# Neuroimaging in suspected physical abuse

**Descriptor:**

Neurological imaging of children who are suspected of being the subject of physical abuse.

**Background:**

In March 2008, the Royal College of Radiologists (RCR) and the Royal College of Paediatrics and Child Health (RCPCH) published “Standards for Radiological Investigations of Suspected Non-accidental Injury”. These guidelines were superseded by a new RCR publication in 2017. "The Radiological investigation of Suspected Physical Abuse in Children." This guideline advises that neuro-imaging should be undertaken in any child under the age of one when there is suspected physical abuse and in older children where there is external evidence of trauma and / or abnormal neurological signs or symptoms. In children under the age of one who are the subject of physical abuse, there is a high incidence of occult head injury despite a normal neurological examination. It is vital to screen these children to ensure the injuries are not missed. Physical abuse is associated with more severe brain damage and is the most common cause of mortality in children who are admitted with head injuries. CT is the first line of investigation as it is readily available, can be performed in a short period of time and reliably detects acute haemorrhage. MRI scans are indicated for non acute presentation and on day 2-5 for a follow-up of patients with abnormalities detected on the CT scan or for further evaluation of persisting neurological abnormailities. MRI of the whole spine is also indicated.   Further followup MRI imaging is recommended if the intial MRI shows abnormality or if there is persisting neurological abnormaility.

## The Cycle

**The standard:**

All children under the age of one presenting with suspected physical abuse should undergo neuro-imaging.

**Target:**

100%

## Assess local practice

**Indicators:**

Percentage of cases which adhere to the protocol.

**Data items to be collected:**

• Retrospective review of radiological reports for children under the age of one who have undergone a skeletal survey for suspected physical abuse

• For each patient, document whether CT and/or MRI scans had been undertaken during the same admission as the skeletal survey. What the results of these examinations were - ie normal / abnormal and whether further MRI imaging has been performed.

**Suggested number:**

• 20 consecutive patients under the age of one who have been investigated with a skeletal survey for suspected physical abuse

  - For smaller departments it may be appropriate to look at all cases (under the age of one) in a 12 month period

**Suggestions for change if target not met:**

• Present the results of the audit to radiologists, radiographers and clinicians who are involved in the care of children with suspected physical abuse

• Increase awareness of the guidelines from the RCR and the importance of neuro-imaging in children under the age of one who are suspected of being subject to physical abuse

• Keep a copy of the guidelines readily available in the department

• Review and re-audit in 12 months depending on demonstrated compliance with guidelines

**Resources:**

• Retrospective review of reports on the Radiology Information System (approximately 2 hours)

**References:**

1. The Radiological Investigation of suspected physical abuse in children. 2017, revised November 2018; Royal College of Radiologists <https://www.rcr.ac.uk/system/files/publication/field_publication_files/bfcr174_suspected_physical_abuse.pdf>
2. Harper et al. Additional injuries in young infants with concern for abuse and apparently isolated bruises; J Pediatr. 2014 Aug;165(2):
3. Rubin et al. Occult Head Injury in High-Risk Abused Children; Paediatrics, June 2003, Vol.111, No. 6
4. Duhaime et al. Head Injury In Very Young Children: Mechanisms, Injury Types, And Opthalmological Findings In 100 Hospitalized Patients Younger Than 2 Years Of Age; Paediatrics, Aug 1992, Vol. 90, No. 2

**Editor's comments:**

In larger centres, when managing cases referred from other hospitals, it may be more appropriate to obtain a list of suspected physical abuse cases from the relevant Paediatric department as the skeletal survey may have been performed elsewhere and not show up in a local RIS search. Outside referrals can then be checked to ensure that neurological imaging was performed following referral if not done prior to referral.

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