Trauma Service Guidelines
Title: **Post Traumatic Amnesia Screening and Management**
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Background

Care of the patient suffering from PTA requires a multidisciplinary approach that addresses the patient's environment, their interactions with it and both their cognition and behaviour [1].

The following guideline was developed to:

- Screen patients for the presence of PTA.
- Assist the health care team to assess patient care requirements such as environment & supervision.
- Assist with discharge planning for those patients in PTA.

What is Post Traumatic Amnesia (PTA)?

PTA is a stage of traumatic brain injury recovery and it is defined as a "…mental disturbance characterised by disorientation, impaired attention, memory failure of day-to-day events, illusions, misidentification of family, friends, medical & nursing staff" and may demonstrate behavioural changes [1].

The true pathophysiologic mechanism of PTA is not known. Symonds's (1946) and many since felt that PTA is associated with a traumatic brain injury and the shearing of the axons in the frontal and temporal lobes of the brain. These forces result in breakage, bruising and/or swelling of the axons; consequently the message pathways are interrupted and/or broken. This is commonly described as Diffuse Axonal Injury (DAI) [1-3].

The diffuse character of the injury makes it impossible to predict the nature and the extent of the damage. In PTA recovery the longer the symptoms last, the less a full recovery to a premorbid level of function is likely [4-6].

The presentation of PTA varies from person to person and they can have significant behavioural changes. Patients usually have no awareness of these changes and will usually not remember this time period when they recover.

Some features of PTA may include: (*This list is not hierarchical and patients may suffer from one or many of these [3, 7]*)

Changes to cognition or thinking
- Fixation on a single topic or activity
- Reduced problem solving or planning ability
- Confusion and disorientation
- Loss of day-to-day memory

Physical
- Headaches
- Nausea/ vomiting
- Dizziness / unsteady on feet
- Intolerance to bright light or loud noise

Changing Emotions
- Talkative or quiet
- Aggression and/or agitation/ irritable
- Depressed / withdrawn

Behaviours
- Inappropriate (swearing or sexually explicit gestures)
- Impulsive
- Poor or irregular sleep cycle
- Restlessness, thrashing, needing to wander/ impulsive

Screening Criteria for PTA

All patients with a history of a Mild Brain Injury (MBI) require screening for PTA using **Abbreviated Westmead PTA scale (A-WPTAS)** [8, 9].

The A-WPTAS is for use only from injury to 24 hours.

Mild Brain injury is defined as a head strike resulting in a ***GCS 13-15*** *with* one or more of the following [10]:

- Loss of consciousness < 30 mins.
- Confusion and disorientation (no intoxication, different from baseline).
- Retrograde or anterograde amnesia.

Note: GCS can be < 13 after the head strike, if it increases to 13-15 within 30 mins then they meet the MBI inclusion criteria.

The Abbreviated Westmead PTA Scale (A-WPTAS) [9]

The A-WPTAS is an objective measure of PTA which was developed to assist in the early identification of cognitive impairment following MBI. It combines the standardised GCS (out of 15) plus 3 memory questions to assess new learning and gauge the patient's orientation and ability to retain new information [7, 10].

To use A-WPTAS:

- Patients must be screened within the first 24 hours from time of injury.

If they meet the criteria but are unable to be screened in the first 24 hours, they should be referred to an Occupational Therapist for assessment

- GCS and LOC must be validated by healthcare professional i.e. recorded in ambulance record and not by bystanders or family.
- Patient needs to have a motor score of 6 and eye score of 4.
- It is conducted hourly for a maximum of 4 hours.
- Patients are cleared on **their first** score of 18/18.
- Patients unable to achieve a score of 18/18 within 4 hours should be referred to OT to conduct further assessments.

Note: This is a screening tool only and clinical judgement should be used. Further assessment may be required if any concerns are identified.

All patients screened for PTA should be provided with MBI education and counselling, including the written handout on TRM01.03 Mild Brain Injury Discharge brochure, this is available on iPolicy. The A-WPTAS can be commenced in the Emergency Department or on the wards by competent health professionals.

Other Considerations

The A-WPTAS is for MBI injury that results from a head strike; it is important to ensure that all other causes of loss of consciousness are ruled out when screening a patient with a MBI. Other causes include drug use, intoxication, shock, epilepsy, metabolic disturbances, infection, cerebral hypoxia, pre-existing brain injury or psychiatric disorders [9].

Drug and alcohol use and withdrawal post injury can make assessment for PTA screening and assessment difficult. A collateral history will assist to differentiate PTA from withdrawal. The Addiction Medicine team should be referred once a history of the patients drug and or alcohol use is gained to further assess and assist with the management of withdrawal if required.

Delirium and dementia can make the assessment of patients with a MBI complex. A collateral history regarding the patient's premorbid function and cognition assists in determining baseline for the patient. If a patient is at a high risk of delirium, strategies should be implemented as per MH02.02 Delirium, Diagnosis, Prevention and Management Policy [11].

Patients assessed using the Delirium Observation and Screening Scale (DOS) scoring ≥ 3 (indicating the patient is likely delirious) should have PTA assessments ceased until the patient is no longer showing signs of delirium [DOS is < 3]. These patients will need referral to OT.

Post-Concussion

Both neurosurgical and cognitive-behavioural-social symptoms can develop post a MBI. Acute life threatening complications requiring neurosurgical intervention are rare however post-concussion symptoms are common and may have a significant impact on patients and their families [2]. Concussion is defined as a traumatic injury to the brain that results in the temporary loss of normal brain function, without any identifiable structural abnormalities on imaging.

Concussion is a subset of a mild TBI, but not the same thing.

Typical post-concussion symptoms include [9]:

- Headaches
- Dizziness
- Memory impairment
- Poor concentration
- Mood swings
- Behavioural changes
- Social dysfunction

If these are ongoing after >24 hours) they may require assessment by Occupational Therapy (OT) using the Rivermead Post Concussive questionnaire [2].

Discharging a Patient Home with a Mild Brain Injury

Patients with MBI who have:

- Cleared PTA.
- Normal mental status (alertness/behaviour/cognition).
- No clinical risk factors indicating the need for CT scan or normal CT scan if performed.
- Minor and/or improving post-concussion symptoms.
- Responsible person available for transport home and supervision for 24/24.
- Patient or person responsible understands discharge instructions**.**

Whilst many patients may make an excellent physical recovery after a period of PTA, a spectrum of cognitive, emotional, functional, social, employment and learning (educational) problems can be disabling over the longer term[4 12].
Verbal and written information has been shown to reduce anxiety and reporting of ongoing symptoms. It also provides information to patients and their families on when to return to hospital to seek further immediate care and ongoing assistance or support for persistent symptoms[2, 9]. Ensure patients are provided with the TRM01.03 Mild Brain Injury Discharge brochure, this is available on iPolicy.

Assessment of PTA

Patients with a Moderate Brain Injury (GCS 9-12 > 30mins - 24hours) or any of the following require an Occupational Therapy (OT) referral for PTA assessment using the **Westmead PTA Scale (WPTAS)** [2]:

- Have sustained a moderate brain injury [GCS 9-12 >30 mins at the scene].
- Have failed the A-WPTAS (have not gained 18/18 over 4 hour timeframe).

Westmead PTA Scale 12 questions; this includes 7 for testing both normal day-to-day orientation, 5 for testing the laying down of new information as well as autobiographical memory (age & DOB). It is a standardised prospective measure of PTA and has been shown to have a high level of interrater reliability.

The WPTAS is recommended to measure PTA as it:

- Provides an index of severity of PTA symptoms.
- Monitors and provides a gross cognitive assessment of the patient.
- Helps direct the care and the environment of the patient.
- Is portable and can be conducted by a trained member of the multidisciplinary team.

PTA testing using the WPTAS begins when the patient regains consciousness and can communicate with or without verbal ability (GCS >8). The WPTAS is completed daily by a qualified member of the multidisciplinary team who has undergone relevant training. PTA testing ceases when the patient has reached the WPTAS operational definition of being **out of PTA**; achieving a perfect score of 12/12 on 3 consecutive days, therefore this test requires a minimum of 4 days for a patient to be deemed out of PTA.

Some patients will never score 12/12 on 3 consecutive days so clinical judgement may be needed to determine whether the patient has an amnestic syndrome or not. Neuropsychological opinion may be required if it is unclear whether the patient remains in PTA or has ongoing long term cognitive deficits as a result of the brain injury.

The WPTAS should be conducted in a quiet ward/ room with no distractions such as TV, food, or young children. Obvious cues or aids like clocks should be hidden or removed.

Severe Brain Injury (GCS 3-8) /Disorders of Consciousness [13]

Disorder of consciousness (DOC) refers to a range of neurological conditions including coma, unresponsive wakefulness and minimally conscious state whereby wakefulness and/or awareness is impaired as a result of a traumatic brain injury (TBI). Patients emerging from coma after severe brain injury often transition through states of altered consciousness.

Disorders of Consciousness Definitions [13, 14]

Coma is a state of unarousable unresponsiveness, lasting > 6 hours in which a person cannot be woken, fails to respond normally too painful stimuli, light or sound, lacks a normal sleep–wake cycle, and does not initiate voluntary actions.

Unresponsive wakefulness syndrome (UWS) is wakefulness with absent awareness of self or the environment (non-purposeful behaviours either spontaneously or in response to stimuli). They have no language comprehension or meaningful expression. They may have intact sleep–wake cycles and a range of reflexive and spontaneous behaviours.
Minimally conscious state (MCS) is wakefulness with minimal awareness, or a state in which minimal but definite behavioural evidence of self or environmental awareness is demonstrated on an inconsistent, but reproducible or sustained, basis.

Recovery

Emergence from a minimally conscious state is signalled by the recovery of reliable and consistent demonstration of functional interactive communication and object use.

Best practice identification and neuro-behavioural assessment of a DOC includes repeated assessments via a multidisciplinary approach with Occupational (OT) and Speech Therapy (SP) clinicians using the JFK Coma Recovery Scale – Revised (CRS-R). This is the best validated, standardised neurobehavioural DOC assessment tool currently available [15, 16]. OT and SP complete the tool and document recommendations for appropriate interventions to support recovery.

The JFK CRS-R is comprised of six subscales designed to assess arousal level, audition, language comprehension, visuoperception, motor function, oromotor capacity, expressive speech, and yes/no communication in patients with DOC. It is scored out of 23 with higher scores indicating emergence from DOC [15-17].

Once a patient is deemed to have emerged from a DOC, the OT will then commence the WPTAS as appropriate. Given the patient is now alert and able to engage, the stimulus is then reduced as per 'PTA precautions' to enable the brain time to recover and process new information.

Management of the patient in a DOC state

Unlike PTA, it is recommended that patients presenting with a disorder of consciousness are stimulated, as guided by therapists, to encourage transition through the states of altered consciousness and emerge [17].

During this time recommended stimulation includes:

- Increased personal and meaningful sensory stimulation to support progression towards DOC emergence e.g. playing music in the patient's room, having the TV on in the background or their visitors talking to the patient.
- All members of the multidisciplinary team, and their visitors should provide increased sensory stimulation.
- Encourage family members to bring in meaningful items (e.g. photos, keepsakes) to utilise in assessment tasks to increase the likelihood of stimulating a response.

It is important that we provide the patient's family and carers with regular updates regarding current DOC state and progress. They are able to observe the CRS-R assessment, however they should be informed that the tasks to stimulate neuro-behavioural responses may be confronting to witness.

See AHSP03.03 Neuro-Behavioural Assessment of a Disorder of Consciousness Guideline [13].

Recovery from TBI and the Management of a Patient in PTA

PTA is a stage of recovery from a brain injury as described above. The injured brain like other muscles and organs requires rest to fully recover once a patient emerges from coma. If used too soon or too much the brain can fatigue very quickly and become overwhelmed triggering unwanted behaviours. The management of a patient in PTA should assist them to not have to "think" too much, to keep things predictable and simple (low –stimulus). As they emerge they may be able to begin to have more structure and "stimulation".

Patients in PTA require a consistent team approach to create and maintain a low-stimulus, quiet and supportive environment. Patients recovering from a brain injury require a lot of rest with only short periods of stimulus.

The following is recommended [1]:

- Single room where possible.
- Quiet and calm environment; reduce external stimuli e.g. no TV, radio, phone, bright lights, loud noise, clutter.
- Encourage a consistent approach with routine and structure.
- Cluster activities so patients are not overwhelmed, allow enough rest in between.
- Monitor visitors – one or two at a time and for short periods only.
- Create a familiar environment; using a few key personal objects and photos.

Multidisciplinary Team: Use signage on the patients' room/ door to notify the healthcare team that the patient is in PTA and requires a modified approach to ward rounds, assessment, meals and care.

Environment: To ensure that the patient is not "over stimulated", their room should be as bare as possible. This means removing all unnecessary furniture, oxygen outlets, tables, chairs, signage (except those introduced for the management of PTA), newspapers, and magazines. Curtains should be closed and the lighting kept at a low level at all times. There should be no TV, radios, computers, iPads /phones etc. Noise as much as possible should be kept to a minimum.

Communication: When interacting with the patient, keep the conversation and instructions simple; speak in a calm and reassuring manner. Establish a reliable yes/no response as early as possible (they may require the assistance/referral to a Speech Pathologist). Patients experiencing PTA do not have the capacity to make decisions for themselves.

Routine: Appropriate Occupational Therapy/ Nursing interventions during PTA include introducing the patient to simple tasks such as personal care. It is important to note that the patient should not undergo an intensive rehabilitation program until they have "emerged" from PTA. A number of rehabilitation centres offer a low stimulus environment to assist in caring for a patient experiencing PTA.

Family: Resist pressure to make predictions about the prognosis of the patient with the family while the patient is still in PTA. It is the role of the multidisciplinary team to educate and provide support for family and friends. Families are very important to patient recovery, whilst they are unable to lay down new memories, family and friends can be an anchor point for them. Families and friends should be educated about PTA and the specific nursing care requirements and how they can help as soon as the patient is admitted to the ward. This is an opportunity to explain how to best care for the patient in PTA and ensure the family has an understanding of what PTA is and the environment they need for their recovery. The TRM01.04 Post Traumatic Amnesia Information for Family and Friends is a booklet which provides basic information and self-care instructions for the patient's loved ones and is available on iPolicy.

Changing the environment with emergence of PTA

Patients who gradually emerge from PTA can benefit from personalised rehabilitation whilst still in RMH. The introduction of external stimuli and routine retraining of Activities of Daily Living (ADL's) has been associated with improved functional outcomes [3].This can improve the patients transition into the community and reduce length of stay [6]. This should be considered in conjunction with the Occupational Therapist and the multi-disciplinary team (MDT) and may include establishing a routine with ADL's, meals and sleep wake cycle.

Considering the patients agitation level and fatigue, the routine may need to be flexible or if the patient becomes agitated, disorientated or confused during the retraining, the stimuli should be removed and reverted to previous management. This is a sign that their brain cannot cope with this activity at this time and can be noted as a trigger [18].

Management of Behaviour

Clinical aggression as defined in the MH02.02.08 Management of clinical aggression policy [19] is "a form of behaviour which causes actual or perceived harm to people and occurs with or without forethought; an act or gesture, which suggests that violence may occur".

Treatment and management of agitation in the patient in PTA is challenging. The agitated patient can resist nursing care, be disruptive, pose a physical risk to themselves, family and staff members. Agitated behaviours may include aggression, (physical or verbal), restlessness (being impulsive, pulling at IVC's, IDC's feeding tubes), confusion, fatigue, altered sleep/wake cycle [1]. Traditional management strategies for aggressive patients such as negotiation and problem solving are unlikely to be successful. Better strategies may be reassurance and distraction to settle the aggression. It is likely that the outbursts will be short lived, try speak softly, reassuringly and don't argue. Try to change the subject.

It is important to identify any acute medical reason for the agitation or change in mental state (e.g. hydrocephalus, intracranial haemorrhage/haematoma, drug and alcohol withdrawal, sepsis or medications). Environmental factors are the mainstay of PTA management. Consider and manage things that could cause the aggressions such as over stimulation, hygiene needs, pain, hunger and thirst[19]. If a patient is restless, impulsive and screened as a fall risk, for patient safety they should be nursed on the floor on a low- low bed. A behavioural special should be considered to assist in observing and managing behaviour.

Where possible sedation ***should not be used*** to manage behavioural problems, it reduces the patient's level of arousal, which can increase confusion and prolong agitation. It is recommended that ***restraints should also be avoided*** as they can lead to greater agitation and increased need for intervention. If necessary refer to MH 02.02.07 Restrictive Interventions, Mechanical, Physical, Chemical Restraint Procedure [20] .

Psychiatry review should be sought if there is severe behaviour disturbance or where there is a need for higher than recommended doses of anti-psychotic medication (subject to Psychiatry agreement). If the behaviour escalates and there is a risk of clinical aggression the steps outlined in the clinical aggression policy should be followed MH02.02.08 Management of clinical aggression policy.[19]

Discharge and Rehabilitation for Moderate and Severe Brain Injury

The multidisciplinary team should work together to determine the best discharge plan for patients who have experienced PTA. Patients who are still in PTA will require a period of acute brain injury rehabilitation.

Referral of compensable patients (e.g. TAC, Work Cover, Private Insurance) to rehabilitation should be considered in accordance with the Melbourne Health policy MH01.12 Referral of patients to Private Rehabilitation Facilities [21]. Rehabilitation choices are based on the facility that offers the best service for the patient in discussion with the patient's family.

Referral for non-compensable patients or those not accepted by private rehabilitation centers are referred to Consultation Liaison Rehabilitation and Aged Care (CLRACC) Team who will assess the patient and waitlist them for the most appropriate public ABI unit.

Patients in PTA should not be discharged home, allowed to self-discharge or have unsupervised leave from or within the hospital**.** If a patient absconds or is missing, the Melbourne Health policy MH01.09 Missing Patient/Absconded Patient should be followed [22].

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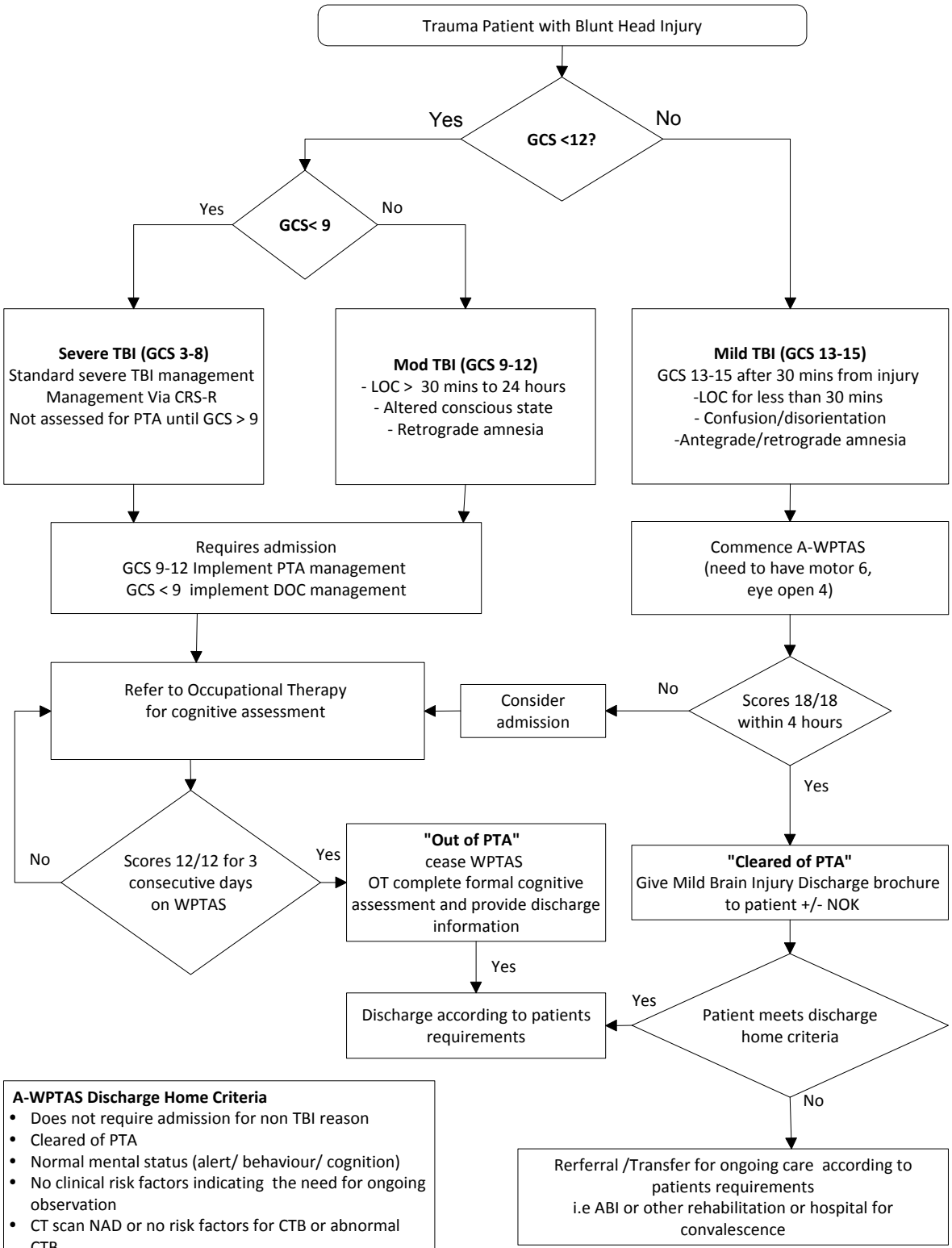

A-WPTAS Discharge Home Criteria

- Does not require admission for non TBI reason
- Cleared of PTA
- Normal mental status (alert/ behaviour/ cognition)
- No clinical risk factors indicating the need for ongoing observation
- CT scan NAD or no risk factors for CTB or abnormal CTB
- Minor improving post concussion symptoms
- Person responsible available for transportation and supervision 24/24
- Patient and or person responsible understands discharge instructions