving	Warning Signs of Unsafe Driving
• Accurate vision • Maintaining lane position • Concentration for extended periods of time • Memory functioning (i.e., directions) • Problem solving • Hand-eye coordination • Quick reaction time • Sound judgement and safety awareness/ability to anticipate dangerous situations • Monitoring simultaneous inputs	• Missing signs or signals • Drifting across lanes • Becoming fatigued or easily distracted • Getting lost in familiar areas • Near misses/accidents • Slow decision-making • Driving at inappropriate speeds

across multiple domains including visual perception, cognition (especially information processing and divided attention), communication, and motor coordination; these domains are commonly impacted following brain injury.

While the skills required to be a good driver and the warning signs of unsafe driving appear to be straightforward (Table 2), determining whether someone is fit to drive is complex.

Clinical Practice Guideline for the Rehabilitation of Adults with Moderate to Severe TBI (INESSS-ONF, 2015)

A physician/health care professional with experience in traumatic brain injury should assess individuals who wish to drive, in accordance with local legislation and in liaison with the interdisciplinary rehabilitation team (Level C).

If the capacity of the person with traumatic brain injury to drive is unclear, a comprehensive assessment of capacity to drive should be undertaken at an approved driving assessment centre or service or by professionals qualified to conduct such an evaluation (Level C).

If during the assessment or treatment of a person with traumatic brain injury, the interdisciplinary rehabilitation team determines that the person's ability to drive safely may be affected, then they should:

- *Provide clear guidance to treating health professionals, the person and family/caregivers about any concerns about driving, and reinforce the need for disclosure and assessment in the event that return to driving is sought later post-injury*
- *Provide the person with information about the law and driving after TBI*
- *If applicable, advise the person and/or their advocate that they are obliged by law to inform the relevant government body that the person has suffered a neurological or other impairment and to provide the relevant information on its effects (Level C).*

11.5.1 Comprehensive Driving Evaluation

A driving assessment should not only be done to determine if an individual should return to driving, but to determine if remedial training or supports are necessary. Further, it identifies if any licensing conditions need to be put in place. This step is in accordance with clinical practice guideline recommendations put forth by INESSS-ONF.

Post injury there is a need for a trained professional, often a physician or an occupational therapist, to determine whether an individual is safe to return to driving. Clinicians must balance the importance of driving in facilitating independence and community reintegration with the potential risks posed to the patient, any passengers, as well to the wider community. This is a challenging task; unfortunately, many healthcare professionals do not feel properly trained/educated on this topic.

Clinical Tip!

When considering a patient's fitness to drive, a careful review of their medications should be done.

Physicians should be aware of their duty to report patients who have a medical condition that may impact their fitness to drive; depending on the province or territory in which they practice, this duty may be mandatory or discretionary. The physician's duty to report reflects their responsibility to the public and supersedes their duty to maintain individual patient confidentiality. Ultimately, it is the licensing authority – not the physician – that makes the final determination regarding one's fitness to drive.

In order to safely operate a motor vehicle after TBI, individuals require the following: 1) insight into their disability, 2) adequate reaction times, 3) adequate ability to coordinate visual-motor function, 4) adequate leg function for braking or adaptive technology, 5) adequate ability to divide attention to perform multiple simultaneous tasks, and 6) enough responsibility to comply reliably with the rules of the road and to drive within any conditions set by licensing authorities (CMA Driver's Guide). Car modifications may be possible to overcome physical difficulties such as impaired leg function, but are less likely to be able to compensate for cognitive impairments. A detailed history, collateral history from family members, neurological physical examination and cognitive screening will help inform decision making. If the clinician is unsure after completing their own examination, he/she may arrange for their patient to see an appropriate medical specialist in consultation or refer to a driver assessment centre for functional testing. It is important to note that the patient may be responsible for the cost of a driving evaluation.

The Comprehensive Driving Evaluation is a functional assessment that includes both an off-road evaluation and an on-road practical driving test (summarized in Figure 1).

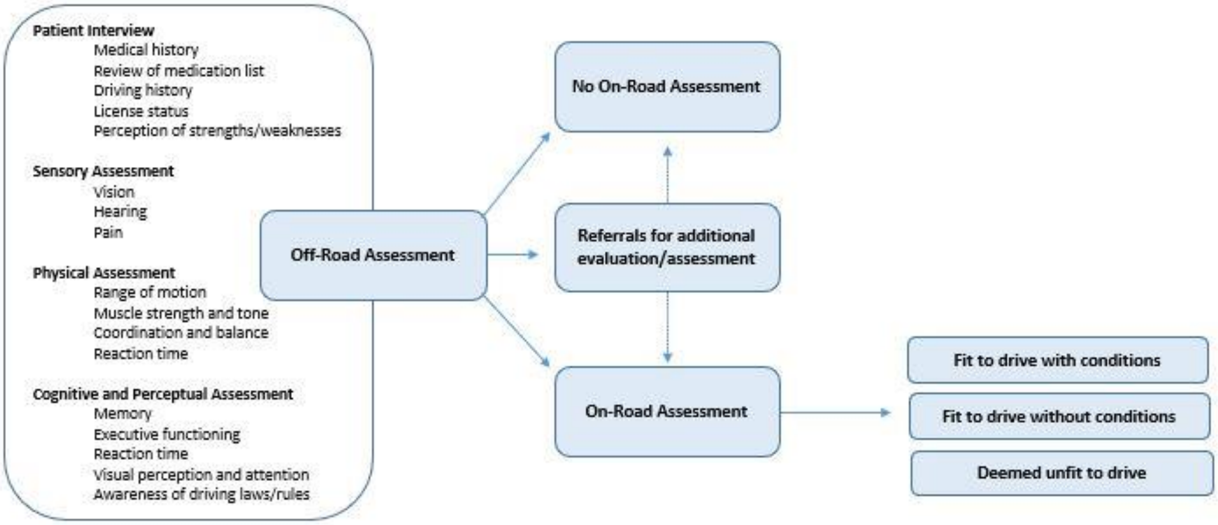


Figure 1. A depiction of a comprehensive driving evaluation

Off-Road Assessment

The components of the off-road evaluation may vary based on the clinicians' observations and concerns. However, it often involves assessment of the patient's cognitive and perceptual awareness (Table 3).

Table 3. Tests of Key Cognitive Domains for Assessment of Driving Capacity (adapted from Schultheis & Whipple, 2014).

Cognitive Domain	Tests commonly used in literature
Attention	WAIS Digit Span Trail Making A Conners Performance Test UFOV
Visual Spatial	WAIS Block Design Raven Progressive Matrices Rey Figure MVPT
Processing Speed	Symbol Digit Modality Trail Making Test A & B PASAT
Executive Functioning	Stroop Wisconsin Card Sorting Tower of Hanoi WAIS-Comprehension WAIS – Abstract Reasoning

Q4. What cognitive domains are important to assess in an off-road driving assessment?

1. Attention
2. Visual Spatial awareness
3. Processing speed
4. Executive functioning

On-Road Assessment

The on-road assessment is usually provided in a dual-control vehicle to allow the assessor to maintain control and safety of the vehicle. The driving assessment is on a route that allows the individual several instances to demonstrate each driving maneuver (e.g., lane changes, turning, stopping, intersections, speed adjustment, signage recognition). The assessor may provide feedback to the individual being tested to see whether they are able to adapt their behaviour throughout the remainder of the drive. This test can not only determine driving fitness but also highlights if driving training is needed. Driving training may be recommended if someone shows driving deficits with the capacity to learn new strategies or if vehicle modifications were made and additional practice is warranted (Schultheis & Whipple, 2014). The training sessions typically cover fundamental driving skills, compensatory techniques such as memory strategies or adaptive equipment, and methods for improvement (Schultheis & Whipple, 2014).

Q5. What information can you obtain from an on-road driving assessment?

1. If it is appropriate for the individual to return to driving
2. If any remedial training is necessary
3. If any vehicle modifications need to be made
4. If any licensing conditions need to be put in place

It is recommended that healthcare professionals familiarize themselves with their local legislation on licensing evaluation and protocols. Further, it is important that appropriate steps are taken if a patient is found to be driving against medical advice or once their license has been revoked.

Several factors are associated with return to driving in individuals with ABI including: chronicity of injury (McKay et al., 2015), performance on tests of visual attention, working memory, processing speed, and task switching (Perumparaichallai et al., 2014), psychomotor speed and cognitive flexbility (Cullen et al., 2014). Deficits of vision and mobility, as well as recurrent seizures, are significant limiting factors in return to driving (Hawley, 2001). Moreover, pre-injury behaviours play a role in post-injury driving fitness. Driving violations and accidents, risky driving styles, and risky personality before injury all decreased the likelihood of driving fitness after injury (Pietrapiana et al., 2005).

Q6. What factors are associated with return to driving in individuals with ABI?

1. Pre-injury driving experience
2. Chronicity of injury
3. Performance on tests of visual attention, working memory, processing speed, and task switching
4. Psychomotor speed and cognitive flexibility
5. Vision and mobility

11.5.2 Interventions for Return to Driving

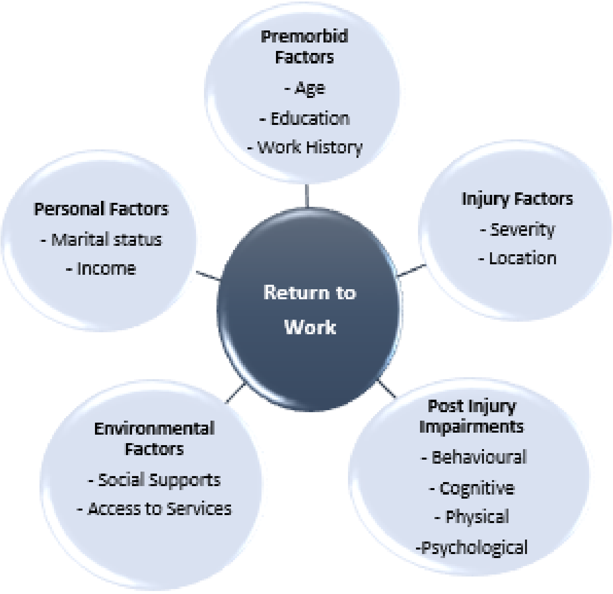
Participation in a multidisciplinary neuro-rehabilitation program has been shown to improve driving-related deficits, and thus increase the rate of individuals returning to driving following ABI (Leon-Carrion et al., 2005; Perumparaichallai et al., 2014). In the literature, 32% to 75% of individuals returned to driving following ABI (Fleming et al., 2014a; Formisano et al., 2005; Hawley, 2001; Leon-Carrion et al., 2005; Liddle et al., 2012; Perumparaichallai et al., 2014; Pietrapiana et al., 2005). Unfortunately, people often return to driving in an effort to feel independent before they are ready (Leon-Carrion et al., 2005; Liddle et al., 2011, 2012).

11.5.3 Alternative Transportation Options

In some cases, individuals do not return to driving or did not drive prior to their injury. In such cases, reliance on alternative modes of transportation are necessary. Individuals may be able to commute with family members/co-workers or use public transportation (e.g., buses); however, the use of public transportation may require cognitive or motor abilities that are compromised post injury (Colantonio et al., 2010). In many communities, accessible transportation for individuals with disabilities is also available; however, these services often require pre-planning and scheduling. Depending on where the individual lives post injury, lack of transportation may mean necessary services cannot be accessed.

11.6 Vocational Rehabilitation and Productivity

Vocational rehabilitation and productivity includes paid employment, educational pursuits, and volunteer work. Vocational success has significant implications for life satisfaction, depression and anxiety following ABI; however, participating in gainful and challenging employment and achieving social and financial stability post injury can be challenging. Following ABI, there are often declines in rates of productivity, employment, and schooling.



Barriers to returning to school or work may include:

- Cognitive dysfunction
- Sensory overload
- Fatigue
- A lack of knowledge on employers' behalf regarding appropriate accommodations, modifications and expectations
- Lack of knowledge regarding regulations and rights as an employee

Rates of resuming education following ABI range from 44% to 75% (Avesani et al., 2005; Kennedy et al., 2008; Todis et al., 2011). Upon returning to school, special education services are often needed (Todis et al., 2011), and changes to academic status, major, and/or the school attended may be necessary (Kennedy et al., 2008). Further, issues with understanding instructions, retaining information, and time management often pose challenges to returning students.

Employment rates at one-year post injury range from 27.8% to 66.5% (Andelic et al., 2012; Avesani et al., 2005; Dikmen et al., 1994; Forslund et al., 2014; Forslund et al., 2013a; Huebner et al., 2003; Johnson, 1998; Jourdan et al., 2013; Ketchum et al., 2012; Klonoff et al., 2001; Klonoff et al., 1998; Ponsford & Spitz, 2015; Rietdijk et al., 2013; Walker et al., 2006). Those who resume vocational activities often do so at a lesser capacity compared to their pre-injury levels of employment (Grauwmeijer et al., 2012; Jourdan et al., 2013; Klonoff et al., 2001; Rietdijk et al., 2013). Return to work may also be delayed during litigation, as it is commonly feared this will negatively influence the legal case.

Table 4. Factors that Influence Return to Productivity

Factors	References
Better injury severity indictors	(Andelic et al., 2012; Avesani et al., 2005; Forslund et al., 2014; Forslund et al., 2013a; Jourdan et al., 2013; Lexell et al., 2016)
Shorter duration of PTA	(Avesani et al., 2005; Johnson, 1998; Ketchum et al., 2012)
Shorter lengths of stay in hospital	(Avesani et al., 2005; Jourdan et al., 2013; Ketchum et al., 2012; McCrimmon & Oddy, 2006)
Better functional recovery	(Avesani et al., 2005; Grauwmeijer et al., 2012; Ketchum et al., 2012; Klonoff et al., 1998)
Fewer cognitive deficits	(Ponsford & Spitz, 2015; Rietdijk et al., 2013)
Younger age	(Forslund et al., 2014; Jourdan et al., 2013; Klonoff et al., 2001; Lexell et al., 2016; Lustig et al., 2003)
Higher level of education prior to injury	(Forslund et al., 2014; Ketchum et al., 2012; Ponsford & Spitz, 2015)

Q7. What factors influence return to productivity?

1. Better injury severity indicators
2. Shorter duration of post-traumatic amnesia
3. Shorter lengths of stay in hospital
4. Better functional recovery
5. Fewer cognitive deficits
6. Younger age
7. Higher level of education prior to injury

11.6.1 Evaluation of Return to Work

Individuals with brain injury should be assessed for vocational rehabilitation; the components of this assessment are provided below. When an individual is looking for a career change or has limited job experience, job shadowing and volunteering may be beneficial options. In some instances, a situational assessment allows the rehabilitation specialist to observe and determine the following: learning style, performance quality/consistency, transferable skills, training needs, accommodations, and other occupational options (West, 2013). Moreover, there are many online career interest assessments available to help identify potential occupations for those unsure of next steps. If these tests are used, assistance may be needed with interpreting the results.

Regardless of ones' work history, after completion of the assessment there is a need to determine whether return to work is possible and if the career choice is appropriate. For those who return to work, clinical practice guidelines recommend supported employment which would include: job placement (e.g., matching needs and abilities, communicating with employer, travel and training), job site training and advocacy, and job retention and follow-up (INESSS-ONF, 2015). If a patient is assessed and deemed unable to engage in paid employment, other options such as volunteer work, should be explored.

Clinical Practice Guideline for the Rehabilitation of Adults with Moderate to Severe TBI (INESSS-ONF, 2015)

Individuals with TBI should be assessed for the need for vocational rehabilitation to assist their return to work or to school, or for entering the workforce for those not previous employed and should include (C):

- *Comprehensive pre-injury history (including educational and work history)*
- *Current capacities of the person, in particular at the cognitive, psychological and physical levels*
- *Current social status*
- *Evaluation of the person's vocational and/or educational needs*
- *Identification of difficulties which are likely to limit the prospects of a successful return to work or to school and appropriate interventions to minimize them*
- *Direct liaison with employers (including occupational health services when available) or education providers, to discuss needs and the appropriate action in advance of any return*
- *Evaluation of environmental factors, workplace and psychosocial aspects including social environment and work culture*
- *Verbal and written advice about their return, including arrangements for review and follow-up*

11.6.2 Interventions for Vocational Rehabilitation and Productivity

Post injury, individuals may lack insight into their deficits and may experience difficulty with self-direction and fatigue. Numerous studies have reported improvements in return to work and competitive job placement as a result of vocational interventions, which often occur in tandem with improved productivity, participation, independence, and integration.

Programs shown to be effective in improving vocation-related outcomes include:

- Vocational rehabilitation (Bonneterre et al., 2013; Buffington & Malec, 1997; Radford et al., 2013)
- Resource facilitation (Backhaus et al., 2010; Trexler et al., 2016)
- Community reintegration (De Kort et al., 2002; Geurtsen et al., 2008; Geurtsen et al., 2012; Malec et al., 2000)
- Problem-solving (Man et al., 2013)
- Goal-setting (Bergquist et al., 2012)
- Mentoring (Kolakowsky-Hayner et al., 2012)
- Specialized programs that provide supported employment and on-site job training are particularly effective (Wall et al., 1998; Watanabe, 2013).

General inpatient or outpatient rehabilitation programs may also be effective for improving employment outcomes. Trexler et al. (2016) reported that access to a multidisciplinary team led to an increase in employment and independence compared to standard outpatient care. Similarly, inpatient rehabilitation may also improve return to work post ABI; Walker et al. (2006) found that 39% of individuals were employed at 1-year post injury following rehabilitation. The reader is encouraged to review the online ERABI module for a full list of interventions; however, given the limited evidence for many of them, they have not been included in this guidebook chapter.

Clinical Practice Guideline for the Rehabilitation of Adults with Moderate to Severe TBI (INESSS-ONF, 2015)

- *Vocational rehabilitation interventions should be offered to individuals with TBI who require support and training to assist their return to work or to school, or for entering the workforce for those not previously employed. Vocational rehabilitation should include cognitive, communicative, physical and behavioural strategies, work simulation activities, and on-site training (Level C).*

- *Standard vocational rehabilitation interventions offered to individuals with TBI, such as cognitive training and behaviour modification, should be monitored for effectiveness, and supported employment should be provided for those who wish to return to work and for whom the standard interventions are insufficiently effective (Level C).*

11.6.2.1 Educational Interventions

Educational interventions provide individuals with an ABI an opportunity to learn more about the potential challenges encountered following a brain injury, as well as the resources that are available to them. MacLennan & MacLennan (2008) assessed a simulated college experience and its ability to predict college performance and success. Of the three participants, two performed poorly and did not return to school, while one participant was successful in the program and did return to school. It was speculated that the simulation may make individuals more aware of their impairments and make more informed decisions about pursing further education; however, more studies are needed to evaluate the effectiveness of this program as well as other educational interventions before firm conclusions can be made.

11.6.2.2 Mentorship

Mentorship provides an individual with a trained mentor or peer to help with the transition to living with an ABI. Mentorship has been effective in people with an ABI, particularly in terms of educating the individual about the resources and methods available to assist them in pursuing their vocational goals (Kolakowsky-Hayner et al., 2012). Mentorship is also useful for providing an individualized approach to achieve the desired employment outcomes. Kolakowsky-Hayner et al. (2012) evaluated a community-based mentoring program and found trained mentors helped most of the program participants return to work or school. The mentorship also increased participants' community integration and independence, functional performance, and adaptability (Kolakowsky-Hayner et al., 2012).

11.6.2.3 Return to Work/School Programs

While much of the research looking at community rehabilitation programs lacks a control group, the findings are in favour of offering supports for work and school re-entry (Buffington & Malec, 1997; Klonoff et al., 1998; Malec et al., 2000; Wall et al., 1998). Klonoff et al. (1998) found that more than half of the work re-entry program participants were employed after the program, although only a small portion of participants returned to the same pre-injury level of work or school. Individuals with strong patient and family working alliances and work eagerness were found to have favourable outcomes. In a study by Gamble & Moore (2003), significantly more individuals who received supported employment services were employed compared to those who did not receive support; however, those who did not have access to supported employment services had a higher average income and worked more hours each week.

Various studies have reported improvements in competitive job placement and retention because of supported employment strategies. The most important aspect of this vocational intervention seems to be on-site job training provided by vocational rehabilitation experts. As suggested by the findings of Wall et al. (1998), increased job success may be achieved through community based vocational training programs which combine the concepts of work adjustment and supported employment. Participants have shown increased employment success and satisfaction when techniques that foster self-confidence were used, instruction and adjustments were given for specific work tasks, and a job coach was available to minimize interpersonal problems (Wall et al., 1998).

11.6.2.4 Resource Facilitation

Resource facilitators provide support for transitioning back into the community for individuals with an ABI. They provide a comprehensive explanation of available resources, as well as how to access them (Trexler et al., 2010). Part of their focus is to assist with vocational goals when desired by the individual. Two studies have found that substantially more participants who received aid from a resource facilitator returned to work compared to standard care (Radford et al., 2013; Trexler et al., 2010). Trexler et al. (2010) also found that community participation increased when employment increased, potentially because work increases one's motivation to become involved in the community again. Alternatively, it may be that individuals who return to work are more independent and therefore better able to participate in the community than those who are not employed.

11.6.2.5 Cognitive Interventions

Depending on severity, cognitive impairments can reduce or eliminate vocational options for individuals with an ABI; therefore, it is imperative that vocational rehabilitation includes a cognitive rehabilitation component. While more research is needed, based on what is currently available, cognitive training does not seem effective for improving rates of employment compared to conventional therapies. Vanderploeg et al. (2008) compared two different treatment approaches for vocational rehabilitation, cognitive-didactic therapy and functional-experiential rehabilitation therapy. After one year of cognitive didactic therapy, over one third of participants had returned to work, but this was similar to participants in the functional treatment arm (Vanderploeg et al., 2008). Salazar et al. (2000) evaluated the effect of an in-hospital cognitive rehabilitation program compared to a limited home rehabilitation program on return to employment and fitness for military duty. There were no significant differences between groups in terms of the number of participants who returned to work or were fit for active duty (Salazar et al., 2000). Although there was no difference between the treatment and control groups, Salazar et al. (2000) reported high employment rates (90% and 94%, respectively); this was likely due to the study having been conducted during the acute phase of recovery, which may have reduced the potential impact that the intervention could have had due to spontaneous recovery.

11.7 Caregiving and Caregiver Burden

While the chapter to this point has focused on the individual who sustained the injury, others are often impacted as well. Following ABI, someone is often required to take on the responsibility of ensuring that the injured individual receives proper care and much of that responsibility comes when the individual is discharged into the community and is no longer receiving inpatient services. This may be a "primary caregiver", often a family member, or distributed across a larger network of individuals. The caregiver role can be both physically and emotionally challenging. *Caregiver burden is the term used to broadly encompass all of the responsibilities and overall impact faced by those who assume the caregiver role.* When caring for someone with ABI, challenges can arise related to changes in the injured individual's level of emotional control, personality, behaviour, physical abilities, and cognitive abilities (Brooks et al., 1986; Hall et al., 1994; Jacobs, 1988; Kreutzer et al., 1994; McKinlay et al., 1981; Oddy et al., 1978; Thomsen, 1984; Willer et al., 1991). The situation may be compounded by loss of income and/or transportation, increased care and medication costs, ongoing therapy demands, and a lack of community-based services.

The responsibility of providing care for individuals with ABI can lead to increased levels of stress. Fortunately, caregiver burden has been found to decrease over time (Bayen et al., 2016; Dillahunt-Aspillaga et al., 2013), as the individual's outcome improves and the caregiver becomes accustomed to providing care. The caregiver experience can be broken down into three categories: burden, satisfaction, and mastery (Table 5).

Table 5: Common Indicators of Caregiver Burden, Satisfaction, and Mastery (Albert et al., 2002)

Caregiver Burden	Caregiver Satisfaction	Caregiver Mastery
• Not enough time • Anxiety • Not enough sleep • Not enough privacy • Strain on personal relationships • Depression • Interruptions at work • Low energy • Inability to get outside the home	• Patients appreciate caregiver • Caregivers feel close to patients • Caregivers enjoy helping patients • Caregiving adds meaning to life	• Feeling that one is a good care manager • Feeling that one understands patient problems • Knowing where to go for help • Confidence handling caregiving challenges • Having a reasonable plan for the future

• Use of alcohol or drugs • Feeling overwhelmed • Isolation • Uncomfortable having visitors • Caregiver doesn't get needed support		• Effective handling of benefits and insurance

The need for social relationships and support systems in caregiving has been reported as well. Caregivers who meet with friends less frequently and receive less social support typically feel more burdened and isolated (Chronister et al., 2016; Coy et al., 2013; Davis et al., 2009; Liu et al., 2015; Manskow et al., 2015; Stevens et al., 2013). Other family members are often a vital source of support for caregivers. Perrin et al. (2013) reported that families scoring higher in cohesion, communication, and functioning resulted in lower caregiver burden and depression, and higher levels of satisfaction with life among caregivers. Families whose members supported each other, openly expressed their feelings, and were capable of flexibility demonstrated improved adjustment to the consequences of brain injury (Martin, 1988). Leibach et al. (2014) found that the "five family needs" – household, informational, health, financial, and social support – were significantly associated with caregiver burden, depression, anxiety, life satisfaction, and self-esteem. Therefore, interventions that address these family needs can reduce the negative effects of caregiving, while interventions aimed at caregiver mental health can provide caregivers with the tools necessary to meet the needs of the family.

Clinical Practice Guideline for the Rehabilitation of Adults with Moderate to Severe TBI (INESSS-ONF, 2015).

- *Rehabilitation programs for individuals with traumatic brain injury should be developed in collaboration with caregivers to ensure carryover into the community (Level C).*

- *Individuals who assume a caregiver role (e.g., family members, spouse, non-professional paid caregivers) to a person with traumatic brain injury should be provided with information relevant to their role. This should include but not be limited to the need for support, training and education; and practical and emotional support regarding stress, mental health issues and their own quality of life, including the need to plan respite care when required (Level C).*

- *Family and caregivers of individuals with traumatic brain injury should be provided with access to ongoing support. Supportive groups and therapies, e.g., associations / peer support / mentoring, mindfulness-based cognitive therapy, yoga, art, pet or music therapy, etc., should be considered (Level C).*

- *The rehabilitation team should assess and document the family's capcity for and interest in taking on a caregiver role for the person with TBI (Level C).*

11.7.1 Interventions

11.7.1.1 Interventions of Support or Cognitive-Behavioural Interventions

Rivera et al. (2008) compared caregivers who received problem-solving therapy or education to those who received only education. The treatment group showed significant decreases in depression, health complaints, and dysfunctional problem solving. No significant interactions between treatment and time were found for caregiver well-being or burden (Rivera et al., 2008). Problem solving therapy training may be a beneficial intervention for improving certain caregiver outcomes. Studies examining support groups offered via videoconferencing (Damianakis et al., 2016) or by telephone (Brown et al., 1999) have been shown to positively influence emotions and reduce levels of burden and distress, respectively.

Kreutzer et al. (2009) studied families who participated in a Brain Injury Family Intervention program that focused on cognitive behavioural therapy and education on family dynamics (e.g., managing stress). The authors found that family members benefited in terms of meeting needs and overcoming service obstacles, although the program did not strongly improve their family functioning, life satisfaction, or psychological well-being. In a more recent study of the same intervention, Kreutzer et al. (2015) reported that the program significantly reduced caregiver burden and improved family needs and satisfaction with services relative to pre-treatment.

Powell et al. (2016) reported that caregivers receiving a telehealth self-management intervention comprised of education and mentored problem-solving showed improved coping ability and psychological well-being, when compared to usual care. In a follow-up to this study, Powell et al. (2017) reported that, 6 months post ABI, caregivers were able to increase their involvement in recreational and professional endeavors. At this time, continuing concerns presented by caregivers included emotional adjustment, time management, and creating healthy habits (Powell et al., 2017).

11.7.1.2 Educational Interventions

Education and access to information have been found to have a positive effect on burden. Caregivers regarded health information support as a valuable resource, particularly in the early stages of TBI care (Calvete & de Arroyabe, 2012; Liu et al., 2015). When these resources are unavailable or inaccessible, it can negatively impact caregiver mental health. Doyle et al. (2013) revealed that the majority of unmet caregiver needs revolved around health information regarding the patient, thus increasing their levels of anxiety and depression. However, ways of helping caregivers implement this information may be needed in order for education to be effective. In fact, Dillahunt-Aspillaga et al. (2013) found that caregivers felt their most useful resource was patient-caregiver support and advocacy.

Several studies examined whether an educational intervention was effective for reducing caregiver depression. Fortune et al. (2016) provided educational modules on a variety of different topics for caregivers of individuals with ABI and reported that it did not improve caregiver depression or anxiety in comparison to wait-list control participants, but there were significant improvements in caregiver strain and perceived criticism. Morris (2001) also found that providing educational material to caregivers did not impact caregiver depression or anxiety. From these two studies, educational interventions do not appear to have a beneficial impact on caregiver depression, although they may have positive impacts on other caregiver outcomes. Contrary to this, a study by Sinnakaruppan et al. (2005) did show that education can have a positive effect on one measure of depression (General Health Questionnaire); however, this effect was not seen when using the Hospital Anxiety and Depression Scale within the same study and should be interpreted with caution.

11.8 Case Study

Mr. F…

Mr. F is a 43-year-old man who you are seeing in the outpatient clinic. Four months ago, he was a helmeted cyclist who was struck by a vehicle. He sustained the following injuries: left sided epidural hematoma overlying the frontal and temporal lobes, left temporal bone fracture, and right clavicle fracture. He required an acute craniotomy for evacuation of the epidural hematoma. His clavicle fracture was managed non-operatively. He was admitted to an inpatient neurorehabilitation unit for 4 weeks before being discharged home with his wife and 12-year-old daughter.

At today's appointment he is accompanied by his wife. He has not yet returned to driving since his accident. He is tired of depending on his wife to drive him places. He wishes he could help his wife by being able to drive their daughter to some of her activities as well. They live in a small town and it is difficult to access the community on foot or by public transit. He is beginning to feel isolated. Although, he also admits to feeling anxious about driving and feels uncomfortable even as a passenger.

How do you respond to Mr. F's inquiry and concerns?

You begin with a thorough but focused history and physical examination.

Q1. What are important elements to include in your patient history?

Answer:

1. Past medical history (e.g., loss of consciousness, presyncope, syncope, seizures, or dementia)
2. Medication list (NB: pay special attention to medications that may cause sedation or slow cognitive processing)
3. Social history (e.g., alcohol, cannabis, or other substance use)
4. Driving history (e.g., descriptions of past accidents or near accidents)
5. License status
6. Collateral history from wife
7. Review of systems (e.g., vision, hearing, pain, cognition, sensation, weakness, spasticity or spasms, mood, and fatigue)

Q2. What are important elements to include in your physical examination?

Answer:

1. Visual acuity, visual fields, and assessment for presence of visual neglect
2. Neck range of motion
3. Ankle range of motion, and dorsiflexion/plantarflexion power
4. Upper and lower extremity coordination
5. Mental status – attention, memory, executive function, judgment, and insight

You conduct a history and physical examination for Mr. F.

Patient History

Past Medical History:	Otherwise healthy
Medications:	Nortriptyline 25mg at bedtime
Social History:	No substance use
Driving History:	No previous accidents or near accidents
License Status:	License is active
Additional History from Spouse:	Mr. F appears anxious and uneasy when riding in a car as a passenger. He often tightly grips the door handle to his right. His wife describes him as “jumpy” and states he frequently checks over his shoulder as if he is anticipating something bad is going to happen.
Review of Symptoms:	No diplopia. No visual blurring. Intermittent tinnitus most noticeable at bedtime. Headaches 4-5 days per week. These have been reduced to 1 day per week since starting treatment with nortriptyline. No sensory changes. No focal weakness. No spasms. He also describes feeling anxious particularly around the idea of being hit by a car again when he is on the road. He sleeps well and feels rested in the morning. He is prone to developing fatigue if he overexerts himself, but does not experience excessive daytime sleepiness.

Physical Examination

Cranial Nerves:	Visual acuity is 20/30 with both eyes open and examined together. Visual fields full. No visual or auditory neglect.
Neck Range of Motion:	Cervical range of motion is full and pain-free.
Ankle Range of Motion:	Ankle range of motion is full and symmetrical.
Sensory/Motor:	Sensation to pinprick is normal. No tactile neglect. Muscle tone is normal. There is full power in the upper and lower extremities. Gait examination is unremarkable. Finger to nose and heel to shin testing is within normal limits. Rapid alternating movements are normal.
Mental Status:	His Montreal Cognitive Assessment total score is 27/30 (delayed recall 2/5). He accurately performed 4/5 serial 7 subtractions. He has good insight into his anxiety and realizes that this may be a barrier when it comes to his goal of safely returning to driving.

Q3. Taking into account the above findings, what are your recommendations?

Answer:
Given the presence of significant anxiety and some impairments in attention and memory on cognitive screening, it would be reasonable to refer Mr. F for a functional driving assessment. This would include a more in depth off road assessment as well as an on road assessment. In this particular case, not only will this assessment provide further information on whether Mr. F is fit to drive, but may also provide the opportunity for him to participate in training to assist in the implementation of compensatory techniques and to build up his confidence in order to reduce anxiety.

You discuss this recommendation with Mr. F and his wife. You also notify them that there will be a fee for this assessment that will not be covered by the provincial health insurance program.

Q4. Mr. F asks what he can expect during and following the assessment. How do you counsel him?

Answer:
You explain that the assessment is often conducted by an occupational therapist who begins initially with an off-road assessment of factors that can influence one's ability to drive. Subsequently, if the assessor believes it is safe, an on-road assessment will be done. After completing the full assessment, the assessor will advise him of the outcome. Possible outcomes include pass, fail or training. If the outcome is a fail, the Ministry of Transportation will be notified and Mr. F's license will be placed under medical suspension. When training is recommended, the number of lessons that are required is variable and depends on individual circumstances. Again, there is a fee associated with any lessons that occur after the completed assessment.

Mr. F completes his functional driving assessment and a series of 5 lessons is recommended. During these lessons, he follows a process of graded exposure and the occupational therapist incorporates relaxation training as well as education on anxiety and coping skills. At the completion of the program, Mr. F reported increased confidence, competence, and comfort as a driver, passenger and pedestrian.

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