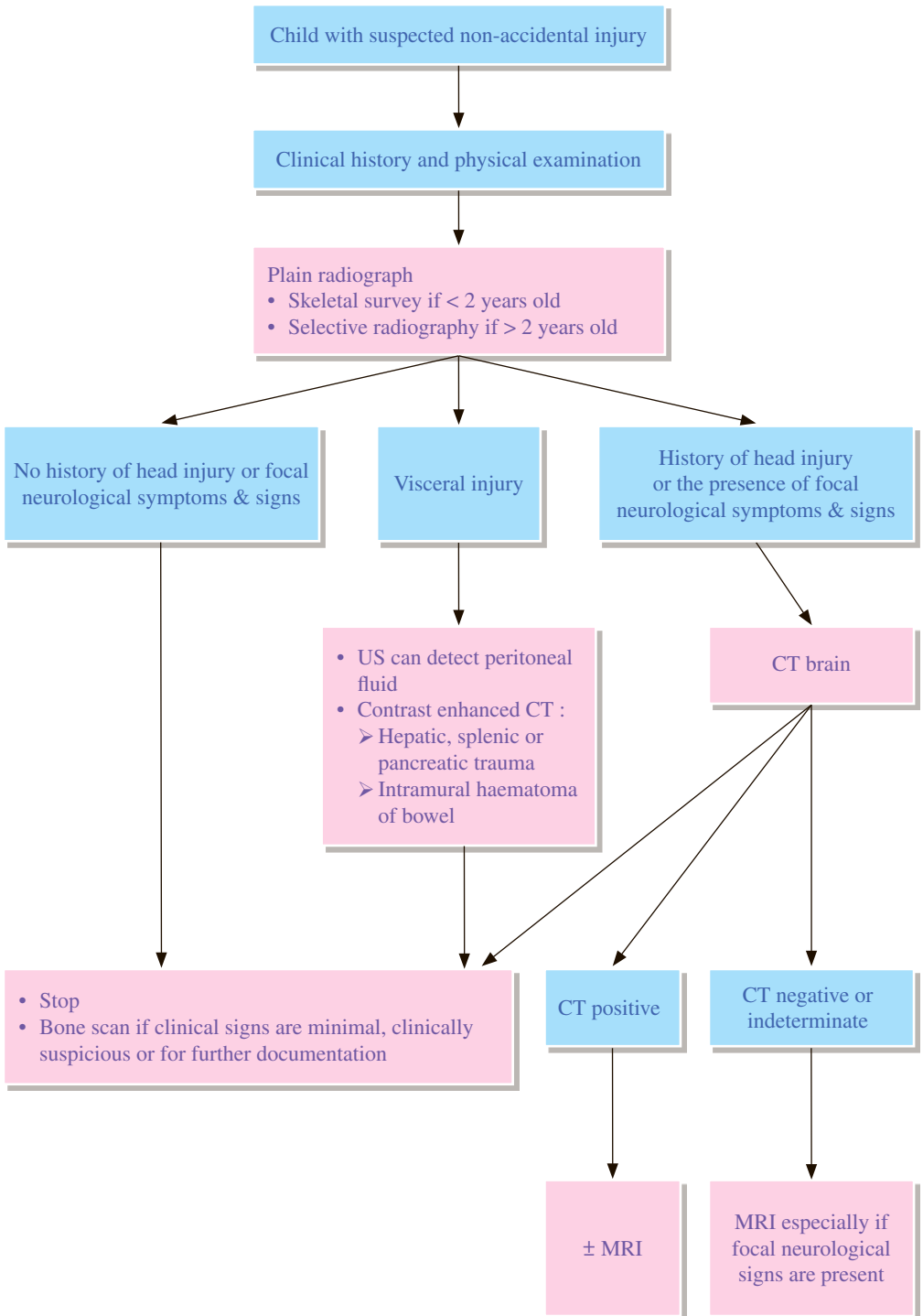


PD 1 Suspected non-accidental injury



REMARKS

1 General

- 1.1 Child abuse is not an imaging diagnosis. The role of imaging is to support the clinical diagnosis of child abuse in the proper clinical and social context and also to assist the evaluation of the severity and extent of injury.

2 Musculoskeletal trauma

- 2.1 Skeletal survey includes skull (frontal and lateral), spine (lateral cervical, thoracic and lumbar), chest (frontal including clavicles, and oblique views of bilateral ribs), abdomen (frontal, including pelvis and both hips), upper extremities (frontal humeri, forearms, and hands), and lower extremities (frontal femora, lower legs, and feet).
- 2.2 Conventional radiography is the primary imaging examination for musculoskeletal trauma.
- 2.3 Avoid 'babygram' as it is diagnostically inadequate.
- 2.4 Complete skeletal survey is normally indicated in children less than 2 years of age who have clinical evidence of child abuse, or in infants less than 1 year of age who show evidence of significant neglect and deprivation. In children between 2 years and 5 years of age, the skeletal survey may be tailored according to history and physical examination findings.
- 2.5 **For children more than 5 years old, skeletal survey is rarely indicated.**
- 2.6 Bone scans may be considered for children in whom skeletal survey is negative but clinical suspicion of non-accidental injury (NAI) is high. Bone scan is sensitive for the extent of bone injury, acute non-displaced and subtle healing fractures. Its pitfalls include normal uptake around the growth plates leading to difficult identification of metaphyseal-epiphyseal injuries, missed symmetrical fractures, inability to determine the age and type of fracture and relative insensitivity in detecting skull and vertebral body fractures. It should be used as a problem-solving study rather than first line.
- 2.7 Role of MRI and US for evaluating skeletal injury in NAI has not been established with reference to prevailing international guidelines and recommendations.

3 Skull trauma

- 3.1 Skull radiographs form part of the full skeletal survey for non-accidental injury.
- 3.2 In children with head trauma who are at increased risk of intracranial injury, CT is the preferred initial imaging modality and also improves definition of depressed and other complex fractures.
- 3.3 Bone scan is unreliable in identifying skull fractures.

4 Intracranial trauma

- 4.1 CT is both sensitive and specific in defining acute intra- and extra-cerebral injuries, especially subarachnoid haemorrhage.
- 4.2 MRI is useful in the subacute and chronic settings and is superior in detecting subdural haematomas, cortical contusions and shearing injuries. It can determine the age of extra-cerebral fluid collections and timing of intracranial haemorrhage.
- 4.3 MRI should be performed in patients whose clinical symptoms are disproportionate to the CT findings.

5 Visceral trauma

- 5.1 Imaging examinations should be tailored to specific clinical concern.
- 5.2 Abdominal US is useful to detect peritoneal fluid but is less sensitive than CT to detect solid organ injury.

REFERENCES

1. The Royal College of Radiologists, Royal College of Paediatrics and Child Health. Standards for Radiological Investigations of Suspected Non-Accidental Injury. London: The Royal College of Radiologists; 2008.
2. Wootton-Gorges SL, Soares BP, Alazraki AL. ACR Appropriateness Criteria® Suspected Physical Abuse – Child. Available at <https://acsearch.acr.org/docs/69443/Narrative/>. American College of Radiology. Accessed 2017 May 17.
3. American College of Radiology. ACR–SPR Practice Parameter For The Performance And Interpretation of Skeletal Survey in Children. Revised 2016 (Resolution 10). Reston: American College of Radiology; 2016.
4. Caviness AC. Skull fractures in children. In: UpToDate, Post TW (Ed), UpToDate, Waltham, MA; 2014.
5. Merten DF, Radkowski MA, Leonidas JC. The abused child - a radiological reappraisal. *Radiology*. 1983; 146: 377-381.
6. Merten DF, Carpenter BLM. Radiologic imaging of inflicted injury in the child abuse syndrome. *Pediatr Clin North Am*. 1990; 37: 815-837.
7. Mandelstam SA, Cook D, Fitzgerald M, Ditchfield MR. Complementary use of radiological skeletal survey and bone scintigraphy in detection of bony injuries in suspected child abuse. *Arch Dis Child*. 2003; 88: 387-390.
8. Conway JJ, Collins M, Tanz RR, Radkowski MA, Anandappa E, Hernandez R, et al. The role of bone scintigraphy in detecting child abuse. *Semin Nucl Med*. 1993; 23: 321-333.
9. Sato Y, Yuh WTC, Smith WL, Alexander RC, Kao SCS, Ellerbroek CJ. Head injury in child abuse - evaluation with MR imaging. *Radiology*. 1989; 173: 653-657.
10. Kleinman PK. Diagnostic imaging in infant abuse. *AJR Am J Roentgenol*. 1990; 155: 703-712.
11. Hardt N, Kuttenger J. Chapter 2: Radiology of Craniofacial fractures. *Craniofacial Trauma Diagnosis and Management*. Berlin Heidelberg: Springer-Verlag; 2010. p. 15-28.
12. Stauss J, Hahn K, Mann M, De Palma D. Guidelines for paediatric bone scanning with 99mTc-labelled radiopharmaceuticals and 18F-fluoride. *Eur J Nucl Med Mol Imaging*. 2010; 37: 1621-1628.
13. Conway JJ, Collins M, Tanz RR, Radkowski MA, Anandappa E, Hernandez R, Freeman EL. The Role of Bone Scintigraphy in Detecting Child Abuse. *Semin Nucl Med*. 1993; 23: 321-333.