TRAUMATIC BRAIN INJURY – MULTIDISCIPLINARY CARE AND MANAGEMENT

1. Purpose	A guideline for the multidisciplinary management of patients with a Traumatic Brain Injury (TBI). This includes the transfer from the Intensive Care Unit 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.
2. Risk Rating	Medium
3. National Standards	1 - Clinical Governance 2 - Partnering with Consumers 4 - Medication Safety 5 - Comprehensive Care 6 - Communicating for safety 8 - Recognising and responding to acute deterioration
4. Employees it Applies to	All medical, nursing and allied health staff involved in the care of the patient with a TBI.

5. PROCESS

Definitions

Traumatic Brain Injury

- A TBI is a nondegenerative, noncongential insult to the brain from an external mechanical force, possibly leading to permanent or temporary impairment of cognitive, physical and psychosocial functions, with an associated diminished or altered state of consciousness.

Multi-disciplinary

- A group/range of professionals and commonly including medical, nursing and allied health professionals.

Challenging Behaviours

- A behaviour that causes physical and /or psychological discomfort or harm, to the person, or others.

5.1 IDENTIFICATION OF APPROPRIATE PATIENTS

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

Patients must meet 2 of the following criteria for this CIBR to be applicable:

- 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 SGH ICU CLIN 026 *Acute Brain Injury - Management of patient with*

THIS DOCUMENT BECOMES UNCONTROLLED WHEN PRINTED
DISCARD PRINTED DOCUMENTS IMMEDIATELY AFTER USE

5.2 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.

5.3 PATIENT REVIEW

5.3.1 TBI Team Round

The TBI Team Round facilitates multidisciplinary team input into complex TBI patients to ensure a safe transition from the Intensive Care Unit (ICU) to the ward environment. The ICU Liaison nurse is responsible for notifying the TBI team (via the paging system) who will review those identified patients within the ICU. Some patients may also require review/re-review in the ward environment; this should be arranged by the TCM 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 (TCM)
- 5A Clinical Nurse Educator (CNE)
- 5A Nursing Unit Manager (NUM)/ 5A In-charge RN
- 5A Trauma Physiotherapist + Senior Trauma Physiotherapist (PT)
- Trauma Occupational Therapist (OT) + Senior Trauma Occupational Therapist (OT)
- 5A/ICU Speech Pathologist (SP)
- 5A Social Worker (SW)
- ICU Social Worker (SW)
- Mental Health Clinical Nurse Consultant (CNC)(as required)
- Bedside ICU Registered Nurse
- Rehabilitation Registrar
- Neurosurgical Registrar

5.3.2 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 appropriate to refer for Coma Recovery Scale (CRS), a standardised neurobehavioral assessment measure designed for use in patients with disorders of consciousness or Post Traumatic Amnesia testing (PTA), a standardised test that measures length of PTA in TBI patients.
- 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, mental health neuropsychology)
- Patients with TBI should be transferred at the most appropriate time in their rehabilitation trajectory and during business hours (Monday to Friday, 0800-1600Hrs)– consideration should

THIS DOCUMENT BECOMES UNCONTROLLED WHEN PRINTED
DISCARD PRINTED DOCUMENTS IMMEDIATELY AFTER USE

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, or high observation room.

5.3.3 TBI Team Round & Patient Review Plan and Documentation

The TCM 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 ventilation status (intubated/extubated/tracheostomy), stable/unstable, best GCS, falls risk, current behaviour issues
- Identification of concerns – aggression risk based on medical/social history, family & social/ psychosocial/mental health requirements , pre-morbid cognitive function and personality
- Recommendations – interventions from allied health (PTA, splints, mobility restrictions, swallow recommendations, communication strategies), 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, level of nursing observations
- 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 and 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 ICU admission.

5.3.4 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 available 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 they are unable, to attend the points discussed or any concerns should be relayed to the Neurosurgical team by the Trauma Case Manager and documented on eMR.

5.3.5 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:

THIS DOCUMENT BECOMES UNCONTROLLED WHEN PRINTED
DISCARD PRINTED DOCUMENTS IMMEDIATELY AFTER USE

- 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 and doctors names, visiting times, rest times, estimated time of OT review, estimated time of PT review, meal times). Care should be taken not to have answers of questions used in PTA displayed on board.
- Explain and implement use of communication strategies / Alternative and Augmentative Communication options (AAC)
- Co-ordination of allied health and establishment of goals in collaboration with patient and his/her family.

5.3.6 Planning for Transfer of The Patient with a TBI to The Ward Environment

- During the TBI team patient review, whether patients should only be transferred from the ICU during certain hours should be discussed and documented on eMR with the ICU medical staff.
- The TBI team are able to also discuss the preferred disposition of the patient once they leave the ICU. Multi-trauma patients with active trauma related issues, when possible should be transferred to 5A. Those patients with isolated TBI and no active, ongoing multisystem issues would be suitable for either 5A or 3S. 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. This patient demographic are likely to have a prolonged admission at SGH and consideration must be given to the need for extra emotional support and reassurance for the patient and their families.

5.4 THE MULTIDISCIPLINARY TEAM

5.4.1 Occupational Therapy (OT) Role in The Non-Acute Phase

- The TCM is responsible for the early 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 Coma Recovery Scale-Revised (CRS-R) should be commenced in conjunction with the Speech Pathologist. Once the patient's level of arousal improves, PTA testing should begin.
- OT initial assessment, upper limb assessment, pressure area care assessment and seating equipment needs assessment will be completed as deemed appropriate.
- Post Traumatic Amnesia (PTA) testing: SGH-TSH 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
  - Reduced 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)

5.4.2 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)

5.4.3 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.

5.4.4 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 State Insurance Regulatory Authority (SIRA), iCARE, Life Time Care and Support (LTCS) schemes and/or National Disability Insurance Scheme (NDIS): SW will inform the patient's NOK about these 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 NOK by SW. In some cases the lodgement of SIRA/iCARE/LTCS/NDIS paperwork will be facilitated by SW
- To monitor the progress of all applications. If accepted/allocated a case manager, SW and TCM are responsible for the documentation of such details (claim number/participant number/ case manager contact details) in the patients eMR.

5.4.5 Speech Pathology (SP) Role in The Non-Acute Phase

- In patients who have undergone tracheostomy, Multi-disciplinary assessment of tracheostomy requirements for secretion management, appropriate timing for cuff deflation (in collaboration with medical team and physio) and assessment, treatment and augmentation of communication for patients with a tracheostomy.
- Assessment of dysphagia at appropriate time in patient treatment trajectory, with objective assessment via Modified Barium Swallow where clinically indicated.

THIS DOCUMENT BECOMES UNCONTROLLED WHEN PRINTED
DISCARD PRINTED DOCUMENTS IMMEDIATELY AFTER USE

- Management of dysphagia including implementation of diet and fluid modifications and strategies as indicated, to optimise safety and efficiency of oral intake.
- Assessment and management of communication (speech, voice and language) / cognitive-communication deficits including education to staff and family members regarding impact of TBI communication and optimising successful communicative interactions.

5.5 MANAGEMENT OF THE TBI PATIENT IN THE WARD ENVIRONMENT

Multidisciplinary team management of patients with TBI is optimised with a collegiate and cohesive approach. Communication between team members is key, and all plans, interventions and interactions should be clearly documented on eMR 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

5.5.1 The First 24 Hours of Admission to The Ward

- Arrangements for patient to be allocated to an appropriate room (single or 4 bedded)
- Introduction of Registered Nurse (RN) and NUM 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 and doctors names, visiting times, rest times, estimated time of OT review, estimated time of PT review, Speech Pathology review, and meal times). Care should be taken not to have answers of questions used in PTA displayed on board.
- Ensure nutrition/hydration recommendations are adhered to (i.e. NBM/ enteral feeing / PO intake) with meals/drink consistencies in adherence with the most recent swallowing recommendations as per Speech Pathology.
- Co-ordination of allied health and establishment of goals in collaboration with patient and his/her family.

5.5.2 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

THIS DOCUMENT BECOMES UNCONTROLLED WHEN PRINTED
DISCARD PRINTED DOCUMENTS IMMEDIATELY AFTER USE

- *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, the head of bed should be at least 30* (this is the responsibility of the treating team to document on eMR). If there are conflicting mobility orders or a lack of clear documentation, the TCM should be contacted on pager #012 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 with Naso-gastric feeding commenced if required. Patients may require early consideration for a Percutaneous Endoscopic Gastronomy (PEG) tube if their caloric intake is not sufficient or if patient will require longer term enteral feeding due to dysphagia. This decision should be made by the treating team in conjunction with SP, Dietetics and Trauma/Gastroenterology.
- *Fluids and Electrolytes*: Accurate fluid balance chart (FBC) should be maintained upon admission to the 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 as this may indicate that the patient has developed the Syndrome of Inappropriate Anti-Diuretic Hormone (SIADH). Increase fluid intake or complaints of thirst should also be documented and the team notified. If not diagnosed or treated promptly the patient can suffer from severe dehydration +/- electrolyte imbalance. The frequency of electrolyte pathology is at the treating team's discretion.
- *Falls* risk management in line with SESLHDPR/380 *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.

5.6 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 and/or cognitive-communication disorder (for example rudeness, loud voice or insulting others)

THIS DOCUMENT BECOMES UNCONTROLLED WHEN PRINTED
DISCARD PRINTED DOCUMENTS IMMEDIATELY AFTER USE

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 SGH ICU CLIN 049 *Aggressive Behaviour Prevention and Management, ICS 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).

5.6.1 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 intervention or physical restraint due to an aggressive event, there should be a plan for subsequent events in the patients eMR 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 initiated, and documented in the patients eMR on the TBI team patient review.
- Patients who have been identified as having multiple risks should be considered for Level 1 nursing observations on the ward for at least 24 hours so nursing care needs can be identified, and evaluation of management strategies can be made. Patients who have multiple risk factors may not be suitable for shared rooms as this can be a high stimulus environment and risk escalating behaviours.

5.6.2 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).

THIS DOCUMENT BECOMES UNCONTROLLED WHEN PRINTED
DISCARD PRINTED DOCUMENTS IMMEDIATELY AFTER USE

5.6.3 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

5.6.4 TBI and Mental Health

- The Mental Health Act 2007 provides provision for detention and treatment for persons suffering from mental illness or disorder[3]. 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 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 24 hours a day (Public Guardian NSW, Phone No; 02 8688 2650 or 1800 451 510).
- In the case of patients who have a TBI as a result of deliberate self-harm (DSH) and are in PTA, an application for a Guardianship Order should be obtained allowing detention for medical treatment as required. The use of the Mental Health Act will be considered on a case by case basis for patients who are likely to pass PTA quickly and will require a MH admission following medical treatment.
- 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 emergence from PTA and may extend the period of confusion. Likewise, the use of benzodiazepines often worsens confusion. (Appendix 3: Pharmacological Guide)

5.7 DISCHARGE OF THE PATIENT WITH TBI

5.7.1 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 SGH. A verbal referral with the BIU Registrar also takes place. This information is then placed in the patient's eMR 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.

5.7.2 Liverpool Brain Injury Unit (LBIU)

- The TCM is responsible for the weekly update of the current TBI patients at SGH 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 provides feedback regarding bed progression and request for more information if required to the TCM.
- For patients who experience a protracted wait for BIU bed, may progress in their recovery sufficiently 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.

5.7.3 SGH to an In-patient Brain Injury Unit

- Notify NOK of pending transfer
- Admitting Team: 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 patients transfer. A CD of the patient's imaging should also be sent
- Physiotherapy: In preparation for a patients transfer to an inpatient unit, PT will provide a written, comprehensive handover outlining current PT treatment and future management plans.
- Occupational Therapy: In preparation for a patients transfer to an inpatient unit OT will provide a written, comprehensive handover outlining current patient management and future plans 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.
- Neuropsychologist: Written, comprehensive handover which can be a copy of assessment findings if available
- Social Worker: Will provide a written, comprehensive handover outlining – SIRA/iCARE paperwork status (including Life Time Care applications, SIRA/iCARE claim numbers and NDIS applications), 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.
- Speech Pathology: Will provide a written, comprehensive handover outlining: tracheostomy management (when applicable) and swallowing and communication assessment, intervention, recommendations and plan.
- Other members of the multidisciplinary team may also be required to document handover to the accepting unit

5.7.4 SGH to an Outpatient Brain Injury Service

In some cases patients are able to be discharged home with outpatient Brain Injury Rehabilitation after discussion with the interdisciplinary team. The TCM in conjunction with the Rehabilitation Service can provide the details of the Outpatient clinic most appropriate for the patient's home address. 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 compromise patient safety. Must have confirmed accommodation, financial support and source of social support. Must have all insurance (iCARE, SIRA, private insurer) paperwork submitted or being completed.
- 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 – OT will confirm suitability for outpatient BIU based on clinical judgement informed by results of standardised cognitive assessments (including PTA scale) and functional cognitive assessments. Patients must clear PTA testing prior to discharge. OT will liaise closely with the patient's family to determine suitability to return home. Appropriate support, education and intervention should be provided to the patient and their family. The

THIS DOCUMENT BECOMES UNCONTROLLED WHEN PRINTED
DISCARD PRINTED DOCUMENTS IMMEDIATELY AFTER USE

patient must have demonstrated ability to perform self-care tasks or have a nominated person/s to provide the support required.

- Clearance from Speech Pathology – The patient should have sufficient communication skills to safely transition to the community or informed support person/s to assist in safe reintegration to community. If the patient has a tracheostomy in situ they (or carer) must be able to manage the tracheostomy independently, including emergency support. If swallowing difficulties persist, access to recommended consistencies of fluids and diet.
- Neuropsychologist referral – If the patient has been seen by a Neuropsychologist during admission, further assessment may be required post discharge. Usually this will be conducted by the outpatient service after the patient's initial assessment.

5.7.5 Discharge process for Outpatient Brain Injury Unit

- Admitting team: A comprehensive medical discharge outlining mechanism, interventions, clinical course, complications and follow-up appointments should be completed. 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
- Activity restrictions/advice: The discharge document should include 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
- Physiotherapy: 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 inventions 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.
- Occupational Therapy: 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.
- Neuropsychologist: Written, comprehensive handover from neuropsychologist which can be a copy of assessment findings if available
- Social Work: Will provide a detailed discharge report, insurance paperwork (iCare, SIRA, LTCS, private insurance) status should be included with progress, any complicated social circumstances, accommodation issues, and any SW interventions undertaken throughout hospital admission.
- Speech Pathology: Will provide a written, comprehensive handover, swallowing and communication assessment, interventions undertaken, recommendations and plan. If the patient has a tracheostomy, then detailed management advice and recommendations for troubleshooting must be provided for the patient and relatives management. This should include an Emergency contact number for urgent tracheostomy issues.
- Other members of the multidisciplinary team may also be required to document handover to the accepting service

THIS DOCUMENT BECOMES UNCONTROLLED WHEN PRINTED
DISCARD PRINTED DOCUMENTS IMMEDIATELY AFTER USE

6. Cross References	SESLHDPR/380 *Falls prevention and management for people admitted to acute and subacute* SESLHDPR/483 *Restrictive practices with adult patients* SESLHDPR/298 *Tracheostomy Clinical Management Procedures for Adult Inpatients* SGH ICU CLIN 026 *Acute Brain Injury - Management of patient with* SGH-TSH CLIN155 - *Post Traumatic Amnesia (PTA) Testing - Protocol For* SGH ICU CLIN 049 *Aggressive Behaviour Prevention and Management, ICS SGH*
7. Keywords	Traumatic Brain Injury, Trauma, Post Traumatic Amnesia
8. Document Location	SGH Trauma Homepage
9. External References	1. Williamson, D., Frenette, A.J., Burry, L.D., Perreault, M., Charbonney, E., Lamontagne, F., Potvin, M.-J., Giguère, J.-F., Mehta, S. and Bernard, F. (2019). *Pharmacological interventions for agitated behaviours in patients with traumatic brain injury: a systematic review*. *BMJ Open*, 9(7), p.e029604. 2. (Aaronson, A. & Lloyd, B. 2015. *Aggression after traumatic brain injury: a review of current literature.* Psychiatric Annuals. Vol. 45, No. 8, 422-426. Doi: 10.3928/00485713-20150803-08 3. Sabaz, M. 2010. *Challenging Behaviours Project: Adults*. NSW Agency for Clinical Innovation. Page 19.) 4. http://www.legislation.nsw.gov.au/#/view/act/2007/8/whole 5. https://www.aci.health.nsw.gov.au/networks/brain-injury-rehabilitation/about/brain-injury-rehabilitation-program 6 NSW Brain injury Rehabilitation Program. Challenging Behaviours Projects: Adults. 2010. Page 3-27 7 Post Traumatic Amnesia Screening and Management. *The Royal Melbourne Hospital, Melbourne, Victoria.* 2014 8 Sleep-wake disorders in patients with Traumatic Brain Injury. *Up To Date.* 2015. 9 Acute Ward Management of Adults with Traumatic Brain Injury. *Royal Perth Hospital, Perth, Western Australia.* 2014 10 Traumatic brain injury: epidemiology, classification and pathophysiology. *Up To Date.* 2015
10. Consumer Advisory Group (CAG) approval	Not applicable
11. Aboriginal Health Impact Statement	The Aboriginal Health Impact Statement does not require completion because there is no direct or indirect impact on Aboriginal people. Approval: T22/
12. Implementation and Evaluation Plan	**Implementation:** The document will be published on the SGH-TSH business rule webpage and distributed via the monthly SGH-TSH CGD report. **Evaluation:** 3 monthly meetings regarding effectiveness of process and identification of any persisting issues. Compliance with CIBR to be assessed on an individual case basis by the members of the TBI

THIS DOCUMENT BECOMES UNCONTROLLED WHEN PRINTED
DISCARD PRINTED DOCUMENTS IMMEDIATELY AFTER USE

	multidisciplinary team.
13. Knowledge Evaluation	**Q1**: How often does the TBI Team Round occur? **A1**: Once a week, or more often if a patient's clinical condition requires **Q2**: Ideally, what time of day should a patient with a TBI be transferred to the ward? **A2**: During business hours (Monday-Friday 0800-1600Hrs). This allows for any adjustments or changes in clinical condition to be managed by a full cohort of senior staff. **Q3**: Who coordinates the transfer of care to a Brain Injury Unit? **A3**: The Trauma Case Managers are responsible for the identification, referral and updating of the relevant Brain Injury Unit.
13. Who is Responsible	Trauma Director SGH Trauma Case Managers SGH

THIS DOCUMENT BECOMES UNCONTROLLED WHEN PRINTED
DISCARD PRINTED DOCUMENTS IMMEDIATELY AFTER USE

Approval for: Traumatic Brain Injury – Multidisciplinary Care and Management	
Specialty/Department Committee	Committee: SGH TBI Working Party Committee Chairperson: Raphael Mendoza, Chair
Nurse Manager (SGH)	Andrew Bridgeman, Nurse Manager Surgery Date: 24.11.2021
Medical Head of Department (SGH)	Mary Langcake, Director of Trauma Date: 24.11.2021
Safe Use of Medicine Sub-Committee	Chairperson: A/Prof Winston Liauw Date: 15.03.2022
Executive Sponsor	Andrewina Piazza-Davies (A/ Operations Manager Surgery, Critical care and W&CH) Date: 24.11.2021
Contributors to ClBR	Raphael Mendoza Trauma Case Manager (CNS2) Kelly Sharp Trauma Case Manager (CNS2) Julie Beeson (ICU Liaison) Lynne Roberts (5A NUM) Catherine Griffiths (5A CNE) Sharlene Thurecht (PT) Diane Mouhanna (CL CNC) Michaela Zammit (OT) Jennifer Handforth (SP) Donna O'Rouke 5A (SW) Sarah O'Hare (SESLHD Trauma & PARTY CNC)

Revision and Approval History				
Revision Date	Revision number	Reason	Coordinator/Author (Position)	Revision Due
Mar 2017	0	Update and review	Trauma CNC	Mar 2020
Mar 2022	1	Major Review	Raphael Mendoza TCM CNS2	Mar 2025

General Manager's Ratification	
Angela Karooz (A/GM SGH)	Date: 22.03.2022

THIS DOCUMENT BECOMES UNCONTROLLED WHEN PRINTED
DISCARD PRINTED DOCUMENTS IMMEDIATELY AFTER USE

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 Lability	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

THIS DOCUMENT BECOMES UNCONTROLLED WHEN PRINTED
DISCARD PRINTED DOCUMENTS IMMEDIATELY AFTER USE

Appendix 2 - MANAGEMENT OF AGGRESSIVE PATIENTS WITH TBI

Perceived Risk to Self = Low	– 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	– In-charge to notify team (during hours) or after hours surgical registrar (after hours) & Trauma Case Manager (7 days, 0700-2130hrs) – 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 notes and communicate this with nursing staff
Perceived Risk = High	– 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 SESLHDPR/483 *Restrictive practices 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 – 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
Perceived Risk = Extreme	– A serious threat to the physical wellbeing of staff (e.g. weapons or personal threats) – Call 2222 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	Anti-depressant
Aggression	Clonazepam	Quetiapine and /or Risperidone	Propranolol	Olanzapine / Clonazepam	Doxepin
Violence				Midazolam	
Frustration	Sodium Valproate / Carbamazepine				
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			Sertraline
Agitation			Propranolol		
Suspicion		Olanzapine and/or Risperidone			
Mood Swings	Sodium Valproate / Carbamazepine				
Psychosis		Olanzapine and/or Risperidone			
Depression					Sertraline / Citalopram

THIS DOCUMENT BECOMES UNCONTROLLED WHEN PRINTED
DISCARD PRINTED DOCUMENTS IMMEDIATELY AFTER USE

Medication	Recommended Dosage		
	Initial Dose	Range	Maximum Dose
Carbamazepine (Therapeutic drug monitoring may be required)	PO, 200mg – 400mg divided in 2 doses daily	400mg – 1600mg (increase 200mg/day increments until response is achieved)	1600mg Daily
Citalopram	20mg, PO	20mg – 40mg	40mg Daily
Doxepin	25mg, PO	25mg – 75mg	75mg Daily
Midazolam (Use only in Acute/Extreme circumstances, can impair recovery time and induce amnesia)	0.01-0.08mg/kg IV over 2-3minutes every 5-15minutes.	0.5mg - 5mg **Doctor & Clinical Discretion**	5mg **Doctors & Clinical Discretion**
Olanzapine	5mg, PO/Wafer	5mg – 30mg (increase 5mg/day increments until response achieved)	30mg
Propranolol (monitor HR/BP)	10mg, PO, TDS or QID	10mg - 80mg (increase 10mg/week increments until response achieved)	320mg Daily
Quetiapine IR	50mg, PO, divided in 2 doses daily	100mg – 800mg (increase 100mg/day increments until response is achieved)	800mg daily
Risperidone (monitor orthostatic hypotension)	1mg, PO, divided in 2 doses daily	1mg – 6mg (increase 1mg/day increments until response is achieved)	6mg Daily
Sertraline	50mg, PO	50mg – 200mg (Increase 50mg/week increments until response is achieved.	200mg Daily
Sodium Valproate	600mg, PO	600mg – 2000mg (increase 200mg/day at day 3 intervals until control is achieved	2000mg Daily

- *Patients who were previously prescribed anti-depressants should be reinstated when safe to do so.*
- *Prescribing of new medications can be reviewed over time and in relation to PTA testing*

THIS DOCUMENT BECOMES UNCONTROLLED WHEN PRINTED
DISCARD PRINTED DOCUMENTS IMMEDIATELY AFTER USE