

MAJOR TRAUMA TRIAGE PROTOCOL

Trauma Team Call

Bleep 6000 and ask for Adult / Paediatric / Obstetric Trauma Team if any of the following criteria are met.

Trauma team consists of senior ED doctor/consultant, surgical SHO and reg, anaesthetic SHO and reg +/- paediatric team +/- Obstetric team

Physiology Factors	Anatomy Factors	Mechanism of Injury	Co-morbidity Factors
Adult: <ul style="list-style-type: none"> • Systolic BP < 90 • RR <10 or > 29 • GCS < 13 Paediatric: <ul style="list-style-type: none"> • Respiratory distress • Cap Refill < 2 • Tachy / Bradycardia • Inappropriate behaviour 	<ul style="list-style-type: none"> • Penetrating injury • High energy blunt injury • Flail chest • Associated burns • ≥ 2 long bone #s • Unstable pelvis • Skull # • Associated paralysis • Crushed, degloved, mangles or amputated extremity 	<ul style="list-style-type: none"> • Ejection from vehicle • Fall > 6m (20ft) • Death of an occupant • Delayed extraction • Vehicle rollover • High speed crash • Large animal injury • Pedestrian / cyclist thrown or run over 	<ul style="list-style-type: none"> • Pregnancy • Age < 5 or > 65 • Anticoagulants • Bleeding disorder • IDDM • Immuno-compromised • Other significant organ impairment

MAJOR TRAUMA – ADULTS (SEE ALSO TRIAGE, ‘ABC’, BURNS, HEAD INJURY, FRACTURES

This term refers to patients who have been injured and who are either very ill *or who may become very ill later*. The patients are identified using the triage protocol in Section One.

Assess patients using recognised ATLS principles.

MAJOR TRAUMA

AMPLE history

Allergies
 Medications
 Past medical history
 Last meal
 Events leading

Primary Survey

- A: Ensure patent airway, airway adjunct or intubate if necessary
 Protect neck with 'stiffneck' collar, sandbags and tap on a trauma mattress
- B: Assess breathing – check for chest wall trauma, auscultate, sats RR
 Apply 100% oxygen
 Ventilate if inadequate respiration
- C: Assess circulation and cardiovascular status
 Haemorrhage control
 2 large bore IV access – send bloods for FBC / U+E / Cross match
 Fluid resuscitation with 0.9% normal saline +/- O neg blood – permissive hypotension
 Pelvic binder if potentially unstable fracture
- D: Mini-neurological assessment to include AVPU / GCS, pupils, posture, log roll (include PR exam if any spinal tenderness)
- E: Expose patient to identify obvious injuries, cover up to prevent heat loss
- Request imaging as indicated:
 - CT head and C-spine
 - CT chest / abdo / pelvis
 - Trauma series x-rays if no indication for CT – c-spine / chest / pelvis
 - Analgesia as required e.g. aliquots of morphine 5-10 mg IV +/- antiemetic

Secondary Survey

Keep re-assessing 'ABC'

Do a secondary survey: Head
 Chest
 Abdomen
 Pelvis
 Limbs
 Reflexes

Do not delay unstable patients with uncontrolled haemorrhage from going to theatre for definitive or damage control surgical treatment

BURNS (SEE ALSO MAJOR TRAUMA & TRIAGE)

The patient deteriorates as the inflammation progresses

Discuss with Burns Unit if:

- Potential airway burns (signs of smoke inhalation at nose or mouth)
 - >20% BSA involved (>15% in children)
 - Burns in difficult areas (hand, perineum)
 - Circumferential, deep or full thickness burns (check sensation & appearance)
-
- Apply water gel (beware hypothermia) and give 100% oxygen
 - Give iv Morphine at once – large doses often required. In severe burns a morphine infusion may be required
 - ABC – remember that burned patients have often sustained other injuries. Shock in first few hours is not due to burns
 - You must ask for an early anaesthetic assessment if any suspicion of airway burns - they will get worse.
 - Think of inhaled poisoning – CO or cyanide*. Measure COHb if consciousness is in any way impaired. If elevated COHb discuss hyperbaric oxygen with Craigavon Hospital
 - Have another look at burns- superficial or deep? Estimate % BSA using Lund and Browder Chart (below)
 - Give if >20% BSA give iv fluids to prevent the onset of burns shock –

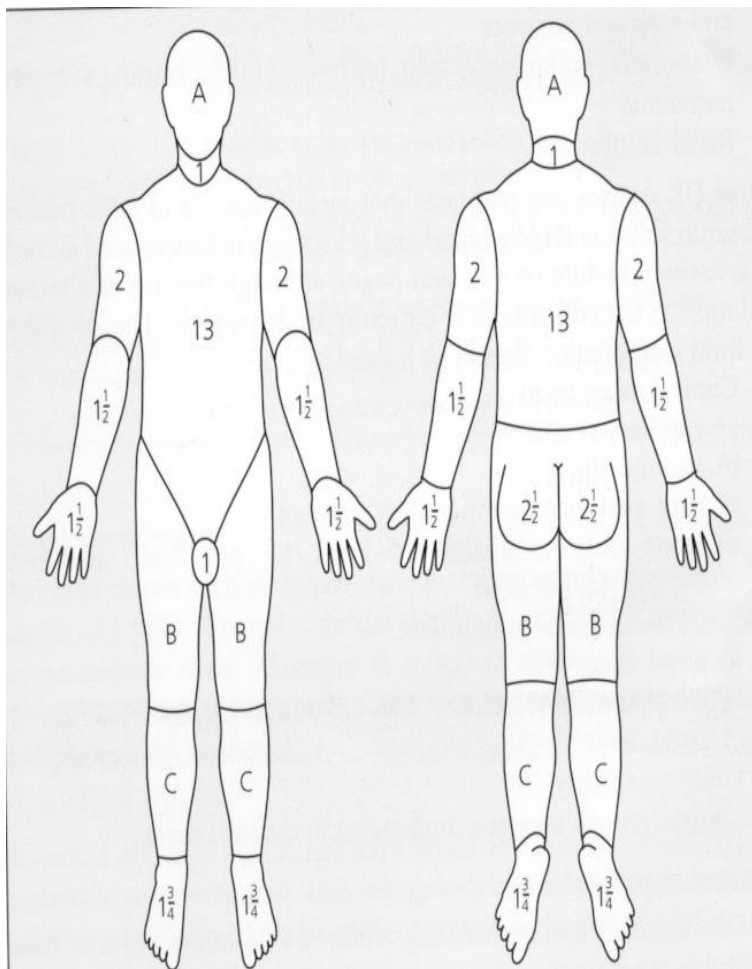
Volume in mls = wt(kg) x %BSA x ½ in first four hours from time of burn

- TREAT ALL VICTIMS OF FIRE IN UNEXPLAINED CARDIAC ARREST FOR CYANIDE POISONING ---THERE IS A CYANIDE TREATMENT PACK IN RESUS.

Lund and Browder Chart

	Age in years					
	<1	1	5	10	15	Adult
A = ½ head (%)	9.5	8.5	6.5	5.5	4.25	3.5
B = ½ thigh (%)	2.75	3.25	4	4.25	4.5	4.75
C = ½ leg (%)	2.5	2.5	2.75	3	3.25	3.5

Classification of burn depth	
Classification	Features
First Degree (superficial, partial)	Limited to epithelial layer of the skin . Very painful and erythematous. Excluded from estimates of % burns Heals well
Second Degree (deep, partial)	Extends to dermis Painful Heals more slowly
Third Degree (full thickness)	Analgesic Full-thickness burn tissue is unable to stretch in response to underlying oedema, and circumferential full-thickness burns thereby exert a tourniquet effect that may compromise tissue perfusion and require urgent release or 'escharotomy'



HEAD INJURY (SEE ALSO MAJOR TRAUMA)

This is a high-risk injury!

Follow the 2014 NICE guidelines given on the next two pages to help you manage head injuries.

As well as acutely injured patients, you will often see patients attending “minors” a few days after the event complaining of persistent headache etc.

Late-presenting head injury symptoms and patients on Warfarin have a strong association with CT abnormality – discuss with a senior doctor.

Safe discharge and Admission

Do not send home patients with head injury if GCS less than 15

Do not send home patients with head injury if no one at home

Patients can be admitted to the Observation ward if GSC 15 or have a normal CT (performed as per the guidelines) and GCG 14 or 15

Patients should be admitted under the surgical team if GCS 13 or less, abnormal CT, polytrauma patient or no Observation beds available.

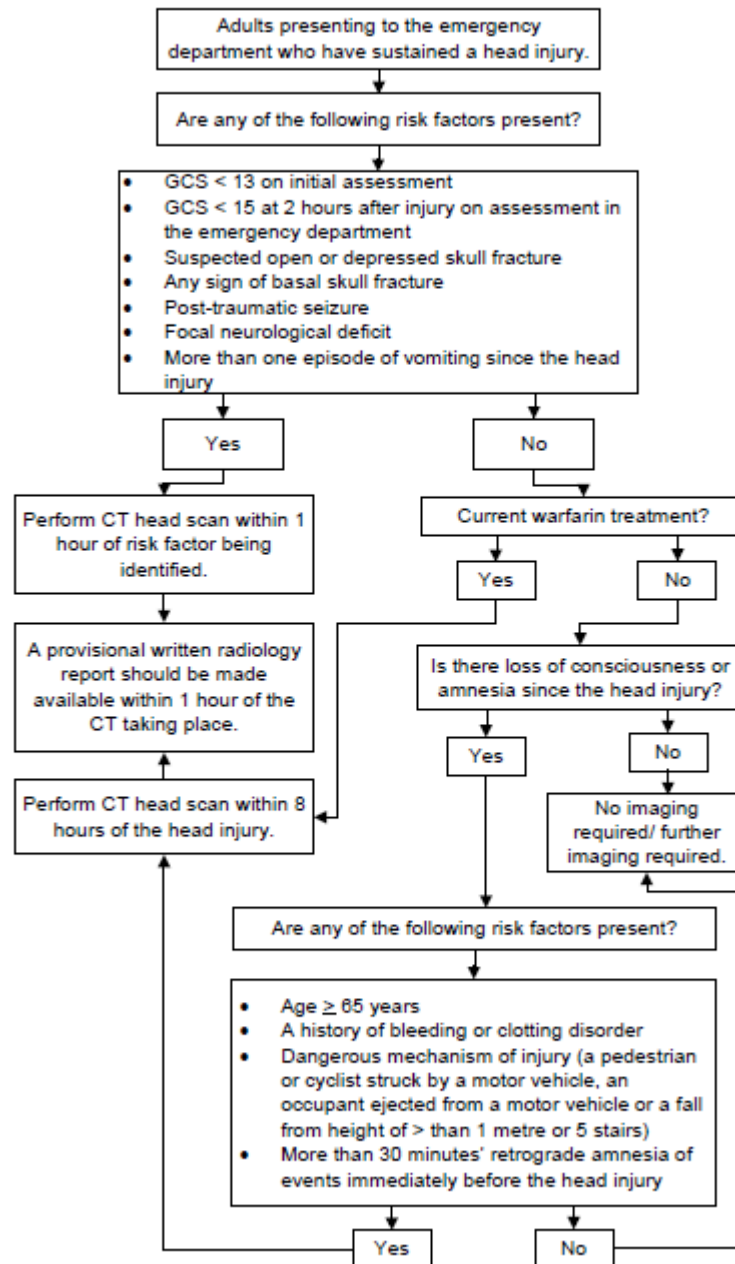
Written and verbal discharge advice should be given to all patients / relatives. These are found on Symphony.

Referral to Neurosurgical Team

All patients with abnormalities on CT Head scan should be referred to the Neurosurgical SpR in RVH #6124. Remember to document in the notes the times and name(s) of the doctor(s) you discussed the case with. Clearly document any advice given, especially if the patient is likely to be admitted under another team.

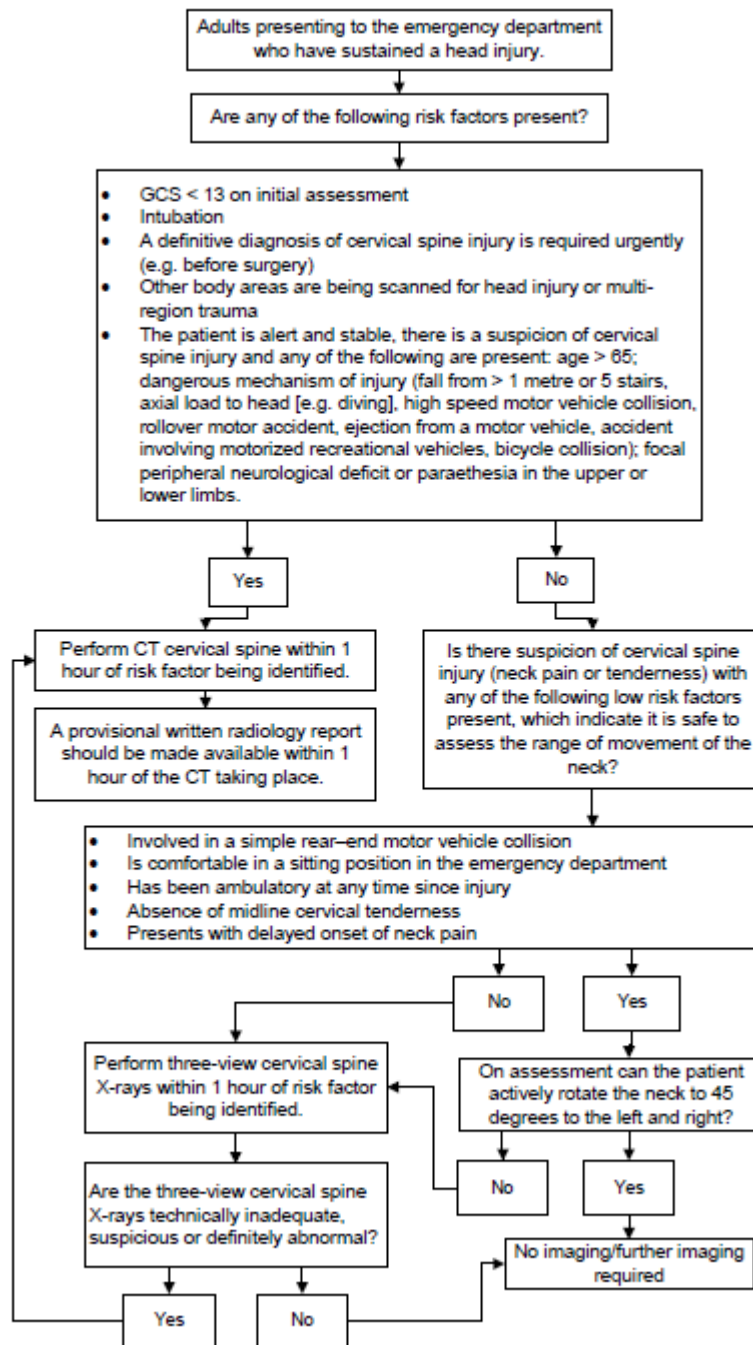
Summary of 2014 NICE Head Injury Guidelines

Algorithm 1: Selection of adults for CT head scan



If patients are anti-coagulated (warfarin, NOAC) with a significant head injury, reversal should be given immediately and an urgent CT performed as above. NICE recommends CT head imaging within 8 hours for patients with head injury on anticoagulant and without indicators for urgent CT scan but regionally it has been recommended that these scans are performed within 1 hour and urgent consideration is given to reversal of the warfarin (or NOAC).

Algorithm 3: Selection of adults for imaging of the cervical spine



CONCUSSION AND RETURN TO SPORT

Concussion is a common injury, especially in young people playing sports. Significant harm can be caused by a second head injury in a patient with concussion. This is taken very seriously in professional sports such as rugby but non-professionals are at risk too. The following is taken from the Observation Ward discharge advice for return to sport and should be explained to the patient should be followed.

- ☑ Prior to fully returning to sport/ strenuous activity, it is important that you follow the 'step-wise' system overleaf to allow you to return safely.
- ☑ It is likely that you may experience a number of symptoms as a result of your head injury (listed below). **These are different to the immediate return indications listed on the Head Injury Advice Sheet**
- ☑ It is vital that your symptoms have completely cleared at each level for a minimum of 24 hours before you progress to the next level.
- ☑ You should not return to any full sporting activity in less than 1 week.
- ☑ Where any unconsciousness or significant loss of memory after the injury (post traumatic amnesia) has occurred there should be no full contact activity (Level 5) within 3 weeks. In these circumstances a medical review by your GP or your professional medical advisor should be undertaken before any full contact activity.

Possible Symptoms after a head injury

Mild headache	Poor concentration
Tiredness	Irritability
Dizziness	Memory problems
Sleep disturbance	

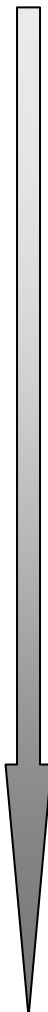
If symptoms develop at any exercise level then you should return to Level One (i.e. 24 hours rest).

Contact your GP if your symptoms are persistent and/or not improving
On discharge

Second Impact Syndrome

Second Impact Syndrome is a rare condition which occurs when a person with symptoms related to their recent head injury (concussion) suffers a second head injury. Second impact syndrome may occur days or weeks after the initial concussion. This second injury may be relatively minor but it can lead to collapse and death. For this reason we do not recommend full contact

in sports for at least three weeks and only after medical advice. It is also important to inform your doctor of your initial head injury.



LEVEL 1	No physical activity /complete rest
LEVEL 2	Low levels of physical activity i.e. <i>symptoms do not come back during or after the activity.</i> e.g. walking, light jogging, light stationary biking, light weightlifting (lower weight, higher reps, no bench, no squat).
LEVEL 3	<i>Sport specific training or Moderate levels of physical activity with body/head movement</i> e.g. running in football, moderate jogging, brief running, moderate-intensity stationary biking, moderate-intensity weightlifting (reduced time and/or reduced weight from your typical routine).
LEVEL 4	<i>Heavy non-contact physical activity / training drills</i> e.g. sprinting/running, high-intensity stationary biking, regular weightlifting, routine non-contact sport-specific drills
LEVEL 5	<i>Full contact in controlled training/practice.</i>
LEVEL 6	Full contact in games/ Return to competition.

Adapted from McCrory P, et al. Br J Sports Med 2013;47:250–258.

doi:10.1136/bjsports-2013-092313

FRACTURES (SEE ANKLE AND FOOT, SHOULDER AND CLAVICLE, KNEE, NECK, WRIST, SEDATION, FALLS AND HAND INJURIES)

This handbook cannot give an exhaustive account of fracture management, however guidelines about the management of common fractures can be found later in this section. As well as this, McRae provides easy-to-follow guidelines in the department's copy of "Practical Management of Fractures". Consult these first but ask for advice if in doubt.