Head Injury Pathway

Clinical Assessment/ Management tool for Children

Management - Acute Setting





Suspected/ Observed Head Injury? Contact Lead ED / Do the symptoms and/or signs suggest an immediately life threatening injury? Yes **Paediatric Doctor** Move to Resuscitation History: **Examination:** (see table 1) **Patient presents** Assess conscious level - GCS (see table 2) When? Mechanism of injury? If time critical transfer, call and pupils Loss of consciousness? Vomiting? Fitting? SORT (023 8077 5502) Confused or repetitive speech? Persisting dizziness? · Skull integrity (bruises; wounds; boggy Amnesia (anterograde /retrograde)? swelling) + fontanelle assessment Worsening headache Are there safequarding concerns · Signs of base of skull fracture Contact child Clotting disorder (e.g. delay in presentation; injury protection / social Signs of focal neurology Concern not consistent with history or age/ services team Cervical spine developmental stage of child)? · If under 3 years, undress and examine fully Table 1 Green - low risk Amber - intermediate risk Red - high risk

Symptoms & Signs

Nature of

injury and

conscious

level

Other

Record your findings (See "Good Medical Practice" http://bit.ly/1DPXI2b)

GMC Best Practice recommends:

· Behaviour considered normal by parent

 No more than 2 episodes of vomiting (>10 minutes apart) Minor bruising or minor cuts to the head

Low risk mechanism of injury

No loss of consciousness; GCS = 15

Alert, interacting with parent, easily rousable

Child cried immediately after injury

- Mechanism of injury: fall from a height > 1m or greater than child's own height
- Alert but irritable and/or altered behaviour
- 3 or more episodes of vomiting (>10 minutes apart)

Additional parent/carer support required

- Persistent or worsening headache Amnesia or repetitive speech
- Persisting dizziness

Clotting disorder

If no

deterioration

A bruise, swelling or laceration > 5cm if age < 1 year

- Mechanism of injury: considered dangerous (high speed RTA; GCS < 15 / altered level of consciousness
- · Witnessed loss of consciousness lasting > 5mins
- Amnesia lasting > 5mins
- Abnormal drowsiness Post traumatic seizure
- Skull fracture open, closed or depressed
- Tense fontanelle (infants)
- Signs of basal skull fracture (haemotypanum, 'panda' eyes, CSF leakage from ears/ nose; Battle's sign (mastoid ecchymosis)
- Focal neurological deficit

Green Action

- Provide written and verbal advice (see advice sheet)
- If concussion, provide advice about graded return to normal activities (see figure 2)
- Think "safeguarding" before sending home

Amber Action

- Consider <u>safeguarding risk</u>
- Observe in department for at least 4 hours post-injury
- Provide analgesia
- Discuss with ED or paeds senior if under 1 year

If deterioration (suggestive of raised ICP)

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)

First Draft Version: June 2016 Review Date: June 2018.

Head Injury Pathway Clinical Assessment/ Management tool for Children

Management - Acute Setting





Table 2: Modified Glasgow Coma Scale for infants and Children

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

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

Glossary of Terms		
ABC	Airways, Breathing, Circulation	
APLS	Advanced Paediatric Life Support	
AVPU	Alert Voice Pain Unresponsive	
B/P	Blood Pressure	
CPD	Continuous Professional Development	
CRT	Capillary Refill Time	
ED	Hospital Emergency Department	
GCS	Glasgow Coma Scale	
HR	Heart Rate	
MOI	Mechanism of Injury	
PEWS	Paediatric Early Warning Score	
RR	Respiratory Rate	
WBC	White Blood Cell Count	

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?					
<u> </u>					
· · · · · · · · · · · · · · · · · · ·	Suspicion of non-accidental injury				
Post-traumatic seizure, but no history of epilepsy					
(paediatric) <15	On initial assessment GCS <14, or for children under 1 year GCS (paediatric) <15				
	At 2 hours after the injury GCS <15				
	or depressed skull injury or tense fontanelle.				
 Any sign of basal skull fracture (haemotymanum 'panda eyes, cerebrospinal fluid from the ear or nose, Battle's sign). Focal neurological deficit 					
1	r 1 year, presence of bruise, swelling or laceratio	_n			
of more than 5cm					
<u> </u>					
Yes	No				
Perform CT head scan	Are any of the following present	?			
within 1 hour of risk factor being identified. A	\				
provisional written radiolog	• Witnessed loss of conciousness >5 min	utes			
report should be made	Abnormal drowsiness				
available within 1 hour of the CT head scan taking place.					
• Dangerous mechanism of injury (nigh-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) lasti minutes (anaecament not necesible in pre-				
	minutes (assessment not possible in pre children and unlikley in any child <5 year				
					
	Yes, >1 Yes, 1 No	$\overline{}$			
	factor factor	<u></u>			
Observe for a minimum	of	, ,			
Observe for a minimum of 4 hours post head injury. Current warfrin treatment?					
		_ 			
Are any of the following		No			
risk factors present dur observation?	ing	\downarrow			
• GCS <15,	Perform CT head scan	imaging			
• Further vomiting	within 8 hours of the injury	uired. Use			
• Further episodes of	A provisional written	clinical dgement			
abnormal drowsiness		determine			
	1 hour of the CT head Wh	en further			
Yes No	T T I SCALLIAKINO DIACE T T	ervation is equired.			

Head Injury Pathway

Clinical Assessment/ Management tool for Children

Healthier Together



Management - Acute Setting

Figure 2: suggested graded recovery regime following concussion (taken from BMJ 2016; 355 doi: https://doi.org/10.1136/bmj.i5629 (Published 16 November 2016)

