Neuropsychological assessment of children and adults with traumatic brain injury

Guidelines for the NSW Compulsory Third Party Scheme and Lifetime Care and Support Scheme

2013
Introduction

The Neuropsychological assessment of children and adults with traumatic brain injury: Guidelines for the NSW Compulsory Third Party Scheme and Lifetime Care and Support Scheme 2013 (catalogue no. MAA01) (hereafter referred to as the Guidelines) have been developed to provide information on the assessment and reporting of neuropsychological impairment following traumatic brain injury (TBI) sustained or suspected to have arisen from injuries sustained in a motor vehicle crash. It is for use by:

- All parties involved in a Compulsory Third Party (CTP) claim when a claimant requires neuropsychological assessment for diagnosed or suspected TBI including claimants who are also participants in the Lifetime Care and Support Scheme (LTCSS). It is issued under section 44 of the Motor Accidents Compensation Act 1999.
- All parties involved with a LTCSS participant who is not involved in a CTP claim, but requires neuropsychological assessment for diagnosed or suspected TBI. It is issued under section 58 of the Motor Accidents (Lifetime Care and Support) Act 2006.

Neuropsychology is a division of psychology where ‘knowledge of psychology and the brain’ is applied ‘to research and diagnostically assess brain dysfunction in individuals’.1

Neuropsychological assessment provides a detailed profile of an individual’s strengths and weaknesses, and is recognised as a sensitive tool for the diagnosis of cognitive impairment, particularly in cases where changes are subtle and not evident on screening assessments or neuroimaging. It helps with diagnosis and treatment planning for people experiencing difficulties with memory, attention, language or other aspects of cognition or behaviour. Because neuropsychological conditions can worsen or improve with time and treatment, neuropsychological assessment is valued as providing a baseline for future comparison of changes over time. It can also be used in predicting and enhancing social, educational and vocational outcomes. Involves a clinical interview and a range of individually administered tests. They can range from brief consultations to detailed comprehensive evaluations involving several hours of face-to-face contact. The results of the assessment are then used to assist with developing individual treatment recommendations or plans’.2

In the NSW CTP and LTCS Schemes neuropsychological assessment is conducted predominantly for clinical purposes and may provide information on recovery, prognosis and rehabilitation. Assessment reports may also be used for medico-legal and claims management purposes. However, an assessment required for treatment and rehabilitation purposes takes priority.

These Guidelines have been developed by the Motor Accidents Authority (MAA) as the statutory corporation that regulates the NSW Motor Accidents Scheme in the provision of the CTP Scheme in partnership with the Lifetime Care and Support Authority (LTCSA) which administers the LTCSS.

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1 Psychology Board of Australia website, August 2012
2 Australian Psychological Society website, August 2012 – psychology.org.au/community/specialist/clinicalheuro/
Purpose

The purpose of the Guidelines are to provide a reference for all parties to ensure that neuropsychological assessments for injured people who are CTP claimants and LTCSS participants are conducted in a manner that:

- maximises the usefulness of assessment data and reports for the individual with TBI and other parties
- minimises the occurrence of multiple neuropsychological assessments that reduce the validity of results
- decreases the costs of a claim by reducing the need for multiple assessments
- assists parties to identify and report on TBI within the CTP and LTCS Schemes
- limits the inconvenience to injured individuals by minimising the number of assessments.

These Guidelines replace four separate documents produced in 2006.

There are significant differences in the neuropsychological assessment of children and adults, and in the assessment of mild TBI compared with moderate to extremely severe TBI. These Guidelines highlight these differences. Requests for neuropsychological assessments contrary to these Guidelines may be considered unreasonable.

Scope

These Guidelines should be used when information on an injured person’s neuropsychological functioning is required to:

- inform or report on recovery, rehabilitation planning, progress and prognosis
- assist in informing the determination of the level of permanent impairment in the CTP Scheme
- assist with informing eligibility in the LTCSS.

However, a neuropsychological assessment in isolation is not used to determine the level of impairment for the purposes of a CTP claim or establish eligibility status for the LTCSS.

Section 86 of Motor Accidents Compensation Act 1999 states that a CTP claimant must comply with any request by the person against whom the claim is made, or the person’s insurer, to undergo a medical examination or rehabilitation assessment excepting where the assessment is unreasonable, unnecessarily repetitious or dangerous.

Section 27 of the Motor Accidents (Lifetime Care and Support) Act 2006 states that a LTCSS participant must comply with any reasonable request made by the LTCSA or an assessor in connection with an assessment of or dispute about the treatment and care needs of the participant, including a request to undergo a medical examination or other examination by a health professional.

CTP claimants with severe TBI may also be participants of the LTCSS. These Guidelines apply to the conduct of neuropsychological assessments for all LTCSS participants regardless of their involvement in the CTP Scheme. Neuropsychological assessments for LTCSS participants may be used to inform eligibility determinations as well as to inform treatment, rehabilitation and care programs.
Overview
The Guidelines contain three parts to guide neuropsychological assessment in the CTP and LTCS Schemes:

- **Part 1: Arranging assessments**
  This section of the Guidelines outlines the roles, processes, responsibilities and requirements for conducting neuropsychological assessment of injured people. This part of the Guidelines establishes the procedures for arranging assessments and the mandatory sharing of reports. It has been developed to ensure all parties share relevant information, distribute neuropsychological reports and agree on the psychologist who will conduct the assessment.

- **Part 2: Conducting assessments**
  This section of the Guidelines is for psychologists who conduct neuropsychological assessments and describes the process of assessment and information required in the neuropsychological assessment report.

- **Part 3: Information and forms**
  This section of the Guidelines includes fact sheets to provide information about neuropsychological assessment and forms designed to promote communication and adherence with the Guidelines.
Part 1: Arranging assessments

Principles

This section of the Guidelines establishes the procedures for arranging assessments and the mandatory sharing of reports. It outlines the processes, responsibilities and requirements for all parties with an interest in the neuropsychological assessment of injured people who are claimants in the CTP Scheme and/or participants in the LTCSS to ensure all parties:

- understand their roles and responsibilities
- agree on the psychologist who will conduct the assessment
- are aware of the purpose and timing of neuropsychological assessment for injured people
- provide relevant information prior to assessments
- share neuropsychological assessment reports.

With effective communication and adherence with these Guidelines, neuropsychological assessments can be scheduled at appropriate intervals to provide the necessary information required for rehabilitation, CTP claims management, LTCSS participant planning and settlement purposes. This is important for injured people, particularly children and those who will require multiple assessments through the course of their development and recovery, to ensure all measures are taken to limit the number of assessments undertaken.

Neuropsychological assessments conducted for rehabilitation planning and treatment purposes take priority over medico-legal assessments.

Provision of supplementary information may negate the need for additional and unnecessary neuropsychological assessments.

In the event that an assessment is required for management or settlement of a CTP claim, or to inform eligibility of a LTCSS participant, the following should be considered before arranging a medico-legal assessment:

- **When was the last neuropsychological assessment conducted?**  
  At least 12 months, and ideally 2 years should pass between assessments. Assessments arranged more frequently than the schedule recommended in the Guidelines may impact the validity of results, place an unnecessary burden on the injured person and impose an avoidable cost.

- **When is a neuropsychological assessment likely to be required for clinical purposes?**  
  The ideal timing for assessments to inform rehabilitation will be influenced by the severity of the person’s brain injury, their age, the time since injury and any approaching transitions or milestones such as school transitions, returning to or commencing work and commencing independent living. Whenever possible, rehabilitation needs should direct the timing for neuropsychological assessments.

- **Does the person receive services from a NSW Health Brain Injury Rehabilitation Program?**  
  If the individual requiring assessment is a current patient of any of the NSW Brain Injury Rehabilitation Programs (BIRP), the BIRP will nominate the psychologist and distribute reports.

- **Can a clinical neuropsychological assessment report be used for medico-legal purposes?**  
  A clinical report has a different use and purpose to a medico-legal report. However, much of the information typically required for medico-legal purposes may be available in the report, or from the assessing psychologist, particularly when the assessment has been conducted within the preceding 12–24 months.
Can supplementary information be requested to satisfy medico-legal or other purposes?
The CTP insurer, solicitor or other party seeking additional information should contact the psychologist who most recently conducted a neuropsychological assessment to determine whether medico-legal or other appropriate information required can be provided to supplement the report. This could include information required for pre-settlement or opinion on an individual’s capacity to manage their affairs.

The specific issues to be addressed, questions to be answered and cost for providing any additional information should be negotiated prior to the provision of any supplementary documentation. The psychologist will be able to provide advice regarding the appropriateness and usefulness of any supplementary information on a case by case basis as well as advice regarding the timing of subsequent assessments for clinical purposes.

Does any supplementary information need to be shared with all parties?
The CTP insurer, solicitor or other party seeking additional information should contact all other parties advising that supplementary information is being sought from the psychologist and outlining the nature of the request. The Neuropsychological assessment notification (NAN) form (catalogue no. MAA02) can be used for this purpose. The response from the psychologist should be shared with all parties.
Roles and responsibilities

The roles and responsibilities for parties with an interest in neuropsychological assessments of CTP claimants and LTCSS participants include but are not limited to the following.

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<th>Role</th>
<th>Responsibilities</th>
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| **CTP claimants, LTCSS participants and families** | • Comply with any request by the person against whom the claim is made, the person’s insurer, or the LTCSA to undergo a neuropsychological assessment unless the assessment is unreasonable, unnecessarily repetitious or dangerous.  
  • Provide all relevant information to the assessing psychologist.  
  • Advise all parties of any other assessments conducted. |
| **Psychologist**                  | • Ensure they have received all relevant information prior to assessment (including confirmation that appropriate time has passed since any previous neuropsychological assessment).  
  • Conduct neuropsychological assessment in accordance with this Guideline, best clinical practice, ethical and professional standards.  
  • Provide a report to the relevant party for distribution in a timely manner. |
| **Medical Providers**             | • May refer the injured person for neuropsychological assessment for diagnostic purposes or to inform treatment planning.  
  • Inform all parties of the intention to arrange an assessment and agree on the psychologist to conduct the assessment.  
  • Provide all relevant information to the assessing psychologist in advance of the assessment.  
  • Use information provided in the report to inform clinical management. |
| **Rehabilitation Providers**      | • May refer the injured person for neuropsychological assessment for diagnostic purposes or to inform treatment planning.  
  • Inform all parties of the intention to arrange an assessment and agree on the psychologist to conduct the assessment.  
  • Provide all relevant information to the psychologist in advance of the assessment.  
  • Use information provided in neuropsychological report to inform direction of rehabilitation program. |
| **Lifetime Care and Support Authority** | • May refer the injured person for neuropsychological assessment for diagnostic purposes, to inform treatment, rehabilitation or care decisions, or to inform the decision for eligibility.  
  • Inform all parties of the intention to arrange an assessment and agree on the psychologist to conduct the assessment.  
  • Provide all relevant information to the psychologist in advance of the assessment. |
| **CTP insurers**                  | • May refer the injured person for neuropsychological assessment for medico-legal information, diagnostic purposes or to inform treatment planning.  
  • Inform all parties of the intention to arrange an assessment and agree on the psychologist to conduct the assessment.  
  • Provide all relevant information to the psychologist prior to the assessment.  
  • Use information provided in report to inform overall claims management.  
  • Share the report and findings with all parties. |
| **Solicitors**                    | • May refer claimant for medico-legal neuropsychological assessment to inform compensation claim status.  
  • Inform all parties of the intention to arrange an assessment and agree on the psychologist to conduct the assessment.  
  • Provide all relevant information to the psychologist prior to the assessment.  
  • Share the report and findings with all parties. |
Choosing a psychologist

The BIRP should be contacted to nominate the psychologist to conduct the neuropsychological assessment if the injured person is a current BIRP patient. In other situations, such as claimants with mild TBI who may not be a patient of the BIRP, all parties (including both plaintiff and defendant representatives) should agree on the psychologist.

The psychologist must be registered with the Psychology Board of Australia (PsyBA) and be competent to conduct neuropsychological assessments. Competence can be determined by endorsement for approved areas of practice which specifies advanced qualifications or supervised experience according to the Guidelines on area of practice endorsements issued under section 39 of the Health Practitioner Regulation National Law. The PsyBA Register of practitioners which includes endorsed areas of practice is available at ahpra.gov.au/Registration/Registers-of-Practitioners.aspx

Parties arranging assessments are responsible for ensuring the psychologist is appropriately registered, endorsed and competent to conduct the assessment. The psychologist must be cognisant of General Principle ‘B.1. Competence’ of the Australian Psychological Society (APS) Code of Ethics, as adopted by the PsyBA, when determining whether they are able to provide a neuropsychological assessment. Registered psychologists endorsed in Clinical Neuropsychology as an approved area of practice by the PsyBA are qualified and competent to conduct neuropsychological assessments. The psychologist must be able to complete the assessment report in a suitable time frame and agree to adhere to the Guidelines. Costs should also be agreed while arranging the assessment.

The party initiating the assessment should inform all other parties and provide information about the assessment and the nominated psychologist by completing the NAN form. They will also be responsible for distributing reports to all parties (ie the rehabilitation provider, the individual’s solicitor, the LTCSA, the CTP insurer and its solicitor) as soon as they are available.

Any dispute regarding the psychologist nominated to conduct an assessment must be raised with the party initiating the assessment within 10 working days after advice has been provided and the following process applied.

1. The initiator provides a list of three suitably qualified, available and accessible psychologists competent to conduct a neuropsychological assessment to the other party.
2. The responder may select one from this list or nominate an alternative three.
3. The initiator may select one from the alternative list.
4. If none are selected, the parties submit evidence of their disagreement to the Principal Information Officer at the MAA’s Claims Advisory Service. The parties should not submit the names of psychologists they have suggested.
5. The Principal Information Officer will randomly select an appropriate psychologist (from the MAS Medical Assessor list on the MAA website) to conduct the assessment. Any psychologist on this list may be selected including those previously nominated by either party.

Disputes about whether a neuropsychological assessment is reasonable and necessary may be referred to the LTCSA or the Motor Accidents Assessment Service.

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3 Psychology Board of Australia’s Guidelines on area of practice endorsements issued under the Health Practitioner Regulation National Law Act 2009
4 Endorsement to practice Clinical Neuropsychology by the Psychology Board of Australia requires competency which should be distinguished from professional interest groups such as the Australian Society for the Study of Brain Impairment, the International Neuropsychological Society and the National Academy of Neuro-psychologists (USA). Membership of such groups does not necessarily imply competency in clinical neuropsychology. Only registered psychologists with Psychology Board of Australia endorsement in the practice area of Clinical Neuropsychology can use the title clinical neuropsychologist.
Scheduling assessments

The scheduling of an assessment will be influenced by the severity of the injured person’s TBI, their age, the time since injury, the progress of the claim and/or their LTCSS participant status. A number of issues should be considered when determining whether a neuropsychological assessment is required, including but not limited to the following:

- Many people with moderate to severe TBI, and most children with TBI will usually be monitored by a treating rehabilitation team. It is recommended that neuropsychological assessments are conducted by a psychologist on the treating team when possible.

- Current evidence indicates that the most appropriate clinical management of uncomplicated mild TBI is to provide information about the effects on injured people and their families, and advise on management strategies. It is not always clinically indicated to perform a neuropsychological assessment for people with mild TBI, especially when the injury is uncomplicated.

- There are a proportion of people who have sustained a mild TBI who may experience persistent sequelae. The timing and number of assessments for clinical purposes will vary depending on clinical indicators for these injured people.

- Assessments for settlement purposes may not be advisable until the injured person’s condition has stabilised. For children it is recommended that this assessment is delayed until late adolescence or early adulthood as it is not possible to confidently predict future needs while the child is still developing (except in some cases of extremely severe TBI).

- When settlement is pursued prior to the recommended time, it is strongly advised that the final assessment is performed at least one year and ideally two years after the previous assessment.

Neuropsychological assessments should only be scheduled when clinically indicated and in consideration of the following:

<table>
<thead>
<tr>
<th>Mild traumatic brain injury</th>
<th>Adults</th>
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<tbody>
<tr>
<td><strong>Children</strong></td>
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<tr>
<td>Assessments should only occur if clinically indicated and:</td>
<td>Assessments should only occur if clinically indicated and:</td>
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<tr>
<td>• at least three months post-injury or when problems arising from the reported brain injury are first detected (a longer time period may be required if the child is under four years at the time of injury)</td>
<td>• at least three months post-injury or when problems arising from the reported brain injury are first detected</td>
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<tr>
<td>• at least 12 months after initial assessment</td>
<td>• where required for the determination of capacity for return to work or study</td>
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<tr>
<td>• before settlement (assessments for settlement purposes should be undertaken once a child’s cognitive profile is stable)</td>
<td>• before settlement</td>
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<tr>
<td>• for some injured children with complicated mild TBI the recommendations for scheduling assessments for moderate TBI may be applicable.</td>
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<tr>
<th>Moderate to severe traumatic brain injury</th>
<th>Adults</th>
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<tr>
<td><strong>Children</strong></td>
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<tr>
<td>Assessments should only occur if clinically indicated and:</td>
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<tr>
<td>• within the first six months post-injury (if the child is under four years at the time of injury, wait until prior to commencing school)</td>
<td>• within the first six months post-injury (if not delayed by medical and physical concerns)</td>
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<td>• at major transitions such as starting high school or when considering post-school options</td>
<td>• where required for the determination of capacity for return to work or study, guardianship, financial management or independent living</td>
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<tr>
<td>• prior to eligibility determination for LTCSS participants</td>
<td>• prior to eligibility determination for LTCSS participants</td>
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<td>• before CTP claim settlement.</td>
<td>• before CTP claim settlement.</td>
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The timing and number of assessments should be guided by injury severity and clinical need. The timing of assessments for clinical purposes will vary depending on clinical indicators. It is important that medico-legal assessments do not take place at the same time as clinical reviews unless the assessment report can be shared by all parties including the treating team. A medico-legal assessment coinciding with clinical reviews at critical times during treatment and recovery can interfere with the rehabilitation process.

Neuropsychological assessments conducted for rehabilitation planning and treatment purposes take priority over medico-legal assessments. Communication and collaboration between the parties will ensure multiple assessments are not required.

Multiple assessments and practice effects

Neuropsychological assessments are sometimes repeated to measure the change attributable to spontaneous recovery, treatment effects or deterioration in brain function. However, neuropsychological tests are unlike other medical tests such as blood tests or MRI brain scans. Such medical tests can be done at repeated intervals without one assessment influencing the other. In contrast, one occasion of neuropsychological testing can have a significant impact on the results of the subsequent occasion of testing.

These ‘practice effects’ can inflate results and invalidate the opinions or recommendations made for rehabilitation. To reduce these effects and maximise reliability, the assessments need to be carefully timed and only tests with known errors of measurement should be used. Interpretation of test scores on a second occasion of testing presents considerable challenges. The complexity of interpretation is exponentially compounded the more times a person undergoes assessment on a particular test. For this reason the number of occasions of testing should be kept to a minimum. A minimum period of 12–24 months between assessments is recommended.

Due to possible practice effects, every effort must be made to ensure that these assessments do not interfere with the injured person’s rehabilitation. Before arranging a medico-legal assessment every effort should be made to acquire the required information in what is available or could be obtained through liaison with the assessing psychologist.

In order to provide an informed and valid interpretation, it is imperative that the psychologist is provided with the names of the tests used and the raw scores obtained on previous assessment for comparison with current test scores. This will allow for appropriate statistical analysis of the change in results and for the selection of tests to be included to minimise practice effects.

Fatigue and assessment

Cognitive fatigue commonly occurs following TBI and may result in impaired concentration and sub-optimal performance on neuropsychological testing. The impact of fatigue on test performance should be taken into account. When fatigue is an obvious problem appropriate rest breaks should be provided.

For people with mild TBI appropriate rest breaks during a single session may be required.

For people with moderate to extremely severe TBI, rest breaks during a single session may be appropriate, or testing over several days may be required.
Communication between parties

All parties have responsibility to communicate and share information before and after a neuropsychological assessment as outlined in the roles and responsibilities section.

A series of fact sheets, available in Part Three of the Guidelines, provide information about neuropsychological assessment for individuals undergoing assessment, their families, significant others and other parties with an interest in the information provided in reports.

To ensure that effective communication and sharing of information occurs for each neuropsychological assessment, the party arranging the assessment should facilitate the following:

- all parties informed of the assessment at least four weeks before the appointment using the NAN form
- fact sheets provided to the individual and other parties as required
- the psychologist, CTP insurer, and solicitors have the Guidelines
- the assessing psychologist and other parties are advised of any additional questions, instructions or issues to be addressed by the assessment
- all relevant information is forwarded to the psychologist conducting the assessment including:
  - the claimant’s personal details including date of birth
  - referring letter, clearly outlining the issues to be covered in the report and any additional requirements from other parties
  - relevant medical and rehabilitation reports including ambulance records, hospital and clinical notes
  - previous neuropsychological assessment reports, and any relevant test scores or data from other psychologists
  - education reports
  - employment history (where available)
  - if an interpreter is required.
- distribute the report to all parties as soon as available.

A NAN form is provided in Part Three of the Guidelines and should be used to notify all parties that an assessment has been arranged.

Use of reports

Adherence with the Guidelines by all parties will ensure that neuropsychological assessment reports will meet clinical, CTP claims management and LTCSA planning needs as well as providing important information to the injured person, their family and service providers involved in treatment, rehabilitation and care. This includes satisfying the need for information in the early recovery period that provides:

- assessment of estimated pre-injury level of functioning where possible
- evaluation of post-injury neuropsychological functioning.

Neuropsychological assessment reports may be used up to and during the process of settling a CTP claim. Reports prepared according to the Guidelines should include test raw scores and sources of normative data such that a qualified psychologist with access to the manuals and reference material would be able to provide an independent interpretation.

Test raw scores should be attached to the report for future use by other psychologists.
Part 2: Conducting assessments

This section of the Guideline is for psychologists conducting neuropsychological assessments for CTP claimants or LTCSS participants and should be read in conjunction with Part One.

The assessing psychologist is responsible for:

- ensuring their compliance General Principle ‘B.1. Competence’ of the APS *Code of Ethics*, as adopted by the PsyBA, when determining whether they are able to provide a neuropsychological assessment
- confirming receipt of, or seeking all relevant information prior to assessment
- checking that appropriate time has passed since any previous neuropsychological assessment before scheduling an appointment
- conducting neuropsychological assessment in accordance with the Guidelines, best clinical practice, ethical and professional standards
- reporting on the assessment findings
- providing the report to the party arranging the assessment for distribution to all relevant parties
- conducting the assessment in accordance with the APS *Code of Ethics* as adopted by the PsyBA.

There are significant differences in the assessment of neuropsychological function in children and adults, and in the assessment of mild or moderate-severe TBI. Any differences are highlighted in the relevant section of the Guidelines to indicate different approaches recommended according to the individual’s age or severity of injury.

This section recommends tests that are sensitive and useful for the neuropsychological assessment of all TBI. The selection of specific tests and normative data recommended in the Guidelines are examples of appropriate measures. These can be supplemented or substituted with other tests at the discretion of the psychologist depending on the circumstances of each case.
Definitions

The assessment of TBI and classification of the severity of an injury is reflected both by the depth of disturbance in consciousness (coma), as well as the duration of post-traumatic amnesia (PTA).

The Glasgow Coma Scale (GCS) (Teasdale & Jennett, 1974) score and the Children’s Coma Scale (Teasdale & Jennett, 1974) are used to assess depth of coma.

PTA is assessed using the Westmead PTA Scale, the Westmead PTA Scale for Children or the Abbreviated Westmead-PTA Scale. Clinical assessment is used to determine the duration of PTA of children under seven years and may also be used to determine the duration of PTA for older children and adults with TBI. Due care is required when interpreting PTA test scores as failure on PTA scales can occur for reasons other than amnesia.

Severity of TBI is assessed and defined as follows.

Mild traumatic brain injury

The operational definition of mild TBI (Carroll et al, 2004) is defined by the World Health Organisation (WHO) Collaborating Centre for Neurotrauma Task Force on Mild TBI as follows:

‘Mild TBI is an acute brain injury resulting from mechanical energy to the head from external physical forces. Operational criteria for clinical identification include:

i. One or more of the following: confusion or disorientation, loss of consciousness for 30 minutes or less, post-traumatic amnesia for less than 24 hours, and/or other transient neurological abnormalities such as focal signs, seizure, and intracranial lesion not requiring surgery;

ii. Glasgow Coma Scale score of 13–15 after 30 minutes post-injury or later upon presentation for healthcare.

These manifestations of mild TBI must not be due to drugs, alcohol, medications, caused by other injuries or treatment for other injuries (eg systemic injuries, facial injuries or intubation), caused by other problems (eg psychological trauma, language barrier or coexisting medical conditions) or caused by penetrating craniocerebral injury.’

Most mild TBIs are not characterised by gross structural brain changes (Giza & Hovda, 2004). Axons are stretched or twisted without being sheared or torn, and most axons recover over time (Iverson, 2005). Cellular and vascular mechanisms such as ionic shifts, abnormal energy metabolism, diminished cerebral blood flow and impaired neurotransmission have been implicated in the acute cognitive and behavioural symptoms reported following a mild TBI (Barkhoudarian et al., 2011; Giza & Hovda, 2004).

It is important to differentiate between individuals with uncomplicated mild TBI and those with a complicated mild TBI. A complicated mild TBI has been defined as meeting diagnostic criteria for mild TBI, with a trauma related abnormality – eg contusion that does not require surgery, present on the day-of-injury brain CT scan (Carroll et al, 2004). In individuals with mild complicated TBI neuropsychological performance in the early days and weeks after injury may be poorer, and longer-term cognitive outcome may be worse (Iverson, 2005) than for individuals with uncomplicated mild TBI.

5 PTA is typically measured in Australian hospitals using the Westmead PTA Scale. On the first day of testing, the score is based on answers to basic orientation questions and seven is the maximum possible score. On each subsequent day, the patient is required to also recall basic information such as the assessor’s name and face and three picture cards with the maximum score on each day being 12. PTA is considered to have ended on the first day of three consecutive days of full scores of 12 out of 12, with changed picture cards. Full details are available at psy.mq.edu.au/PTA.

6 The Westmead PTA Scale for Children (Marosszeky et al., 1993) is used to assess children over seven years.

7 Ponsford et al. (2004) and Shores et al. (2008) revised the original Westmead PTA scale for the acute measurement of PTA following mild TBI in adults. A short-form of these scales, the Abbreviated Westmead-PTA Scale (AWPTAS) has been validated to prospectively measure PTA within the first 24 hours following mild TBI in adults (Meares et al, 2011). The AWPTAS contains the five verbal orientation items from the GCS and the three picture cards. Credit is given for the performance scores from the motor response (a score of six) and eye opening (a score of four) components of the GCS. A patient is considered to be out of PTA the first time they attain optimal scores (18 out of 18). Details are available at psy.mq.edu.au/gcs. Many individuals will be out of PTA by the time they arrive at hospital or before prospective measurement of PTA begins. For these patients duration of PTA may be retrospectively evaluated (Gronwall & Wrightson, 1980; Ruff et al. 2009).
Moderate to extremely severe traumatic brain injury

Teasdale, 1995 distinguishes moderate to extremely severe TBI as follows:

- Moderate TBI is defined by a disturbance in consciousness producing a GCS score of 9–12, and a period of persistent deficits in retaining new information and processing new memories (PTA) of 1–24 hours.
- Severe TBI is defined by a GCS of 3–8, and a period of PTA of 1–7 days.
- Very severe TBI is characterised by a period of PTA of 1–4 weeks
- Extremely severe TBI is defined by a period of PTA of greater than four weeks.

TBI in children

- The Westmead PTA scale can only be used reliably in children aged seven years and older.
- Clinical assessment is used to determine duration of PTA in younger children and may also be used to determine the duration of PTA in older children.
- The Abbreviated Westmead PTA Scale has not yet been validated for assessing PTA in children.
- GCS as a severity measure is used with caution with paediatric populations, given the difficulty in assessing verbal and eye responses in younger children (Adelson & Kochanek, 1998) and its unreliability at measuring coma in infants (Ewing-Cobbs et al., 1997).
- The Children’s Coma Scale is used for assessing disturbance in consciousness (coma) in young children.

Primary TBI refers to a form of brain damage that results from mechanical forces producing tissue deformation at the moment of injury. These deformations may directly damage the blood vessels, axons, neurons and glia in a focal, multi-focal or diffuse pattern of involvement. Secondary TBI occurs as a complication of the different types of primary brain damage (Blumbergs, 1997).
Neuropsychological sequelae of traumatic brain injury

The neuropsychological sequelae of TBI are different for mild TBI compared to moderate and extremely severe TBI. Children with a TBI present with different patterns than adults. The typical patterns of impairment are described for each group.

Children with mild TBI

Children with mild TBI and their families often describe cognitive, emotional and somatic symptoms in the first few months following an uncomplicated mild TBI. These symptoms can include concentration problems, forgetfulness, fatigue and headache. These post-concussive symptoms can occur in the absence of demonstrable evidence of brain injury although CT scans are not always sensitive to identifying pathology.

The majority of children who sustain a mild TBI have excellent outcomes with no long-term impairment (Anderson et al., 2001). The persistence of post-concussive symptoms beyond approximately a three month period may reflect both injury related changes in brain functioning and non-injury related factors such as premorbid vulnerability and post-injury child and family adjustment (Yeates & Taylor, 2005; Yeates et al., 1999). There is also an increase in the possibility of poor outcome following mild TBI when two or more risk factors are present, acting to compound the effect of any one factor on recovery and outcome. For instance, children with premorbid learning or behavioural disturbance are at greater risk of poorer outcomes than children with an unremarkable premorbid history (Dennis, et al., 2000; Dennis et al., 2007; Fay et al., 2010; Farmer et al., 2002; Yeates et al., 2005).

Children who sustain a complicated mild TBI, where there is evidence of cerebral pathology have poorer cognitive outcomes compared to those who sustain an uncomplicated mild TBI (Yeates et al., 2009; Hessen et al., 2007).

Children with moderate to extremely severe traumatic brain injury

The outcome of a TBI is usually determined by an interaction of factors, that include injury factors (eg severity of injury), developmental factors (eg age at injury), time (eg time post-injury) and child/family factors (eg premorbid functioning, family functioning). Risk factors for poor outcomes include severity of injury, young age at injury and premorbid child and/or family vulnerabilities. There is an increase in the risk of poorer outcomes when two or more risk factors are present.

The research has consistently demonstrated that a moderate to extremely severe traumatic brain injury has neurobehavioural consequences that may be long-term and in the majority of cases, permanent (Catroppa et al., 2008). There is typically a dose-response relationship between injury severity and neuropsychological outcomes, with the most severe injuries resulting in the poorest outcomes.

Age at injury is known to contribute to outcome. Younger children are most vulnerable to poorer outcomes. Emerging and developing skills are the most vulnerable to impairment following a brain insult, whereas established skills are less likely to be disrupted. Nevertheless, the relationship between age at injury and outcomes is not necessarily linear. The effects of a moderate to extremely severe TBI early in life may also disrupt future acquisition of cognitive skills that occur later in development (eg high level planning). Deficits may therefore not become apparent until later in development when those skills are expected to emerge. Whilst the cognitive and behavioural sequelae of adult TBI is most often stabilised by two years post-injury, the full effects of a TBI acquired during childhood are often not established until early adulthood.

Child, family and environmental factors are increasingly being recognised as important contributors to outcome. Children and families with premorbid vulnerabilities (eg pre-injury attention difficulties, psychiatric disturbance, low socioeconomic status) are known to have poorer cognitive, behavioural and functional outcomes. The relationship between family functioning and severity of injury is known to be bidirectional (Taylor et al., 2001), whereby parent distress is related to the presence of behaviour problems and in turn, behaviour problems associated with severe TBI impact family functioning.

During childhood and adolescence, the young person has the opportunity to benefit and perhaps improve their prognostic outcomes with appropriate therapy and education supports. For this reason, it is recommended that medico-legal neuropsychological assessments for those who have sustained a moderate to extremely severe TBI, take place in late adolescence or early adulthood when their cognitive abilities are likely to have stabilised. In some cases, the prognosis for individuals with extremely severe TBI can be determined earlier.
Adults with mild traumatic brain injury

Cognitive deficits in working memory, attention, information processing and memory have been reported immediately after a mild TBI. In general, most individuals recover from these deficits within 1–3 months (Ponsford et al., 2000; Frencham, Fox and Maybery, 2005). Impairments in perceptual reasoning and verbal comprehension (indexed scores of the Wechsler scales) and motor skills have not been reported either acutely or in the longer term. Gross memory problems have not been found after the acute phase (Frencham et al., 2005).

A number of individuals report cognitive, physical and emotional symptoms immediately after and in the months following a mild TBI. This cluster of symptoms has been called Post Concussion Syndrome (PCS) (Alexander, 1995). Subjective reporting of PCS symptoms after three to six months has been described as persistent PCS. PCS symptoms are not specific to individuals with mild TBI (Iverson, 2005; Meares et al., 2011) and classification of PCS and individual symptoms in the same individuals may vary over time (Meares et al., 2011). A growing body of evidence suggests PCS symptom reporting both acutely and in the chronic period is associated with psychological distress (pre and post-injury; Silverberg & Iverson, 2011). There is less consistent evidence to support a link between mild TBI (loss of consciousness, PTA, or neuropsychological function) and PCS (Silverberg & Iverson, 2011). Factors such as pre and post injury psychiatric disorder, post-traumatic stress, pain and being female are associated with PCS-like symptoms (Meares et al., 2006; Meares et al., 2008; Meares et al, 2011; Ponsford et al., 2012). A significant range of psychiatric disorders occur following mild TBI (Bryant et al, 2010) and those such as depression may also influence symptom reporting (Lange et al, 2011). Personality traits and individual’s perceptions of their symptoms may also impact on recovery (Garden et al, 2010; Hou et al, 2012).

Adults with moderate to extremely severe traumatic brain injury

Following moderate to extremely severe TBI, a range of deficits or changes may occur in cognitive functioning. The degree of cognitive impairment is related to the severity of the injury, with more diffuse and persistent deficits occurring as the length of coma increases (Dikmen et al., 1995). In moderate to severe injuries, impairments may be observed in speech/language, orientation, attention/concentration, visuospatial skills, memory and awareness (Borgaro & Prigatano, 2002). Such deficits may be detected at one, 12 and 24 months post injury (Dikmen et al., 1990) and as long as 30 years post-injury (Himanen et al., 2006). The most persistent of these deficits may be in memory, attention, executive function and speed of information processing (Millis et al, 2001; Rohling et al., 2003; Langeluddecke and Lucas, 2003; Langeluddecke and Lucas, 2005; Mathias & Wheaton, 2007; Walker et al., 2009).
Information required in neuropsychological assessment reports

Source of background information

All sources relevant to formulating the neuropsychological opinion should be documented. This may include ambulance and hospital records, discharge summaries, nursing records if relevant, radiological reports or the reports of any other relevant investigations. Reports of subsequent investigation or intervention by any health professional, including neurologists, rehabilitation medicine specialists, psychiatrists, or other psychologists may also be included.

In general, reports of injuries other than TBI, and subsequent treatment are not relevant to the neuropsychological presentation. However, these should be included if they contain information that is used in forming the psychologist’s opinion. For example, other significant injuries which may suggest high energy at impact including facial fractures (Hohlrieder et al, 2004) or medical procedures that could confound an accurate diagnosis.

Further documentation that should be sought includes any other neuropsychological assessment report and test results, an employer’s report (if relevant), school reports and pupil records.

When the psychologist preparing the report refers to results for tests they have not conducted, they should identify the psychologist who conducted the testing, and state their qualification. Any other person who was involved in the assessment apart from the psychologist (eg interpreter, student, psychometrician) should be named and their role and qualifications described in the report.

Describing the injury

There are usually at least two sources of information describing the injury. One is the individual’s verbal description of the event, which should be identified as such. For children, a parent or caregiver will be the most likely provider of this information. If the history is given by someone other than the individual, this should be stated clearly. Another source is the record of the event from ambulance or hospital records, including the following information:

- whether or not there was loss of consciousness or alteration in mental state at the time of accident (indicate if this was objectively measured using the GCS or a subjective report)
- duration of loss of consciousness (indicate if this was objectively measured using the GCS or a subjective estimate)
- duration of post-traumatic amnesia (indicate if this was objectively measured using a PTA Scale or a subjective estimate)
- drug and/or alcohol use at the time of accident
- whether any medication with the potential to affect central nervous system functioning was administered in the early stages of medical management
- investigations conducted and results (eg CT brain scan)
- whether any medical/surgical procedures were undertaken which could confound accurate diagnosis of mild TBI (eg intubation and sedation, anaesthesia)
- evidence of confounding medical illness (eg epilepsy).

The injured person may be able to provide a description of the event; however the reliability of this will depend on their age, the length of their retrograde and post-traumatic amnesia, developmental level and cognitive abilities. It should be stated clearly whether the history is provided by someone other than the individual being assessed and include their relationship.
Presentation

The location of the assessment should be identified. Where relevant, the following aspects of the presentation should be addressed, giving due consideration to cultural factors:

- English language competence
- visual/auditory/motor problems
- symptoms of fatigue
- mood and affect and their effect on cognition
- motivation
- comprehension of task requirements
- speech including thought production and organisation of thought
- interpersonal manner
- whether there was any sensorimotor, cognitive or behavioural impediment to the administration of tasks including hemiplegia or spinal cord injury
- handedness.

Pre-injury history

Significant information about the injured person’s history is important to determine pre-injury level of functioning. Any issues that may have given rise to a neuropsychological problem need to be included in the report by including relevant information on:

- any other medical conditions, including epilepsy, and prior TBI
- history of any developmental disorders such as learning difficulties, Attention Deficit Hyperactivity Disorder or Autism Spectrum Disorder
- previous psychiatric history, including mood disorder
- relevant educational and work history should be documented. One of the main purposes would be to use this information to estimate premorbid intellectual level. When available, school reports should be reviewed.

Additional information for children, adolescents and adults should also be reported as follows:

<table>
<thead>
<tr>
<th>Children and adolescents – growth and development history including:</th>
<th>Older adolescents and adults – other factors provided by self or significant other report including:</th>
</tr>
</thead>
<tbody>
<tr>
<td>• significant pregnancy and birth history</td>
<td>• alcohol use</td>
</tr>
<tr>
<td>• developmental milestones (crawl, walk, first words, 2–3 words together)</td>
<td>• other recreational drug use, including marijuana</td>
</tr>
<tr>
<td>• premorbid use of therapy services</td>
<td>• use and exposure to language other than English.</td>
</tr>
<tr>
<td>• first language. If English is a second language, document</td>
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<tr>
<td>when child was exposed to English language consistently.</td>
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</tbody>
</table>
Information from the individual being assessed, a significant other or a parent/caregiver

An individual’s age and severity of injury will determine the reliability of information they provide. When possible and appropriate the individual being assessed should provide a spontaneous report on sequelae from the accident as well as provide responses to specific questions about:

- cognitive changes
- personality, mood, and emotional changes
- pain, including headache
- fatigue
- impact on activities of daily living
- work or academic performance
- behaviour or social changes.

It is strongly recommended that an interview with a parent/caregiver (for children) or family member/significant other (for adults) form part of the assessment to specifically provide information about:

<table>
<thead>
<tr>
<th>Child – interview with parent/caregiver including:</th>
<th>Adult – interview with significant other including:</th>
</tr>
</thead>
<tbody>
<tr>
<td>• pre-injury functioning, as well as any changes observed following the injury</td>
<td>• pre-injury functioning, as well as any changes observed following the injury</td>
</tr>
<tr>
<td>• psychosocial history and relevant family history</td>
<td>• report of the individual’s current ability</td>
</tr>
<tr>
<td>• specific information about post-injury sequelae including any academic performance, behaviour and social changes.</td>
<td>• any inconsistency with the individual’s self report and significant other’s report should also be noted.</td>
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</tbody>
</table>

Post-injury history

Parent/caregiver, self or significant other report of the injured person’s recovery or changes in function since the injury should be reported including:

- presence of emotional and/or behavioural problems
- rehabilitation and therapy services
- employment history since injury (for adults and older adolescents)
- educational achievement as documented in school reports including level of educational support (for children and adolescents attending school).

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8 Consideration should be given to using reliable and valid self-report measures (e.g. DASS, PTSD Checklist – Specific/Civilian)
9 Consideration should be given to using a numerical rating scale; verbal rating scale; visual analogue scale or other valid and reliable measures of pain (Martelli, Nicholson and Zasler, 2007)
Neuropsychological test selection

Test selection will be influenced by the severity of the injured person’s suspected or confirmed TBI and their age. The tests provided in the Guidelines are sensitive and useful for the neuropsychological assessment of all TBI and are examples of appropriate tools that may be selected to assess the domains listed. The tests recommended can be supplemented or substituted with other tests at the discretion of the psychologist depending on the circumstances of each case. It is expected that the psychologist will make test selection and conduct the assessment in accordance with the APS Code of Ethics as adopted by the PsyBA.

Test selection for children with traumatic brain injury

The neuropsychological assessment for children should address the following areas:

- post concussive symptoms (for children with mild or suspected TBI)
- estimated pre-morbid ability including the information used to determine this
- assessment of current intellectual ability including verbal comprehension and perceptual reasoning
- level of performance in specific cognitive domains including:
  - memory/learning
  - attention/speed of information processing
  - executive function
  - emotional functioning and its effect on cognition.

<table>
<thead>
<tr>
<th>Domain</th>
<th>Methods and measures of assessment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Estimated pre-morbid ability</td>
<td>A comprehensive developmental history is the most appropriate premorbid information to obtain when the child is injured early in life, prior to commencing school. In the case of young people who sustained their injury during school age years, their premorbid level of functioning can be estimated by their levels of academic functioning. It is advised that premorbid school reports and/or NAPLAN results be obtained. Additional information on premorbid functioning may be obtained from assessments of reading, receptive vocabulary or general knowledge; however these are not necessarily reliable indicators.</td>
</tr>
</tbody>
</table>
| Intellectual functioning    | Wechsler, Wechsler Preschool & Primary Scale of Intelligence – Third edition Australian (WPPSI-III), 2004  
                                 Wechsler, Wechsler Intelligence Scale for Children – Fourth Edition Australian (WISC-IV), 2005 |
| Memory/learning             | Cohen, Children’s Memory Scale (CMS), 1997  
                                 Wide Range Assessment of Memory & Learning – Second Edition (WRAML-2) |
| Attention/executive functioning | Manly et al., Test of Everyday Attention for Children (TeaCh), 1999  
                                    Delis et al., Delis Kaplan Executive Function System (D-KEFS)/2001  
                                    Gioia et al., Behavior Rating Inventory of Executive Function (BRIEF), Parent & Teacher, 2000 |
| Speed of information processing | Wechsler, Processing Speed Index (PSI) of the WISC-IV, 2005 |
                                 Subtests: Pseudoword Decoding, Word Reading, Reading Comprehension, Numerical Operations, Spelling.  
                                 Woodcock-Johnson, Academic Form B |
| Affect/behaviour            | Achenbach, Child Behaviour Check List (CBCL), 1991 |
                                 Vineland Adaptive Behavior Scale-Second Edition (VABS-II) |
Test selection for adults with traumatic brain injury

The neuropsychological assessment for adults with TBI should address the following areas:

- post concussive symptoms within the previous month (for adults with mild TBI)
- level of effort
- estimated pre-morbid ability including the information used to determine this
- assessment of current intellectual ability including verbal comprehension and perceptual reasoning level of performance in specific cognitive domains including:
  - memory/learning
  - attention/speed of information processing
  - executive function
  - emotional functioning and its effect on cognition.
- comment on the impact of any of the above on performance of activities of daily living if appropriate.

<table>
<thead>
<tr>
<th>Domain</th>
<th>Methods and measures of assessment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Level of effort</td>
<td>Tombaugh, <em>Test of Memory Malingering</em>, 1996</td>
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<tr>
<td>Effort measures from <em>Advanced Clinical Solutions</em> for the WAIS-IV and WMS-IV, Pearson, 2009</td>
<td></td>
</tr>
<tr>
<td>Estimated pre-morbid ability</td>
<td>Test of pre-morbid functioning <em>Advanced Clinical Solutions</em>, Pearson, 2009</td>
</tr>
<tr>
<td>Current intellectual function</td>
<td><em>Wechsler, Wechsler Adult Intelligence Scale – IV (WAIS-IV)</em>, 2008</td>
</tr>
<tr>
<td>Memory function</td>
<td><em>Wechsler, Wechsler Memory Scale – IV (WMS-IV)</em>, 2009</td>
</tr>
<tr>
<td>Delis et al., <em>California Verbal Learning Test II (CVLT-II)</em>, 2000</td>
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<tr>
<td>Rey Auditory Verbal Learning Test (RAVLT)</td>
<td>psy.mq.edu.au/RAVLT</td>
</tr>
<tr>
<td>Attention/speed of information processing</td>
<td><em>Wechsler, WAIS-IV Working Memory Index</em>, 2008</td>
</tr>
<tr>
<td><em>Wechsler, WAIS-IV Processing Speed Index</em>, 2008</td>
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<tr>
<td>Weschler, <em>WMS-IV Visual Memory Index</em>, 2009</td>
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<tr>
<td>Smith, <em>Oral and Written Symbol Digit Modalities Test</em>, 1992</td>
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<tr>
<td>Tombaugh, <em>Continuous Test of Information Processing (CTIP)</em>, 2008</td>
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<tr>
<td>Heaton et al., <em>Trail Making Test A</em>, 2004</td>
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<tr>
<td>Executive function</td>
<td>Heaton, Miller, Taylor and Grant, <em>Category Test</em>, 2004</td>
</tr>
<tr>
<td>Grant and Berg, <em>Wisconsin Card Sorting Test</em>, 1981</td>
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</tr>
<tr>
<td>Heaton, Miller, Taylor and Grant, <em>FAS – Controlled Oral Word Association Test</em>, 2004</td>
<td></td>
</tr>
<tr>
<td>Heaton et al., <em>Trail Making Test B</em>, 2004</td>
<td></td>
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<tr>
<td>Emotional functioning</td>
<td>Lovibond and Lovibond, <em>Depression Anxiety Stress Scales</em>, 1995</td>
</tr>
<tr>
<td>Weathers et al., <em>PTSD-Checklist-Specific (PCL-S) and PTSD-Checklist-Civilian</em> (PCL-C), 1993</td>
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</tbody>
</table>

10 The PCL-S (specific) asks about symptoms in relation to an identified ‘stressful experience’. The PCL-C (civilian) asks about symptoms in relation to ‘stressful experiences’ (ptsd.va.gov/professional/pages/assessments/ptsd-checklist.asp). Because of the difficulty in differentiating between amnesia due to TBI and psychogenic amnesia, any item relating to an inability to recall an important aspect of the trauma (in the PCL-S this is Item 8: ‘Trouble remembering important parts of the stressful experience?’) is generally omitted from the overall score and cluster score (O’Donnell, Creamer, Bryant, Schnyder, and Shalev, 2003).
Test interpretation, opinion and recommendations

Forming a neuropsychological opinion involves consideration of the test results in the context of the following factors:

- the individual’s pre-morbid ability
- psychosocial history
- cultural and linguistic background
- prior medical history
- chronic pain
- current medication
- alcohol and/or drug use
- level of motivation
- psychological status
- psychometric issues such as the quality of normative data and practice effects of repeated testing.

The opinion should be clearly stated with a summary of the evidence used in its formulation. The following may be considered:

- In your opinion was there evidence/lack of evidence that a TBI occurred? This evidence should be based on the definitions provided on page 13–14, consideration of the documented evidence (e.g., changes on CT brain scan, LOC, altered consciousness) and taking into account confounding factors.
- Did the TBI occur as a consequence of the accident in question? (i.e., comment on causation)
- The severity of the TBI, using the recommended criteria and definition of mild TBI (Carroll et al., 2004) or moderate to extremely severe TBI (Teasdale, 1995).
- Did the current performance on assessment represent an optimal effort by the individual?
- What is the individual’s current state of cognitive functioning?
- Was there evidence of a change in cognitive functioning from pre-morbid levels?
- Was there evidence of change, if any, consistent with a TBI?
- What was the course of the change? Was it immediately apparent? Did it improve or worsen over time?
- What has been the effect on the person’s behaviour, personality, mood, functional restriction in current or future capacity to work and general quality of life?
- For children, what has been the impact on the young person’s capacity to learn, their cognitive development and achievement of developmental milestones.

The likely prognosis may be required in medico-legal reports.

Recommendations for further treatment

Recommendations outlining specific compensatory rehabilitation strategies should be made if appropriate. The recommendations may also include referral to other agencies such as vocational rehabilitation, BIRP services or referral to a psychiatrist or clinical psychologist for further management.

Reporting and releasing test data

Neuropsychological assessment reports may be used up to and during the process of settling the claim. Reports prepared according to the Guidelines should include test raw scores and sources of normative data such that a qualified psychologist with access to the manuals and reference material would be able to provide an independent interpretation. Test raw scores should be attached to the report for future use by other psychologists. This allows for meaningful comparison with current test scores and enables appropriate statistical analysis of the change in results. It also allows the psychologist to select alternate forms (when available) to minimise practice effects.
Part 3: Information and forms

The information sheets and forms provided are intended to enhance understanding of the process and purpose of neuropsychological assessments for people with TBI who are CTP claimants and/or LTCSS participants. It is the responsibility of all parties to be aware of the Guidelines. The party initiating the assessment is responsible for completing and distributing the *Neuropsychological assessment notification* (NAN) form (catalogue no. MAA02) to all parties along with the distribution of the relevant fact sheets.

**Forms**
- *Neuropsychological assessment notification* (NAN) form (catalogue no. MAA02)

**Fact sheets**
- *For the injured person, relatives and significant others* (catalogue no. MAA05)
- *For psychologists and other health service providers* (catalogue no. MAA03)
- *For solicitors, CTP insurers and LTCSA staff* (catalogue no. MAA06)
- *For the party arranging the assessment* (catalogue no. MAA04)
Neuropsychological assessment notification

Information
- This form must be completed by the party initiating or arranging a neuropsychological assessment at least four weeks prior to the proposed neuropsychological assessment date and distributed by e-mail or fax to all relevant parties.
- This form has been developed as part of the *Neuropsychological assessment of children and adults with traumatic brain injury: Guidelines for the NSW Compulsory Third Party Scheme and Lifetime Care and Support Scheme 2013* (catalogue no. MAA01).
- Adherence ensures all parties with an interest in the neuropsychological assessment of claimants in the NSW Compulsory Third Party Scheme (CTP) or participants in the NSW Lifetime Care and Support Scheme (LTCSS) are notified of planned assessments and share information provided before and after assessments.

How to fill in this form
Please use black ink only and print within the boxes in BLOCK LETTERS.
Where options are provided, please mark box(es) with a ✔ to indicate selection(s).

<table>
<thead>
<tr>
<th>Name of individual to be assessed</th>
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<tbody>
<tr>
<td><strong>Title</strong></td>
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<td><strong>Family/Surname</strong></td>
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<td><strong>Given name</strong></td>
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<tr>
<td><strong>Other names</strong></td>
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<tr>
<th>Date of birth (DD/MM/YYYY)</th>
<th>Date of assessment (at least four weeks from this notification) (DD/MM/YYYY)</th>
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</table>

Compensation or claim status:
- [ ] CTP claim (insurer/claim number if known)
- [ ] LTCSA participant (LTCSA number if known)
- [ ] Both CTP claimant and Lifetime Care and Support Authority (LTCSA) participant

Previous assessment
- Date of most recent assessment (DD/MM/YYYY)
- Time since last assessment:
- Previous assessment conducted by
- Recommended reassessment date on most recent assessment (DD/MM/YYYY)

Provide reason if this assessment is at a different time than recommended in the most recent report
### Neuropsychological assessment notification

**This assessment**

- **Nominated psychologist:**
- **Unit number/Street number/Property number (include Lot or DP number if applicable):**
- **Street name:**
- **Suburb:**
- **State:**
- **Postcode:**
- **Daytime contact number:**
- **Mobile number:**
- **Fax number:**
- **Email:**
- **Reason if psychologist is different than for previous assessment:**

**Purpose/reason for this assessment (tick all appropriate):**

- Clinical review to inform progress and rehabilitation planning
- Provide additional information for WPI (CTP), or eligibility (LTCSA) determination
- Medico-legal (including settlement, claim status, diagnostic/attribution)
- Other (please specify)

**Reason if this assessment is at a different time than recommended in the most recent report:**

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**Information**

- This form must be completed by the party initiating or arranging a neuropsychological assessment at least four weeks prior to the proposed neuropsychological assessment date and distributed by e-mail or fax to all relevant parties.
- This form has been developed as part of the Neuropsychological assessment of children and adults with traumatic brain injury: Guidelines for the NSW Compulsory Third Party Scheme and Lifetime Care and Support Scheme 2013 (catalogue no. MAA01).
- Adherence ensures all parties with an interest in the neuropsychological assessment of claimants in the NSW Compulsory Third Party Scheme (CTP) or participants in the NSW Lifetime Care and Support Scheme (LTCSS) are notified of planned assessments and share information provided before and after assessments.

**How to fill in this form**

- Please use black ink only and print within the boxes in BLOCK LETTERS.
- Where options are provided, please mark box(es) with a ✔ to indicate selection(s).

**Name of individual to be assessed**

- **Family/Surname:**
- **Given name:**
- **Other names:**

**Date of birth (DD/MM/YYYY) Date of assessment (at least four weeks from this notification) (DD/MM/YYYY):**

---
This notification is provided on [Date] to the following parties (Complete all relevant or indicate if not applicable with N/A)

<table>
<thead>
<tr>
<th>Role</th>
<th>Name</th>
<th>Phone number</th>
<th>Fax number</th>
<th>Email</th>
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<tbody>
<tr>
<td>BIRP or other rehabilitation team</td>
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<td>Primary doctor or General Practitioner</td>
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<td>Case manager (if relevant)</td>
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<td>LTCSA coordinator (if relevant)</td>
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<td>CTP insurer contact (if relevant)</td>
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<td>Solicitor (if relevant)</td>
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<td>Other (specify)</td>
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</table>
**Neuropsychological assessment notification**

List all instructions, advice or information provided to the psychologist: (include reports and dates, specific opinions sought, other relevant information)

<table>
<thead>
<tr>
<th>Role Name and contact</th>
<th>Name</th>
<th>Phone number</th>
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- Refer to *Neuropsychological assessment of children and adults with traumatic brain injury: Guidelines for the NSW Compulsory Third Party Scheme and Lifetime Care and Support Scheme 2013* (catalogue no. MAA01) for further information about roles, responsibilities and process.
- Any dispute regarding the assessment must be made in writing to the initiating party within 10 working days of this notification.
- Any instructions, advice or information provided to the psychologist by other parties must be shared with all parties (include reports, specific opinions sought, other information).

This form has been completed by

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<tr>
<th>Title</th>
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Disclaimer

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Information on the latest laws can be checked by visiting the NSW legislation website [legislation.nsw.gov.au](http://www.legislation.nsw.gov.au).

This publication does not represent a comprehensive statement of the law as it applies to particular problems or to individuals or as a substitute for legal advice. You should seek independent legal advice if you need assistance on the application of the law to your situation.

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Catalogue No. MAA02 Claims Advisory Service 1300 656 919
Motor Accidents Authority, Level 25, 580 George Street, Sydney, NSW 2000

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For the injured person, relatives and significant others

You have been referred for a neuropsychological assessment to measure and evaluate your thinking and behaviour through interview, observation and testing.

The psychologist will have information about you from your doctor and others who have been providing treatment or been involved in your rehabilitation. You will be asked questions about yourself and your accident.

You will be asked questions about your current medications and drug or alcohol use as these can influence your thinking ability and test performance.

You will be given a range of tasks to complete to estimate your abilities in a number of areas. The testing can take up to six hours to complete. Breaks are provided as needed. Sometimes testing may be done over more than one day.

The assessment may cover cognitive areas (thinking skills) such as:

- general intellectual level
- memory and learning
- attention and concentration
- language
- planning and organisation
- problem solving
- effort.

The psychologist will analyse the interview, other information and the test results carefully and write a report. They may also discuss the results with your doctor, therapists, case manager, Compulsory Third Party (CTP) insurer (if relevant), Lifetime Care and Support Authority (LTCSA) coordinator (if relevant) and solicitors. The report will also be sent to these people.

Who can do neuropsychological assessments?

Psychologists who have undergone specialised training in this area conduct these assessments. These psychologists are experienced in detecting changes in thinking processes, memory and behaviour that may be the result of brain injury.

Why have a neuropsychological assessment?

Assessments help by identifying strengths and weaknesses. They are used for decisions about study or work and other areas of your life after the injury. They can also be used to help make decisions about other services that may assist you in your recovery and rehabilitation.

The results also help the CTP insurer/LTCSA and solicitor to manage your case. Neuropsychological assessment reports are shared between your treating doctor, therapists, your solicitor and the insurer and their solicitor.

The assessments may be repeated to help the psychologist measure both short and long term recovery but repeated assessments can make results less useful. If assessments are being organised by different people contact your case manager/coordinator, treating doctor or solicitor.

It is important that assessments are at least one year, and ideally two years apart (except in specific circumstances).
What should you bring?
Your reading glasses (if required), any school reports, results or certificates from any courses you have completed.

Other information
Family members or significant others attending the assessment may also be asked some questions as part of the evaluation. However, this person will not be with you during testing.

The psychologist will be able to detect if you are not attempting tasks to the best of your ability. If this occurs the assessment may be stopped. Genuine problems will be detected in the tests.

You should not bring children (unless the child is the injured person) with you as the assessment takes several hours and requires your full attention.

You should not drink any alcohol on the day of assessment. Only take medication that has been prescribed by your doctor.

Questions?
If you have any questions about your appointment contact the person who has organised the appointment for you.

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For psychologists and other health service providers

In the Compulsory Third Party (CTP) and Lifetime Care and Support (LTCS) Schemes, reports on neuropsychological assessments are used for more than informing the treating rehabilitation team to guide intervention plans and monitor recovery. The results and reports from these assessments are also useful for insurers and solicitors when considering the claim, establishing the severity of injury, determining settlement or assessing benefits. However, reports should not be arranged solely for these medico-legal purposes.

Assessments conducted for rehabilitation planning and treatment purposes take priority over medico-legal assessments, and where possible, the needs of all parties should be met through a single assessment.

Psychologists receiving referrals for assessments of people with CTP claims or who are Lifetime Care and Support Authority (LTCSA) participants have a role in ensuring the individuals are not being inconvenienced by unnecessary assessments. This can be achieved by considering the following:

- **Before accepting a referral and conducting an assessment:**
  - Check that the referring party has determined if a treating team, such as the NSW Brain Injury Rehabilitation Program, is involved with the person. If so, the assessment should be referred to the treating psychologist in the first instance.
  - Determine when the most recent assessment was conducted. Assessments should be at least one year, and ideally two years apart.
  - Review the Neuropsychological assessment notification (NAN) form (catalogue no. MAA02) to determine which other parties may have an interest in your report on the assessment.
  - If an interested party requests specific information, consider how this may be provided (e.g., within the report or as a supplement) and accommodate this request whenever possible. This reduces the need for additional assessments.

- **When arranging and during the assessment:**
  - Ensure the injured person has not recently attended another assessment before they attend the appointment.
  - Confirm which information they are required to bring to the appointment.
  - Help the injured person to understand that the information in the report may be used by all parties with an interest, including opposing solicitors.

- **After conducting an assessment and preparing a report:**
  - If a request for additional information comes after a report has been finalised, consider how this may be accommodated. Additional charges for such requests should be negotiated prior to providing supplementary information. Providing additional or supplementary information may alleviate the need for an additional assessment.
  - Discussions and alternatives when an interested party is seeking an assessment at times contrary to those indicated by the person’s recovery path. For example, could the information or documentation be provided by the treating physician or another health professional?
The Neuropsychological assessment of children and adults with traumatic brain injury: Guidelines for the NSW Compulsory Third Party Scheme and Lifetime Care and Support Scheme 2013 (catalogue no. MAA01) has been developed to inform all interested parties of their role and responsibility in the arrangement and conducting of neuropsychological assessments.

The Guidelines also contain detailed information regarding the areas of cognitive functioning that should be assessed, examples of tests that could be used and the information and opinions that should be included in the report.
Neuropsychological assessments are conducted to assess cognitive ability and functioning. In the NSW Compulsory Third Party (CTP) Scheme and Lifetime Care and Support (LTCS) Scheme these assessments are conducted with people who have sustained, or are suspected to have sustained, traumatic brain injury (TBI) in a motor vehicle crash. The information from assessments and reports is used by the treating rehabilitation team to guide intervention plans and monitor recovery.

The results and reports from these assessments are also useful for insurers and solicitors when considering the claim, establishing the severity of injury, determining settlement or assessing benefits. However, reports should not be arranged solely for these purposes if avoidable. Before recommending an assessment, insurers and solicitors must determine the expected timeframes for assessments required for informing the injured person’s rehabilitation and recovery, and work with these schedules. If there are no plans in place an assessment may be arranged. Assessments should be conducted at least one year, and ideally two years apart.

The Neuropsychological assessment of children and adults with traumatic brain injury: Guidelines for the NSW Compulsory Third Party Scheme and Lifetime Care and Support Scheme 2013 (catalogue no. MAA01) has been developed to inform all interested parties of their role and responsibility in the arrangement and conducting of neuropsychological assessments.

Important considerations for insurers and solicitors are:

- When considering arranging an assessment insurers and solicitors should:
  - find out when the most recent assessment was conducted, and when a subsequent assessment has been recommended and wait for this timeframe if possible
  - contact the psychologist who has conducted previous assessments for advice and information
  - inform all parties of the intention to arrange an assessment using the Neuropsychological assessment notification (NAN) form (catalogue no. MAA02) at least four weeks prior to the assessment date.

- If an assessment has been recently completed:
  - the insurer or solicitor should request a copy of the report
  - and a specific matter or issue of interest is not addressed in the report the psychologist should be asked to provide supplementary information to reduce the need for an additional assessment. Costs associated should be determined prior to the provision of information and all other parties advised.

- When advice that a neuropsychological assessment has been arranged by another party, (via the NAN) an insurer or solicitor should:
  - agree that the nominated psychologist is suitable to conduct the assessment or notify the other parties if there is not agreement within 10 working days of receiving the advice (see the Guidelines for details)
  - provide the nominated psychologist and all other parties with any relevant information or specific instructions in advance of the assessment date.
When a solicitor or insurer needs to arrange an assessment they must:

- advise all parties of the assessment date, psychologist and information/instructions provided by completing and distributing the NAN
- ensure that the nominated psychologist is appropriately experienced and qualified to conduct the assessment and will adhere to the Guidelines
- agree to distribute the report to all parties.

Insurers and solicitors must be familiar with their roles and responsibilities as outlined in the Guidelines. Requests for assessments that are contrary to the Guidelines may be considered unreasonable, put unnecessary burden on the injured person and may impact the validity of results due to practice effects.

Questions?

If you have any questions about an assessment or report contact the psychologist or treating physician for information, before arranging an additional assessment.
For the party arranging the assessment

Neuropsychological assessments conducted to assess cognitive ability and functioning may be required for a number of reasons including to assess the impact of a brain injury, monitor recovery and inform rehabilitation plans. Information from assessments may also be used to assist with claims and case management for injured people with NSW Compulsory Third Party Scheme (CTP) claims and those who are Lifetime Care and Support Scheme (LTCS) participants.

Neuropsychological assessments may be recommended by any party with an interest in the injured person, their recovery or claim including the:

- treatment provider, case manager or rehabilitation team
- GP or other physician coordinating care and recovery
- CTP rehabilitation advisor, injury management advisor or claims manager
- Lifetime Care and Support Authority (LTCSA) coordinator
- solicitor acting for the injured person or insurer.

To ensure that an assessment is reasonable, necessary and clinically appropriate the person initiating the neuropsychological assessment must:

- **Confirm the date of the most recent previous assessment**
  If an assessment has been conducted in the previous two years, steps must be taken to determine whether the information required can be obtained from the last report, or by requesting additional information from the assessing psychologist.

- **Determine the date recommended for the next assessment for rehabilitation purposes**
  When possible assessments should be conducted according to clinical need. An assessment required for claims management or decision making purposes should be discussed with the psychologist who conducted the most recent assessment, or a member of the treating rehabilitation team (if relevant). If an assessment is proposed that is sooner than required for clinical management the reasons must be conveyed to, and supported by, all parties.

- **Complete the Neuropsychological assessment notification (NAN) form (catalogue no. MAA02)**
  This must be distributed to all parties four weeks prior to the proposed assessment. The initiating party must also ensure that all parties are aware of the information and instructions provided to the nominated psychologist.

- **Ensure the psychologist has all relevant information prior to the assessment**
  This includes any particular instructions provided to be addressed in the report.

- **Distribute the report to all parties**

**Questions?**

If you have any questions about an assessment or report, contact the psychologist or treating physician for information, before arranging an additional assessment.
Appendices

Acknowledgements

These Guidelines are a revision of four separate documents developed in 2006. The Motor Accidents Authority thanks the working party involved in developing the original guidelines, the working party involved in this revision and all interested parties who contributed during the consultation process that informed the development of the revised Guidelines.

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