



## Contact details

Victoria Thomas  
Clinical Effectiveness Co-ordinator  
Clinical Effectiveness Programme  
Research Division  
**Royal College of Paediatrics  
and Child Health**  
50 Hallam Street  
London, W1W 6DE

Tel: 020 7307 5674  
Fax: 020 7307 5690  
E-mail: [enquiries@rcpch.ac.uk](mailto:enquiries@rcpch.ac.uk)

Registered Charity no: 1057744

September 2001

# Guidelines for Good Practice

## Early Management of Patients with a Head Injury

These recommendations have been derived from an original guideline document produced by the Scottish Intercollegiate Guidelines Network.<sup>1</sup> The full guideline may be obtained at the following website: <http://www.sign.ac.uk>. This publication presents evidence-based recommendations for the early management of patients with a head injury. Please note that the original guideline also contains extensive advice in addition to that summarised here, and it is strongly recommended that the full guideline is accessed. The guideline report states that a review of the original guideline, taking into account any new evidence, will take place in 2002. Guidelines are 'systematically developed statements to assist decisions about appropriate care for specific clinical circumstances' based on systematic reviews of the research literature. Guidelines are not intended to restrict clinical freedom, but practitioners are expected to use the recommendations as a basis for their practice. Local resources and the circumstances and preferences of individual patients will need to be taken into account. Where possible, recommendations are based on, and explicitly linked to, the evidence that supports them. Areas lacking evidence are highlighted and may form a basis for future research.

### Aim

The aim of the original guideline was to make recommendations to inform the initial management of head injuries.

### Background

About 100,000 people with a head injury attend hospital in Scotland each year (approximately 2% of total population). Most of the large number of patients who attend hospital after a head injury do not develop life-threatening or disabling complications in the acute stage. However, in a small but important group of patients, outcome is made worse by a failure to detect promptly or to adequately deal with complications. Outcome after head injury depends on the initial severity of the injury, the extent of any subsequent complications and how these are managed. Much of the debate around the initial treatment of patients with a head injury focuses on the methods used to identify the patients at risk and to provide appropriate care, in terms of investigations utilised, observations performed and where these should be carried out. This guideline was published in 2000 and is available in the form of a guidelines report and a quick reference guide.

### The Role of the Royal College of Paediatrics and Child Health

In order to raise awareness about the existence of the original guideline and to ensure its relevance for children's health, the College (through its Quality of Practice Committee) assessed the original guideline against the checklist laid out in its 'standards' document.<sup>2</sup> Having established the quality of the guideline's methodology in this way, the College recruited independent reviewers to examine the recommendations presented in the guideline document in the context of the original research papers from which they were derived. These reviewers were expert in both the clinical area under examination and in critically appraising research literature. The findings of the reviewers are presented here. Where discrepancies between their findings and the originals exist, both recommendations have been included. The shaded boxes indicate these areas of discrepancy. In addition, the guideline also includes a series of 'paediatric good practice statements' that are not necessarily evidence-based.

The levels of evidence used throughout are those derived from the US Agency for Health Care Policy and Research, 1993 (see below).<sup>3</sup> The College's appraisal should not be considered valid beyond the end of 2003, and new evidence at any time could invalidate these recommendations. **Please note that those recommendations ORIGINALLY ascribed a Grade C have not been appraised by the College.**

## Grades of Evidence/Derivation of Recommendations

- Grade A Evidence:** Requires at least one randomised controlled trial as part of the body of literature of overall good quality and consistency, addressing the specific recommendation.
- Grade B Evidence:** Requires availability of well-conducted clinical trials but no randomised clinical trials on the topic of the recommendation.
- Grade C Evidence:** Requires evidence from expert committee reports or opinions and/or clinical experience of respected authorities. Indicates absence of directly applicable studies of good quality.

## Recommendations for Good Practice

Recommendations	Grade	Endorsed by the College
<b>Assessment and classification</b>		
<ul style="list-style-type: none"> <li>Use of the Glasgow Coma Score, post-resuscitation with repeated clinical assessment and the use of evidence-based protocols, should guide the management of head injured patients<sup>4-12</sup> (<b>Original statement:</b> The management of head injured patients should be guided by clinical assessments and protocols based on the Glasgow Coma Scale and Glasgow Coma Score. Grade B)</li> </ul> <p><b>Paediatric Practice Point</b> <i>The Glasgow Coma Scale is difficult to apply to the young (under 5 years) child. Although modifications exist, great care needs to be taken with its interpretation and this should be done by those with experience in the management of the young child.<sup>13</sup></i></p>	<b>B</b>	✓
<b>Indications for referral to hospital</b>		
<ul style="list-style-type: none"> <li>A head injured patient should be referred to a facility capable of undertaking and interpreting skull x-rays if <b>any</b> of the following is present: <ul style="list-style-type: none"> <li>Impaired consciousness (GCS &lt;15/15) at any time since injury</li> <li>Amnesia for the incident or subsequent events</li> <li>Neurological symptoms e.g. severe and persistent headache, nausea and vomiting, irritability or altered behaviour, seizure</li> <li>Clinical evidence of a skull fracture (e.g. CSF leak, periorbital haematoma)</li> <li>Significant extracranial injuries</li> <li>A mechanism of injury suggesting: a high energy injury (e.g. road traffic accident, fall from height); possible penetrating brain injury; possible non-accidental injury (in a child)</li> <li>Continuing uncertainty about the diagnosis after first assessment</li> <li>Medical co-morbidity</li> <li>Adverse social factors (e.g. no-one able to supervise the patient at home)<sup>14-23</sup></li> </ul> </li> </ul>	<b>B</b>	✓
<b>Principles of management</b>		
<ul style="list-style-type: none"> <li>A head injured patient should initially be assessed and managed according to clear principles and standard practice as embodied in (for children) the Advanced Paediatric Life Support (APLS) system</li> </ul>	<b>C</b>	
<b>Imaging</b>		
<ul style="list-style-type: none"> <li>CT scanning should be readily available, on a 24 hour basis, to A&amp;E Departments responsible for assessing head injured patients</li> </ul>	<b>C</b>	
<ul style="list-style-type: none"> <li>Risk factors should be taken into account when considering the need for radiological imaging<sup>14 17 18 19 20 23 24 27-46</sup> (<b>Original statement:</b> Selection for imaging should be based on known 'risk' factors for the presence of a skull fracture or an intracranial lesion. Grade B)</li> </ul>	<b>B</b>	✓
<ul style="list-style-type: none"> <li>Skull films should be carried out if any of the following apply and if CT is not being performed: <ol style="list-style-type: none"> <li>If the patient is alert and orientated and obeying commands (GCS 15/15) <b>but:</b> <ul style="list-style-type: none"> <li>the mechanism of injury has not been trivial; or</li> <li>consciousness has been lost; or</li> <li>the patient has loss of memory or has vomited; or</li> <li>the scalp has a full thickness laceration or a boggy haematoma; or</li> <li>the history is inadequate</li> </ul> </li> <li>or</li> <li>If the level of consciousness is impaired (GCS ≤14/15)<sup>18 20 46-55</sup></li> </ol> </li> </ul> <p>(<b>Original grade B</b>)</p>	<b>C</b>	✓

## Recommendations for Good Practice

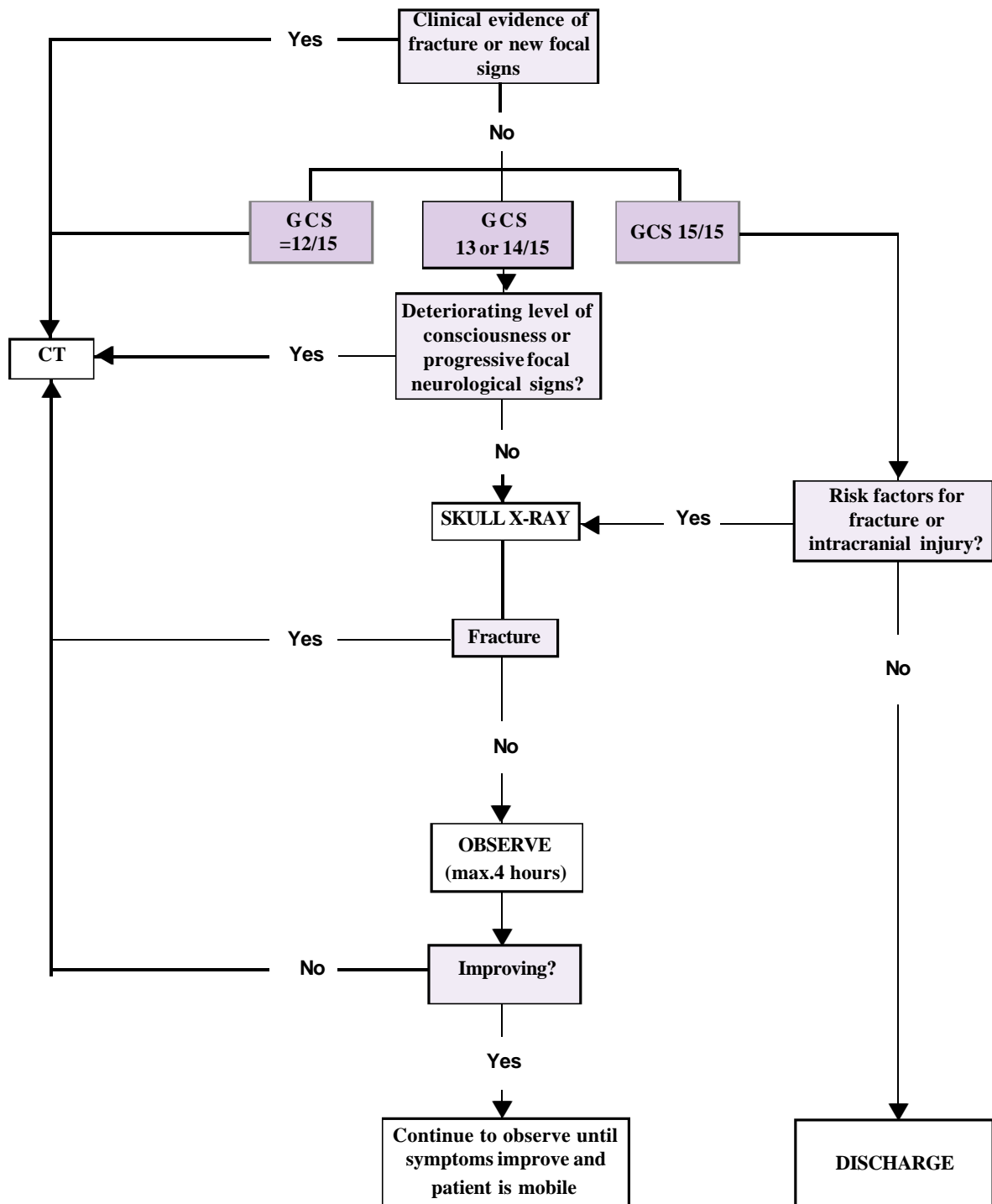
	Grade	Endorsed by the College
<b>Imaging continued</b>		
<ul style="list-style-type: none"> <li>● Doctors who interpret and make clinical decisions based upon skull films or scans should be trained to do so. All imaging should be reviewed by an experienced radiologist as soon as possible <sup>56</sup> <b>(Original grade: B)</b></li> </ul>	<b>C</b>	✓
<ul style="list-style-type: none"> <li>● Transport or transmission of images should be used to communicate about patients in whom the appropriate management is not otherwise clear <sup>57 58 60</sup></li> </ul>	<b>B</b>	✓
<ul style="list-style-type: none"> <li>● CT scanning should be done in a patient who has any of the following features:               <ol style="list-style-type: none"> <li>1. The patient is eye opening only to pain or does not converse (CGS 12/15 or less)</li> <li>2. A deteriorating level of consciousness or progressive focal neurological signs</li> <li>3. Confusion or drowsiness (GCS 13 or 14/15) followed by failure to improve within at most 4 hours of clinical observation</li> <li>4. Radiological/clinical evidence of a fracture, whatever the level of consciousness</li> <li>5. New focal neurological signs which are not getting worse</li> <li>6. Full consciousness (GCS 15/15) with no fracture but other features e.g. severe and persistent headache, nausea and vomiting, irritability or altered behaviour, a seizure <sup>21 24 28 31 36 38 39 42 48 54 59-61</sup></li> </ol> <b>(Original grade B)</b> <p><b>Paediatric Practice Points</b>  <i>Skull fractures in children, though significantly associated with an increased risk of intracranial injury, are not as discriminating as in adults. In children with a head injury, significant intracranial injury occurs more frequently in the absence of a skull fracture than is the case in adults. Clinical features (e.g. tense fontanelle) are an equally important factor in determining the need for a CT scan to rule out intracranial injury</i></p> <p><i>In the absence of clinical signs of intracranial injury, observation by experienced paediatric medical and nursing staff in an appropriate unit/ward is an alternative to urgent CT scan</i></p> <p><i>See also Figure 1 overleaf</i></p> </li> </ul>	<b>C</b>	✓
<ul style="list-style-type: none"> <li>● Imaging of the cervical spine, including the cervico-thoracic junction should be carried out:               <ul style="list-style-type: none"> <li>▪ In a fully conscious patient (GCS (15/15) if clinical symptoms or signs or the mechanism of injury indicate the possibility of injury</li> <li>▪ In a patient with persisting impaired consciousness (GCS 14/15 or less)</li> <li>▪ In an unconscious patient (not localising pain (GCS 6/15 or less) CT scanning of the cervical spine down to C2 should be undertaken routinely, at the time of head scanning <sup>62-71</sup></li> </ul> </li> </ul>	<b>B</b>	✓
<b>Admission or discharge?</b>		
<ul style="list-style-type: none"> <li>● A patient should be admitted to hospital if:               <ul style="list-style-type: none"> <li>▪ The level of consciousness is impaired (GCS &lt;15/15)</li> <li>▪ The patient is fully conscious (GCS 15/15) but any of the following risk factors are present:                   <ul style="list-style-type: none"> <li>- continuing amnesia (for at least 5 minutes after injury)</li> <li>- continuing nausea and/or vomiting</li> <li>- a seizure at any time after injury</li> <li>- focal neurological signs</li> <li>- irritability or abnormal behaviour</li> <li>- clinical or radiological evidence of a recent skull fracture or suspected penetrating injury</li> <li>- an abnormal CT scan</li> <li>- severe headache or other neurological symptoms</li> </ul> </li> <li>▪ The patient has significant medical problems</li> <li>▪ The patient cannot be supervised by a responsible adult <sup>18 27 55 72-79</sup></li> </ul> </li> </ul> <p><b>Paediatric Practice Points</b>  <i>Children should be admitted if any of the following risk factors apply:</i> <ul style="list-style-type: none"> <li>- history of loss of consciousness</li> <li>- neurological abnormality or persisting headache or vomiting</li> <li>- clinical or radiological evidence of skull fracture or penetrating injury</li> <li>- difficulty in making a full assessment</li> <li>- suspicion of non-accidental injury</li> <li>- other significant medical problem</li> <li>- not accompanied by responsible adult or social circumstances considered unsatisfactory</li> </ul> </p>	<b>B</b>	✓



## Recommendations for Good Practice

	Grade	Endorsed by the College
<b>Follow up</b>		
<ul style="list-style-type: none"> <li>A discharge letter should be sent to the general practitioner about every patient, whether or not admitted to hospital<sup>93-96</sup> <b>(Original grade B)</b></li> </ul> <p><b>Paediatric Practice Point</b>  <i>Children suffering significant head injury should be followed up by a specialist multidisciplinary team to assess the need for rehabilitation and should include notification to the school medical service and the primary health care team.</i></p>	C	✓

**Figure 1: Use of radiographic investigations in patients (>5 years of age) with a head injury**



## Clinical audit

The original published guideline document contains the following key indicators on auditing outcomes of patients attending hospital with a head injury.

1. Has a comprehensive assessment been documented?
  - a) Have guidelines been followed in decision-making about investigation?
  - b) Have guidelines been followed in decisions about admission or discharge for home observation?
  - c) Have guideline for neurosurgical consultation been appropriately used?
  - d) Have decisions about neurosurgical consultation or transfer been carried out appropriately?
2. Have clear and appropriate instructions been given about management?
3. Have appropriate instructions been given to patients discharged?
4. Has progress in hospital been appropriately documented?
5. Is there evidence of untoward incidents in patient management?

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## Acknowledgements

We would like to thank all those who participated in this review, in particular those reviewers who appraised the recommendations:

- **Dr Robert Forsyth**, *Consultant Paediatric Neurologist*
- **Dr Ian Maconochie**, *Consultant in Paediatric Accident and Emergency Medicine*
- **Dr Harry Baumer**, *Consultant Paediatrician*

We would also like to thank the members of the Quality of Practice Committee who oversaw the process of the review:

- Dr Harry Baumer (Chairman)
- Dr Jill Challener
- Professor Richard Cooke
- Dr Ruth Gilbert
- Dr Jill Gregory
- Mrs Linda Haines
- Dr Chris Kelnar
- Dr Monica Lakhanpaul
- Dr Stuart Logan
- Dr Karen Turnock
- Dr William Whitehouse