

# Preparing an Expert Report for the Family Court and Lessons Learnt

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# About me;

- ⦿ Consultant Paediatric Radiologist since 2012
- ⦿ Training; Leeds, Toronto, Barcelona.
- ⦿ Providing expert reports for the family courts since January 2017.
- ⦿ Skeletal and neuroimaging.
- ⦿ Approximately 30 reports/year.

# Practical Considerations....

- ⊙ “Are you ready/good enough to be an expert”?
  - What constitutes an expert ?
  - Difficult to define
  - Individual experience/practice
  - Know the Research (limitations thereof)
  - Court Judgement
  - Internal/External Peer review
    - “Northern Heads”\* - Established by Manchester/Alder Hey
- ⊙ Familiarity with Part 25 “Experts and Assessors”

# Practical Considerations.....

- ⦿ Taking on Instructions...
- ⦿ Recommendations/personal contacts
- ⦿ Working through an agency ?
- ⦿ Process
  - Queries re: availability/remit/COI/cv/costs
  - Letter of Instruction
  - Receipt of Court bundle/Imaging
  - Provide your Report/invoices
  - *Follow-up questions*
  - *Expert's meeting*
  - *Factfinding hearing (Court attendance "giving evidence")*
  - *Judgement*
- ⦿ Courses

# What I have learned....

- ⦿ Open-minded but always say what you think (and explain why).
- ⦿ Never be scared to change your mind (and explain why).
- ⦿ The radiology (medical) evidence is not the only consideration.
- ⦿ Recognise that it's ok to say you don't know.
  - Acknowledge the limitations of your personal experience/knowledge.
  - Acknowledge the limitations of research.
- ⦿ Not to be intimidated by the process.

# The report

## Systematic approach

### Scientific paper

- \*\*\*
- Abstract
- Introduction
- Material/methods
- Results
- Discussion
- Conclusion
- \*\*\*
- References

### Court Report

About the author

Executive summary

\*\*\*

Radiology/Court bundle

Radiological findings

Comments on Radiological Findings

Summary

Questions in LOI

References

## Explanation of terms

## Images

## Body map

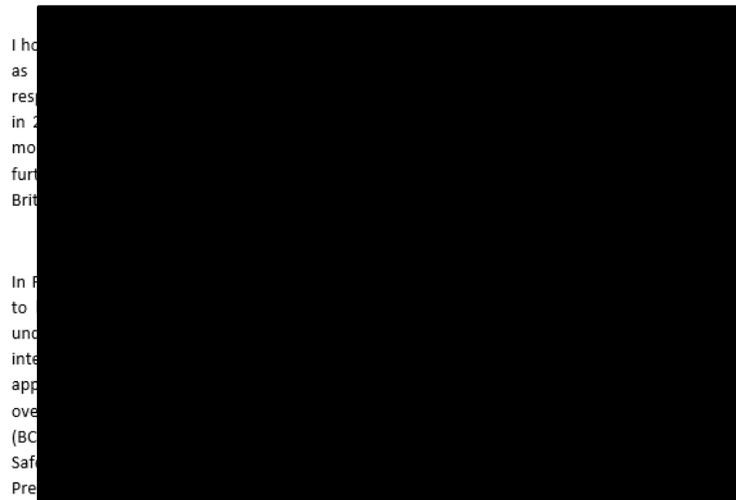


35 **Conflicts of Interest**

None.

**About the author**

40 I, Adam Oates, have been a qualified medical practitioner since 2003, a practising radiologist since 2006 and a Consultant Paediatric Radiologist at Birmingham Children's Hospital since January 2012.



I understand it is my duty as an expert to help the court on matters within my expertise and that this duty overrides any obligation that I may have to the solicitors or their client from whom I have received instructions.

**Executive Summary**

70 On ~~xxxxx~~ Dis ~~xxxxx~~ that she was ~~xxxxx~~ of conscious ~~xxxxx~~ her head, back, abdomen and lower limbs.

75 Subsequent blood tests confirmed severe dehydration with evidence of pre-renal failure. A series ~~xxxxx~~ d scan, abdomen ~~xxxxx~~ the imaging ~~xxxxx~~ of different ages, along with very extensive bilateral skull fractures. In addition, having reviewed the ultrasound images of the abdomen and pelvis, I believe there may be features of an intraabdominal (bowel) injury.

80 By way of potential explanation for the injuries, on 14/xx/20xx ~~xxxxx~~ had been cared for by her father ~~xxxxx~~ it has been ~~xxxxx~~ also impacted ~~xxxxx~~ vomit and by 18/xx/20xx she was drowsy with sunken eyes. At ~~xxxxx~~ on 18/xx/20xx the 85 parents dialled 111 and ~~xxxxx~~ was taken to hospital by ambulance.

The injury ~~xxxxx~~ dary to falling ~~xxxxx~~ of the rib fracture ~~xxxxx~~ reframe associated ~~xxxxx~~ ve the 90 skull fractures are acute.

The report contains a number of radiological images (page 6 to 18) described in chronological order to indicate the pathology such that it may assist the court. A diagrammatic summary of the injuries is indicated on page 19. A conclusion of the report is provided on page 31 and the questions posed in the LOI are addressed from page 32.

95 **Materials Reviewed:**

**Radiological Imaging:**

- Unenhanced head CT (Computerised Tomography scan) dated 18/xx/20xx from xxxxxx District Hospital.
- Abdominal/pelvis Ultrasound dated 18/xx/20xx from xxxxxx District Hospital.
- 100 • Skeletal Survey dated 19/xx/20xx from xxxxxx District Hospital.
- Skeletal Survey dated 29/xx/20xx from xxxxxx District Hospital.

**Other Materials:**

105 In addition, I have reviewed the court bundle including the following documents:

Letter of Instruction.

The court bundle including medical records from xxxxxx District Hospital;

Child Protection Medical Report by Dr xxxx xxxx, Consultant Paediatrician xxxxxx NHS Foundation Trust dated 25/xx/20xx (Not paginated in my bundle)

110 Radiology report of Dr xxx xxxxx, Consultant Paediatric Radiologist of the initial skeletal survey of 19/xx/20xx unpaginated.

First narrative statement of the 2<sup>nd</sup> Respondent Father xxxxxx xxxxxx, dated [REDACTED] unpaginated.

115 Addition narrative statement of the 2<sup>nd</sup> Respondent Father xxxxxx xxxxxx, dated [REDACTED] unpaginated.

Narrative statement of the 1st Respondent Mother xxx [REDACTED], dated [REDACTED] unpaginated.

Response to threshold of 1st Respondent Mother xxxxxx [REDACTED] [REDACTED] unpaginated.

120 Response to threshold of the 2<sup>nd</sup> Respondent Father xxxxxx xxxxxx, undated and unpaginated.

Police Disclosure bundle and associated photograph/diagrammatic representation of bedroom layout at [REDACTED] respectively.

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**Radiology imaging findings:**

Below is a chronological review of selected radiological studies and images to indicate the relevant pathology. The source image quality is diagnostic. This radiology report contains numerous radiological images which have been reviewed on a diagnostic quality, Agfa Pacc  
130 work station before being exported to a PC and then inserted into the report. The reproduced images therefore cannot be considered diagnostic but provide a representation of the pathology seen on the original images. Although the images are black/white they are better reproduced on colour printout, or ideally on a computer monitor.

135 **Unenhanced head CT dated 18/xx/20xx from xxxxxx District Hospital**

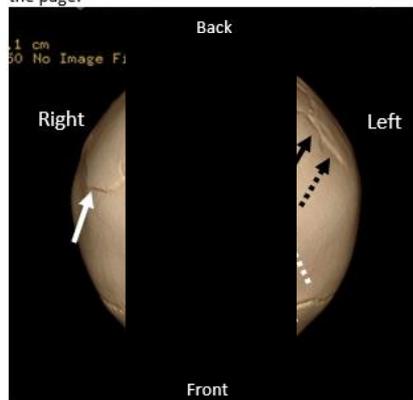
A CT or computerised tomography scan produces a 3 dimensional representation of an anatomical structure based on a computational analysis of x-ray beam attenuation. This revealed;

- No structural brain abnormalities.
- 140 • Right-sided skull fractures;
  - Right parietal [parietal refers to the bone forming the side of the skull] fracture extending from the midpoint of the sagittal suture posteroinferiorly to the right lambdoid suture. [Sutures are bands of fibrous tissue separating the skull bones in a young child and contributes to the inherent skull compliance as is required when negotiating the birth canal].
  - 145 ○ The fracture then extends across the lambdoid suture and through the occipital bone [thick bone forming the back of skull] via a diastase [widened] small accessory suture to the foramen magnum [the large opening at the base of the skull where the brain extends into the spinal cord].
  - 150 ○ There is very minimal associated soft tissue scalp swelling.
  - No associated intracranial haemorrhage.

- 155
- Left-sided skull fractures;
    - Complex left parietal fracture with a depressed and multiple branching components.
    - The fracture margins are ill-defined with tiny associated foci of calcification which appears to traverse the fracture site – this is suggestive of a degree of bone healing (and will be discussed in detail in the “Comments on Imaging” section below).
    - Minimal overlying soft tissue scalp swelling
    - Two further parallel linear lucencies (discontinuities in the bone) extending from the sagittal suture are evident and thought to reflect further fractures.
- 160

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Figure 1a: 3-D volume reformats (to assess the surface of the skull) from the head CT of 18/xx/20xx. The skull is viewed from above with forehead oriented to the lower aspect of the page.



Extensive branching left parietal skull fracture (black arrows). There appears to be a focal depression (dashed black arrow).

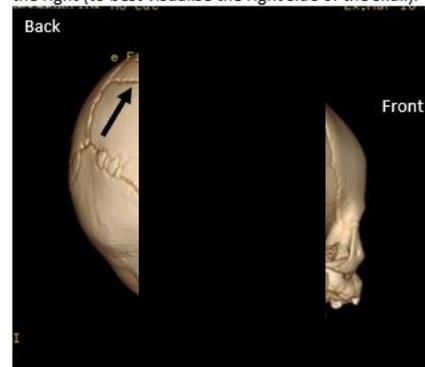
The partially imaged right parietal skull fracture is also demonstrated (white arrows) extending inferiorly from the sagittal suture (SS).

On the left there are 2 further linear lucencies extending inferiorly from the sagittal suture (dashed white arrows).

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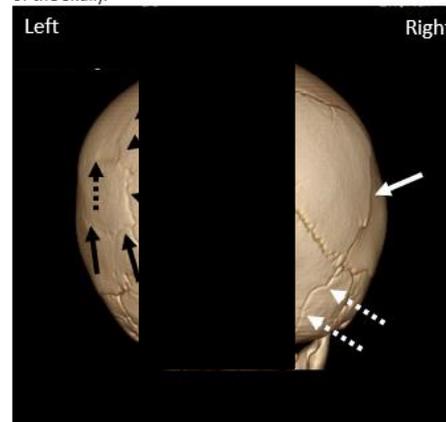
Figure 1b: 3-D volume reformats. The skull is viewed from behind with the head turned to the right (to best visualise the right side of the skull).



Extensive right parietal skull fracture (black arrows) which crosses the lambdoid suture (LS) and continues into the occipital bone (dashed blacked arrows).

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Figure 1c: 3-D volume reformats. The skull is viewed from behind (to best visualise the back of the skull).

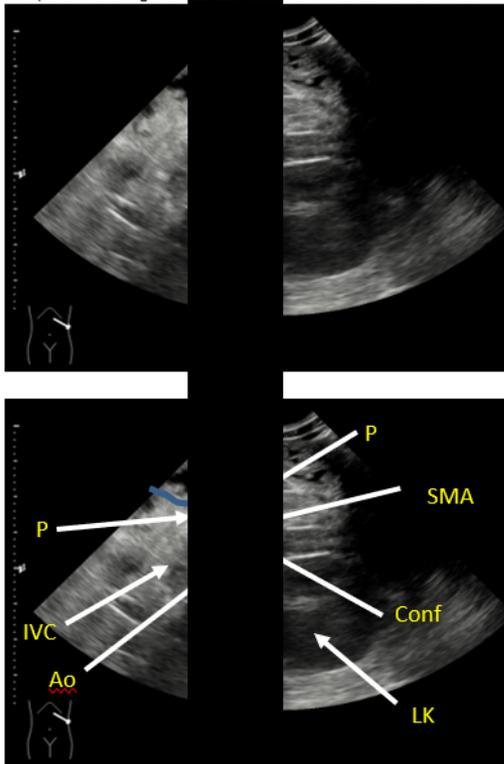


Extensive branching left parietal skull fracture (black arrows). There is a focal depression (dashed black arrow) consistent with a depressed fracture.

The partially imaged right parietal skull fracture is also demonstrated (white arrows) extending inferiorly from the sagittal suture (SS) and into the occipital bone (dashed white arrows).

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Figure 2a: Selected ultrasound image dated 18/xx/20xx. The upper panel is not annotated. The lower panel indicating the same image but is annotated for reference.



Transverse image through the upper abdomen immediately to the left of the midline.  
The possible haematoma is delineated by the blue line.  
Anatomical landmarks;  
Aorta (Ao)  
Superior mesenteric artery (SMA)  
Confluence of superior mesenteric vein and splenic vein (Conf)  
Inferior vena cava (IVC)  
Vertebral body acoustic shadow (VB)  
Pancreas (P)  
Left kidney (LK).

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255 **A skeletal survey was performed on 19/xx/20xx from Yxxxxx District Hospital.**

A standard aspect of a paediatric safeguarding imaging protocol is a skeletal survey which is a radiological assessment of all the bones in the body to assess for occult injuries (i.e. injuries that may not be apparent on clinical examination). In addition, national protocol dictates that a total of 3 views of the chest are performed to increase the sensitivity of detection of subtle, acute fractures.

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- The bone density and morphology is within normal limits and there is no radiological evidence of a predisposition to fracturing.
- Multiple bilateral rib fractures;

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- R
- R
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- L
- L

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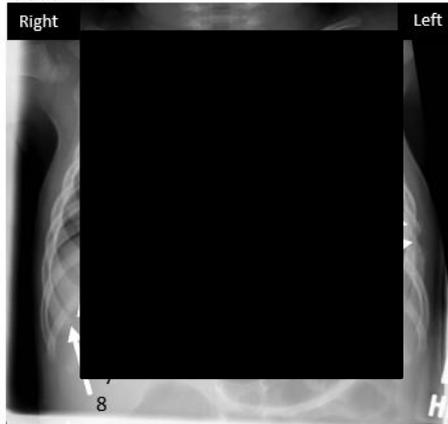
- The ribs create an “arc-shaped” structure as they form the chest wall.
- Posteriorly is at the back of the arc.
- Laterally is at the side or midpoint of the arc.
- Anteriorly is at the front of the arc.
- Costochondral junction reflects the extreme anterior aspect of the rib.

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- Bifid left 5<sup>th</sup> rib (normal variant)
- Suspected further fracture to the right distal tibia diaphysis (towards the end of the bone shaft).
  - Slight angulation of the bone with associated periosteal thickening tracking along the shaft.

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285 Figure 3a: Frontal chest radiograph from the skeletal survey series of radiographs from 19/xx/20xx.



Numerous rib fractures are evident as indicated by the white arrows. The number indicates the respective rib.

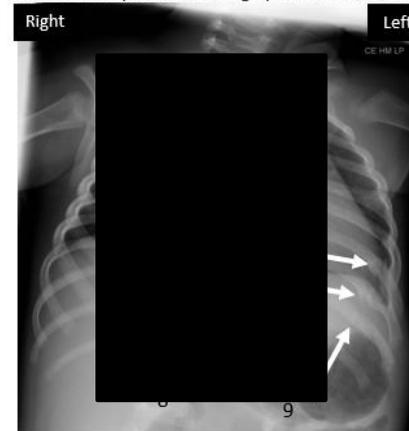
Figure 3b Right oblique chest radiograph (to best visualise the right-sided ribs) from the skeletal survey series of radiographs from 19/xx/20xx.



Numerous rib fractures are evident as indicated by the white arrows. The number indicates the respective rib.

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Figure 3c: Left oblique chest radiograph (to best visualise the left-sided ribs) from the skeletal survey series of radiographs from 19/xx/20xx.



Numerous rib fractures are evident as indicated by the white arrows. The number indicates the respective rib.

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Figure 3d: Abdominal/pelvis radiograph from the skeletal survey series of radiographs from 19/xx/20xx.

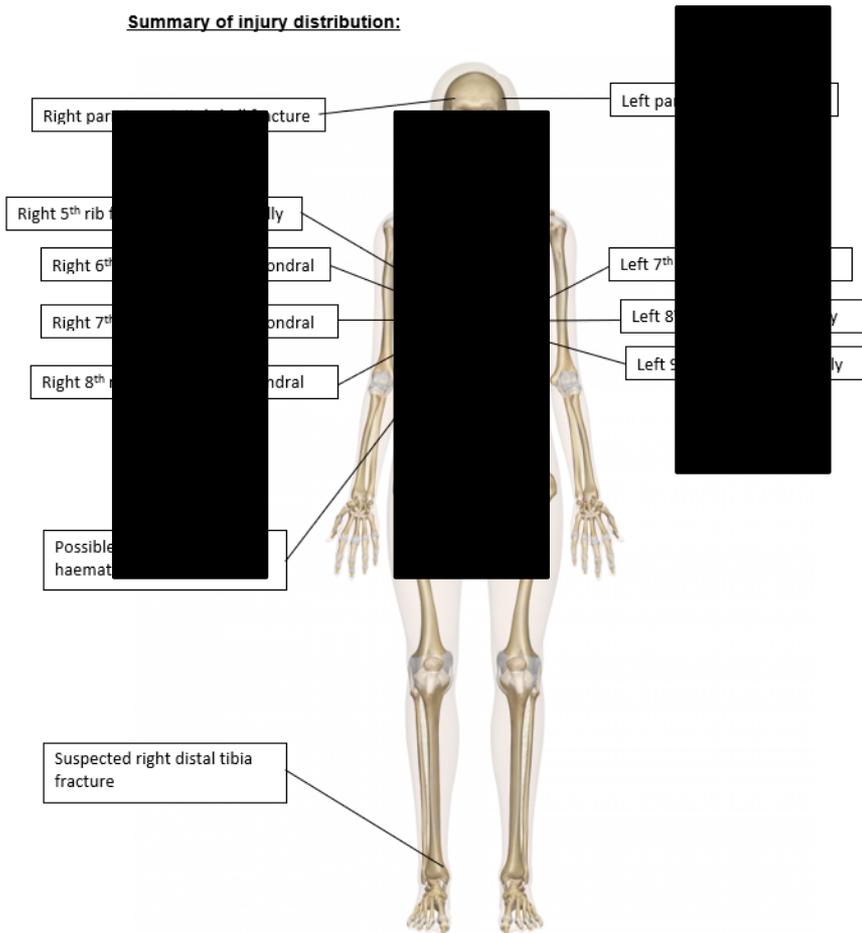


It is difficult to reliably assess the bowel wall on an x-ray radiograph however I agree with the local team that there is likely bowel wall thickening (white arrows) and abnormal separation of bowel loops.

Bowel wall thickening is a non-specific finding but can be seen in inflammation including trauma to the bowel.

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**Summary of injury distribution:**



**Comments on Imaging**

**Skull fractures in the accidental and abusive settings**

The infant skull consists of a number of bones separated by the fibrous sutures that contribute to the inherent compliance of an infant's skull. The fibrous sutures intersect at the fontanelles which are the palpable soft spots of an infant's skull.

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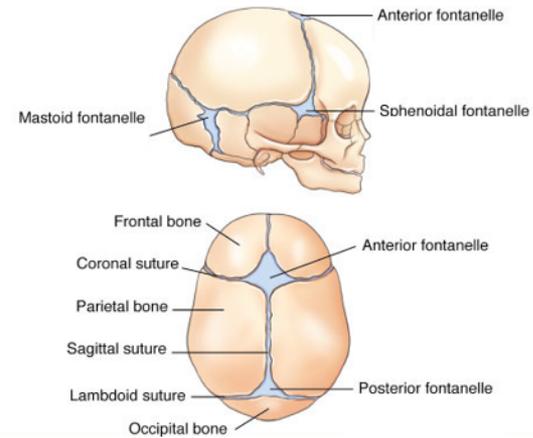


Figure 6: Schematic diagram indicating the anatomy of the sutures of the skull in an infant.

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Skull fractures can occur in both the accidental and non-accidental settings. Based on imaging alone it may not always be possible to differentiate between these two aetiologies but rather it is a matter of correlating the described presenting history with the severity of injury (both clinically and radiologically).

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The majority of accidental head injuries are due to impact and result in no injury or just a bruise or bump. Less commonly there may be a skull fracture but the skull is a non-weight-bearing structure and does not fracture spontaneously.



Occasionally a child can suffer from an underlying rare genetic condition which can predispose to fractures. One such condition is Osteogenesis Imperfecta (OI) which has been described as brittle bone disease. OI is a rare genetic disorder which is diagnosed on clinical (e.g. family history, blue sclera) and radiological features but can require confirmatory genetic testing for mutations in type IA collagen. Key radiological features of OI include;

- Osteopenia (bones of reduced density)
- Slender ribs
- Bowing of the femora
- Wormian bones (intra-sutural bones)
- Dense metaphyseal bands

xxxxxx, does not have any of these radiological features.

**Correlation with presenting history/carers described causative events:**

Ultimately it is essential in any safeguarding evaluation to correlate the injuries seen with the proposed mechanism as given by carers and I note the description of xxxxxx falling off a bed on 14/xx/20xx (as described at point 52 of Mr xxxxxx's Statement dated 22/05/2019);

52. Shortly after this front room holding and said she had table and the floor to be consoled. xxxxxx was calm again xxxxxx's cries and shouting, being

I note the height of the bed is described as 50 cm in the Police Disclosure bundle and I have reviewed the associated photograph and diagrammatic representation of the bed/bedside table layout (at A127 and A144, respectively). While it is very unlikely (but theoretically possible - based on the published literature) that a skull fracture could occur from a fall

height of the bed with falling off a bed with skull fractures. More than one edge/corner of the bedside table could fall height/impact. In addition, producing the skull fracture. Skull fractures are unlikely to occur.

In regard to the possibility that falling off a bed is a possibility, other than perhaps with a traumatic event.

Finally, it is theoretically possible, but unlikely in my opinion that the fracture occurred on 14/xx/20xx.

I am aware of the severity and wide distribution of the injuries.

650 **Report conclusion**

- The image quality is diagnostic.
- No underlying medical condition is evident radiologically that would predispose to fracturing.
- Multiple bilateral rib fractures occurring on at least 2 separate occasions.
- Extensive bilateral parietal skull fractures with a depressed component on the left and extension into the occipital bone on the right.
- Suspected right tibia fracture.
- Possible intraabdominal injury.
- I understand there is also a description of widespread bruising although I defer to the expert paediatrician to further evaluate.
- I believe it is highly improbable that the extent of the injuries would be sustained secondary to falling off a bed - even if ~~xxxxxx~~'s head impacted with an adjacent bed-side table prior to impacting the floor.
- The constellation of injuries is very severe and unless there is an as yet undisclosed description of at least two episodes of significant accidental trauma I believe the injuries are inflicted in nature and occurring on more than on occasion.

675 **Schedule of Questions as per Letter of Instruction.**

**Your instructions**

Please review the court papers, scans, x-rays, child's medical records and answer the following questions:

680 1. In Relation to the Skull Fracture

- 685 1.1 Please identify and explain the cranial injuries suffered by ~~xxxxxx~~  
This is described in the main body of the report and summarised at page 31 but briefly very extensive bilateral skull fractures.
- 690 1.2 Please identify all possible mechanisms for each of the injuries you identify addressing the likelihood of each possibility and those you include or exclude, explaining your reasons.  
This is described in detail in the main body of the report but the injuries are most likely secondary to two discrete forceful impacts to the head. The left parietal fracture has a localised depressed area suggesting that there has been a very significant impact with a relatively, focused narrow structure such as a corner of a piece of furniture.
- 695 1.3 Please comment, so far as you are able, on the degree of force necessary to cause all or any of the injuries identified  
The skull is a non-weight-bearing structure and does not fracture spontaneously. It is not possible to experimentally quantitate the level force to produce skull fractures but it is likely to be significant and certainly greater than occurs in everyday activities in a child of 6 months. In the case of ~~xxxxxx~~ the skull fractures are very severe and I certainly do not believe that the constellation of fractures would occur secondary to falling from a bed - even if the head impacted with a bedside table prior to hitting the floor.
- 700 1.4 Please indicate the possible time frame for each injury identified, again explaining your reasons.  
There is no published established timetable for skull fracture healing however in the case of ~~xxxxxx~~ on the head CT there is only very minimal soft tissue scalp swelling associated with either the left or right -sided fractures and in my experience this is very unusual if a fracture is acute (particularly given the very extensive nature of the skull fractures and therefore one would anticipate a large volume of scalp swelling/bleeding). In addition, the small fragments of calcified material (bone-like) adjacent to, and traversing the left parietal fracture site, are very unusual in an acute skull fracture and I believe are suggestive that

**References**

800 Anholz, et al. Bilateral Pediatric Skull Fractures: Accident or Abuse? The Journal of Trauma: Injury, Infection, and Critical Care (1998). 45: 172-174

Barber *et al.*, The yield of high-detail radiographic skeletal surveys in suspected infant abuse (2015) *Pediatr Radiol* 45:69–80

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Dwek. The Radiographic Approach to Child Abuse. (2011). *MD Clin Orthop Relat Res* 469:776–789

Dubajme et al. Crush injuries to the head in children. *ACNeurosurgery*, (1995). 7: 401-6.

810 Kemp *et al.*, Neuroimaging: what neuroradiological features distinguish abusive from non-abusive head trauma? A systematic review *Arch Dis Child* (2011) 96:1103-12.

815 Prosser *et al.*, A Timetable for the Radiologic Features of Fracture Healing in Young Children, *American Journal of Roentology* (2012) 198:1014–1020

820 Thomas *et al.*, Patterns of accidental craniocerebral injury occurring in early childhood. *Arch Dis Child* (2013) 98:787-792.

Vinchon *et al.*, Confessed abuse versus witnessed accidents in infants: comparison of clinical, radiological, and ophthalmological data in corroborated cases (2010). *Childs Nerv Syst* 26: 637-45.

**Statement of compliance**

I understand that my overriding duty is to the court, both in preparing reports and in giving oral evidence. I have complied and will continue to comply with that duty.

830 I have set out in my report what I understand from those instructing me to be the questions in respect of which my opinion as an expert is required.

I have done my best, in preparing this report, to be accurate and complete. I have mentioned all matters that I regard as relevant to the opinions I have expressed. All of the matters on which I have expressed an opinion lie within my field of expertise.

835 I have drawn to the attention of the court all matters, of which I am aware, which might adversely affect my opinion.

Wherever I have no personal knowledge, I have indicated the source of factual information.

I have not included anything in this report which has been suggested to me by anyone, including the lawyers instructing me, without forming my own independent view of the matter.

840 Where, in my view, there is a range of reasonable opinion, I have indicated the extent of that range in the report.

At the time of signing the report I consider it to be complete and accurate. I will notify those instructing me if, for any reason, I subsequently consider that the report requires any correction or qualification.

845 I understand that this report will be the evidence that I will give under oath, subject to any correction or qualification I may make before swearing to its veracity.

I have attached to this report a statement setting out the substance of all facts and instructions given to me that are material to the opinions expressed in this report or upon which those opinions are based.

**Statement of truth**

850 I confirm that insofar as the facts stated in my report are within my own knowledge I have made clear which they are and I believe them to be true, and the opinions I have expressed represent my true and complete professional opinion.

Dr Adam Oates



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# Conclusions

- ⦿ Frustrating
- ⦿ Time-consuming
- ⦿ Stressful
  
- ⦿ Hugely rewarding
- ⦿ Intellectually challenging
- ⦿ Insight into other peoples lives
- ⦿ £