

# *A Conscious Decision*

A review of the use of general anaesthesia and conscious sedation in primary dental care

Report by a Group chaired by the Chief Medical Officer  
and Chief Dental Officer

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# Executive Summary

1. General anaesthesia is one of the methods used to reduce pain and anxiety associated with dental treatment. Others include local anaesthesia and conscious sedation.
2. The use of general anaesthesia for dental treatment in the NHS outside hospital has changed over time. Key features of the trend have been:
  - an overall fall in the use of general anaesthesia for dental treatment since the mid-1960s;
  - an increased use, after 1992, which coincided with the emergence of specialist services offering general anaesthesia to dental practices;
  - in only one other European country, for which information was available, are general anaesthetics for dental treatment given outside hospital;
  - a small number of dentists accounted for the majority of general anaesthetic use. In the period from July to September 1999 just 45 dentists (about 0.25% of the total) provided treatment for 69% of all general anaesthetics used in NHS general dental practice;
  - a striking fall in general anaesthesia for dental treatment after November 1998 following the introduction of new General Dental Council (GDC) guidance;
  - marked regional variations in the use of general anaesthesia for dental treatment with the highest provision in the North;
  - a growth in the use of conscious sedation as an alternative to general anaesthesia for dental treatment, particularly since November 1998;
  - no comparable data are available for private dental treatment.



## *Deaths of patients who had received general anaesthesia for dental treatment*

3. Although deaths are uncommon during or immediately after general anaesthesia for dental treatment they are more likely to occur than with other pain and anxiety reduction methods. Moreover every death is a tragedy for the individual and family concerned. Investigation of deaths has too often highlighted factors which seemed potentially avoidable.
4. The key features of trends in deaths associated with general anaesthesia for dental treatment outside hospital are:
  - a reduction in the number of deaths since the 1960s in line with the decrease in the use of general anaesthesia in dental practice;
  - in only seven years in the last 35 years there were no deaths associated with general anaesthesia for dental treatment outside hospital;
  - three consecutive years in the 1990s (1993-1995) in which there were no such deaths followed by the four subsequent years (i.e. 1996–1999) in which there were eight deaths, of which five were children.
5. Investigations and inquiries into these recent deaths have been critical of the standard of care provided in fundamental areas such as: pre-operative assessment; monitoring of electrical heart activity, blood pressure, oxygen and carbon dioxide levels; start of resuscitation and transfer to specialist critical care.

## *Current policy directed at standards of care*

6. Current policy related to the protection of patients is based on guidance produced by a number of expert committees over recent years. Most notable amongst these was the Working Party chaired by Professor Poswillo. The Report in 1990 made over 50 recommendations aimed at reducing the risk of death or adverse health effects during dental treatment, including treatment under general anaesthesia. The recommendations included the following areas: standards of dental anaesthesia practice; equipment and facilities; training; inspection and registration of premises.

7. The Poswillo recommendations were implemented in the NHS through the Regional Health Authorities, backed by £20 million of government funding. It is clear that implementation has not been comprehensive or consistent. High quality practice, based on these and other standards to assure patient safety has not always been provided. Nor are the standards rigorously monitored and enforced.
8. In 1998 the General Dental Council acted to strengthen the standards relating to the provision of general anaesthesia for dental treatment. Although this was followed by a substantial reduction in the use of general anaesthesia for dental treatment, two further deaths have occurred outside hospital, and one in hospital following general anaesthesia for dental treatment.
9. NHS regulations governing the use of dental general anaesthesia outside hospital are now more permissive than the GDC guidance because they still allow dentists to give general anaesthetics.
10. There is a lack of statutory regulation of general anaesthesia given in private dental practices. The Care Standards Bill, which is expected to receive Royal Assent in the summer, will regulate general anaesthesia provided by dentists working outside the NHS.

## *Conclusions*

11. Standards aimed at protecting patients from the effects of serious complications of general anaesthesia or conscious sedation administered during dental treatment are not rigorously applied or enforced.
12. Despite a large number of expert reports which have been aimed at improving such standards, it seems that patients are still vulnerable to unexpected death or non-fatal complications occurring outside hospital in circumstances which seem to be avoidable.
13. It is unlikely that further attempts to refine general anaesthesia in dental practice outside hospitals through guidance, inspection and enforcement will provide sufficient assurance.
14. It is important that conscious sedation as an alternative to general anaesthesia for dental treatment continues to be as safe as possible.
15. It is essential that standards in private dental practice are properly regulated.

## Recommendations

16. The Expert Group makes the following recommendations:

- The use of general anaesthesia to reduce the pain and anxiety associated with dental treatment should be discouraged. General anaesthesia should be undertaken only when absolutely necessary.
- After 31<sup>st</sup> December 2001, general anaesthesia for dental treatment should only take place in a hospital setting.
- Modern standards of general anaesthesia for dental treatment must be implemented and enforced until all such treatment is carried out in hospitals. This should include the registration and inspection of premises and facilities; agreed protocols for provision of advanced life support and transfer to critical care facilities; the use of dedicated assistants; appropriate patient information, assessment, written consent and patient escorts. NHS Regulations relating to the use of general anaesthesia for dental treatment outside hospital should be strengthened.
- Comparable standards should be maintained and enforced in NHS and private dental practice.
- High standards of conscious sedation must be attained. This should include the use of dedicated assistants; appropriate undergraduate and postgraduate training and similar arrangements for patient assessment, consent and patient escorts as for general anaesthesia.
- Higher standards of resuscitation are required in dental practice irrespective of whether general anaesthesia or conscious sedation is carried out. This must include training in basic life support with airway adjuncts for all clinical staff and their assistants and training in advanced life support where general anaesthesia is administered. Members of the team must practise resuscitation together at regular intervals. All clinical staff in dental practices must undertake training to ensure that they can deal effectively with medical emergencies. All of the training must be recorded and monitored by health authorities.
- All instances of equipment failure must be reported to the Medical Devices Agency.

- Better data should be obtained on fatal and non-fatal complications of general anaesthesia and conscious sedation for dental treatment. For morbidity associated with general anaesthesia and conscious sedation for dental treatment this should be undertaken by the Royal College of Anaesthetists and the Society for the Advancement of Anaesthesia in Dentistry (SAAD) respectively.
- The NHS Executive should reiterate that the Poswillo revenue funding which has been incorporated into health authority baseline allocations, should continue to be used for the purposes set out in HSG(93)29.

# Chapter 1

## Introduction

**This chapter sets out the background to the Committee’s work, its terms of reference and the outcomes it seeks to achieve.**

General anaesthesia for dental treatment dates from the middle of the nineteenth century, and was the first reliable method of pain control for any surgical treatment. The use of general anaesthesia was followed at the turn of the twentieth century by ‘local anaesthesia’ when compounds based on cocaine were first injected for dental treatment to provide pain relief without making the patient unconscious.

A choice between local and general anaesthesia for dental treatment has been available for many years but general anaesthesia carries significantly more risks than local anaesthesia. As there are some patients who cannot be given dental treatment under local anaesthesia, attention must focus on which patients should receive a general anaesthetic and how the associated risks and complications can be minimised.

Many expert reports and reviews of this difficult topic have been published in the past. In 1990 an expert working party under the chairmanship of Professor David Poswillo prepared a report on *General Anaesthesia, Sedation and Resuscitation in Dentistry*<sup>1</sup> (referred to in this document as the “Poswillo Report”) for the Standing Dental Advisory Committee of the Department of Health. The report made wide ranging recommendations covering skills, drugs and equipment, training and dental practice requirements necessary to minimise the risks associated with general anaesthesia for dental treatment. Action since then has promoted the use of conscious sedation and local anaesthesia as alternatives to general anaesthesia for dental care whenever possible. Advice has been issued on standards of clinical care, access, availability of services, case selection and referral, premises, emergency procedures and the regulatory position.

### *Reasons for the establishment of the current Group*

The provision of general anaesthesia for dental treatment declined in England and Wales throughout the 1970s and 1980s. However, there was an increase after 1992 which became more marked from 1994. This increase was attributed to a growth in the number of dental practices offering dental treatment under general anaesthesia on referral from other

dentists. Up to around 1992, not only had the number of general anaesthetics declined but the number of deaths associated with general anaesthesia and dental treatment had also fallen. The subsequent increase in general anaesthetics given outside hospital has been associated with an increase in the number of deaths reported. Although small in number these deaths represent personal tragedies for the patient and families concerned.

Major public concern followed three particular deaths of children after general anaesthesia for dental treatment in the period up to the summer of 1998. One of the anaesthetists involved was disciplined by the General Medical Council (GMC) and another was imprisoned after being found guilty of manslaughter. Since that time three more dental patients have died.

### *Action taken by the General Dental Council*

The regulatory body for dentists is the General Dental Council (GDC).

In November 1998 the GDC issued to all dentists revised guidance on the provision of general anaesthesia for dental treatment<sup>2</sup>. This requires that a general anaesthetic for dental treatment must be given by a medically qualified anaesthetist on the specialist register held by the GMC, or by a trainee working under supervision as part of a Royal College of Anaesthetists' approved training programme, or by a non-consultant NHS career grade doctor working under the supervision of a named consultant anaesthetist. The guidance also sets out the responsibilities of the dentist when referring patients for general anaesthesia and when treating patients under general anaesthesia, together with requirements for recovery, discharge and access to critical care.

The number of general anaesthetics in the General Dental Services of the NHS declined by almost 80% after the issue of this guidance, when comparing the quarter July to September 1999 with the same period in 1998. During the same period there was an increase in the number of sedations although this did not match the fall in the number of general anaesthetics administered.

Six months later, in May 1999, the GDC issued to all dentists revised guidance on conscious sedation for dental treatment and on resuscitation. The term 'conscious sedation' was defined and guidance on the appropriate assessment of the patient and the management of pain and anxiety using this and other techniques was set out. The necessity for written consent, record keeping and pre-operative and post-operative instructions also formed part of the guidance, together with the skills and equipment expected when dealing with medical emergencies.

## Terms of Reference

The Group under the joint Chairmanship of the Chief Medical Officer, Professor Liam Donaldson, and the Chief Dental Officer, Mr Robin Wild, was established by the then Minister of State for Health, the Rt Hon Alan Milburn MP and met for the first time in February 1999. The Group was asked to address the following terms of reference:

*To review the use of general anaesthesia and sedation with dental treatment with particular reference to the setting in which they take place and the manner of their delivery.*

In carrying out this task it was important to adopt clear definitions of the various techniques used to relieve pain and anxiety in dental treatment. The Group agreed the following definitions.

## Definitions

### *General anaesthesia*

“Any technique using equipment or drugs which produces a loss of consciousness in specific situations associated with medical or surgical interventions”.

### *Conscious Sedation*

“A technique in which the use of a drug or drugs produces a state of depression of the central nervous system enabling treatment to be carried out, but during which verbal contact with the patient is maintained throughout the period of sedation. The drugs and techniques used to provide conscious sedation for dental treatment should carry a margin of safety wide enough to render loss of consciousness unlikely”.<sup>i</sup>

There is no room for ambiguity in this definition of conscious sedation. The technique must be such that the level of sedation keeps the patient conscious, retaining their protective reflexes, and able to understand and respond to verbal communication. ‘Deep sedation’ in which these criteria are not fulfilled must be regarded as general anaesthesia.

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<sup>i</sup> This is the same definition of conscious sedation as that adopted by the General Dental Council in May 1999.

The same drugs and dosages applied to different patients can have different effects so particular knowledge and skills are necessary in carrying out conscious sedation. The margin of safety must be wide enough to make loss of consciousness unlikely. It is misguided to believe that a single drug or combinations of drugs can be applied to all situations in which conscious sedation is required.

### *Goals and outcomes*

The review aimed to make recommendations which would address the key issues and concerns:

#### *Aims of the review*

- promote alternatives to general anaesthesia such as local anaesthesia and conscious sedation
- ensure that general anaesthesia would be used only when other pain and anxiety control methods for dental treatment are inappropriate
- reduce mortality, morbidity and the complications of general anaesthesia for dental treatment to the lowest level possible
- ensure that general anaesthesia and conscious sedation are provided to the same professional standards wherever they are performed and that the public can have confidence in the safety and quality of these services in all parts of the country.



# Chapter 2

## Trends in General Anaesthesia and Sedation

**This chapter sets out the trends and patterns of use of general anaesthesia and sedation in NHS dental treatment. It describes the pattern of deaths as a complication of dental treatment outside hospitals.**

General anaesthesia and sedation are delivered in a number of settings in the public and private sectors. In the public sector NHS dental treatment is provided by dental practitioners who are:

- i) self-employed dentists who work to a scale of fees through the General Dental Services (GDS) of the NHS or who are salaried to work in the GDS.
- ii) employed by the NHS and work in either the Community Dental Service (CDS) or the Hospital Dental Services (HDS). Dentists in the CDS provide general dental treatment for children and people with special needs (such as those with learning disabilities), together with patients that general dental practitioners refer for specific dental care. Those in the HDS mainly carry out specialist work on referral from general dental and medical practitioners and consultant colleagues. They treat patients who are likely to need the backup of hospital facilities.
- iii) dentists who provide Personal Dental Services (PDS) within the NHS under an agreement made with a health authority.

Private dental treatment is provided to patients who make arrangements with practitioners outside the NHS by dentists who are:

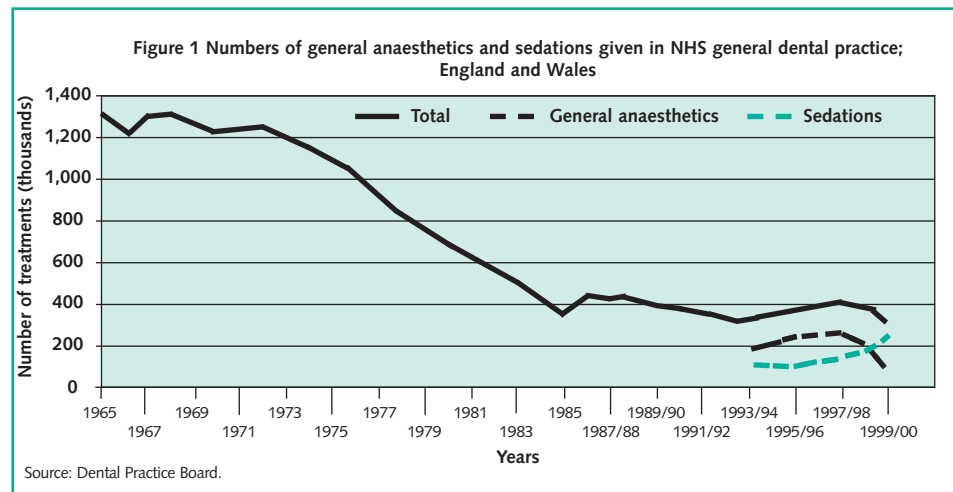
- i) wholly private dental practitioners who enter into arrangements with individuals
- ii) dental practitioners who do a mixture of private and NHS work.

Reliable data on the trends in the use of general anaesthesia and sedation for dental treatment are only readily available for NHS dental care. Such data are not directly comparable across NHS sectors. No information is available from the private sector. There is no comprehensive information on side-effects or non-fatal complications associated with general anaesthesia and sedation for dental treatment.

The National Health Service (Primary Care) Act 1997 allows for the provision of Personal Dental Services (PDS). This is an alternative way of providing dental services under an agreement between the provider and a health authority. A small number of pilot schemes within PDS involve general anaesthesia. The Act allows for these and other PDS schemes to become permanent alternatives to the provision of other NHS dental services. However, in the context of the trends described in this chapter they will have had little effect up to now and so are not considered further in this review of service trends.

## Provision of general anaesthetics and sedations in the NHS

### The pattern for the General Dental Services



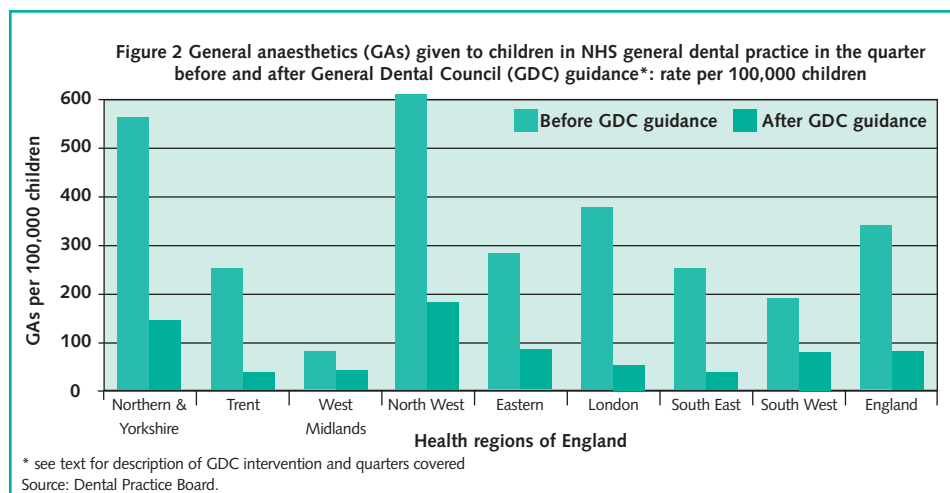
The provision of general anaesthesia has fallen steadily since the mid-1960s although it increased after 1992 (Figure 1). Expert reports produced on the issue during this period have often been followed by a drop in the provision of general anaesthesia in dental practice.

The number of general anaesthetic administrations in the General Dental Services in England decreased by almost 80% (from 57,000 to 12,000) for the quarter July to September 1999 compared with the same period in 1998. This is almost certainly due to the General Dental Council (GDC) issuing guidance in November 1998 requiring the use of an appropriately trained medically qualified anaesthetist and the development of protocols for transferring patients to a critical care facility in the event of an emergency. In contrast, the increase of 53% (from 38,000 to 58,000) in the number of sedations over the same period, albeit from a much smaller base, probably reflects the substitution of this technique for general anaesthesia for many patients.

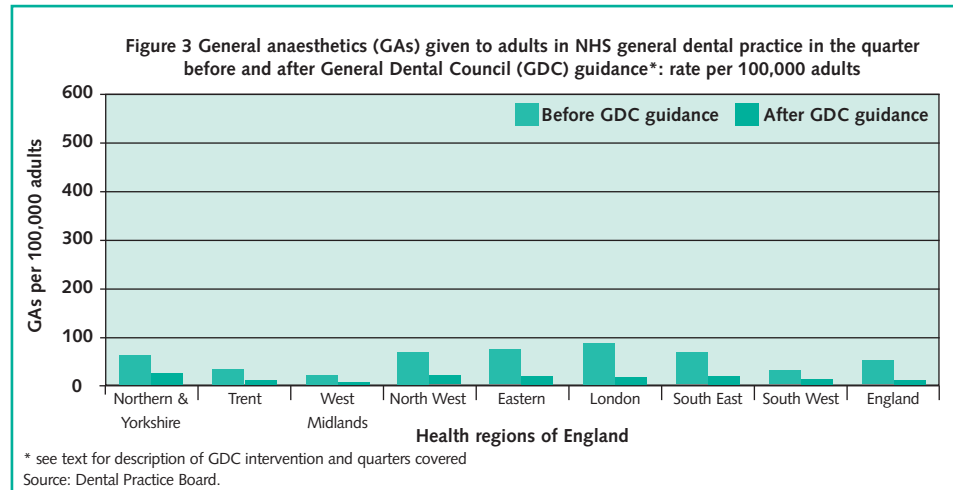
Further references in this text to trends will use the terms ‘before GDC guidance’ and ‘after GDC guidance’. When these terms are used the period ‘before’ is the quarter July to September 1998 and the period ‘after’ is the quarter July to September 1999. Whilst these data are not completely up to date it is the last period, using the same months in a year, when a direct comparison can be made between the numbers of general anaesthetics and sedations provided before and after the GDC amended their ethical guidance.

### Regional Differences

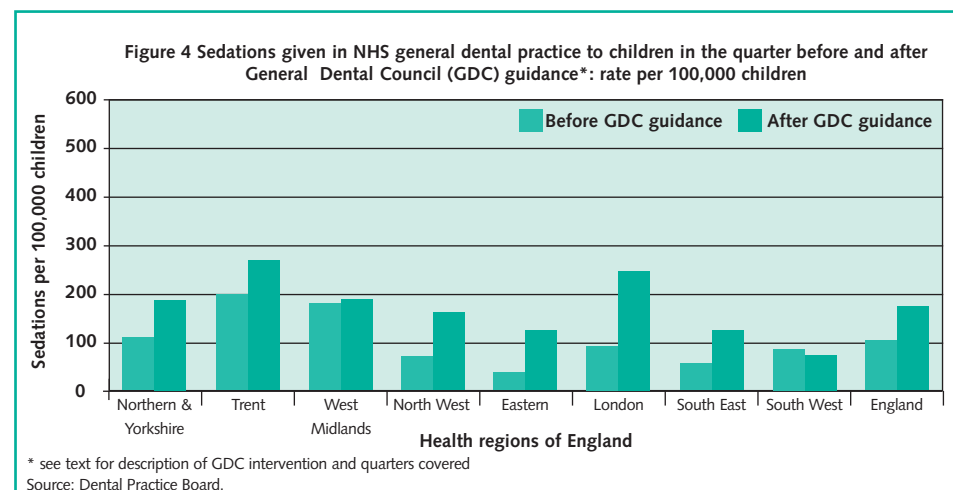
The provision in the General Dental Services of general anaesthesia (GA) for dental treatment for children, in each NHS Health Region (Figure 2) showed relatively high usage in northern parts of the country and very low use in the West Midlands, with a fall after the GDC guidance in all Regions. In the GDS, children are patients aged under 18 years.



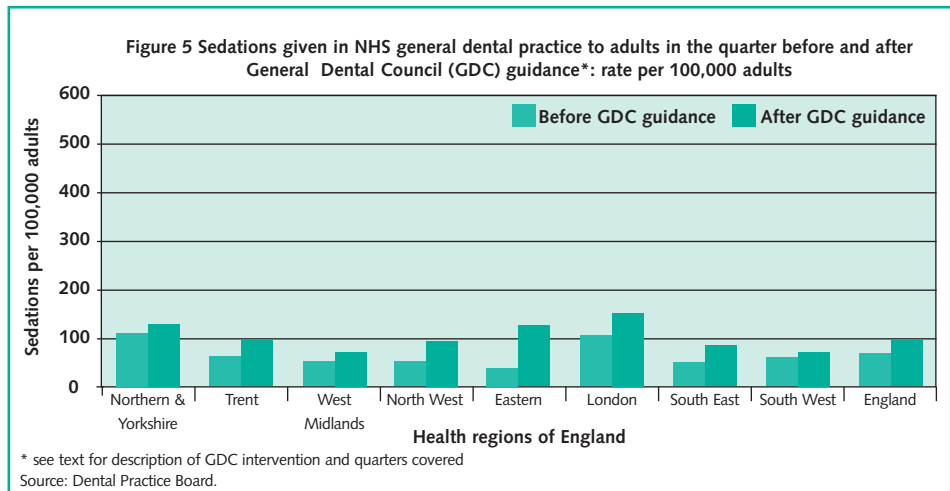
The pattern is different for general anaesthesia for dental treatment in adults. Fewer are performed overall. The highest rates before the GDC guidance were in the London and Eastern Regions and after the GDC guidance in the Northern and Yorkshire Region (Figure 3).



There are also regional differences in the provision of children’s sedations. The Eastern and South East Regions had particularly low numbers before the GDC guidance and the Trent and London Regions a relatively high level of provision after the guidance (Figure 4).



The number of sedations for adults per head of population is less than that for children. Since the GDC guidance there have been more sedations given to adults per head of population in the London, Northern and Yorkshire and Eastern Regions compared with the rest of England (Figure 5).



*Pattern for NHS general dental practices which provide the highest number of general anaesthetics*

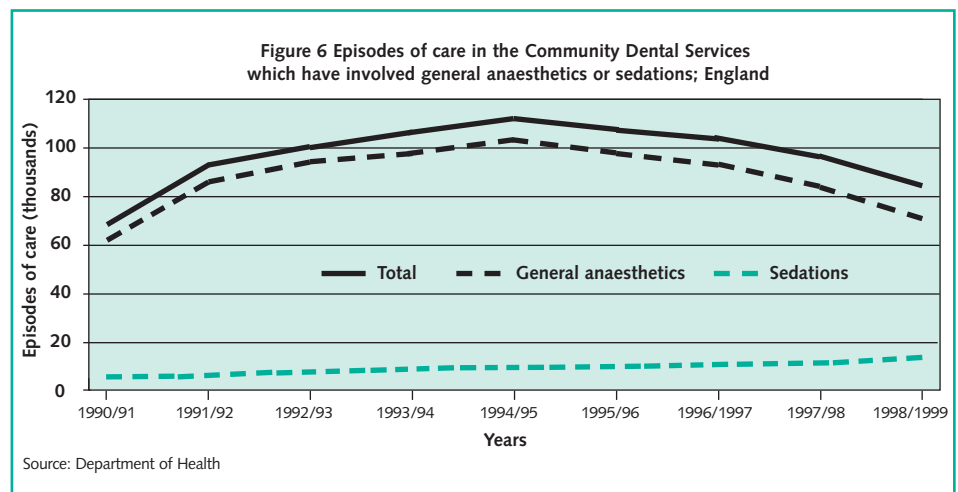
The provision of general anaesthesia by dentists in the General Dental Services who made claims for 90 or more general anaesthetics fell between the quarters July to September 1998 and 1999. Before the GDC guidance, 178 (about 1% of all principal dentists in England) made claims for 71% of all the general anaesthetics in the General Dental Services. In the corresponding period after the GDC guidance the number of high volume dentists had fallen to 45 (about 0.25% of all principal dentists) but this small number still accounted for 69% of all the general anaesthetics in the General Dental Services. The average number of general anaesthetics provided for these high usage dentists per quarter fell only slightly between the two periods, from 232 to 196 GAs. There is little variation between Regions except for Northern and Yorkshire where the average number per high volume dentist increased by 77% to 485, a figure which is double that of the next highest Region.

Table 1: Analysis of general anaesthetics by region for dentists in NHS general dental practice who made claims for 90 or more in the quarter ending September 1999 (quarter ending September 1998 in brackets)

Region	Number of GA treatments	% of all GA treatments in region	Number of dentists	Average number of treatments per dentists
Eastern	976(5,549)	69% (82%)	6(20)	163(277)
North West	2,404(8,507)	70%(69%)	15(39)	160(218)
Northern and Yorkshire	1,939(6,035)	69%(57%)	4(22)	485(274)
South West	799(1,974)	80%(80%)	5(12)	160(164)
London	980(9,035)	59%(78%)	6(41)	163(220)
South East	970(6,641)	67%(80%)	4(26)	242(255)
Trent	489(2,532)	87%(61%)	3(11)	163(230)
West Midlands	258(1,049)	66%(61%)	2(7)	129(150)
ENGLAND	8,815(41,322)	69%(71%)	45(178)	196(232)

Source: Dental Practice Board

In the Community Dental Service the vast majority of general anaesthetic work is undertaken on children. In the CDS, children are patients aged under 16 years. Figure 6 shows the number of episodes of care in the CDS involving general anaesthetics or sedations from 1990/91 to 1998/99. The figures cover both children and adults. The highest provision was in the North West Region. The CDS carry out very few courses of treatment for adults which contain a general anaesthetic (6,800 in 1998/1999) and relatively few courses containing sedation for children (8,500 in 1998/1999) or adults (4,400 in 1998/1999).



## *The recent pattern for the Hospital Dental Services*

Given the drop in provision of general anaesthesia for dental treatment within general dental practice in the NHS, it is important to examine the provision in hospitals so as to establish whether there has been any shift from general dental practice to hospital dental practice since the GDC guidance was issued.

The number of general anaesthetics administered for dental treatment in hospitals is not known and the nature of this work generally is different from that in general dental practice. Nevertheless an impression of whether a shift from primary to secondary care has occurred is given by the numbers of ordinary admissions and day cases seen by the dental specialities, the majority of whom are likely to have received their treatment under general anaesthesia.

The numbers of oral surgery and paediatric dentistry ordinary admissions fell by about 1000, and day cases increased by about 400, suggesting that the number of general anaesthetics fell by approximately 600 between the quarter ending September 1998 and that ending September 1999. The reduction of 11% for ordinary admissions is slightly greater than the 7% reduction for all medical and dental specialities over the same period. The number of day cases for oral surgery and paediatric dentistry increased by 1% or 400 over the same period which contrasts with a 4% fall for all medical and dental specialities.

Nearly three-quarters of the patients receiving hospital dental treatment are outpatients. The number of outpatient attendances has declined slightly and waiting times for first appointments have risen since the GDC guidance was issued. Comparing September 1998 with September 1999 the number of patients waiting 13 weeks or more for first outpatient appointment rose by 18%. This rise probably reflects other factors rather than any consequence from the reduction in the use of general anaesthetics in general dental practice; there was a similar rise of 17% in the numbers waiting for all medical and dental specialities over the same period.

## *General anaesthesia and sedation provision in Europe*

An attempt was made to survey practice in other European countries but it proved difficult to obtain comprehensive data. However, where information was given, general anaesthesia for dental treatment in other European countries was generally provided in hospitals with scarcely any provision in general dental practice (except for Switzerland).

## Deaths following general anaesthesia for dental treatment

The figures in Table 2 show that as the provision of general anaesthesia declined from 1965, deaths also decreased broadly in line with the numbers of general anaesthetics undertaken. The number of deaths rose in the late 1990s following an increase in general anaesthetic provision.

**Table2: Deaths in England associated with general anaesthesia and dental treatment with the setting where the general anaesthesia was provided.**

Year	Total	Under 15/16*	Dental practice†	Hospital	Year	Total	Under 15/16*	Dental practice†	Hospital
1965	4	0			1983	5	1	4(1)	1(0)
1966	6	2			1984	3	1	2(1)	1(0)
1967	5#	1	2(1)	2(0)	1985	4	4	1(1)	3(3)
1968	10	4	6(4)	4(0)	1986	4	2	3(2)	1(0)
1969	6	1	3(1)	3(0)	1987	3	1	0	3(1)
1970	9#	4	4(1)	4(1)	1988	1	0	0	1(0)
1971	12#	2	7(1)	4(1)	1989	3	3	1(1)	2(2)
1972	9	3	4(3)	5(0)	1990	2	0	0	2(0)
1973	7#	0	3(0)	2(0)	1991	1##	0	0	1
1974	13#	4	7(1)	5(2)	1992	6#	3	4(3)	1(0)
1975	5	1	5(1)	0	1993	1	1	0	1(1)
1976	9#	4	7(3)	1(1)	1994	0	0	0	0
1977	8	3	5(2)	3(1)	1995	0	0	0	0
1978	8	1	5(1)	3(0)	1996	2	1	2(1)	0
1979	9	0	4(0)	5(0)	1997	1	1	1(1)	0
1980	5	2	3(1)	2(1)	1998	3**	2**	3(2**)	0
1981	4	1	4(1)	0	1999	3	1	2(1)	1(0)
1982	7	1	3(1)	4(0)					

### Totals all Years

Number of deaths	Under 15/16	Dental Practice†	Hospital
178#	55	95(36)	65(14)

Source: Department of Health

Figures in brackets relate to number of children.

\* Prior to 1982 under 15 years of age. From 1982 under 16 years of age.

\*\* Includes a case in Scotland.

# Place of operation and numbers of deaths do not tally.

## Case in Wales.

† Includes cases in the CDS.

## Factors influencing trends in provision

When the trends in provision since 1965 are considered, there are a number of potential reasons for the overall decline in the use of general anaesthesia for dental treatment including:

- the reduction in dental caries which has resulted in fewer teeth requiring extraction



- changed attitudes of patients and dentists favouring conservation of natural teeth
- an increase in the use of sedation techniques
- the impact of various reports on clinical standards since 1967.

The increase in the number of general anaesthetics since 1992 is likely to be due mainly to the increased provision by practices specifically geared to the administration of general anaesthesia. The November 1998 GDC guidance placed far more restrictive requirements on the provision of general anaesthesia for dental treatment. In addition to reducing the numbers of general anaesthetics, the tighter restrictions in the guidance appear to have discouraged specialist providers of general anaesthesia. For example, one of the main providers of this type of service has informed the Department of Health that it was no longer providing general anaesthetic services.

### *Chapter 2 - Conclusions*

- Provision of general anaesthesia has fallen steadily since the mid-1960s although there was an upward trend between 1992 and 1998.
- As the provision of general anaesthesia declined the overall number of deaths also fell.
- Following a three year period (1993–1995) in which no deaths occurred associated with general anaesthesia for dental treatment outside hospital, eight deaths occurred during 1996 to 1999, of which five were children.
- Since the issue of the General Dental Council revised guidance in November 1998 there has been a reduction of over three-quarters in the number of general anaesthetic treatments provided in NHS general dental practice.
- The use of sedation in the same period increased by almost half, reflecting its use as an alternative to general anaesthesia.
- Provision of general anaesthesia for dental treatment varies across England with a relatively high level of provision in the North.
- Since the General Dental Council guidance there has been overall a reduction in the number of both outpatients and inpatients seen by the dental specialities in hospitals and a slight increase in the number of day cases.
- No data are available to show trends in the use of general anaesthesia in private dental practice.

# Chapter 3

## Review of Present Arrangements

**This chapter reviews the current arrangements for the provision of general anaesthesia and sedation for dental treatment and aims to identify where there are problems or barriers to improvement.**

### *Legislation*

#### *Legislation relating to all dentists*

The Dentists Act 1984 (as amended) is the main legislation relating to the way dentistry can be practised in the United Kingdom. This Act does not specify procedures, such as general anaesthesia or sedation, which can be carried out by dentists. However, under this Act the General Dental Council (GDC) can discipline dentists by removing or suspending them from the Dentists Register if they are guilty of serious professional misconduct.

Many of the drugs used in general anaesthesia and sedation are medicines available only on prescription. Under the Medicines Act 1968 and its subsequent amendments, all dental practitioners like medical practitioners, whether in the public or private sectors, are able to administer any prescription-only medicine to their patients or direct that another person administers that medicine. This means that dentists are allowed to administer any medicine required in an emergency while the patient is undergoing surgical procedures.

#### *Legislation relating to dentists in the NHS*

Where a dentist provides services within the NHS additional rules apply. These stem from the National Health Service Act 1977. Part I of this Act relates to hospital and community dental services and Part II to services provided by general dental practitioners. NHS regulations<sup>14</sup> allow general dental practitioners to provide general anaesthetics and set out the arrangements they must make until recovery of the patient is complete after giving treatment either under general anaesthesia or sedation.

Dentists who are employees of a health authority or NHS Trust are bound by the terms and conditions of their employing authority when providing treatment. The Secretary of State for Health has powers, under Schedule 2

of the National Health Service and Community Care Act 1990, to issue directions to NHS Trusts to require employees undertaking certain functions to have particular qualifications or experience. Other matters, such as the way treatments are performed, cannot be centrally controlled.

A total of 5 Personal Dental Services pilots introduced under the National Health Service (Primary Care) Act 1997 include the provision of general anaesthesia. This has enabled the local health authority to require specific standards to be provided on such matters as pre-anaesthetic assessment visits, equipment, emergency drugs, staffing levels and training.

### *Professional guidance*

The General Dental Council's guidance in November 1998 was revised in collaboration with the Royal College of Anaesthetists. It requires that general anaesthesia for dental treatment, whether in the NHS or private sector, may only be administered by a medically qualified individual who is:

- on the specialist register of the General Medical Council as an anaesthetist;  
or
- a trainee working under supervision as part of a Royal College of Anaesthetists' approved training programme;  
or
- a non-consultant career grade anaesthetist with an NHS appointment working under the supervision of a named consultant anaesthetist who is a member of an NHS anaesthetic department where the non-consultant anaesthetist is employed.

In February 1999 the Royal College of Anaesthetists (RCA) published similar guidelines for general anaesthesia for dentistry<sup>3</sup>. The Medical Royal Colleges are responsible for setting the standards for practice in the medical specialities. These standards are not enshrined in statute but they do carry considerable weight and the courts would have reference to them in reaching decisions in cases involving standards of clinical care. The General Medical Council (GMC), which is an independent statutory body, also has regard to compliance with accepted clinical standards in reaching decisions on matters of fitness to practice. For example, following deaths under general anaesthesia in dental practices, the GMC has erased one doctor from the Medical Register and severely reprimanded another with a recommendation that he undergo additional training.

- **Professional guidance is now more restrictive than current NHS legislation and means that current regulations within the NHS are not consistent with the standards set by the professions' regulatory bodies. This anomaly must be corrected.**

### *Common and Criminal Law*

Dentists and doctors are subject to the common law. For instance, a court may find that a dental or medical practitioner has acted negligently in treating a patient and may award damages against them to compensate the patient for any harm caused.

They are also subject to the criminal law. In 1999, following the death of a patient who received dental treatment under general anaesthesia, the medical anaesthetist was found guilty of manslaughter and sentenced to a term of imprisonment.

### *Review of current standards*

#### **General standards relating to the prevention of and response to emergencies during dental treatment**

To prevent avoidable emergencies occurring during dental treatment it is essential that an adequate preliminary assessment is undertaken for each patient before decisions are taken as to how they will be treated. This must include selecting with the utmost care the most suitable means of pain and anxiety control from the range of choices available. Part of this process must include taking a proper medical and dental history as well as the review of other relevant clinical information.

Guidance to dentists from the GDC sets out in detail the need for appropriate medical histories for the provision of dental treatment under local anaesthesia, conscious sedation and general anaesthesia. The Royal College of Anaesthetists guidelines<sup>3</sup> (1999) set out those cases to which general anaesthesia for dentistry should be limited.

It was clear from the Group's review that preliminary assessment has not always been adequate. In some cases the decision to use general anaesthesia appears to have been taken lightly, as a convenient option. It is essential that the dentist fully explores alternative methods of pain and anxiety control with the patient, parent or carer. There must be a discussion about the risks associated with each method so that an informed choice can be made by, or on behalf of, the patient.

- **Dentists referring a patient for a general anaesthetic must be particularly aware of their responsibilities; these are set out in the GDC's ethical guidance and include that clear justification for the use of a general anaesthetic be made in a referral letter. Referring dentists have a responsibility to ascertain that the facilities at the premises to which they refer patients are adequate and that the clinical staff are properly trained.**

#### *Resuscitation skills*

When an emergency does occur it is essential that dentists and their staff are able to cope with it. Staff in dental practices must have a level of skill in resuscitation to enable them to cope with any complications associated with treatment given, whether under local anaesthesia, conscious sedation or general anaesthesia. All members of the dental team are health care professionals and are likely to encounter situations requiring special skills in resuscitation. Such skills can be life saving. The Poswillo Report recommended that in dental practices all staff in contact with patients must be able to carry out basic life support.

The guidance of both the GDC and the Royal College of Anaesthetists require that for general anaesthesia there should be the facility for the provision of advanced life support if required. Basic life support and advanced life support skills are set out in a Resuscitation Council (UK) publication '*The 1998 Resuscitation Guidelines for use in the United Kingdom*'<sup>10</sup>.

All clinical dental practice staff should be able to carry out basic life support with appropriate airway adjuncts. Also, where general anaesthesia is administered all clinical staff and their assistants must be competent in advanced life support for adults and children. Training undertaken in basic life support and advanced life support should be clearly recorded and undertaken at intervals in line with the UK Resuscitation Council's guidance. All members of the team must practice resuscitation together at regular intervals. Health authorities should monitor that the required training has been undertaken.

- **All dental practice staff who have contact with patients must be trained in basic life support; where general anaesthesia is administered all clinical staff and their assistants must also be skilled in advanced life support.**

### *Emergency equipment and drugs*

The Poswillo Report was highly specific in listing the drugs and their dosage that should be kept in dental practice for emergencies. It is apparent that this has not been consistently implemented and practitioners use different lists. In one of the dental practices in which a patient has died since the Poswillo Report was published there were no emergency drugs available. In another case the emergency drugs were out of date. This is unacceptable. The recently published Scottish Office document 'Emergency Dental Drugs' MEL (1999) 22<sup>6</sup> sets out a list of drugs and equipment to be available in all dental practices. Every dental practice should have the necessary drugs to respond effectively to emergencies and these should be comprehensive enough to be used in the unexpected collapse of any patient.

### *Training in medical emergencies*

All dental practices should be staffed, trained and equipped, to the current standards, to deal with emergencies or collapse of patients. In particular training, including the use of appropriate emergency drugs where necessary, in the treatment of patients with medical emergencies occurring within the dental surgery arising from:

- cardiac arrest
- myocardial infarction
- anaphylactic reactions
- vasovagal attacks
- asthma attacks
- epileptic seizures
- hypoglycaemia

➤ **All dental practices must have the appropriate equipment and drugs to deal with emergencies or collapse of patients. The staff must be trained in coping with such emergencies. All members of the dental team must practise resuscitation together at regular intervals.**

➤ **Health authorities should monitor that the equipment for resuscitation is present, the drugs in date and the required training has been undertaken. Health authorities must ensure that a written protocol for the dental practice is in place to ensure that dental practitioners and their staff can deliver resuscitation effectively, that drugs used are in date and that equipment is in good working order.**

## *Standards specific to the use of general anaesthesia for dental treatment*

The most comprehensive recent set of professional standards relating to the provision of general anaesthesia and sedation for dental treatment derive from the Poswillo Report(1990)<sup>1</sup>. This report set out over 50 recommendations covering general anaesthesia, sedation and resuscitation.

The Government subsequently made over £20 million available to facilitate implementation of the Poswillo Report through the then, Regional Health Authorities<sup>4,5, 9, 15</sup>. However, it is now clear that a number of the recommendations were not fully or consistently implemented, whilst others have become outdated.

This section sets out the standards required to deliver safer, effective general anaesthetic and conscious sedation services for dental treatment using the framework set out in the Poswillo Report, modified by more up to date standards where these are available. In particular the Group used documents produced since 1990 including the Jackson Report (1993)<sup>7</sup>, the Clinical Standards Advisory Group Report on Dental General Anaesthesia (1995)<sup>8</sup>, guidance from the General Dental Council (1998 and 1999)<sup>2</sup>, standards and guidelines from the Royal College of Anaesthetists (1999)<sup>3</sup> and the Report of The National Dental Advisory Committee of the Scottish Office on Emergency Dental Drugs (NHS MEL (1999) 22)<sup>6</sup>.

The deaths after general anaesthesia for dental treatment which occurred in the 1990s show the inability of some of the anaesthetic and dental teams to respond quickly and effectively to serious and unexpected crises when the patient developed cardiac or respiratory problems.

In reviewing the deaths which have occurred outside hospitals during this time the Group was concerned to note some recurring features.

### *Recurring features of dental deaths outside hospital*

- inadequate pre-treatment assessment
- lack of suitably trained staff to carry out appropriate resuscitation
- absence of resuscitation training involving all members of the anaesthetic and dental teams
- inadequate anaesthetic equipment and monitoring
- delays in instituting appropriate resuscitation measures in cases of sudden collapse
- absence of comprehensive resuscitation equipment in good working order

Irrespective of whether general anaesthetics are being carried out in dental practice or elsewhere, they must be carried out in a way that minimises the chances of serious complications arising and ensures effective resuscitation when emergencies do occur.

### *Transfer arrangements*

The GDC's amended guidance (1998) refers to a written protocol between the dentist making arrangements for general anaesthesia and the anaesthetist. The protocol must set out the provision of advanced life support where general anaesthesia is provided. This protocol also requires appropriate arrangements for the immediate transfer of a patient to a critical care facility. The first few minutes following the collapse of a patient are the most important and, when dental treatment was being undertaken under general anaesthesia outside a hospital setting, there was not sufficient reassurance that all that should be done in the first few minutes following the collapse of a patient could consistently be carried out to modern day standards.

- ➡ **To ensure that high quality critical care is available as soon as possible, dental treatment under general anaesthesia should be provided in a hospital setting.**

By 'hospital setting' we mean 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 maintained in connection with any such institution.



### *The provision of anaesthetists*

The Poswillo Report set out conditions by which dentists and doctors without registrable qualifications in general anaesthesia could continue to provide this service. The amended GDC guidance (1998) has restricted this provision to practitioners on the General or Specialist Register of the GMC with recognised qualifications in anaesthesia or in training to attain them or working in the NHS under a named consultant anaesthetist. This change is of major importance since it effectively gives control of the standards of provision of general anaesthesia for dental treatment to the Royal College of Anaesthetists.

Regrettably there have been three further deaths since the GDC's 1998 guidance was issued. Medical practitioners provided the anaesthesia in all of these cases. However, it is unclear whether the Royal College of Anaesthetists' guidelines were followed. Manslaughter charges have been brought by the police in one case.

Assuming that current levels of general anaesthetics administered for dental treatment continue it would be expected that the present provision of anaesthetists will be sufficient to provide the service needed. However, it will be important to ensure that there will be an adequate number of individuals trained to provide a general anaesthetic service for patients needing it for dental treatment in the future. The Royal College of Anaesthetists has pointed out that in recent years a low priority has been given to the training of specialists in general anaesthesia for dental treatment. This must be kept under review by the College and other workforce planning bodies.

All anaesthetists in training in the specialist registrar grade must be able to demonstrate that they have devoted an appropriate part of their professional training to cases involving dental treatment. The trained anaesthetist should be able to resolve any problems associated with sharing a patient's airway with a dentist.

- **There is a need to monitor and ensure the future provision of anaesthetists with adequate training and experience of general anaesthesia for dental treatment.**

### *Support staff for anaesthetists*

The Poswillo Report stated that the dental anaesthetist and the dentist must each be able to rely on an assistant for support if there were problems with the administration of general anaesthesia. The Royal College of Anaesthetists has stated that this level of staffing means that a minimum of four people, including the dentist and anaesthetist, is required for any dental procedure performed under general anaesthesia.

It is clear that this standard has not been comprehensively achieved. Most of the recent unsuccessful attempts to resuscitate patients who have died whilst receiving dental treatment under general anaesthesia have been associated with an absence of dedicated trained help for either the anaesthetist or the dentist.

- **It is essential that when a general anaesthetic is given the anaesthetist and the dentist each have appropriately trained and competent, dedicated assistance so that routine and unexpected events can be dealt with in a safe, efficient and effective manner. The teams must practise resuscitation together at regular intervals.**

### *Equipment, monitoring and drugs for general anaesthesia*

The Poswillo Report (1990) made the most specific recommendations for the equipment which dental practices should have to support the practice of general anaesthesia.

Of the £20 million made available to implement the Poswillo Report, £9 million was initially allocated for general anaesthesia, including purchasing equipment, and subsequently the remainder for meeting residual equipment requirements, the cost of additional anaesthetic and sedation sessions, training needs and the purchase of sedation equipment. From 1995/96, the Poswillo revenue funding was built into the annual baseline allocations of all health authorities<sup>9,15</sup>. This was done to continue funding the implementation of the various recommendations in the Poswillo Report, including additional general anaesthetic and sedation sessions, equipment purchase and maintenance and training, in order to meet clinical need as safely as possible.

The Royal College of Anaesthetists guidelines on general anaesthesia for dentistry set out general requirements that:

- equipment should be designed specifically for the dental setting
- appropriate monitoring and resuscitation equipment and drugs should be available and the equipment checked by the anaesthetist before use
- there should be immediate access to spare apparatus in the event of failure
- maintenance be in accordance with manufacturer's instructions

Equipment should also conform to British or European Standards at the time of purchase.

The Poswillo Report (1990) also made specific recommendations in this respect advocating the availability and use of equipment for monitoring the following for patients undergoing general anaesthesia:

- electrical heart activity (electrocardiogram)
- blood pressure (sphygmomanometer)
- oxygenation (pulse oximeter)
- carbon dioxide level (capnograph)

as well as appropriate arrangements for the delivery of emergency drugs and oxygen.

At some of the coroners' inquests and subsequent enquiries related to deaths after general anaesthesia for dental treatment inadequacies or failures to use monitoring equipment were highlighted. It is also clear from some of the deaths that have occurred recently that equipment for monitoring and for resuscitation has not always been either readily available or in working order. This is an unacceptable standard of practice.

In addition to the emergency drugs which must be available in all dental practices, antagonist drugs for the reversal of anaesthetic and sedation agents used must also be available where general anaesthesia or conscious sedation are provided .

- **The anaesthetist must ensure that adequate and appropriate equipment is properly maintained and checked and that it is in good working order before being used, in accordance with professional standards. Anaesthetists must also ensure that they are familiar with the equipment and be sure they are using it appropriately.**

### *Training of dentists*

Undergraduate and, where appropriate, postgraduate dental courses must include practical training to ensure that dentists and their teams are able to carry out dental treatment whilst sharing a patient's airway with an anaesthetist.

### *Case selection and consent*

No general anaesthetic is without risk. It is of paramount importance that patients are carefully selected for general anaesthesia in discussion with the patients themselves, or their parents or carers. General anaesthesia should only be given when judged to be clinically necessary for providing dental treatment.

### **Dentists and doctors must be trained in the alternative techniques used to control pain and anxiety in dentistry.**

Research has shown that the dentist has the greatest influence on the decision to give general anaesthesia to a child. This is often influenced by non-clinical factors such as the preference of the dentist, the attitude of the patient or parent, and how the provision of general anaesthesia is structured locally. There will always be some cases where dental treatment cannot be performed without a general anaesthetic. In these cases the benefits of the treatment must be expected to outweigh the potential risk in providing general anaesthesia for that treatment.

The Poswillo Report recommended that written consent should be obtained on each occasion prior to the administration of a general anaesthetic. The GDC guidance to dentists on professional and personal conduct makes it clear that written consent must be obtained before a general anaesthetic is administered. The same applies to the administration of conscious sedation. From reviews of the deaths associated with general anaesthesia for dental treatment it appears that there have been cases where the written consent of patients or their carers had not been obtained.

On each occasion that general anaesthesia is to be provided written consent to the procedure must be obtained. Consent should be obtained only after full information on the risks and benefits of the intended procedure and its alternatives have been discussed and understood. The case history and notes prepared during the pre-treatment assessment should form part of the basis on which consent is obtained.

- **Prior to a general anaesthetic for dental treatment being administered written evidence of consent must be obtained after all alternatives have been explored and the risks of the procedure made clear to the patient or their carer.**

#### *Patient information and escorts*

It is important that patients are prepared appropriately before treatment and are not discharged before the practitioner is satisfied that it is safe to do so.

The Poswillo Report recommended that patients should be provided with written comprehensive pre-treatment and post-treatment instructions and advice. The GDC guidance to practitioners also makes it clear that patients must be given clear and comprehensive written pre-operative and post-operative instructions. It is particularly important that patients have suitable adult escorts. In two of the deaths in the late 1990s, accompanying relatives had themselves received dental treatment whilst unconscious immediately before the patients who died. This is unacceptable and should not be allowed to occur.

In any case where general anaesthesia is being suggested the patient or their carer must be provided with an explanatory leaflet which sets out the alternative ways of providing pain and anxiety control and the risks involved with each. This leaflet should be provided before referral to another practitioner or before consent is obtained so that the patient, or carer, can take the information into account in making their decision.

A patient must be accompanied by a responsible adult who is able to look after those in their care and who is not receiving a general anaesthetic or sedation on the same day.

- **Patients undergoing dental treatment under general anaesthetic must be given adequate pre-operative and post-operative information. On no account should those escorting patients themselves undergo general anaesthesia during the same visit.**

#### *Inspection of premises where general anaesthesia for dental treatment is provided*

The Poswillo Report recommended that in dental practice, surgeries where general anaesthesia was provided should be subject to inspection and registration. That report suggested a route through the addition of these services to those set out in the Registered Homes Act, 1984, as a specified

procedure. This Poswillo recommendation was not implemented. Except when using equipment requiring specially controlled techniques, dental surgeries remain outside the scope of the Registered Homes Act 1984.

In determining a dentist's application to join a health authority list to provide NHS General Dental Services, the practice premises may be inspected by the health authority. Decisions to inspect do not follow a consistent pattern around the country. They are dependent on the individual health authority's policy. General Dental Practice Advisers have usually carried out these inspections, although a small number of health authorities have also included a specialist anaesthetist in the inspection team for practices providing general anaesthetics. If a need for subsequent inspections of practices is brought to the attention of a health authority they will usually be carried out, although there must be a reasonable period of notice for the dentist or practice owner.

In reviewing the deaths that have occurred after general anaesthesia in general dental practice a number of the failings that were found would have been obvious at a thorough unannounced inspection.

It is also a particular weakness of the present arrangements that the inspection of dental practices in the private sector is not even regulated to the limited extent of that in the NHS.

Department of Health Ministers have agreed to a provision being made within the Care Standards Bill, which is expected to receive Royal Assent in the summer. This provision would require premises where general anaesthesia was provided for dental treatment in the private sector to be registered and inspected on a regular basis. This could provide the basis for the enforcement of standards if the practice of using general anaesthesia was to continue in private dental practices and dental practices providing general anaesthesia privately outside hospitals.

To ensure equal standards apply to all dentistry, NHS Regulations should be strengthened to allow for lists of practices where general anaesthetics are carried out to be kept and for specific inspection requirements for those practices to be set.

Decisions on an acceptable standard for the facilities provided for general anaesthesia, including detailed guidance regarding equipment, staffing levels, available skills, drugs and premises should be judged as matters of clinical governance (see HSC 1999/065)<sup>13</sup> working within the framework of guidance given by the professional bodies and the Department of Health. The facilities must be monitored during the inspection of the premises.

- **As long as general anaesthesia is permitted to be administered outside hospital all practice premises where it is undertaken, whether in the public or private sectors, should be listed and, on a regular basis, inspected to ensure that equipment, drugs and staff procedures are in place to cope with routine and unexpected events relating to patients. Inspections should include unannounced visits during working hours. Health authorities should be responsible for maintaining lists of all dental practices in their areas at which general anaesthesia is provided in the NHS and for undertaking inspection visits. Private practice should fall within the proposed amendment to the Registered Homes Act 1984 and subsequently to the proposed National Care Standards Commission, subject to Parliamentary approval.**

## *Standards specific to the use of conscious sedation*

### *The provision of sedationists*

Under current arrangements dentists or doctors can provide sedation for patients receiving dental treatment. It has been accepted for some time that when the patient is conscious throughout the procedure, both sedation and dental treatment can safely be carried out by a single person with suitable training in both sedation and dentistry.

Despite this there has been prolonged debate in the 1990s regarding the details of techniques used for sedation and their safety. With some techniques it is difficult to control whether patients drift in and out of consciousness, and practitioners should only use any method after appropriate training.

The GDC in its guidance on sedation (1999) defined ‘conscious sedation’ only and reinforced this by stating that the patient must remain conscious at all times. This is an important development, which should reduce the possibility of mis-interpreting how sedation should be conducted for dental treatment. We reinforce it in the definition of conscious sedation adopted in this report.

### *Support staff for sedationists*

The Poswillo Report agreed with the guidance of the GDC at that time that a second appropriate person must be present throughout when a patient was receiving sedation. The Jackson Report (1993)<sup>7</sup> provided similar guidelines.

Despite this, in one recent case where a patient died the dental nurse assisting had received little formal training in resuscitation, was not asked to carry out and did not carry out any resuscitation procedures.

The most recent GDC guidance (May 1999)<sup>2</sup> states that a suitably trained assistant be present throughout when a patient is receiving conscious sedation and specifies that this is to monitor the condition of the patient and to assist when complications arise.

- There must be an appropriately trained and competent dedicated assistant present in the surgery with the patient at all times, to assist the dentist providing dental treatment under conscious sedation. After leaving the surgery a trained assistant shall be directly responsible for the patient's protection until the dentist is satisfied that recovery is sufficient for the patient to be discharged from the premises.

#### *Equipment for conscious sedation*

Of the various reports since 1967, the Poswillo Report made the most specific recommendations for the equipment and drugs which dental practices should have to support the practice of sedation. This included the availability and use of dedicated inhalational sedation machines capable of delivering a fixed maximum level of nitrous oxide and a fixed minimum level of oxygen when providing relative analgesia (a particular sedation technique using inhalation); the use of indwelling cannulae for intravenous sedation; and additional equipment for the resuscitation of patients who had received sedation. It is essential that all machines used for conscious sedation meet the above guidelines bearing in mind the potential for general anaesthetic machines to be used for conscious sedation. The Group recommends that all inhalation sedation machines should be regularly maintained and equipped to the British or European Standard applicable at the time of their purchase.

- Problems arising from the use of sedation equipment must be reported to the Medical Devices Agency and should be investigated where appropriate.
- It is important to reinforce existing guidance on standards for conscious sedation as this technique is likely to continue to be used increasingly for the reduction of pain and anxiety.



### *Arrangements with patients for sedation*

A number of authoritative sources, including the Poswillo and Jackson Reports and the current GDC guidance indicate that the arrangements made with patients for whom sedation is proposed should be similar to those who receive general anaesthesia. In particular:

- the decision to sedate should be agreed with the patient on the basis of the most appropriate method of pain and anxiety control for their case
- written consent must be obtained
- appropriate written pre-operative and post-operative instructions must be given
- responsible adult escorts must accompany patients home. The GDC's guidance states that this may be relaxed at the discretion of the dentist where nitrous oxide and oxygen alone have been used to consciously sedate an adult patient
- the escort should not have been sedated on the same day.

In addition, the Group considered that:

- **When referring a patient, the referring dentist must provide clear justification for the use of conscious sedation in a letter and be satisfied that an appropriate service to modern day standards can be provided by the treating dentist and sedationist.**

### *Training standards for sedation*

There has been an increased need for appropriate training in sedation techniques in dentistry because of the growth in this type of practice in the past twenty years. This growth has accelerated since November 1998 following the amendment of the guidance on general anaesthesia by the General Dental Council.

To accommodate this need, the use of sedation techniques has been a priority topic for postgraduate training in the public sector since 1991. A distance learning video<sup>11</sup> on general anaesthesia, sedation and resuscitation was produced for all dentists in the GDS in 1993. In 1998/9 at least 449 courses either wholly or partly on sedation were provided for dental practitioners working within the NHS. A computer aided distance learning programme is also under development.

There is a number of dentally and medically qualified postgraduate trainers working under the auspices of the Society for the Advancement of Anaesthesia in

Dentistry (SAAD) in both dental practice and hospitals. They have been providing core theoretical knowledge and some practical training, not only within dentistry but also within other medical specialities. Formalised postgraduate training at a practical level is currently only provided by dental schools in the Universities of London (Guy's, King's and St Thomas', St. Bartholomew's and the Royal London) and Newcastle. In Wales practical training in conscious sedation for post-graduates is available at three centres. Therefore, the majority of qualified dentists learn conscious sedation techniques either through the public sector courses referred to above or through SAAD.

At undergraduate level the teaching of conscious sedation is variable, resulting in a wide variation in the experience of newly qualified dentists. Guidelines for teachers of sedation in dentistry to dental undergraduates have recently (May 1999) been set out by the Dental Sedation Teachers Group<sup>12</sup>, a group whose aims include:

- improving standards of teaching of conscious sedation
  - continuing to develop a common curriculum in sedation
- ❖ **Undergraduate dental curricula should contain modules to equip students with the ability to assess the suitability of various methods of anxiety and pain control including behavioural techniques and experience of administering sedation by inhalation and intravenously and of operating on sedated patients. Dental and medical practitioners providing sedation require further appropriate postgraduate training in the theory and practice of conscious sedation before they can provide this unsupervised.**
  - ❖ **Approved training bodies should create courses with an emphasis on the practical needs of dental and medical practitioners and undergraduate students and not be purely theoretically based. These should be provided by trained and experienced teachers.**
  - ❖ **Medical and dental practitioners should be able to demonstrate adequate theoretical and clinical training in conscious sedation before providing this service.**

### *Consent and patient information*

The arrangements for patients for whom conscious sedation is to be provided must be similar to those for whom a general anaesthetic is to be given. In particular, information on alternative ways of providing pain and anxiety control must be given and written consent obtained.

### *Patient escorts*

A responsible adult must accompany the patient home. This requirement may be relaxed for adults, at the discretion of the dentist, where nitrous oxide and oxygen alone have been used for conscious sedation.

- ➡ **Prior to conscious sedation for dental treatment being administered, written consent must be obtained after all alternatives have been explored and the relative risks of the procedure made clear to the patient or their carer.**

### *Monitoring morbidity and mortality*

The Poswillo Report recommended that there should be an ongoing enquiry into mortality and morbidity in relation to general anaesthesia and sedation for dental treatment. This was never established.

### *Morbidity*

There is very limited information about patients who have suffered adverse health effects following general anaesthesia and conscious sedation. Many expert reports have called for morbidity, in relation to anaesthesia and dentistry, to be scrutinised in a more formal way.

Currently, suspected adverse drug reaction reports are submitted to the Committee on Safety of Medicines (CSM)/Medicines Control Agency (MCA) via the Yellow Card Scheme, on a voluntary basis by doctors, dentists, pharmacists and coroners and under statutory obligations by pharmaceutical companies. If a member of the public suspects that they have suffered an adverse drug reaction the CSM or MCA would advise them to consult their doctor as he or she is best placed to advise patients on their treatment.

Physicians may, if they consider it appropriate, submit a Yellow Card to the CSM or MCA providing full clinical details of the suspected reaction, to allow a complete evaluation of the report. The company holding the marketing authorisation for the drug concerned in the UK is also responsible for noting any serious suspected adverse reaction brought to its attention. The marketing authorisation holder in the UK is also responsible for making adequate provisions to ensure that it receives notification of all world-wide adverse drug reactions that meet UK reporting criteria.

Despite all this, it is generally accepted that adverse incidents are under-reported. Also, reports received directly from patients without validation by a doctor or dentist are not entered on the MCA's Adverse Drug Reactions On-line Information Tracking (ADROIT) database.

Following a review of all available evidence, including spontaneous adverse reaction data and randomised controlled trials, at the end of November 1999 the CSM advised that halothane, a drug commonly used in inducing and maintaining general anaesthesia for dental treatment, should not be used in patients under 18 years of age undergoing dental procedures outside hospital. It also advised that there should be stronger warnings about the risk of cardiac rhythm irregularities when this drug is used.

The extent of morbidity for general anaesthesia and conscious sedation for dentistry in England is unknown. Without this information it is not possible to assess fully the risks inherent in a course of treatment or to provide patients and practitioners with complete information regarding those risks.

- **It is recommended that the extent of morbidity associated with general anaesthesia and conscious sedation is recorded and analysed by the Royal College of Anaesthetists and the Society for the Advancement of Anaesthesia in Dentistry respectively. In addition it is recommended that the General Dental Council's guidance more specifically addresses the need for dentists to comply with the need to report to the appropriate bodies adverse events and reactions, as a matter of good professional practice.**

## *Mortality*

At present, reliance is placed on the accuracy of the completed death certificate for the cause of a person's death. However, there is inconsistency in recording the association of a death with dental treatment, particularly when death has occurred some time after, and in a different place from, the administration of the general anaesthetic. The system of data entry at the Office for National Statistics has recently been computerised and a field added to the computer database identifying 'deaths associated with dental treatment'. Nevertheless this still relies on comprehensive details being recorded accurately on the death certificate, since poor recording only comes to light some time later.

Deaths in hospital associated with general anaesthesia for dental treatment are reported to the National Confidential Enquiry into Peri-Operative Deaths.

Currently deaths following general anaesthesia for dental treatment are notified to the Department of Health in an ad hoc way.

Whilst these arrangements are likely to allow an accurate picture to be assembled for the Department where inquests are attended, it is not satisfactory to depend on ad hoc procedures for recording deaths associated with general anaesthesia for dental treatment and a firmer basis should be established.

- **Coroners should be asked to notify the Department of Health of deaths associated with general anaesthesia for dental treatment for as long as it is permitted to be provided in dental practices.**

### *Chapter 3 - Conclusions*

- A number of expert reports have set standards for the safe use of general anaesthesia for dental treatment in non-hospital settings most notably the Poswillo Report (1990) which was supported by £20 million funding for implementation.
- Important aspects of the Poswillo Report were never effectively implemented in spite of the above funding. In addition some standards have progressed since then.
- The review of deaths after general anaesthesia in dental practices has highlighted failures to meet basic standards in areas covered by the Poswillo and other expert reports.
- Poswillo funding for revenue expenditure was incorporated into health authorities baselines in 1995/6 in the expectation that it would continue to be used for funding the safe provision of general anaesthesia and conscious sedation for dental treatment and certain training needs.
- Present NHS regulations do not contain sufficient powers to restrict or regulate conditions in which general anaesthesia for dental treatment and sedation are given. Moreover, NHS regulations now appear more permissive than the recent General Dental Council restrictions.
- There are currently no means to regulate general anaesthesia in private dental practice, but the Government proposes to introduce powers in the Care Standards Bill.
- NHS Regulations need to be strengthened to deliver equivalent standards to those proposed in the Care Standards Bill.
- Greater safety of general anaesthesia for dental treatment would be assured by restricting its use to hospital settings.

- Notwithstanding any change of policy there is at present an important need to rigorously enforce standards for general anaesthesia for dental treatment. Furthermore many of these standards will ensure safer conditions for other dental patients undergoing conscious sedation or other forms of pain or anxiety control.
- Conscious sedation is an inherently safer procedure than general anaesthesia, provided dentists and doctors have undertaken appropriate postgraduate training and the staff involved are suitably skilled and have the appropriate equipment, drugs and premises and the ability to deal effectively with any emergencies.
- Arrangements for monitoring mortality following general anaesthesia for dental treatment are inadequate. The extent of morbidity for general anaesthesia and sedation for dentistry in England is unknown. Without this information, risks inherent in a course of treatment cannot be fully assessed nor can patients and practitioners be provided with complete information regarding those risks.

# Chapter 4

## Recommendations

**Recommendation 1: General anaesthesia should be used less frequently for the provision of dental treatment.**

The Group recognises that for some patients there will always be a need for dental treatment to be provided under general anaesthesia. However, given the risk associated with the procedure general anaesthesia should be undertaken only when absolutely necessary. It should only be considered, in discussion with patients or their carers, after all other options have been excluded. The monitoring of the referral of patients for, and the provision of, dental treatment under general anaesthesia should be subject to audit under the new clinical governance arrangements

**Recommendation 2: General anaesthesia for dental treatment whether under NHS or private practice arrangements should only take place in a hospital setting no later than 31<sup>st</sup> December 2001.**

The recognised risks of general anaesthesia in dentistry need to be reduced further. The General Dental Council's 1998 amendment to the guidance on professional standards requires that general anaesthetics for dental treatment are given only by suitably medically qualified anaesthetists and that agreed protocols must be produced on resuscitation and the transfer of patients to a critical care facility. Failing to follow these standards can lead to dentists being barred from practising. The changes appear to have significantly reduced the use of general anaesthesia for dental treatment. Current NHS guidance is more permissive than that issued by the General Dental Council. Existing clinical standards in the NHS do not appear to have been fully implemented, rigorously monitored or robustly enforced. Private practice, until now, has not been regulated at all other than through the standards set by the regulatory bodies.

Although deaths are uncommon, all recent deaths, most of which have been of children, appear to have been associated with lapses of standards in: availability, maintenance and application of equipment; skills; or the administration of drugs.

In only one other European country, for which information was available, are general anaesthetics for dental treatment given outside hospital.

The recommendation is aimed at restricting such anaesthesia to hospitals, whether in the public or private sectors, as the setting where the public can have the greatest confidence in the safety of the service provided and the support facilities available.

By the term 'hospital setting' we mean 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 maintained in connection with any such institution.

The move to a hospital based general anaesthetic service for the provision of dental treatment should be made as quickly as possible and be accomplished by 31<sup>st</sup> December 2001 at the latest. Progress with the implementation of this as well as the other measures recommended in this report should be reviewed by a suitably constructed group of experts at that time.

**Recommendation 3: Modernised standards of general anaesthesia for dental treatment outside hospital should be implemented and enforced until Recommendation 2 is brought into effect.**

It is recognised that restricting general anaesthesia for dental treatment to a hospital setting may not be able to be implemented immediately. Until this occurs standards for existing practice in both NHS and private dental practices where general anaesthesia is provided need to be strengthened and rigorously enforced to reduce the risk of further deaths or adverse health effects.

This will involve a range of measures, discussed in Chapter 3, aimed at ensuring high standards of practice and patient safety, to be enforced immediately. They include:

- the listing of premises and of making appropriate inspection arrangements
- acceptable standards for facilities, trained personnel, drugs and equipment for the provision and monitoring of general anaesthesia and of resuscitation
- ensuring appropriate assistance for both the anaesthetist and the dentist



- giving adequate pre-operative and post-operative information to patients to include the risks of the procedure and alternatives, obtaining written consent and ensuring suitable escorting arrangements
- written protocols for the provision of advanced life support and suitable transfer arrangements to a critical care facility.

Coroners should also be asked to notify the Department of Health of all deaths associated with general anaesthesia for dental treatment during this time.

**Recommendation 4: NHS Regulations relating to the use of general anaesthesia for dental treatment outside hospital should be strengthened prior to the implementation of Recommendation 2.**

NHS regulations governing the use of general anaesthesia outside hospital are now more permissive than the GDC guidance and will not be as strict as the requirements on the private sector which are being introduced through the Care Standards Bill, subject to its enactment. The regulations must be amended to take account of the higher standards now introduced by the dental profession and to ensure that common standards apply across dentistry for the regulation of general anaesthesia for dental treatment.

**Recommendation 5: Modern standards for general anaesthesia for dental treatment must be maintained irrespective of location.**

Even when all general anaesthetics for dental treatment are being carried out in a hospital setting it will be necessary for modern standards to be in place and enforced. These issues are discussed in Chapter 3. Examples of areas for particular attention are:

- the adequate assessment of the suitability of each patient proposed for general anaesthesia
- the need to ensure that full and appropriate information has been given to the patient or their carer, that written consent has been obtained and that suitable escorts are present
- that training of anaesthetists and dentists will need to be geared to the needs of patients receiving dental treatment under general anaesthesia.

Over time we would expect the same standards to apply to other medical and surgical procedures where the same risks are involved.

**Recommendation 6: High standards must be achieved during the provision of conscious sedation for dental treatment.**

It is important that high standards are maintained in conscious sedation because if undertaken badly it can also pose a risk to life. We have highlighted in the report the areas that will need to be addressed to ensure high standards of conscious sedation. These include:

- the presence of an appropriately trained and dedicated assistant
- the importance of sufficient dental and medical undergraduate and postgraduate training
- that practitioners should only use any method after they have demonstrated they have received appropriate theoretical and clinical training
- that similar arrangements should apply as those recommended for the provision of general anaesthesia, regarding information given to the patient or their carer and the need to obtain written consent
- appropriate arrangements for escorts.

**Recommendation 7: Higher standards of resuscitation for personnel working on patients treated under general anaesthesia and conscious sedation for dental treatment must be attained.**

Irrespective of the method of analgesia or anxiety reduction any patient undergoing dental care can present a medical emergency and require immediate resuscitation.

Again we highlight the areas that particularly need to be addressed in all dental practices and these include :

- written protocols to ensure that resuscitation can be delivered effectively using appropriate drugs and equipment.
- appropriate training of clinical practice staff for resuscitation and other medical emergencies. In particular, basic life support should be able to be carried out using appropriate airway adjuncts.

**Recommendation 8: Better data must be obtained on fatal and non-fatal complications of general anaesthesia and conscious sedation for pain and anxiety relief for the provision of dental care.**

There is very limited information about patients who have suffered adverse health effects following general anaesthesia or conscious sedation for dental treatment. The report sets out the need :

- to monitor both mortality and morbidity and suggests bodies who might undertake this
- for the General Dental Council to consider providing guidance on the reporting of adverse reactions by dentists as a matter of good professional practice.

**Recommendation 9: All instances of general anaesthesia and conscious sedation equipment failure must be reported to the Medical Devices Agency.**

Problems arising from the use of general anaesthesia and sedation equipment must be reported to the Medical Devices Agency and should be investigated where appropriate.

**Recommendation 10: Funding incorporated in Health Authority baselines in 1995/96 should continue to be used for the provision of high quality general anaesthesia and sedation services.**

The NHS Executive should reiterate that Poswillo revenue funding devolved to health authorities in 1995/6, and subsequently incorporated into their baseline allocations, should continue to be used for the purposes set out in HSG(93)29.

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