Document Control

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1. Introduction

This is a pathway designed to stream line the admission pathway for adult patients who present to North Devon District Hospital with a head injury.

2. Purpose

Clinical Pathways aim to improve the quality, continuity and co-ordination of care for the patient across different disciplines and sectors.

This pathway has been written to:

- To ensure that patients within NDDH sustaining a head injury receive the correct care in the correct timeframe.
- Improve the quality, continuity and coordination of care for the patient by a multidisciplinary team and reduce the risks associated with poor head injury care.

3. Scope

This pathway relates to the following staff who may be involved in the assessment and delivery of head injury care:

- Medical staff
- Registered nurses
- Professionals allied to medicine

4. Definitions

For the purposes of this guideline, head injury is defined as any trauma to the head other than superficial injuries to the face.

5. Aim

To ensure that patients within NDDH sustaining a head injury receive the correct care in the correct timeframe.

6. Objectives

All patients will be assessed and treated as per NICE Head Injury Guidelines CG176 (https://www.nice.org.uk/guidance/CG176).

Patients requiring time-critical neurosurgery will be identified rapidly and receive emergency transfer to Derriford Hospital.

Patients requiring admission for observation will receive neurological observations as per NICE guideline CG176.

Patients with multiple care needs will be managed by the most appropriate specialty.

Patients whose brain injury requires more than 24 hours in hospital will be assessed by rehabilitation teams with experience of managing traumatic brain injury.

Patients deteriorating whilst in hospital will receive emergency re-assessment from staff specifically trained in the assessment and management of traumatic brain injury.

Patients being discharged home will receive guidance on home management and follow-up care.

7. Imaging head and neck

Follow NICE CG176 guidance for imaging of the head and cervical spine on ED guidelines on BOB

(Appendix 1)

8. Transfer of patients for CT scan

The Safe Transfer of Patients policy should be adhered to MT SOP 7 Transfer to CT on ED guidelines on BOB

http://ndht.ndevon.swest.nhs.uk/?page_id=8516

Patients with GCS less than 9 require airway protection and must be accompanied to CT scan by a suitably qualified clinician.

Patients who are combative must be accompanied to CT scan by a clinician able to deal with this and/or appropriate sedation.

Use of the vacuum mattress is recommended for patients with a suspected spinal injury.

9. Discussion with Neurosurgery

Patients meeting any of the following automatic acceptance criteria (below), regardless of the mechanism of injury, are automatically accepted by Derriford as the Major Trauma Centre. They should be transferred to Derriford Emergency Department as a time-critical emergency. Hand over the patient to the Major Trauma Centre Senior Doctor via the telephone number in Resus. The Major Trauma Centre Senior Doctor will inform the neurosurgical team.

Patients with other significant findings on the head or neck CT, or where there is doubt if transfer is in the patient's best interests, must be discussed with neurosurgery. Call the neurosurgical registrar via Derriford switchboard. Patients who are not suitable for transfer, e.g. due to un-survivable injuries, need not be discussed with the Neurosurgical team.

It is important that the ceiling of care is discussed with the neurosurgeons at the time of the initial consultation. If the neurosurgical team advise that the patient should be admitted for observation at NDDH rather than transferred to Derriford, the ceiling of care must be established at this stage, so that if the patient deteriorates it is clear whether or not they should be for neurosurgical intervention or for palliative care at NDDH.

Automatic Acceptance Criteria for TBI
Definite penetrating cranial trauma
GCS less than 9 after initial resuscitation

Less than 70 years with intracranial haematoma and mass effect causing ANY midline shift

10. Transfer of Patients to Derriford Hospital

The Inter- hospital Transfer policy should be adhered to: MT SOP 8 Inter-hospital transfer (ED guidelines on BOB)

http://ndht.ndevon.swest.nhs.uk/?page_id=8516

The on-call ITU consultant should be informed of all patients requiring transfer for assessment of what level of anaesthetic support and intervention will be required.

Patients requiring time-critical transfer from a ward (except the critical care unit) should be taken to ICU, theatre, recovery or ED for stabilisation prior to transfer. Patients with any of the following, but not exclusively, should be intubated and ventilated:

Indications for Intubation and Ventilation
GCS 8 or less
Loss of protective airway reflexes
Persistent hypoxia (PaO_2 less than 10kPa with supplemental oxygen) or hypercapnoea ($PaCO_2$ greater than 6kPa)
Spontaneous hyperventilation ($PaCO_2$ less than 4kPa)
Irregular respirations
Deteriorating GCS (motor score drop by 1 or more)
Unstable facial fractures
Heavy bleeding into the mouth
Seizures

During transfer maintain PaO_2 greater than 13kPa and $PaCO_2$ 4.5-5.0kPa. Mean Arterial Pressure [MAP] at least 80mmHg (use fluid & vasopressors). Combative patients or those in whom significant deterioration is anticipated should also be considered for intubation and ventilation prior to transfer. Peninsula critical care network transfer documentation should be completed.

11. Admission of patients for neurological observation

Admit a patient with one or more of the following features:

Admission Criteria
New, significant abnormality on CT
GCS less than 15
Awaiting CT scan which cannot yet be achieved
Continuing worrying signs (e.g. vomiting, severe headache)
Other concerns (e.g. intoxication, other injuries, suspected NAI, meningism, CSF leak)
Social concern – lives alone, frail, vulnerable

Patients requiring admission should ideally be cared for by teams (doctors and nurses and also physiotherapists, OTs, psychologist, SLT s) trained in the care of traumatic brain injury. However, sometimes a patient has another problem which takes precedence and requires their admission to an area without this specific expertise. Appendix 3.

Medical Unit

TBI is not a medical problem. However, elderly patients with a minor head injury in whom the cause of the head injury is a collapse of known or unknown cause, and who have significant frailty issues who require geriatrician input along the frailty pathway should be admitted to MAU. Patients with significant post-head injury symptoms are not appropriate for this pathway. Older patients without significant frailty issues in whom the mechanism of injury is clearly traumatic (i.e. not a collapse) should not be admitted to MAU.

Even though patients have minor head injury, they may well have cognitive or behavioural issues that need to be assessed by specialist therapy staff. All patients should be referred to the rehabilitation service.

Multiple Injuries

Patients with multiple injuries are best cared for by the team trained to deal with their most severe and urgent problem. Patients with significant post-head injury symptoms should be referred to the rehabilitation service.

The need for transfer to the Major Trauma Centre (MTC) and discussion with the MTC co-ordinator should be considered in all patients with multiple injuries.

Critical Care

More than one type of serious injury (e.g. significant head injury and long bone fracture or chest injury) indicates the need for Critical Care Unit admission. The physiological instability of these patients places them at high risk of deterioration. Patients with GCS less than 13, particularly with a motor score less than 6 (i.e. unable to obey commands) should also be considered for admission to the Critical Care Unit.

Patients with significant post-head injury symptoms should be referred to the rehabilitation service.

Surgical Specialty (CDU once available)

Young patients with isolated mild to moderate head injury and older patients with isolated mild to moderate brain injury and no significant frailty issues without other reasons for admission will be admitted under the care of the general surgical consultant team.

Even though patients have minor head injury, they may well have cognitive or behavioural issues that need to be assessed by specialist therapy staff. All patients should be referred to the rehabilitation service.

Patients with significant post-head injury symptoms should be referred to the rehabilitation service.

Once the CDU facility is established these patients will be admitted to CDU under the care of the emergency physicians for the first 24 hours of their stay

ASU / other rehabilitation beds – post acute phase

Patients with moderate or severe brain injury who have positive findings on CT, either due to on-going severe symptoms or on the advice of the neurosurgical team, may need on-going rehabilitation. After an initial period of observation on HDU or under the care of the surgeons, patients who have significant acute findings on CT but who are not accepted for referral to the neurosurgeons should be discussed with the lead stroke physician who will identify the most appropriate rehabilitation bed e.g. ASU / Elizabeth ward / other elder care bed.

12. Trauma nurse co-ordinator

The trauma nurse co-ordinator must be informed of all patients admitted for head injury observation. The TNC should ensure the ABI rehabilitation team is aware of all TBI patients especially those who have been transferred out so that preparation can be made for their on-going rehabilitation on repatriation.

13. Tertiary survey

All patients admitted for observation post head injury should have the need for a tertiary survey determined at the first post admission ward round. The consultant in charge of their care should determine who should perform the tertiary survey and refer accordingly.

14. Observation

Wherever the patient is admitted to, neurological observations will be performed as per NICE guidance CG176: Neurological observations are all of:

- GCS, pupil size & reactivity, limb movements, respiratory rate, heart rate, blood pressure, temperature, oxygen saturations
- These will be recorded every half-hour until GCS is 15, then
- Half-hourly for 2 hours
- Hourly for 4 hours
- 2-hourly thereafter

If the patient deteriorates, the frequency of observations will revert to half-hourly and follow the same pattern.

15. Senior medical review

Any of the following prompts an urgent review by a senior doctor:

Indications for Medical Review

Development of agitation or abnormal behaviour
A sustained (at least 30minutes) drop of 1 point in GCS
Any drop of 2 points in the motor score, or 3 points total between the verbal and eye-opening scores.
Development of severe headache or persisting vomiting
New or evolving neurological symptoms or signs e.g. pupil inequality, asymmetrical limb or facial movement.

Best practice is for nursing staff to gain a second nursing opinion to confirm a drop in GCS prior to calling the doctor however this must never be allowed to delay the medical review.

A patient with significant deterioration will be referred for a repeat CT head scan. The scan should be performed within 1 hour of the deterioration being recorded with an urgent report.

16. Aquired brain injury (ABI) rehabilitation service tbc

The need for a specialist ABI rehabilitation service is identified AND A proposal pathway is being developed for consideration by the commissioners.

17. Discharge

Patients can be discharged when:

- They are GCS15 or for patients with chronic neurological impairment, their usual conscious level.

AND

- They have responsible adult supervision for 24hours post-injury, or
- They have a negligible risk of further complications (e.g. normal head CT with no coagulopathy).

AND

- They have no severe post-head injury symptoms

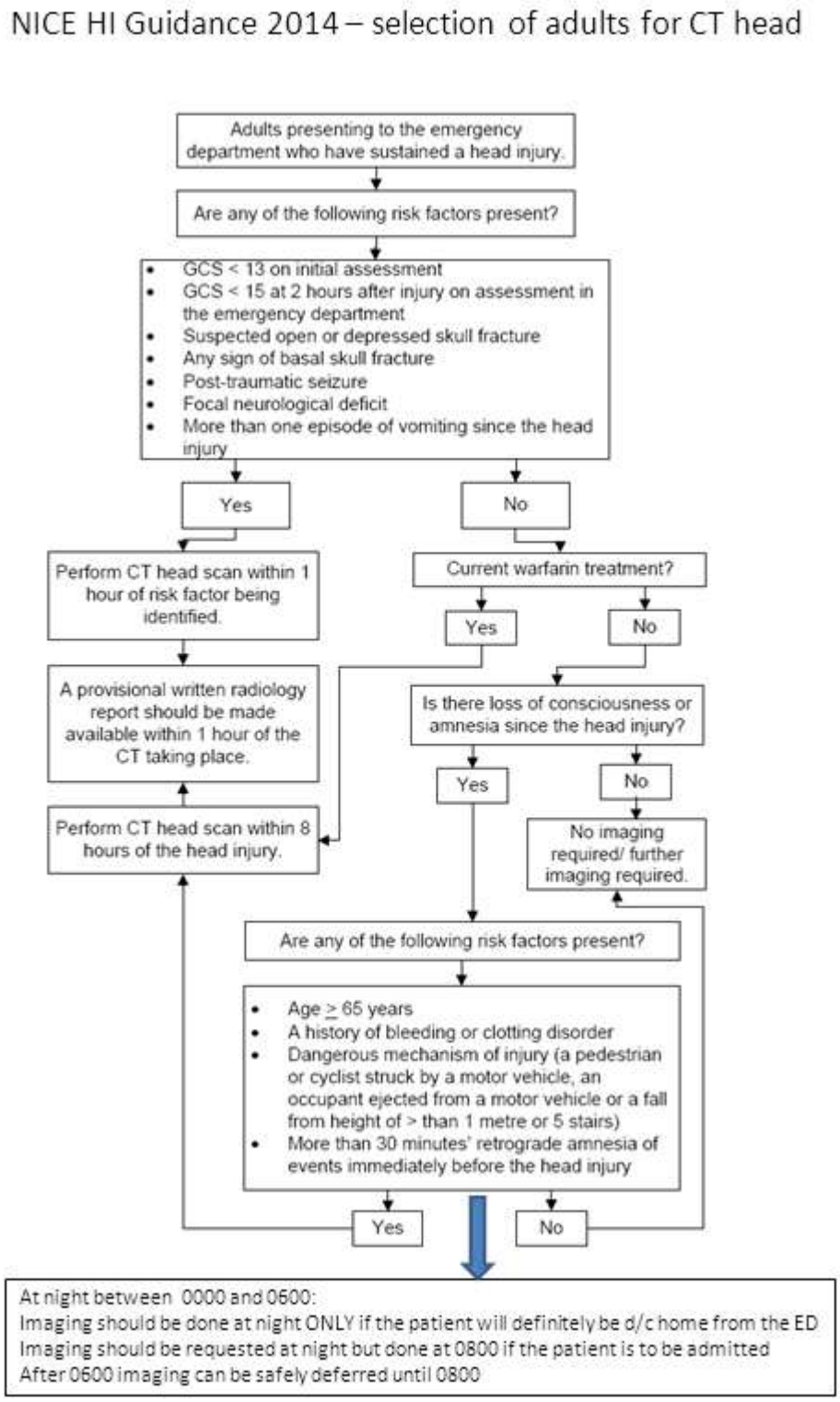
OR

- They have received neuro-rehabilitation review and are being discharged with appropriate support.

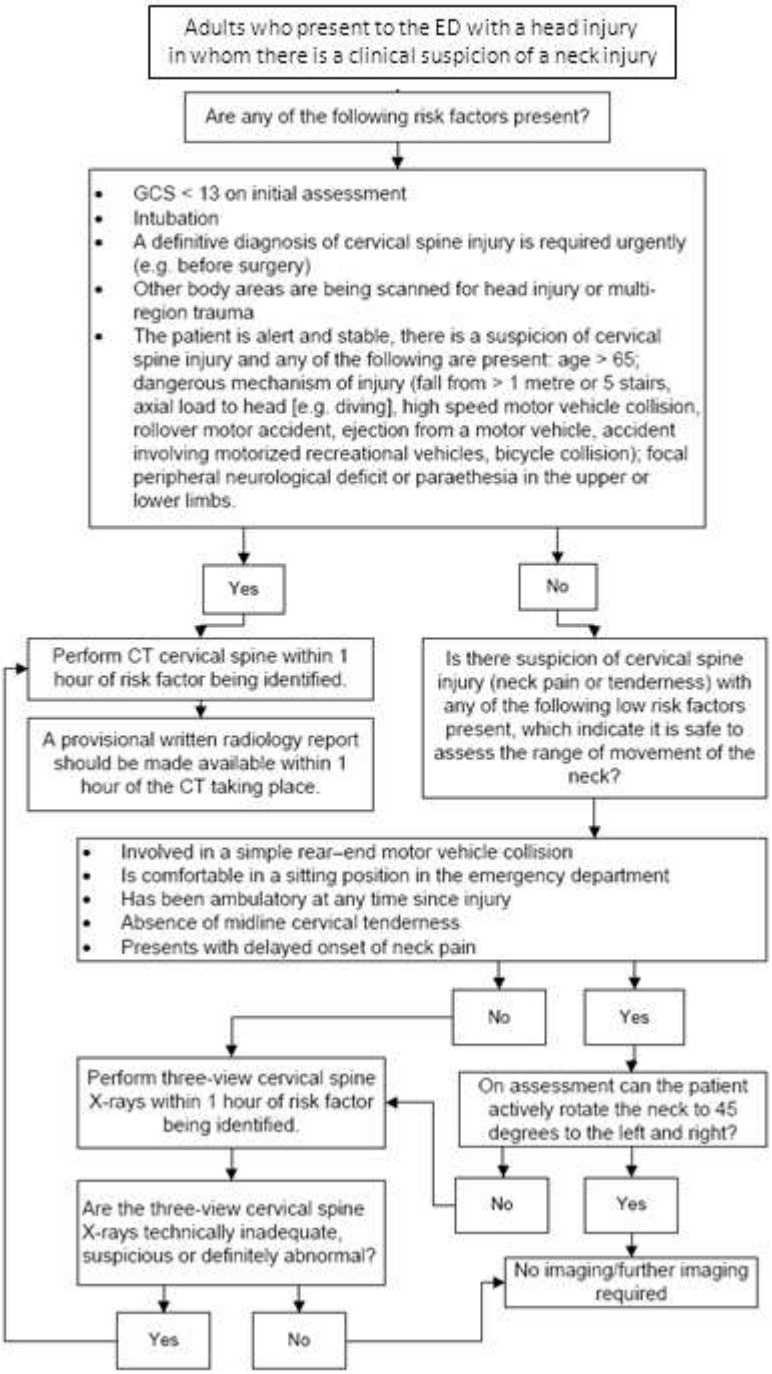
Patients should be given the Adult Head Injury Discharge Advice leaflet.

Patients who have received a head CT scan or inpatient admission for post-head injury symptoms should be advised to discuss neuro-rehabilitation follow-up with their GP. The need for a specialist ABI rehabilitation service is identified and under development.

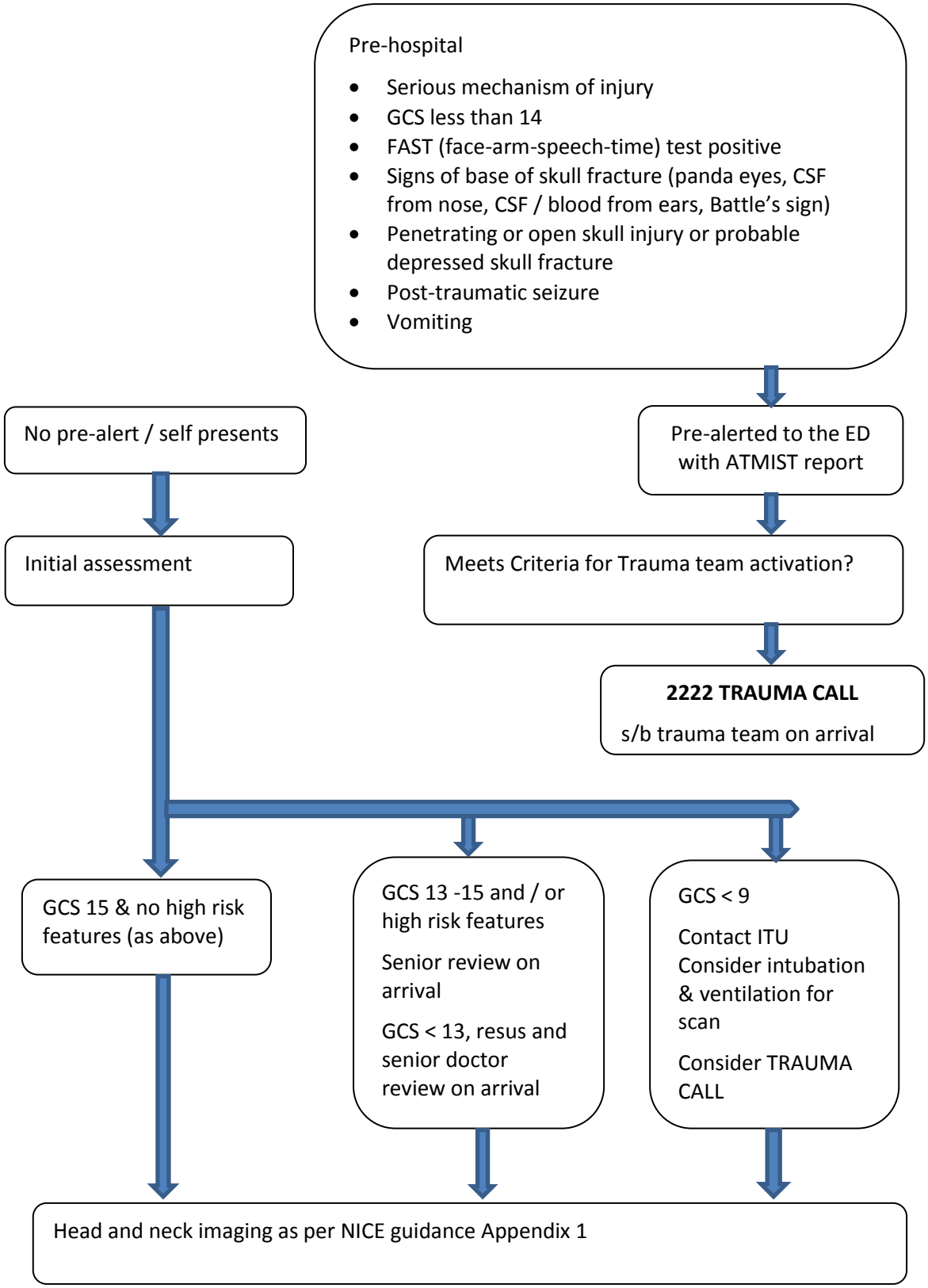
Appendix 1: CT protocol



NICE HI Guidance 2014 – selection of adults for CT neck



Appendix 2: Pre-hospital & ED flowchart



Appendix 3: Admission flow chart