1. Introduction

Falls are a major cause of disability and the leading cause of death due to injury in adults in the UK, especially in people aged above 75. Patient falls account for almost 40% of the patient safety incidents reported to the National Reporting and Learning System (NRLS).

Although most falls result in no serious injury, approximately 5% of older people in community dwelling settings who fall experience a fracture or require hospitalisation. The incidence of falls in hospitals is two to three times greater than that in the community. 1-2 patients die in UHL each year following a fall during hospitalisation, often as the result of a head injury.

The aim of this guideline is to:

- Offer a management plan for in-patient head injury to health care professionals working with adults, especially with older people
- Provide guidance on the frequency of neurological observation following in-patient falls
- Provide guidance on when repeat-neuroimaging is required
- Signpost appropriate care planning and involvement of the neurosurgical team at Nottingham University Hospital (NUH) following in-patient falls resulting in head injury

More detail is found in Head Injury in Adults - Initial Management, Neurosurgical Referral & MTC Transfer (Trust Ref: B38/2018)

2. Scope

The guideline applies to all healthcare staff working within UHL including Bank and Agency staff and those on honorary contracts.

This document provides detailed evidence based clinical guidance for managing head injury following in-patient falls. Although the guidance is aimed at all adults, it is particularly relevant to older people (defined as aged 65 and above).

3. Recommendations, Standards and Procedural Statements

3.1 Neurological observations – guidance for nursing staff

See separate Glasgow Coma Scale Guidance (B15/2012).

Neurological observations: the minimum acceptable information for neurological observations is GCS score, pupil size and reactivity, limb movements and NEWS2.

Protocol as follows :

- ½ hourly for 2 hours
- 1 hourly for 4 hours
- 2 hourly thereafter
- To revert back to ½ hourly if the patient's neurological status deteriorate less than 15, or >=2 points from baseline.
- To continue for a minimum of 24 hours regardless of result of CT scan unless a senior clinician advises to stop
- A Senior Medical review is required within 24 hours. Patients should remain in hospital for observation unless advised by a senior clinician

*** If the fall was unwitnessed and patient is unable to clearly confirm whether they hit their head, proceed as if head injury has been sustained**

3.2 Indications for CT Head

See appendix 1.

3.3 Cervical Spine Assessment

The reviewing doctor should use their clinical judgement to decide whether spine immobilisation is required and the correct imaging modality. Patients with pre-existing arthritis may have neck pain in the absence of injury and may not need imaging/immobilisation, but this is at the discretion of the reviewing doctor.

See appendix 2 and Cervical Spine Injuries UHL Policy Trust Ref B16/2014.

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3.4 Referral to Neurosurgeon (discuss with senior colleague/ neurologist)

Discuss the care of all patients with significant new abnormalities on CT scan with a neurosurgeon. Minor contusions may be managed without neurosurgical involvement at the discretion of a senior clinician.

Other reasons for discussing a patient's care plan with a neurosurgeon include:

- persisting coma (GCS ≤ 8) after initial resuscitation unexplained confusion for more than 4 hours
- deterioration in GCS after admission (especially motor response deterioration) progressive focal neurological signs
- seizure without full recovery
- definite or suspected penetrating injury cerebrospinal fluid leak

3.5 Indications for Repeat Imaging

Have any of the following happened and confirmed by second member of staff? Is the change appraised urgently by a supervising doctor?

- Agitation or abnormal behaviour developed
- GCS dropped by 1 point and lasted for at least 30 minutes (especially a drop of 1 point in the motor response score)
- Any drop of 3 or more points in the eye-opening or verbal response scores, or 2 or more points in the motor response score
- Severe or increasing headache developed or persistent vomiting
- New neurological symptoms or signs, such as pupil inequality or asymmetry of limb or facial movement
- GCS 15 (or whatever GCS deemed normal for patient) not achieved after 24h despite normal initial CT (consider MRI instead of repeat-CT)

3.6 Indications to Reverse Anticoagulation

Delay in reversal of anticoagulation can cause irreversible neurological damage! Discuss immediately with haematologist on-call for Prothrombin Complex Concentrate or DOAC reversal agent. For further information see references 7e-h.

- Any life-threatening bleeding, including intracranial bleeding, in patients taking warfarin should be reversed immediately with Prothrombin Complex Concentrate (PCC). Discuss with on call haematologist. Vitamin K alone is insufficient.
- Likewise, patients on Direct Oral Anticoagulants (DOACs; e.g. Dabigatran, Rivaroxaban, Edoxaban or Apixaban) or Clopidogrel should also be discussed urgently with on call haematologist for PCC or specific reversal agent.

- See: Prothrombin Complex Concentrate

3.7 Important Points

- Stop/withhold anticoagulant and anti-thrombotic in all patients with a significant head injury unless there is a compelling clinical reason to continue
- If it is not clear if loss of consciousness or amnesia treat as if present
- Discuss with anaesthetic team prior to neuroimaging if GCS less than 9 or airway problems
- Refer to the Falls Management Policy for Adult Inpatients (B15/2014) for on-going post-fall management

4. Education and Training

Staff who identify education and training requirements in relation to this guideline must discuss and action these with their line manager.

5. Monitoring and Audit Criteria

All guidelines should include key performance indicators or audit criteria for auditing compliance,

if this template is being used for associated documents (such as procedures or processes) that support a Policy then this section is not required as all audit and monitoring arrangements will be documented in section 8 of the Policy.

Key Performance Indicator	Method of Assessment	Frequency	Lead
Incidents where a patient sustains a head injury following an inpatient fall. Review and report of incidents actioned and issues or concerns escalated as per Incident and Accident Reporting Policy A10/2002	Datix	As received	Ward Sister / Charge Nurse, Matron and Named Consultant

6. Legal Liability Guideline Statement

Guidelines or Procedures issued and approved by the Trust are considered to represent best practice. Staff may only exceptionally depart from any relevant Trust guidelines or Procedures and always only providing that such departure is confined to the specific needs of individual circumstances. In healthcare delivery such departure shall only be undertaken where, in the judgement of the responsible healthcare professional' it is fully appropriate and justifiable - such decision to be fully recorded in the patient's notes.

7. Supporting Documents and Key References

- Head Injury in Adults - Initial Management, Neurosurgical Referral & MTC Transfer (Trust Ref: B38/2018)
- Falls Management for Adult Inpatients UHL Policy (Trust Ref: B15/2014)
- Glasgow Coma Scale UHL Guideline (Trust Ref:B15/2012)
- National Institute for Health and Care Excellence, 2023. Head injury: assessment and early management 'Head injury', NG232

- Oral Anticoagulation with Warfarin and Coumarins UHL Guideline (Trust Ref: B44/2016)
- DOAC (Direct Oral Anticoagulants) Reversal in Bleeding Patients UHL Emergency Department Guideline (Trust Ref: C13/2017)
- Cervical Spine Injuries UHL Policy Trust Ref B16/2014.
- Injectable Medicines Guide ('Medusa') – Dried prothrombin concentrate (Beriplex P/N)
- Injectable Medicines Guide ('Medusa') Dried prothrombin concentrate (Octaplex)

8. Key Words

Head injury, fall, GCS, neuro observations, CT, neuroimaging, injury

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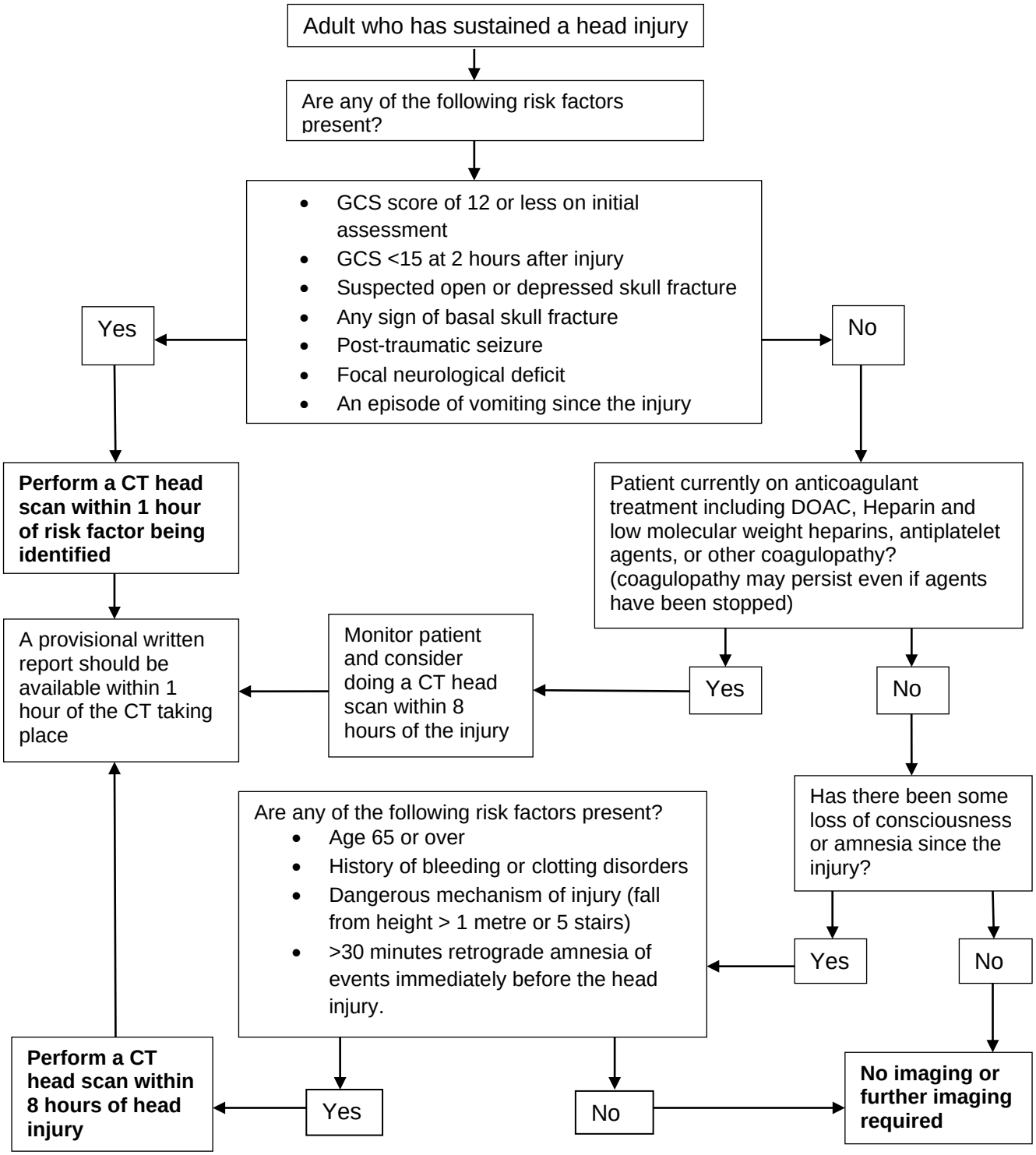
This table is used to track the development and approval and dissemination of the document and any changes made on revised / reviewed versions

DEVELOPMENT AND APPROVAL RECORD FOR THIS DOCUMENT		
Author / Lead Officer:	James Reid UHL Exec Lead: Medical Director	**Job Title:** Consultant Geriatrician
Reviewed by:		
Approved by:	**Policy and Guideline Committee**	**Date Approved: 15 March 2024 (latest version)**

REVIEW RECORD			
Date	**Issue Number**	**Reviewed By**	**Description Of Changes (If Any)**
29/02/2024		J Reid, Lorna Knight, Amy Stones	Amendments to flow charts for CT head and CT spine imaging in keeping with NICE guidance; links to other relevant trust guidance. Complete revision of sections on neurological observations and anticoagulation

DISTRIBUTION RECORD:			
Date	**Name**	**Dept**	**Received**

Indications for CT head



Cervical Spine Assessment