Supplementary

Appendix 1. Electronic Search Strategy

The initial electronic database searches were conducted on 20 April 2022 from database inception to that date. Automated database alerts were subsequently maintained until April 2026 to identify newly published records meeting the search criteria. The search strategy was developed in consultation with an academic librarian and combined terms relating to children, general anaesthesia and dental disease.

Table A1. Search strategies used in electronic databases

Database	Results
MEDLINE (Ovid)	3,095
PubMed	2,894
Scopus	2,748
Web of Science	1,028
Dentistry and Oral Sciences Source	409
EThOS	0
OpenGrey	0

MEDLINE (Ovid)

1. (child* or paed* or ped*).mp.

2. ((general and anae*) or (general and anes*)).mp.

3. dent*.mp.

4. (caries or decay).mp.

5. 1 and 2 and 3 and 4

Results retrieved: 3,095

PubMed

(child* OR paed* OR ped*)

AND

(general AND anae* OR general AND anes*)

AND

(dent* OR caries OR decay)

Results retrieved: 2,894

Scopus

(TITLE-ABS-KEY(child*) OR TITLE-ABS-KEY(paed*) OR TITLE-ABS-KEY(ped*))

AND

(TITLE-ABS-KEY(general AND anae*) OR TITLE-ABS-KEY(general AND anes*))

AND

(TITLE-ABS-KEY(dent*) OR TITLE-ABS-KEY(caries) OR TITLE-ABS-KEY(decay))Results retrieved: 2,748

Web of Science Core Collection

#1 child* OR paed* OR ped*

#2 general ana* OR general anes*

#3 dent*

#4 caries OR decay

#5 #1 AND #2 AND #3 AND #4

Results retrieved: 1,028

Dentistry and Oral Sciences Source (EBSCOhost)

S1 child* OR paed* OR ped*

S3 (general AND anae*) OR (general AND anes*)

S6 dent*

S7 caries* OR decay

S1 AND S3 AND S6 AND S7

Results retrieved: 409

EThOS

(child* OR paed* OR ped*)
AND
("general anae*" OR "general anes*")
AND
(dent* OR caries OR decay)

Results retrieved: 0

ADDITIONAL SEARCHING

Reference lists of included studies were hand searched to identify additional relevant publications. A consultation exercise was undertaken with members of the British Society of Paediatric Dentistry (BSPD) to identify unpublished or ongoing work relating to repeat dental general anaesthesia in children.

Additional studies identified through stakeholder consultation: n = 3

Appendix 2. Characteristics of Included Sources

Author	Reference	Year	Country	Repeat DGA rate	Treatment approach	Radiographic assessment	Medical status	Treatment provider	Treatment planner
LeGault	(87)	1972	Canada	10.7%	Comprehensive care	Not stated	Healthy patients only	Paediatric specialists	Paediatric specialist
Mitchell	(88)	1985	UK	7.2%	Comprehensive care	Not stated	Medically compromised / special healthcare needs only	Not stated	Not stated
Roeters	(89)	1985	Netherlands	10.2%	Comprehensive care	Not stated	Medically compromised / special healthcare needs only	Paediatric specialists	Paediatric specialist
Chee	(69)	1988	USA	15%	Comprehensive care	Yes	Medically compromised / special healthcare needs only	Paediatric specialists	Paediatric specialist
Smallridge	(90)	1990	UK	20.9%	Extraction only	Not stated	Mixed population	Not stated	GDP
O'Sullivan	(91)	1991	UK	2.5%	Comprehensive care	Not stated	Mixed population	Paediatric specialists	Paediatric specialist
Thompson	(92)	1994	New Zealand	4.2%	Comprehensive care	Not stated	Mixed population	Paediatric specialists	Paediatric specialist
Nunn	(93)	1995	Australia	12%	Comprehensive care	Not stated	Mixed population	Not stated	Paediatric specialist
Landes	(62)	1996	UK	23%	Extraction only	Not stated	Mixed population	GDPs	GDP
Wong	(94)	1997	UK	14%	Comprehensive care	Yes	Mixed population	Not stated	Paediatric specialist
Grant	(95)	1998	UK	0%	Extraction only	If required	Mixed population	Not stated	Paediatric specialist
MacCormac	(65)	1998	UK	31%	Extraction only	Not stated	Mixed population	CDS – non-specialists	GDP
Almeida	(75)	2000	USA	17%	Comprehensive care	Yes	Healthy patients only	Not stated	Not stated
Carson	(55)	2000	UK	54%	Extraction only	Not stated	Mixed population	GDPs	GDP
Harrison	(44)	2000	UK	9.5%; 75% of single-tooth extraction cases required a repeat DGA	Extraction only	Not stated	Healthy patients only	Not stated	GDP
Jamjoom	(59)	2001	Saudi Arabia	0.2%	Comprehensive care	Not stated	Mixed population	Paediatric specialists	Paediatric specialist
Sheller	(14)	2003	USA	11.6%	Comprehensive care	Not stated	Healthy patients only	Not stated	Not stated
Clewett	(96)	2004	UK	26.6%	Extraction only	Not stated	Healthy patients only	GDPs	GDP
Drummond	(70)	2004	New Zealand	5.1%	Comprehensive care	Not stated	Not stated	Paediatric specialists	Not stated
Macpherson	(66)	2005	UK	25%	Extraction only	Not stated	Mixed population	Not stated	GDP
Al-Malik	(97)	2006	Saudi Arabia	0.5%	Comprehensive care	Not stated	Mixed population	Paediatric specialists	Paediatric specialist
Albadri	(37)	2006	UK	11.9%	Comprehensive care	21% of those who required a repeat had radiographs	Healthy patients only	Not stated	Paediatric specialist
Kakaounaki	(60)	2006	UK	10.7%	Extraction only	Not stated	Healthy patients only	Not stated	GDP
Kwok-Tung	(98)	2006	USA	3.5%	Comprehensive care	If required	Medically compromised / special healthcare needs only	Not stated	Paediatric specialist

Author	Reference	Year	Country	Repeat DGA rate	Treatment approach	Radiographic assessment	Medical status	Treatment provider	Treatment planner
Barberia	(99)	2007	Spain	6.3%	Comprehensive care	Not stated	Mixed population	Paediatric specialists	Paediatric specialist
O'Leary	(35)	2007	Ireland	51%	Comprehensive care	If required	Medically compromised / special healthcare needs only	Not stated	Not stated
Schroth	(100)	2007	Canada	76%	Comprehensive care	Not stated	Not stated	GDPs	GDP
O'Donnell	(38)	2009	UK	4.6%	Comprehensive care	Sometimes	Mixed population	Not stated	Mixed (69.7% paediatric)
Page	(42)	2009	New Zealand	2.4%	Comprehensive care	Not stated	Mixed population	Not stated	Not stated
Richards	(101)	2009	UK	4.96%	Extraction only	Not stated	Mixed population	Not stated	Not stated
Amin	(76)	2010	Canada	8%	Comprehensive care	Not stated	Healthy patients only	Paediatric specialists	Paediatric specialist
Kakaounaki	(33)	2011	UK	8.9%	Extraction only	Not stated	Mixed population	Not stated	GDP
Olley	(102)	2011	UK	47%	Not stated	Not stated	Mixed population	Not stated	Not stated
Siddik	(103)	2011	UK	4.1%	Comprehensive care	Not stated	Mixed population	Not stated	Paediatric specialist
El Batawi	(79)	2014	Saudi Arabia	4.2%	Comprehensive care	Not stated	Healthy patients only	Paediatric specialists	Paediatric specialist
Fitzsimons	(104)	2014	UK	11.7%	Not stated	Not stated	Medically compromised / special healthcare needs only	Not stated	Not stated
Savanheimo	(105)	2014	Finland	11%	Comprehensive care	Not stated	Mixed population	Paediatric specialists	Paediatric specialist
Tahmassebi	(106)	2014	UK	12.9%	Comprehensive care	Not stated	Mixed population	Not stated	Not stated
Alkilzy	(107)	2015	Germany	2%	Comprehensive care	Not stated	Mixed population	Paediatric specialists	Paediatric specialist
Amin	(77)	2015	Canada	2.9%	Comprehensive care	Not stated	Healthy patients only	Paediatric specialists	Paediatric specialist
D'Mello	(43)	2015	Australia	4.9%	Comprehensive care	Not stated	Medically compromised / special healthcare needs only	Paediatric specialists	Paediatric specialist
Deery	(108)	2015	UK	<1%	Comprehensive care	Not stated	Not stated	Not stated	Paediatric specialist
EzEldeen	(109)	2015	Belgium	24%	Comprehensive care	Not stated	Healthy patients only	Not stated	Not stated
Goodwin	(110)	2015	UK	12%, 15%, 28%, 13%, 37%, 30%	Comprehensive care	Not stated	Mixed population	Not stated	Not stated
Bücher	(41)	2016	Germany	10.8%	Comprehensive care	Where indicated	Medically compromised / special healthcare needs only	Paediatric specialists	Paediatric specialist
Friend	(31)	2016	UK	6.4%	Extraction only	Not stated	Healthy patients only	OMFS	Non-paediatric specialist (OMFS)
Jogezai	(36)	2016	UK	3.3%	Comprehensive care	<30% of patients	Mixed population	GDPs	GDP
Raja	(111)	2016	UK	3.2%	Extraction only	Not stated	Mixed population	SCD	Non-paediatric specialist (SCD)
Guidry	(15)	2017	USA	4.9%	Comprehensive care	Not stated	Mixed population	Paediatric specialists	Paediatric specialist
McAuliffe	(112)	2017	Ireland	10%	Extraction only	Not stated	Not stated	Not stated	Not stated
Bakkal	(73)	2018	Turkey	2%	Comprehensive care	Not stated	Mixed population	Paediatric specialists	Paediatric specialist
Timms	Unpublished	2018	UK	0.62%	Comprehensive care	Where required	Mixed population	Paediatric specialists	Paediatric specialist

Author	Reference	Year	Country	Repeat DGA rate	Treatment approach	Radiographic assessment	Medical status	Treatment provider	Treatment planner
	data, stakeholder consultation								
Lucas	(64)	2018	UK	7.6%	Extraction only	Not stated	Healthy patients only	Mixed providers	Not stated
Marshall	(32)	2018	UK	0.8%	Comprehensive care	Yes	Healthy patients only	Paediatric specialists	Paediatric specialist
P J Steed	Unpublished data, stakeholder consultation	2018	UK	1.8%	Comprehensive care	In over 85% of cases	Mixed population	Not stated	Not stated
Rudie	(113)	2018	USA	18%	Comprehensive care	Not stated	Mixed population	Paediatric specialists	Paediatric specialist
Brown	(82)	2019	UK	5%	Comprehensive care	Yes	Mixed population	Paediatric specialists	Paediatric specialist
Edmonds	(114)	2019	USA	13%	Comprehensive care	Not stated	Healthy patients only	Paediatric specialists	Paediatric specialist
Gakhal	(50)	2019	UK	1.1%	Not stated	Present for 35% requiring a repeat DGA	Mixed population	Not stated	GDP
Kirby	(46)	2020	UK	0.06%	Comprehensive care	In 22/41 of repeats 53%	Mixed population	Paediatric specialists	Paediatric specialist
König	(47)	2020	Germany	12.3%	Comprehensive care	Not stated	Mixed population	Not stated	Not stated
Pani	(115)	2020	Saudi Arabia	5.4%	Comprehensive care	Not stated	Healthy patients only	Not stated	Not stated
Warren	(68)	2020	USA	33%	Comprehensive care	Not stated	Mixed population	Mixed providers	Mixed
Azadani	(40)	2021	USA	13%	Comprehensive care	Yes	Healthy patients only	Paediatric specialists	Paediatric specialist
Chen	(56)	2021	Australia	8.4%	Comprehensive care	Not stated	Mixed population	Not stated	Not stated
J. F. Large	(63)	2021	UK	1%	Comprehensive care	Not stated	Mixed population	Not stated	Paediatric specialist
Parry	(116)	2021	Ireland	47%	Comprehensive care	Not stated	Medically compromised / special healthcare needs only	Not stated	Not stated
Pecci-Lloret	(34)	2021	Spain	20.7%	Comprehensive care	Only in 27.9%	Medically compromised / special healthcare needs only	Paediatric specialists	Paediatric specialist
Smorthit	(27)	2021	UK	5.4%, 4.7%, 2.6%	Comprehensive care	Not stated	Not stated	Not stated	Not stated
Vertullo	(39)	2021	Canada	13.8%	Comprehensive care	Not stated	Mixed population	Paediatric specialists	Paediatric specialist
Teresa Ng	Unpublished data, stakeholder consultation	2022	UK	1.23%	Comprehensive care	Not stated	Mixed population	GDPs and SCD	Non-paediatric specialist (GDP/SCD)

Author	Reference	Year	Country	Repeat DGA rate	Treatment approach	Radiographic assessment	Medical status	Treatment provider	Treatment planner
Zaheer	(117)	2022	UK	2%	Extraction only	If required	Not stated	OMFS	Non-paediatric specialist (OMFS ± orthodontics)
Teague	(13)	2025	UK	1.21%	Comprehensive care	Yes	Mixed population	Paediatric specialists	Paediatric specialist
Yazdanbakhsh	(118)	2025	Canada	9.9%	Comprehensive care	Not stated	Mixed population	Not stated	Not stated
Hurry	(51)	2026	UK	7.26%	Comprehensive care	Not stated	Mixed population	Paediatric specialists	Paediatric specialist

Three unpublished sources were identified through stakeholder consultation and are therefore not included as conventional bibliographic references.

Appendix 3. PRISMA-ScR Checklist

SECTION	TOPIC	ITEM	PRISMA-ScR CHECKLIST ITEM	REPORTED ON PAGE #
TITLE	**Title**	**1**	Identify the report as a scoping review.	1
ABSTRACT	**Structured summary**	**2**	Provide a structured summary that includes (as applicable): background, objectives, eligibility criteria, sources of evidence, charting methods, results, and conclusions that relate to the review questions and objectives.	1
INTRODUCTION	**Rationale**	**3**	Describe the rationale for the review in the context of what is already known. Explain why the review questions/objectives lend themselves to a scoping review approach.	2–3
INTRODUCTION	**Objectives**	**4**	Provide an explicit statement of the questions and objectives being addressed with reference to their key elements (e.g., population or participants, concepts, and context) or other relevant key elements used to conceptualize the review questions and/or objectives.	3
METHODS	**Protocol and registration**	**5**	Indicate whether a review protocol exists; state if and where it can be accessed (e.g., a Web address); and if available, provide registration information, including the registration number.	3
METHODS	**Eligibility criteria**	**6**	Specify characteristics of the sources of evidence used as eligibility criteria (e.g., years considered, language, and publication status), and provide a rationale.	4
METHODS	**Information sources**	**7**	Describe all information sources in the search (e.g., databases with dates of coverage and contact with authors to identify additional sources), as well as the date the most recent search was executed.	4; Supplementary Appendix 1, p. 14
METHODS	**Search**	**8**	Present the full electronic search strategy for at least 1 database, including any limits used, such that it could be repeated.	Supplementary Appendix 1, pp. 14–16

SECTION	TOPIC	ITEM	PRISMA-ScR CHECKLIST ITEM	REPORTED ON PAGE #
METHODS	**Selection of sources of evidence**	**9**	State the process for selecting sources of evidence (i.e., screening and eligibility) included in the scoping review.	4
METHODS	**Data charting process**	**10**	Describe the methods of charting data from the included sources of evidence (e.g., calibrated forms or forms that have been tested by the team before their use, and whether data charting was done independently or in duplicate) and any processes for obtaining and confirming data from investigators.	4
METHODS	**Data items**	**11**	List and define all variables for which data were sought and any assumptions and simplifications made.	4–5
METHODS	**Critical appraisal of individual sources of evidence**	**12**	If done, provide a rationale for conducting a critical appraisal of included sources of evidence; describe the methods used and how this information was used in any data synthesis (if appropriate).	Not applicable – critical appraisal was not undertaken
METHODS	**Synthesis of results**	**13**	Describe the methods of handling and summarizing the data that were charted.	4–5
RESULTS	**Selection of sources of evidence**	**14**	Give numbers of sources of evidence screened, assessed for eligibility, and included in the review, with reasons for exclusions at each stage, ideally using a flow diagram.	5; Figure 1
RESULTS	**Characteristics of sources of evidence**	**15**	For each source of evidence, present characteristics for which data were charted and provide the citations.	6–7; Appendix 2, pp. 17–19

SECTION	TOPIC	ITEM	PRISMA-ScR CHECKLIST ITEM	REPORTED ON PAGE #
RESULTS	**Critical appraisal within sources of evidence**	**16**	If done, present data on critical appraisal of included sources of evidence (see item 12).	Not applicable – critical appraisal was not undertaken
RESULTS	**Results of individual sources of evidence**	**17**	For each included source of evidence, present the relevant data that were charted that relate to the review questions and objectives.	8–9; Appendix 2, pp. 17–19
RESULTS	**Synthesis of results**	**18**	Summarize and/or present the charting results as they relate to the review questions and objectives.	6–9
DISCUSSION	**Summary of evidence**	**19**	Summarize the main results (including an overview of concepts, themes, and types of evidence available), link to the review questions and objectives, and consider the relevance to key groups.	10–12
DISCUSSION	**Limitations**	**20**	Discuss the limitations of the scoping review process.	11–12
DISCUSSION	**Conclusions**	**21**	Provide a general interpretation of the results with respect to the review questions and objectives, as well as potential implications and/or next steps.	12
FUNDING	**Funding**	**22**	Funding for the review reported; funding of individual included sources was not charted	12 (funding for the review reported)

Source: Tricco AC, Lillie E, Zarin W, et al. PRISMA Extension for Scoping Reviews (PRISMA-ScR): Checklist and Explanation. Ann Intern Med. 2018;169:467–473.