

# HEAD INJURIES

## Learners Guide

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### PRE-READING

Please have a read of one or more before your session

RCEMLearning module on head injury (September 2018)

OPENPediatrics “Introduction to Traumatic Brain Injury”  
(February 2016)

A good resource for learning about managing cases with strong suspicion of severe injury

Neuroprotective strategies for severe traumatic brain injury  
(Paediatric FOAM)

Neuroprotective strategies for severe traumatic brain injury  
(Paediatric FOAM)

Please have a look at your department/region’s guideline for managing head injuries in children, and consider which parts you are/not comfortable with already.

## WHAT ARE THE KEY LEARNING POINTS?

- Children present very commonly with head injuries
- Most require no more than observation and/or clear advice for parents on what to look out for
- Some require imaging - CT is our current modality of choice in emergency care
- Use decision support tools to guide CT use
- Don't be afraid to use CT, especially when presentation to services is delayed by 24h+.
- Sedation may be necessary to safely scan younger children or those with pain/agitation.
- Severe injuries require neuroprotective measures to prevent secondary injury

### CASE 1

A 6yo girl is brought in by ambulance to the ED you work in. She was playing on a climbing frame and fell off the top onto concrete, onto her head. Handover states that she was briefly knocked unconscious, then returned to a GCS = 15, but has become more drowsy en route to hospital.

On your initial assessment, there is a large swelling to the left side of her scalp and forehead, and there appears to be some blood leaking from her left ear. Her GCS is 12 (E3V4M5) but the rest of her vital signs are within normal limits.

**Outline your management steps**

**How soon do you want this child to have CT imaging?**

**The scan shows an extradural haematoma. How can you direct your team to prevent secondary brain injury?**

## CASE 2

You see a 20 month old boy in your ED, who was playing with his 6 year old cousin when he ran into an opening door at home. He cried immediately, and vomited around 10 minutes later.

Having been brought into the ED, which is 20 minutes from his home, he has vomited twice more. There was no LOC or seizure activity, and other than looking nauseated he appears to be behaving normally.

**To scan or not to scan?**

**What guidance do the parents/nursing staff looking after this child in the ED need?**

**How long will you observe for, and what if the child vomits again?**

## ADVANCED CASE 1

A 9 month old child presents after rolling off a bed onto the floor. You see a 7cm swelling on his occiput. In the trauma call, he is held in mum's arms and is crying. You are unsure over how to proceed - the child definitely needs CT imaging, but how should we ensure they keep still?

## ADVANCED CASE 2

An 8 year old girl is brought in by her dad. She clashed heads with another player at basketball two days previously, and did not initially seek medical advice as she was 'fine'. She had to leave school early today because she had trouble seeing the board & teacher, and felt sick. There are no focal neurological findings but there is a bruise on the parietal part of the scalp on the right, and you cannot feel the scalp. **What do you do?**

## ADVANCED CASE 3

A 15 year old girl re-attends 10 days after being knocked unconscious for 10-15 seconds while jumping for a header playing football. She passed a pitchside concussion test and continued to play, but was substituted after saying she felt dizzy, and was seen in an ED. A CT scan was performed - which showed no bleed, contusion or fracture.

She says she found it hard to concentrate on schoolwork for a week afterwards, but this is now normal. She wants to know exactly when she can go back to playing as she has an important match in 3 days. **What do you do?**

## MCQS

**1. You see a 4 year old with a head injury. All of the following are an indication for urgent CT imaging except:**

- A**  
GCS<14
- B**  
Sign of a basal skull fracture
- C**  
Focal neurology on examination
- D**  
Post-traumatic seizure
- E**  
Loss of consciousness for a few seconds

**2. In an intubated child with an extradural haematoma causing mass effect, the following are important considerations in managing intracranial pressure:**

- A**  
Managing untreated pain
- B**  
Using RR or tidal volume to control pCO<sub>2</sub>
- C**  
Keeping O<sub>2</sub> saturations 94-98%
- D**  
Keeping blood glucose tightly controlled between 4-8
- E**  
Removing any constrictive neck devices (tube ties, cervical collars etc)

### 3. When managing children with head injuries True or False ?

**1**

If the mechanism of injury is dangerous, the cervical spine should be CT imaged along with the head.

**2**

It is good practice to discuss management of delayed presentations with a senior before discharge

**3**

3 vomits in 10 mins constitutes separate 'episodes' of vomiting.

**4**

CT imaging is essential in those with haemophilia.

**5**

Intranasal diamorphine can be used to manage pain & keep a child still for scanning.

## Take home tips

- 1 Observation costs nothing
- 2 Mechanism is everything
- 3 Sedation is likely to be a consideration in scanning young children - anticipate this
- 4 Use decision-support tools to guide your imaging & think carefully if presentation is delayed
- 5 Think NAI especially if an explanation for an injury does not hold up to repeated history-taking
- 6 When preventing secondary brain injury, think about physiology + optimising each aspect

## REFERENCES

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