

TRAUMATIC BRAIN INJURY – MULTIDISCIPLINARY CARE AND MANAGEMENT

<p>Cross References (including NSW Health/ SESLHD policy directives)</p>	<p>SESLHD PR380 - Falls prevention and management for people admitted to acute and subacute SESLHD PR/483 Restraint Use with Adult Patients SGSHHS CLIN ICU - Management of Acute Brain Injury Patients SGSHHS CLIN155 - Post Traumatic Amnesia (PTA) Testing - Protocol For SGSHHS CLINICU - Aggressive Behaviour Prevention and Management ICU SGH</p>
<p>1. What it is</p>	<p>A guideline for the multidisciplinary management of patients with a Traumatic Brain Injury (TBI). This includes the transfer from the Intensive Care Services to an appropriate ward as well as the coordination of appropriate discharge planning. This guideline involves all clinicians within the Trauma Multidisciplinary team as well as the patient and their families.</p>
<p>2. Risk Rating</p>	<p>Low</p>
<p>3. Employees it Applies to</p>	<p>All medical, nursing and allied health staff involved in the care of the patient with a TBI.</p>

4. Process

4.1 IDENTIFICATION OF APPROPRIATE PATIENTS

The Trauma Case Manager (TCM) is responsible for the identification of patients with a TBI admitted to St George Hospital.

Patients applicable to this CBR must meet 2 of the following criteria:

- Aged greater than 16 years of age*
- Moderate TBI (for example documented GCS of 9-12 on scene)
- Severe TBI (for example a documented GCS of 8 or less on scene)

* Paediatric patients (<16 years of age) with TBI who have a risk of deterioration and/or require surgical intervention should be referred as soon as practical to Sydney Children’s Hospital, Randwick.

Initially patients should be managed as per [SGSHHS CLIN ICU - Management of Acute Brain Injury Patients](#)

4.2 TRAUMA MULTIDISCIPLINARY TEAM MEETING (TRAUMA MDT) AND REFERRAL TO THE TBI TEAM

A trauma MDT is held weekly to discuss all Trauma patients with other medical specialties and allied health. A patient suitable for a review by the TBI team round will be identified at this meeting.

4.3 PATIENT REVIEW

4.3.1 TBI Team Round

The TBI Team Round facilitates multidisciplinary team input into complex TBI patients to ensure a safe transition from the Intensive Care Services to the ward environment. The Intensive Care Unit (ICU) Liaison is responsible for notifying the TBI team (via the paging system) who will review those identified patients within the in the Intensive Care Services.

Some patients may also require review/re-review in the ward environment also; this should be arranged by the Trauma Case Manager to follow immediately after the review of those patients in the ICU. The TBI team patient review will be conducted at a pre-arranged time and members of the TBI team round include:

- ICU Liaison nurse
- Trauma Case Manager
- 3S Clinical Nurse Educator
- 3S Nursing Unit Manager (NUM)/ 3S In-charge RN
- 3S Trauma Physiotherapist + Senior Trauma Physiotherapist
- Trauma Occupational Therapist (OT)
- 3S Social Worker
- ICU Social Worker
- Mental Health Clinical Nurse Consultant (as required)
- Bedside ICU Registered Nurse
- Rehabilitation Registrar
- Neurosurgical Registrar

4.3.2 TBI Team Round & Patient Review procedure

- Observe the patient
- Discuss their mechanism of injury, identified injuries, interventions, clinical condition/behaviour management issues, medical history, social history (including social support network, living arrangements pre-presentation, employment status) and discharge goals
- Identify when the patient is likely to be able to commence Post Traumatic Amnesia testing (PTA)
- Discuss any limitations in the progression of the patients mobility and what steps can be taken during the patients acute phase to ensure there is minimal delay in physical rehabilitation (for example – ascertaining exact weight bare/mobility status from sub-specialities, equipment required, adjuncts such as splints)
- Ensure all appropriate allied health teams are aware of the patient (drug and alcohol, speech pathologist, hand occupational therapist, clinical psychology, neuropsychology)
- Patients with TBI should be transferred at the most appropriate time in their rehabilitation trajectory and during business hours (0800-1600)– consideration should be given to the pre-existing case load on the receiving ward as well any provisions such as increased staffing that may need to be arranged prior to transfer
- Ascertain the patient requirements for a 1:1 nursing or allocation of a front, single room

4.3.3 TBI Team Round & Patient Review Plan and Documentation

The Trauma Case Manager is responsible for the documentation of the patient assessment and plan using the following as a guide:

- Identification that the entry is part of the TBI team patient review
- Those involved in the patient review

- Brief history – for example noted mechanism of injury, age, residential town/suburb
- Current clinical status – for example intubated/extubated, stable/unstable, best GCS, falls risk, current behaviour issues
- Identification of concerns – aggression risk based on medical/social history, family & social/ psychosocial requirements , pre-morbid cognitive function
- Recommendations – interventions from allied health (PTA, splints, mobility restrictions), pharmacological agents helpful in the management of difficult behaviours in TBI, ward preference (Trauma/Surgical Ward or Neurosurgical Ward), room required (single or multi patient room at front of the ward), establishment of routine
- Plan – whether the appropriate wards are able to accommodate the patient immediately or in the future in consultation with the appropriate CNE/ NUM. Also, who will organise interventions or appropriate allied health reviews/external discharge referrals.
- Person to contact in regards to the patients discharge planning and non-acute management of TBI

The TBI team round & patient review should be conducted in such a way to promote patient confidentiality and privacy. Some patients may require multiple assessments by the TBI team due to prolonged Intensive Care Services admission.

4.3.4 TBI Team Round & Patient Review Transfer Considerations

It is important to recognise that the ward environment poses a significant increase in environmental stimulus for the patient with a TBI. There is also a direct decrease in the available nursing resources to the patient with a TBI due to patient to nurse ratio. Ideally, if possible, patients with a TBI should have a slow increase in environmental stimulus and slow decrease in nursing resources – ideally in an area of low flow and patient/relative traffic and noise. The TBI team round & patient review will be able to recommend patients ready for transfer to an appropriate surgical ward.

A member of the Neurosurgical team should be present at the TBI Team Round. However, if unable to attend the points discussed or any concerns should be relayed to the Neurosurgical team by the Trauma Case Manager.

4.3.5 Care of the non-acute patient with a TBI in the ICU environment

The strategies employed for the multidisciplinary management of a patient with a TBI in the ward environment (see below) can be adapted in the ICU environment. Early establishment of routines are important in ensuring a less disruptive transition between the Intensive Care Services environment and the ward environment. Further strategies include:

- Education regarding visiting times and number of visitors allowed at one time, importance of a low stimulus environment (no TV, mobile phone, loud noises, books or magazines)
- Encourage family to bring in (if able) a few key personal items (blanket/pillow, photo, suitable pyjamas)
- Explain importance of the establishment of routine to patient and family (visiting hours, meal times, wake and rest periods)

- Explain and implement use of orientation board (nurses name, visiting times, rest times, estimated time of Occupational Therapist review, estimated time of Physiotherapist review, meal times). Care should be taken not to have answers of questions used in PTA displayed on board.
- Co-ordination of allied health and establishment of goals in collaboration with patient and his/her family.

4.3.6 Planning for transfer of the patient with a TBI to the ward environment

During the TBI team patient review, whether patients should only able to be transferred from the Intensive Care Services during certain hours should be discussed & documented with the Intensive Care Services medical staff.

The TBI team are able to also discuss the preferred disposition of the patient once they leave the Intensive care Services. Multi-trauma patients with active trauma related issues, when possible should be transferred to 3S. Those patients with isolated TBI and no active, ongoing multisystem issues would be suitable for either 3S or 6S. Disposition is dependent on the clinical workload of the receiving ward as well as the complexity of each patients clinical condition. The identified issues and recommended solutions should be documented clearly in the patient's notes and communicated with the NUM/IC of both the Intensive Care Services and the ideal receiving ward.

The patient and their Next of Kin (NOK) should be notified of any planned changes prior to them occurring. It is important to be mindful that this patient demographic are likely to have a prolonged admission at STG and they will often require extra emotional support and reassurance.

4.4 THE MULTIDISCIPLINARY TEAM

4.4.1 Occupational therapy (OT) role in the non-acute phase

The TCM is responsible for the identification of appropriate patient referrals to the OT. PTA testing should commence as soon as the patient is conscious and able to communicate intelligibly. If the patient's level of arousal is too low for PTA testing, a screen for minimally conscious patients such as the Western Neuro Sensory Profile (WNSSP) can be completed. Once patient arousal improves, PTA testing should commence.

OT initial assessment, and assessment of patients upper limb function and review of pressure care needs will be completed as appropriate

Post Traumatic Amnesia (PTA) testing: [SGSHHS CLIN155 - Post Traumatic Amnesia \(PTA\) Testing - Protocol For](#)

The longer a patient is in PTA the more likely they are to have challenging behaviours.

Cognitive defects commonly seen in patients with a TBI include:

- Impaired memory
- Slowed processing
- Lessened attention span
- Inability to apply logic
- Impaired reasoning and problem solving

It is important to identify the types of challenging behaviours a patient is exhibiting and how to manage these. (Appendix1 – Table – Challenging Behaviours)

4.4.2 Role of Neuropsychologist in the non-acute phase

In an inpatient setting, a person who has sustained a TBI may be referred for a neuropsychological assessment for any of the following reasons:

- PTA assessment: at the discretion of the OT/treating team, neuropsychology may be involved to determine whether a patient has emerged from PTA (for example: if the team believes a patient is no longer in PTA, however the patient has not passed the Westmead PTA Scale)
- Cognitive assessments – if a patient is no longer in PTA, a referral may be made to determine the patient's neuropsychological profile and potential ongoing effects of the injury
- Development and implementation of behavioural management plan – to assist family and/or staff with the effective management of disruptive and difficult behaviours
- Capacity assessments – to determine a patient's ability to consent to medical treatment, or make decisions regarding their accommodation/finances/medical care etc. (Note: capacity must be assessed on a decision specific basis)

4.4.3 Physiotherapy (PT) role in the non-acute phase

PT management of TBI patients aims to treat impairments based on thorough assessment. A holistic approach to this patient population is crucial for both acute and non-acute management and safe discharge planning.

Management in the non-acute phase and the progression of treatment is based on PT indications for intervention. Where possible, treatment sessions may need to be scheduled to maintain a set routine.

4.4.4 Social Work (SW) role in the non-acute phase

Some SW interventions can begin during the acute phase but are patient/family dependant. Introduction of the SW role should occur early in the patient's admission to SGH.

- To explain the Motor Accidents Authority (MAA) and Life Time Care and Support (LTCS) schemes: SW will inform the patient's next of kin about these two schemes if appropriate. It is the TCM's role to then complete any paperwork required from the treating team so that these can be explained to the patient's next of kin by SW. In some cases the lodgement of MAA/LTCS paperwork will be facilitated by SW
- To monitor the progress of all applications. If accepted/allocated a case manager, SW are responsible for the documentation of such details (claim number/participant number/ case manager contact details) in the patients clinical notes

4.5 MANAGEMENT OF THE TBI PATIENT IN THE WARD ENVIRONMENT

The management of this type of patient functions only when all members of the multidisciplinary team approach the situation in a cohesive manner. All plans, interventions and interactions should be clearly documented and discussed with the bedside RN +/- family +/- patient.

All members of the multidisciplinary team should be aware of the basic principles when interacting with a TBI patient:

- Keep voice low and calm
- Simple, one step instructions

- Questions should only require a yes or no whilst patient is in the early phases of PTA
- The number of people at the bedside should be limited to 2 at any one time

4.5.1 The first 24 hours of admission to ward

- Arrangements for patient to be allocated a single room if this is available
- Introduction of Registered Nurse and NUM when able to patient and his/her family with an orientation to the ward
- Patients family members should be given the Understanding Traumatic Brain Injury booklet
- Education regarding visiting times and number of visitors allowed at one time, importance of a low stimulus environment (no TV, mobile phone, loud noises, books or magazines)
- Encourage family to bring in (if able) a few key personal items (blanket/pillow, photo, suitable pyjamas)
- Explain importance of the establishment of routine to patient and family (visiting hours, meal times, wake and rest periods)
- Explain and implement use of orientation board (nurses name, visiting times, rest times, estimated time of Occupational Therapist review, estimated time of Physiotherapist review, meal times). Care should be taken not to have answers of questions used in PTA displayed on board.
- Co-ordination of allied health and establishment of goals in collaboration with patient and his/her family.

4.5.2 Ongoing management in the ward environment

As well as regular observations, there are TBI patient specific considerations-

- Neurologic: Glasgow Coma Scale (GCS) observations should be attended with the frequency determined by the treating team. Where possible and safe to do so, the team should consider a reduction in frequency to promote adequate periods of rest especially overnight
- Respiratory: Chest physiotherapy should continue as part of the day to day care of the TBI patient. Incentive spirometry should be encouraged, as well as sitting out of bed, or > 45* in bed where appropriate. Early mobilisation is encouraged where safe to do so. Mobility plans should be clearly documented in the patient's notes to facilitate this. For those patients on bed rest or who are not mobilising, their head of bed should be at least 30* (this is the responsibility of the treating team to document). If there is conflicting mobility orders or a lack of clear documentation, the TCM should be contacted for clarification and facilitation of appropriate documentation.
- Gastrointestinal: A bowel chart should be commenced upon admission to the ward. Regular aperients should be charted by the treating team and reviewed daily. A dietician review should have occurred in the ICU and continue upon transfer to the ward. A food chart and regular weights should be commenced as deemed necessary by the Dietician. Patients may require early Speech Pathology review +/- early consideration for a Percutaneous Endoscopic Gastronomy (PEG) tube if their caloric intake is not sufficient.

- Fluids and Electrolytes: Accurate fluid balance chart should be maintained upon admission to ward to monitor input and output and overall fluid balance. Any urine output > 250ml/hr for two consecutive hours or a concern for excessive urine output should be documented and the team notified. Increase fluid intake or complaints of thirst should also be documented and the team notified. The frequency of electrolyte pathology is at the treating team's discretion
- Falls risk management in line with [SESLHD PR380 - Falls prevention and management for people admitted to acute and subacute](#)
- Sleep Wake Cycle: An altered Sleep Wake cycle is common for patients with a TBI. Re-establishment of a sleep wake cycle is crucial for the promotion of long term functional recovery. Characteristics of altered sleep wake cycle include insomnia, difficulty maintaining sleep, early morning awakening and nightmares. Others include excess daytime sleepiness and increased need for sleep. Treatment for altered sleep wake cycle includes the establishment of a daily routine that the patient and their family are aware of. Waking and resting should occur at set times during the day and night. When possible, patients should be encouraged to leave the ward with responsible family/friends for short periods of time once they are out of PTA and the members of the multidisciplinary team are happy for this to occur. If not appropriate to leave the ward, blinds in the patient's room should be opened in the daylight hours and shut overnight/during rest periods. The length/frequency of waking/complaints of sleep disturbance should be clearly documented and noted by the treating team.

More information and education can be found on the e-learning link

4.6 DIFFICULT BEHAVIOUR – EARLY IDENTIFICATION OF RISK

Early identification and intervention is required to prevent challenging behaviours impacting a patient's ability to function in the medium term (rehabilitation phase) and long term (post rehabilitation phase) as well as minimising the potential for an escalation in aggressive behaviour. Three most common types of challenging behaviour displayed by patients with a TBI are:

1. Aggression (verbal and physical and defined as an outward display of anger, hostility or violence towards another person)
2. Inappropriate social behaviour (for example rudeness, loud voice or insulting others)
3. Lack of initiation (requiring constant redirection, limited ability to complete activities of daily living). The aim with early management and plans is to increase the likelihood of the patient participating in Brain Injury rehabilitation in the medium term.

Other challenging behaviours include self-harm, inappropriate sexual behaviour, repetitive behaviour and wandering/absconding.

The TBI team patient review should identify those patients at risk of the above behaviours based on the completion of the screening tool by the ICU bedside RN. Identification of potential risk for aggression and the management of escalating behaviour is described in [SGSHHS CLINICU - Aggressive Behaviour Prevention and Management ICU SGH](#)

Note: Pharmacological restraint/management of patients with TBI is outlined in Appendix 1: Challenging Behaviours (differs from that described in the Aggressive Behaviour Management document).

4.6.1 Predictive risk factors for potential aggressive behaviour

- Pre-existing characteristics – reported poor management of stressful circumstances, prior aggression or self-harm, use of drugs or alcohol to cope and/or pre-existing mental health diagnosis/admission. The need for review by the Mental Health CNC should be identified early in the patients admission, actioned (if not already done) and documented in the patients notes on the TBI Ward Round.
- Social issues – early involvement of social work is integral to establishing any complex family dynamics or pre-existing issues. Likewise, it is just as important to identify that a patient has a supportive family and social network. A SW handover should occur between the ICU SW and the ward based SW – this handover is crucial in the multidisciplinary management of the patient with a TBI

If these risk factors are identified or the patient has had documentation of aggressive behaviour prior to transfer to the ward, this should be handed over verbally to the accepting nurse/in-charge on the ward. If the patient has required pharmacological restraint or physical restraint due to an aggressive event, there should be a plan for subsequent events in the patients notes prior to transfer to the ward.

Patients with a TBI and a prior history of drug or alcohol abuse have demonstrated higher rates of verbal aggression, physical aggression against objects and other people ^{1&2}.

Wandering / absconding and inappropriate social behaviour. Early involvement of the Drug and Alcohol team should be identified, actioned (if not already done) and documented in the patients notes on the TBI team patient review.

4.6.2 Difficult Behaviour – Management of Aggressive Patients with TBI

The patient with TBI who is displaying difficult behaviour may be resisting nursing care, be disruptive in the ward environment, pose a physical risk to themselves, visitors or staff.

Once a patient is thought to be demonstrating aggressive behaviour steps should be taken in line with the staff member's perception of risk of harm (Appendix 2).

4.6.3 Behavioural Management Plan

The TBI team patient review may decide certain patients with TBI require a behavioural management plan.

The implementation of a behavioural management plan will be a multidisciplinary responsibility.

4.6.4 TBI and Mental Health

The Mental Health Act 2007 provides provision for detention and treatment for persons suffering from mental illness or disorder³. Patients with TBI often present in the acute phase with agitation, psychotic symptoms such as paranoid thoughts and hallucinations which can make treatment and behaviour management very challenging. In cases of TBI where the patient is still in PTA, the Mental Health Act cannot be used to detain and treat, as symptoms are a result of an organic cause. Patients can only be detained in a medical ward and provided with treatment under a Guardianship Order. Emergency Guardianship orders can be obtained by calling the Office of The Public Guardian who can provide on call advice 24hours a day. In the case of patients who have a TBI as a result of a suicide attempt and are in PTA, a guardianship order should still be applied for to allow detention for medical

treatment. The use of the Mental Health Act will only be considered when a patient is medically cleared and involuntary mental health treatment is required.

In some cases it may be necessary to prescribe and administer pharmacological agents to assist with the management of neurobehavioral and neuropsychiatric symptoms. If this is the case, the process should be discussed (when/if safe to do so) with the patient and/or family. Haloperidol should not be used in patients with TBI as it slows their emergency from PTA and lengthens the time they are confused. Likewise, benzodiazepines often worsens confusion. (Appendix 3: Pharmacological Guide)

4.7 DISCHARGE OF THE PATIENT WITH TBI

4.7.1 Early Referral to Rehabilitation Services

The TCM is responsible for the early referral and discussion with an appropriate Brain Injury Unit (BIU) as well as a referral to the Rehabilitation Service at STG. A verbal referral with the BIU Registrar also takes place. This information is then placed in the patient's bedside notes and reflected on the MDT list as being completed or outstanding. A copy of the New South Wales Ambulance Service Case Sheet should also be sent, as well as any CT reports and operation reports.

Referral to NSW Specialist BIU's is based on the patient's residential address

⁴ and often happens within the first 48-72 hours of a patient's admission.

4.7.2 Liverpool Brain Injury Unit (LBIU)

The TCM is responsible for the weekly update of the current TBI patients at STG who have been referred to LBIU. This update is in the form of email communication using a standardised template which includes information pertaining to outstanding clinical issues, family dynamics and mobility status. The NUM of LBIU then returns feedback regarding bed progression and request for more information if required to the TCM.

For patients who experience a protracted wait for BIU bed, there is the possibility they could progress far enough to be suitable for a non-acute BIU bed. In this case, some BIU's can provide a review of the patient to determine the most appropriate discharge plan. This should be discussed at the Trauma MDT.

4.7.3 SGH to an In-patient Brain Injury Unit

- Notify NOK of pending transfer
- Completed, comprehensive, multidisciplinary discharge note from the admitting team including any sub-speciality follow-up that is required. These appointments should be made and documented prior to the patient's transfer. A CD of the patient's imaging should also be sent
- Written, comprehensive handover from PT outlining: In preparation for a patient's transfer to an inpatient unit, PT are required to complete a detailed discharge summary following ISBAR format
- Written, comprehensive handover from OT outlining: In preparation for a patient's transfer to an inpatient unit OT required to complete detailed discharge summary following ISBAR format. A copy of PTA score sheets and any cognitive assessments completed will also be forwarded to the treating therapist. If the patient is in PTA at

time of transfer, photos of therapists used in PTA testing will also be forwarded to the BIU to ensure continuity of testing

- Written, comprehensive handover from neuropsychologist which can be a copy of assessment findings if available
- Written, comprehensive handover from SW outlining – MAA paperwork status (including Life Time Care applications, MAA claim numbers), a brief description of the patient's pre-admission social situation as well as the current social circumstance, accommodation issues, financial arrangements and interventions to address ongoing need.
- Other members of the multidisciplinary team may also be required to document handover to the accepting unit

4.7.4 SGH to an Outpatient Brain Injury Service

In some cases patients are able to be discharged home with outpatient Brain Injury Rehabilitation. Locations of such outpatient services vary from patient to patient however the TCM in conjunction with the Rehabilitation Service can provide the details of the most appropriate service. These patients must fulfil the following multidisciplinary criteria prior to discharge to ensure their safety and the promotion of less long term morbidity:

- Referral for outpatient services deemed appropriate by service provider and referral accepted
- Clearance of PTA or completed neuropsychologist assessment
- Clearance from SW – no outstanding issues in regards to social circumstances that could deem patient unsafe. Must have confirmed accommodation, financial support and source of social support. Must have all Motor Accident Authority (if applicable) paperwork submitted or in the process of being submitted.
- Clearance from PT – Patient's must be cleared from PT interventions, for example they are safe to mobilise independently or with required mobility aids.
- Clearance from OT – Recommendations around requirements for inpatient/outpatient BIU will be made based on the OT's clinical reasoning, considering results of standardised cognitive assessments (including PTA scale) and functional cognitive assessments. As per PTA protocol, patients must clear PTA testing prior to discharge. Functional assessments of cognition may be required to determine safety to return home with outpatient follow up. OT will liaise closely with the patient's family to determine suitability to return home. Appropriate support, education and intervention should be provided to patient and their family.
- Neuropsychologist referral – If seen by a Neuropsychologist whilst an inpatient a patient may be referred to further assessment as an outpatient. It is likely that this will be conducted by the outpatient service after the patient's initial assessment.

4.7.5 Discharge process for Outpatient Brain Injury Unit

- Comprehensive medical discharge outlining mechanism, interventions, clinical course, complications and follow-up appointments. It is important that this discharge summary is discussed with patient and their NOK prior to discharge. Any follow-up appointments should be made and documented in the medical discharge if possible

- Comprehensive explanation and documentation of restrictions such as driving, working, access to finances, use of kitchen appliances and supervision requirements. The NOK must be present for this explanation
- Written, comprehensive handover from PT outlining – PT will complete a detailed discharge summary following ISBAR format if required. Patients and their families should be provided with education regarding any mobility aids or additional outpatient PT interventions required. PT should inform the treating team if a patient requires further outpatient PT intervention so that this can be included in the patients discharge summary.
- Written, comprehensive handover from OT outlining – OT will complete detailed discharge summary following ISBAR format and all equipment required should be in place. Any assessment forms and results will also be forwarded to the outpatient unit/therapist.
Patient, family and carers should be provided with education regarding the management of patient’s deficits particularly when a decline in cognition is identified or behavioural deficits are identified.
- Written, comprehensive handover from neuropsychologist which can be a copy of assessment findings if available
- Written, comprehensive handover from SW outlining – MAA paperwork status, progress, any complicated social circumstances, accommodation issues, any interventions – Centrelink etc.
- Other members of the multidisciplinary team may also be required to document handover to the accepting service

5. Keywords	Traumatic Brain Injury, Trauma, Post Traumatic Amnesia,
6. Functional Group	ICU/ICU2, 3 South and 6 South.
7. External References	<p>1. (Aaronson, A. & Lloyd, B. 2015. <i>Aggression after traumatic brain injury: a review of current literature</i>. Psychiatric Annuals. Vol. 45, No. 8, 422-426. Doi: 10.3928/00485713-20150803-08</p> <p>2. Sabaz, M. 2010. <i>Challenging Behaviours Project: Adults</i>. NSW Agency for Clinical Innovation. Page 19.)</p> <p>3. http://www.legislation.nsw.gov.au/#/view/act/2007/8/whole</p> <p>4. https://www.aci.health.nsw.gov.au/networks/brain-injury-rehabilitation/about/brain-injury-rehabilitation-program</p> <p>NSW Brain injury Rehabilitation Program. Challenging Behaviours Projects: Adults. 2010. Page 3-27</p> <p>Post Traumatic Amnesia Screening and Management. <i>The Royal Melbourne Hospital, Melbourne, Victoria</i>. 2014</p> <p>Sleep-wake disorders in patients with Traumatic Brain Injury. <i>Up To Date</i>. 2015.</p> <p>Acute Ward Management of Adults with Traumatic Brain Injury. <i>Royal Perth Hospital, Perth, Western Australia</i>. 2014</p> <p>Traumatic brain injury: epidemiology, classification and pathophysiology. <i>Up To Date</i>. 2015</p>

8. Consumer Advisory Group (CAG) approval of patient information brochure (or related material)	Not applicable
9. Implementation and Evaluation Plan Including education, training, clinical notes audit, knowledge evaluation audit etc	Implementation via the TBI working party – multidisciplinary approach. 3 monthly meetings regarding effectiveness of process and identification of any persisting issues. Compliance with CBR to be assessed on an individual case basis by the members of the TBI multidisciplinary team.
10. Knowledge Evaluation	<p>Q1: How often does the TBI Team Round occur? A: Once a week, or more often if a patient's clinical condition requires</p> <p>Q2: Ideally, what time of day should a patient with a TBI be transferred to the ward? A: During business hours. This allows for any adjustments or changes in clinical condition to be managed by a full cohort of senior staff.</p> <p>Q3: Who coordinates the transfer of care to a Brain Injury Unit? A: The Trauma Case Managers are responsible for the identification, referral and updating of the relevant Brain Injury Unit.</p>
11. Who is Responsible	Trauma Director SGH Trauma CNC SGH

Approval for Traumatic Brain Injury – Multidisciplinary Care and Management	
*Specialty/Department Committee	Committee title: Trauma Chairperson name/position: A/ Prof Richard Morris Date: 31.3.17
*Nurse Manager	Name/position: Andrew Bridgeman Date: 31.3.17
*Medical Head of Department	Name /position: A/ Prof Richard Morris Date: 31.3.17
*Drug and Therapeutics Committee (SGH)	Chairperson's Name: A/Prof Winston Liauw Date: 23.05.17
Contributors to CIBR development e.g. CNC, Medical Officers (names and position title/specialty)	Jessica Keady Trauma CNC Julie Beeson ICU Liaison Lynne Roberts 3S NUM Steve Klekackoski 3S CNE Clara Gordon OT Diane Mouhanna CL CNC Sharlene Thurecht PT

Revision and Approval History

Date	Revision number	Author (Position)	Revision due
Mar 2017	0	Trauma CNC	Mar 2020

General Manager's Ratification	
Name Leisa Rathborne	Date: 30.05.17

Appendix 1: CHALLENGING BEHAVIOURS

Adapted from Managing Challenging Behaviour after TBI (LBIU)

Behaviour	Example	Management
Decreased memory capability	Repetitive questioning Forgetting location of items Forgetting recent instructions Longer term memory loss	Memory prompting using diaries Whiteboard for reminders (routine, visiting hours)
Lack of injury awareness	Inability to recognise effect of TBI on self	Change the subject Discuss this lack of insight with family. It is likely the patient will have an increase of insight.
Decreased concentration span	Complaints of boredom Unable to complete activities or tasks	Give simplistic, single step tasks Remove distractions
Slow Processing	Takes longer to answer questions or problem solve	Be patient Don't rush patient.
Poor Initiation	Lack of motivation	Encouragement to perform tasks or to interact Routine establishment.
Impulsivity	Acts without thinking Often unpredictable	Difficult to manage Prevent situations whereby the patient will be in danger Explain to patient the need to stop and think
Emotional Liability	Difficulty projecting appropriate emotions, eg. crying instead of laughing	Don't react Limit risk of patient feeling embarrassed
Inappropriate Sexual Behaviour	Unwelcome requests or discussion of a sexual nature.	Set boundaries with patient Explain the behaviour is inappropriate Distract with other activities
Aggressive Outbursts (physical or verbal)	Often triggered by a constant theme.	Document preceding event to attempt to establish triggers Leave the room if safe to do so Minimise danger to yourself, colleagues and patient
Depressive Symptoms	Withdrawn Expressing thoughts of helplessness	Team to refer to Clinical Psychology

Appendix 2 - MANAGEMENT OF AGGRESSIVE PATIENTS WITH TBI

Perceived Risk to Self = Low	<ul style="list-style-type: none"> - Attempt to de-escalate. Speak calmly, be cautious of body language, and keep tone of voice constant - Attempt to redirect or change the subject of confrontation - Don't argue or attempt to have your point understood, patients in PTA have a limited ability to negotiate or problem solve - Offer reassurance and empathy - Outbursts are usually short lived if managed well in their initiation - Document in the patients notes any possible triggers (e.g. being woken from sleep, frustration with physical limitations, and tiredness during visiting hours) to the aggression and the method/techniques used to de-escalate. Nursing handover should include any identified triggers and methods for de-escalation
Perceived Risk = Moderate	<ul style="list-style-type: none"> - In-charge to notify team (during hours) or after hours surgical registrar (after hours) & Trauma Case Manager (7 days, 0700-2200hrs) - Further de-clutter patients room to remove possible dangers - Continue de-escalation techniques, one person should be talking, and background distractions kept to a minimum - The medical review should include the assessment of differential causes (besides the TBI alone) including pain (the patient may have an inability to communicate they have pain and their behaviour is the sign for this), infection, the likelihood of drug or alcohol withdrawal, hypoxia, basic needs such as the need to use the toilet, hunger or dehydration (again , the patient may have an inability to communicate this need) - Medical staff to document plan in patients notes and communicate this with nursing staff
Perceived Risk = High	<ul style="list-style-type: none"> - Activation of duress alarms to notify security of risk to staff - The Nurse in-charge should consider whether visitors should be asked to leave. Ensuring visitor safety is as important as ensuring the patient and staff safety - Environmental modifications or physical restraints may be required – this is not ideal but a last resort to ensure the safety of the patient and staff. It should occur in line with SES LHD PR/483 Restraint Use with Adult Patients - Those involved in the physical or pharmacological restraint of the patient should ensure they are wearing appropriate PPE - The NUM/AHSNM should be notified of any patient requiring pharmacological or physical restraint

	<ul style="list-style-type: none"> - Events leading up to and the actions taken should be documented in the patient’s notes. A clear plan should then also be documented in the patient’s notes and communicated with nursing staff
<p>Perceived Risk = Extreme</p>	<ul style="list-style-type: none"> - A serious threat to the physical wellbeing of staff (e.g. weapons or personal threats) - Call 777 – State your location and “CODE BLACK” - Police will attend - Four R’s: Remain calm, Retreat if safe to do so, Raise the alarm and Record details. - Post event, documentation should occur in the patient’s clinical notes

Appendix 3: PHARMACOLOGICAL GUIDE

Adapted from Managing Challenging Behaviour after TBI (LBIU)
(Note: Haloperidol is not a recommended first line medication).

Behaviour	Anti-convulsant	Anti-psychotic	Beta-blocker	Sedation
Aggression	Clonazepam	Doxepin		Olanzapine / Clonazepam
Violence				Midazolam
Frustration	Sodium Valproate / Tegratol			
Delusions		Olanzapine and/or Risperidone		PRN Olanzapine and/or Risperidone
Hallucinations		Olanzapine and/or Risperidone		
Thought Disturbance		Olanzapine and/or Risperidone		
Anxiety		Olanzapine and/or Risperidone	Pindolol	
Suspicion		Olanzapine and/or Risperidone		
Mood Swings	Sodium Valproate / Tegratol			
Psychosis		Olanzapine and/or Risperidone		
Depression		Sertraline / Citalopram		

Medication	Recommended Dosage
Carbamazepine	100mg – 1.2 mg, PO, daily.
Citalopram	20-60mg, PO.
Doxepin	25mg – 75mg, PO, usually nocte.
Midazolam	0.01-0.08mg/kg IV over 2-3minutes every 5-15minutes.
Olanzapine	Tablet/Wafer/IM – Ideally wafer (difficult for patient to spit out) – 2.5-30mg daily. 5- 10mg nocte.

Medication	Recommended Dosage
Pindolol (if patient experiences HR/BP issues with Propranolol)	Start 20mg, PO, TDS. Increase to maximum of 320mg.
Quetiapine	25-50mg BD (maximum 700mg, PO). Being cautious of hypotension.
Risperidone	0.5mg -4mg, PO or IM.
Sertraline	50-150mg, PO.
Sodium Valproate	600mg-2g, daily.