Guidelines For The Management Of Children Referred For Dental Extractions Under General Anaesthesia

The Association of Paediatric Anaesthetists of Great Britain & Ireland

The Royal College of Anaesthetists

The Association of Anaesthetists of Great Britain & Ireland

The Association of Dental Anaesthetists www.dentalanaesthesia.org.uk

The British Society of Paediatric Dentistry

FGDP (UK) PROMOTING EXCELLENCE IN DENTISTRY

Royal College of Nursing

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These guidelines are published in good faith by the Association of Paediatric Anaesthetists of Great Britain and Ireland, on behalf of the endorsing organisations listed on page 5. SIGN methodology was used and the Guideline Development group included nominated representatives from stakeholders, as detailed on page 6. The members of the Guideline Development Group have agreed the process and outcomes of their deliberations. The guidelines have been peer reviewed by all the relevant stakeholder organisations, as well as representatives of children, young people and families. If there are any inaccuracies, please contact the Chair of the Guideline Committee via either the email address below or the APA website: http://www.apagbi.org.uk/

The APA supports the Guideline Development Group with expenses for travel, secretarial and librarian support to help produce the guidelines and for any material required for dissemination of the guidelines. There is no other remuneration to individual members of the Guideline Development Group.

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Guidelines For The Management Of Children Referred For Dental Extractions Under General Anaesthesia

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1. INTRODUCTION

These guidelines were commissioned by the Association of Paediatric Anaesthetists of Great Britain and Ireland, in collaboration with the Association of Dental Anaesthetists; the British Society of Paediatric Dentistry; the Royal College of Anaesthetists; the Association of Anaesthetists of Great Britain and Ireland and the Royal College of Nursing. They are designed to provide evidence-based information on the management of children and young people who are referred for dental extractions under general anaesthesia.

The guidelines were prepared by a committee of healthcare professionals, with the assistance of a patient representative. Prior to publication, there was a period of open consultation during which suggestions were received from representatives of patient groups and professional organisations. The target users of these guidelines include dentists, anaesthetists, registered nurses, dental nurses and operating department assistants / practitioners. Some sections of the document may also be of interest to parents / carers. Barriers to implementation and health economics were not within the remit of these guidelines and were not considered by the Guideline Development Group.

In this document the term "outpatient" is used to describe short-stay ambulatory care. It is acknowledged that the facilities and organisation of such services vary widely throughout the United Kingdom; however, general anaesthesia for dental extractions must be provided within a hospital setting as defined below. It is also recognised that many hospitals now incorporate their paediatric dental service within a day-case surgical service, which may allow the safe management of more complex cases. It is emphasised that, whatever the length of stay, children undergoing general anaesthesia for dental extractions should receive the same standard of care as children undergoing general anaesthesia for any other procedure.

These guidelines have been officially endorsed by all the organisations listed below:

- Association of Paediatric Anaesthetists of Great Britain and Ireland
- Association of Dental Anaesthetists
- Association of Anaesthetists of Great Britain & Ireland
- British Society of Paediatric Dentistry
- Royal College of Anaesthetists
- Royal College of Nursing
- Faculty of General Dental Practice (UK)

The guidelines are also officially supported by the Royal College of Paediatrics and Child Health.

The document will be reviewed every five years.

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2. COMMITTEE

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Dr Christine Arnold	Specialist in Special Care Dentistry (Association of Dental Anaesthetists)
Dr Michael Blayney	Consultant Anaesthetist (Royal College of Anaesthetists)
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Declaration

The Guideline Development Group is editorially independent and members had travel expenses reimbursed by the APAGBI according to its published expenses policy.

There were no Conflicts of Interest (available on request from apagbiadministration@aagbi.org).

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3. METHODOLOGY AND EVIDENCE GRADING

Electronic and manual searches were performed of the published literature up to 31st October 2010 (See Appendix I) Included were English language meta-analyses, systematic reviews, randomised controlled trials, clinical trials, cohort studies, case series and studies in patients aged 0 – 18 years. Members of the Guideline Development Group also performed manual searches of guidelines published by relevant professional regulatory bodies, associations and Royal Colleges. The Guideline Development Group reviewed some of the literature relating to adult patients, particularly where results could reasonably be extrapolated to the care of older children and adolescents. Case reports were excluded, together with articles published in foreign languages and those describing the use of drugs or techniques that were not applicable to practice within the United Kingdom.

Evidence was assessed, using SIGN methodology and definitions, as level 1 – 4 according to the criteria below. Recommendations were graded A – D according to the level of evidence used to compile them. For areas where published evidence was insufficient to make a formal recommendation, Good Practice Points (GPP) are provided. The latter indicate best clinical practice, based on the clinical experience and opinion of the Guideline Development Group. Mandatory recommendations are legal requirements or standards agreed by the General Medical Council and/or General Dental Council.

3.1 LEVELS OF EVIDENCE (WWW.SIGN.AC.UK)

1++	High quality meta-analyses, systematic reviews of randomised controlled trials (RCTs), or RCTs with a very low risk of bias
1+	Well-conducted meta-analyses, systematic reviews, or RCTs with a low risk of bias
1-	Meta-analyses, systematic reviews, or RCTs with a high risk of bias
2++	High quality case control or cohort studies with a very low risk of confounding or bias and a high probability that the relationship is causal
2+	Well-conducted case control or cohort studies with a low risk of confounding or bias and a moderate probability that the relationship is causal
2-	Case control or cohort studies with a high risk of confounding or bias and a significant risk that the relationship is not causal
3	Non-analytic studies, e.g. case reports, case series
4	Expert opinion

3.2 GRADES OF RECOMMENDATIONS (WWW.SIGN.AC.UK)

[A] At least one meta-analysis, systematic review, or RCT rated as 1++, and directly applicable to the target population; or a body of evidence consisting principally of studies rated as 1+, directly applicable to the target population, and demonstrating overall consistency of results

[B] A body of evidence including studies rated as 2++, directly applicable to the target population, and demonstrating overall consistency of results; or extrapolated evidence from studies rated as 1++ or 1+

[C] A body of evidence including studies rated as 2+, directly applicable to the target population and demonstrating overall consistency of results; or extrapolated evidence from studies rated as 2++

[D] Evidence level 3 or 4, or extrapolated evidence from studies rated as 2+

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4. DEFINITION OF A GUIDELINE

The Scottish Intercollegiate Guidelines Network (www.sign.ac.uk) in their Guideline Developers Handbook (SIGN 50) states that:

Clinical practice guidelines have been defined as "systematically developed statements to assist practitioner and patient decisions about appropriate health care for specific clinical circumstances". They are designed to help practitioners assimilate, evaluate and implement the ever increasing amount of evidence and opinion on best current practice. Clinical guidelines are intended as neither cookbook nor textbook but where there is evidence of variation in practice, which affects patient outcomes, and a strong research base providing evidence of effective practice, guidelines can assist healthcare professionals in making decisions about appropriate and effective care for their patients.

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5. MEDICOLEGAL STATUS OF GUIDELINES

SIGN has clarified the status of guidelines as follows:

Clinical guidelines do not rob clinicians of their freedom, nor relieve them of their responsibility to make appropriate decisions based on their own experience and according to the particular circumstances of each patient. It is stressed that the standard of care required by law derives from customary and accepted practice rather than from the imposition of practices through clinical guidelines.

To be liable for clinical negligence, it must be established that the course the healthcare professional has adopted "is one which no professional man of ordinary skill would have taken if he had been acting with ordinary care". This test, from a case Hunter v Hanley in 1955 was developed further by the Bolam test, i.e. a healthcare professional is not guilty of negligence if "he has acted in accordance with a practice accepted as proper by a responsible body of men skilled in that particular art". A healthcare professional may therefore defend a charge of negligence with evidence that (s)he acted in conformity with the practice accepted by another body of opinion. The test applied by the Court is therefore based on what is actually done in practice rather than on a prescription of what should be done as proposed by guidelines. Customary and accepted practice will be established in court by introduction of expert testimony. Although clinical guidelines will not be introduced as a substitute for expert testimony, they may be referred to by an expert witness as evidence of such customary and accepted practice.

It is important to emphasise that guidelines are intended as an aid to clinical judgment not to replace it. Guidelines do not provide the answers to every clinical question, nor guarantee a successful outcome in every case. The ultimate decision about a particular clinical procedure or treatment will always depend on each individual patient's condition, circumstances and wishes, and the clinical judgment of the healthcare team.

Guidelines are, however, intended to address variation in practice. While there is no compulsion to implement any guideline or individual recommendations, NHS Boards, clinical teams, and individual practitioners in primary and secondary care should all be able to define the standard of care which they provide, and to justify if necessary why these do not meet nationally agreed recommendations.

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6. AIMS AND REMIT

To develop an evidence-based consensus on the care pathway from referral to discharge for children and young people who are referred for dental extractions under general anaesthesia.

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7. KEY QUESTIONS

7.1 What is the optimal integrated care pathway for children and young people who may require general anaesthesia for dental extractions?

7.2 To which children and young people will these guidelines apply?

7.3 What assessment and preparation are required?

7.4 How can the requirement for general anaesthesia, especially repeat general anaesthesia, be reduced?

7.5 What should be the minimum standards for seniority and competencies of staff?

7.6 What are the minimum standards for perioperative monitoring?

7.7 Is intravenous access necessary?

7.8 What are the implications of various anaesthetic techniques for perioperative care and postoperative adverse effects?

7.9 What is the optimal analgesic regimen?

7.10 What equipment and staffing levels are required for recovery?

7.11 What should be the criteria and procedures for discharge home?

7.12 What advice should be given about postoperative care following discharge?

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8. A SUGGESTED CARE PATHWAY

Referring Dentist

Child requiring dental extractions not manageable within general dental practice setting

Referral guidelines and proforma

Primary Care Setting

Assessment Appointment

(Dentist with experience in Paediatric Dentistry)

- Dental and medical history
  Dental examination & radiology
  Definitive treatment planning
- **Agreement on the most appropriate form of pain and anxiety management**

General anaesthesia required

- Preliminary anaesthetic assessment performed by assessing dentist
- Access to the opinion of an anaesthetist, if required
- Patient preparation. Requirement for sedative premedication considered. Verbal & written information provided

Acquisition of informed consent

Suitable for 'outpatient' GA

Setting - dependent on local facilities

GA not considered to be the best option, i.e. suitable for treatment under local anaesthesia +/- inhalational sedation (but GDP unable to provide)

Extractions arranged by dental assessor

GA is considered to be the best option, but not suitable for 'outpatient' setting (e.g. significant medical condition or complex dental problem)
See paragraph 11 – Conditions requiring special consideration

Link to hospital day care, inpatient and paediatric services,
including access to Consultant in Paediatric Dentistry

Hospital Appointment

(Routine non-emergency cases)

- **Assessment by anaesthetist**
- **Confirmation of consent**
- **Dental extractions performed**

Hospital Setting *

*** As defined by: A Conscious Decision: A review of the use of general anaesthesia and conscious sedation in primary dental care. DOH 2000 [6]. General anaesthesia for dental treatment in a hospital setting with critical care facilities. CDO letter DoH; 2001 [29].**

9. KEY RECOMMENDATIONS

9.1 REFERRAL

Recommendation 1

Dental extractions should only be performed under general anaesthesia when this is considered to be the most clinically appropriate method of management.

(MANDATORY)

Recommendation 2

All services should develop a local referral proforma, distributed with appropriate guidance to all referrers. The referral letter should clearly justify the use of general anaesthesia, though the ultimate decision on whether general anaesthesia is administered should be made at the assessment appointment.

(GRADE D)

9.2 ASSESSMENT AND PREPARATION

Recommendation 3

Children undergoing general anaesthesia for dental extractions should receive the same standard of assessment and preparation as children admitted for any other procedure under general anaesthesia.

(GRADE D)

Recommendation 4

Options for the dental extractions, including whether they are performed under local anaesthesia, local anaesthesia supplemented with conscious sedation, or general anaesthesia, should be explained to the parent / carer and child (where appropriate), allowing adequate time for each option to be considered. The associated benefits and risks of each technique should also be discussed.

(MANDATORY)

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Recommendation 5

Unless there is an urgent clinical need for treatment, assessment should ideally be undertaken at a separate appointment. This should include the formation of a treatment plan, preparation for the procedure and associated general anaesthesia, assessment of the need for sedative premedication, information sharing, discharge planning and an explanation of fasting instructions together with an appropriate regimen for analgesia. Sufficient time should be provided to allow the parent / carer and child to arrive at a considered opinion and to give informed consent.

(GRADE D)

Recommendation 6

The assessing dentist should ideally be a specialist in paediatric dentistry, or a dentist who can demonstrate the necessary competencies to carry out comprehensive treatment planning for children who require general anaesthesia. The dentist should be trained and experienced in the behavioural management of children, including conscious sedation (particularly inhalational sedation). The dentist should also be conversant with all clinical guidelines relevant to the assessment, diagnosis, treatment planning and management of children requiring dental extractions under general anaesthesia. Relevant radiological investigations should be available at the assessment appointment.

(GRADE D)

Recommendation 7

At the assessment appointment, written information should be provided in suitable formats for the child and the parent / carer. This should include details about:

- Preoperative preparation, including preoperative fasting
- The proposed treatment plan, including benefits and risks
- The availability of alternative treatment options
- The process of general anaesthesia, including potential side effects and complications
- Appropriate escorts for the child on the day of the procedure
- Postoperative arrangements, including suitable transport home
- Postoperative care and analgesia.

(GRADE D)

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Recommendation 8

The opinion of an appropriately trained and experienced anaesthetist should be available, if required, prior to the treatment appointment. Dental and relevant medical case records should also be available.

(GRADE D)

9.3 APPROPRIATE SITE AND FACILITIES

Recommendation 9

Children requiring general anaesthesia for dental extractions should be managed in a child-centred, family-friendly hospital setting. This should provide the space, facilities, equipment and appropriately trained personnel required to enable resuscitation and critical care to be immediately, efficiently and effectively undertaken, should the need arise. Agreed protocols and appropriate communication links must be in place, both to summon additional assistance in an emergency situation and for the timely transfer of paediatric patients to dedicated areas such as high dependency units (HDUs) or intensive care units (ICUs), if necessary.

(MANDATORY)

9.4 PERIOPERATIVE CARE

Recommendation 10

Children undergoing general anaesthesia for dental extractions should receive the same standard of care as children admitted for any other procedure under general anaesthesia. This should include an opportunity to visit the department before the day of the procedure, as well as access to preoperative preparation by registered children's nurses and / or play specialists. If such staff are not employed within the department, arrangements should be made to ensure appropriate availability on a flexible basis.

(GRADE D)

Recommendation 11

Children undergoing general anaesthesia for dental extractions should be cared for in a family-orientated environment. This should allow the parent / carer to accompany the child during induction of general anaesthesia, where appropriate. Treatment rooms should be child-friendly, with suitable play and recreational equipment in the waiting areas. There should be physical separation from adult patients, as well as adequate space to accommodate the equipment required to meet the needs of the child with physical disabilities.

(GRADE D)

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Recommendation 12

Parents and carers should be informed of the potential adverse effects of general anaesthesia, including the timescale of these. Advice should be given about return to school and normal activities, as well as the management of behavioural changes at home.

(GRADE C)

Recommendation 13

Children undergoing general anaesthesia for dental extractions should be managed by staff who have received appropriate training, and who are competent in paediatric anaesthesia and paediatric resuscitation. Regular updates in resuscitation techniques, together with practice as a team in the management of simulated emergencies, are essential to maintain skills and optimise effective team working in a genuine crisis.

(GRADE D)

Recommendation 14

Whenever general anaesthesia is administered to a child, clinical observation should be supplemented by minimum standards of monitoring. These standards should be uniform irrespective of the duration, location or mode of anaesthesia.

(GRADE D)

Recommendation 15

Intravenous access should be considered for every patient. Topical local anaesthetic cream (Ametop® / EMLA® / LMX4®) should be applied preoperatively to potential sites for venepuncture, where appropriate.

(GPP)

Recommendation 16

All clinical staff should be aware of relevant legislation including the Children Act 2004 (or its equivalent), the rights of the child, safeguarding of children / child protection and the process of obtaining consent. All members of staff who care for children should be aware of local policies concerning the management of uncooperative children.

(GPP)

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Recommendation 17

All clinical staff caring for children should have the necessary level of competence in the safeguarding of children / child protection. *

(MANDATORY)

*This should be a minimum of "Level 2 Competence", as outlined by the Intercollegiate Document on Safeguarding Children and Young People (2010).[75]

9.5 PERIOPERATIVE ANALGESIA

Recommendation 18

Unless contraindicated, non-steroidal anti-inflammatory drugs (NSAIDs) and / or paracetamol should be used to provide analgesia for dental extractions under general anaesthesia. These drugs may be combined or given separately before, during or after surgery. Opioids are not routinely required for uncomplicated dental extractions.

(GRADE B)

Recommendation 19

Infiltration of a local anaesthetic agent combined with a vasoconstrictor agent may have a role in achieving haemostasis, with possibly some benefit in terms of analgesia in the older child who is able to understand the sensation of numbness.

(GRADE B)

Recommendation 20

The standards for recovery and discharge following general anaesthesia for dental extractions in children should be the same as those following general anaesthesia for any other procedure.

(GPP)

Recommendation 21

Children should be managed in a dedicated and appropriately equipped children's recovery area, on a one-to-one basis, by designated members of staff who receive regular training in paediatric resuscitation. A registered children's nurse must be available to provide care for paediatric patients and to supervise other nursing staff who may be involved in the care of children. A member of staff who is trained and competent in advanced paediatric life support should be available until the child is discharged from the department.

(GRADE D)

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9.6 RECOVERY AND DISCHARGE

Recommendation 22

Facilities should allow parents / carers to be present as soon as their child emerges from general anaesthesia. Adequate time should be allowed for the second stage of recovery and appropriate facilities should be provided for the child who requires prolonged recovery for medical, nursing, or social reasons.

(GPP).

Recommendation 23

Discharge or transfer of the patient should be based on specified criteria, irrespective of the time taken to achieve these.

(GPP)

Recommendation 24

Suitable transport home should be arranged. The child must be accompanied by a responsible adult.

(GPP)

Recommendation 25

Written and verbal advice about postoperative care should be provided for the parent / carer. A responsible adult must be available for care of the child at home. Clear information should also be provided on appropriate lines of communication in the event of any subsequent queries or postoperative problems.

(GPP)

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10. APPLICATION OF THESE GUIDELINES

- These guidelines are intended to apply to children and young people aged 1 – 18 years.

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11. CONDITIONS REQUIRING SPECIAL CONSIDERATION IN CHILDREN REFERRED FOR DENTAL EXTRACTIONS UNDER GENERAL ANAESTHESIA

- Anatomical or functional abnormalities of the airway
- Severe or poorly controlled asthma
- Cardiac disease which is symptomatic, requires treatment or has not been investigated
- Asymptomatic heart murmurs
- Coagulopathy, anti-coagulant therapy or anti-platelet therapy
- Abnormal Body Mass Index (<18.5 or > 30) [1-5]
- Gastro-oesophageal reflux which requires treatment
- Impaired renal or hepatic function
- Unstable metabolic or endocrine disorders
- Congenital syndromes or conditions associated with increased anaesthetic risk
- History of significant problem occurring under general anaesthesia
- Family history of significant problem occurring under general anaesthesia
- Previous abnormal reaction to anaesthetic agents
- Significant neurological or neuromuscular disorders
- Significant skin or connective tissue disorders
- Active systemic infection
- Haemoglobinopathies
- Significant learning disabilities or behavioural abnormalities
- Severe anxiety or history of unsatisfactory experience associated with general anaesthesia
- Requirement for sedative premedication

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12. REFERRAL, ASSESSMENT AND PREPARATION

12.1 REFERRAL

Dental procedures should only be performed under general anaesthesia when the latter is judged to be clinically necessary to deliver the required treatment [6]. Clear justification for the use of general anaesthesia should be made in the referral letter [7]. (Evidence Level 4)

Recommendation 1

Dental extractions should only be performed under general anaesthesia when this is considered to be the most clinically appropriate method of management.

(MANDATORY)

Guidelines on the referral process and acceptance criteria should be issued to all referrers. A standard referral proforma should be used to obtain essential information for patient triage [8-12]. (Evidence Level 2+)

In accordance with existing guidelines, the referrer should specify any indications for the use of general anaesthesia to perform the dental extractions. The ultimate decision on whether general anaesthesia is administered should, however, be made by the service provider when the patient attends the assessment appointment. [6, 7, 13, 14] (Evidence Level 4)

Recommendation 2

All services should develop a local referral proforma, distributed with appropriate guidance to all referrers. The referral letter should clearly justify the use of general anaesthesia, though the ultimate decision on whether general anaesthesia is administered should be made at the assessment appointment.

(GRADE D)

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12.2 ASSESSMENT AND PREPARATION

Dental extractions in children are often performed in the primary dental care setting, using local anaesthesia either with or without sedation. General anaesthesia may be required if these techniques are not suitable, particularly if they have been previously unsuccessful. Other factors to be considered include:

- The potential inability of the child to cooperate, determined by age, development, language or disability
- The existence of any psychological disorder
- The presence of acute dental infection
- The requirement for extractions in multiple quadrants

Children undergoing general anaesthesia for dental extractions should receive the same standard of assessment and preparation as children admitted for any other procedure under general anaesthesia. (GPP)

Prior assessment has been demonstrated to facilitate the patient pathway on the day of surgery [15]. (Evidence Level 4)

Recommendation 3

Children undergoing general anaesthesia for dental extractions should receive the same standard of assessment and preparation as children admitted for any other procedure under general anaesthesia.

(GRADE D)

12.2.1 SEPARATE ASSESSMENT VISIT

Assessment should ideally occur at a separate visit and incorporate dental, medical, and preliminary anaesthetic assessments [14, 16-18]. (Evidence Level 2+, 4) Special consideration may be required in urgent clinical cases or where there are geographical and / or social limitations.

A separate assessment appointment may allow:

- Confirmation of the need for treatment
- Modifications to the proposed treatment plan
- Opportunity for detailed discussion and consideration of alternative treatment options, together with the associated risks. Options for the dental extractions include: local anaesthesia, local anaesthesia supplemented with conscious sedation, or general anaesthesia [19].
- Assessment of the degree to which the explanations are understood by the parent /carer and the child [6, 7, 14, 17]. (Evidence Level 2+, 4)

- Reduction in the requirement for general anaesthesia by using alternative methods of pain and anxiety management [16], (Evidence Level 2+)
- Reduction in the requirement for repeat general anaesthesia through appropriate treatment planning [16, 20]. (Evidence Level 2+)
- Identification of any medical problems that may require the advice of an anaesthetist. [21]. (Evidence Level 4)
- Support for the child and parent / carer during preparation for general anaesthesia
- Assessment of the requirement for sedative premedication
- Discussion of: fasting instructions, appropriate escorts for the child on the day of the procedure, pain management, discharge advice, suitable transport home and return to normal activities

Recommendation 4

Options for the dental extractions including whether they are performed under local anaesthesia, local anaesthesia supplemented with conscious sedation, or general anaesthesia, should be explained to the parent / carer and child (where appropriate), allowing adequate time for each option to be considered. The associated benefits and risks of each technique should also be discussed.

(MANDATORY)

12.2.2 CONSENT

In children, the process of obtaining consent for dental extractions under general anaesthesia should be the same as obtaining consent for any other diagnostic or therapeutic procedure.

Informed consent must be obtained in writing from a parent or guardian with parental responsibility in accordance with the Children Act 2004 (or its equivalent), as well as other professional guidelines on obtaining consent. [22-26] Children who are competent should be invited to take part in the consent process. In order to provide informed consent to examination or treatment, children and their parents /carers should receive verbal and written information about the following [25, 27, 28]:

- Details of the proposed treatment plan, including benefits and risks
- Availability of alternative treatment options
- The process of general anaesthesia, including potential side effects and complications
- Preoperative fasting, appropriate escorts for the child on the day of the procedure, suitable transport home, post operative care and analgesia [7, 29]

(Evidence Level 4)

The decision to perform the procedure should involve the provision of information, acquisition of informed consent and maintenance of confidentiality [30]. Information for the parent / carer should be provided in an appropriate and easily understood format. Similarly, information for the child should be provided in a suitable format and where possible, the child's understanding should also be established[27, 28]. When treatment is not considered to be an emergency, obtaining consent should be seen as a process and not the isolated event of securing a signature immediately prior to the procedure being performed. The consent process should involve a discussion of treatment options with the provision of sufficient information to the parent /carer and the child. Appropriate time should then be provided to allow an informed decision to be reached. Information about the potential side effects and complications of general anaesthesia should be discussed early in this process. (Evidence Level 4)

If general anaesthesia is required for the dental extractions, the process of consent should begin before the patient meets the anaesthetist. It is neither practical nor desirable for all the information to be provided to children and parents /carers at the preoperative meeting with the anaesthetist. Other than in exceptional circumstances, it is not acceptable to provide children or parents / carers with new information at the time of general anaesthesia [26]. Evidence Level 4)

Preoperative preparation for children and parents / carers should employ a range of media and pre-treatment programmes, with contributions from all members of the multidisciplinary team[30]. (Evidence Level 4)

Recommendation 5

Unless there is an urgent clinical need for treatment, assessment should ideally be undertaken at a separate appointment. This should include the formation of a treatment plan, preparation for the procedure and associated general anaesthesia, assessment of the need for sedative premedication, information sharing, discharge planning and an explanation of fasting instructions together with an appropriate regimen for analgesia. Sufficient time should be provided to allow the parent / carer and child to arrive at a considered opinion and to give informed consent.

(GRADE D)

12.2.3 DENTAL ASSESSMENT

Dental assessment should ideally be performed by a specialist in paediatric dentistry [17, 31], or a dentist who can demonstrate the necessary competencies to carry out comprehensive treatment planning for children who require general anaesthesia. Where the assessing dentist is not a specialist, support from a specialist or consultant should be readily available, if required, through established clinical networks. Access to other specialties, such as orthodontics, oral surgery and maxillofacial surgery should also be available for all children.

The assessing dentist should be trained and experienced in the behavioural management of children and the use of conscious sedation techniques, particularly inhalation sedation [32]. (Evidence level 4)

The assessing dentist should also be conversant with all clinical guidelines relevant to the assessment, diagnosis, treatment planning and management of children who require dental extractions under general anaesthesia. [33, 34] (Evidence Level 4)

Familiarity with the management of anxious children is also important in determining the requirement for sedative premedication. The opinion of a suitably trained and experienced anaesthetist should be available prior to the treatment appointment, if required, with dental and relevant medical case records also made available. [21] (Evidence Level 4)

Comprehensive assessment, including radiography should facilitate the treatment planning process and may reduce the requirement for repeat general anaesthesia [14, 35]. (Evidence Level 4)

Recommendation 6

The assessing dentist should ideally be a specialist in paediatric dentistry, or a dentist who can demonstrate the necessary competencies to carry out comprehensive treatment planning for children who require general anaesthesia. The dentist should be trained and experienced in the behavioural management of children, including conscious sedation (particularly inhalational sedation). The dentist should also be conversant with all clinical guidelines relevant to the assessment, diagnosis, treatment planning and management of children requiring dental extractions under general anaesthesia. Relevant radiological investigations should be available at the assessment appointment.

(GRADE D)

12.2.4 ANAESTHETIC ASSESSMENT

Although questionnaires may be used for the initial screening process prior to general anaesthesia, there should always be access to the opinion of a suitably trained and experienced anaesthetist. The anaesthetist is ultimately responsible for the anaesthetic assessment and the adequacy of the information provided for each child and parent /carer prior to general anaesthesia [21, 26, 36]. The dental case records and relevant medical case records should be made available at the time of the anaesthetic assessment. (Evidence Level 4)

Accepted guidance[21, 36] emphasises the importance of preoperative assessment to ensure that:-

- Patients are fit for general anaesthesia
- Results of any relevant investigations are available at the time of treatment

- Children and parents / carers are given an opportunity to express any concerns they may have about general anaesthesia and the proposed treatment plan.

All patients requiring general anaesthesia must be seen by an anaesthetist preoperatively [21]. The anaesthetist is responsible for deciding whether or not a patient is fit for general anaesthesia, however it is common for other professional groups to be involved in the assessment process. (Evidence Level 4)

It is inappropriate for a particular type of premedication, technique of anaesthesia or method of pain management to be agreed without consultation with an anaesthetist. [21] (Evidence Level 4)

Written material may improve the information acquired by parents / carers and may enhance satisfaction. The timing of delivery of this information is also important.[37] (Evidence Level 2+)

Parents / carers and children should be advised that they will meet the anaesthetist prior to treatment, with the opportunity for further discussion and explanation.

Recommendation 7

At the assessment appointment, written information should be provided in suitable formats for the child and the parent / carer. This should include details about:

- **Preoperative preparation, including preoperative fasting**
- **The proposed treatment plan, including benefits and risks**
- **The availability of alternative treatment options**
- **The process of general anaesthesia, including potential side effects and complications**
- **Appropriate escorts for the child on the day of the procedure**
- **Postoperative arrangements, including suitable transport home**
- **Postoperative care and analgesia.**

(GRADE D)

Recommendation 8

The opinion of a suitably trained and experienced anaesthetist should be available, if required, prior to the treatment appointment. Dental and relevant medical case records should also be available.

(GRADE D)

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13. APPROPRIATE SITE AND FACILITIES (AS DEFINED BY THE DEPARTMENT OF HEALTH)

General anaesthesia for dental extractions should only be administered within a 'hospital setting'. The term 'hospital setting' was defined in the Department of Health document 'A Conscious Decision' (2001) as … "*any institution for the reception and treatment of persons suffering illness or any injury or disability requiring medical or dental treatment, which has critical care facilities on the same site and includes clinics and outpatient departments in connection with any such institution"* [7]. The terms 'hospital setting' and 'critical care facilities' were further clarified by the Department of Health in May 2001. [38]

13.1 'HOSPITAL SETTING' [38]

Children requiring general anaesthesia should be treated within an age-appropriate, child-centred and family-friendly hospital setting. The 'hospital setting' should be at least equivalent to that of a hospital within the NHS, including clinics and day care facilities associated with those institutions, where:

- Surgery or procedures which involve the use of general anaesthesia, with or without local anaesthesia, are regularly undertaken,
- Trained personnel are immediately available to assist the anaesthetist with the resuscitation of a collapsed patient so that the patient's airway, breathing and circulation are fully supported without delay,
- Facilities and staff are able to support and maintain a collapsed patient pending recovery or supervised transfer to a high dependency unit (HDU) or intensive care unit (ICU) that may, in some instances, be on a separate hospital site.

This does not necessarily mean that general anaesthesia for dental extractions should only be provided in what might be considered the main operating suite of those institutions. Usually, the clinics and day care facilities described above would be situated within the grounds of the hospital and either within, or close to, the main body of the hospital. Agreed protocols and appropriate communication links must be in place to summon extra help and also for the timely transfer of patients to dedicated areas such as HDUs or ICUs, should the need occur.

Usually, it is self-evident whether or not a particular site for the provision of general anaesthesia for dental extractions is part of the hospital setting. In cases of doubt, decisions on whether a proposed site is acceptable should be made by the responsible commissioning and healthcare provider organisations on a site-by-site basis taking into account:

- The building, equipment and facilities available,

- The arrangements made for the immediate provision of critical care (see below) at the proposed site. This should include easy access for emergency services and for a patient on a stretcher,

- The arrangements in place for the timely transfer of the patient to HDUs or ICUs, should this be necessary.

13.2 'CRITICAL CARE FACILITIES' [38]

A 'critical care facility' in this context is an area or room which has the space, equipment and appropriately trained personnel to enable critical care and resuscitation to be efficiently and effectively undertaken, should the need arise. The space required could be the existing operating area, if this is of sufficient size. Of paramount importance however, is the immediate, efficient and effective management of the collapse. 'Critical care facilities' in the context of this guidance are not necessarily dedicated areas such as HDUs or ICUs.

If there is a sudden and serious collapse of a patient during general anaesthesia for dental extractions, the overriding need is to provide swift and expert medical care. Additional skilled personnel must be immediately available, together with emergency drugs and equipment including defibrillation facilities.

All personnel involved with the administration of general anaesthesia must have up-to-date skills in advanced life support. The additional skilled support required should be provided by personnel who are trained specifically as a team to manage life-threatening situations. The level of care provided should be based on the needs of the patient and at least equivalent to "Level 2 Critical Care", as defined for adults by the Department of Health.[39]

Agreed protocols and appropriate communication links must be in place, both to summon additional assistance in an emergency situation, as well as for the timely transfer of paediatric patients to dedicated areas such as HDUs or ICUs, should the need occur.

Recommendation 9

Children requiring general anaesthesia for dental extractions should be managed in a child-centred, family-friendly hospital setting. This should provide the space, facilities, equipment and appropriately trained personnel required to enable resuscitation and critical care to be immediately, efficiently and effectively undertaken, should the need arise. Agreed protocols and appropriate communication links must be in place, both to summon additional assistance in an emergency situation and for the timely transfer of paediatric patients to dedicated areas such as high dependency units (HDUs) or intensive care units (ICUs), if necessary.

(MANDATORY)

Return to ToC

14. PERIOPERATIVE CARE

14.1 GENERAL PRINCIPLES OF CARE

Children undergoing general anaesthesia for dental extractions should receive the same standard of care as children admitted for any other procedure under general anaesthesia. This includes the completion of an appropriate preoperative checklist [40-46]. (Evidence Level 4)

An opportunity should be provided for the children to visit the department before the day of the procedure. There should also be access to preoperative preparation by registered children's nurses and / or play specialists [40, 41, 43-46]. If such staff are not employed directly within the department, flexible options should be considered in order to ensure appropriate availability on a sessional basis. (Evidence Level 4)

Recommendation 10

Children undergoing general anaesthesia for dental extractions should receive the same standard of care as children admitted for any other procedure under general anaesthesia. This should include an opportunity to visit the department before the day of the procedure, as well as access to preoperative preparation by registered children's nurses and / or play specialists. If such staff are not employed within the department, arrangements should be made to ensure appropriate availability on a flexible basis.

(GRADE D)

Children requiring general anaesthesia for dental extractions should be managed in a safe, family-orientated and child-friendly environment, separate from adult patients [47, 48]. This should allow parents / carers to accompany their child during induction of general anaesthesia, where appropriate. Suitable equipment, toys and games should be provided, together with a play area to reduce anxiety and improve recovery [49, 50]. The emotional and physical requirements of children should be reflected in the design of the operating theatre department, the appearance of the anaesthetic and recovery areas, as well as the working practices of the staff involved [48, 50, 51]. There should also be adequate space to accommodate the equipment required to meet the needs of the child with physical disabilities [41, 47, 51, 52]. A registered children's nurse must be available to supervise other nursing staff who may be involved in the care of children. Play specialists should also be available. [50]. (Evidence Level 4)

Recommendation 11

Children undergoing general anaesthesia for dental extractions should be cared for in a family-orientated environment. This should allow the parent / carer to accompany the child during induction of general anaesthesia, where appropriate. Treatment rooms should be child-friendly, with suitable play and recreational equipment in the waiting areas. There should be physical separation from adult patients, as well as adequate space to accommodate the equipment required to meet the needs of the child with physical disabilities.

(GRADE D)

14.2 PROCEDURE ON ARRIVAL AT THE WARD / ADMISSION AREA

Planned arrival times should allow adequate time for preparation of the child, whilst considering that strategies to reduce anxiety should include the shortest safe fasting times and minimal waiting times[30] (Evidence Level 4).

It is essential to confirm that fasting instructions have been followed. Baseline measurements and observations should be recorded (e.g. weight, temperature and pulse) for comparison with those obtained postoperatively.

A final dental and anaesthetic assessment should be made and topical local anaesthetic cream (EMLA® / Ametop® / LMX4®) applied, if appropriate. If the requirement for sedative premedication becomes apparent at this stage, having previously been unrecognised, it may be appropriate to reschedule the procedure to allow a planned strategy for anxiety management.

Parents / carers should be given appropriate support to reassure and comfort their child during induction and recovery.

14.3 MINIMUM STANDARDS FOR SENIORITY AND COMPETENCE OF ANAESTHETIST AND ANAESTHETIC ASSISTANT

Irrespective of the setting, children undergoing general anaesthesia for dental extractions should receive the same standard of care as those undergoing general anaesthesia for any other procedure. They should be anaesthetised by a consultant anaesthetist on the specialist register, who in addition to undertaking regular and relevant paediatric practice sufficient to maintain core competencies, possesses dedicated training and skills in paediatric dental general anaesthesia, and undertakes appropriate continuing professional development (CPD). [13, 51, 53, 54] Children may also be anaesthetised by a Staff Grade or Associate Specialist (SAS) anaesthetist, or Specialty Doctor (SD), provided that he or she satisfies the same criteria and that there is a nominated supervising consultant anaesthetist with appropriate experience [51] . Trainees anaesthetising children should always be appropriately supervised by a consultant with relevant experience [51]. (Evidence Level 4)

The anaesthetist should be assisted by staff (anaesthetic nurses or operating department practitioners/assistants) with specific training in paediatrics and skills relevant to paediatric dental general anaesthesia [13, 51]. (Evidence Level 4)

The anaesthetist should be assisted by staff (anaesthetic nurses or operating department practitioners/assistants) with specific training in paediatrics and skills relevant to paediatric dental general anaesthesia [13, 51]. (Evidence Level 4)

In the immediate post-anaesthetic recovery period, management of the patient should be in accordance with existing guidelines. [36, 51, 55, 56] (Evidence Level 4) The child should be managed in the recovery ward or post-anaesthesia care unit, on a one-to-one basis, by a designated trained member of the recovery team who has appropriate training in paediatric resuscitation [55]. A registered children's nurse must be available to supervise other nursing staff who may be involved in the care of children. A member of staff trained and competent in advanced paediatric life support should be present whenever general anaesthesia is administered to a child. [51] (Evidence Level 4)

14.4 ANAESTHETIC CONSIDERATIONS

Parents / carers should be advised that general anaesthesia may have short-term adverse effects such as headache, sore throat, sickness, dizziness and mild allergic reaction[28, 29, 57]. The risk of serious complications should also be explained[57]. Information should be provided on the effects of general anaesthesia on the child's cognition and behaviour. These usually resolve within 48 hours, however they may persist for up to 2 weeks, with effects on the child's performance at school as well as care of the child at home.[58, 59] (Evidence Level 3) There is some evidence that intravenous anaesthesia produces fewer such effects and also reduces postoperative vomiting.[60, 61] (Evidence Level 2+)

Recommendation 12

Parents and carers should be informed of the potential adverse effects of general anaesthesia, including the timescale of these. Advice should be given about return to school and normal activities, as well as the management of behavioural changes at home.

(GRADE C)

14.5 TRAINING IN PAEDIATRIC RESUSCITATION

Children undergoing general anaesthesia should be managed by staff who have received appropriate training and who are competent in paediatric anaesthesia and paediatric resuscitation [51]. Regular updates in resuscitation techniques, together with practice as a team in the management of simulated emergencies, are essential to maintain skills and optimise effective team working in a genuine crisis [13]. Training should follow guidance outlined by the Resuscitation Council (UK) [62]. (Evidence Level 4)

Specifically, anaesthetists administering general anaesthesia for dental extractions in children should be trained according to the most recent guidelines in advanced life support for children and should maintain the necessary skills [13, 36, 51, 62-65]. All members of the anaesthesia team should have experience in managing clinical emergencies, including paediatric life support. Recovery staff should also receive regular training in paediatric resuscitation. A member of staff trained and competent in advanced paediatric life support should be present for all sessions during which general anaesthesia is administered to children [36, 51]. (Evidence Level 4)

Recommendation 13

Children undergoing general anaesthesia for dental extractions should be managed by staff who have received appropriate training, and who are competent in paediatric anaesthesia and paediatric resuscitation. Regular updates in resuscitation techniques, together with practice as a team in the management of simulated emergencies, are essential to maintain skills and optimise effective team working in a genuine crisis.

(GRADE D)

14.6 MINIMUM STANDARDS FOR PERIOPERATIVE MONITORING

Nationally accepted guidelines on minimum standards of monitoring for general anaesthesia have been published by the *Association of Anaesthetists of Great Britain and Ireland (AAGBI)* [66]. Clinical observation must be supplemented by core standards of monitoring whenever a child is anaesthetised, in order to monitor the patient's physiological state and depth of anaesthesia, as well as the functioning of anaesthetic equipment. These minimum standards should be uniform irrespective of the duration, location, or mode of anaesthesia.

The following monitoring devices must always be available to ensure the safe conduct of general anaesthesia:

- Pulse oximeter
- Non-invasive blood pressure monitor
- Electrocardiogram
- Airway gas monitor (oxygen, carbon dioxide and volatile agent)
- Airway pressure monitor (whenever intermittent positive pressure ventilation is employed)

A nerve stimulator (if a neuromuscular blocking agent has been administered) and means of measuring the patient's temperature must also be available.

In children, it may not always be possible to attach all monitoring before the induction of anaesthesia due to lack of, or potential loss of, cooperation. Monitoring should however be commenced as soon as possible, and the reasons for any delay recorded in the patient's case-records. A detailed summary of the anaesthetic technique employed

should be clearly recorded, together with the information provided by the monitoring devices.

Monitoring should be maintained postoperatively until the child has fully recovered from general anaesthesia (i.e. has reached the end of Stage 1 Recovery), with clinical observations being supplemented by the following monitoring devices, where appropriate:

- Pulse oximeter
- Non-invasive blood pressure monitor

The following must also be immediately available:

- Electrocardiogram
- Nerve Stimulator (if a neuromuscular blocking agent has been administered)
- Temperature measuring device
- Capnograph

Recommendation 14

Whenever general anaesthesia is administered to a child, clinical observation should be supplemented by minimum standards of monitoring. These standards should be uniform irrespective of the duration, location or mode of anaesthesia.

(GRADE D)

14.7 INTRAVENOUS ACCESS

Recent national surveys have demonstrated that it is widely considered to be good practice to establish intravenous access during the course of general anaesthesia for dental extractions in children [67-69]. Intravenous access should be considered for every patient. Topical local anaesthetic cream (Ametop® / EMLA®/ LMX4®) should be applied preoperatively to potential sites for venepuncture, where appropriate. (Evidence Level 4)

Recommendation 15

Intravenous access should be considered for every patient. Topical local anaesthetic cream (Ametop® / EMLA® / LMX4®) should be applied preoperatively to potential sites for venepuncture, where appropriate.

(GPP)

14.8 MANAGEMENT OF THE UNCOOPERATIVE CHILD WHO REQUIRES GENERAL ANAESTHESIA FOR DENTAL EXTRACTIONS

All clinical staff should be aware of relevant legislation including the Children Act 2004 (or its equivalent), the rights of the child, safeguarding of children / child protection and the process of obtaining consent [22, 25, 26, 51, 53, 54, 70-75]. All members of staff who care for children should be aware of local policies for the management of uncooperative children. [70-72]. (Evidence Level 4)

Recommendation 16

All clinical staff should be aware of relevant legislation including the Children Act 2004 (or its equivalent), the rights of the child, safeguarding of children / child protection and the process of obtaining consent. All members of staff who care for children should be aware of local policies concerning the management of uncooperative children.

(GPP)

14.9 TRAINING IN SAFEGUARDING OF CHILDREN

The safety of the child is paramount. Specific guidance for anaesthetists has been developed jointly by the Association of Paediatric Anaesthetists of Great Britain and Ireland, the Royal College of Paediatrics and Child Health, and the Royal College of Anaesthetists[74]. Detailed guidance for the dental team is also available from the Department of Health[76]. All clinical staff who have any contact with children, young people and / or parents / carers should have a minimum of "Level 2" competence in safeguarding children / child protection, in accordance with the competency framework outlined in the Intercollegiate Document on Safeguarding Children and Young People (2010) [75]. Evidence Level 4

Recommendation 17

All clinical staff caring for children should have the necessary level of competence in the safeguarding of children / child protection. *

(MANDATORY)

*This should be a minimum of "Level 2 Competence", as outlined by the Intercollegiate Document on Safeguarding Children and Young People (2010).[75]

15. PERIOPERATIVE ANALGESIA

The available evidence on perioperative analgesia in children has recently been summarised by the Association of Paediatric Anaesthetists of Great Britain and Ireland [77]. Children undergoing dental extractions should be subject to the same generic principles of pain management as children undergoing any other surgical procedure. These principles include the need for age appropriate pain scoring, consideration of a range of analgesia techniques, together with information and instructions for parents about postoperative pain management [77]. There should be appropriate post-operative pain assessment and management policies, usually supported by a pain team[30].(Evidence Level 4)

Dental extractions are known to be associated with pain that can persist for up to 72 hours and analgesic treatment is frequently required [78, 79]. (Evidence Level 2+) Younger children and those having multiple extractions are more likely to experience pain and distress[80].(Evidence Level 3)

Children undergoing dental extractions should receive adequate analgesia based on widely accepted principles of pre-emptive, multi-modal analgesia and a modern understanding of analgesic pharmacology. Analgesic therapy should preferably start before surgery and be continued for as long as required postoperatively [77]. (Evidence Level 4)

Non-steroidal anti-inflammatory drugs (NSAIDs) provide satisfactory analgesia for dental extractions. Diclofenac or ibuprofen, either alone or in combination with paracetamol, each provides more effective analgesia than paracetamol alone [80, 81]. (Evidence Level 2++)

Opioid analgesics are not usually required to provide analgesia for uncomplicated dental extractions. They demonstrate no analgesia benefit over NSAIDs and may prolong recovery and increase sedation [82-84]. (Evidence Level 2++) However, opioid analgesics may be considered for multiple or difficult extractions. They may also be required as rescue analgesia when NSAIDs and paracetamol are contraindicated or have proved to be insufficient.

Recommendation 18

Unless contraindicated, non-steroidal anti-inflammatory drugs (NSAIDs) and / or paracetamol should be used to provide analgesia for dental extractions under general anaesthesia. These drugs may be combined or given separately before, during or after surgery. Opioids are not routinely required for uncomplicated dental extractions.

(GRADE B)

Evidence suggests that, in children, when dental extractions are performed under general anaesthesia in the presence of systemic analgesia, the use of local anaesthesia for additional analgesia is of minimal benefit. [85-90]. Trauma to the lip, cheek or tongue may occur following the use of local anaesthesia, particularly in small children. The sensation of numbness may also cause distress in younger children. Nevertheless, the combination of a local anaesthetic agent with a vasoconstrictor agent may be useful, primarily to reduce bleeding, with possibly some benefit in terms of analgesia in the older child who is able to understand the sensation of numbness. (Evidence Level 2++)

Recommendation 19

Infiltration of a local anaesthetic agent combined with a vasoconstrictor agent may have a role in achieving haemostasis, with possibly some benefit in terms of analgesia in the older child who is able to understand the sensation of numbness.

(GRADE B)

15.1 ANALGESIC REGIMENS FOR DENTAL EXTRACTIONS IN CHILDREN

Analgesic drugs may be administered preoperatively, intraoperatively or postoperatively, via the oral, intravenous or rectal route as appropriate. The following dosage guidelines (Table 1, and accompanying notes) are based on recommendations from the British National Formulary for Children (BNFC) and the publication by the Association of Paediatric Anaesthetists of Great Britain and Ireland entitled 'Good Practice in Postoperative and Procedural Pain' (2008).[77, 91] (Evidence Level 4)

Table 1. Suggested Analgesia Regimens for Dental Extractions in Children

	PREOPERATIVE	**INTRAOPERATIVE**	**POSTOPERATIVE**
OPTION 1	Oral **Paracetamol** 20mg/kg, 1 hr pre-operatively	--------	Oral **Ibuprofen** 5–10mg/kg, PRN
OPTION 2	Oral **Paracetamol** 20mg/kg, 1 hr pre-operatively	**Diclofenac** 1mg/kg per rectum (PR) after induction *	---------
OPTION 3	Oral **Paracetamol** 20mg/kg **and** oral **Ibuprofen** 5-10mg/kg, 1 hr pre-operatively	-------	---------
OPTION 4	Oral **Ibuprofen** 5-10mg/kg, 1 hr pre-operatively	--------	Oral **Paracetamol** 20mg/kg, PRN
OPTION 5	Oral **Ibuprofen** 5-10mg/kg, 1 hr pre-operatively	IV **Paracetamol** 15mg/kg **	---------
OPTION 6		IV **Paracetamol** 15mg/kg **	Oral **Ibuprofen** 5-10mg/kg, PRN

NOTES (to accompany Table 1):

1. **Unless contraindicated, all children should receive a preparation of Paracetamol and /or NSAID perioperatively.**

   If Paracetamol or NSAIDs have not been administered either preoperatively or intraoperatively, either oral Paracetamol 20mg/kg or oral Ibuprofen 5 – 10mg/kg may be administered in the recovery period

2. **Rectal preparations ***

   Diclofenac 1 mg/kg per rectum (PR) may be administered after induction of anaesthesia and following documented consent (if preoperative NSAIDs have not been administered). There is evidence that rectal diclofenac is more rapidly absorbed than oral NSAIDs, giving higher plasma levels [92]. (NB. Rectal **Paracetamol** is not recommended due to high dosage requirements (up to 45mg/kg), slow absorption and variable plasma concentrations [93, 94]).

3. **Intravenous preparations****

   IV **Paracetamol 15mg/kg** may be administered as an alternative to the oral route for children over 1 year old. This should be infused over a period of 15 minutes, which may limit its use for some very brief dental extractions.

   IV Diclofenac may be considered as an alternative but is not licensed for use in children [95].

4. **Opioids**

   Opioids are not routinely required for uncomplicated dental extractions, but may be administered intraoperatively for children undergoing multiple or difficult extractions (e.g. **Fentanyl** 0.5 – 1.0mcg/kg IV or **Tramadol** 1 – 2 mg/kg IV) [84, 96]. If an opioid is used then an antiemetic agent should be considered (please refer to the APAGBI guidelines for evidence-based advice on prevention and treatment of postoperative nausea and vomiting).[97]

   Following the administration of Paracetamol and an NSAID either preoperatively or intraoperatively, the treatment of pain experienced during the immediate post-anaesthetic recovery period may require an opioid as **rescue analgesia** (e.g. **Codeine** 0.5 – 1mg/kg orally, or **Tramadol** 1 – 2mg/kg orally).

5. **Local anaesthesia**

   Local anaesthetic agents may be administered by the dental surgeon. However, there is limited evidence for any benefit in terms of analgesia in children undergoing general anaesthesia in the presence of systemic analgesia. Younger children may become distressed by the sensation of numbness. There is also the risk of trauma to the tongue, lips and cheeks.

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16. RECOVERY AND DISCHARGE HOME

Recovery from general anaesthesia can be divided into three stages [98]. (Evidence Level 4)

First Stage Recovery

This stage lasts until the patient is awake, protective reflexes have returned and pain is controlled.

Second Stage Recovery

This stage begins at the end of stage one and ends when the patient is ready for discharge from hospital.

Late Recovery

This phase is very variable and ends when the patient has made a full physiological and psychological recovery from the surgical procedure.

The anaesthetic technique employed should be designed to maximise the speed and quality of recovery in the first and second stages, and so facilitate discharge from hospital [98].

16.1 EQUIPMENT AND STAFFING LEVELS IN THE RECOVERY AREA

Recovery from general anaesthesia for dental extractions in children requires the same standards of monitoring and staffing as recovery from any other procedure performed under general anaesthesia [55, 66].

There should be a separate recovery area for children, allowing parents / carers to be present as soon as their child has emerged from general anaesthesia. This should be within an age-appropriate child-friendly environment[51, 55]. (Evidence Level 4)

The recovery area should have appropriate equipment for management of the paediatric airway. Resuscitation equipment should also be immediately available. Children should be managed on a one-to-one basis, by designated trained members of the recovery staff, who receive regular training in paediatric resuscitation. A registered children's nurse must be available to provide care for paediatric patients and to supervise other nursing staff who may be involved in the care of children. A member of staff who is trained and competent in advanced paediatric life support should be available until the child is discharged from the department[51]. No fewer than two members of staff should be present when a child who does not fulfil the criteria for discharge remains within the recovery area [55]. (Evidence Level 4)

Standards of monitoring during recovery from dental extractions under general anaesthesia should be the same as those for any other procedure performed under

general anaesthesia. Clinical observations should be supplemented by use of a pulse oximeter and non-invasive blood pressure monitor, where appropriate. An electrocardiogram and capnograph should also be available, together with a nerve stimulator and a device to measure the patient's temperature [66]. (Evidence Level 4)

Recommendation 20

The standards for recovery and discharge following general anaesthesia for dental extractions in children should be the same as those following general anaesthesia for any other procedure.

(GPP)

Recommendation 21

Children should be managed in a dedicated and appropriately equipped children's recovery area, on a one-to-one basis, by designated members of staff who receive regular training in paediatric resuscitation. A registered children's nurse must be available to provide care for paediatric patients and to supervise other nursing staff who may be involved in the care of children. A member of staff who is trained and competent in advanced paediatric life support should be available until the child is discharged from the department.

(GRADE D)

16.2 DISCHARGE CRITERIA

Discharge from the recovery room (and ultimately, discharge home) is the responsibility of the attending clinicians, however the adoption of strict discharge criteria allows this decision to be delegated to the recovery staff [55].

Scoring systems exist to aid in the assessment of recovery, for example the Post-Anaesthesia Score modified for Day Surgery[99, 100] or the Post-anaesthesia Discharge Scoring System[101].

The discharge process should create an environment in which parents / carers understand their roles and responsibilities for continuing care and therefore feel confident to take their child home.

Whoever takes responsibility for assessing the suitability of a child for discharge should ensure that the following criteria are fulfilled:

16.2.1 CRITERIA FOR DISCHARGE

- Conscious level should be consistent with the child's preoperative state
- Cardiovascular and respiratory parameters should be stable
- Pain, nausea, vomiting and surgical bleeding should be minimal
- Mobility should be at a preoperative level
- A responsible adult must be present to accompany the child home (this adult must be able to give the child his / her undivided attention during the journey home)
- Suitable transport home should have been arranged

In addition to these criteria for discharge, the following should also be ensured:

- Contact telephone numbers should be provided for both emergency and continuing care
- Verbal and written instructions about the child's recovery at home should be given to the parent / carer, with confirmation of the level of understanding
- Follow-up arrangements should be made where appropriate
- Support and guidance on the administration of medication at home should be provided as necessary
- A letter to the General Dental Practitioner should be posted or given to the parent / carer, depending on the policy of the unit
- Suitable home environment, with regard to supervision of the child as well as access to further healthcare services, if required [102].

Although discharge home is not time-dependent, adequate time should be allowed for the second stage of recovery. Appropriate instructions should be given to the parent / carer and suitable transport home should be arranged[103, 104]. A responsible adult must accompany the child home and be available for subsequent care at home. Facilities

should be available for the child who requires prolonged recovery for medical, nursing or social reasons. These facilities should allow the parent / carer to accompany their child, where appropriate.

Recommendation 22

Facilities should allow parents / carers to be present as soon as their child emerges from general anaesthesia. Adequate time should be allowed for the second stage of recovery and appropriate facilities should be provided for the child who requires prolonged recovery for medical, nursing, or social reasons.

(GPP)

Recommendation 23

Discharge or transfer of the patient should be based on specified criteria, irrespective of the time taken to achieve these.

(GPP)

Recommendation 24

Suitable transport home should be arranged. The child must be accompanied by a responsible adult.

(GPP)

Recommendation 25

Written and verbal advice about postoperative care should be provided for the parent / carer. A responsible adult must be available for care of the child at home. Clear information should also be provided on appropriate lines of communication in the event of any subsequent queries or postoperative problems.

(GPP)

16.2.2 CARE AFTER DISCHARGE

Postoperative instructions [14, 35] should cover:

- Analgesia
- Postoperative nausea and vomiting
- Residual effects of general anaesthesia
- Bleeding
- Mouth-care
- Details of any sutures in-situ
- Eating
- Return to school or normal activities
- Lines of communication in the event of postoperative problems
- Prevention of caries[35]

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18. APPENDICES (SEE WEBSITE FILE FOR APPENDICES)