WHAT PRESENTATIONS TRIGGER CHILD PROTECTION INVESTIGATIONS WITH SKELETAL SURVEYS?

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Aims Royal College of Radiologists (RCR) (2018) published guidelines that senior clinicians who suspect a child has been subjected to physical abuse, request a skeletal survey in all children under two years old and computed tomography (CT) head scan if under one.1 All require a follow-up skeletal survey (FUSS) within 11 to 14 days, and no later than 28 days. In addition to imaging for specific presentations, we audited clinical presentations triggering child protection investigations and imaging performed to see if local procedures adhere to national guidance.2 Positive investigations were scrutinised for further occult injuries.

Methods Data was collected over a 20 month period (September 2019 to April 2021). Patients were identified from our Radiology database and audited against national guidance. Data on demographics, clinical presentation, skeletal survey, CT-head or MRI head, the rate of injury detection and if further injuries were identified at FUSS.

Results In 20 months, 29 children had primary skeletal surveys performed. All of the cases were seen by a consultant in keeping with RCR guidance.1 28 (97%) were under 2 years old, 16 (55%) under 1 years old.

10 (34%) initial skeletal surveys showed a fracture or metallic foreign body, 5 (17%) which were additional to the presentation.

18 (62%) patients had neuroimaging, 15 CT-heads and 3 MRI head. 12 (75%) of the children < 1 year had a CT-head, 3 (19%) an MRI and 1 (6%) no neuroimaging.

5 (27%) of neuroimaging showed additional injuries (bleed or fracture).

16 children presenting with bruising (table 1), 6 (38%) had other injuries on initial imaging, 3 had additional fractures, 1 a metallic foreign body at a different site and 2 intracranial bleeds.

5 children did not attend their FUSS, 2 cases were closed prior, 1 relocated by social care and 1 child investigation was ongoing. 1 child the reason for non-attendance was not established. 2 (8%) of 24 FUSS identified new fractures. 1 additional fracture after positive initial skeletal survey and 1 after a negative initial skeletal survey.

Conclusion Bruising was the commonest indication for skeletal survey. 34% of initial surveys confirmed injury with 17% showing additional injuries. 16 children presented with bruising 6 (38%) had evidence of additional injuries (fractures or foreign bodies) on further imaging. Neuroimaging showed additional injuries in 27%, supporting current guidelines, consistent with Lindberg, who found 18% of skeletal surveys had at least one new fracture.2

FUSS was achieved in a majority however 1 child the reason for non-attendance was not clear demonstrating the importance of local procedures and re-auditing to ensure 100% compliance.

8% of our follow up skeletal surveys demonstrated new injuries which may have evidential and safety implications, this is similar to Harper et al who found rates of new fractures identified on FUSS ranged from 8% to 28%.3

REFERENCES
1. The Radiological Investigation of Suspected Physical Abuse in Children, RCR, 2018
2. Yield of skeletal survey by age in children referred to abuse specialists Lindberg et al, 2014

Abstract 1068 Table 1

<table>
<thead>
<tr>
<th>Presentation</th>
<th>Number of cases</th>
<th>%</th>
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</thead>
<tbody>
<tr>
<td>Bruising</td>
<td>16</td>
<td>55</td>
</tr>
<tr>
<td>Bone swelling or fractures</td>
<td>8</td>
<td>28</td>
</tr>
<tr>
<td>Head injury</td>
<td>3</td>
<td>10</td>
</tr>
<tr>
<td>Apnoeic episodes</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>Radiological findings on MRI scan</td>
<td>1</td>
<td>3</td>
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TIME FOR A CHANGE? A PRAGMATIC APPROACH TO INVESTIGATING NON-ACCIDENTAL INJURIES COULD POTENTIALLY SAVE SIGNIFICANT AMOUNTS OF MONEY IN A CASH-STRAPPED NHS

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Aims Distinguishing unintentional from non-accidental injuries (NAI) can be challenging, necessitating the clinical acumen of experienced clinicians to offer opinions to the probabilities of abuse. National guidelines on haematological investigations exist to aid the interrogation of these cases.1 However, little is said about the costs associated with extensive workups which could be financially detrimental to an already struggling healthcare system. In addition to evaluating quality adherence to existing guidelines, we aim to assess if current recommendations are valuable in reaching meaningful conclusions in the context of NAI and identifying haematological disorders at first presentation.

Methods This re-audit studied all children under the age of 16 who required haematological investigations as part of the Child Protection workup from October 2020 till November 2021. Children who were not suspected for NAI or haematological disorders were excluded.

Results All 35 boys and 21 girls were referred for suspected NAI (n=56). The distributions by age were <1 month (0), 1-6 months (8), 6-24 months (23), and 24 months (25). 100% of patients adhered fully to the recommended first-line investigations. Extended coagulation profiles (Factors VIIIc, XIII and Von Willebrand factor) were performed at a neighbouring Trust, taking a mean of 13 days to obtain the results. The commonest abnormal result was Von Willebrand factor (23.2%), which also makes the commonest indication for haematology referrals. Out of 12 total cases, 2 were discussed locally and 10 were referred to the tertiary paediatric haematologist, whereby the latter required an average of 36 days till an outcome. None were eventually deemed to be Von Willebrand Disease and only one case was concluded to be NAI. Table 1 highlights the frequencies of false abnormal results from repeat testing. Sourcing previous years’ national reference costs,2 the estimated expenses for all first-line investigations excluding repeat tests were >£50.
Conclusion This reaudit has demonstrated substantial local improvement in adherence to the national guidelines, following the implementation of a WebICe NAI Panel of Investigations as recommended during the first cycle. There were tendencies to depend on tertiary services for processing laboratory results and obtaining paediatric haematology input, inevitably prolonging wait times. Local services, particularly haematology should be the initial point of contact for discussing cases. None of the children were eventually found to have bleeding disorders. Coupled with the substantial degree of false abnormal rates in repeat testing, this raises two serious questions – are these reliable screening tests, and has practice moved into heavy reliance on laboratory investigations as compared to clinical acumen? We infer that most abnormal results were attributed to the ‘acute phase’ during initial presentation, hence it is vital to repeat any abnormal result prior to commencing treatments. In a movement to maximize cost-efficiencies within the NHS, our recommendations remain two-fold; we urge the College to revisit its current guidance specifically on revising first-line haematological investigations, and district general hospitals to optimize the use of local resources.

REFERENCES
5. Royal College of Radiologists, 2018.

Abstract 1053 Table 1
Proportion of infants sedated during imaging

<table>
<thead>
<tr>
<th>Radiological investigation</th>
<th>Total infants imaged</th>
<th>Proportion of infants sedated</th>
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</thead>
<tbody>
<tr>
<td>Skeletal survey</td>
<td>27</td>
<td>33% (9/27)</td>
</tr>
<tr>
<td>Cranial imaging (CT head)</td>
<td>20</td>
<td>20% (5/20)</td>
</tr>
</tbody>
</table>

Abstract 1053 Table 2
Qualitative assessment of sedation success by dose of chloral hydrate

<table>
<thead>
<tr>
<th>Dose of chloral hydrate</th>
<th>Successful sedation</th>
<th>Partially successful sedation</th>
<th>Unsuccessful sedation</th>
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<tbody>
<tr>
<td>30-100 mg/kg</td>
<td>2</td>
<td>2</td>
<td>-</td>
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<tr>
<td>50-90 mg/kg</td>
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<td>1</td>
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</tr>
<tr>
<td>50-50 mg/kg</td>
<td>-</td>
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</table>

Conclusion There is little published literature to guide clinicians prescribing pharmacological sedatives for routine skeletal survey or CT head. Pharmacological sedation was required for one fifth of infants undergoing CT head and one third of infants undergoing skeletal survey, despite provision of appropriate distraction by paediatric specialists. Clinicians could be aided by larger published datasets and regular local audit to allow optimisation of initial dosage.

REFERENCES
5. Royal College of Radiologists, 2018.