

# General anaesthesia for dentistry

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## Abstract

Dental anaesthesia developed down a different pathway from the rest of anaesthesia. Techniques such as nasal mask anaesthesia in the sitting position were specific to dental surgery, which took place largely outside hospital in dental clinics. Now dental anaesthesia is confined to locations within the aegis of a hospital and anaesthetic techniques are similar to those in other surgical specialities. Dental surgery consists of extractions and conservation. Short procedures for the extraction of teeth may still be carried out in children using a nasal mask, but more difficult extractions in adults and children, or conservation procedures are best done with a laryngeal mask or endotracheal tube. Close liaison with the dental surgeon is imperative in the planning of the anaesthetic technique. The downward pressure applied to the mandible during the extraction of teeth may cause reduction in airway patency unless intubated, and the anaesthetist may need to support the jaw and head in order to provide counter-pressure, also preventing excessive movement of the neck.

Patients needing general anaesthesia include children, those with allergy to local anaesthetics, and adults with special needs, as well as those adults who are likely to need surgical extractions with removal of alveolar bone. During the recovery phase, the airway has to be watched carefully as the potential for obstruction is increased due to stimulation and soiling of the larynx with bleeding. Paracetamol and non-steroidal analgesics are the mainstay of analgesia in combination with local anaesthetic infiltration and specific dental blocks. In addition, stronger analgesics such as tramadol may be required in adults who are having multiple extractions.

It should be an aim to provide all dental surgery in a day case setting, and careful choice of the technique should make this possible for all but those with unstable cardiorespiratory disease.

**Keywords** Day surgery; dental conservation; dental extraction; paediatric dental anaesthesia; special needs patients; surgical extractions

**Royal College of Anaesthetists CPD matrix:** 3A02, 3A06, 1C02, 2D02, 2D05, 1E03, 1F01.

## Historical background

In December 1846, the first anaesthetic in Britain was given by a dental surgeon, who then operated on his patient. This signalled the introduction of general anaesthesia to England, and also the development of the subspeciality of dental anaesthesia, which continued down a pathway somewhat different and isolated from other branches of anaesthesia. This explains some of its idiosyncrasies. Dental pain is a common problem and, until recently, dental anaesthetics were given in huge numbers – 1.2 million in 1972 and 184,000 in 1992. Most took place in dental surgeries,

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## Learning objectives

After reading this article, you should be able to:

- describe different types of dental surgery and indications for general anaesthesia
- obtain consent for children and special needs adults
- describe management of the airway and conduct of anaesthesia

which were often converted domestic dwellings with no regulation of standards. The small number of anaesthetic deaths was not significantly different from hospital anaesthetic mortality, but examination of individual cases often revealed avoidable causes of death and obsolete techniques. Operator–anaesthetists were banned in 1981, although the anaesthetist still did not have to be medically qualified. The Poswillo Report (1990)<sup>1</sup> made the important statement that the standards of anaesthetic care and equipment should be the same wherever the operation took place. In 1998, the General Dental Council said that dental anaesthetics should be the responsibility of an accredited anaesthetist, which stopped dentists from giving general anaesthetics. In 2002, the Department of Health restricted dental anaesthetics to facilities within the reach of the support provided by a district general hospital. Since then, dental anaesthesia has rejoined the mainstream in terms of personnel and practice.

## Indications for general anaesthesia

There has been a definite increase in the patient demand for general anaesthesia to facilitate dentistry and dental surgery. Many would feel that this needs to be redressed with careful reference to the balance of risk versus benefit. However there are some definite indications for general anaesthesia:

- where the dentistry is likely to be extensive, and unsuitable for an awake patient with difficult surgical extractions
- for small children who may not tolerate dental surgery under local anaesthesia
- allergy to local anaesthetics (rare)
- patients with mental disabilities that make it difficult for them to cooperate with surgery
- where there is acute inflammation so that the local anaesthetic may not be effective because of local change in pH
- patients with medical conditions making awake dental surgery difficult, such as extreme gag reflexes, or inability to maintain adequate mouth opening.

## Types of dental surgery

Dental surgery comprises exodontia, which is the removal of teeth, and conservations, which is the preservation of decayed teeth. Removal of teeth can be further divided into simple extractions or more involved surgical extraction requiring the use of a dental drill to remove bone. Conservation of teeth includes removal of decay, filling, crowning and other restorative measures.

## Extractions

First-dentition teeth are designated from front to back by letters A–E, and adult teeth from 1 to 8. Unless they are broken down, baby teeth are usually quick to extract. Adult teeth are more

difficult; in general, the further back they are, the greater the difficulty particularly in impacted wisdom teeth. These may require oral surgical techniques including the raising of a flap, and drilling of bone. Small children may need extraction of adult 6s because they erupt 'silently' at 6–7 years and are often neglected. Adult 4s are often extracted in adolescence to make room for the movement of teeth prior to more definitive orthodontic procedures.

### Conservation

Conservation operations can be lengthy if involving multiple teeth, necessitating the use of a drill, which floods the operative site with water, so a pharyngeal pack may be deemed necessary to prevent aspiration even with a cuffed endotracheal tube.

### Operative management

#### Consent in children

Strictly speaking a child may not refuse treatment when the parents have given informed consent, but it would be unwise to persist with trying to anaesthetize a child who is unwilling, unless the consenting adult is happy to assist. Where a child is adamantly refusing consent, it may be felt necessary to delay surgery if the parents are unhappy with proceeding against their child's wishes. This is rarely a problem, and careful sensitive explanation to the child with reassurance about safety and lack of pain, where appropriate is often of huge benefit. However, it is better to let a child go away and think about things, coming back another day than to cause physical trauma or mental distress.

#### Consent in special needs adults

In the past, consent was needed from the parents, if present, or the carers of the special needs adult patient. Changes to the law of consent now determine that one adult may not formally consent to the treatment of another. The responsibility for determining the balance of benefit and risk, and therefore taking responsibility for initiating treatment now lies with two suitably qualified medical practitioners who sign a specific separate consent document. It is expected that a full explanation of the treatment plan, with risks and benefits is given to the parent or carer who is present or contacted by phone. Their agreement to the treatment is signified on the form, although they take no part in the legal process. Clearly it would be unwise to proceed regardless of the concerns of the next of kin or carer. Restraint of patients with physical or mental disabilities who need treatment may sometimes be necessary, but this should always appropriate, minimal and be discussed with the carer who is encouraged to be involved in every stage of the procedure until the patient is fully asleep.

#### Consent in the normal adult

Consent in the normal adult should include a discussion about intubation and possible sore throat, local anaesthetic infiltration of the surgical field with resulting residual numbness and tingling, expectations and timing of postoperative pain, intravenous fluids and antibiotics if necessary.

#### Premedication

Premedication is not usual in dental surgery, but may be used in children with especially challenging behaviour. Midazolam may

be given orally (0.5–0.75 mg/kg), mixed with a small quantity of juice to disguise the taste, or intranasally (0.2–0.3 mg/kg). In special needs adults in conjunction with the GP it may be necessary to give mild sedatives prior to leaving their home to facilitate entering the hospital building, assuaging fear. Oral midazolam, (10–40 mg similarly disguised) can be given on arrival in the day surgical unit, and the patient seated in a suitable environment so that as they become sleepy, they can be safely moved into the anaesthetic room. Safety of the sedated patient is paramount, but this can often be facilitated with minimal distress to the patient and others in the vicinity.

#### Induction

In small children, gaseous induction using sevoflurane with the parent holding the child or cuddling them on their knee is often the simplest method. A pulse oximeter and ECG should be placed before the child goes to sleep. A cannula must be inserted once the child is asleep for all general anaesthetics as intravenous access may be needed at any stage until the child is fully awake.

Older children may be offered a choice of gaseous or intravenous induction. Letting them decide is a good way of enlisting cooperation because the child feels less threatened. Application of local anaesthetic cream to the skin will ensure that insertion of the cannula is painless. However, if propofol is subsequently given through the cannula into a vein in the back of the hand, the injection itself will often hurt, despite the addition of lidocaine. Using a vein in the antecubital fossa almost guarantees that this problem will not arise.

The induction of a special needs patient may involve gaseous induction by stealth, or intravenous induction in those who allow, or are immobile, with the use of local anaesthetic cream where appropriate. The carer should be involved in the choice of method and encouraged to assist in keeping the patient calm.

Induction of this varied group of patients can be successfully achieved with careful planning and patience, and the aim should be to avoid physical restraint if at all possible. Induction in a wheelchair or reclining chair may be the most appropriate method. It is perfectly possible to intubate these patients after induction in the sitting position, and this is indeed the safest way to secure the airway prior to using a hoist to transfer the patient onto the operating table or trolley. A secured airway, ventilation and full non-invasive monitoring at this stage allows for the planning and execution of a controlled and safe manoeuvre.

#### Airway for extraction of teeth

The type of airway chosen depends on the surgery, and it is vital to liaise with the surgeon. Straightforward extraction of a few easy baby teeth may be done using a nasal dental mask. The surgeon inserts a gauze pack from one buccal sulcus to the other in order to prevent too much mouth breathing and aspiration of tooth fragments. The possibility of losing the airway is great. In addition, the operating position is controversial.

Traditionally, patients sat upright in the dental chair, but the sitting position has gradually become less common for dental surgery under general anaesthetic. The nasal mask is still used by some dental anaesthetists, and one of the newer transparent neonatal masks (Figure 1) has significant advantages over the older black Goldman mask for this purpose. The external nares can be seen with a transparent mask so that it is possible to check

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