UK National Clinical Guidelines in Paediatric Dentistry

Guideline for the Use of General Anaesthesia (GA) in Paediatric Dentistry

Contents:

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1. Introduction

It is important to ensure that children and adolescents receive safe and effective pain control. A range of techniques are available, comprising four overlapping categories: behavioural techniques, local anaesthesia (LA), conscious sedation, and general anaesthesia (GA) (Figure 1).
Particular emphasis is placed on the importance of comprehensive treatment planning to ensure a satisfactory standard of oral health after a dental GA.

2. Indications for the use of GA in children.

There are essentially only two indications for GA:

- The child needs to be fully anaesthetised before dental treatment procedures can be attempted.
- The surgeon needs the child fully anaesthetised before dental treatment can be performed.

The difficulty is that neither of these indications are absolute. Both require a degree of judgement on the part of the dental surgeon. The decision to use GA is complicated by the knowledge that there is a small but real risk of death associated with GA. The knowledge that the majority of operative care can be carried out using either LA or LA with conscious sedation, sets dentistry aside from other paediatric surgical specialties where GA is the norm (1,2).
When discussing the use of GA with a child and carer, some general considerations need to be taken into account:

- The co-operative ability of the child.
- The perceived anxiety and how the child has responded to similar procedures.
- The degree of surgical trauma anticipated.
- The complexity of the operative procedure.
- The medical status of the child.

3. Circumstances and conditions suitable for GA.

- Severe pulpitis requiring immediate relief.
- Acute soft tissue swelling requiring removal of the infected tooth/teeth.
- Surgical drainage of an acute infected swelling.
- Single or multiple extractions in a young child unsuitable for conscious sedation.
- Symptomatic teeth in more than one quadrant.
- Moderately traumatic or complex extractions e.g. ankylosed or infra-occluded primary molars, extraction of broken-down permanent molars.
- Teeth requiring surgical removal or exposure.
- Biopsy of a hard or soft tissue lesion.
- Debridement and suturing of orofacial wounds.
- Established allergy to local anaesthesia.
- Post operative haemorrhage requiring packing and suturing.
- Examination under GA, including radiographs, for a special needs child where clinical evidence exists that there is a dental problem which warrants treatment under GA.

Severe pulpitis and acute infection are by far the most common conditions treated under GA (3,4).

4. Circumstances and conditions which rarely justify GA.

- Carious, asymptomatic teeth with no clinical or radiographic signs of sepsis.
- Orthodontic extraction of sound permanent premolar teeth in a healthy child.
- Patient/carer preference, except where other techniques have already been tried.

Extenuating circumstances that override the above limitations are:

- Physical, emotional, learning impairment or a combination of two or more of these.
- Children who have attempted treatment using LA alone or LA combined with conscious sedation and been unable to co-operate.
- Medical problems which are better controlled with the use of GA.

5. Children with medical problems.

These should be managed in collaboration with the child's paediatrician. When appropriate the dental surgeon should seek advice from a physician which should be provided in writing. This advice should cover any special problems related to pre-operative, intra-operative and post-operative care of the child (5,6). The American Society of Anesthesiologists (ASA) Physical Status classification is a useful guide to suitability for day case GA (7). A child with a severe underlying medical condition in categories ASA III or ASA IV should be admitted to a paediatric ward and clinical care shared with a paediatric team.

6. Explanation of risk.

- Once a decision has been made to use GA, it should be explained to the parents that the anaesthetic is not administered by a dentist, but by an anaesthetic consultant who has undergone specialist training in paediatric anaesthesia (or by an anaesthetic specialist registrar under their direct supervision). It should also be explained that the procedure will take place in an operating theatre, with a team trained in the care of children. The potentially serious nature of the procedure should be clearly explained to the parent(s) and, where appropriate, the patient.
- There is a small but real risk of a catastrophe during GA. Agreement should be reached between the dental and anaesthetic teams concerning how and when anaesthetic risk is explained and documented. A key principle of the consent process is that a clinician cannot take informed consent for a procedure which they are not trained to perform themselves. However, the decision to use GA ultimately rests with the dentist, so some explanation of risk is required (8). Details of this process should be subject to local arrangements, but it is likely that clarification of a recommended procedure will come from a future guideline.

7. Treatment planning.

Comprehensive planning aims at ensuring that all the treatment required is carried out under a single GA. The practice of extracting the most grossly carious and/or symptomatic teeth and leaving restorable teeth for future visits as an outpatient using LA with or without sedation is to be deprecated. This has been shown to result in a high rate of repeat GA (9). The inability of the child to accept treatment using LA is an important factor in determining the need for GA.

7.1 Radiographs.

A comprehensive treatment plan is not possible without recent radiographs. An exception to this is when removal of carious primary incisor teeth is planned, where radiographs are of limited diagnostic value.

7.2 Extractions.

If an urgent GA is indicated, unrestorable asymptomatic teeth should be removed in addition to those causing pain or sepsis (9,10).

Balancing and compensating extractions

Guidelines exist for the planning of extraction patterns in paediatric dentistry, and these should be followed (11).

Extraction of a permanent molar

If a permanent molar is to be considered for extraction under GA, the orthodontic implications should be considered, and the need for loss of further permanent molars discussed with the child and parents. If circumstances allow, a specialist or consultant orthodontist should be involved in this planning.

7.3 Restorative treatment options.

Restorative care provided under GA can be more durable than that provided under other circumstances, particularly in very young children (12,13,14). The most predictably successful restoration should be provided. A temporary/provisional restoration may be indicated by other circumstances (e.g. imminent exfoliation).

7.4 Preventive advice.

Parents of children who require the treatment of extensive disease under GA need further preventive advice (15,16). The SIGN guideline “Preventing Dental Caries in Children at High Caries Risk” provides an important source of preventive advice (17).

8. Consent.

- Specific written consent should be obtained at the time of treatment planning and updated on the day of operation. This provides a suitable period of reflection for the parents and/or child (18).
- Care should be taken to ensure that the parent understands whether primary teeth, permanent teeth or both are included in the treatment plan. Even if the extraction of permanent teeth is following the prescription of an orthodontist, it is the operator's duty to ensure that the parents fully understand that the teeth are not replaced naturally. It is good practice to obtain written consent from the child where it is thought that they have sufficient understanding and emotional maturity (18).
- Interpreting services must be used if it is thought that the parents may not understand the nature of the proposed treatment. This should be further reinforced by asking that the parent read the consent form carefully with an interpreter who is able to explain medical/dental terms in the parents' own language. It is not uncommon for a young child to have better English language skills than their parents. In these circumstances it is not acceptable to use the child as an interpreter.
- A blanket consent such as "restorations and extractions as necessary" is inadequate, except where it is agreed that an examination under anaesthesia (EUA) is required before treatment planning can be completed. It should be explained that the decision about the number of fillings and extractions can sometimes only be made when the child is anaesthetised and that this decision is left to the judgement of the operating clinician. If agreement cannot be achieved, further referral to a colleague should be offered.

9. Pre-operative assessment.

Ideally the diagnosis and treatment planning should be carried out on a separate day from that of the GA (5,19,20). This has several advantages, including:

- Allowing the dentist sufficient time to fully explain the treatment required and assess the parents' understanding.
- Allowing the parent and child time to consider the proposed treatment, and ask further questions if necessary.
- The pre-operative anaesthetic assessment may be carried out immediately prior to surgery unless the dentist is uncertain as to a patient's suitability for day surgery - in which case they may ask for an anaesthetic review well in advance of surgery.

10. The clinical setting for GA.

- GA must be carried out in a 'hospital setting' with adequate 'critical care facilities'. Definition of these terms are given in the GDC document *Standards for Dental Professionals* (7), and further guidance is given in '*A Conscious Decision – a review of the use of general anaesthesia and conscious sedation in primary dental care.*' (21)
- Any service for children must be consistent with the Children Act (22).

11. Teamwork.
Issues of airway management, pain control, underlying medical conditions, management/extent of blood loss and duration of the procedure are a shared responsibility. Effective communication with the anaesthetist is the key to providing optimal care for the child under GA.

12. The anaesthetic procedure.
The document '*Standards and Guidelines for General Anaesthesia for Dentistry'*, produced by the Royal College of Anaesthetists (23), provides a guide to best anaesthetic practice for GA. Further technical aspects of anaesthesia are beyond the remit of this guideline.

13. Clinical records.
Complete clinical records itemising each procedure carried out under GA are required, and should be easily distinguishable from out-patient records. Details of the anaesthetic procedures are the responsibility of the anaesthetist.

14. Clinical effectiveness.
- A primary tooth restored under GA should be expected to exfoliate naturally without failure.
- Preformed metal crowns are the most predictable and durable restorations for anything but the smallest of carious lesions in primary molars (24).
- Pulp therapy for primary teeth should be provided with caution under GA, given the clinical failure rates of the medicaments available. Exceptional circumstances (e.g. haemangioma/lymphangioma in supporting tissues) may be a contra-indication to extraction.

15. Discharge.
Responsibility for the discharge process is shared between the dentist, the anaesthetist and the recovery nursing staff. In addition to following any local policies for discharge, more general guidelines for discharge after GA include:
- Patients and parents should receive verbal and written post-operative instructions (Appendix 1).
- Advice should be given of any symptoms that might be experienced in the first 24 hours following discharge.
- Analgesics including paracetamol BNF should be recommended for use in the 24 to 48 hours following discharge.
- Specific instructions regarding mouth care after surgery should be given.
- The nature of any sutures placed should be described and an appointment made for post-operative assessment. It is wise to arrange such a follow up to ensure that healing is progressing normally and that any absorbable (dissolving) sutures have been lost spontaneously.

16. Repeat GA.

Repeat GA is undesirable in terms of morbidity, potential mortality, behavioural/emotional effects on the child, and cost.

- It can be due to failures in the treatment planning process or failure in the adoption of the preventive counselling given as part of an episode of GA (25).
- It has been shown that failure to adopt a *comprehensive* approach to planning for GA is highly likely to lead to a repeat GA.
- Repeat GA may be required for children with medical or behavioural conditions which make GA the most practical method of providing dental care.

Postscript.

This guideline covers an area of paediatric dentistry which attracts a wide range of treatment philosophies, created partly by different disease levels across the United Kingdom, by different resources available to manage extensive dental disease in young children, and by different clinical experiences. The underlying principle is always to provide the best possible care to the child, and this guideline seeks to describe best practice for paediatric dental GA.

Search strategy.

The Entrez PubMed portal to the National Library of Medicine was employed, using the following search words in combination: general anesthesia, dentistry, teeth, children, pediatric, rehabilitation, morbidity.

Consultation process.

Consultation was with the British Society of Paediatric Dentistry, the Consultants in Paediatric Dentistry Group, and the Specialists in Paediatric Dentistry Group. Feedback was collated by the Paediatric Dentistry Clinical Effectiveness Committee.

References

1 Blain KM, Hill FJ. The use of inhalation sedation and local anaesthesia as an alternative to general anaesthesia for dental extractions in children. Br Dent J 1998;184(12):608-11.

2 Shaw A. Inhalation sedation can be used for many children referred for general anaesthesia. Br Dent J 1998;184(12):601.

3 Smallridge JA, Al GN, Holt RD. The use of general anaesthesia for tooth extraction for child out-patients at a London dental hospital. Br Dent J 1990;168(11):438-40.

4 Holt RD, Rule DC, Davenport ES, Fung DE. The use of general anaesthesia for tooth extraction in children in London: a multi-centre study. Br Dent J 1992;173(10):333-9.

5 Landes DP, Clayton-Smith AJ. The role of pre-general anaesthetic assessment for patients referred by general dental practitioners ~~to~~ in the Community Dental Service. Community Dent Health 1996;13(3):169-71.

6 Harrison MG, Roberts GJ. Comprehensive dental treatment of healthy and chronically sick children under intubation general anaesthesia during a 5-year period. Br Dent J 1998 ;184(10):503-6

7 American Society of Anesthesiologists. ASA Physical Status Classification System. http://www.asahq.org/clinical/physicalstatus.htm

8 Standards for Dental Professionals, General Dental Council. 2005.

9 Harrison M, Nutting L. Repeat general anaesthesia for paediatric dentistry. Br Dent J 2000;189(1):37-9.

10 Camilleri C, Roberts G, Ashley P, Scheer B. Analysis of paediatric dental care under general anaesthesia and levels of dental disease in two hospitals. Br Dent J. 2004; 196(4):219-223.

11 Guideline for first permanent molar extraction. http://www.rcseng.ac.uk/fds/clinical_guidelines/documents/guideline_molar_e.

12 O'Sullivan EA, Curzon ME. The efficacy of comprehensive dental care for children under general anesthesia. Br Dent J 1991;171(2):56-8.

13 Eidelman E, Faibis S, Peretz B. A comparison of restorations for children with early childhood caries treated under general anesthesia or conscious sedation. Pediatr Dent 2000;22(1):33-7.

14 Tate AR, Ng MW, Needleman HL, Acs G. Failure rates of restorative procedures following dental rehabilitation under general anesthesia. Pediatr Dent 2002 Jan;24(1):69-71.

15 Hood CA, Hunter ML, Kingdon A. Demographic characteristics, oral health knowledge and practices of mothers of children aged 5 years and under referred for extraction of teeth under general anaesthesia. Int J Paediatr Dent 1998;8(2):131-6.

16 Almeida AG, Roseman MM, Sheff M, Huntington N, Hughes CV. Future caries susceptibility in children with early childhood caries following treatment under general anesthesia. Pediatr Dent 2000;22(4):302-6.

17 Preventing dental caries in children at high caries risk. Scottish Intercollegiate Guidelines Network. 2000.

18 Seeking consent: working with children, Department of Health. 2001.

19 Tochel C, Hosey MT, Macpherson L, Pine C. Assessment of children prior to dental extractions under general anaesthesia in Scotland. Br Dent J 2004;196(10):629-33.

20 Grant SM, Davidson LE, Livesey S. Trends in exodontia under general anaesthesia at a dental teaching hospital. Br Dent J 1998;185(7):347-52.

21 'A Conscious Decision – a review of the use of general anaesthesia and conscious sedation in primary dental care.' Department of Health 2003.

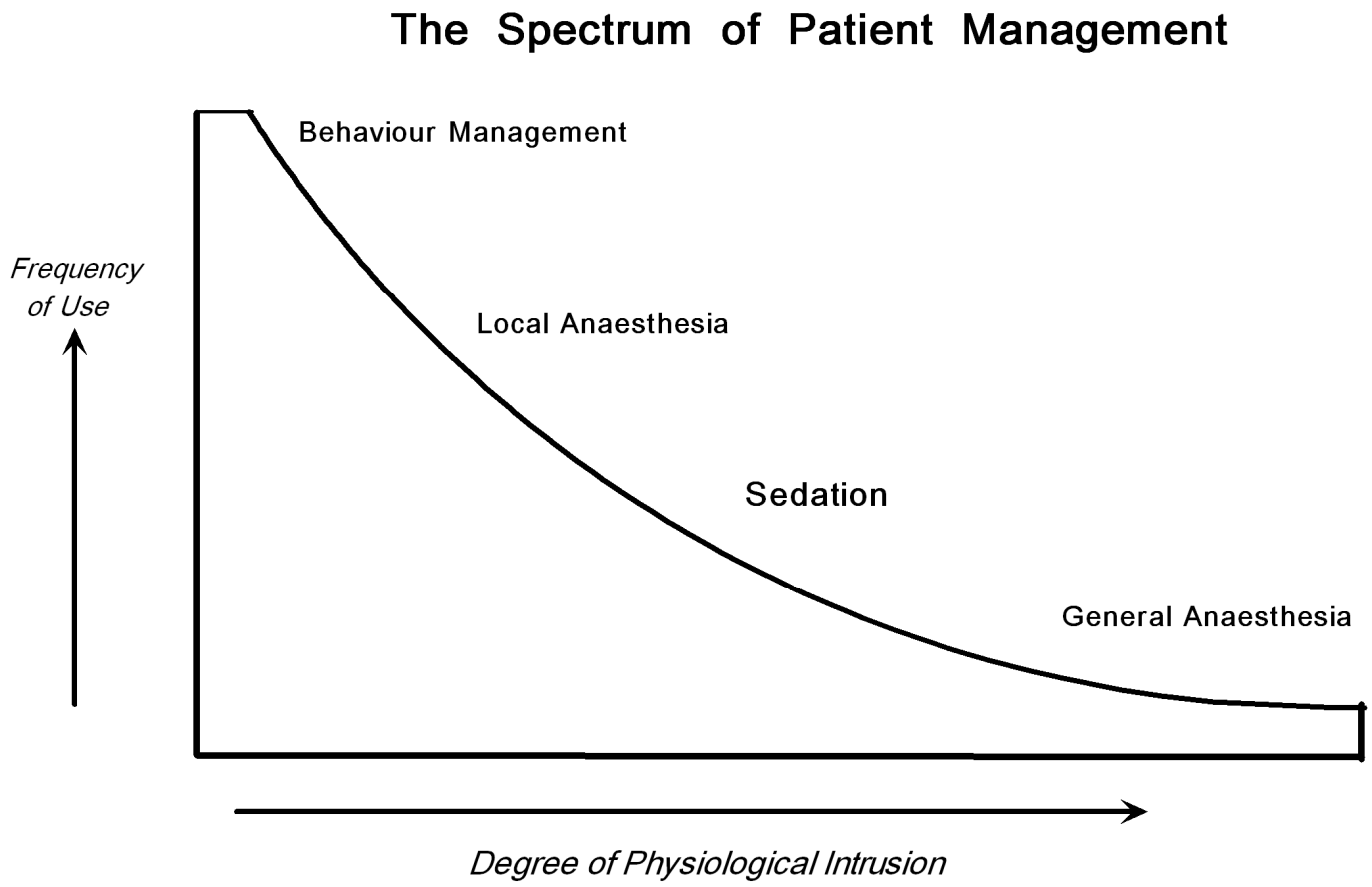
22 The Children Act 2004, HMSO.

23 'Standards and Guidelines for General Anaesthesia for Dentistry'. Royal College of Anaesthetists, 1999.

24 Randall RC, Vrijhoef MM, Wilson NH. Efficacy of preformed metal crowns vs. amalgam restorations in primary molars: a systematic review. J Am Dent Assoc 2000;131(3):337-43.

25 Kakaounaki E, Tahmassebi J, Fayle SF. Further dental treatment needs of children recieving exodontia under general anaesthesia at a teaching hospital in England. Int J Paediatr Dent 2006;16(4):263-9.

FIGURE 1. The Spectrum of Patient Management



APPENDIX 1. Example of discharge advice to parents after dental extractions under GA

DENTAL CARE UNDER GENERAL ANAESTHESIA - DISCHARGE ADVICE FOR PARENTS
We hope the following information will be of help to you:

You will be able to take your child home when you and the nurses feel confident that s/he

- can walk steadily around the ward
- is reasonably comfortable
- is not feeling sick
- is drinking water/juice and able to hold it down

Eating and Drinking:
Your child needs to have a soft, smooth diet and nothing which is too warm or too cold, to avoid discomfort and further bleeding.

Oral Hygiene:
It is important to maintain good oral hygiene as this will promote healing.

- ON THE DAY OF EXTRACTIONS: Your child should avoid rinsing his/her mouth as this may start bleeding.
- THE FOLLOWING TWO DAYS AFTER THE OPERATION:
  You may try salt water mouthwashes and gently introduce tooth brushing as and when comfortable. Young children may not be able to rinse.
  Salt Water: Boil water and pour it into a tumbler. Dissolve a level teaspoon of common salt. Allow to cool until it can be used without burning.

Problems to look for:

- **Pain:** Following dental extractions, a certain amount of discomfort is inevitable. Our aim is for your child to be as comfortable as possible after their operation. Your child may be discharged with pain relieving medication. Please follow the advice from the nursing staff on how to take this medication. If you do not have medication at home please buy paracetamol or ibuprofen syrup from a pharmacy.

- **Swelling:** Your child may experience facial swelling. This common and will disappear within a few days. You may find it helpful to wrap something cool (e.g. frozen peas) in a towel and rest it on the swollen area for a few minutes.

- **Bleeding:** Do not be alarmed if there is a small amount of blood from the extraction sockets. Roll up a clean handkerchief or gauze, moisten with warm water, place over the socket and have your child bite firmly for at least 10 minutes. If this fails to control the bleeding after about 30 minutes, seek professional help.

- **Stitches:** Any dissolving stitches should be gone in a week. Non-dissolving stitches need to be removed and you should receive an appointment for this.

Now that your child is going home, we wish to remind you that after a general anaesthetic there is a period in which his/her judgement, performance and reaction time are affected by the anaesthetic, even though the child may feel quite normal again.
It is therefore very important in the 24 hours after the operation that your child:

- is not allowed to do anything potentially dangerous to her/himself or others, such as playing in an adventure playground, riding a bicycle, climbing trees, swimming, or going out by themselves.
- remains in the immediate care of a responsible adult.
- is given painkillers if necessary or as directed by the dentist.

For urgent enquiries please contact……