Child Protection Evidence Systematic review on Oral Injuries

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While the format of each review has been revised to fit the style of the College and amalgamated into a comprehensive document, the content remains unchanged until reviewed and new evidence is identified and added to the evidence-base. Updated content will be indicated on individual review pages.



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Summary

Facial and intra-oral trauma has been described in up to 49% of infants and 38% of toddlers who have been physically abused.^{1,2} A torn upper labial frenum (often referred to as frenulum or phrenum) is described as the most common abusive injury to the mouth.³⁻⁶ A large scale case-control study identified that 11% of children later found to be abused had a previous intra-oral injury which was not acted upon.⁷

This systematic review evaluates the scientific literature on abusive and non-abusive oral injuries in children published up until **April 2023** and reflects the findings of eligible studies. The 2023 update combined the previous two clinical questions to the single question below:

• What oral injuries are associated with physical child abuse?

The 2023 update included six new studies^{4,5,8-11} that have aimed to describe the frequency and characterisation of oral injuries in children who have been physically abused. Three were carried out in the United States, the other three were from Romania, Portugal, and Australia. All studies, except for one,¹¹ were retrospective in nature. A wide age group range was investigated; from newborn children to 17-years-old. The mean age for three studies was between 14 to 15-years-old,^{5,8,9} under two-years-old in two studies,^{5,11} and seven-years-old in one study.¹⁰ The majority of the children were male in five studies and the proportion of male to female was similar in one study, 51% to 49% respectively.¹⁰ The certainty of abuse diagnosis was high in this update with five out of six studies using multidisciplinary assessment for confirmed abuse cases (rank 2) and one study using criminal court proceedings to confirm abuse (abuse ranking criteria 1).⁹

Key findings:

- Evidence in the literature supports full clinical evaluation for a child with a torn upper labial frenum taking into consideration their age, developmental stage and mechanism of injury. In the absence of concerns about an abusive cause, any other injuries or social concerns, the presence of a torn upper labial frenum alone is not pathognomonic of physical abuse.
- Evidence from the literature shows that a torn labial frenum can be associated with severe abuse. Like many other injuries, a torn labial frenum may be strongly indicative of physical abuse in a young infant or non-mobile child and has also been described as a sentinel injury.⁷
- In older, mobile children, torn labial frenum is a well described accidental injury where there is a clear history of an appropriate accidental mechanism of injury.¹²⁻¹⁵

- Oropharynx bruising was suggested by one study to be a possible indicator of physical abuse.⁴
- Further literature recently picked up in our searches highlighted the significance of oral injuries as sentinel injuries for severe abuse, present in 11% of cases,⁷ and tribal practices, including removal of the 'killer' canine¹⁶ or infant oral mutilation (IOM).

Background

This systematic review evaluates the scientific literature on abusive and non-abusive oral injuries in children published between 1950 and 2023 and reflects the findings of eligible studies. The review aims to answer one clinical question:

• What oral injuries are associated with physical child abuse?

Methodology

A literature search was performed using a number of databases for all original articles and conference abstracts published since 1950. Supplementary search techniques were used to identify further relevant references. See <u>Appendix 1</u> for full methodology including search strategy and inclusion criteria.

Potentially relevant studies underwent full text screening and critical appraisal. To ensure consistency, ranking was used to indicate the level of confidence that abuse had taken place and also for study types.

Findings of clinical question 1 What oral injuries are associated with physical child abuse?

This review included 38 studies that addressed this question.^{1,4,5,8-15,17-43}

Influence of ethnicity and socio-economic group

A study from 1966 specifically noted that 'coloured children' made up the majority of the study population, however no population figures were given by this study.³⁴ One study noted that the ethnicity was representative of the local population.²³ Two studies investigated race as a risk factor, Lopez et al., found no difference in ethnicity to that of the reference population,²³ Dorfman et al. from the United States, has found most of the abused children with the study were Caucasian in race and non-Hispanic in ethnicity.⁵

None of the newly included studies have explored the socio-economic impact on child abuse. However, Balan et al. found a slight increase in the number of oral injuries when the child lived in urban rather than rural locations.⁸

1.1. Labial Frenum

The head was reported as the most common target region in physical abuse,² with 43% of abusive injuries occurring to the face and neck.⁴⁴ Of these injuries, a torn labial frenum (often inappropriately referred to as frenulum) has frequently been described as pathognomonic of child abuse.⁴⁵ However, like other injuries it needs to be part of a holistic assessment including review of the history and child's developmental stage alongside any other injuries or social concerns.

Abusive torn labial frenum

Abusive torn labial frenum was addressed in 15 non comparative studies.^{14,21,24,26,32-41,43} A retrospective study of children aged under 120 months evaluated for physical abuse reported that a torn labial frenum was found in up to 44% (n=42) of the 96 children with oral injury.⁵ Children with a labial frenum injury were more likely to be investigated for abuse versus those with other oral injuries.⁵

A prospective comparative study of 105 abused and non-abused children aged less than three years who were examined within 24 hours of intubation noted that only one child sustained an oral injury as a consequence of intubation (broken tooth). In the 14 abused children, torn labial frena were only observed in three aged, five, 17 and 21 months.²³ Of these abused children, one child had a lower frenum tear with an associated lip abrasion. Another child had an upper labial frenum tear with associated swelling to the lips, bruising to the tongue, blood on the teeth, multiple human bites and eyelid bruising. The third child had a healed frenum scar with associated bruising to the lip, cigarette burns and subconjunctival haemorrhage. Two of the three children with torn labial frena had associated fractures of the skull and upper humerus.

One comparative study of 105 children aged less than three years examined within 24 of hours of intubation did not demonstrate any non-abusive torn frenum.⁴²

Where details were given there were 30 children, aged five years or less and one study reported age range of zero to 10-years for five children.¹⁴ Approximately 90% were fatally abused (where details were given), 13 children had associated head injury^{21,24,26,35-41} and nine children had fatal

head injury.^{26,32,33,35,38-40} Five children had fatal abdominal injuries,¹⁴ one fatality had coexistent anogenital sexual abuse with multiple fractures.⁴¹

Two infants (aged six weeks and three months respectively) presented with an unexplained torn upper frenum and no thorough investigation; they re-presented within three weeks with multiple severe injuries.⁴³

The only mechanism of injury recorded in the literature was a direct blow to the mouth, although no precise mechanism was recorded for the majority of the cases.^{33,43}

Accidental torn labial frenum

Accidental tearing of the labial frenum not related to abuse has been reported in four studies.¹²⁻¹⁵

A study of 324 children aged zero to 10 years undergoing cardio pulmonary resuscitation (CPR) and dying of natural causes found a single case of torn labial frenum occurred as a consequence of CPR (noted as absent at onset of CPR, confirmed at autopsy).¹⁴

There were four non comparative studies included.¹²⁻¹⁵ Two cases occurred as a consequence of intubation.^{13,14}

A three and a half year old child was fatally injured by an air bag; sustaining injuries including a torn labial frenum, multiple fractures and intracranial haemorrhages.¹² A two and a half year old child fell from his bike with intrusion of central upper incisor and torn upper labial frenum. His lip injury was completely healed within 1 week.¹⁵

Congenital abnormalities of the labial frenum

A five year old presented with a small tag on the lower edge of the frenulum.¹⁸ As this was found as part of a child protection examination it was thought that the finding was congenital, however traumatic injury could not be excluded.¹⁸

1.2. Other Intra oral injuries

For the purposes of this review, 'intra-oral' was defined as the area between the vermilion borders of the lips. We did not deal with injuries due to sexual abuse, burns or dental neglect since these are addressed in separate reviews.

Two comparative studies were included.^{4,23} The first study examined 105 children aged less than three years within 24 hours of intubation. Twelve children presented with oral, jaw or neck injury,

10 of which were due to abusive trauma.²³ Six children sustained lip injuries including swelling, petechiae, bruising or lacerations, three included injury to the tongue, with erythema, laceration and a bite mark, three had torn labial frena.²³ All of these children had coexistent injuries including fractures, intracranial injury, burns, bruises, bites or eye injuries.²³

The second study was retrospective in design and looked into 204 eligible medical records with oral injuries.⁴ There were confirmed oral injuries due to physical abuse in 29/204 children (14%). Abused children with oral injuries were significantly younger than those who sustained accidental intra oral injuries (P < 0.0001).⁴ Furthermore, abused children are less likely to have a history of trauma when they were presented to medical care. Abused children with oral injuries were also less likely to have oropharynx symptoms on presentation to medical care. It was found torn upper labial frenum was the most common oral injury regardless of the cause, accidental (67/1750); physical abuse (9/29).⁴ The study highlighted several indicators that were distinctive to the oral injuries associated with physical abuse. These were tongue and tongue frenal injury, oropharynx 'bruise' injuries, younger age, and lack of history of trauma on presentation.

New non-comparative studies were included describing a variety of oral injuries.^{10,11} One study reported that oral injuries in children that are related to physical abuse tend to be associated with blunt force and mechanical suffocation.¹¹

One study found that soft tissue injuries are far more common than dental-periodontal injuries (prevalence 89% vs 14%).⁸

Lacerations and bruising

Laceration or bruising to the lip were commonly reported.^{1,4,5,9,10,19-22,24-33}

Lingual frenum injury

Three month old twins were descried with oral bleeding and lacerated lingual frena as a consequence of forceful insertion of fingers into mouth.²⁰ Co-existent fractures and faltering growth were identified in both twins.²⁰

Multiple injuries

An adult biting the tongue of a 10-month-old infant was reported. Associated injuries included multiple fractures, bruises, lacerations and an intracranial injury.²²

Abusive Extraction of Teeth

A study reported parents extracting their own children's teeth, including their permanent dentition, as a form of punishment.¹⁹

Soft Palate injuries

A case was reported of an unusual injury to the mouth, caused by forceful removal of a dummy obstructing the child's airway, by the parents, causing laceration of soft palate and pneumothorax.¹⁷

Bleeding

In four studies oral bleeding was a presenting symptom of oral physical abuse.^{20,24,30,31}

Other injuries

The remaining injuries included:^{1,8,19-22,24-32,33}

- Mucosal lacerations.
- Dental trauma (including fractures, intrusion and forced extraction).
- Tongue injuries including an adult bite.
- Gingival lesions.
- Ecchymoses.

No characteristics of these lesions were specific to an abusive aetiology.

1.3. Key evidence statements

An injury must never be interpreted in isolation and must always be assessed in the context of medical and social history, child's developmental stage, the history, full clinical examination and relevant investigations. Any unexplained injury, or inconsistent history that causes concern should be promptly investigated as appropriate.

- Any part of the oral cavity can be injured due to physical abuse. Torn labial frenum, lip and oral bruising are the most common reported abusive oral injuries.
- Where age was given, the majority of children with intraoral injury due to physical abuse were less than five years old.
- The oral cavity should be examined in all cases of suspected physical abuse. Unexplained oral injuries with no history of trauma or inconsistent with history, or with other associated oro-facial injuries, should be fully investigated and the possibility of an abusive cause considered.
- Oral injuries due to physical abuse are usually caused by blunt force which can present as an abrasion or contusion.
- Any unexplained torn labial frenum should be fully investigated for physical abuse occult injuries.
- Accidental causes of a torn labial frenum include falls or an accidental blow to the mouth.

1.4. Research implications

Further research is needed:

- Prospective comparative studies of torn labial frenum in children, due to inflicted and accidental causes.
- Epidemiologic studies of torn labial frenum in children aged less than five years, including mechanism of injury and co-existent injuries.
- Recommendation from the 2014 update was to conduct, "prospective comparative studies of intra-oral injuries in abused/non-abused children with researchers trained to recognise oral and dental injuries and detailing co-existent injuries and mechanism of injury." One eligible prospective study was carried out since then.¹¹ However, it only covered six months and hence, a very low number of eligible cases were included (n=3). This timeframe and included cases are low in comparison to the retrospective studies that covered longer periods of time (up to 10 years)⁴ including more cases (up to 320).⁸

Recommendations from the 2023 update:

- Develop guidelines for both medical and dental health care providers to assist with assessment of children presenting to medical care providers with oral injuries.
- Develop context-appropriate communications pathways between medical and dental health care providers.
- Include dental examination as a part of the child protection medical examination.

1.5. Limitations of review findings

- There were small numbers of children represented, with few comparative studies included.
- Uncertainty as to frequency of oral or dental examinations performed in child abuse cases.
- Likely under-recording and under reporting of non-abusive torn frenum.
- Lack of epidemiological data on non-abusive torn frenum.
- No evidence to support any abusive mechanism of injury other than a direct blow.
- Possible underestimate of intra-oral injuries due to uncertainty as to how many oral/dental examinations were conducted.
- Subtle (including healed) signs of oral injuries and other dental injuries may be missed by paediatricians.
- Time lapse between injury and medical assessment can lead to many of the oral injuries healing in the interval.

- Lack of dental representation during the safeguarding and abuse assessment can lead to under reporting of dental findings (e.g., tooth fracture, tooth luxation injuries).
- The limited comparative data means that a probability of abuse for torn labial frenum cannot be estimated.
- The limited comparative data means that a probability of physical abuse as the cause of oral injuries cannot be estimated.
- Paediatricians should be aware of features of primary and secondary dentition, and the likely ages at which they are present.
- Dental examination of the child's teeth (e.g., tooth fracture, luxation injuries, etc.) was not often carried out as part of the physical abuse assessment. This is likely to have led to underreporting of traumatic dental injuries, other dental findings, and dental neglect. Hence, the dentist should be part of the child protection medical team. Alternatively, if any oro-dental abnormalities are found in the child protection medical a dental opinion should be sought where appropriate.

Other useful resources

Clinical question 1

- Be aware of congenital abnormalities of the labial frenum which may be mistaken for a tear^{18,46,47}
- One study recorded the distribution of various types of maxilliary labial frenum attachment.48
- Twisting and pulling the child's lip to cause torn frenum was noted in a single case. This study did not meet our inclusion criteria.⁴⁹
- Previous surveys suggest only 8-18% of suspected abuse cases are referred by dentists.^{1,50}
- Dental neglect frequently co-exists with oral abuse.⁵¹
- UK guidance on child protection referrals for dental practitioners.⁵²
- Dental trauma included dental fractures leading to discolouration of teeth and/or inappropriately missing teeth.⁵³
- Discolouration may occur with dentinogenesis imperfecta⁵³ hypopharyngeal and proximal esophageal rupture with abscess formation.⁵⁴
- Although following the original review we are no longer including single case reports, a 2014 case study has demonstrated supratonsillar lacerations and scattered facial petechiae in an abused 11 month old infant.⁵⁵

Traditional treatment

• Ebinyo: infant oral mutilation (IOM) involving extirpation of primary canine tooth follicles for perceived medical benefits in certain African tribes.^{16,56}

Accidental oral injuries

- In four studies 30% of children aged one to six years sustain dental trauma, the peak age being three years.⁵⁷⁻⁶⁰
- Dental trauma is more frequent in boys than girls.^{5,9-11,57-59,60, Vidal, Dorfman and Sarkar, Balan, Woolf)}
- Four studies found the most common accidental injury is laceration to lips and mucosa.⁵⁷⁻⁶⁰
- A study of dental injury prevalence in Brazilian school children showed that accidental oral injuries were more common in the lower socio-economic group of the study, study children who were obese and those in areas of poor dental care provision. ⁶⁰
- The infants of mothers with more than eight years' education sustained more dental injuries during the first year of life.⁵⁷

Sentinel injuries

• A large scale case-control study identified that 11% of children later found to be abused had a previous intra-oral injury which was not acted upon.⁷

Related publications

Publication arising from oral injuries review:

- Maguire SA, Hunter B, Hunter LM, Sibert J, Mann MK, Kemp AM. Diagnosing abuse: A systematic review of torn frenum and intra-oral injuries. Archives of Disease in Childhood. 2007;92(12):1113-1117. Erratum in Archives of Disease in Childhood. 2008;93(5):453.
- Comment on oral injuries publication: Welbury R. Torn labial frenum in isolation not pathognomonic of physical abuse. Evidence-based Dentistry. 2007;8(3):71

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- Woolf S.M., Leventhal J.M., Gaither J.R., et al. Oral injuries in children less than 24 months of age in a pediatric emergency department. *Child Abuse & Neglect* 2019; 89: 70-77 <u>https://www.sciencedirect.com/science/article/abs/pii/S0145213419300109?via%3Dihub</u>.
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Appendix 1 – Methodology

We performed an all-language literature search of original articles, their references and conference abstracts published since 1950. The initial search strategy was developed across OVID Medline databases using keywords and Medical Subject Headings (MeSH headings) and was modified appropriately to search the remaining bibliographic databases. The search sensitivity was augmented by the use of a range of supplementary 'snowballing' techniques including consultation with subject experts and relevant organisations, and hand searching selected websites, non-indexed journals and the references of all full-text articles.

Standardised data extraction and critical appraisal forms were based on criteria defined by the National Health Service's Centre for Reviews and Dissemination.⁶¹ We also used a selection of systematic review advisory articles to develop our critical appraisal forms.⁶²⁻⁶⁶ Articles were independently reviewed by two reviewers. A third review was undertaken to resolve disagreement between the initial reviewers when determining either the evidence type of the article or whether the study met the inclusion criteria. Decisions related to inclusion and exclusion criteria were guided by Cardiff Child Protection Systematic Reviews, who laid out the basic parameters for selecting the studies. The review programme has now been taken over by RCPCH who have adopted the same degree of rigorous methodology.

Our panel of reviewers included paediatricians, paediatric dentists, designated and named doctors and specialist nurses in child protection. All reviewers underwent standardised critical appraisal training.

Inclusion criteria

Inclusion	Exclusion
Articles of all evidence types	Personal practice
English and non-English articles	Review articles
Patients between 0-17 years of age	Studies where the population included adults and children but where we could not extract data that applied solely to children
Oral injury defined as the vermilion	Single case reports of abusive torn frenum or intra-oral injury
border of the lips to the hypopharynx	(from 2008)
Abusive oral injury	Methodologically flawed papers

Torn labial frenum of any aetiology	Rank of abuse 4 (only rank 5 pre-2008)
	Dental neglect
	Oral injury due to sexual abuse or intentional thermal injury
	Complications or outcome of abusive oral injury

Ranking of abuse

Distinguishing abuse from non-abuse is central to our review questions. As our reviews span more than 40 years, standards for defining abuse have changed markedly. We have devised the following ranking score where '1' indicates the highest level of confidence that abuse has taken place. These rankings are used throughout our systematic reviews (where appropriate).

Ranking	Criteria used to define abuse
1	Abuse confirmed at 10
2	Abuse confirmed by stated criteria including multidisciplinary assessment
3	Abuse defined by stated criteria
4	Abuse stated but no supporting detail given
5	Suspected abuse

Ranking	Criteria used to define accident
Al	Independently witnessed accidental cause or forensic recreation of scene
A2	By confirmation of organic disease (diagnostic test and / or diagnosis from clinical profile)
B1	By multi-disciplinary assessment and child protection clinical investigation
B2	Consistent account of accident by the same individual over time
В3	By checking either the child abuse register or records of previous abuse
C1	Accidental cause / organic diagnosis stated but no detail given
C2	No attempt made to exclude abuse / no detail given

Τı	Randomised controlled trial (RCT)
T ₂	Controlled trial (CT)
T₃	Controlled before-and-after intervention study (CBA)
Oı	Cohort study / longitudinal study
O ₂	Case-control study
O ₃	Cross-sectional
O ₄	Study using qualitative methods only
O₅	Case series
O ₆	Case study
Х	Formal consensus or other professional (expert) opinion (automatic exclusion)

Definition of levels of evidence and grading practice recommendations (this classification is based on the Bandolier system adapted to include the Centre for Reviews and Dissemination's Criteria).

Grade	Level	Type of evidence
A	la	Evidence obtained from a well designed randomised controlled trial of appropriate size (TI)
В	lb	Evidence obtained from a well designed controlled trial without randomisation (T2, T3)
В	lla	Evidence obtained from a well designed controlled observational study e.g. cohort, case-control or cross-sectional studies. (Also include studies using purely qualitative methods) (O1, O2)
С	llb	Evidence obtained from a well designed uncontrolled observational study (O3, O4)
С		Evidence obtained from studies that are case series or case studies (O5, O6)

Search strategy

The below table presents the search terms used in the 2023 Medline database search for all injuries and bites, truncation and wildcard characters were adapted to the different databases where necessary.

Oral injuries search strategy:

1 Child/
2 (child: or toddler: or baby or infant:).mp.
31 or 2
4 non-accidental injur:.mp.
5 dental trauma.mp.
6 nonaccidental injur:.mp.
7 (non-accidental: and injur:).mp.
8 nonaccidental trauma.mp.
9 soft tissue injur:.mp.
10 (abusive trauma or physical abuse).mp.
11 (or/4-10) and 3
12 (child abuse or child protection or child maltreatment).mp.
13 exp child abuse/
14 exp Shaken Baby Syndrome/
15 exp Battered Baby Syndrome/
16 (battered child or shaken baby or battered baby).mp.
17 (child adj3 maltreatment).mp.
18 (child adj3 physical abuse).mp.
19 or/12-18
20 11 or 19
21 Accidents/
22 accident:.mp.
23 (21 or 22) and 3
24 dental trauma.mp.
25 facial injur:.mp.
26 (oral or dental injur:).mp.
27 Incisor/in [Injuries]

- 28 ((intraoral or oral or dental) adj3 (abrasion: or lesion: or laceration:)).mp.
- 29 (frenum or freanum or Frenulum).mp.
- 30 (torn lingual frenu* or torn labial frenu:).mp.
- 31 lingual frenum/
- 32 (lingual frenum or freanum).mp.
- 33 (labial frenum or freanum).mp.
- 34 (torn adj3 frenum).mp.
- 35 (torn adj3 freanum).mp.
- 36 (torn lingual or torn labial).mp.
- 37 alveol:.mp.
- 38 avulsed teeth.mp.
- 39 avulsion injur:.mp.
- 40 (intraoral adj3 burn:).mp.
- 41 (intraoral adj3 lesion:).mp.
- 42 lip scars.mp.
- 43 (lip or lips).mp.
- 44 (scars adj3 lip).mp.
- 45 vermilion border.mp.
- 46 (jaw or tongue).mp.
- 47 floor of mouth.mp.
- 48 lateral luxation.mp.
- 49 subluxated tooth.mp.
- 50 (((Crown adj3 fracture) or root) adj3 fracture).mp.
- 51 dental traumatology.mp.
- 52 oral traumatology.mp.
- 53 gingival contusion.mp.
- 54 gingival tear.mp.
- 55 gingival bruise.mp.

- 56 (articulation or disarticulation).mp.
- 57 (Occlusion or malocclusion).mp.
- 58 (torn fraenum or frenum).mp.
- 59 (gingivae or gingival laceration:).mp.
- 60 (Periodontal injury or gingival injury).mp.
- 61 (Alveolar injury or alveolar fracture).mp.
- 62 (Crown fract: or root fract:).mp.
- 63 (Luxation or luxated tooth).mp.
- 64 (displaced tooth or intruded tooth or extruded tooth or avulsed tooth).mp.
- 65 (intrusion injury or extrusion injury).mp.
- 66 (phrenum or phreanum or phraena).mp.
- 67 Maxillofacial Injuries/
- 68 Facial Injuries/
- 69 (oro-dental injur: or oro-facial injur:).mp.
- 70 tooth injur:.mp.
- 71 Tooth Fractures/
- 72 Tooth Avulsion/
- 73 Oral Hemorrhage/
- 74 dental Trauma*.mp.
- 75 (oral adj3 (bleed* or trauma or contusion or bruise or tear)).mp.
- 76 (gingiva* adj3 (bleed* or trauma or contusion or bruise or tear)).mp.
- 77 Labial Frenum/
- 78 Lingual Frenum/
- 79 or/24-78
- 80 20 and 79
- 81 23 and 79

82 80 or 81

83 Child Abuse, Sexual/
84 sexual abuse.mp.
85 "Review"/
86 (rat:or mouse or mice or hamster: or animal: or dog: or cat: or rabbit: or bovine or sheep).mp.
87 Animals/
88 animal stud\$.mp.
89 or/83-87
90 82 not 89
91 limit 90 to yr="2013 -Current"

Fourteen databases were searched together with hand searching of particular journals and websites. A complete list of the resources searched can be found below.

Databases	Time period searched
ASSIA (Applied Social Sciences Index and Abstracts)	1987 – 2023
Child Data	1958 – 2009†
CINAHL (Cumulative Index to Nursing and Allied Health Literature)	1982 – 2023
Cochrane Central Register of Controlled Trials	1996 – 2014
EMBASE	1980 – 2023
MEDLINE	1950 – 2023
MEDLINE In-Process and Other Non-Indexed Citations	1951 – 2023
Open SIGLE (System for Information on Grey Literature in Europe)	1980 – 2005*
Pubmed E publications (Epub ahead of print)	2022
Scopus	2009 – 2023
Social Care online (previously Caredata)	1970 – 2014
Trip Plus	1997 – 2005‡
Web of Knowledge — ISI Proceedings	1990 – 2023
Web of Knowledge — ISI Science Citation Index	1981 – 2023
Web of Knowledge — ISI Social Science Citation Index	1981 – 2023
* ceased indexing † institutional access terminated ‡ no yield so ceased searching	
Journals 'hand searched'	Time period searched
Child Abuse and Neglect	1977 – 2014
Child Abuse Review	1992 – 2014
Websites searched	Date accessed
Child Welfare Information Gateway (formerly National Clearinghouse on Child Abuse and Neglect)	10 June 2014

Pre-review screening and critical appraisal

Papers found in the database and hand searches underwent three rounds of screening before they were included in this update. The first round was a title screen where papers that obviously did not meet the inclusion criteria were excluded. The second was an abstract screen where papers that did not meet the inclusion criteria based on the information provided in the abstract were excluded. In this round the pre-review screening form was completed for each paper. These first two stages were carried out by a systematic reviewer at the RCPCH and a clinical expert. Finally, a full text screen with a critical appraisal was carried out by members of the clinical expert sub-committee. Critical appraisal forms were completed for each of the papers reviewed at this stage. Examples of the pre-review screening and critical appraisal forms used in previous reviews are available on request (evidence@rcpch.ac.uk).