Head Injury in Children- Full Clinical Paediatric Guideline – Joint Derby & Burton

Reference no.: CH CLIN C20/ May 21/v005

1. Introduction

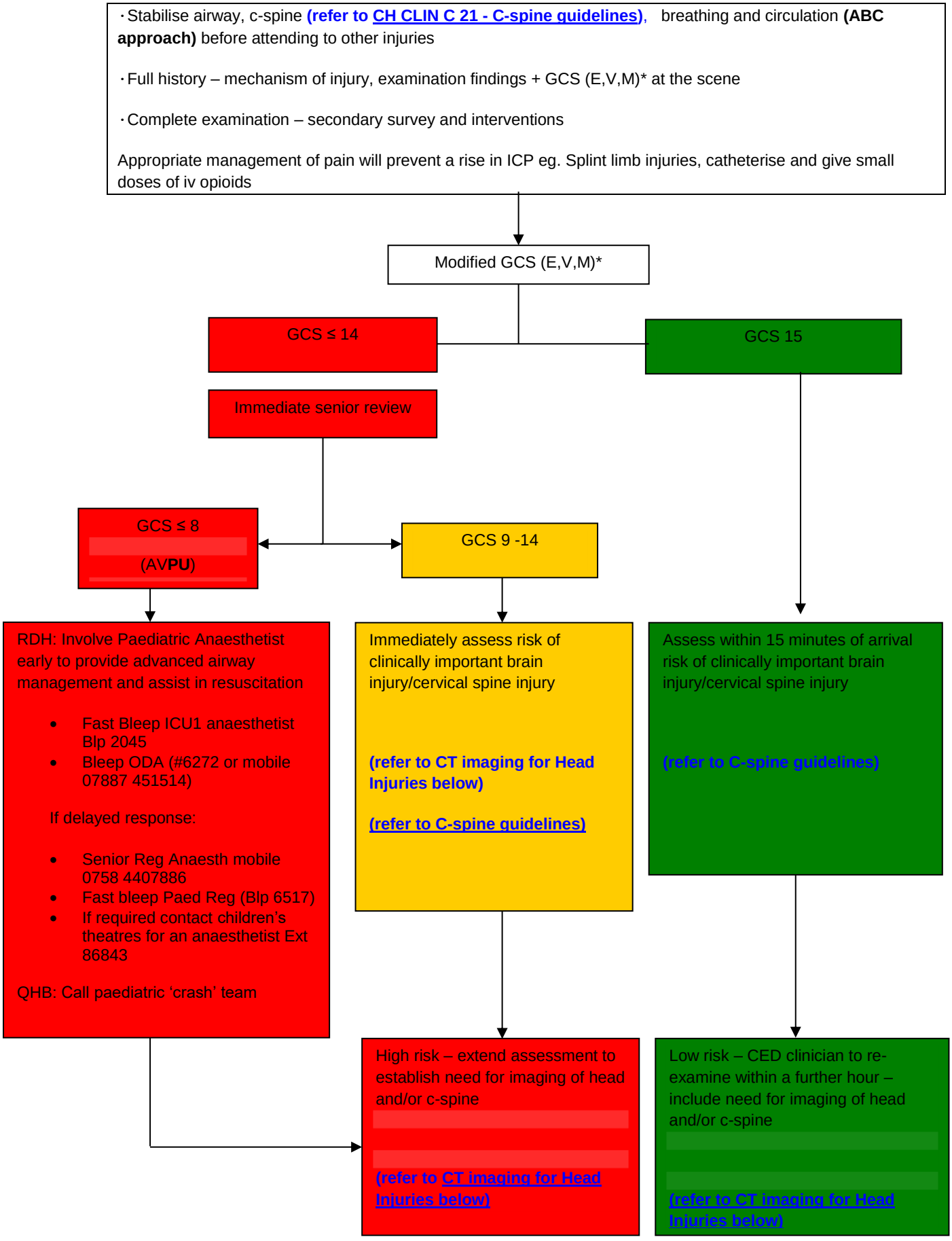
To aid thorough assessment of children with head injury

2. Aim and Purpose

To ensure a systematic approach is taken to provide effective management of children with head injury.

3. Main body of Guidelines

Note: This guideline may require reference to CH CLIN C 21 ' C-spine Imaging Guideline'


·Stabilise airway, c-spine (refer to CH CLIN C 21 - C-spine guidelines), breathing and circulation (ABC approach) before attending to other injuries
·Full history – mechanism of injury, examination findings + GCS (E,V,M)* at the scene
·Complete examination – secondary survey and interventions
Appropriate management of pain will prevent a rise in ICP eg. Splint limb injuries, catheterise and give small doses of iv opioids
Modified GCS (E,V,M)*
GCS ≤ 14
GCS 15
Immediate senior review
GCS ≤ 8
(AVPU)
GCS 9 -14
RDH: Involve Paediatric Anaesthetist early to provide advanced airway management and assist in resuscitation
Fast Bleep ICU1 anaesthetist Blp 2045
Bleep ODA (#6272 or mobile 07887 451514)
If delayed response:
Senior Reg Anaesth mobile 0758 4407886
Fast bleep Paed Reg (Blp 6517)
If required contact children's theatres for an anaesthetist Ext 86843
QHB: Call paediatric 'crash' team
Immediately assess risk of clinically important brain injury/cervical spine injury
(refer to CT imaging for Head Injuries below)
(refer to C-spine guidelines)
Assess within 15 minutes of arrival risk of clinically important brain injury/cervical spine injury
(refer to C-spine guidelines)
High risk – extend assessment to establish need for imaging of head and/or c-spine
(refer to CT imaging for Head Injuries below)
Low risk – CED clinician to re-examine within a further hour – include need for imaging of head and/or c-spine
(refer to CT imaging for Head Injuries below)

CT Imaging for Head Injury Guidelines (under 16)

Are any 1 of the following risk factors present?

- Clinical suspicion of non-accidental injury
- Post-traumatic seizure but no history of epilepsy
- Age > 1 year: GCS < 14 on assessment in ED
- Age < 1 year: GCS (paediatric) < 15 on assessment in ED
- GCS < 15 at 2 hours post injury
- Suspicion of open or depressed skull injury or tense fontanelle
- Any sign of basal skull fracture (haemotympanum, 'panda' eyes, CSF leakage from ears or nose, Battle's sign)
- Focal neurological deficit
- Age < 1 year: presence of bruise, swelling or laceration > 5cm on the head

Seek senior advice: RDH: CED or ED Consultant or ED registrar (Bleep 2020)

QHB: ED consultant

More than 1 of the following risk factors present?

- Witnessed loss of consciousness lasting > 5 minutes
- Amnesia (antegrade or retrograde) lasting > 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 > 3m, high-speed injury from a projectile or an object)
- On anticoagulant therapy* – see below

Seek senior advice:

RDH: CED or ED Consultant or ED registrar (Bleep 2020)

QHB: ED consultant

Yes

Immediate CT Head

RDH:
- Consider involving Paediatric Anaesthetist early to provide advanced airway management and assist in resuscitation (see above contact details)
- Urgent ED/CED Middle Grade or Consultant review

QHB:
- Urgent ED Middle Grade or Consultant review

None

- No imaging required now
- Consider period of observation - D/W CED senior – RDH or Paediatric registrar - QHB

➢ 1 risk factor

- No imaging required now
- Observe for min. 4 hours post injury

Consider CT head if within 4 hours of head injury:
1. GCS < 15
2. Further vomiting
3. A further episode of abnormal drowsiness

*For children who have sustained a head injury with no other indications for a CT head scan and who are having anticoagulant treatment, perform a CT head scan within 8 hours of the injury. For advice on reversal of warfarin anticoagulation in people with suspected traumatic intracranial haemorrhage, see what NICE guidance on blood transfusion.

CT Imaging for Head Injury Guidelines (over 16)

Follow flow charts above fir risk factors

For young people > 16 years with any of the following risk factors who have experienced some loss of consciousness or amnesia since the injury, perform a CT head scan within 8 hours of the head injury:

- Any history of bleeding or clotting disorders
- Patients on anticoagulant therapy
- Dangerous mechanism of injury (a pedestrian or cyclist struck by a motor vehicle, an occupant ejected from a motor vehicle or a fall from a height of greater than 1 metre or 5 stairs).
- More than 30 minutes' retrograde amnesia of events immediately before the head injury.

Admission criteria:

- New, clinically significant abnormalities on CT scan
  - D/w neurosurgical team at QMC (0115 924 9924)
- GCS < 15 regardless of imaging results
- Criteria for CT head fulfilled but delay for scan or patient uncooperative
- Continuing worrying signs – vomiting, severe headaches
- Other concerns - eg. drug or alcohol intoxication, other injuries, shock, NAI suspected
- Difficulty in assessing
- No responsible adult
- Investigation of non-accidental injury (NAI) in children: A clinician with expertise in NAI in children should be involved in any suspected case
- Admission:
  RDH:
  Over the age of 2 years admit under the care of the CED consultants (inform them please). After 11pm inform the ED registrar (Bleep 2020). The paediatric team will have appropriate input as with any other surgical admission. If there is a clinical concern overnight the ED registrar will review.
  Under the age of 2 years the paediatric team are solely responsible
  Paediatric team to inform CED senior at 9am during week days and at 1pm on weekends of any HI patient on the paediatric wards needing review.
  QHB: Admit to PAU/paediatric ward. If clinical condition suggests likely deterioration consider transfer to RDH, or specialist unit, following discussion with RDH General Paediatric Consultant on call

Observations for admission or period of observation:

Minimum acceptable documented neurological observations are:

- GCS
- Pupil size and reactivity
- Limb movements
- Respiratory rate
- Heart rate
- Blood pressure
- Temperature
- Blood oxygen saturation

Perform and record observations half-hourly until GCS = 15

When GCS = 15, minimum frequency of observations starting after initial assessment in ED/PAU is:

- Half-hourly for 2 hours
- Then 1-hourly for 4 hours
- Then 2 hourly thereafter

Patient changes requiring review (Clinical RED FLAGS):

- If any of the following happen:
  - Agitation or abnormal behaviour developed
  - GCS dropped by 1 point and lasted for at least 30 minutes (greater weight to a drop of 1 point in motor response score)
  - Any drop of 3 or more points in the eye-opening or verbal response scores, or 2 or more points in the motor response score
  - Severe or increasing headache developed or persistent vomiting
  - New or evolving neurological symptoms or signs, such as pupil inequality or asymmetry of limb of facial movement

  Confirm change by second competent staff member without delay – if change confirmed seek urgent senior review
- **RDH: contact CED senior if 0900- 2300, if after 2300 ED registrar: Bleep 2020**
- **QHB: call paediatric registrar**
- Consider immediate CT scan, reassess patients clinical condition and manage appropriately
- If GCS 15 not achieved after 24 hours observation, but CT scan normal, consider further CT or MRI imaging following D/W radiology department
- Exclude other causes of reduced level of consciousness

Suitable Discharges from ED*:*

- Minor head injuries – minor scalp or skin laceration or haematoma
- GCS 15, or normal consciousness in infants, at all times
- No significant other injuries
- No fits/focal signs
- Single episode of vomiting
- No severe headache
- Non-dangerous mechanism of injury eg. Non-penetrating injury
- Responsible carer or parent present for 24 hours
    - All patients with any degree of head injury should only be transferred to their home if it is certain that there is somebody suitable at home to supervise the patient. Discharge patients with no carer at home only if suitable supervision arrangements have been organised, or when the risk of late complications is deemed negligible

All discharges from ED must receive:

- Verbal and written head injury advice
- Consider sharing a copy of discharge letter with family/carer if out if area
- Details about how to seek further advice if required
- Written communication to community services (GP, HV or school nurse) (this happens electronically) – consider HV Liaison form if appropriate
  Follow up in CED Hot Clinic RDH in 2 weeks if clinical picture of concussion *Is there a similar option at QHB?*
- Consideration of all safeguarding aspects and referral to safeguarding team and/or Health visitor made where appropriate
- Advice and consideration of referral to alcohol or drug misuse services where appropriate

If a patient returns to ED within 48 hours of discharge with a persistent complaint relating to initial head injury, seek early senior review and consider CT scan

Return to sport after Head Injury

- Concussion is the most common head injury
- There is some evidence to suggest that children who have sustained one head injury are at risk of developing a subsequent head injury because of changes in their behaviour and judgement
- Premature return to sport and a subsequent head injury may result in “Second-impact Syndrome” which often causes brain herniation and death
- There are no management guidelines for children returning to sport and other activities after head injuries currently
- The following advice has been collated from many literature reviews and international sport guidelines

Advice for patients*:*

- After head injury, patients should be advised to refrain from any sport until symptom free
- If there is any LOC or symptoms of concussion (see below), the patient should be advised to refrain from contact sport for 3 weeks or until after consultation by a doctor
  (NB. Many patients and parents will need to be advised which sports are contact sports and which sports to avoid)
- Stress the importance of rest and analgesia

Symptoms of Concussion*:*

Early -	Headache
	Dizziness
	Confusion
	Tinnitus
	Nausea
	Vomiting
	Visual disturbance
Late -	Memory disturbance
	Poor concentration
	Irritability
	Sleep disturbance
	Personality changes
	Fatigue

4. References (including any links to NICE Guidance etc.)

NICE – CG1766 Head Injury – Head injury: assessment and early management of head injury in infants, children and adults September 2014 (updated 2019)

5. Documentation Controls

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