

# SIMULATION with SKILLS: trauma stabilisation CASE T-2



## **History** *{initial candidate briefing prior to arrival of child}*

A nine year old boy is brought into the Emergency department by ambulance. The history is that he was knocked off his bike by a high speed car and was unconscious at the scene.

## **Initial Impression** *{to tell candidate as child arrives}*

He is in a collar with blocks and tape and on a spinal board. He is not wearing a safety helmet. He is beginning to regain consciousness, is crying out and is combative. Paramedics give his GCS in the ambulance as 12. There is a bleeding head wound on the right parietal area and grazes to the left side of his face. The R lower limb is in a box splint. Guide weight 34kg

## **Clinical Course** *{to be given to candidate as he/she progresses through the assessment and treatment of the child}*

Responsive to voice. Trying to resist restraint. RR 20bpm, SaO<sub>2</sub> 98% in air and 100% in high flow oxygen, PR 92bpm, BP 130/75.

There are no signs of respiratory distress, pulses are full and peripheries warm.

As IVs are set up the child becomes quiet and only withdraws slightly from needle puncture. Assessment shows a GCS of 8 and the child is no longer combative. Neurological examination shows pupils are both 3 mm and reactive but sluggish, there is equal movement and reflexes in upper limbs (one lower limb is splinted) and no clinical evidence of basal skull fracture.

He is intubated and ventilated prior to transfer to CT scan. The CT scan reveals no cerebral bleed and cerebral oedema is assumed. CT cervical spine is performed and is reported as normal. In view of the severity of the trauma and the fact that he must be transferred to another hospital for PICU, a 20° tilt is performed to assess whether further spinal imaging is required. There is no visible evidence of trauma to the thoracic or lumbar spine.

## INSTRUCTORS INFORMATION

Please note; this is a practice station.

### Key Treatment Points

<C>Airway & C-spine	Establish airway patency, protect airway	
	Protect cervical spine by MILS, collar, blocks as appropriate	
Breathing	High flow O <sub>2</sub> via face mask	
	Ventilate when required	
Circulation	IV/IO access with wide-bore cannulae	
	Blood for cross match etc	
Disability	Assess neurological status	
Specific Therapy	Call surgeon	
	Call anaesthetist	
	Trauma imaging including CT head/cervical spine	
	IV mannitol or hypertonic saline (on discussion)	
Ongoing care	Contact PICU, consider transfer needs, 20° tilt and assessment of back/flanks	



### Diagnosis

*He has sustained generalised brain injury with cerebral swelling and a fractured R tibia and fibula*

*Skills to be practised by all in this simulation: trauma stabilisation.*

Following the closure of the simulation with any teaching points clarified as necessary, all candidates should perform the trauma stabilisation until competent.

### Equipment

Junior manikin

Baby manikin

Scoop stretcher

Head blocks and tape

Pelvic splints

Triangular bandages

Selection of splints (according to local availability)

- Kendrick splint or equivalent
- Thomas splint
- Box splint

BP cuff

## PELVIC SPLINTAGE

Pelvic splints/binders are indicated where mechanism of injury or clinical findings suggest a pelvic fracture. This emergency stabilisation of the pelvis supports haemorrhage control. **Remember, that first clot is best clot and avoid excessive movement of the child** (see minimal handling below).

When applied correctly, the flat square portion of the pelvic binder should be under the patient's buttocks and the middle strap should overlap the child's greater trochanteric and pubic region (see note below about devices used in younger children).

1. Prepare the pelvic binder for application. This preparation will vary depending on the model used, but ensure that you will be able to pass it easily under the child during either the 20° tilt or the vertical lift. If the child is arriving in the department and you know that a pelvic binder will be required, have this available on the trolley/bed ready for their arrival.
2. During the 20° tilt or the vertical lift place the pelvic binder under the child ensuring that they will return to the correct position on the binder when returned to the trolley/bed.
3. Secure the strap over the symphysis pubis and greater trochanteric region first in devices where there are multiple straps. Further straps should be placed:
  - a. between the anterior superior iliac spine and iliac crests and
  - b. at the level of the symphysis pubis and ischial tuberosity.

**NB. A strap should not be applied above the iliac crests as this can increase abdominal pressure.**

**Replacement of the pelvic binder should only be considered in the child who is haemodynamically stable.**

*Discuss the practicalities of using purpose-built devices in younger children and highlight the potential to use alternatives e.g. an adult BP cuff to achieve the pelvic splintage.*

## PERIPHERAL LIMB SPLINTAGE

Specific limb splintage should be demonstrated to the candidates including the principles of analgesia, traction and application of a number of peripheral limb splints and neurovascular observations.

Splints that should be included:

- Box splint
- Kendrick splint
- Thomas splint

Each of the splints should be demonstrated in turn and their application and use explained.

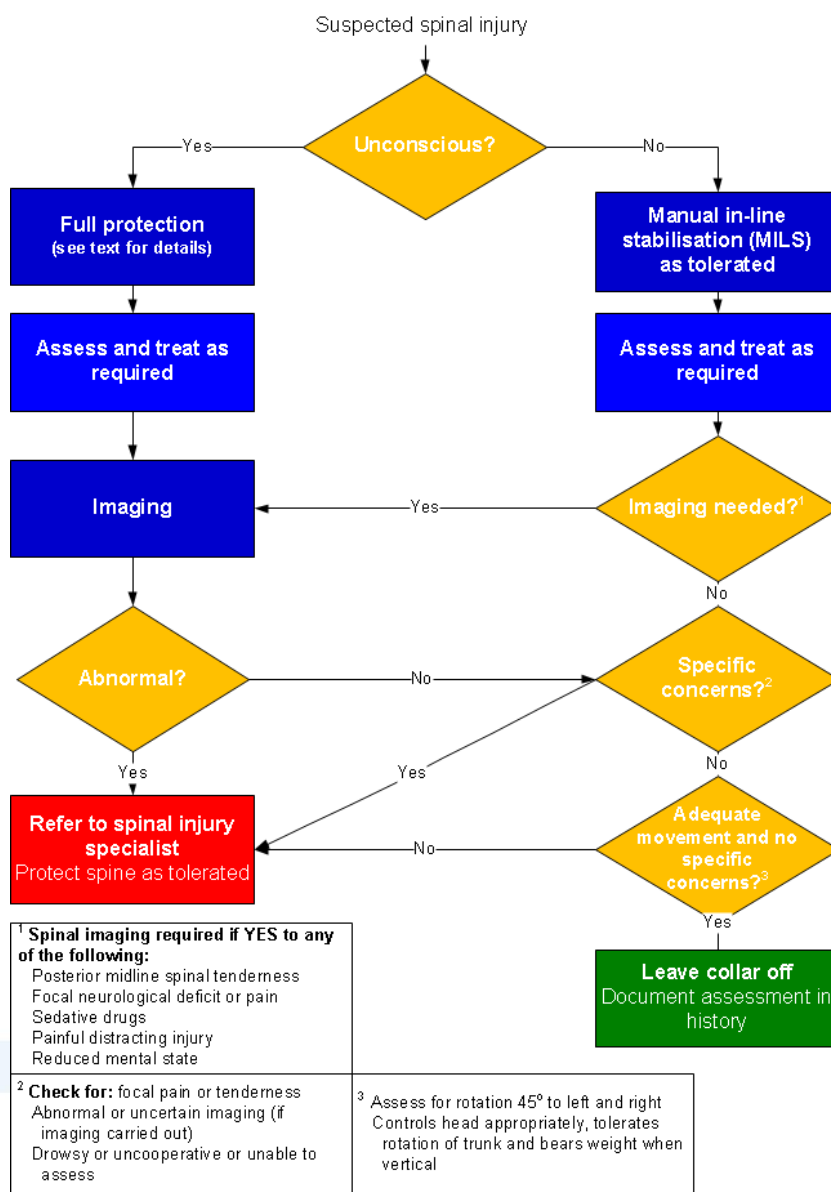
This may also be a good time to discuss femoral nerve blocks in terms of analgesia (see notes below).

**APLS 5e manual p 232-3**

The femoral nerve supplies the femur with sensation, and a block is useful in cases of femoral fracture. The technique may also be of benefit when analgesic agents would interfere with the management or assessment of other injuries. A long-acting local anaesthetic agent should be used so that radiographs and splinting can be undertaken with minimal distress to the child.

**C-SPINE PROTECTION**

During this section of the station it is important to emphasise the approach given in the following algorithm. Emphasise that most children do not have spinal injuries and therefore accurate assessment and clearance of the C - Spine is essential. This algorithm is specifically for those children **with a suspected spinal injury**



1. Manual in-line stabilisation (MILS)
2. If required, blocks and tape, the use of collars is becoming less favorable and may be contraindicated in many cases.

APLS providers would not be expected to clear a c-spine. This should be an expert's decision.

## MINIMAL HANDLING – 20° TILT

In trauma the full log roll in many cases may be contraindicated and often detrimental to the child's condition. Current evidence suggests that a twenty-degree tilt should be used to assess the child's back and flanks for hidden injury. A full log roll can be hugely detrimental to the patient's condition if they have an intra-abdominal or pelvic bleed. In blunt trauma the log roll should take place if required after the trauma CT. The child's injuries should be assessed with the minimal amount of handling, but if hidden injury suspected the 20° tilts should be performed in the same way a log roll would be conducted with a team of 3-4 members as indicated in the manual. It is extremely important to ensure that the tilt is performed consistently and carefully without twisting the spine or torso in a controlled manner.

The 20 degree tilt is used to facilitate the use of a scoop stretcher. Practice this manoeuvre with a manikin during the course skill station. It is important that it is included because it emphasises why 20 degree tilt is important in ensuring that there is minimal handling; 20 degrees is the maximum you need to tilt the child to put a scoop stretcher underneath them and this will avoid disrupting the 'first clot' and any unstable pelvis.

## Closure

Candidates should be given a formal opportunity to ask any questions, when these have been answered to the candidates' satisfaction, the session can be closed by summarising the procedures used.