The National Institute of Clinical Excellence Head Injury Guidelines: A Summary to Assist Implementation

The National Institute for Clinical Excellence guidelines aim to improve the quality of healthcare. They provide evidence-based recommendations for the treatment and care of patients with specific disorders. The guidelines can be used to develop standards of care and provide a useful tool for auditing clinical practice. In 2003, NICE first published guidelines for the management of head injured patients (Clinical Guideline 4). In September, 2007, an extensive update including amendments to existing advice and new recommendations was published (CG 56). The guidelines and the update were compiled by a large panel of interested parties after an exhaustive review of the available literature. This paper aims to summarise the features of head injury care as recommended by the guidelines.

The objective of care for head injured patients is to ensure timely recognition and treatment of significant injuries in an appropriate healthcare setting. The NICE guidelines have led to a shift in management from an "admit and observe" strategy to a "diagnose and decide" approach. The guidelines provide advice on pre-hospital management, assessment in the emergency department, investigation for brain and cervical spine injuries (see Boxes 1, 2 and 3), recommendations for referral and transfer to a neurosurgical unit (see Box 4) and guidelines regarding the admission, care and discharge of brain injured patients (see Box 5).

The key features of the guidelines include the following:

- Head injured patients should be transported to a facility with the resources to resuscitate, investigate and provide initial management of multiple injuries. The initial assessment and management should follow the principles of the Advance Trauma Life Support system. For patients with a GCS 3–8 the paramedic crew should make a stand-by call to ensure that appropriate personnel are available to treat the patient at the receiving hospital.

**Box 1 – CT head imaging in adults**

**CT Head Imaging in adults**

*Immediate CT (within 1 hour of request):*
- GCS ≤13 when assessed in Emergency Department
- GCS ≤15 2 hours after Emergency Department assessment
- Suspected open or depressed #
- Signs of basal skull #
- Seizure
- Focal neurological deficit
- >1 episode of vomiting
- Anticoagulant therapy or coagulopathy

*CT within 8 hours:*
- Pre-traumatic amnesia >30 min
- Age >65 years if any amnesia or loss of consciousness since the injury
- Dangerous mechanism if any amnesia or loss of consciousness since the injury (e.g. pedestrian or cyclist hit by motor vehicle; ejected vehicle occupant; fall >1m or 5 stairs)

**Box 2 – CT head scanning in children**

**CT Head in Children (under 16):**
- Age ≤1 year; GCS ≤15 on assessment in Emergency Department (Paediatric GCS)
- Age ≤1 year; GCS ≤14 on assessment in Emergency Department (Paediatric GCS)
- Age ≤1 year; bruise, swelling or >5cm scalp laceration
- Dangerous mechanism (high speed RTA, fall >3m, high speed projectile injury)
- NAI (personnel should be trained to recognise NAI)
- Witnessed loss of consciousness >5 min
- Seizure (with no history of epilepsy)
- Suspicion of open or depressed #
- Tense fontanelle
- Signs of basal skull #
- Focal neurological deficit

**Box 3 – Cervical Spine Clearance**

*If undertaking urgent head CT the cervical spine should also be scanned*

*In patients who are alert it is safe to fully examine the neck if:*
- Simple rear end collision
- Patient has been ambulant at any time since injury and there is no midline tenderness
- Patient can sit comfortably in emergency department
- Patient presents with delayed onset of neck pain

Requests for cervical spine radiographs in adults and children

*For adults and children age 10-16 years use AP, lateral and odontoid peg views*  
*For children age ≤10 years request AP and lateral views (no peg view)*

Radiographs should be requested if:
- Not safe to assess neck (see above) and CT not indicated
- Active neck rotation is limited to <45 degrees to left and right
- Neck pain/midline tenderness + age >65
- Neck pain/midline tenderness + dangerous mechanism (fall >1m or 5 stairs; axial load; high speed RTA; ejection from vehicle; rollover; bicycle collision; recreational vehicle)
- Cervical spine status required e.g. pre-surgery

**CT Cervical Spine requests in adults and children 10 years or older**

**CT Cervical Spine should be requested if:**
- GCS ≤13 on initial assessment
- Patient is intubated
- Inadequate plain films
- Clinical suspicion persists despite normal plain films
- Undertaking scans for multi-region trauma

**CT Cervical Spine requests in children under 10 years**

Request CT Cervical spine if:
- GCS <9
- Inadequate plain films
- Strong clinical suspicion of injury despite normal plain films

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*With reference to boxes*

NAI = non-accidental injury

# = fracture
• The spine should be immobilised for all patients with GCS < 15, any history of neck pain or tenderness, any extremity paraesthesia, any focal neurological deficit or any other suspicion of a cervical spine injury. Immobilisation should remain in place until a full assessment has been conducted (Box 3).

• Immediate clinical assessment should be conducted in the Emergency Department for all patients with a GCS <15. All patients with a GCS of 15 should be assessed by trained staff within 15 minutes of arrival.

• The admitting team should be competent to assess, observe, investigate and transfer patients. If the patient has sustained polytrauma, admission should be under the care of the team who are dealing with the most severe and urgent clinical problem.

• All serious head injuries (GCS 3-8) should be transferred to a neuroscience unit. If logistics prevent transfer, neurosurgeons should assist and advise.

• Patients and carers should be aware of potential long-term symptoms and disabilities and should know how to seek help. GPs should be able to refer patients with long term sequelae to a suitable healthcare professional for specialist advice.

ERNIE database
The Evaluation and Review of NICE Implementation Evidence (ERNIE) database summarises the literature concerning the uptake of NICE guidance. References to external literature and a simple classification system are provided. ERNIE identifies 11 references that have assessed the implementation of the head injury guidelines. Although this information is far from complete, it provides a sound introduction to further investigation and dissemination of knowledge about the impact of the guidelines. Initially an increased use in resources was considered likely. However, this prediction has not been evident in studies published to date. The 2 to 5 times increased use of CT scans has been associated with a large decrease in admission rate. This has therefore led to a redistribution of patient management from the observation ward to the radiology department with no net increase in cost of care.

Areas for future research
The Guideline Development Group made several recommendations for further research to improve the evidence in specific areas of care. These are summarised below.

1. Should patients be transferred directly to a specialist neurosciences unit or to the nearest district general hospital?

2. The new guidelines regarding the use of CT head scans in children need validation in adults.

3. The role of surgery vs ICP and intensive care monitoring in patients with ‘non-surgical’ mass lesions requires further elucidation. Is there a role for ‘pre-emptive’ surgery?

4. Some evidence supports the transfer of patients with ‘non-surgical’ traumatic brain injury to a specialist neurosciences unit. This practice is not universal and further work is required to evaluate whether the reported improvements in outcome can be achieved across the board.

5. Robust clinical decision tools need to be developed to help predict those patients with mild injury who are likely to develop long term sequelae.

Conclusion
In summary, the NICE Head Injury Guidelines provide the many clinicians involved in the care of brain-injured patients with a sound foundation upon which to build patient care. The challenge for neurosurgeons is to improve the efficacy of management for patients with intracranial mass lesions and to conduct further work to establish the best pathway of care for patients with diffuse brain injury. Neurosurgeons are well placed to aid national guideline implementation.

References


