trust clinical guideline

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Authorised Staff	☐ Ambulance Care Assistant ☒ Emergency Care Assistant ☒ Student Paramedic ☒ Advanced Technician ☒ Paramedic (non-ECP) ☒ Nurse (non-ECP) ☒ ECP ☒ Doctor
Clinical Publication Category	**Guidance (Green) - Deviation permissible; Apply clinical judgement**

1. Scope

1.1 Around 700,000 people attend Emergency Departments (EDs) with a head injury every year in the UK. Whilst most head injuries are minor, 10% of cases are severe, resulting in significant brain injury. Head injuries may be isolated, or part of multi-system trauma. Common causes include falls, assault and road traffic collisions. Alcohol is also an important factor in up to 65% of cases.

2. Background and Definitions

2.1 Head injury may occur as a result of blunt or penetrating trauma causing direct injury at the site of impact; indirect injury may also occur. Examples include contusions on the opposite side of the brain from the impact, as a result of movement of the brain within the skull, or brain injury from shearing or rotational forces as the head accelerates and decelerates after impact.

2.2 The term head injury is defined as any trauma to the head, other than superficial injuries to the face.

3. Guidance

3.1. History

3.1.1 The risk of severe brain injury can often be determined from the history and mechanism of injury, including an assessment of the scene surrounding the patient e.g. significant damage to a protective helmet, blood-staining on objects surrounding a fallen patient or a bulls eye pattern on a vehicle windscreen.

3.1.2 It is important to consider non-accidental injury when approaching any patient with a head injury. Where this is suspected from the history or examination, it must be recorded on the patient clinical record (PCR) and reported using the Trust's safeguarding procedures. The information must be clearly passed to the Emergency Department clinician during the patient handover.

3.2. Pre-hospital Assessment

3.2.1 Successful management of head injuries in the pre-hospital environment requires recognition of the severity of the injury. Minor head injuries are common, and serious complications are rare. The challenge is recognising the more serious head injuries that require referral to an ED. NICE guidelines support clinicians with this process.[1]

3.3 Management of Patients who Require Hospital Attendance

3.3.1 When major trauma is suspected the Trust's major trauma checklist must be completed. The checklist will indicate whether the patient should be conveyed to the nearest Trauma Unit, or transported to a Major Trauma Centre in accordance with Clinical Guidelines (CG24) Trauma Care - Accessing Trauma Services.

3.3.2 When faced with a patient with a severe head injury, use a CABCD approach to ensure adequate oxygenation of the brain, as hypoxia is associated with poorer outcomes. Administration of high flow oxygen should be considered via a non-rebreathing mask to maintain an SPO_2 of >95%. For people with chronic obstructive pulmonary disease who are at risk of hypercapnic respiratory failure, aim to achieve a target SPO_2 of 88-92%, using capnography where available.

3.4 Airway Management and Cervical Spine Immobilisation

3.4.1 Patients with severe head injury may have a reduced level of consciousness and may not be able to effectively protect their airway. In addition, obstruction of the airway may occur secondary to the tongue, blood or secretions in the pharynx. A stepwise approach to airway management must be taken, as detailed within Clinical Guideline (CG03) Airway Management.

3.4.2 Full cervical spine immobilisation is advocated in the following situations, unless other factors prevent it from occurring:

- Glasgow coma scale (GCS) <15 at any time since the injury;
- Mid-line neck pain or tenderness;
- Focal neurological deficit;
- Paraesthesia in the extremities;
- Any other clinical suspicion of cervical spine injury.

3.4.3 Cervical spine injury may often accompany head injury. In patients with an altered conscious level, or in those who have consumed alcohol, reliably excluding cervical spinal injury is impossible. Cervical spine immobilisation is therefore mandatory in this group.

3.5 Breathing

3.5.1 Assist ventilation at a rate of 10 breaths per minute with a bag-valve mask if the patient has a respiratory rate of <10 or >30; if chest expansion is inadequate, or the oxygen saturations are <90% on high flow oxygen. See JRCALC guidelines for paediatric values.

3.6 Circulation

3.6.1 In order to maintain adequate cerebral perfusion in the case of an isolated head injury, the systolic blood pressure should be maintained at 120mmHg, as pressures below this are associated with a poor neurological outcome.

3.6.2 When the head injury is part of multi-system trauma, the systolic blood pressure should be maintained at 90mmHg and/or the presence of a radial pulse, as higher pressures may disturb the blood clotting process. Maintaining a higher systolic pressure must only be considered if there are signs of central hypo-perfusion such as altered mental state or cardiac rhythm disturbance.

3.7 Disability

3.7.1 This consists of an assessment of conscious level, pupillary response and glucose measurement.

3.7.2 The AVPU (alert, voice response, pain response, unresponsive) assessment is recommended as an initial assessment of conscious level, followed by the Glasgow Coma Scale (GCS) at a later stage when there is time to conduct the full assessment.

3.7.3 The receiving hospital must receive an ATMIST pre-alert for all patients with a GCS less than or equal to 8, to ensure appropriately experienced clinicians are available for their treatment and to prepare for imaging.

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3.8 Management of Patients who do Not Require Hospital Attendance

3.8.1 NICE have published guidance for ambulance clinicians which advise that where any of the following criteria are present, the patient should be conveyed to hospital:

- GCS less than 15 on initial assessment.
- Any loss of consciousness as a result of the injury;
- Any focal neurological deficit since the injury (examples include problems

understanding, speaking, reading or writing, decreased sensation, loss of balance, general weakness, visual changes, abnormal reflexes and problems walking);

- Any suspicion of a skull fracture or penetrating head injury since the injury (for example, clear fluid running from the ears or nose, black eye with no associated damage around the eyes, bleeding from one or both ears, new deafness in one or both ears, bruising behind one or both ears, penetrating injury signs, visible trauma to the scalp or skull of concern to the clinician).
- Amnesia for events before or after the injury. The assessment of amnesia will not be possible in pre-verbal children and is unlikely to be possible in any child aged under 5 years;
- Persistent headache since the injury;
- Any vomiting episodes since the injury (clinical judgement should be used in those aged ≤12 years);
- Any seizure since the injury;
- Any previous cranial neurosurgical interventions;
- A high-energy head injury (for example, pedestrian struck by motor vehicle, occupant ejected from motor vehicle, fall from a height of greater than 1 m or more than five stairs, diving accident, high-speed motor vehicle collision, rollover motor accident, accident involving motorised recreational vehicles, bicycle collision, or any other potentially high-energy mechanism);
- History of bleeding or clotting disorder;
- Current anticoagulant therapy such as warfarin (also consider clopidogrel, dabigatran and rivaroxban);
- Current drug or alcohol intoxication;
- Age 65 years or older;
- Suspicion of non-accidental injury;
- Continuing concern by the professional about the diagnosis.

3.8.2 The Trust recognises that on occasion, clinicians may deviate from NICE guidelines in the treatment of a head injury. An example of this may be when patients aged 65 and over have no other criteria for admission other than their age. It is advisable that if you feel a hospital referral is not indicated contrary to NICE guidance, advice is sought from a senior clinician such as an Emergency Care Practitioner or Doctor, and the reason for the deviation is clearly documented on the PCR.

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3.8.3 If none of the NICE criteria for referral to an ED are present, clinicians should consider referral if any of the following factors are present, depending on their own judgement of the severity of the head injury;

- Irritability or altered behaviour, particularly in children under 5 years of age;
- Visible trauma to the head not covered above but still of concern to the clinician;
- Adverse social factors (for example, no one able to support the patient at home);
- Continuing concern by the injured person or their carer about the diagnosis

3.8.4 Emergency Care Practitioners are an excellent resource when considering community treatment of patients with head injuries. They are ideally placed to deliver wound care for minor head lacerations when clinically appropriate, and are able to perform detailed neurological assessments, to support decisions on whether the patient should be managed in the community.

4. Incident Closure

4.1 Patients not requiring conveyance to hospital must be provided with a copy of the PCR and the head injury patient information leaflet, which advises patients of the warning signs that warrant further immediate medical assessment:

- Increasing drowsiness;
- Worsening headache;
- Confusion or strange behaviour;
- Two or more episodes of vomiting;
- Focal neurological problem, e.g. limb weakness;
- Dizziness, loss of balance, or convulsions;
- Any visual problems such as blurring of vision, or double vision;
- Blood, or clear fluid, leaking from the nose or ear;
- Unusual breathing patterns.

5. Documentation

5.1 In line with Trust Policy, a Patient Clinical Record must be completed and annotated appropriately. A Trauma Checklist form must also be completed for all patients where major trauma is suspected. Any deviation from this guideline must be recorded, with any potential or actual adverse event reported through the incident reporting system.

6. References

1. National Institute for Health and Clinical Excellence (2011) Head Injury CG56. NICE.

2. Joint Royal Colleges Ambulance Liaison Committee Pre-Hospital Guidelines. JRCALC.