Rehabilitation Guideline for the Management of Persons with Traumatic Brain Injury

Humanity & Inclusion
2018
Rehabilitation Guideline for the Management of Persons with Traumatic Brain Injury

| Occupational Therapy Guideline |
Foreword

In the framework of the "Advancing Medical Care and Rehabilitation Education" project in Vietnam, and with the guidance and support of the Ministry of Health, Humanity & Inclusion (previously known as Handicap International) and its partners contribute to the strengthening of medical and rehabilitation care for persons with disabilities due to brain lesion (i.e. stroke, traumatic brain injury, cerebral palsy and spina bifida and hydrocephalus).

In order to provide rehabilitation specialists (rehabilitation doctors, nurses, therapists...) with the tools they need to properly support persons with disabilities, the project, with the financial support of the United States Agency for International Development (USAID), has developed up-to-date and comprehensive "Rehabilitation Guidelines".

With the assistance of international experts and Vietnamese specialists, these guidelines have been developed based on the latest available scientific evidences or, where evidences are still lacking, internationally-recognized best-practices. The constant involvement and support received from Vietnamese medical and rehabilitation professionals in the development process ensured contextualization and ownership of these guidelines as they brought in not only their technical expertise but also their knowledge and experiences on the Vietnamese context and the local needs and resources.

Two types of documents have been developed. Besides the General Rehabilitation Guidelines, which provide wide-ranging recommendations on care provision and quality principles, more "Technical" Guidelines have also been produced for each of the targeted conditions. These technical guidelines are specific to one "type" of care (physiotherapy, occupational therapy, speech and language therapy; and for some conditions medical and nursing care as well). They provide rehabilitation professionals with more specific, detailed technical guidance, allowing them to better understand their specific role in the general rehabilitation approach and the provision of multi-disciplinary, person-centred and evidence-based care.

The result of this process is a comprehensive set of guidelines that we hope will be widely spread and support all rehabilitation actors in providing better and higher quality care to the people in need.

The present English version of the Rehabilitation Guidelines has been developed with valued support from the Vietnamese Ministry of Health. It is our hope that the Vietnamese version of the respective guidelines will be officially endorsed by the Ministry as national guidelines for rehabilitation care of persons with brain lesions.

On Behalf of Humanity & Inclusion,

Didier Demey
Country Director
Acknowledgments

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Furthermore, Humanity & Inclusion would like to thank Marlee Quinn for her support in developing these guidelines. Her commitment towards strengthening medical and rehabilitation care in Vietnam is greatly appreciated.

Finally, we would like to acknowledge and thank all the national experts and medical and rehabilitation professionals who, through their participation to the guidelines development and review workshops have greatly contributed to the development of these guidelines. In particular, we would like to recognize the members of the Guidelines Development Committee:

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<th>Description</th>
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<tr>
<td>ACE-III</td>
<td>Addenbrooke’s Cognitive Examination</td>
</tr>
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<td>ADL</td>
<td>Activities of Daily Living</td>
</tr>
<tr>
<td>COPM</td>
<td>Canadian Occupational Performance Measure</td>
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<tr>
<td>FIM</td>
<td>Functional Independence Measure</td>
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<tr>
<td>GAS</td>
<td>Goal Attainment Scale</td>
</tr>
<tr>
<td>GCS</td>
<td>Glasgow Coma Scale</td>
</tr>
<tr>
<td>ICF</td>
<td>International Classification of Functioning, disability and health</td>
</tr>
<tr>
<td>KPI</td>
<td>Key Performance Indicator</td>
</tr>
<tr>
<td>LOC</td>
<td>Loss of Consciousness</td>
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<td>MDT</td>
<td>Multidisciplinary Team</td>
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<td>MMT</td>
<td>Manual Muscle Test</td>
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<tr>
<td>MoCA</td>
<td>Montreal Cognitive Assessment</td>
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<td>MTBI</td>
<td>Mild Traumatic Brain Injury</td>
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<tr>
<td>OT</td>
<td>Occupational Therapist/Therapy</td>
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<tr>
<td>PDOC</td>
<td>Prolonged disorder of consciousness</td>
</tr>
<tr>
<td>PT</td>
<td>Physiotherapist/Physiotherapy</td>
</tr>
<tr>
<td>PTA</td>
<td>Post Traumatic Amnesia</td>
</tr>
<tr>
<td>ROM</td>
<td>Range of Motion</td>
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<tr>
<td>TBI</td>
<td>Traumatic Brain Injury</td>
</tr>
<tr>
<td>SLT</td>
<td>Speech and Language Therapist</td>
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<td>WHO</td>
<td>World Health Organisation</td>
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1. Introduction

1.1. The Need for Guidelines

There are high demands for traumatic brain injury (TBI) rehabilitation. Most TBI survivors are sent home from hospital and do not receive proper rehabilitation. Intensive care units (ICUs) become overloaded especially with those TBI survivors who persist in some of the prolonged disorder of consciousness states. Some of these may be discharged home due to lack of financial support.¹

One of the objectives of the Ministry of Health (MoH) is to “Improve and develop the network of rehabilitation establishments, improve the quality of rehabilitation services; strengthen disability prevention, early detection and intervention, and improve the life quality of persons with disabilities so for persons with disabilities to be fully integrated and participate equally in the society, and to effectively contribute to development of the community where they live in.” (MoH, 2014)

Guidance to realise the desired improvement of rehabilitation services is needed. Guidelines for rehabilitation care for main injuries and health conditions do exist in Vietnam and have been validated by the Ministry of Health in 2014. These are made of two main resource documents:

- “General Guidelines for Rehabilitation Care” describing the needs and procedures to be followed in regard to diagnosis, rehabilitation care and monitoring, and
- "Specialized Rehabilitation Procedures", a guide that provides technical description of available rehabilitation techniques as well as their fields of application, indications, contraindications and expected outcomes.

Such guidelines exist also for ‘TBI’. These MoH guidelines form a rather strong basis for the development of state of the art general and specific guidelines, based on new research findings and compatible with international evidence-based rehabilitation guidelines, and where opportune adapted to the Vietnamese context.

A broad group of national and international experts has contributed in the first semester of 2017 to the production of updated General and Specific guidelines for TBI.

The present Occupational Therapy Guidelines for TBI provide general recommendations and guidance on type of rehabilitation care to be provided as well as "cross-cutting" recommendations in regard of requirements for a system organization, multidisciplinary and comprehensive care, person-centred care, care pathway and referrals, family support and involvement, discharge and follow-up, community reintegration and social participation.

¹ TBI guidelines workshop, Hanoi Feb 2017
1.2. Who Are the Guidelines For

The present guideline is primarily a practical resource tool for Occupational Therapists who are involved in TBI rehabilitation.

They are also useful to any other professional with an interest in TBI rehabilitation including doctors, neurologists, rehabilitation doctors, nurses, physiotherapists, speech and language therapists, dieticians, orthotists, pharmacists, psychologists, specialists in public health, social, community workers and TBI survivors and their family and carers.

1.3. Aim of the Guideline

The guidelines are meant to be a resource guide for the rehabilitation management of those people in Vietnam who are affected by TBI. The guidelines are not prescriptive. They contain various ideas for management but, depending on the local situation, not all of the activities will have to be implemented. In some cases, activities should be adjusted to local circumstances.

They are also intended to not only be a practical resource but an educational tool to assist all health staff and the public as to what is necessary for facilitating effective outcomes in TBI recovery. They may also act as an awareness tool for all staff as to roles and functions of those people who are concerned with TBI rehabilitation. They can be simplified in order to adapt to low level trained staff and for the TBI survivor and family themselves.

Finally, the guidelines can help to bridge the gaps between acute and rehabilitation services especially in terms of guiding referral and communication systems between the two sectors. They can also highlight the gaps and needs in the workforce for specific staff (e.g. fully qualified occupational therapists (OT) and speech and language therapists (SLT) as well as give target recommendations for the coming 5-10 years in how to improve the primary prevention and quality of rehabilitation, including secondary prevention, of TBI in Vietnam.

1.4. Statement of Intent

The guidelines are not intended to serve as a standard of medical care. Standards of care are determined on the basis of all clinical data available for an individual case and are subject to change as scientific knowledge and technology advance and patterns of care evolve. Adherence to the guidelines will not ensure a successful outcome in every case, the ultimate judgment regarding a particular clinical procedure or treatment plan must be made in light of the clinical data presented by the patient and diagnostic and treatment options available. However, it is
advised that significant departures from these guidelines should be fully documented in the patient’s case notes at the time the relevant decision is taken.

1.5. Levels of Evidence

The following recommendations were highlighted by the guideline development group as key clinical recommendations that should be prioritised for implementation in Vietnam. The grade attributed to a recommendation relates to the strength of the supporting evidence on which the recommendation is based. It does not reflect the clinical importance of the recommendation.

<table>
<thead>
<tr>
<th>GRADE</th>
<th>Description</th>
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<tbody>
<tr>
<td>A</td>
<td>Body of evidence can be trusted to guide practice</td>
</tr>
<tr>
<td>B</td>
<td>Body of evidence can be trusted to guide practice in most situations</td>
</tr>
<tr>
<td>C</td>
<td>Body of evidence provides some support for recommendations but care should be taken in its application</td>
</tr>
<tr>
<td>D</td>
<td>Body of evidence is weak and recommendation must be applied with caution</td>
</tr>
<tr>
<td>GPP</td>
<td>Good Practice Point - Recommended best practice based on clinical experience and expert opinion</td>
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1.6. TBI Definition

TBI is an acute brain injury resulting from mechanical energy to the head from external physical forces. (New Zealand Guidelines Group, 2006)

Operational criteria for clinical identification include one or more of the following:

- Confusion or disorientation
- Loss of consciousness
- Post-traumatic amnesia
- Other neurological abnormalities, such as focal neurological signs, seizure and/or intracranial lesion.

These manifestations of TBI must not be due to drugs, alcohol or medications, caused by other injuries or treatment for other injuries (e.g., systemic injuries, facial injuries or intubation), or caused by other problems (e.g., psychological trauma, language barrier or co-existing medical conditions).

TBI can occur in the context of penetrating craniocerebral injuries but in this situation, focal neurological deficits are generally more important than any diffuse element.
1.7. TBI Epidemiology

The numbers of people with any form of TBI is difficult to ascertain due to a universal difficulty in coding of such conditions in hospitals. Many people with a mild TBI often don’t seek medical attention. It is not currently possible to identify how many people, who visit an Emergency Department or general practitioner with an injury that is coded as a head injury, actually have a TBI (New Zealand Guidelines Group, 2006). Systematic review of the literature by the WHO Collaborating Centre Task Force on Mild Traumatic Brain Injury concluded that a ‘true’ population-based rate of mild TBI would be more than 600 cases per 100,000 per year (Cassidy JD et al, 2004). That amounts to more than 560,000 cases per year in Vietnam.

Road traffic injuries are estimated to be the eighth leading cause of death globally (approximately 1.24 million people die every year on the world’s roads), with an impact similar to that caused by many communicable diseases, such as malaria (WHO, 2013). According to the WHO road traffic injuries in Vietnam (4.1%) are the fourth leading cause of death annually, killing more than 21,000 people in 2012. (WHO, 2015)

Traumatic brain injury is one of the main causes of brain death in the intensive care units and the main reasons for Severe TBI are road traffic accidents (motorbike accidents) and falls from height. (Rzheutskaya, 2012).

According to Peden et al road traffic injuries in Vietnam are now the leading cause of fatal and non-fatal injuries. Motorcycles account for approximately 95% of the total number of vehicles in Vietnam and so motorcycle users in Vietnam are most vulnerable to road traffic injuries. According to the World Health Organization, traumatic brain injury (TBI) is the main cause of fatal and non-fatal injury for motorcycle users in Vietnam. No hospital-based or community epidemiological data on TBI in motorcycle users are available in Vietnam. However, it is likely that the burden caused by TBI to the country is significant, given the very low use of motorcycle helmets and the dominance of motorcycles as the main form of transport (Peden M, Scurfield R, Sleet D, Mohan D, Hyder AA, Jarawan E, Mathers C, 2004).

1.8. Primary Prevention of TBI

Mandatory motorcycle helmet use is regarded as the single most effective approach for the prevention of TBI among motorcycle users in both developed and developing countries]. Wearing a helmet reduces the incidence, severity and mortality rates of TBI in motorcycle accidents, ranging from 20% to 45% reduction of fatal and serious head injury (Servadei F, Begliomini C, Gardini E, Giustini M, Taggi F, Kraus J. 2003). Although the use of helmets in Vietnam has steadily increased over the last decade, not all helmets are of good quality and not all wearers use the helmet correctly.
1.9. Recovery after TBI

Neurological recovery following TBI can occur over an extended period of many months or years. Fundamental to rehabilitation services is the appreciation that different people need different input at different stages in their recovery, and that sometimes lifelong support may be required.

The carers of people with significant TBI may also require support over long periods of time.

1.10. What is Occupational Therapy?

1.10.1. Definition

Occupational therapy is a client-centred health profession concerned with promoting health and well being through occupation. The primary goal of occupational therapy is to enable people to participate in the activities of everyday life. Occupational therapists achieve this outcome by working with people and communities to enhance their ability to engage in the occupations they want to, need to, or are expected to do, or by modifying the occupation or the environment to better support their occupational engagement. (WFOT, 2012)

In occupational therapy, occupations refer to the everyday activities that people do as individuals, in families and with communities to occupy time and bring meaning and purpose to life. Occupations include things people need to, want to and are expected to do.

1.10.2. The Role of the Occupational Therapist

Formal Occupational Therapy (OT) is not present as a profession in Vietnam at the time of writing. There is no Occupational Training school and some people are calling themselves OTs having had some short term OT trainings on top of their usual profession as nurse or PT. All TBI survivors should have access to an OT with specific knowledge and expertise in neurological care.

OTs work with TBI survivors to optimise their participation and independence for all daily activities (including self-care such as washing, dressing and feeding, plus leisure and livelihood). This is achieved by either working directly to address recovery of function (including motor, cognitive or perceptual function) or by adapting the task or the environment. OTs work in both the acute and rehabilitation setting and their therapy treatment is based on an assessment of each patient’s unique problems.

When there are no OTs, it is recommended that the above key elements of Occupational Therapy are taken on jointly by the rest of the multidisciplinary team.
Assessment

- Using activity analysis, in which the components of an activity are identified along with the individual’s limitations in carrying it out
- Assessing skills which impact on present activity (e.g. sensorimotor, cognitive, perceptual and psychosocial impairments)
- Assessing skills for the performance of self-care (e.g. washing, dressing, feeding), domestic (e.g. shopping, cooking, cleaning), work and leisure occupations
- Assessing social environment (e.g. family, friends, relationships)
- Assessment of physical environment (e.g. home and workplace)

Intervention

- Helping each patient achieve the highest level of independence possible
- Redeveloping physical, sensory, cognitive, and perceptual skills through activity and practice
- Promoting the use of purposeful, goal orientated activity
- Teaching new strategies to aid optimum level of function
- Advising on appropriate equipment and adaptations to enhance independent function
- Providing appropriate seating and advising on positioning
- Advising and facilitating transport and mobility issues such as driving
- Facilitating the transfer of care from acute stages through rehabilitation and discharge
- Liaising, working with, and referring to other professionals as part of a multidisciplinary team
- Educating the patient and carer in all relevant aspects of stroke care
- Liaising with support groups, and voluntary bodies

2. Pathways and Principles of Rehabilitation

2.1. Introduction

WHO describes rehabilitation as “a set of measures that assist individuals who experience, or are likely to experience, disability [resulting from impairment, regardless of when it occurred (congenital, early or late)] to achieve and maintain optimal functioning in interaction with their environments”. “Rehabilitation measures target body functions and structures, activities and participation, environmental factors, and personal factors.” (WHO, 2011)

Rehabilitation can include a variety of activities in various sectors. In the health sector, rehabilitation addresses chronic, or long-term, conditions and impairments with the goal of reversing or limiting their impact. Services may include speech therapy, physiotherapy,
occupational therapy, the provision of assistive devices, and special surgeries to correct deformities and other types of impairment.

Key aspects of rehabilitation care include:

- Multidisciplinary screening and assessment
- Identification of functional difficulties and their measurement
- Treatment planning through goal setting
- Delivery of interventions which may either effect change or support the person in managing persisting change
- Evaluation of effectiveness of the intervention
- Reporting

Rehabilitation in TBI is difficult and complex. The aim of physical rehabilitation is to aid the recovery of normal functioning as far as possible, and to provide compensatory strategies to minimise the negative impact of the symptoms that persist, ie, to increase independence through the facilitation of motor control and skills. There is strong evidence that demonstrates the effectiveness of this approach in improving functional independence.

Rehabilitation for people with clinically significant TBI may differ from rehabilitation in general due to the influence of executive deficits on the rehabilitation process. Executive deficits refer to limitations associated with primarily frontal lobe damage, which influences attention and concentration, initiation and goal direction, judgement and perception, learning and memory, speed of information processing and communication and other cognitive skills, such as planning and organisation. Rehabilitation must attend to many issues in the TBI survivor including:

- Having a compromised view of their world and evaluation of self, which may take the form of confusion to their own lack of ability, unawareness of deficits, active denial of the effects of the injury or some combination of these
- Cognitive and physical fatigue, which frequently accompanies the condition.
- The survivor may be restless, distractible, disorganised or abnormally loquacious. Their mood may be exaggerated with ready laughter or tears. The individual may be swift to argue, difficult to reason with, and may deny fatigue

### 2.2. Rehabilitation Cycle

The conventional approach to rehabilitation is a cyclical process:

#### 2.2.1. Assessment

- The patient is assessed and needs are identified and quantified;

#### 2.2.2. Goal setting
On the basis of the assessment the goals for rehabilitation of the patient are defined. These can be short term, medium term and long term goals;

A plan to reach these goals is formulated

2.2.3. Intervention

- Giving relevant treatment in order to achieve the goals;

2.2.4. Re-Assessment

- Progress is assessed as to whether the intervention has been effective in order to achieve the agreed goals. If not, then goals and consequent intervention can be revisited.

2.3. ICF

Rehabilitation can be summarised in the ICF (International Classification of Functioning, Disability and Health) model developed by WHO (2001). The ICF conceptualises a person's level of functioning as a dynamic interaction between her or his health condition, environmental factors, and personal factors. It is a biopsychosocial model, based on an integration of the social and medical models of disability. All components of disability are important and any one may interact with another. Environmental factors must be taken into consideration as they affect everything and may need to be changed.

An adapted figure of the International Classification of Functioning (ICF) (WHO, 2001) model shows the application of Occupational Therapy (OT) rehabilitation principles in stroke care:
2.4. Person Centred and Family Centred Care

Best practice service delivery when working with TBI survivors and their families is to adopt person-centred and family-centred approaches.

Treatment and care should take into account individual needs and preferences. Patients should have the opportunity to make informed decisions about their care and treatment, in partnership with their healthcare professionals. If the patient agrees, families and carers should have the opportunity to be involved in decisions about treatment and care. Families and carers should also be given the information and support they need (NICE, 2014).

A person-centred approach should underpin the goal setting process. Treatment goals are more likely to be achieved if patients are involved in setting them. Moreover, there is also evidence that this goal setting process has positive therapeutic value in encouraging the patients to reach their goals. (Hurn et al, 2006)
Person-centred practice places the individual in the centre and emphasises building partnerships with TBI survivors and their families in which they are valued members of the rehabilitation team. It emphasises four aspects:

- Each individual is unique
- Each individual is an expert in their own lives
- Partnerships are key
- There is a focus on an individual’s strengths

Person centred practice situates power and control with the person and their family. It tailors supports to achieve the person’s goals and future and aims for social inclusion, valued roles, and community participation.

Family-centred practice adopts a similar philosophy to person-centred practice and goes further to recognise that families and carers are pivotal decision makers when working with TBI survivors. Family-centred practice is made up of a set of values, attitudes, and approaches to services for TBI survivors and their families. The family works with service providers to make informed decisions about the services and supports the TBI survivor and family receive. In a family-centred approach, the strengths and needs of all family members and carers are considered. The family defines the priorities of the intervention and services. It is based on the premises that families know the TBI survivor best, that optimal recovery outcomes occur within a supportive family and community environment and that each family is unique. Service provides support and respect each family’s capacity and resources. Family capacity includes the knowledge and skills the family requires to support the TBI survivor’s needs and well-being. Capacity is the amount of physical, emotional and spiritual energy necessary to support the TBI survivor, and it directly influences the sense of competency a family member experiences when caring for a TBI survivor.

**Recommendation**

> Rehabilitation services should adopt the philosophies of person-centred and family-centred practice

### 2.5. Multidisciplinary Approach

A central aspect of TBI recovery is through a well-coordinated team approach. This can be achieved by a specialised multidisciplinary team of health professionals. This team involves the use of integrated medical, nursing and allied health skills and can involve social, educational and vocational services to provide individual assessment, treatment, regular review, discharge planning and follow up. As a team the following are necessary:
- Regular multidisciplinary meetings and case conferences to encourage coordination and updates of information
- Ensuring documentation about specific care of the TBI survivor is clear and accessible to all of the team
- Specific liaison with other professionals, teaching staff, the TBI survivor and family/carer
- Setting and meeting appropriate goals
- Supporting the TBI survivor and family/carer by encouraging their involvement in all aspects of care
- Liaison with other healthcare professionals through networks and specific training in the management of TBI

Multidisciplinary team approaches utilise the skills and experience of individuals from different disciplines, with each discipline approaching the patient from their own perspective in separate, individual consultations.

An interdisciplinary team approach integrates separate discipline approaches into a single consultation. That is, the patient-history taking, assessment, diagnosis, intervention and short- and long-term management goals are conducted by the team, together with the patient, at the one time. The patient is intimately involved in any discussions regarding their condition or prognosis and the plans about their care. (Jessup, 2007)

2.6. Intensity and Duration of Occupational Therapy Rehabilitation
The rehabilitation process should begin as soon as possible (at least within 72 hours) following a TBI\textsuperscript{[A]}. Occupational therapists should be guided by rehab doctors regarding when it is first safe to begin assessment, this could be as early as within hours of the injury, particularly for those patients in post-traumatic amnesia (PTA).

For optimal outcomes, higher intensity rehabilitation, featuring early intervention should be delivered by specialist multidisciplinary teams\textsuperscript{[B]}.

For people who continue to make functional gains and have the ability to participate, increased amounts of rehabilitation should be considered with an aim of providing approximately 45 minutes per day for at least five days per week\textsuperscript{[GPP]}.

### 2.7. Risk Assessment and Intervention

Upon initial Occupational Therapy assessment, immediate risks are to be assessed as soon as possible to enable correct and safe management of the person from staff, family and/or carers\textsuperscript{[A]}.

Areas to be assessed by the OT can include:
- Cognitive orientation (time, place and person)
- Where indicated and achievable, OT to administer the A-WPTAS to screen for PTA within 24 hours of injury
- Aggression and impulsivity
- Position, moving and handling
- Falls: standardized assessment is best completed by PT whereas the OT can assess falls risk during functional activities e.g. toileting and showering
- Swallowing (communicate with MDT for information regarding swallow function): OT can consider the risk of aspiration relative to their positioning during feeding
- Functional transfers: toilet, chair, wheelchair, bed
- Pressure injury risk (includes continence status): Nursing may use a standardized assessment such as the Braden scale. OT must assess risk in the context of positioning, transfers and shearing, maintenance of hygiene/continence, specialist equipment needs such as mattresses and seating.
- Communication skills: the ability to express basic needs and comprehend basic instruction on the ward

The OT does not need to complete all of the above in isolation as an MDT approach to assessment is the most effective. For example, it is anticipated that nursing would complete a standardized assessment of pressure injury risk which the OT can draw on.
2.8. Reporting

The OT should record all assessments and interventions completed with each individual in a shared file utilized by the entire MDT\textsuperscript{[GPP]}. This enables efficient MDT work and reduces repetition of assessment and intervention across disciplines. A common file is an efficient means to communicate information to the MDT throughout the therapy process.
3. The Rehabilitation Cycle

3.1. Occupational Therapy Assessment

In all areas of assessment covered within the guidelines, it is assumed that once assessment outcomes are available, education is immediately provided to the patient and their family/carer in order to decrease any new risk associated with new impairments.

**Note: Assessment of non-verbal/aphasic patients**
Where possible, joint OT and Speech and Language Therapy (SLT) assessment of patients who have difficulty with receiving and/or communicating their needs should be provided.

In the absence of SLT expertise, other strategies may be used, such as: the use of picture cards whereby patients can point to items which represent their needs e.g. toilet, hunger; Patients may also be able to communicate by writing their needs down on paper or using gestures such as thumbs up/down.

3.1.1. Acute Assessment

**(I) Post-traumatic amnesia screening and assessment**
Evidence demonstrates that post traumatic amnesia testing is a valuable predictor of intelligence impairment following a traumatic brain injury (Königs M, de Kieviet J, Oosterlaan J, 2012).

Post-traumatic amnesia (PTA) is the time after a period of unconsciousness and/or head strike when the injured person is conscious and awake, but is behaving or talking in a bizarre or uncharacteristic manner.

The person has no continuous memory of day-to-day events, and recent events may be equally affected, so that they are unable to remember what happened a few hours or minutes ago. PTA may last for a few minutes, hours, days, weeks or even, in rare cases, months and since it impacts a TBI survivor’s cognitive ability significantly, assessment and monitoring is essential to acute care management and rehabilitation planning.

General guide to severity as per the Mayo Classification System for Traumatic Brain Injury Severity. (Friedland, 2013)

**(II) Definite Moderate-Severe TBI**
If one of the following was present: death due to this TBI, loss of consciousness of 30 minutes or more, post-traumatic amnesia of 24 hours or more, worst Glasgow Coma Scale score in the first 24 hours <13 (unless invalidated by factors such as intoxication, sedation, systemic shock).
In addition if there was evidence of haematoma, contusion, penetrating TBI, haemorrhage, brain stem injury the TBI would be classified as Definite Moderate-Severe TBI.

(III) Probable Mild TBI
Made if one or more of the following criteria apply: loss of consciousness is momentary to 30 minutes and PTA does not extend beyond 24 hours. If the individual sustains a depressed, basilar, or linear skull fracture (dura intact), then the TBI is still a probable MTBI.

(IV) A classification of Possible TBI
Made if one or more of the following symptoms are present: blurred vision, confusion, dazed, dizziness, focal neurological symptoms, headache or nausea

Duration of PTA has been shown to positively correlate with severity of impairment and inversely with the likelihood of the patient returning to work.

Abbreviated Westmead Post Traumatic Amnesia Scale (A-WPTAS)\textsuperscript{(AI)}
The A-WPTAS \textsuperscript{2} is designed to be used primarily in acute care environments. It may also be used in a sub-acute ward environment for the ongoing assessment of patients transferred from the Emergency Department or for the assessment of patients who have had an in-hospital fall.

Criteria for use:
- The form is to be used within 24hrs of injury for patients with a suspected closed blunt head injury or evidence of head strike
- GCS of 13-15 at the scene or on arrival
- Loss of consciousness (LOC) and/or
- Presents as confused/disorientated
- Patients must be opening their eyes spontaneously and obeying commands to be suitable for an A-WPTAS assessment.
- The form is validated for use in adults but may also be used in paediatrics ≥8yrs old

If the patient is unable to score 18/18 after four trials (one hour apart), then the PTA daily screening assessment is indicated

PTA daily screen\textsuperscript{3} \textsuperscript{(B)}
- Daily testing should be carried out until the TBI survivor is able to achieve a score of 12/12 on three consecutive days
- Patients with aphasia can be tested with visual prompts

\textsuperscript{2} http://psy.mq.edu.au/GCS/A_WPTAS.pdf
\textsuperscript{3} http://psy.mq.edu.au/GCS/WestmeadPTAScale(2009).pdf
- Patients family should be provided written information regarding PTA and management strategies

Often in Vietnam, it is unlikely that a patient who cannot achieve 12/12 on a PTA screen but appears to be well functioning otherwise will agree to stay in hospital until their score has improved; this is often due to time and financial pressures.

In this case, OT should provide the patient and family/carer education regarding the risks of returning home too early and ensure that an informed decision is being made (GPP).

OT should provide the patient and their family/carer written information regarding mild traumatic brain injury (MTBI) which includes clinical signs to look for which may indicate the patient is deteriorating and needs to return to hospital urgently (GGP).

In the case where the person has been cleared of PTA (has scored 12/12 for three consecutive days), the person and their family should also be provided written information regarding MTBI and the need for monitoring once returned home (B).

### 3.1.2. Sub-acute and rehabilitation phase

#### (I) Initial Occupational Therapy interview assessment

A general screening of all key OT areas should be completed during the initial meeting with the patient and the family or in the case of PTA; initial assessment with the patient should begin once the patient is appropriate (GPP). Areas include:
- TBI survivor/family/carers expectations
- Medical information
- Social situation
- Pre-morbid (injury) level of function
- Current level of function
- Provisional hypothesis to guide further assessment planning
- Plans for the next session; Goals may be stated however often this stage is too early to make therapy goals
- The initial interview will guide further assessment.

#### (II) Specific assessment

A specific assessment, indicated after PTA has resolved, includes:
- Cognition
- Vision
- Perception
- Sensation
- Balance
- Upper limb
- Pain/subluxation
- Function: personal, domestic and community ADLs; Ability to communicate needs on the ward; Transfers and mobility; Activity endurance and sleep disturbance.
- Home assessment
- Seating and wheelchair needs
- Wheelchair assessment
- Emotional functioning and psychosocial issues

**Cognitive assessment**

> Standardized assessment

The OT should routinely screen all people post PTA and TBI for cognitive deficits; the MoCA \(^4\) is a suitable tool for most cognitive screening in TBI\(^5\). Where a problem is identified, carry out a comprehensive assessment using valid and reliable standardized tools (where possible) to inform intervention. OT should use the same tool to measure effectiveness of interventions over time but should consider methods to decrease learned responses such as alternatives offered by MoCAtest.org.

Availability of in-depth cognitive assessment tools in Vietnamese is limited. OTs may choose to apply English based assessments with use of live translation to Vietnamese where possible. Tools such as the ACE-III assessment \(^5\) may be considered where clinical skills and knowledge of the assessing OT can support the use of the tools. \(^6\)

The OT should have an awareness of the Ranchos levels of cognitive functioning \(^6\) to inform the cognitive presentation of each TBI survivor \(^7\).

> Non-standardized assessment\(^8\)

Where standardized tools are not available, the OT can assess how the patient is able to receive, process and communicate ideas, thoughts and actions on the ward and during activity through behavioural observation. This includes the patient’s executive function, particularly the assessment of insight into personal risk and their own capabilities.

This form of assessment can be completed through observation of the patient engaging in activity such as personal care and/or domestic tasks. A focus on assessing areas of memory, attention, visuoconstructional skills, executive function and language should underpin assessment.

**Vision**

OTs can screen each TBI survivor for new visual impairment\(^9\). Areas of assessment include:

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\(^8\) [https://www.strokenine.ca/pdf/moca-stm.pdf](https://www.strokenine.ca/pdf/moca-stm.pdf)

- Double Vision (Diplopia)
- Convergence
- Visual tracking (pursuits)
- Crude acuity - ability to recognize objects / number of fingers you are holding up etc
- Colour detection
- Visual fields
- Visual inattention

Where the OT lacks training in visual assessment, discussions with medical staff that have assessed vision can also be a useful way of gaining information on a patient’s vision.

At a minimum, the OT should ask the patient and family if there are any visual difficulties to report, however this is the least reliable method of assessment.

**Perception**

MDT assessment of perception is recommended and ongoing review of perceptual ability throughout the rehabilitation process is necessary to inform precise interventions.

> Hemispatial neglect and inattention

OT can use standardized assessment such as the star cancellation ⁷ or the clock drawing test ⁸ to screen for a potential neglect and spatial awareness difficulty. There is much evidence to support the use of these tools for stroke patients; however, these can also be applied in the TBI setting.

Non-standardized assessment such as observation of activity such as feeding or personal care tasks should be routinely carried out by the OT. In addition, OTs can ask the person basic questions about their perception of the environment to gather more information e.g. can you please describe both sides of the room?

Further areas of perception should be assessed such as:

- *Right and left discrimination* of their own body and the environment e.g. can the person distinguish the left side of their body from their right side? ⁹
- *Spatial relations* ¹⁰:
  - OT can assess depth perception and the patient’s awareness of their position in space relative to their environment through observation of activity
- *Motor Planning / Apraxia* ¹⁰:
  - Can the patient plan and execute meaningful upper limb activity e.g. make a cup of tea, brush their teeth?

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⁷ [https://www.strokengine.ca/pdf/starcancellation.pdf](https://www.strokengine.ca/pdf/starcancellation.pdf)
⁸ [https://www.strokengine.ca/pdf/CDTSampleCircle.pdf](https://www.strokengine.ca/pdf/CDTSampleCircle.pdf)
Can the patient make meaningful gestures? E.g. wave goodbye, blow out a match.

**Sensation**

> Screening and non-standardized assessment

- OT can assess the person’s ability to detect light and deep touch, hot and cold and sharp and blunt sensation over the surface of the upper limbs bilaterally with vision occluded. This can be done with practical local tools which provide each type of sensation safely.

> Standardized assessment

- The application of the author protected Semmes Weinstein monofilament test can be applied only where: 1. The test is available, 2. The OT has training in its application and; 3. The patient presents with a complex sensory impairment and will undergo specific sensory retraining intervention.

> Proprioception

- Assess the ability of the person to recognize the position of each upper limb in space (static); assess distal (thumb, index finger, wrist) to proximal (elbow and shoulder).

> Kinaesthesia

- Assess the ability of the person to recognize the position of the upper limbs in space during movement.

> Agnosia

- Can the person recognize and make sense of visual information in isolation?
- Can the person distinguish between sounds and recognize familiar sounds in isolation?
- Can the person recognize and correctly identify which area of the body is being touched in isolation?

> Stereognosis

- Can the person recognize objects by tactile information only? E.g. can the person recognize chopsticks in their hand with vision occluded?

**Balance**

Functional assessment of balance is recommended. OT can assess static and dynamic balance through observation of activity for example:

> Static balance assessment (standing and sitting): Can the patient sit on the edge of the bed independently or without a loss of balance? Can the patient stand to brush her/his teeth independently or without a loss of balance?

> Dynamic balance (standing and sitting): Can the patient reach down to take pick up shoes from the floor independently or without a loss of balance? Can the patient wash themselves and complete other bathing tasks in standing/sitting independently or without a loss of balance?
Seating and wheelchair needs assessment

An immediate assessment of seating needs should be completed as part of
- The pressure injury risk assessment and
- ADL, functional mobility and transfer assessment.

Assessment should include\textsuperscript{[A]}:
- Ideal posture and positioning including fixed and correctable elements\textsuperscript{2}
- Consideration for secondary complications such as pressure injury, shortening of muscles and contractures (British Society of Rehabilitation Medicine, 2004)
- Effects of gravity on posture
- Level of functional ability

Additional factors should be considered for each individual including\textsuperscript{[A]}:
- Length of time the wheelchair will likely be needed for
- Ability of the patient to propel their own wheelchair
- Upper limb and lower limb function
- The environment in which the wheelchair will be used e.g. indoor and outdoor mobility, community mobility, ground surfaces the chair will be used on
- Activities the wheelchair will be used for e.g. mobility, feeding, grooming
- Availability, affordability and maintenance needs of the different types of wheelchairs and how this suits each individual

Upper limb assessment

Upper limb strength, movement and function should be thoroughly assessed within the MDT context\textsuperscript{[A]}. If the Physiotherapist has assessed muscle strength and tone, then a focus on assessment of upper limb function only is indicated by OT. The role of OT/PT in upper limb assessment will vary in each clinical setting and specific discipline roles in assessment should be defined where possible to reduce repetition and encourage MDT participation.

\textbf{> Assessment for subluxation of the shoulder}
- Gently palpating the glenohumeral joint to detect a subluxation\textsuperscript{[A]}
- Questioning for reports of pain

\textbf{> Assessment of global and local (upper limb) pain\textsuperscript{[GPP]}}
- Questioning the patient for reports of pain when static and moving
- Assess for pain through safe mobilization and meaningful activity
- Gather further information through discussions with the MDT

\textbf{> Dominance}
- Is the patient normally right or left handed?
> Tone
  - Use of the Modified Ashworth Scale (MAS)\(^9\) to assess tone is recommended \[^{[A]}\].

> Muscle strength
Use of the standardized Manual Muscle Test (MMT) 0-5 scale to assess strength is recommended\[^{[A]}\].

> Range of Motion\[^{[GPP]}\]
Functional assessment of passive and active ROM is recommended through observation of meaningful upper limb activity e.g. ability to feed self, ability to wash hair, ability to turn a key, ability to close a button or do up a zip.

> Coordination\[^{[GPP]}\]
Screening for coordination difficulties of the upper extremity can include finger to nose test and/or opposing the thumb to touch the tip of each finger\[^{[C]}\].

If difficulty is detected, functional assessment of coordination is recommended. Observation of meaningful tasks and activity include personal and domestic ADLs which are focused on upper limb use e.g. grooming hair, dressing and feeding\[^{[GPP]}\].

> Functional use

Standardized tools
  - Use of the box and block assessment \(^{10}\) to assess general upper limb function is recommended as this allows measurement of progress over time\[^{[B]}\].
  - Use of the nine-hole peg test \(^{11}\) to assess general fine motor control and function is also recommended to measure progress over time\[^{[C]}\].

Examples of other standardised tests that are useful in measuring changes in upper limb function are:
  - Wolf Motor Function test (WMFT) \(^{12}\)
  - Action Research Arm Test (ARAT) \(^{13}\)
  - Fugl-Meyer Assessment Upper Extremity (FMA-UE) \(^{14}\)

Non-standardized assessment\[^{[GPP]}\]
  - Observational assessment of the functional use of upper limbs is necessary to inform the patient’s current functional status, their level of independence and to inform the goal

\(^9\) https://www.sralab.org/sites/default/files/2017-06/Modified%20Ashworth%20Scale%20Instructions.pdf
\(^{10}\) https://www.sralab.org/sites/default/files/2017-06/Box%20and%20Blocks%20Test%20Instructions.pdf
\(^{11}\) https://www.sralab.org/sites/default/files/2017-07/Nine%20Hole%20Peg%20Test%20Instructions.pdf
\(^{12}\) http://www.midss.org/sites/default/files/wolf_motor_function_test_instructions.pdf
setting and therapy planning process. Upper limb function should be assessed throughout all relevant ADLs (fine motor and gross motor activities) and their use in functional transfers and mobility.

Assessment of Activities of Daily Living

In all functional tasks the OT considers cognition, impulsivity and behaviour, spatial perception, physical function, activity endurance and sleep disturbance which may impact participation and performance\(^{[A]}\). The OT may wish to use a standardized assessment such as the FIM \(^{15}\) or Barthel Index \(^{16}\) to measure change over time.

> Bed mobility and functional transfers\(^{[GPP]}\)

Assessment of bed mobility may be completed with another discipline e.g. Physiotherapy. Assess the patient’s ability to:

- Position and re-position self correctly in the bed
- Bridge to enable lower limb dressing and moving up and down in bed
- Rolling to left and right sides
- Move from lying to sitting
- Move from sitting up in bed to sitting on the edge of the bed
- Assess whether the patient would benefit from adaptive equipment to improve their bed mobility such as a bed pole or additional supportive cushioning to improve position

Assessment of transfers may be completed with another discipline e.g. Physiotherapy. Assess the patient’s ability to\(^{[GPP]}\):

- Sit to stand from the bed, chair, toilet
- Assess all relevant transfers e.g. wheelchair to the toilet, bed to chair
- If relevant assess motorbike and/or car transfers when indicated

Following assessment of bed mobility and transfers, education and guidance should be provided to the patient, family/carer and other staff involved with mobilizing the patient regarding level of assistance that is required and any risks to be aware of.

> Personal Activities of Daily Living

Observational assessment should be carried out in the ward setting. OT should assess the following\(^{[A]}\):

- Patient’s ability to toilet themselves on the ward
- Patients ability to dress/undress, bathe, dry and groom themselves
- Patient’s ability to feed themselves and drink
- Assess any safety issues and make immediate recommendations to be communicated to the patient, family/careers and the MDT for level of assistance in subsequent personal care activities e.g. patient requires one person to assist them with toileting.

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\(^{15}\) https://www.strokengine.ca/pdf/FIMappendixD.pdf

> **Domestic Activities of Daily Living**

Observational assessment can include[^1]:

- Meal and drink preparation
- Making own bed
- Folding laundry

> **Community Activities of Daily Living**

Community assessment should be completed by the inpatient OT when there is (i) An indication for community assessment and (ii) Immediate perceived risk to the safety of the patient/family, particularly close to discharge home[^1]. Assessment may include:

- Shopping and money management
- Community ambulation and patient safety in areas with high traffic/ dangerous roads
- Public/personal transport use

**Home assessment**

An initial interview with the patient and their family regarding the layout of the home environment is necessary as part of the initial OT assessment[^2].

Prior to discharge home, an OT home visit with the patient and family is supported by current international best practice, however at present Vietnam is lacking in sufficient numbers of trained staff available to complete home assessments.

Further, geographical challenges related to distance of patients’ homes from the hospital and heavy traffic means that home visiting will likely be a lengthy process in urban areas and some rural areas. Terrain and reduced road integrity can also become a barrier to home visiting in rural and mountainous areas.

Where a home visit is possible, the OT should accompany the TBI survivor and their family member(s) and/or carer home to assess the following[^2]:

- Functional mobility and transfers
- Performance of ADLs in the home environment
- Risks in the home environment e.g. falls risks, fire hazards

During the home visit, the patient has the opportunity to practice ADLs and mobility in the home environment in order to increase confidence in the home setting and reduce risks upon discharge home.

Where home visit is not possible, it is recommended that the OT at least completes the following[^2]:

- An initial detailed home visit interview to gather information regarding the home environment
- Request family send photos of potentially problematic home areas (if possible)
- Assess the patient’s capacity to manage ADLs in a simulated environment on the ward. If there is not a formal simulated environment available, then OT should attempt to simulate the home environment as best as possible to enable contextualized ADL practice and training e.g. toileting in eastern style toilet, transferring out of a low bed or floor mat, making a meal with the same bench height as is at home.

OT can make recommendations regarding aids and adaptation that may be necessary to enhance function in the home environment immediately following the assessment where possible. This allows family to prepare the home for discharge prior to the patient’s return home (see Recommendations for home modification and management at home section of guidelines for more details).

**Emotional functioning and psychosocial issues**
- Issues related to adjustment to illness/disability and patient’s self-perception in the context of age, gender, sexuality, family and relationships should be considered;
- Patients will likely experience significant changes in mood and behaviour control due to TBI and therefore an MDT approach to the provision of patient centred assessment and intervention to promote good emotional health and behavioural management should be considered throughout the rehabilitation process.

### 3.2. Goal Setting and Therapy Planning

Following the assessment process which informs clinical reasoning, goal setting with the TBI survivor and their family is imperative.

All TBI survivors and their families should be involved in the goal setting process and their wishes and expectations should routinely be acknowledged. The use of standardized tools is recommended to enable patient centred, specific goal setting which are underpinned by both patient performance and patient satisfaction.

- The author protected Canadian Occupational Performance Measure (COPM) enables the documentation of short and long term goals but also assists the patient and the therapist to prioritize these goals. 17
- The Goal Attainment Scale (GAS) is another goal setting tool which may be considered for use (see Annex 1 for example GAS score sheet)
- OT’s should select a goal setting tool which is relevant and suitable for the clinical setting.

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17 The COPM has been translated and validated in a Vietnamese version in 2018.
Treatment planning will be completed by the OT who considers the persons’ goals, their strengths, their challenges, their personal resources and the amount of time available for rehabilitation activities. The OT should also consider resources in the home/community setting to enable ongoing rehabilitation post discharge from the inpatient setting taking into account all aspects of the ICF model.

**Timing**
Initial goal setting and treatment planning should be completed within the first week of admission to rehabilitation. However, if the person is only able to complete a short period of rehabilitation, then goal setting should begin as early as is possible.

### 3.3. Occupational Therapy Intervention

Following assessment, specific intervention to either remediate or compensate for loss in cognitive function and/or functional independence should commence as soon as possible.

**Acute setting**

#### 3.3.1. Prolonged Disorder of Consciousness (PDOC)

Interventions to improve arousal or alertness where indicated within the MDT and clinical setting:

- Multimodal sensory stimulation to improve arousal and enhance clinical outcomes
- Auditory stimulation, especially when given in a familiar voice, to increase arousal in the short term
- Increased complexity rather than intensity of stimulation to enhance effectiveness
- Work with MDT to promote optimal pressure reduction
- Work with the MDT to promote optimal posture and positioning
- Work with the MDT to maintain joint range of motion of the upper limbs

#### 3.3.2. Post Traumatic Amnesia intervention

Whilst a patient is in post-traumatic amnesia (PTA), OT interventions include environmental modification to promote recovery and family/carer education.

Optimal conditions for recovery from PTA include a dimly lit, calm and quiet room with little visual stimulation e.g. limited staff/visitors, no television no computers or phones etc and as little auditory stimulation as possible. Sleep and rest are vital to recovery and hence TBI survivors should not be woken unless it is totally necessary.

- Reduce environmental stimulation as much as possible such as noise, light, visual information as much as possible; consider using bed sheets to create a barrier around the
bed which can block some light and visual stimulation; discourage use of phones, radios
and or other electronic devices [GPP]

- Don’t wake the patient unless it is necessary
- Educate MDT (as indicated), family and other people sharing the TBI survivor’s room
  regarding the need for reduced noise, light and activity in the room
- Try to encourage family to only allow for one visitor at a time

### 3.3.3. Pressure Care Equipment Prescription

For those patients assessed as at a moderate to high risk of the development of a pressure
injury:

- OT must discuss the availability, accessibility and affordability of pressure care equipment
  with the MDT and the family [GPP]
- As soon as possible, the patient should acquire pressure relieving equipment for use on
  the ward and have considered pressure management in the home environment with OT
  guidance [GPP]
- Additionally, education regarding pressure relieving strategies such as: increasing mobility
  as much as possible, re-positioning in bed/chair every two hours, encourage weight
  shifting, correct positioning and avoiding shearing when moving the TBI survivor should
  be provided and monitored by the MDT [A]
- For those patients at moderate to high risk of developing a pressure injury, provision of a
  specialized pressure relieving mattress is recommended [A]
- Provision of a specialized pressure relieving cushion for the patient when sitting in a chair
  or in a wheelchair is recommended [A]
- Locally sourced equipment is ideal, however if financial support is available, then
  regionally sourced equipment should also be considered e.g. a patient from the Yen Bai
  (Northern Vietnam) province may consider accessing products available in Hanoi [A]

### Sub-Acute and Rehabilitation Phase

#### 3.3.4. Cognitive Rehabilitation

Cognitive interventions should not be carried out in isolation but rather in the context of the
holistic rehabilitation program that also address mood, emotion and behaviour with a focus on
enabling individuals to return to meaningful participation [A].

**([I] Insight/self-awareness)**

There is some available evidence to suggest that strategies to improve insight/awareness are
effective when embedded in an ADL focused rehabilitation program [D].

Strategies which have been used include:

- Videotaping the patient while engaged in tasks, re-play the video and have he/she rate
  his/her performance
### (II) Memory

**Restitution and compensatory strategies**

For patients with mild – moderate impairment, use of internal and external aids to enhance participation is recommended. However, for patients with severe memory impairment, a focus on developing external strategies with clear functional and meaningful goals is the aim.

**Internal**[^1]:
- Mnemonics: making associations (method of loci) with new information to enhance encoding and retrieval e.g. name-face recall, story recall; Using mental imagery to enhance encoding; Reworking information/discussing information in your own words to enhance the encoding process
- Chunking and cueing information
- Increase learning through errorless learning (practice of meaningful activity where there is little chance the patient will produce an incorrect answer)
- Use of work book based pen and paper strategies can be used but there is often limited functional change observed when the activities are not meaningful and relevant to ADLs.

**External**[^2]:
- OT can use orientation cards on the ward to assist the patient to orient themselves to time, place and person every day; Enabling the patient to begin to monitor this themselves (as is able) is recommended
- Use of aids to assist recall e.g. smart phone reminders/calendars/alarms, use of notebooks, diaries, audiotapes, making written lists
- Environmental strategies such as contextual cues and prompts to aid recall and increase independence.

### Attention

TBI survivors should be provided strategy training related to the management of attention difficulties in meaningful and relevant situations. The OT can grade tasks in their level of difficulty by (i) Altering the complexity of the task relative to the selective attention, sustained attention and alternating attention skills required for the task and (ii) Altering the environment that the task is completed in, e.g. low or high stimulus environment. Example activities include:
- Sorting and grouping money
- Categorizing items such as food, clothes, toiletries etc
- Meal preparation e.g. making a sandwich (lower complexity), cooking a bowl of noodles (higher complexity)
- Completing a task with the use of written directions only e.g. fold all of these clothes and put the red in one basket and the blue in the other basket
• Finding a named place in the community with use of maps or other external strategies (higher complexity)
• Computer based training can be useful for some TBI survivors

**Executive functioning**
Training related to the management of difficulties with planning, problem solving and goal management in personally relevant situations is recommended[^8]. For example:

• Practice of planning components of an activity prior to engagement and encouraging the person to use their own judgment throughout the process
• Increase the difficulty of activity by increasing the amount of tasks to attend too (multitasking) e.g. boiling noodles and chopping vegetables

### 3.3.5. Vision
For people with visual deficits, repetitive practice of remedial and compensatory activities can be provided such as:

• Practice reading skills, road safety, object identification and recognition, meaningful ADL practice[^GPP]
• Compensatory: scanning, prompts to turn heads to the effected side, incorporate trunk rotation[^GPP]
• The OT should encourage family to provide verbal reminders to improve efficacy[^GPP]

### 3.3.6. Perception
The majority of evidence related to intervention for perceptual related difficulties following TBI relates to stroke. However, strategies can be applied to TBI patient[^GPP].

**(I) Neglect/inattention**

• Utilize simple cues to draw attention to the effected side
• Manipulation of the effected side
• Visual scanning training in addition to sensory stimulation of the effected side through activity supported by structured feedback
• Visual anchoring used as a cue
• Scatter items across visual fields to encourage attention to effected side
• Activities requiring both sides of body in the context of functional activities
• Prism adaption may be prescribed by medical staff and be utilized as a tool for therapy
• Eye patching may be prescribed by medical staff and utilized to enhance interventions
• Mental imagery to enhance attention to and use of the neglected side[^B]

***(II) Agnosia and stereognosis**[^GPP]

• Brief compensatory interventions such as increasing the patient’s awareness of the deficit can be useful
- Compensatory strategies can be followed by training to recognize stimuli with the remaining intact senses/perceptual abilities

### 3.3.7. Upper Limb Rehabilitation

**I) Activity**

Task specific motor therapy to improve performance and engagement in meaningful ADLs is recommended\([GPP]\). For example:

- Practice of personal ADLs such as brushing teeth, combing hair and feeding
- Gross motor skills such as dressing and bathing
- Fine motor skills such as turning a key, hanging washing with pegs, smart phone use, preparing vegetables for a meal, writing shopping lists
- Bilateral training to complete tasks
- Computerized games and virtual reality training with adapted upper limb controls where available
- There is no evidence to support the use of functional electrical stimulation to improve upper limb function with TBI survivors

**II) Sensorimotor impairment**

**Weakness**

- Progressive resistance exercises may be used in selected people initially to enhance their ability to engage in functional activities
- Task specific repetitive training\([GPP]\)

**Loss of sensation**

- Although the current evidence relates to stroke, application for TBI patients is reasonable\([GPP]\)
- A perceptual learning based sensory discrimination program can be provided where the OT has received training in this form of intervention (Carey, L, Macdonell, R, Thomas, MA, 2011)
- Sensory training designed to facilitate transfer can also be provided (Carey et al, 2011)

**III) Limb apraxia**

- For patients with confirmed apraxia, tailored interventions such as strategy training can be used
- Interventions should be embedded in meaningful and relevant activities to reduce apraxic movement e.g. dressing strategies, feeding strategies\([GPP]\)

### 3.3.8. Balance, Transfers and Functional Mobility

- ADL practice which requires balance (static and dynamic), transfers and functional mobility should be used to enhance engagement in meaningful activity and improve these three aspects of function\([GPP]\).
3.3.9. ADL Rehabilitation

- TBI survivors with difficulty completing ADLs should be provided with task specific repetitive practice and trained use of appropriate assistive devices to enhance participation and independence in personal, domestic and community based ADLs[^A]

- The patient, the family and/or carer and the MDT should be advised regarding techniques and equipment to maximize outcomes related to ADL performance, sensorimotor, perceptual, cognitive and physical capacities[^B]

- Community ADL practice should be integrated into rehabilitation as appropriate which may include the practice of crossing roads, visits to local shops, completing shopping tasks and practice of money management and accessing public transport[^GPP]

- Discussions regarding return to driving may be indicated and can include information about modifications available for motor bikes and cars in Vietnam which may be relevant for the patient[^GPP]

3.3.10. Virtual reality training

- At present there is little evidence to support the use of virtual reality and computer based re-training in TBI[^D]. However, this is considered an emerging area of practice and may have some benefit for TBI survivors who require upper limb rehabilitation and to improve movement and balance.

3.3.11. Fatigue and Activity Endurance

- Education regarding fatigue post TBI should be provided for the patient and their family and/or care[^GPP]

- Education and practice regarding management strategies such as energy conservation techniques, development of optimal sleep patterns and rest schedules and the importance of avoiding alcohol and sedatives should be provided and implemented throughout the therapy program by the entire MDT[^GPP]

3.3.12. Wheelchair

(I) Prescription

There are various locally and internationally manufactured wheelchairs available in Vietnam at present. These range significantly in terms of quality and cost per seating system[^GPP]

- OTs need to work closely with the patient, family, MDT and wheelchair technician (as able) to enable the most patient-centred, sustainable and affordable option for each individual

- OTs should also take into account the maintenance needs of the chair and if it is unlikely the patient can have the chair serviced locally and/or cannot afford maintenance, then other options which are most sustainable should be considered in this context

Once the wheelchair is provided the OT and MDT should complete the following steps (WHO, 2012):
- Satisfactory fitting of the specialized wheelchair seating system to the TBI survivor in line with WHO standards at a minimum\[A\]
- Incorporation of any other necessary equipment, e.g. communication aids, ventilator, etc.
- Formal testing of the whole system for suitability and stability\[A\]
- Preliminary evaluation of achievement of objectives\[A\]
- Education for the TBI survivor and carers on how to use the wheelchair system\[2,A\]
- Formalized risk assessment\[A\]
- Implement a plan for regular review\[2,A\]

For detailed information on wheelchairs see WHO: Guidelines on the provision of manual wheelchairs in less-resourced settings and the WHO reference manual for participants.

(II) Review
It is recommended that once a person is successfully fitted with a wheelchair then\[B\]:
- The first review should be completed three months following delivery.
- Following this, review should be completed every 6-12 months, dependent on the person’s needs. (British Society of Rehabilitation Medicine, 2004)

3.3.13. Assistive Devices
- Assistive devices should be recommended where appropriate and included in all ADL based rehabilitation sessions to enhance the person’s comfort using the device(s) and to enable the person to habitually use the devices outside of therapy, in daily life\[B\]
- Devices may include: adapted cutlery and kitchen aids, dressing and bathing aids, domestic devices to assist cooking and meal preparation, mobility devices, telephone/smart phone devices to assist memory and planning.

3.3.14. Psychosocial Issues and Intervention
(I) Sexuality\[C\]
The TBI survivor and their partner (where applicable) should be offered the opportunity to discuss concerns regarding sexual issues. These may include: physical concerns regarding capacity for engagement, positioning, environmental concerns, methods for self-stimulation and the availability of assistive devices for use with or without a partner (available locally and internationally). Where indicated (and appropriate) this conversation can be had with other members of the MDT for example, medical advice regarding available medications in conjunction with OT based advice regarding safe positioning and activity endurance may be required.

Other sexuality related concerns may require attention through discussion with OT including re-integration into society and basic exploration of managing and seeking relationships. Ideally this would be supported by a Psychologist and where indicated, a Social Worker.

The topic of sexuality in Vietnam can often be sensitive and therefore appropriate precautions and preparations should be taken into account e.g. gender of the patient and the therapist, age
related considerations, sexual orientation of the patient. OT must ensure that conversations are to remain confidential and the up most respect for the patient’s goals are maintained at all times; The OT should seek senior support to assist patients with issues of sexuality as required.

(II) Psychosocial, behavioural and emotional impairments

- Functional skills training within a holistic therapy program can improve social participation, community reintegration, independent living, emotional well-being and quality of life[^A]
- Encourage the TBI survivor to engage in aerobic exercise (where possible) to improve mood and community activity is recommended[^C]
- Social skills re-training interventions are recommended to improve participation[^C]
- Peer support/counselling where available is recommended[^C]
- Referral to the MDT psychologist and social worker (where available) for assessment is recommended[^C]
- Support and education for patients and their families regarding adjustment to disability, recognizing that psychological needs may change over time and in different settings is recommended[^GPP]
- An MDT approach to support emotional functioning is recommended e.g. medical input to assess the need for medication prescription and OT input to enable management of ADLs in the context of changes in mood and behaviour[^A]

(III) Social integration and communication

- Opportunities for social integration on the ward with other patients and once returned home into the community should be explored[^GPP]
- In the inpatient setting, the use of functional activity groups can serve as a useful way to engage patients in therapy whilst providing an opportunity to practice socialization and communication[^GPP]
- Referral to social peer mentoring programs are recommended where possible[^D]
- Timing and readiness for social engagement should be assessed by the OT prior to recommendation for group therapy and social engagement.

3.4. Discharge and Follow-Up

3.4.1. Discharge Procedures

In addition to home environmental support, OT should refer the TBI survivor onto relevant and available community services[^B]. These may include:

- Community therapy services
- A private clinician
- Local social services for support regarding disability pension support and other potentially supportive services
- Linking the TBI survivor in with available local exercise and/or activity and social groups in their area as able
OT must ensure the person and family are aware of precautions to take related to completing activity in the home and the community. OT should ensure that equipment required for discharge is in place and the TBI survivor and family feel confident utilizing this at home. (American Occupational Therapy Association, 2016)

A written post-discharge care plan which details all of the aforementioned information should be provided to the person and their family and a copy should be filed in the TBI survivors file.

3.4.2. Recommendations for Home Modification and Management at Home

Following the home assessment procedures as already outlined, the OT may recommend environmental modification and/or adaption to various aspects of the home setting in order to increase safety and suitability of the environment for the patient’s new functional status, such as:

- Provision of supportive adaptations e.g. grab rails, banister railing, changes to water taps and other permanent fixtures, stair lifts (only where affordable for patient) etc
- Provision of advice regarding home modification: ramps to enhance wheelchair and frame access, platform steps, widening of doorways etc
- Provision of general advice to reduce hazards in the home e.g. removal of clutter, clear all walk ways and remove electrical cords from ground surfaces etc
- Improve the confidence of the TBI survivor and the family regarding managing ADLs at home following discharge

Where home visiting is not possible the OT should follow assessment processes as outlined in the home assessment section of this document. Preparation for return home can be assisted in the following ways:

- OT should attempt to simulate the home environment as best as possible to enable contextualized ADL practice and training e.g. toileting in eastern style toilet, transferring out of a low bed or floor mat, making a meal with the same bench height as is at home
- OT can make recommendations regarding aids and adaptions that may be necessary to enhance function in the home environment based on patient and family report and photos of the home environment
- OT can provide advice regarding the reduction of hazards in the home based on patient/family reports and photos

3.4.3. Leisure

- Targeted Occupational Therapy interventions can be used to enhance engagement in leisure activities. (National Institute for health and Care Excellence (NICE), 2014)
- The OT can utilize principles of activity analysis and adaption to enhance participation based on the patients’ goals and motivation.
3.4.4. Return to Work

- Where appropriate, advice regarding return to work may be provided to the patient and their family.
- OT should consider the patient’s functional status and physical wellbeing related to cognition, perceptual capacities, physical abilities, sensory changes and activity endurance in relation to the demands of the intended job role.
- An MDT approach when providing return to work advice should be taken, however the lead role remains with the OT.

3.4.5. Return to Driving

- Where appropriate, advice regarding return to driving may be provided to the patient and their family.
- OT should consider the patient’s functional status and physical well-being related to cognition, perceptual capacities, physical abilities, sensory changes, visual changes and activity endurance in relation to the complex demands of driving a motor bike and/or car in Vietnam.


Hurn J, Kneebone I, Cropley M. *Goal setting as an outcome measure: A systematic review*. Clinical Rehabilitation 2006;20(9):756-72


Annexes

1. Goal Attainment Scale (GAS)
# MFC Patient Objectives/Goal Attainment Scaling Sheet (GAS)

**Patient Name:**

**Hospital No.:**

**Admission date:**

**Date scored:**

**Keyworker:**

**Importance to patient:** Score into importance of 1 to 3 = very important.

**Probability of achieving (professional):** Score of 1 to 3 = probable.

**Goal attainment baseline:** Usually set at -1 (occasionally -2 if couldn't be worse).

**Goal attainment score:** 0 = goal as expected. -1 = less than expected.

- -3 = much less than expected. +3 = much more than expected. +1 = more than expected.

## PATIENT’S OBJECTIVES:

| Level of patient involvement in goal setting: | Probability | Importance | Value
|--------------------------------------------|-------------|------------|-------|

- 0 = no involvement
- 1 = minimal
- 2 = moderate
- 3 = with guidance only

<table>
<thead>
<tr>
<th>Patient’s stated objective:</th>
<th>Related measurable outcome: (0 = achievement)</th>
<th>Baseline:</th>
<th>Score:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Date set:</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

| 1                          |                                             |          |       |
|                            |                                             |          |       |
|                            |                                             |          |       |

| 2                          |                                             |          |       |
|                            |                                             |          |       |
|                            |                                             |          |       |

| 3                          |                                             |          |       |
|                            |                                             |          |       |
|                            |                                             |          |       |

**P.T.O if necessary**

<table>
<thead>
<tr>
<th>Date set:</th>
<th></th>
<th></th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Results of GAS calculation</th>
<th>Baseline:</th>
<th>Achieved score:</th>
<th>Change score:</th>
<th>Date:</th>
</tr>
</thead>
</table>
NOTES ON COMPLETION:

- Ask the patient, with help from an SLT if communication is very difficult (or relatives for patients in minimally conscious states) what are their top objectives for the period of rehabilitation e.g. to achieve by discharge (ideally 3, 4 issues at most).
- Transfer these to the first column of the GAS form as the patient/relative expresses them.
- Share these with the rest of the treating team. The Team attempts to express the patient’s Objectives in a SMART format, while still maintaining the original meaning. Sometimes a SMART objective will be only one small step towards their expressed objective if this is an unrealistic aim for the admission. SMART objectives are entered in the second column of the GAS form.
- The Team rates the probability of achieving the objective, from their perspective.
- The Team scores the baseline, usually -1 but when the problem is as bad as it could possibly be it would be scored -2. A brief description of baseline function is entered in the right hand column to justify this score.
- The reformatted Objectives are agreed with the patient (or relative) and they are asked to state the importance of each to them on a scale of 1 to 3. If an Objective is rated particularly difficult to achieve by the Team or the patient is unhappy about the wording, then the reasons for this may be best discussed in more detail by the professional with most involvement.
- After a few weeks it may be helpful to review the objectives with the patient/relatives to see if their understanding of their situation has changed and if they would like to add to or modify their top objectives. This can often be a good talking point in developing realistic expectations about rehabilitation and outcomes.
- At the final Goal Setting Meeting before discharge the Team scores the level of achievement of each Objective. If the objective has not been reached as expected (i.e. scored other than at 0) a description of the situation (the variance) should be added to justify the score.
- GAS Calculation. Use the Excel GAS calculator. The importance; probability; baseline and achieved scores of each goal are entered into the Excel formula and the resulting baseline; achieved and change scores should be copied into the boxes at the bottom of the Objectives/GAS sheet. Attach a copy of the calculation sheet to the GAS goals.
- Feedback individuals’ goal achievement at team meetings and produce cumulative data about the service annually or as required.
Disclaimer
Healthcare professionals are expected to take the present clinical guidelines fully into account when exercising their clinical judgment. However, the guidance does not override the responsibility of healthcare professionals to make decisions appropriate to the circumstances of each patient, in consultation with the patient and/or their guardian or carer.

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