NATIONAL INSTITUTE FOR HEALTH AND CLINICAL EXCELLENCE

Centre for Clinical Practice

Review consultation document

Review of Clinical Guideline (CG89) – When to suspect child maltreatment

Background information

Guideline issue date: 2009

3 year review: 2012 (first review)

National Collaborating Centre: National Collaborating Centre for Women's and Children's Health

1. Consideration of the evidence

Literature search

From a systematic literature search, new evidence was identified that related to the following clinical areas within the guideline:

- Physical features
    - Injuries
        - Bruises
        - Burns
        - Eye trauma
        - Fractures
        - Intracranial injuries
        - Oral injury

        - Spinal injuries
        - Visceral injuries
    - Anogenital symptoms, signs and infections
- Clinical presentations
    - Apparent life-threatening events
    - Attendance at medical services
- Emotional, behavioural and interpersonal/social functioning
- Parent–child interactions

Through this stage of the process, a sufficient number of studies (n=82) relevant to the above clinical areas were identified from the literature search to allow an assessment for a proposed review decision and are summarised in table 1 below.

The majority of studies identified were observational in nature. It was not always possible from the abstract to differentiate the exact study type. It was not always clear if the children in the studies were determined to have been abused or suspected to have been abused. In addition, other alerting features and outcomes may have been reported in the full text of the publication.

No additional clinical area was identified from initial intelligence gathering, qualitative feedback from other NICE departments and the views expressed by the Guideline Development Group that required further focused literature searches.

All references identified through the literature search and initial intelligence gathering can be viewed in Appendix 1.

Table 1. Summary of articles from the literature search

Clinical area 1: Physical features		
Clinical question	**Summary of evidence**	**Relevance to guideline recommendations**
Related clinical questions from the guideline When is feature X a reason to suspect child maltreatment? Features that may be in X - • Bruises • Thermal injuries • Fractures • Intracranial injuries • Eye trauma • Spinal injuries • Visceral injuries • Oral injury	Through an assessment of the abstracts from the literature search 47 studies relevant to the clinical question were identified. **Bruises (3 studies)** CG89 recommends that child maltreatment should be suspected if the following alerting features are observed: • Bruising in the shape of a hand, ligature, stick, teeth mark, grip or an implement. • Bruising or petechiae (tiny red or purple spots) not caused by a medical condition (for example, a coagulation disorder), with an unsuitable explanation, including those: • in a child who is not independently mobile	No new evidence was identified which would invalidate current guideline recommendations.

• Genital and anal symptoms/genital and anal signs • Sexually transmitted infections **Relevant section of guideline and recommendations** **4.1, 4.2.**	• that are multiple or in clusters • of similar shape and size • on non-bony parts of the face or body, including the eyes, ears and buttocks • on the neck that look like attempted strangulation • on the ankles and wrists that look like ligature marks. Three studies (one case control and two retrospective chart reviews) were identified that addressed this area of the guideline. The abstracts from these studies either supported the recommendations on bruises[1, 2] or provided no new physical feature that would contradict or change the current recommendations in this area[3]. **Burns (1 study)** CG89 recommends that for thermal injuries child maltreatment should be suspected if a child has a burn or scald: • if the explanation is absent or unsuitable • if the child is not independently mobile	

	• on soft tissue areas not expected to accidentally come into contact with a hot object (for example, backs of hands, soles of feet, buttocks, back) • in the shape of an implement (for example, cigarette or iron) • that indicates forced immersion (for example, scalds to buttocks, perineum and lower limbs, to limbs in a glove, stocking or symmetrical distribution or with sharply delineated borders One retrospective chart review which included a description on the distribution of burns resulting from abuse which were consistent with current recommendations in this area was identified[4]. Hence, no evidence that would change current recommendations within CG89 was identified. **Eye trauma (5 studies)** CG89 recommends suspecting child maltreatment if a child has retinal haemorrhages or injury to the eye in the absence of major confirmed accidental trauma or medical explanation, including birth-related causes.	

	The literature search identified 1 systematic review, 1 prospective study, 1 retrospective cross-sectional study and 2 retrospective reviews that investigated retinal haemorrhages[5, 6,7,8,9]. The abstracts from these studies provided evidence that supported the current recommendations. **Fractures (16 studies)** CG89 recommends to suspect child maltreatment if a child has 1 or more fractures and there is no medical condition that predisposes to fragile bones (for example, osteogenesis imperfect (OI) or osteopenia of prematurity), or if the explanation is absent or unsuitable, including: • fractures of different ages • X-ray evidence of occult fractures (for example, rib fractures in infants). In addition a research recommendation to investigate how abusive fractures can be differentiated from those resulting from conditions that lead to bone fragility and those resulting from accidents, particularly in relation to metaphyseal fractures, was made within CG89.	

	Sixteen studies (2 systematic reviews[10,11], 1 prospective study[12], 1 cross-sectional study[13], 2 retrospective comparative studies[14,15], 3 retrospective case series[16,17,18] and 7 retrospective chart reviews[19,20,21,22,23,24,25]) were identified in relation to this section of the guideline. The abstracts from 10 studies provided evidence that supported either the recommendations or the evidence already detailed in the clinical guideline in the following areas: fractures of different ages, child age younger than 18 months, fracture patterns and an unclear medical explanation or history for the fracture[10,11,19,20, 21,22,23 ,24,25]. In addition, 6 studies that related to the research recommendation were identified. 4 studies investigated bone fragility resulting from medical conditions: • three studies focused on OI, with 2 retrospective reviews [21,24] detailing the experience of families with children with OI misdiagnosed as child abuse and 1 systematic review[11] which sought to determine specific features that could differentiate OI from child maltreatment. The abstract from this review concluded that it is difficult to differentiate bone diseases from child maltreatment due to	

	ambiguity in the history and physical examination at the time of presentation. • one cross-sectional study on vitamin D insufficiency indicated that this was not associated with multiple fractures or diagnosis of child abuse[13]. These studies do not currently provide evidence to suggest clear alerting features as sought by the research recommendation. Two retrospective studies that have investigated metaphyseal fractures as indicators of abuse were identified[18,25]: • One small case series compared children at different risks of abuse in a selected population of children all under 1 year with a complete metaphyseal fracture of the distal femur[18]. The findings of the study indicated that a classic metaphyseal lesion was an indicator of infant abuse. This supports the evidence from 2 studies already detailed within CG89 that femoral metaphyseal fractures are more common among abused infants. • The second study also assessed children less than 1 year and compared the prevalence of the classic metaphyseal lesion in infants at low and high risk for abuse[25]. A classic metaphyseal lesion was reported to be an indicator of infant abuse. Whilst this study provides new evidence on metaphyseal fractures it	

	appears from the abstract that the children's status with regards to abuse was not determined. It would be pertinent to wait for further evidence, particularly on the applicability to other age ranges of children and different bones of this altering feature, before updating this area of the guideline. This area will be considered in the future reviews of this guideline. **Intracranial injuries (10 studies)** CG89 recommends to suspect child maltreatment if a child has an intracranial injury in absence of major confirmed accidental trauma or known medical cause in one or more of the following circumstances: • there is an absent or unsuitable explanation • the child is aged under 3 years • there are also other inflicted injuries, retinal haemorrhages, or rib or long bone fractures • there are multiple subdural haemorrhages with or without subarachnoid	

	haemorrhage with or without hypoxic ischaemic damage to the brain. Three systematic reviews[26,27,28], 1 case control study[29], 1 retrospective comparative study[30], 3 retrospective case series[31,32,33] and 2 retrospective chart reviews[34,35] were identified in the literature search that addressed intracranial injuries and child maltreatment. One of the systematic reviews formed the basis of the evidence detailed in CG89 and was published post CG89[26]. The results presented in the abstracts of these studies were in line with the evidence and recommendations presented in CG89. This included evidence in relation to children with abusive head trauma being significantly younger than patients with non-abusive head trauma, their neurologic symptoms and the presence of subdural and retinal hemorrhage. In addition a systematic review on neurological features diagnosed by CT or MRI that differentiate abusive head trauma from non-abusive head trauma indicated that multiple, interhemispheric, convexity and posterior fossa haemorrhages and cerebral oedema were associated with abusive head trauma. This new evidence does not contradict the current recommendations. **Oral injury (2 studies)**	

	The recommendation for CG89 recommends considering child maltreatment if a child has an oral injury and the explanation is absent or unsuitable. The results of a retrospective observational case series and a retrospective cross-sectional study support the current recommendation for oral injuries[36, 37]. **Spinal (2 studies)** The recommendations in CG89 for children who present with spinal injuries (injury to vertebrae or within the spinal canal) in the absence of major confirmed accidental trauma state to suspect physical abuse. The spinal injury may present as: • a finding on skeletal survey or magnetic resonance imaging • cervical injury in association with inflicted head injury • thoracolumbar injury in association with focal neurology or unexplained kyphosis (curvature or deformity of the spine). The literature search identified 2 studies, a systematic review and a retrospective case series[38, 39]. Both of the abstracts from these studies supported the evidence detailed in CG89 that spinal injuries are often associated with intracranial injuries in children with non-accidental head injury**.**	

	Visceral Injuries (1 study) The recommendations for children presenting with intra-abdominal or intra-thoracic injury was to suspect child maltreatment if there is no major confirmed accidental trauma, with an absent or unsuitable explanation, or with a delay in presentation. One retrospective study was identified which supported the recommendation that abdominal injuries in abused children present in a pattern similar to that of children with accidental abdominal trauma[40]. **Anogenital symptoms, signs and infections (7 studies)** Numerous recommendations were made in CG89 detailing the many alerting features and sexually transmitted infections that should prompt a healthcare provider to consider or suspect sexual abuse. **Symptoms (1 study)** A case control study was identified which found that lower urinary tract symptoms	

	were not significantly associated with children that were exposed to sexual abuse[41]. This finding is in line with CG89 as there are no current recommendations that relate to lower urinary tract symptoms as an alerting feature. **Genital and anal signs (3 studies)** One systematic review, and 1 retrospective case series found evidence that was in line with CG89 on hymenal findings and vaginal discharge in girls presenting for non-acute, sexual assault[42,43]. In addition 1 retrospective case series reported that timing of examination after the alleged incident affected the rate of anogenital injury reporting as previously noted in the guideline[44]. The studies identified by the literature search support the evidence and recommendations in CG89 that state healthcare providers should: • Suspect sexual abuse if a girl or boy has a genital, anal or perianal injury (as evidenced by bruising, laceration, swelling or abrasion) and the explanation is absent or unsuitable. • Consider sexual abuse if a girl or boy has a genital or anal symptom (for example, bleeding or discharge) without a medical explanation.	

	Infections (3 studies) Numerous recommendations were made in CG89 on sexually transmitted infections. The literature search identified 3 studies in children under 13 years with either confirmed or suspected child sexual abuse (2 cross sectional surveys and a retrospective case series) that have investigated sexually transmitted infections[45,46,47]. Two studies investigated infections covered within CG89 (Neisseria gonorrhoea, Chlamydia trachomatis, Trichomonas vaginalis, Treponema pallidum, HIV, and herpes simplex virus type 2) and provide supporting evidence for the recommendations to suspect sexual abuse if a child younger than 13 years has any of these infections unless there is clear evidence of mother-to-child transmission during birth or blood contamination[45,47]. The third study compared human papillomavirus (HPV) infection in children without previous consensual sexual activity, and found that HPV prevalence was associated with child sexual abuse, age and anogenital warts[46]. CG89 recommends that healthcare providers should consider sexual abuse if a child younger than 13 years has anogenital warts unless there is clear evidence of mother-to-child transmission during birth or non-sexual transmission from a member of the household. This study may in part answer a research recommendation made within CG89 to investigate the	

	association between anogenital warts and sexual abuse in children of different ages.	
Clinical area 2: Clinical presentations		
Clinical question	**Summary of evidence**	**Relevance to guideline recommendations**
Related clinical questions from the guideline When is feature X a reason to suspect child maltreatment? Features that may be in X - • Repeated attendance at medical services • Apparent life threatening event **Relevant section**	Through an assessment of the abstracts from the literature search 4 studies relevant to the clinical question were identified. **Apparent life-threatening events (ALTE) (3 studies)** The literature search identified 3 studies that had examined ALTE in relation to child maltreatment:: • A retrospective study of infants admitted for an apparent life-threatening event indicated that abusive head trauma is in the differential diagnosis for infants with an ALTE [48]. • A prospective cohort study indicated that the subsequent mortality rate for children who present with an ALTE is low, but child abuse was one of the	No new evidence was identified which would invalidate current guideline recommendations.

of guideline and recommendations 5.1, 5.3, 5.6	identifiable causes of death[49]. • A prospective study indicated that ALTE events alone are unlikely to cause retinal haemorrhages in children younger than 2 years[50]**.** These studies support the current evidence and recommendations on ALTE and intracranial injuries within CG89. Recommendations on ALTE that state the health care provider should suspect child maltreatment if a child has repeated ALTEs, the onset is witnessed only by one parent or carer and a medical explanation has not been identified. **Attendance at medical services (1 study)** A systematic review (republished) was identified that considered repeated healthcare use, age and injury type as a sign of maltreatment in injured children attending emergency departments[51]. The orginal review was included in CG89. No new evidence was identified that would change the recommendation within CG89 (which was derived from one other study and the clinical opinion of the GDG by Delphi consensus) that healthcare providers should : • Consider child maltreatment if there is an unusual pattern of presentation to and contact with healthcare providers, or there are frequent presentations or reports	

	of injuries.	
Clinical area 3: Emotional, behavioural and interpersonal/social functioning		
Clinical question	**Summary of evidence**	**Relevance to guideline recommendations**
Related clinical questions from the guideline When is feature X a reason to suspect child maltreatment? Features that may be in X – • Emotional and behavioural states • Self-harm • Abdominal pain • Disturbances in eating and feeding	Through an assessment of the abstracts from the literature search 27 studies relevant to the clinical question were identified. All forms of maltreatment have the potential to comprise a child's emotional, behavioural and interpersonal development. Many of the abstracts retrieved do not state the type of maltreatment or setting. In addition it is not always possible from the abstract to accurately determine the study type. **Emotional and behavioural states (21 studies)** CG89 makes a series of recommendations on which features to consider when considering maltreatment with regard to a child's emotional and behavioural state. In general the alerting features that should prompt a healthcare provider to consider child maltreatment include any behaviour or emotional state in a child if it is inconsistent with	No new evidence was identified which would invalidate current guideline recommendations.

behaviour • Selective mutism (elective mutism) • Head-banging and body rocking • Wetting and soiling • Sexualised behaviour • Runaway behaviour • Dissociation **Relevant section of guideline recommendations** **7.1, 7.2**	their age and developmental stage where there is no medical explanation or other stressful situation unrelated to maltreatment. The literature search identified 21 observational studies that related to this section of the guideline: • A retrospective observational study indicated that maltreatment was an indicator of developmental delay in infants and toddlers[52]. • The results of a study suggested that both physical abuse and neglect are associated with diminished cognitive flexibility in adolescents[53]. • A study reported that children who had reported dissociative symptoms upon disclosure of child sexual abuse were at an increased risk of developing attention problems[54]. • One study found that exposure to physical and emotional abuse and neglect were associated with relative deficits in at least one neurocognitive function[55]. • Trauma symptoms were found to mediate the association between maltreatment and internalizing and externalizing behaviours in preschool children in a case control study[56]. • Three comparative studies indicated exposure to interpersonal violence, childhood verbal abuse, and maltreatment with a negative self-schema were	

	associated with dissociation in children who had been maltreated[57,58,59]. • In addition child maltreatment (including both sexual and physical abuse) was determined to be associated with a range of mood, substance abuse, metal health and personality disorders in 13 observational studies[60,61,62,63,64,65,66,67,68,69,70,71,72]. The assessment of these abstracts corroborates the evidence detailed within CG89 and supports the recommendations made with regard to emotional and behavioural states exhibited in a child or young person and when to consider maltreatment. **Behaviour disorders or abnormalities either seen or heard about (6 studies)** **Self harm (1 study)** An observational comparative study in adolescent females was identified that indicated post-traumatic stress symptoms mediated the relationship between maltreatment and self-injury[73]. The study supports the evidence and recommendations in CG89 that state healthcare providers should consider past or current child maltreatment if a child or young person is deliberately self-harming.	

	Sexualised behaviour (4 studies) Healthcare providers were recommended to suspect child maltreatment: • If a prepubertal child displays or is reported to display repeated or coercive sexualised behaviours or preoccupation • And sexual abuse if a prepubertal child displays or is reported to display unusual sexualised behaviours. • Either past or current child maltreatment if a child or young person's sexual behaviour is indiscriminate, precocious or coercive. A number of studies were identified and an assessment of their abstracts provided supporting evidence for these recommendations with no additional alerting features. A cross sectional study reported a link between sexual abuse and sexual behaviour problems in preadolescent children in a care setting and a prospective cohort indicated that maltreatment other than sexual abuse, may be linked to the development of sexualized behaviors[74,75]. In addition, a cross sectional and a longitudinal study indicated that eroticism and sexual anxiety were distinct outcomes of sexual abuse as well as risk-taking propensity and sensation seeking in adolescents[76, 77]. **Disturbances in eating and feeding behaviour (1 study)**	

	A case-control study which supported the evidence presented within the guideline was identified. The study indicated that there were higher rates of childhood maltreatment in adolescents with anorexia nervosa binge-eating/purging than in adolescents with anorexia nervosa restricting type and healthy adolescents[78] . Evidence was presented in CG89 that indicated that eating disorders such as anorexia nervosa may be associated with a history of maltreatment. The GDG did not make a recommendation about eating disorders in relation to current abuse.	
Clinical area 4: Parent–child interactions		
Clinical question	**Summary of evidence**	**Relevance to guideline recommendations**
Related clinical questions from the guideline When is feature X a reason to suspect child maltreatment? Features that may be in X –	Through an assessment of the abstracts from the literature search 5 studies relevant to the clinical question were identified. CG89 recommends that emotional abuse should be considered if there is concern that parent-or carer-child interactions may be harmful and to suspect emotional abuse when persistent harmful parent or carer-child interactions are observed or reported.	No new evidence was identified which would invalidate current guideline recommendations.

• Parent–child interactions **Relevant section of guideline recommendations** **8**	Five observational studies (1 case control study[79], 2 comparative stdies[80,81], 1 cross sectional study[82], and a prospective cohort study[58]) were identified in the literature search. An assessment of the abstracts from these studies indicated that the they supported the current recommendations in CG89 as they indicated the following: • Deficits in emotion recognition and non-affective parent-child communication were found to be associated with parents whose children were maltreated[80,79,81]. • Dissociation in young adulthood was significantly predicted by observed lack of parental responsiveness in infancy[58]. • Parental cognitive risk factors and disciplinary style child physical are predictive of abuse potential[82].	

No recent or ongoing clinical trials were identified that were within the scope of the guideline.

New evidence was identified that was relevant to 2 research recommendations in the original guideline.

- How can abusive fractures be differentiated from those resulting from conditions that lead to bone fragility and those resulting from accidents, particularly in relation to metaphyseal fractures?[11,13, 18,21,24,25]

- What is the association between anogenital warts and sexual abuse in children of different ages? [46]

Guideline Development Group and National Collaborating Centre perspective

A questionnaire was distributed to GDG members and the National Collaborating Centre to consult them on the need for an update of the guideline. The respondents indicated that there was no new evidence within the scope of the guideline however new evidence and ongoing research in relation to interventions were noted. No substantial modifications to any practices recommended by the current guideline were reported by respondents.

Ongoing research commissioned by the NIHR Health Services Research as part of the NHS R&D Service Delivery and Organisation Programme was identified. This research aims to develop a tool-kit to help foster a safeguarding culture within the hospital environment to detect children at risk of abuse and devise appropriate protective actions before discharge. It is due to complete in 2014. GDG members highlighted the Munro Review of Child Protection as a potential source of new policies or priorities that would impact on the current guideline. It focuses on safeguarding and principles of child

protection but does not provide specific detail or guidance relating to alerting features for identification of maltreatment by healthcare providers.

GDG members were asked whether they felt exclusions listed in the scope of the original guideline were still justified. One respondent felt that some major risk factors need inclusion within the scope as they are important in recognising vulnerable families, however specific details were not provided. With regard to current inequalities in access to services or service provision not addressed in the current guideline 1 respondent suggested that NHS reorganisation may cause potential inequalities to access and increase risks for vulnerable children.

Overall, 1 respondent felt that the guideline did not require an update at this time. Conversely, 2 respondents felt that the guideline should undergo an update and that there was sufficient variation in current practice to warrant an update of the current guideline. Only 1 respondent detailed the areas that may require updating, however, no currently available evidence was provided. These included: physical features (bruising in non-ambulant disabled children), sexual abuse (the RCPCH Physical Signs in sexual abuse is due to be published in 2013), adolescent neglect, parent-or carer-child interactions (the importance of detecting lack of “mindedness” or attunement in carers towards infant).

Implementation and post publication feedback

In total 112 enquiries were received from post-publication feedback, the majority of which were routine. An issue relating to a recommendation on home education was raised. This was rectified and the recommendation wording altered for the republication in December 2009. There were also 3 enquiries relating to underage sex and legal issues within the guideline. These

were clarified by and in line with guidance from the Crown Prosecution Service on ‘consensual experimentation’.

The implementation programme led to a number of issues being raised at the time of the initial guidance publication. These included the need to effectively disseminate, raise awareness and embed the guidance into clinical practice. In addition, the provision of education and training for healthcare professionals was identified as an issue. NICE has produced education resources to support this.

Qualitative input from the field team recorded the following feedback in relation to this guidance: The guidance was welcomed as straightforward with easily understandable recommendations. However some recommendations were noted to be not specific enough leaving too much to interpretation. It was suggested that the guidance should be of a higher profile as this would benefit other potential stakeholders who work with children at risk and potentially enhance joint working and save costs. However, it was noted that the guidance was clinically based and may be less meaningful to other audiences with regards to some terminology.

Relationship to other NICE guidance

The following NICE guidance is related to CG89:

Guidance	**Review date**
CG9 Eating Disorders: Core Interventions in the Treatment and Management of Anorexia Nervosa, Bulimia Nervosa and Related Eating Disorders 2004	2014
CG111 Nocturnal Enuresis in Children (Bedwetting): the Management of Bedwetting in Children	2013

2010	
CG99 Constipation in Children: the Diagnosis and Management of Idiopathic Childhood Constipation in Primary and Secondary Care 2010	2013
CG16 Self-harm: The short-term physical and psychological management and secondary prevention of self-harm in primary and secondary care 2004	2014
CG77 Antisocial personality disorder 2009	2015
CG113 Longer-term care and treatment of self-harm 2011	2014
CG110 Pregnancy and complex social factors: A model for service provision for pregnant women with complex social factors 2010	2013
CG128 Autism in children and young people 2011	2014
Related NICE guidance in progress	
Autism: the management and support of children and young people on the autism	Publication date: 2013
Conduct disorders and antisocial behaviour in children and young people: recognition, intervention and management	Publication date: 2013

Anti-discrimination and equalities considerations

No evidence was identified to indicate that the guideline scope does not comply with anti-discrimination and equalities legislation. The original scope is inclusive of all children under 18 years and provides a summary of clinical features associated with child maltreatment (alerting features) that may be observed when a child presents to healthcare professionals. The guidance is of relevance to those who work in or use the NHS in England and Wales and in the independent health sector and should prompt all healthcare professionals to think about the possibility of maltreatment. In addition, the guideline does not address risk factors for child maltreatment, service organisation, child protection procedures, communication of suspicions to parents, carers or the child and education and information for parents, carers and the child.

Conclusion

The evidence and intelligence identified through the update review process indicate that there are no additional areas which would indicate a significant change in clinical practice. There are no factors described above which would invalidate or change the direction of current guideline recommendations.

Review recommendation

The guideline should not be considered for an update at this time.

Centre for Clinical Practice
16th July 2012

Appendix I

1 . Pierce MC, Kaczor K, Aldridge S et al. (2010) Bruising characteristics discriminating physical child abuse from accidental trauma.[Erratum appears in Pediatrics. 2010 Apr;125(4):861]. Pediatrics 125:67-74.

2 . Ingham AI, Langlois NE, and Byard RW. (2011) The significance of bruising in infants--a forensic postmortem study. Archives of disease in childhood 96:218-220.

3 . Valvano TJ, Binns HJ, Flaherty EG et al. (2009) Does bruising help determine which fractures are caused by abuse? Child Maltreatment 14:376-381.

4 . Hayek SN, Wibbenmeyer LA, Kealey LD et al. (2009) The efficacy of hair and urine toxicology screening on the detection of child abuse by burning. Journal of Burn Care & Research 30:587-592.

5 . Bhardwaj G, Chowdhury V, Jacobs MB et al. (2010) A Systematic Review of the Diagnostic Accuracy of Ocular Signs in Pediatric Abusive Head Trauma. Ophthalmology 117:983-992.

6 . Curcoy AI, Trenchs V, Morales M et al. (2010) Retinal hemorrhages and apparent life-threatening events. Pediatric Emergency Care 26:118-120.

7 . Binenbaum G, Mirza-George N, Christian CW et al. (2009) Odds of abuse associated with retinal hemorrhages in children suspected of child abuse. Journal of Aapos: American Association for Pediatric Ophthalmology & Strabismus 13:268-272.

8 . Thackeray JD, Scribano PV, and Lindberg DM. (2010) Yield of retinal examination in suspected physical abuse with normal neuroimaging. Pediatrics 125:e1066-e1071.

9 . Kobayashi Y, Yamada K, Ohba S et al. (2009) Ocular manifestations and prognosis of shaken baby syndrome in two Japanese children's hospitals. Japanese Journal of Ophthalmology 53:384-388.

10. Kemp AM, Dunstan F, Harrison S et al. (2008) Patterns of skeletal fractures in child abuse: systematic review. [Review] [24 refs]. BMJ 337:a1518-

11. Pandya NK, Baldwin K, Kamath AF et al. (2011) Unexplained fractures: child abuse or bone disease? A systematic review. [Review]. Clinical Orthopaedics & Related Research 469:805-812.

12. Hansoti B and Beattie TF. (2008) Limb fractures and nonaccidental injury in children less than 24 months of age. European Journal of Emergency Medicine 15:63-66.

13. Schilling S, Wood JN, Levine MA et al. (2011) Vitamin D status in abused and nonabused children younger than 2 years old with fractures. Pediatrics 127:835-841.

14. Baldwin K, Pandya NK, Wolfgruber H et al. (2011) Femur fractures in the pediatric population: abuse or accidental trauma? Clinical Orthopaedics & Related Research 469:798-804.

15. Bullock DP, Koval KJ, Moen KY et al. (2009) Hospitalized cases of child abuse in America: Who, what, when, and where. Journal of Pediatric Orthopaedics 29:231-237.

16. Hui C, Joughin E, Goldstein S et al. (2008) Femoral fractures in children younger than three years: The role of nonaccidental injury. Journal of Pediatric Orthopaedics 28:297-302.

17. Al-Mahroos F, Al-Amer EA, Umesh NJ et al. (2011) Pattern of skeletal injuries in physically abused children. Bahrain Medical Bulletin 33:

18. Arkader A, Friedman JE, Warner WC et al. (2007) Complete distal femoral metaphyseal fractures: A harbinger of child abuse before walking age. Journal of Pediatric Orthopaedics 27:751-753.

19. DeGraw M, Hicks RA, and Lindberg D. (2010) Incidence of fractures among children with burns with concern regarding abuse. Pediatrics 125:e295-e299.

20. Duffy SO, Squires J, Fromkin JB et al. (2011) Use of skeletal surveys to evaluate for physical abuse: Analysis of 703 consecutive skeletal surveys. Pediatrics 127:e47-e52.

21. Kocher MS and Dichtel L. (2011) Osteogenesis imperfecta misdiagnosed as child abuse. Journal of Pediatric Orthopaedics Part B 20:440-443.

22. Pandya NK, Baldwin KD, Wolfgruber H et al. (2010) Humerus fractures in the pediatric population: an algorithm to identify abuse. Journal of Pediatric Orthopaedics, Part B 19:535-541.

23. Shrader MW, Bernat NM, and Segal LS. (2011) Suspected nonaccidental trauma and femoral shaft fractures in children. Orthopedics 34:360-

24. Singh KM and Dichtel L. (2011) Osteogenesis imperfecta misdiagnosed as child abuse. Journal of Pediatric Orthopaedics, Part B 20:440-443.

25. Kleinman PK, Perez-Rossello JM, Newton AW et al. (2011) Prevalence of the classic metaphyseal lesion in infants at low versus high risk for abuse. AJR American:1005-1008.

26. Maguire S, Pickerd N, Farewell D et al. (2009) Which clinical features distinguish inflicted from non-inflicted brain injury? A systematic review. [Review] [52 refs]. Archives of disease in childhood 94:860-867.

27. Togioka BM, Arnold MA, Bathurst MA et al. (2009) Retinal Hemorrhages and Shaken Baby Syndrome: An Evidence-Based Review. Journal of Emergency Medicine 37:98-106.

28. Kemp AM, Jaspan T, Griffiths J et al. (2011) Neuroimaging: what neuroradiological features distinguish abusive from non-abusive head trauma? A systematic review. [Review]. Archives of disease in childhood 96:1103-1112.

29. Vinchon M, De Foort-Dhellemmes S, Desurmont M et al. (2010) Confessed abuse versus witnessed accidents in infants: Comparison of clinical, radiological, and ophthalmological data in corroborated cases. Child's Nervous System 26:637-645.

30. Fujiwara T, Okuyama M, and Miyasaka M. (2008) Characteristics that distinguish abusive from nonabusive head trauma among young children who underwent head computed tomography in Japan. Pediatrics 122:e841-e847.

31. Matschke J, Voss J, Obi N et al. (2009) Nonaccidental head injury is the most common cause of subdural bleeding in infants <1 year of age. Pediatrics 124:1587-1594.

32. Fickenscher KA, Dean JS, Mena DC et al. (2010) Occult cranial injuries found with neuroimaging in clinically asymptomatic young children due to abusive compared to accidental head trauma. Southern Medical Journal 103:121-125.

33. Choudhary AK, Bradford RK, Dias MS et al. (2012) Spinal subdural hemorrhage in abusive head trauma: a retrospective study. Radiology 262:216-223.

34. Koe S, Price B, May S et al. (2010) Medical, social and societal issues in infants with abusive head trauma. Irish Medical Journal 103:102-105.

35. Goldstein JL, Leonhardt D, Kmytyuk N et al. (2011) Abnormal neuroimaging is associated with early in-hospital seizures in pediatric abusive head trauma. Neurocritical Care 15:63-69.

36. Kidd AJ, Beattie TF, and Campbell-Hewson G. (2010) Frenal injury in children is not pathognomic of non-accidental injury. Emergency Medicine Journal 27:52-

37. Cavalcanti AL. (2010) Prevalence and characteristics of injuries to the head and orofacial region in physically abused children and adolescents--a retrospective study in a city of the Northeast of Brazil. Dental Traumatology 26:149-153.

38. Koumellis P, McConachie NS, and Jaspan T. (2009) Spinal subdural haematomas in children with non-accidental head injury. Archives of disease in childhood 94:216-219.

39. Kemp AM, Joshi AH, Mann M et al. (2010) What are the clinical and radiological characteristics of spinal injuries from physical abuse: a systematic review. [Review] [42 refs]. Archives of disease in childhood 95:355-360.

40. Hilmes MA, Hernanz-Schulman M, Greeley CS et al. (2011) CT identification of abdominal injuries in abused pre-school-age children. Pediatric Radiology 41:643-651.

41. Yildirim A, Uluocak N, Atilgan D et al. (2011) Evaluation of lower urinary tract symptoms in children exposed to sexual abuse. Urology Journal 8:38-42.

42. Anderst J, Kellogg N, and Jung I. (2009) Reports of repetitive penile-genital penetration often have no definitive evidence of penetration. Pediatrics 124:e403-e409.

43. Berkoff MC, Zolotor AJ, Makoroff KL et al. (17-12-2008) Has this prepubertal girl been sexually abused?. [Review] [39 refs]. JAMA 300:2779-2792.

44. Campbell R, Patterson D, Dworkin E et al. (2010) Anogenital injuries in childhood sexual abuse victims treated in a pediatric Forensic Nurse Examiner (FNE) program. Journal of forensic nursing 6:188-195.

45. Girardet RG, Lahoti S, Howard LA et al. (2009) Epidemiology of sexually transmitted infections in suspected child victims of sexual assault. Pediatrics 124:79-86.

46. Unger ER, Fajman NN, Maloney EM et al. (2011) Anogenital human papillomavirus in sexually abused and nonabused children: a multicenter study. Pediatrics 128:e658-e665.

47. Whaitiri S and Kelly P. (2011) Genital gonorrhoea in children: determining the source and mode of infection. Archives of disease in childhood 96:247-251.

48. Guenther E, Powers A, Srivastava R et al. (2010) Abusive head trauma in children presenting with an apparent life-threatening event. Journal of Pediatrics 157:821-825.

49. Parker K and Pitetti R. (2011) Mortality and child abuse in children presenting with apparent life-threatening events. Pediatric Emergency Care 27:591-595.

50. Curcoy AI, Trenchs V, Morales M et al. (2010) Retinal hemorrhages and apparent life-threatening events. Pediatric Emergency Care 26:118-120.

51. Woodman J, Lecky F, Hodes D et al. (2010) Screening injured children for physical abuse or neglect in emergency departments: a systematic review. [Review] [36 refs]. Child: Care, Health & Development 36:153-164.

52. Scarborough AA, Lloyd EC, and Barth RP. (2009) Maltreated infants and toddlers: predictors of developmental delay. Journal of Developmental & Behavioral Pediatrics 30:489-498.

53. Spann MN, Mayes LC, Kalmar JH et al. (2012) Childhood abuse and neglect and cognitive flexibility in adolescents. Child Neuropsychology 18:182-189.

54. Kaplow JB, Hall E, Koenen KC et al. (2008) Dissociation predicts later attention problems in sexually abused children. Child abuse & neglect 32:261-275.

55. Fishbein D, Warner T, Krebs C et al. (2009) Differential relationships between personal and community stressors and children's neurocognitive functioning. Child Maltreatment 14:299-315.

56. Milot T, Ethier LS, St-Laurent D et al. (2010) The role of trauma symptoms in the development of behavioral problems in maltreated preschoolers. Child abuse & neglect 34:225-234.

57. DePrince AP, Chu AT, and Combs MD. (2008) Trauma-related predictors of deontic reasoning: a pilot study in a community sample of children. Child abuse & neglect 32:732-737.

58. Dutra L, Bureau JF, Holmes B et al. (2009) Quality of early care and childhood trauma: a prospective study of developmental pathways to dissociation. Journal of Nervous & Mental Disease 197:383-390.

59. Valentino K, Cicchetti D, Rogosch FA et al. (2008) True and false recall and dissociation among maltreated children: the role of self-schema. Development & Psychopathology 20:213-232.

60. Harkness KL, Lumley MN, and Truss AE. (2008) Stress generation in adolescent depression: the moderating role of child abuse and neglect. Journal of Abnormal Child Psychology 36:421-432.

61. Courtney EA, Kushwaha M, and Johnson JG. (2008) Childhood emotional abuse and risk for hopelessness and depressive symptoms during adolescence. Journal of Emotional Abuse 8:281-298.

62. Carey PD, Walker JL, Rossouw W et al. (2008) Risk indicators and psychopathology in traumatised children and adolescents with a history of sexual abuse. European Child & Adolescent Psychiatry 17:93-98.

63. Sonnby K, Aslund C, Leppert J et al. (2011) Symptoms of ADHD and depression in a large adolescent population: co-occurring symptoms and associations to experiences of sexual abuse. Nordic Journal of Psychiatry 65:315-322.

64. King DC, Abram KM, Romero EG et al. (2011) Childhood maltreatment and psychiatric disorders among detained youths. Psychiatric Services 62:1430-1438.

65. Romero S, Birmaher B, Axelson D et al. (2009) Prevalence and correlates of physical and sexual abuse in children and adolescents with bipolar disorder. Journal of Affective Disorders 112:144-150.

66. Scott KM, Smith DR, and Ellis PM. (2010) Prospectively ascertained child maltreatment and its association with DSM-IV mental disorders in young adults. Archives of General Psychiatry 67:712-719.

67. Horesh N, Ratner S, Laor N et al. (2008) A comparison of life events in adolescents with major depression, borderline personality disorder and matched controls: a pilot study. Psychopathology 41:300-306.

68. Colins O, Vermeiren R, Vreugdenhil C et al. (1-2-2009) Are psychotic experiences among detained juvenile offenders explained by trauma and substance use? Drug & Alcohol Dependence 100:39-46.

69. Boxer P and Terranova AM. (2008) Effects of multiple maltreatment experiences among psychiatrically hospitalized youth. Child abuse & neglect 32:637-647.

70. Badmaeva VD. (2011) Consequences of sexual abuse in children and adolescents. Neuroscience and Behavioral Physiology 41:259-262.

71. Ozbaran B, Erermis S, Bukusoglu N et al. (2009) Social and emotional outcomes of child sexual abuse: a clinical sample in Turkey. Journal of Interpersonal Violence 24:1478-1493.

72. Hebert M, Lavoie F, Vitaro F et al. (2008) Association of child sexual abuse and dating victimization with mental health disorder in a sample of adolescent girls. Journal of Traumatic Stress 21:181-189.

73. Shenk CE, Noll JG, and Cassarly JA. (2010) A multiple mediational test of the relationship between childhood maltreatment and non-suicidal self-injury. Journal of Youth & Adolescence 39:335-342.

74. Tarren-Sweeney M. (2008) Predictors of problematic sexual behavior among children with complex maltreatment histories. Child Maltreatment 13:182-198.

75. Merrick MT, Litrownik AJ, Everson MD et al. (2008) Beyond sexual abuse: the impact of other maltreatment experiences on sexualized behaviors. Child Maltreatment 13:122-132.

76. Simon VA and Feiring C. (2008) Sexual anxiety and eroticism predict the development of sexual problems in youth with a history of sexual abuse. Child Maltreatment 13:167-181.

77. Bornovalova MA, Gwadz MA, Kahler C et al. (2008) Sensation seeking and risk-taking propensity as mediators in the relationship between childhood abuse and HIV-related risk behavior. Child abuse & neglect 32:99-109.

78. Jaite C, Schneider N, Hilbert A et al. (2012) Etiological role of childhood emotional trauma and neglect in adolescent anorexia nervosa: a cross-sectional questionnaire analysis. Psychopathology 45:61-66.

79. Hildyard K and Wolfe D. (2007) Cognitive processes associated with child neglect. Child abuse & neglect 31:895-907.

80. Asla N, de PJ, and Perez-Albeniz A. (2011) Emotion recognition in fathers and mothers at high-risk for child physical abuse. Child Abuse and Neglect 35:712-721.

81. Milot T, St-Laurent D, Ethier LS et al. (2010) Trauma-related symptoms in neglected preschoolers and affective quality of mother-child communication. Child Maltreatment 15:293-304.

82. McElroy EM and Rodriguez CM. (2008) Mothers of children with externalizing behavior problems: cognitive risk factors for abuse potential and discipline style and practices. Child abuse & neglect 32:774-784.