

Hampshire, Isle of Wight, Portsmouth and Southampton Designated Doctors for Safeguarding Position on CT head scans for children under one year old with suspected physical abuse

National guidance on radiological investigation for suspected physical abuse in children, last reviewed in 2019, recommends that imaging 'should always include...computed tomography (CT) head scan in children under one year old.'¹

National radiology guidance is based on studies from United States hospitals that report high yields for occult injuries on CT head scan (19-37%)²⁻⁵. In 2021, two studies from the UK were published that found much lower yields, with a paper from Wessex finding no occult intracranial injuries suggestive of abusive head trauma in the 363 CT head scans included⁶, and a paper from Cardiff finding a yield of 1.7% (2/115) for occult findings once those with skull fractures and head and neck bruising are excluded.⁷

Although risks are small, exposure to radiation is known to increase the risk of cancer.^{8,9} The precise level of risk in infants is unknown, though they are likely to have higher levels of risk than other ages.¹⁰

The Royal College of Paediatrics and Child Health (RCPCH) are updating their systematic review on head and spinal injuries. We understand that this will include a review of the evidence on neuroimaging in suspected abusive head trauma.

Pending the RCPCH review, and any updated reviews from the Society and College of Radiographers and the Royal College of Radiologists, the position of the Hampshire, Isle of Wight, Portsmouth and Southampton Designated Doctors for Safeguarding is:

In suspected physical abuse of a child under one year of age a CT head scan should always be requested if there are neurological signs, skull fractures, head, neck or scalp injuries, an unexplained low haemoglobin (usually in an ill child), or clear witnessed head impact or shaking injury .

In other cases, a CT head scan should always be considered. However, a decision not to request one can be made by the lead paediatrician taking into account the specific details of each case. If a CT head scan is not to be performed in a child under the age of one year, the reasoning for this must be clearly documented in the child's records.

If CT head scan is not carried out it is important that a skull X-ray is included in the skeletal survey

¹ Society and College of Radiographers and the Royal College of Radiologists. *The radiological investigation of suspected physical abuse in children*. Revised first edition. London. Society and College of Radiographers and the Royal College of Radiologists, 2018

² Rubin DM, Christian CW, Bilaniuk LT et al. Occult Head injury in high-risk abused children. *Pediatrics* 2003;111:1382-6 <https://doi.org/10.1542/peds.111.6.1382>

³ Laskey AL, Holsti M, Runyan DK, Socolar RR. Occult head trauma in young, suspected victims of child abuse *J Pediatr* 2004;144(6): 716-22 <https://doi.org/10.1016/j.jpeds.2004.02.023>

⁴ Harper NS, Feldman KW, Sugar NF et al. Additional injuries in young infants with concern for abuse and apparently isolated bruises. *J Pediatr* 2014; 165(2): 383-8 <https://doi.org/10.1016/j.jpeds.2014.04.004>

⁵ Greenes DS, Schutzman SA. Occult intracranial injuries in infants. *Ann Emerg Med* 1998;36:680-6. [https://doi.org/10.1016/s0196-0644\(98\)70067-8](https://doi.org/10.1016/s0196-0644(98)70067-8)

⁶ Daley H, Smith H, McEvedy S, King R, Andrews E, Hawkins F, Guppy N, Kiryazova T, Macleod R, Blake E, Harrison R. Intracranial injuries on computed tomography head scans in infants investigated for suspected physical abuse: a retrospective review. *Archives of disease in childhood*. 2021 May 1;106(5):456-60.

⁷ Glenn K, Nickerson E, Bennett CV, Naughton A, Cowley LE, Morris E, Murtagh U, Kontos K, Kemp AM. Head computed tomography in suspected physical abuse: time to rethink?. *Archives of disease in childhood*. 2021 May 1;106(5):461-6.

⁸ Bjj M, Offiah AC. Imaging in suspected child abuse: necessity or radiation hazard? *Arch Dis Child* 2015;100:1163-8 <http://dx.doi.org/10.1136/archdischild-2015-308418>.

⁹ Rao R, Browne D, Lunt B et al. Radiation doses in diagnostic imaging for suspected physical abuse. *Arch Dis Child* 2019;104:863-8 <http://dx.doi.org/10.1136/archdischild-2018-316286>.

¹⁰ Slovis TL, Strouse PJ, Strauss KJ. Radiation exposure in imaging of suspected child abuse: benefits versus risks.