Suspected/Observed Head Injury? Perform full PEWS obs including BP

History:
• When? Mechanism of injury?
• Loss of consciousness? Vomiting? Fitting? Persisting dizziness?
• Amnesia (anterograde/retrograde)?
• Worsening headache?
• Clotting disorder?

Examination:
• Assess conscious level - GCS (see table 2) and pupils
• Confused or repetitive speech?
• Skull integrity (bruises; wounds; boggy swelling) + fontanelle assessment
• Signs of base of skull fracture
• Signs of focal neurology
• Cervical spine
• If under 3 years, undress and examine fully

Do the symptoms and/or signs suggest an immediately life threatening injury? (see table 1)

Yes

• Contact Lead ED/ Paediatric Doctor
• Move to Resuscitation Area
• If time critical transfer, call SORT (023 8077 5502)

Are there safeguarding concerns (e.g. delay in presentation; injury not consistent with history or age/developmental stage of child)?

Concern

• Contact safeguarding / children’s services team

Green - low risk

Nature of injury and conscious level
• Low risk mechanism of injury
• No loss of consciousness
• Child cried immediately after injury
• Alert, interacting with parent, easily rousable
• Behaviour considered normal by parent

Amber - intermediate risk

• Mechanism of injury: fall from a height > 1m or greater than child’s own height
• Alert but irritable and/or altered behaviour

Red - high risk

• Mechanism of injury: considered dangerous (high speed road traffic accident; >3m fall)
• Suspicion of NAI
• GCS < 15/ altered level of consciousness
• Witnessed loss of consciousness lasting > 5mins
• Persisting abnormal drowsiness
• Post traumatic seizure

Are the symptoms and/or signs suggestive of raised ICP?

If no deterioration

If deterioration

Green Action
• Provide written and verbal advice (see advice sheet)
• If concussion, provide advice about graded return to normal activities

Amber Action
• Consider safeguarding risk
• Observe in department for at least 4 hours post-injury
• Provide analgesia
• Discuss with ED or paeds senior if under 1 year

Urgent Action
• Assess need for CT (see figure 1)
• Admit for neurology obs (every 15 minutes until GCS 15, then hourly).
• If time critical transfer, call SORT (023 8077 5502)

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Head Injury Pathway
Clinical Assessment/Management tool for Children
Management - Acute Setting

**Figure 1: Selection of children for CT head scan**

Children presenting to the emergency department who have sustained a head injury.

Are any of the following risk factors present?

- Suspicion of non-accidental injury
- Post-traumatic seizure, but no history of epilepsy
- On initial assessment GCS <14, or for children under 1 year GCS (paediatric) <15
- At 2 hours after the injury GCS <15
- Suspected open or depressed skull injury or tense fontanelle.
- Any sign of basal skull fracture (haemotympanum 'panda eyes, cerebrospinal fluid from the ear or nose, Battle's sign).
- Focal neurological deficit
- For children under 1 year, presence of bruise, swelling or laceration of more than 5cm on the head.

Perform CT head scan within 1 hour of risk factor being identified. A provisional written radiology report should be made available within 1 hour of the CT head scan taking place.

Observe for a minimum of 4 hours post head injury.

Are any of the following present?

- Witnessed loss of consciousness >5 minutes
- Abnormal drowsiness
- 3 or more discrete episodes of vomiting
- Dangerous mechanism of injury (high-speed road traffic accident either as a pedestrian, cyclist or vehicle occupant, fall from height of > 3 metres, high speed injury from an object
- Amnesia (antegrade or retrograde) lasting >5 minutes (assessment not possible in pre-verbal children and unlikely in any child <5 years).

Perform CT head scan within 8 hours of the injury. A provisional written radiology report should be made available within 1 hour of the CT head scan taking place.

Current anticoag treatment?

Yes

- Yes, >1 factor
- Yes, 1 factor

No

Are any of the following risk factors present during observation?

- GCS <15
- Further vomiting
- Further episodes of abnormal drowsiness

Yes

No

Perform CT head scan within 8 hours of the injury. No imaging required. Use clinical judgement to determine when further observation is required.

Table 2: Modified Glasgow Coma Scale for infants and Children

<table>
<thead>
<tr>
<th>Child</th>
<th>Infant</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eye opening</td>
<td>Spontaneous</td>
<td>4</td>
</tr>
<tr>
<td>To speech</td>
<td>To speech</td>
<td>3</td>
</tr>
<tr>
<td>To pain only</td>
<td>To pain only</td>
<td>2</td>
</tr>
<tr>
<td>No response</td>
<td>No response</td>
<td>1</td>
</tr>
<tr>
<td>Best verbal response</td>
<td>Oriented, appropriate</td>
<td>5</td>
</tr>
<tr>
<td>Confused</td>
<td>Coos and babbles</td>
<td>4</td>
</tr>
<tr>
<td>Inappropriate words</td>
<td>Irritable cries</td>
<td>3</td>
</tr>
<tr>
<td>Incomprehensible sounds</td>
<td>Cries to pain</td>
<td>2</td>
</tr>
<tr>
<td>No response</td>
<td>Moans to pain</td>
<td>1</td>
</tr>
<tr>
<td>Best motor response*</td>
<td>Obey commands</td>
<td>6</td>
</tr>
<tr>
<td>Localises painful stimulus</td>
<td>Moves spontaneously and purposefully</td>
<td>5</td>
</tr>
<tr>
<td>Withdraws in response to pain</td>
<td>Withdraws to touch</td>
<td>4</td>
</tr>
<tr>
<td>Flexion in response to pain</td>
<td>Withdraws to response in pain</td>
<td>3</td>
</tr>
<tr>
<td>Extension in response to pain</td>
<td>Abnormal flexion posture to pain</td>
<td>2</td>
</tr>
<tr>
<td>No response</td>
<td>Abnormal flexion posture to pain</td>
<td>1</td>
</tr>
</tbody>
</table>

* If patient is intubated, unconscious, or preverbal, the most important part of this scale is motor response. Motor response should be carefully evaluated.