Sussex Trauma
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Sussex Trauma Network

Guidelines for Management of:

Severe Traumatic Brain Injury

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Management of Severe Traumatic Brain Injury

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1 Executive Summary

- Most patients with severe traumatic brain injury (TBI) will be triaged or conveyed to the appropriate Major Trauma Centre (MTC).
- Most adult patients will be taken to the Emergency Department at the Royal Sussex County Hospital, Brighton.
- Paediatric patients will be conveyed to the nearest Paediatric MTC.
- They will be assessed by a Trauma Team lead by an ATLS certified clinician.
- They will have an initial non-contrast head CT within one hour of the risk of brain injury being identified.
- They will also have cervical spine CT performed at the same session unless there is no possibility of cervical spine trauma e.g. penetrating head injury.
- They will have a provisional written radiology report within 1 hour of a CT head or cervical spine scan being performed.
- All adults and children who have passed their 16th birthday with severe TBI will be referred to the duty Neurosurgical team at the MTC.
- Children under the age of 16 with severe TBI who are in the MTC should be discussed with the duty Neurosurgical Consultant or Registrar to decide whether they should have initial local treatment before transfer to a Paediatric Neurosurgical Centre.
- Children under the age of 16 with severe TBI who are in a Trauma Unit should be referred directly to the nearest Paediatric Neurosurgical Centre.
- Patients with severe TBI should have access to specialist treatment from a neuroscience unit, who will decide if the patient will be admitted under their care.
- Otherwise, the patient will be admitted under the care of the most relevant speciality according to local practice.
- Patient in hospital with new cognitive, communicative, emotional, behavioural or physical difficulties that continue 72 hours after a traumatic brain injury should have an assessment for inpatient and community-based rehabilitation.
- Patients with rehabilitation needs will be referred to the relevant provider.

2 Introduction

Severe Traumatic Brain Injury (TBI) is one of the major traumatic causes of death in the UK.

For those who survive, moderate or severe TBI may lead to long-term or life-long health problems that may affect all aspects of a person’s life. A person with a moderate or severe TBI may need ongoing care to help with their recovery. A moderate or severe TBI not only impacts the life of an individual and their family, but it also can have a large economic burden on social and health services.

3 Purpose of the Guideline

The purpose of this guideline is to clearly define the care pathway for patients with severe traumatic brain injury including referral pathways to and from the Major Trauma Centre (MTC) (Royal Sussex County Hospital (RSCH)) and network Trauma Units (TUs).

3.1 Aims & Objectives

The aims and objectives of this guideline are:

- To provide a system-wide approach for management of patients with severe TBI
- To define appropriate patient pathways for these patients
- To list appropriate accepted routes of communication
- To highlight continuing areas of contention
- To help meet TQUINs requirements for creation of network-agreed guidelines for the Network and Trauma Units (TUs)

4 Definitions

4.1 Traumatic Brain Injury

Traumatic brain injury (TBI) is defined as damage to the brain resulting from external mechanical force, such as rapid acceleration or deceleration, impact, blast waves, or penetration by a projectile. (Ref1).

4.2 Severe Traumatic Brain Injury

TBI is classified on the basis of symptoms of brain dysfunction. Severe TBI may have a presentation GCS of 3 to 8 (Mayo Classification) OR post traumatic amnesia of more than 7 days OR loss of consciousness of more than 24 hours.

5 Scope

The guideline covers all major trauma patients with severe TBI within the Sussex Trauma Network. It replaces and supersedes all relevant previous STN Guidelines and is applicable to adults and children.

6 Relevant Documents and Guidance

This guideline assumes and incorporates compliance with:

- NICE Clinical Guideline [CG176] - Head injury: assessment and early management
- NICE Quality Standard [QS74] – Head Injury

7 Responsibilities, Accountabilities and Duties

8 Standard Operating Procedure

8.1 Pre-Hospital Triage

Nearly all patients with Severe TBI are conveyed to hospital and have pre-hospital triage by one or both of the two main pre-hospital service providers – SECAMB and AAKSS. Each of these services cover a wider area than the STN and has its own pre-hospital triage algorithms to determine which hospital an individual patient is conveyed to.

According to SECAMB guidelines current at the time of printing, patients with a GCS motor score of less than 4 or obvious open or depressed skull fracture, who do not have an exclusion criterion (see STN - Patient Pathways), would be conveyed to the appropriate MTC. However, patients with inadequately controlled airway, breathing and circulation might be taken to the nearest hospital.

All adult patients with Severe TBI conveyed by AAKSS within the STN will be taken to the MTC at the Royal Sussex County Hospital, Brighton.

Paediatric patients will be conveyed to the nearest Paediatric MTC.

8.2 Initial Assessment

Whichever hospital the patient arrives at, they will be assessed by a Trauma Team lead by an ATLS certified clinician.

8.3 Imaging

The patient will have an initial non-contrast head CT within one hour of the risk of brain injury being identified (Quality Statement 1). They will also have cervical spine CT performed at the same session unless there is no possibility of cervical spine trauma e.g. penetrating head injury (Quality Statement 3).

They will have a provisional written radiology report within 1 hour of a CT head or cervical spine scan being performed (Quality Statement 4).

8.4 Specialist Referral

All adults and children who have passed their 16th birthday with severe TBI will be referred to the duty Neurosurgical team at the MTC. However, the mode of this referral will depend on the circumstances.

If the patient is in a Trauma Unit and is found to have a life-threatening condition, then the patient should be transferred to the MTC using the Immediate Transfer process (see STN Patient Pathways document) – unless they meet the exclusion criteria. This involves notification of the MTC duty ED Consultant prior to transfer. The duty Neurosurgical Consultant or Registrar should also be notified, either by the TU or MTC ED doctor, prior to arrival.

Examples of Severe TBI with a life-threatening condition include:

- Extradural haematoma with altered GCS
- Traumatic subdural haematoma in patients requiring airway support
- Depressed skull fracture with significant contusions requiring airway support

For all other adults and children 16 years and above, whether in the MTC or another Hospital, FIRST contact the duty Neurosurgical Consultant or Registrar at RSCH (01273 696955) AND complete on-line referral on https://www.referapatient.org/refer-a-patient.

Ensure that PACS images are available to the Neurosurgical Team.

Children under the age of 16 with severe TBI who are in the MTC should be discussed with the duty Neurosurgical Consultant or Registrar (see above) to decide whether they should have initial local treatment before transfer to a Paediatric Neurosurgical Centre

Children under the age of 16 with severe TBI who are in a TU should be referred directly to the nearest Paediatric Neurosurgical Centre.

The nearest Paediatric Neurosurgical Centres taking emergencies are:

- King's College Hospital
- St George's Hospital
- Southampton General Hospital

8.5 Admission

All patients with severe TBI should be admitted to the most suitable acute hospital under the care of the most appropriate inpatient speciality.

People with a head injury who have a Glasgow Coma Scale (GCS) score of 8 or lower at any time should have access to specialist treatment from a neuroscience unit (Quality Statement 5).

The duty Neurosurgical team to whom the patient was referred, will decide whether the admission will be under their care, and if so, arrange the admission. This will include all patients with isolated severe TBI needing ongoing neurosurgical care and monitoring.

Otherwise, the patient should be admitted under the care of the most relevant speciality according to local practice. This may include general surgery, trauma surgery, orthopaedic surgery, elderly care medicine and acute medicine.

Local pathways about acceptance of such patients should be agreed and documented prior to need for them.

8.6 Rehabilitation

Patients who are in hospital with new cognitive, communicative, emotional, behavioural or physical difficulties that continue 72 hours after a traumatic brain injury should have an assessment for inpatient and community-based rehabilitation (Quality Statement 6 and 7).

The patient must be medically optimised for the therapists to determine their rehabilitation needs. The patient should be discussed in a Multidisciplinary Team (MDT) setting to identify the appropriate rehabilitation pathway. If the patient is at the MTC, the Major Trauma Rehabilitation Coordinator and the Head Injury Nurse Specialist help support the therapy team facilitate family meetings, complete referrals and act as a single point of contact between the family and carers and rehabilitation units.

Patients with rehabilitation needs should be referred to the relevant provider. This should be done before discharge home, or repatriation to a local hospital (see STN Repatriation Policy). If the patient has complex rehabilitation needs, the PCAT (Patient Categorisation Tool) can be used to identify whether the patient requires a level 1 or 2 rehabilitation bed. Referral to the appropriate rehabilitation unit must also be done prior to repatriation.

All patients admitted with severe TBI will require a Rehabilitation Prescription completed by a trained therapist who is a member of the MDT before they are discharged.

8.7 Audit

- All patients with severe TBI are eligible for inclusion in and should be entered into the ongoing national Trauma Audit and Research Network (TARN) audit (see www.tarn.ac.uk).

- Any patients whose treatment falls outside this guideline should be raised onto the network Clinical governance log and discussed through internal clinical governance mechanisms.

9 Training Implications

STN aims to provide an online training module supporting the specific and unique elements of this pathway.

10 Documentation

There is no formal documentation of this process, other than the following:

- Written and computer patient medical records including order comms, PACS etc
- Referapatient online records
- Rehabilitation prescriptions
- Repatriation referral forms
- PCAT (Patient Categorisation Tool) form

11 Monitoring Arrangements

These include:

- STN Clinical Governance log

- TARN Audit

12 Equality Impact Assessment Screening

None in process.

13 Links to other SOPs and Trust policies

This guidance refers to and links with the following STN publications:

- STN Patient Pathways (present version called Patient Pathway v9.5a) from www.bsuh.nhs.uk/stn/docs/
- STN Repatriation Policy (present version called Repatriation Policy v4) from www.bsuh.nhs.uk/stn/docs/
- STN Guideline - Specialist Rehabilitation Services – still pending but will be at www.bsuh.nhs.uk/stn/docs/

14 References

- en.wikipedia.org/wiki/Traumatic_brain_injury
- NICE Clinical Guideline [CG176] - Head injury: assessment and early management
- NICE Quality Standard [QS74] – Head Injury
- www.referapatient.org/refer-a-patient
- www.tarn.ac.uk

15 Appendices

15.1 Appendix 1 – Abbreviations

AAKSS	Air Ambulance Kent Surrey Sussex
ATLS	Advanced Trauma Life Support
CT	Computerised Tomography
ED	Emergency Department
GCS	Glasgow Coma Scale
LEH	Local Emergency Hospital
MDT	Multi-Disciplinary Team
MTC	Major Trauma Centre
PCAT	Patient Categorisation Tool
SECAMB	South East Coast Ambulance Service
TBI	Traumatic Brain Injury
TQUINs	Trauma Quality Indicators
TU	Trauma Unit
TUs	Trauma Units