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GENERAL ANAESTHESIA, SEDATION AND RESUSCITATION IN DENTISTRY

REPORT OF AN EXPERT WORKING PARTY

Prepared for the Standing Dental Advisory Committee

MARCH 1990

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1. INTRODUCTION

BACKGROUND

- 1.1 Concern has been expressed recently about the safety of continuing to provide dental general anaesthetic services outside hospitals. Comment has also been made about the wide regional variation in the demand for dental treatment under general anaesthesia.

TERMS OF REFERENCE

- 1.2 We were appointed in the late autumn of 1989 and our terms of reference were to:

- consider in the light of present knowledge, and having regard to regional differences, the need for the use of general anaesthesia and sedation in dentistry outside hospitals,
- develop guidelines for the safe use of general anaesthesia and sedation in dentistry, together with appropriate provision for resuscitation,
- consider the need for undergraduate, vocational and continuing postgraduate education in general anaesthesia, sedation and resuscitation in dentistry,
- make recommendations by 31 March 1990.

- 1.3 We were advised that our remit covered England only. However, we were pleased to have been joined by a member appointed by the Scottish Home and Health Department. It is our understanding that, in Wales, a separate committee has been established to examine the provision of anaesthesia in dentistry, but publication of its report will be deferred pending the outcome of our deliberations. We are conscious that what we recommend must be applicable to the United Kingdom as a whole.

- 1.4 We have been made aware that the press release announcing the setting up of the Working Party has caused some confusion by stating that we would be considering two major concerns, i.e.

- that active encouragement should be given to ensure that the number of anaesthetics administered in dental treatment continues to decline;
- that where the use of general anaesthesia continues outside hospitals the highest standard of patient safety continues to be maintained.

We believe the second of these to be of the utmost importance and the introduction generally of the measures we recommend for patient safety will result in a decline in the number of anaesthetics administered.

However, it is a reduction in the need for general anaesthesia in dentistry which we would wish to encourage.

PREVIOUS ENQUIRIES

- 1.5 A number of Committees have previously considered general anaesthesia in relation to dentistry. We have been struck by the similarity of their recommendations and the inability or unwillingness of authorities to implement them.
- 1.6 As long ago as 1967 the Report of the Joint Sub-Committee of the Standing Medical and Dental Advisory Committees included the recommendation that 'ideally all general dental anaesthetics should be administered by specialist anaesthetists trained in dental anaesthesia'. The report went on to say that whilst the ideal could not be attained for many years to come they already considered that undergraduate training, medical as well as dental, could not produce competent dental anaesthetists.
- 1.7 The Report of the Working Party on Training in Dental Anaesthesia (Wylie, 1978) reported the widely accepted view that undergraduates were inadequately trained in dental anaesthesia, called for a national policy for training in dental anaesthesia at the postgraduate level and the establishment of a list of recognised dental anaesthetists.
- 1.8 The Report of the Inter-Faculty Working Party considering the implementation of the Wylie Report (Seward, 1981) recommended how postgraduate training in dental anaesthesia might be made available.
- 1.9 In the meantime, two further reports had commented on general anaesthesia in dentistry. The Report of the Nuffield Foundation of 'An Inquiry into Dental Education' (1980) identified dental anaesthesia as one of the subjects with wide variation in standards of teaching. It went on to say that the General Dental Council (GDC) recognised that the then undergraduate course could not produce a completely trained anaesthetist. The Committee recommended "that, ultimately, general anaesthetics will be administered only by trained anaesthetists and that in the early future only those dentists with postgraduate training will give general anaesthetics in the General Dental Service and the Community Dental Service".
- 1.10 The Dental Strategy Review Group in its report "Towards Better Dental Health" (1981) endorsed strongly these recommendations and went on to say that "for the foreseeable future dentists will be called on to administer general anaesthetics and it is essential that immediate steps be taken to provide the necessary postgraduate opportunities in order to improve services to patients".

SENIOR HOUSE OFFICER TRAINING

1.11 These reports led the Department of Health and Social Security, in consultation with the Faculties of Anaesthetists and Dental Surgery of the Royal College of Surgeons to establish in 1986 a number of Senior House Officer training posts in dental anaesthesia. Special funding over three years was provided as a 'pump-priming' exercise for the scheme. However, whilst proving of immense personal benefit to the few dentists who accepted the opportunity of further training, the scheme must be viewed as a failure. The principal reasons for this would appear to have been the logistics of providing an appropriate and timely theoretical course, the difficulty of providing sufficient experience in intravenous sedation, and the attitudes of health and medico-legal authorities to dental graduates training in anaesthesia administering anaesthetics to patients for conditions unassociated with dentistry.

EVIDENCE

1.12 A number of organisations and individuals responded to an invitation to submit written evidence for our consideration. We have been encouraged also by the level of response to the general request for interested parties to provide written evidence. The organisations and individuals who submitted written evidence are listed at Appendix G. Most respondents criticised the very short time allowed for the receipt of observations and some, the lack of opportunity to present oral evidence. Nevertheless, a considerable volume of evidence has been received and we have been reassured that much of it, including that from general dental practitioners, is consistent with the main thrust of what we intend to recommend. There is no doubt that there is a rapidly approaching watershed in the provision of general anaesthesia for dentistry outside hospitals. We have, therefore, tried to be positive in what we recommend so that services to patients will not only be maintained but improved.

2. DEFINITIONS

- 2.1 A primary concern has been to give consideration to acceptable definitions of Sedation and General Anaesthesia.
- 2.2 The Wylie report included the following definition of simple 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 should carry a margin of safety wide enough to render unintended loss of consciousness unlikely". This has been adopted by the GDC with only minor amendment and included in the Council's Notice for the Guidance of Dentists.
- 2.3 We have reservations about this definition on the grounds that it fails to emphasise the essential basic element in simple dental sedation of hypnotic suggestion and reassurance, it places emphasis on central nervous depression rather than mood alteration, it condones multiple drug use without differentiating between inhalational and intravenous sedation and it ignores the amelioration of physical stress responses.
- 2.4 We have, therefore, defined simple dental sedation as "A carefully controlled technique in which a single intravenous drug, or a combination of oxygen and nitrous oxide, is used to reinforce hypnotic suggestion and reassurance in a way which allows dental treatment to be performed with minimal physiological and psychological stress, but which allows verbal contact with the patient to be maintained at all times. The technique must carry a margin of safety wide enough to render unintended loss of consciousness unlikely."
- 2.5 We recommend this be adopted forthwith as the accepted definition of Simple Dental Sedation and that the GDC give consideration to amending its Notice for the Guidance of Dentists.
- 2.6 Others have defined a state of 'Deep Sedation'. We regard any technique of sedation other than that we have defined above as coming within the meaning of dental general anaesthesia.

PRINCIPAL RECOMMENDATIONS

We recommend that:

- (i) Simple dental sedation be defined as "A carefully controlled technique in which a single intravenous drug, or a combination of oxygen and nitrous oxide, is used to reinforce hypnotic suggestion and reassurance in a way which allows dental treatment to be performed with minimal physiological and psychological stress, but which allows verbal contact with the patient to be

maintained at all times. The technique must carry a margin of safety wide enough to render unintended loss of consciousness unlikely."

(Para 2.4)

- (ii) Any technique of sedation other than as defined above be regarded as coming within the meaning of dental general anaesthesia.

(Para 2.6)

3. GENERAL ANAESTHESIA

- 3.1 Historically the development of general anesthesia has been linked closely with dentistry. The ability to administer a dental anaesthetic to contemporary standards was traditionally part of undergraduate dental education and training. There is, however, agreement that, for some years now, it has not been possible to provide dental undergraduates with sufficient practical experience in the administration of general anaesthesia and for them to achieve a level of competence in what is an increasingly complex field. The principal reason advanced for this is a decrease in the need for general anaesthesia in relation to dental treatment.

DEMOGRAPHIC CHANGES

- 3.2 The use of general anaesthesia in dentistry has declined steadily over the years. In the 1967 Report on Dental Anaesthesia, it was stated that about 2,000,000 general anaesthetics were administered annually for dental purposes in England and Wales. By the financial year 1988/89 the number of general anaesthetics administered in the General Dental Service (GDS) and the Community Dental Service (CDS) in England only had been reduced to approximately 371,000. Almost 70% of these were for the treatment of children under the age of 15 years. However, most would still appear to have been administered for exodontia. We are concerned that these figures do not include general anaesthetics provided under private contract. Such data do not exist.
- 3.3 Most District Health Authorities include the provision of an anaesthetic service as part of their community dental services. Data show that only in a few cases are these anaesthetics administered by dental personnel.
- 3.4 In view of the fact that almost 80% of the 371,000 general anaesthetics referred to above were administered in general practice, we have attempted to obtain data from the Dental Practice Board (DPB) of the number of practices in England currently offering general anaesthesia as part of treatment and the proportions of anaesthetics administered by dental and medically qualified persons respectively. We were told that such data were not available. We think it worth making the point here that, bearing in mind the volume of data collected in respect of patients, their treatment and practitioners, it is regrettable that more usable data is not readily available. This would be of considerable value.
- 3.5 Even so, some very useful information has emerged from a manual analysis of raw data for 1989 supplied by the DPB in respect of four Family Practitioner Committees

(FPC) - Cleveland, Humberside, Rochdale and Berkshire. Needless to say this must be treated with extreme caution since the FPC's are not representative of England as a whole and the data relate to the number of dentists being paid for the administration of general anaesthesia and sedation. It is not possible to provide the data by practice nor the number of anaesthetics administered by doctors.

TABLE I

GENERAL DENTAL SERVICES: GENERAL ANAESTHESIA (ITEM 13(a))

FPC	CLEVELAND	HUMBERSIDE	ROCHDALE	BERKSHIRE
POPULATION (ESTIMATED) AT 30 JUNE 1987)*	554,500	846,500	206,700	740,600
TOTAL NUMBER OF CONTRACTORS ON DPB LIST DURING 1989	196	233	80	364
NUMBER OF CONTRACTORS CLAIMING PAYMENT FOR THE ADMINISTRATION OF GENERAL ANAESTHESIA (PERCENT IN BRACKETS)	146(74%)	167(72%)	20(25%)	60(16%)
RANGE OF ADMINISTRATIONS	1 to 500	1 to 985	5 to 447	1 to 109
MEAN NUMBER OF ADMINISTRATIONS PER CONTRACTOR	90	129	117	11
CONTRACTORS PROVIDING MORE THAN THE MEAN NUMBER OF ADMINISTRATIONS	44	28	7	15
CONTRACTORS PROVIDING MORE THAN 250 ADMINISTRATIONS	12	10	3	0

* - DPB DIGEST OF STATISTICS 1988/89

- ADMINISTRATION(S) = NUMBER OF ADMINISTRATIONS PAID FOR IN 1989

The data clearly demonstrate the North/South differences in the number of practitioners providing an anaesthetic service and the number of anaesthetics administered. However, even in the northern FPCs' very few dentists appear to claim payment for sufficient administrations per annum to justify the cost to them of providing a service.

- 3.6 It has been put to us that there will always be a proportion of the population for whom treatment under general anaesthesia is the preferred option. We concur with this view but believe the present level of administration is made up of both genuine need and an element of demand, some of which is conditioned by cultural norms. Where there is clinical justification, the profession must never be put in a position of having to deny a patient treatment under general anaesthesia. There is nevertheless, scope for reducing both need and demand.
- 3.7 The dental health of the nation has improved dramatically in recent years, but there remains considerable regional variation in the prevalence of dental disease, particularly dental caries in children. Further improvements can be expected following the attention being given to changing attitudes to treatment and the development of prevention and continuing care both for adults and children. The prevention of dental caries in the younger age groups by measures such as fluoridation will have a significant impact on the need and demand for treatment under general anaesthesia. There is also considerable potential for the increased use of the alternative technique of sedation. Nevertheless, we are agreed there will remain an unquantifiable need for the use of general anaesthesia in dentistry. Our aim is to ensure that this is met as safely as possible.

SAFETY

- 3.8 It is important to emphasise that dental general anaesthesia has an excellent safety record. Mortality is monitored on an annual basis and figures for the last ten years for which data are available are included in the Table II.

TABLE II

DEATHS ASSOCIATED WITH DENTAL TREATMENT:
ENGLAND AND WALES

YEAR	TOTAL	NUMBER INCLUDING GENERAL ANAESTHESIA	PLACE OF OPERATION	
			DENTISTS	HOSPITAL
1979	11	9	4	5
1980	5	4	1	2
1981	5	4	4	0
1982	8(1)	7(1)	3(1)	4(0)
1983	5(1)	5(1)	4(1)	1(0)
1984	3(1)	3(1)	2(1)	1(0)
1985	4(4)	4(4)	1(1)	3(3)
1986	4(2)	3(2)	3(2)	1(0)
1987	5(2)	4(2)	2(1)	3(1)
1988	3	1	0	1

Figures in brackets relate to children under the age of 16 years

In recent years, there has been a reduction in the number of anaesthetics administered for dentistry outside hospital. There has also been a small number of fatalities. In our view, the simple anaesthetic does not exist. General anaesthesia is never without risk and should be avoided if possible. Patients who seek general anaesthesia should be persuaded of the benefits of alternative techniques.

3.9 We cannot emphasise enough, where general anaesthesia is to be employed, the importance of patient case selection and the need to obtain a full medical history.

3.10 Data on the morbidity of general anaesthesia in dentistry are not available. Any adverse reactions to anaesthetic or sedative agents reported to the Committee on Safety of Medicines are apparently not coded in such a way as to permit easy access to the data relevant to

dental treatment. We regard this lack of morbidity data with some concern and will make recommendations to rectify this.

- 3.11 It is our firm belief that there can be no compromises in the standards for dental anaesthesia. The same general standards in respect of personnel, premises and equipment must apply irrespective of where general anaesthesia is administered. These statements are not made on the assumption that general anaesthetic fatalities in the dental surgery will thereby be eliminated but in an endeavour to ensure that patients can have confidence when submitting themselves to general anaesthesia in the dental surgery.

ANAESTHETIC TRAINING

- 3.12 The dental profession has a high safety record in the administration of general anaesthesia. There are many excellent, experienced dental surgeons administering general anaesthetics. The comments we have received indicate they would wish to retain the legal right to administer an anaesthetic.
- 3.13 It is clear that the undergraduate dental course no longer provides sufficient practical experience for "the responsibility which the law allows them to assume on graduation" (Nuffield, 1980). We sought information from the Deans of Dental Schools in England on current teaching, practical instruction and hands on experience in general anaesthesia. Not all replied, but from the replies received it would appear that the educationalists have done little to ensure that dentists on graduation should be allowed to continue to claim the right to administer a general anaesthetic for dental purposes. In all fairness, however, it is our impression that an increasing number of the profession would not be concerned if they were no longer entitled so to do. We agree with all those who have previously looked at this matter. Dental anaesthesia must be regarded as a postgraduate subject and undergraduates will only be expected to have acquired an understanding of the theory of general anaesthesia and knowledge of its administration and of maintenance of the airway. It is understood that the GDC recommendation concerning this aspect of the dental curriculum is currently under review.
- 3.14 In medicine, as in dentistry, the undergraduate receives minimal theoretical teaching and practical experience in general anaesthesia. The College of Anaesthetists is responsible for overseeing postgraduate training leading to specialist accreditation. It is the view of the College that all anaesthetics should be administered by or under the supervision of, accredited anaesthetists. We regret that College regulations make it impossible for dental graduates without a medical qualification to obtain appropriate training leading to accreditation. It is our earnest hope that the availability of a shortened medical course for dental graduates will eliminate this difficulty for those wishing to pursue a

career in anaesthesia. It is incumbent upon the College of Anaesthetists to recognise its responsibility for amending the requirements leading to accreditation to include specific and comprehensive teaching and experience in dental anaesthesia. In our view, experience limited to managing a shared airway will not be sufficient to establish competence and confidence or to encourage a continuing interest in dental anaesthesia.

ANAESTHETIC SERVICES

- 3.15 Our predecessors have seen a specialist dental anaesthetic service as an ideal which could only be attained in time. We cannot afford to take such a long term view. Immediate action is necessary if there is not to be a shortfall in dental anaesthetic services in the near future. There are a number of reasons for this:
- (i) The number of dental surgeons with training and experience in dental anaesthesia is diminishing as members reach retirement age. These will not be replaced by new graduates.
 - (ii) In recent years there has been little or no training in general anaesthesia provided by way of vocational training schemes or section 63 courses.
 - (iii) Dentists without a medical qualification do not meet the requirements for training of the College of Anaesthetists.
 - (iv) The differential subscriptions being imposed by the defence organisations on medical practitioners in high risk specialties such as anaesthesia.
- 3.16 A specialist anaesthetic service will require a specific commitment by consultant anaesthetists to providing dental anaesthetic sessions. Health Authorities, for their part, must ensure through appropriate contracts the availability of sufficient dental anaesthetic services to meet the requirements of their catchment populations. We recommend that Health Authorities review existing arrangements as a matter of urgency. We would also wish to encourage accredited anaesthetists to provide anaesthetic services for dental practitioners.
- 3.17 What we have said about dental undergraduate training and dentists must apply equally to medical undergraduates and doctors without specialist anaesthetic training. There will however be a need for doctors and dentists with experience in the administration of dental anaesthesia to be permitted to continue to practice the art provided they can satisfy the relevant authorities of their knowledge, experience and competence. We propose that such practitioners should be under no detriment. The College of Anaesthetists and the Faculty of Dental Surgery shall assume responsibility now for setting appropriate criteria and assessing eligibility. We recommend that

these arrangements shall be implemented within two years of the publication of our report.

PREMISES

- 3.18 There have been some suggestions that, in future, all outpatient dental anaesthesia should be provided in hospital departments. We do not think it either a realistic proposition or that it would be entirely in the best interests of patients. We support the view expressed to us that many patients respond better to the relaxed friendly atmosphere of an efficient dental practice.
- 3.19 Dental treatment under general anaesthesia is already provided in hospital dental outpatient departments and increasingly in day care units. It is appropriate that these arrangements be continued and extended for the care of patients requiring hospital treatment either because of their medical condition or the nature of the dental treatment required. However, most of the treatment currently provided under general anaesthesia in the general dental and community dental services is simple exodontia with some more prolonged anaesthesia for routine conservation and surgery. We see no reason why this should not continue provided surgeries and clinics are equipped to the recommended standards of monitoring and personnel necessary for patient safety. Some authorities are considering setting up specially equipped surgeries in clinics or health centres with a view to them being used by practitioners. It is clear from the evidence we have received that some practitioners have taken the necessary steps to equip and staff their own surgeries to a similar standard. There is, of course, the general requirement that the premises should be suitable with adequately sized surgery, separate recovery room and good access for emergency services. We have concerns about the trend to small surgeries in general practice and will express these again later.

MONITORING

- 3.20 A number of organisations have published guidelines on minimum standards of monitoring required during general anaesthesia. There is increasing medico-legal pressure for these to be adopted. Clinical observation should be augmented, where appropriate, by the use of continuously-acting monitoring devices. We consider that the following items of equipment are essential for the non-invasive monitoring of the patient under general anaesthesia and must be available in dental surgeries;
- (i) Electrocardiogram
 - (ii) Pulse Oximeter
 - (iii) Non-invasive Blood Pressure Device

- (iv) Capnograph for the recognition and measurement of end tidal carbon dioxide where endotracheal anaesthesia is practised.

We are conversant with the opinion, still widely held amongst responsible dental anaesthetists, that the transient nature of most dental anaesthetics argues for simple clinical observation and against sophisticated, potentially frightening and time-consuming monitoring aids. We therefore accept that the final decision on the level of monitoring in each individual case must be a matter for professional judgement. However, patient safety must not be compromised.

- 3.21 We recognise the advice of competent authorities that good practice demands that a defibrillator be immediately to hand when ever general anaesthetics are administered. Where possible, all equipment, including the anaesthetic machine should conform to the recognised performance standard. Equipment should be installed, regularly serviced and maintained in accordance with manufacturer's instructions.
- 3.22 We believe that all general anaesthetic surgeries should be subject to inspection and registration to ensure that they are suitably equipped and maintained to the recommended standard. We believe this to be of such fundamental importance that, if necessary, enabling legislation should be introduced.
- 3.23 However, our attention has been drawn to Section 21 of the Registered Homes Act 1984. We note that under Section 21(1)(c)(i) premises used for the carrying out of surgical procedures under anaesthesia are subject to control. This does not apply to dental surgeries but dental surgeries used for treatment by specially controlled techniques (eg lasers) are subject to control under Section (21)(1)(c)(v). We note also that under Sections 21(4) and 21(5) the Secretary of State may by regulation make any technique of medicine or surgery subject to control. We would urge that these powers are exercised in respect of dental procedures under general anaesthesia in dental surgeries outside hospitals.
- 3.24 We appreciate that meeting these requirements and others that follow in our report, will add significantly to the cost of providing a general anaesthetic service in dental practice. We address the financial implications of this in paragraphs 6.1 to 6.6.

INTRAVENOUS ACCESS

- 3.25 It has been put to us that all patients having general anaesthetics should have intravenous access established, even if this is not to be the preferred route of induction and maintenance of anaesthesia. This may not always be a realistic or desirable option in the context

of dental anaesthesia for simple exodontia. We recommend, therefore, that, when intravenous agents are used, or where more prolonged or complex anaesthesia is contemplated, an indwelling needle or cannula should be used and not removed until the patient is fully recovered.

AUXILIARY PERSONNEL

- 3.26 The safe administration of general anaesthesia depends on good training and teamwork. Modern anaesthetic practice demands dedicated and trained anaesthetic assistants. The dental anaesthetist must, therefore, be able to rely on a surgery assistant or practice nurse specifically trained and competent in that role. The operator must also be able to rely on the skilled assistance of a surgery assistant.
- 3.27 Few dental surgery assistants employed in dental practice have received formal training so as to reach the standard necessary to obtain the National Certificate. We would urge as many surgery assistants as possible to undertake this training but further training will be necessary for those assisting the anaesthetist. The appropriate training and examining authorities should give consideration to developing suitable courses. Dentists who accept responsibility for training their own dental surgery assistants will need to take account of any syllabuses which are produced and to structure their training accordingly. We refer to the life support skills required of dental surgery assistants later.

RECOVERY AND AFTER CARE

- 3.28 Well trained dental surgery assistants are equally essential for the care of the recovering patient. Dentists must ensure that their staff have the training and maturity necessary since problems often arise during this time. We consider recovery to include the return of protective reflexes and a patient-controlled airway. Most dental anaesthetic patients will be recovered quickly in the surgery and assisted to the recovery room and regain composure. At no time should the recovering patient be left unattended.
- 3.29 There should be good communication between the surgery and recovery room. Both should be readily accessible to the ambulance and resuscitation services if required. If the recovery room is used for the care of the unconscious, or patients slower to recover, it must be provided with the necessary equipment for monitoring to be continued, together with all drugs and apparatus necessary for resuscitation and means of keeping the patient warm. The recovery assistant must be able to maintain and protect the airway, be able to assist in patient monitoring including applying the necessary leads, etc, and be able to implement basic life support measures.

DOCUMENTATION

- 3.30 We cannot emphasise enough the importance of good contemporaneous records of all treatments and procedures including any complications or difficulties encountered. These will be of value for audit as well as medico-legal purposes.
- 3.31 It is essential that written consent is obtained on each occasion prior to the administration of a general anaesthetic. We understand that this is not common practice in the GDS, and that implied consent may be inferred by the patient having signed Form FP17 agreeing to National Health Service treatment. We do not consider this provides sufficient protection for dentists or patients. We recommend that consideration be given to producing a national general anaesthetic/sedation consent form for use by general dental practitioners. Patients must also be provided with comprehensive written pre and post treatment instructions and advice. (See Appendix F)

PRINCIPAL RECOMMENDATIONS

We recommend that:

- (i) The use of general anaesthesia should be avoided wherever possible.
(Para 3.8)
- (ii) The same general standards in respect of personnel, premises and equipment must apply irrespective of where the general anaesthetic is administered.
(Para 3.11)
- (iii) Dental anaesthesia must be regarded as a postgraduate subject.
(Para 3.13)
- (iv) All anaesthetics should be administered by accredited anaesthetists who must recognise their responsibility for providing dental anaesthetic services.
(Para 3.14)
- (v) Anaesthetic training should include specific experience in dental anaesthesia.
(Para 3.14)
- (vi) Health authorities should review the provision of Consultant dental anaesthetic sessions to ensure they are sufficient to meet local needs.
(Para 3.16)

- (vii) Doctors and dentists with knowledge, experience and competence sufficient to satisfy the College of Anaesthetists and the Faculty of Dental Surgery be under no detriment.
(Para 3.17)
- (viii) The no detriment arrangements must have been implemented within two years of the publication of this report.
(Para 3.17)
- (ix) The administration of general anaesthesia, in dental surgeries and clinics equipped to the recommended standards of monitoring necessary for patient safety shall continue.
(Paras 3.6 and 3.19)
- (x) An electrocardiogram, a pulse oximeter and a non-invasive blood pressure device are essential for the non-invasive monitoring of a patient under general anaesthesia.
(Para 3.20)
- (xi) A capnograph be used where tracheal anaesthesia is practised.
(Para 3.20)
- (xii) A defibrillator must be available.
(Para 3.21)
- (xiii) Equipment conforming to recognised standards should be purchased and installed, regularly serviced and maintained in accordance with manufacturers' instructions.
(Para 3.21)
- (xiv) General anaesthetic surgeries be subject to inspection and registration.
(Para 3.22)
- (xv) Intravenous agents should be administered via an indwelling needle or cannula which should not be removed until the patient has fully recovered.
(Para 3.25) and (4.15)
- (xvi) Appropriate training must be provided for those assisting the anaesthetist and the dentist.
(Para 3.26)

- (xvii) At no time should the recovering patient be left unattended.
(Para 3.28)
- (xviii) Adequate recovery facilities should be available.
(Para 3.29)
- (xix) Good contemporaneous records of all treatments and procedures be kept.
(Para 3.30)
- (xx) Written consent be obtained on each occasion prior to the administration of a general anaesthetic.
(Para 3.31)
- (xxi) Consideration be given to developing a national general anaesthetic/sedation consent form for general dental practitioners.
(Para 3.31)
- (xxii) Patients be provided with comprehensive pre and post treatment instructions and advice.
(Para 3.31)

4 SEDATION

4.1 Inhalational and Intravenous Sedation attract separate fees under the General Dental Service. Information is therefore available of the number of administrations for which fees are claimed each year. During the financial year 1988/89, in England, these amounted to approximately 93,000 administrations by inhalation and 59,000 by injection. These figures do not reflect the true extent of the use of the techniques since sedation will have been provided also by private contract. However, the data in respect of Cleveland, Humberside, Rochdale and Berkshire give an indication of the proportion of practitioners providing sedation as part of their GDS contract. This varies from 18% in Rochdale to 29% in Humberside. It appears, therefore, that sedation is not as widely practised, under the GDS, as might have been supposed.

TABLE III

GENERAL DENTAL SERVICES: SEDATION (ITEM 13(R))

FPC	CLEVELAND	HUMBERSIDE	ROCHDALE	BERKSHIRE
TOTAL NUMBER OF CONTRACTORS ON DPB LIST DURING 1989	196	233	80	364
NUMBER OF CONTRACTORS CLAIMING PAYMENT FOR THE ADMINISTRATION OF SEDATION (PERCENT IN BRACKETS)	40(20%)	65(29%)	14(18%)	81(22%)
NUMBER OF CONTRACTORS CLAIMING PAYMENT FOR THE ADMINISTRATION OF INHALATION SEDATION (PERCENT IN BRACKETS)	22(11%)	39(17%)	3(4%)	46(13%)
RANGE OF ADMINISTRATIONS OF INHALATION SEDATION	1 to 281	1 to 295	1 to 21	1 to 273
MEAN NUMBER OF ADMINISTRATIONS OF INHALATION SEDATION PER CONTRACTOR	42	37	8	28
NUMBER OF CONTRACTORS CLAIMING PAYMENT FOR THE ADMINISTRATION OF INTRAVENOUS SEDATION (PERCENT IN BRACKETS)	28(14%)	44(19%)	13(16%)	58(68%)
RANGE OF ADMINISTRATIONS OF INTRAVENOUS SEDATION	1 to 706	1 to 156	1 to 34	1 to 164
MEAN NUMBER OF ADMINISTRATIONS OF INTRAVENOUS SEDATION PER CONTRACTOR	33	20	11	23

* - ADMINISTRATIONS(S) = NUMBER OF ADMINISTRATIONS PAID FOR IN 1989

- 4.2 We have already defined simple dental sedation (Para 2.4). Our definition includes both inhalational and intravenous techniques. As we have defined them, they are inherently safe and we would wish to encourage their use, wherever possible in preference to general anaesthesia.

SEDATION BY INHALATION

- 4.3 The separate techniques of relative analgesia and inhalation sedation have proved particularly helpful in the treatment of the anxious and difficult child patient. 63% of the administrations within the GDS referred to above were for children aged under 15 years.
- 4.4 We have considered whether there should be an upper limit on the percentage of nitrous oxide to keep these techniques within our definition of simple dental sedation. Inhalation sedation already imposes an upper limit of 25% by volume of nitrous oxide and the Seward Report was of the opinion that "the evidence suggests that the upper limit should be set at about 30% nitrous oxide." We accept that the concentration necessary to sedate some patients will produce anaesthesia in others.
- 4.5 The technique of relative analgesia offers more flexibility and universal application than inhalation sedation, and is sufficiently easy to control and monitor to justify an upper limit of 70% nitrous oxide by volume. It is our view, therefore, that relative analgesia machines should have a fixed lower limit of 30% oxygen by volume. Some machines are promoted as dual GA/RA machines but the definition of simple sedation demands that only a dedicated machine with this fixed lower limit of oxygen should be used. We recommend the development of a British Standard for relative analgesia machines.

INTRAVENOUS SEDATION

- 4.6 The benzodiazepines, diazepam and midazolam have a proven place as the intravenous sedative drugs of choice in dental practice. The development of the specific benzodiazepine antagonist flumazenil has added a further dimension to the safety of these drugs by allowing for immediate reversal of their effects. However, whilst flumazenil must be available, its use should be reserved for an emergency and not routinely to speed recovery. The pharmacokinetic half-life of flumazenil is shorter than of the benzodiazepines. Sedation may, therefore, recur after the patient has left the surgery.
- 4.7 Our definition requires intravenous sedation to be limited to the use of one drug with a single titrated dose and an end point remote from anaesthesia. The use of more than one drug must not be considered as simple sedation and would require the same precautions as the administration of a general anaesthetic.
- 4.8 In contrast to inhalational sedation, 98% of the intravenous administrations in the GDS were for patients aged 15 years and over. We do not recommend intravenous sedation for children, particularly those under the age of 10 years. The use in all children should be approached with caution as the effects may be unpredictable.

EDUCATION AND TRAINING

- 4.9 The General Dental Council Notice for the Guidance of Dentists states that "where intravenous and inhalational sedation techniques are employed a suitably experienced practitioner may assume the responsibility of sedating the patient, as well as operating, provided that as a minimum requirement a second appropriate person is present throughout the procedure". We concur with this view. Sedation in dentistry involves techniques which may be performed by dentists with adequate training; moreover, competent and experienced dentists are well placed to provide the practical training.
- 4.10 Our enquiries of Deans of Dental Schools indicate that there is wide variation in the theoretical teaching of sedation and more importantly in the practical training and experience provided. It is our view that more emphasis needs to be given to this. We see no reason why undergraduates should not have had 'hands on' experience of inhalational sedation and have managed a minimum of 10 cases prior to qualification. We believe that this is sufficient experience to provide inhalation sedation.
- 4.11 In so far as intravenous sedation is concerned we take a slightly different view. Undergraduate education should be no less extensive but practical experience is likely to be more limited. It is essential, however, that undergraduates should become proficient in venepuncture, a skill which many existing practitioners still have to

acquire. Additional clinical experience could be obtained by attachment to phlebotomy clinics, anaesthetic and accident and emergency departments. We would hope that each undergraduate might have had experience of managing at least five cases of simple intravenous dental sedation prior to qualification.

- 4.12 For dentists intending to practice intravenous sedation further training will be essential. This should be part of vocational training and all interested graduates should complete a recognised course within two years of qualification to consolidate their skills. Refresher training should be sought at appropriate intervals thereafter. It would seem that in some parts of the country postgraduate training programmes are already well developed, but there are very few courses of the type we recommend which include 'hands on' experience. It is hoped that guidance might be provided for Postgraduate Dental Deans in the organisation of such courses.

AUXILIARY PERSONNEL

- 4.13 The GDC guidance places a responsibility on dental sedationists to ensure that their chairside support staff are adequately trained. Little consideration has been given to what might be termed 'adequate training'. Few dental surgery assistants employed in dental practice have received formal training so as to reach the standard necessary to obtain the National Certificate. For those who have, we understand that an advanced certificate in Assisting in the Care of the Patient relating to Treatment under Conscious Sedation has been introduced. We commend this initiative, as we do formal Dental Surgery Assistant training generally. Dentists who accept the responsibility for training their own assistants should make themselves conversant with the syllabus for the Advanced Certificate and structure their training along similar lines. Records should be kept of training undertaken.

PREMISES AND EQUIPMENT

- 4.14 We do not see a need to recommend that surgeries for the provision of dental care under sedation be inspected and regulated as we suggest for general anaesthesia. The surgery must be of sufficient size to permit the resuscitation of the patient should the need arise.
- 4.15 It is our view that careful clinical monitoring of the patient is usually all that is required. Pulse oximetry is desirable but not essential. Where it is used dentists must be aware of the significance of the readings. Intravenous agents should be administered by an indwelling needle or cannula which is not removed until the patient has fully recovered.

RECOVERY AND AFTER CARE

- 4.16 Recovery is generally uneventful but supervision is required. A dedicated recovery assistant is not usually necessary. All patients treated with the aid of sedative techniques should be accompanied by a responsible person. This person should stay with the patient until recovery is deemed sufficiently complete for the accompanied patient to leave the premises.

DOCUMENTATION

- 4.17 It is important that written consent is obtained on each occasion prior to the use of sedation and comprehensive written pre and post treatment instructions and advice should be provided. In particular, it should be remembered that the benzodiazepines may give rise to amnesia.

Documentation must be both detailed and accurate and dentists should be encouraged to seek relevant feedback from their patients. This will be of value to clinical audit.

PRINCIPAL RECOMMENDATIONS

We recommend that:

- (i) Sedation be used in preference to general anaesthesia wherever possible.
(Para 4.2)
- (ii) For sedation by inhalation the minimum concentration of oxygen be fixed at 30% by volume.
(Para 4.5)
- (iii) A British Standard for relative analgesia machines be developed.
(Para 4.5)
- (iv) Flumazenil be reserved for emergency use.
(Para 4.6)
- (v) Intravenous sedation be limited to the use of one drug with a single titrated dose and an end point remote from anaesthesia.
(Para 4.7)
- (vi) The use of intravenous sedation in all children be approached with caution.
(Para 4.8)

- (vii) Practical training in sedation for dentistry be provided by dentists.
(Para 4.9)
- (viii) More emphasis be given to undergraduate education in sedation.
(Para 4.10)
- (ix) Undergraduates should have had experience of administering inhalational sedation in 10 cases.
(Para 4.10)
- (x) All undergraduates should be proficient in venepuncture.
(Para 4.11)
- (xi) Undergraduates should have had experience of managing at least 5 cases involving intravenous sedation.
(Para 4.11)
- (xii) Interested dentists should complete a recognised course in intravenous sedation within two years of qualification. Refresher training should be sought at appropriate intervals thereafter.
(Para 4.12)
- (xiii) Guidance should be provided for Postgraduate Dental Deans in the organisation of courses.
(Para 4.12)
- (xiv) Dentists should make themselves conversant with the syllabus for the advanced certificate for dental surgery assistants.
(Para 4.13) and (3.26)
- (xv) Dentists must be aware of the significance of pulse oximetry readings.
(Para 4.15)
- (xvi) All patients treated with the aid of sedative techniques be accompanied by a responsible person.
(Para 4.16)
- (xvii) Prior written consent to treatment should be obtained and comprehensive written pre and post treatment instructions and advice be provided.
(Para 4.17)

5. RESUSCITATION

- 5.1 Collapse can occur in dental practice at any time. It may not be associated with the administration of a general anaesthetic or sedation. It is an event which may never happen but for which every member of the dental team and practice staff should be properly trained and prepared. They must be conversant with the part they have to play and the procedures should be regularly practised under simulated conditions.
- 5.2 The occurrence of collapse can be minimised by careful patient selection and by adopting approaches to dental treatment which take significant medical history into account. An awareness of these points could make for the more effective management of collapse. Prior to providing treatment it is important to establish that any essential regular medication has been taken and not omitted by the patient because they were going to have dental treatment. Treatment should be planned for the most appropriate time of the day. This underlines the need for patients to be provided with good written pre and post-operative advice to be provided particularly if the patient is to be treated under general anaesthesia or sedation. Instructions should include the importance of not consuming food or drink for at least 4 hours before these procedures. We recognise that this may not be universal practice presently prior to sedation but consider it to be best advice.
- 5.3 A report of the Royal College of Physicians (1987) into the training and organisation for resuscitation from cardiopulmonary arrest recommended that dentists and dental staff should be trained in basic life support. We concur with this view. All dental staff in contact with patients including dentists, dental hygienists, dental therapists, dental surgery assistants and receptionists must be fully conversant with and proficient in the basic life support skills. These are the ability to perform expired air resuscitation and external chest compression without equipment except perhaps a simple airway.
- 5.4 We believe it important that each person should have their proficiency in these procedures of cardiopulmonary resuscitation (CPR) tested and certificated. Whilst it may be appropriate for their employer to do this, there is merit in this being done by an outside agency. We commend both the St John Ambulance and the British Red Cross Society for this purpose. We would wish to underline again the need for a team approach to training and for regular reassessment of proficiency. It is essential that all members of the dental team know how to summon the help of the local emergency services.
- 5.5 We recommend that every practice should have the Resuscitation Council's Manual "ABC of Resuscitation" and be familiar with its contents. In addition dentists must be proficient in the use of airway adjuncts, i.e. airways, face masks, suction equipment and oxygen.

Dental Students should be taught basic life support very early in the course and prior to having any contact with patients. They must be given regular opportunities throughout the course to test their proficiency under simulated conditions. By graduation they must have knowledge of formal airway management and be proficient in the use of airway adjuncts.

GENERAL ANAESTHESIA

- 5.6 We have previously stated there must be no compromises in the standards for dental anaesthesia. It follows that all dental anaesthetists, including those who wish to continue their anaesthetic practice under the no detriment arrangements, must be proficient in advanced life support skills. These are; formal airway management including the ability to intubate, the ability to establish and maintain intravenous lines and the knowledge and ability to administer appropriate resuscitation drugs and to use the defibrillator. We recognise that some dental anaesthetists will need training to acquire these skills. This is a matter of urgency.

EQUIPMENT AND DRUGS

- 5.7 We have already commented on surgery size in paragraphs 3.19 and 4.14; we make no apology for doing so again here. In general dental practice particularly there has been a trend towards smaller surgeries. Few surgeries are purpose built and there are obvious economic pressures on the use of space. There has been a move generally towards seated and 'four-handed' dentistry. These trends have undoubtedly increased the efficient provision of dental care but equally they may pose difficulties in the effective resuscitation of a patient. We would urge all concerned to look critically at their surgeries with resuscitation in mind. Is there sufficient space around the chair to allow the dental team to perform their allocated tasks? Is the chair sufficiently robust and stable to allow chest compression to be performed? Is there room to bring the portable oxygen supply into the surgery and is there sufficient access to permit the safe removal of the patient prior to full recovery should this be required?
- 5.8 Every dental practice must be equipped to enable resuscitation to be performed. There must, therefore, be readily available independently-powered portable suction (collapse may occur other than in the surgery), airway adjuncts and a self-inflating resuscitation bag. A portable oxygen supply with appropriate valves, metering and delivery system must be immediately available. It is preferable that the dental chair has an immediate override release mechanism for it to go flat and that it is sufficiently robust and well maintained to permit external chest compression. Lists of essential equipment, as appropriate, are included at Appendices B, C and D. It is important that all resuscitation equipment be regularly checked and maintained.

5.9 We have given detailed consideration to developing a list of drugs for the resuscitation of patients which should be available in every dental practice. In doing so note has been taken of the recommendations of the Resuscitation Council (UK) and lists prepared by other organisations. Our list is in two parts and is as follows:

1. First Line Resuscitation Drugs

- (i) Oxygen
- (ii) Adrenaline 1mg in 1ml or 10ml
- (iii) Lignocaine 1% (10ml)
- (iv) Atropine 0.6mg (1ml)
- (v) Calcium Chloride 13.4% (10ml)
- (vi) Sodium Bicarbonate 8.4% (50ml)
- (vii) Glyceryl Trinitrate Tabs 300 mcg or
or Glyceryl Trinitrate 400 mcg per metered
sub-lingual spray dose

2 Second Line Drugs

- (i) Aminophylline 250 mg (10ml)
- (ii) Salbutamol Inhaler 100 mcg per metered dose
- (iii) Chlorpheniramine maleate 10 mg (1ml)
- (iv) Dextrose 50% (50ml)
- (v) Hydrocortisone 100 mg (2ml)
- (vi) Flumazenil 500 mcg (5ml)
- (vii) Naloxone 0.4 mg (1ml)

- (viii) Midazolam 10 mg (5ml)
- (ix) Suxamethonium 100 mg (2ml)
- (x) Infusion Solution
- (a) Dextrose 4% / Saline 0.18% 500ml
- (b) Colloid solution 500ml

5.10 All the above drugs must be available in every dental practice. It is acknowledged that some dentists will

not be familiar with the dosages and indications for many of them. They are there for the use of dentists and doctors fully trained in advanced life support techniques. Attention is drawn to the British National Formulary (BNF) for details. Some of the drugs require to be administered intravenously. We understand that only a minority of dentists are proficient in venepuncture. We have recommended already that all undergraduates should be taught this skill. We now recommend that all dental practitioners who are not proficient should seek to acquire the skill as soon as possible.

- 5.11 All drugs have a shelf-life. It is essential that expiry dates are regularly reviewed and out of date stock replaced. Our recommended list of drugs with minimum stock requirements is repeated in Appendix A.

Appendix D is a list of the essential items of equipment, over and above the usual stocks required for anaesthesia, and which must be available at all times in surgeries where general anaesthesia is administered. A limited number of these items are also required where sedation is practised. (Appendix C)

PRINCIPAL RECOMMENDATIONS

We recommend that:

- (i) Every member of the dental team should be trained in resuscitation. Training should be a team activity.
(Para 5.1)
- (ii) Resuscitation procedures should be regularly practised in the surgery under simulated conditions.
(Para 5.1)
- (iii) A medical history, including any medication the patient may be receiving, should be obtained prior to every course of treatment.
(Para 5.2)
- (iv) Written instructions should include the importance of not consuming food or drink for at least 4 hours prior to general anaesthesia or sedation.
(Para 5.2)
- (v) All dental staff must be fully conversant with and proficient in the basic life support skills.
(Para 5.3)

- (vi) Every member of the dental team should have their proficiency in cardiopulmonary resuscitation tested and certificated.
(Para 5.4)
- (vii) Every practice should have the Resuscitation Council's manual "ABC of Resuscitation" and be familiar with its contents.
(Para 5.5)
- (viii) Dentists must be proficient in the use of airway adjuncts.
(Para 5.5)
- (ix) Dental students be taught basic life support very early in their course. By graduation they must have knowledge of formal airway management and be proficient in the use of airway adjuncts.
(Para 5.5)
- (x) All dental anaesthetists must have advanced life support skills.
(Para 5.6)
- (xi) All dentists look critically at their surgeries to ensure their suitability for resuscitation.
(Para 5.7)
- (xii) Every dental surgery be equipped to enable resuscitation to be performed.
(Para 5.8)
- (xiii) The drugs listed be available in every dental surgery.
(Para 5.9)
- (xiv) All dental practitioners should be proficient in venepuncture.
(Para 5.10)
- (xv) Stocks of drugs are reviewed regularly and out of date stock replaced.
(Para 5.11)
- (xvi) The listed items of equipment as set out in appendices B, C and D be available in surgeries as appropriate.
(Para 5.11)

6. FINANCIAL IMPLICATIONS AND OTHER MATTERS

FINANCE

- 6.1 It is almost inevitable that any expert working party will make recommendations that give rise to the need for additional expenditure. We have found it necessary to do likewise. Our recommendations are concerned with patient safety.
- 6.2 We are convinced of the continuing need for general anaesthesia in general dental practice if a service with reasonable access for patients is to be maintained. Practitioners wishing to continue to provide a general anaesthetic service will be expected to meet the criteria for patient safety we have set out in this report. Moreover, we have recommended strongly that dental practices providing general anaesthesia should be subject to the same requirements of inspection and registration as other private health care premises providing a similar service. All this will require considerable capital investment and there are also revenue consequences.
- 6.3 The cost of the additional equipment necessary for patient monitoring is substantial. Allowance will need to be made for its regular maintenance and service and for its periodic replacement. This, together with the cost of inspection and registration, and any costs for required alterations to premises, is likely to effect a reduction in the number of practices prepared to continue to offer a general anaesthetic service.
- 6.4 We are aware, of course, of the method of remunerating dentists under the GDS. Traditionally capital investment has not been directly reimbursed. All practice expenses including the cost of employing auxiliary personnel, are recouped via fees paid per item of service. This system relies on averaging costs, and would appear to us to be too insensitive. It does not allow those practitioners providing an anaesthetic service to the contemporary standard which patient safety demands to adequately cover the expense of providing this service.
- 6.5 The requirements for patient monitoring are likely to increase the time necessary to treat a patient under general anaesthesia. The provision of a general anaesthetic should attract an increased fee. However, we are concerned that a disproportionate increase should not be responsible for an apparent increase in demand for general anaesthesia. Other means must be found of recompensing practitioners for the additional expenditure incurred in providing an anaesthetic service.
- 6.6 We trust that the Health Departments and the Profession will give these matters their most urgent attention.

POSTGRADUATE TRAINING

- 6.7 We have asked for an increase in the availability of postgraduate training in general anaesthesia, sedation and resuscitation. The first of these is likely to be modest and will depend on the number of practitioners who feel inclined to continue as dental anaesthetists. On the other hand, there will be need for a substantial commitment to training in sedation and resuscitation. We trust that sufficient Section 63 funds will be made available and that specialist associations which provide training in general anaesthesia, sedation and resuscitation will respond to the challenge also. We would wish to emphasise yet again the importance of training in resuscitation as a dental team activity.

AUDIT

- 6.8 We have previously mentioned our disappointment at the dearth of morbidity data available to us. Mortality in relation to dental anaesthesia is monitored annually. Emphasis is now being placed on the importance of clinical audit and methods of measurement are being developed. We suggest, therefore, the Department with the cooperation of dental and anaesthetic authorities, should initiate an ongoing study to audit both morbidity and mortality in relation to dental anaesthesia and sedation. This could take the form of a national study group similar to that responsible for the Confidential Enquiry into Perioperative Deaths and would be responsible for assessing all relevant data on a biennial basis. We recommend that a Standing Committee on Dental Anaesthesia, Sedation and Resuscitation be established for this purpose.

THE FUTURE

- 6.9 In the interests of patient safety, we have been very specific in defining Simple Dental Sedation. We have done so in the full knowledge that drugs suitable for oral sedation and new inhalational agents are under development and evaluation. We believe that until such time as they have been fully evaluated and found general acceptance, simple dental sedation should be limited to the techniques we recommend. It will be for others to judge if, and when, our definition requires amendment in the light of those developments. We trust that this will be a function for a Standing Committee on Dental Anaesthesia, Sedation and Resuscitation.

PRINCIPAL RECOMMENDATIONS

We recommend that:

- (i) The Health Departments and the Profession consider jointly as a matter of urgency the financial implications of our recommendations to dental practice.

(Para 6.6)

(ii) Sufficient funds be made available for postgraduate training in general anaesthesia, sedation and resuscitation for dentists and their teams.

(Para 6.7)

(iii) An ongoing enquiry into mortality and morbidity in relation to dental general anaesthesia and sedation be set up.

(Para 6.8)

LIST OF DRUGS FOR EMERGENCY USE

1.	<u>FIRST LINE RESUSCITATION DRUGS</u>	<u>MINIMUM</u>
(i)	Oxygen	
(ii)	Adrenaline 1mg in 1ml or 10ml	x 5 ampoules
(iii)	Lignocaine 1% (10ml)	x 5 ampoules
(iv)	Atropine 0.6mg (1ml)	x 5 ampoules
(v)	Calcium Chloride 13.4% (10ml)	x 2 ampoules
(vi)	Sodium Bicarbonate 8.4% (50ml)	x 3 ampoules
(vii)	Glyceryl Trinitrate Tabs 300mcg	x 10
	or Glyceryl Trinitrate 400 mcg per metered sub-lingual spray	x 1 dose
2.	<u>SECOND LINE DRUGS</u>	
(i)	Aminophylline 250 mg (10ml)	x 2 ampoules
(ii)	Salbutamol inhaler 100 mcg per metered dose	x 2 refills
(iii)	Chlorpheniramine maleate 10mg (1ml)	x 2 ampoules
(iv)	Dextrose 50% (50ml)	x 1
(v)	Hydrocortisone 100 mg (2ml)	x 5 ampoules
(vi)	Flumazenil 500 mcg (5ml)	x 5 ampoules
(vii)	Naloxone 0.4mg (1ml)	x 5 ampoules
(viii)	Midazolam 10 mg (5ml)	x 5 ampoules
(ix)	Suxamethonium 100 mg (2ml)	x 5 ampoules
(x)	Infusion solution	
(a)	Dextrose 4%/Saline 0.18% 500ml	x 2 packs
(b)	Colloid Solution 500ml	x 2 packs

LIST OF ESSENTIAL ITEMS OF EQUIPMENT FOR RESUSCITATION WHICH
MUST BE AVAILABLE IN EVERY DENTAL PRACTICE

AIRWAY MAINTENANCE

1. Suction apparatus - powered and portable (independently powered)
2. Simple airway adjunct (e.g. pocket resuscitator mask with valve)
3. Cricothyroid puncture needle x 1

Oxygen and Artificial Ventilation

1. Portable oxygen with appropriate valves, metering and delivery system
2. Self-inflating bag, valve and mask with oxygen enhancement facility.

Maintenance of Circulation

1. Disposable syringes - sizes 2,5,10ml x 5 of each
2. Disposable needles - sizes 21 & 23G x 10 of each
3. Disposable IV cannulae - sizes 16 and 22G x 5 of each
4. Disposable IV Infusion Sets x 2
5. Scissors x 1
6. Tourniquet, Sphygmomanometer, Stethoscope x 1 of each
7. Injection Swabs

Appendix C

LIST OF ESSENTIAL ITEMS OF ADDITIONAL EQUIPMENT FOR
RESUSCITATION IN A SEDATION SURGERY

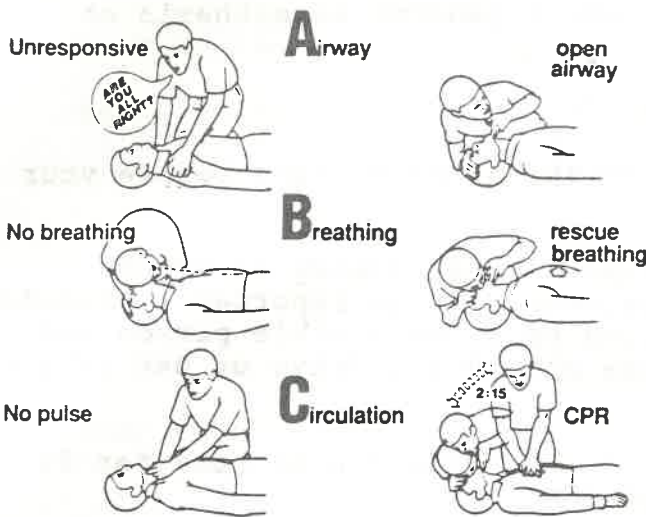
AIRWAY MAINTENANCE

			<u>MINIMUM</u>
1.	Suction Tubing and Yankauer sucker	x	1 of each
2.	Suction catheters - sizes 6, 10 FG	x	2 of each
3.	Oropharyngeal airways - sizes 1,2,3	x	1 of each

LIST OF ESSENTIAL ITEMS OF ADDITIONAL EQUIPMENT FOR
RESUSCITATION IN A GENERAL ANAESTHETIC SURGERY

1.	Suction tubing and Yankauer sucker	x	1 of each
2.	Suction catheters - sizes 6,10 FG	x	2 of each
3.	Oropharyngeal airways - sizes 1,2,3	x	2 of each
4.	Nasopharyngeal airways - sizes 6,7,8mm	x	1 of each
5.	Disposable tracheal tubes - sizes 4.5, 5, 6,7,8,9mm	x	1 of each
6.	Macintosh laryngoscope	x	1
	- adult blade	x	1
	- child blade	x	1
	(with batteries and spare bulbs)		
7.	Catheter mount	x	1
8.	Mouth gag - with offset jaws	x	1
9.	Magill intubating forceps	x	1
10.	20 mls syringe for tube cuff inflation	x	1
11.	KY jelly	x	1
12.	Adhesive tape	x	1

CARDIOPULMONARY RESUSCITATION



Call for help

- Including
 - defibrillator
 - airway adjuncts
 - oxygen
 - emergency kit

↓

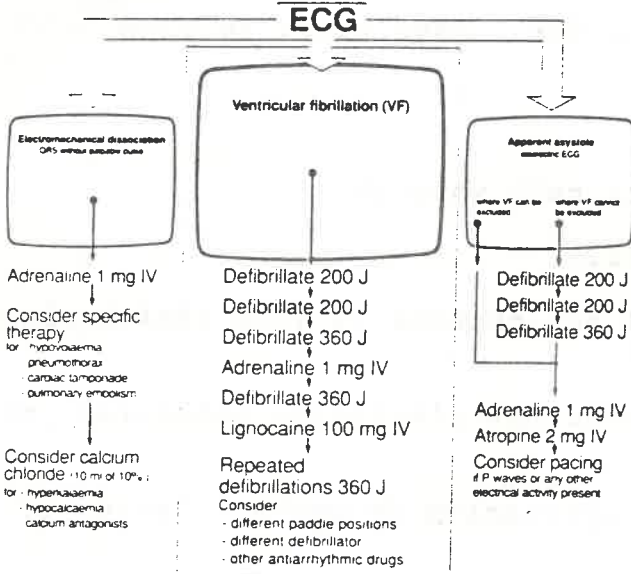
Consider

- precordial thump in witnessed or monitored arrest

- 2 rescuer CPR

1 : 5

- and mouth-to-mask ventilation



Place paddles correctly

If flat trace, check switches, connections and gain.

Give oxygen

Secure airway
Intubate if necessary

Cannulate large vein

Continue CPR

Continue CPR for up to 2 min. after each drug. Do not interrupt CPR for more than 10 sec., except for defibrillation.
If an i.v. line cannot be established, consider giving double doses of adrenaline, lignocaine or atropine via an endotracheal tube.

<p>PROLONGED RESUSCITATION</p> <p>Give 1 mg adrenaline IV every 5 minutes</p> <p>Consider 50 mmol sodium bicarbonate (50 ml of 8.4%) or according to blood gas results</p>	<p>POST RESUSCITATION CARE</p> <p>Check:</p> <ul style="list-style-type: none"> - arterial blood gases - electrolytes - chest x-ray <p>Observe monitor and treat patient in an intensive care area</p>
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The Resuscitation Council (UK)

in conjunction with

Swedish Society of Cardiology Finnish Cardiac Society
 Danish Society for Anaesthesia and Intensive Care Finnish Society of Anaesthesiologists
 Norwegian Society of Cardiology Finnish Society of Intensive Care
 Norwegian Society of Anaesthesiologists Danish Society of Cardiology
 00365 EN (Danish Society of Anaesthesiology)

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Resuscitation Council (UK)

Copies of the Resuscitation Council's Manual "ABC of Resuscitation" can be obtained from BMA Publications.

SUGGESTED PATIENT INFORMATION LEAFLET

For patients to be treated under general anaesthesia or sedation.

Pre treatment:

1. Do not eat or drink anything for 4 hours before your appointment.
2. You may experience some loss of memory of events surrounding your treatment. It is important, therefore, that you be accompanied by a responsible person and under no circumstances should you drive or use public transport.
3. Arrange for someone to stay with you at home for 24 hours after the treatment.
4. Smoking is discouraged for 2 days prior to your appointment.

At Appointment

1. Do not wear make up or nail varnish.
2. Wear flat heeled shoes.
3. Inform the dentist of any changes in your health since your last appointment.
4. Bring any drugs or medicines (including inhalers) you may be taking.
5. Bring a case for any spectacles or contact lenses if worn.

After Treatment

1. Do not drive a motor vehicle or)
ride a bicycle)
2. Do not cook or operate machinery)
3. Do not make important decisions)
or sign papers) For 24 hours
4. Do not drink alcohol)
5. Do not take sleeping tablets)
6. Observe any special precautions, advised by your anaesthetist or dental surgeon, including any necessary pain relief.
7. If you have any problems, please contact your dental surgeon. Telephone no.....

LIST OF ORGANISATIONS AND INDIVIDUALS WHO SUBMITTED WRITTEN EVIDENCE

1. Mr N Andrews
2. Association of Anaesthetists
of Great Britain and Ireland
and the College of Anaesthetists
- (Joint Working Party)
3. Association of Dental
Anaesthetists
4. Mr J W Aukett
5. Bedfordshire Dental Advisory
Committee
6. Bedfordshire Local Dental
Committee

7. Mr S Boulton

8. British Dental Association
9. British Dental Association
(Welsh Council)
10. British Medical Association
11. British Paedodontic Society
12. Mr I L Brown
13. Mr G T Cheney
14. Cheshire Local Dental Committee
15. Mr I R Coates
16. Ms P Coates
17. Conference of Postgraduate
Dental Deans, British
Postgraduate Medical Federation
18. Dr M H Cook
19. Mr O Corrigan
20. Mr P Coulthard
21. Mr D C Craig
22. Mr A C Crawford

23. Mr A N Crawford
24. Mr J K Cross
25. Mr W E Crossland
26. Cumbria Family Practitioner
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28. Dr M Dalton
29. Dr J Darragh
30. Mr P J Davenport and Mr R Greening
31. Dental School, University of Birmingham
32. Dental School, University of Bristol
33. Dental School, University of Newcastle upon Tyne
34. Derbyshire Local Dental Committee
35. District Dental Officers Group
36. Faculty of Dental Surgery, Royal College of Surgeons
37. Faculty of Medicine, University of Southampton
38. General Dental Council
39. Glasgow Dental Hospital and School
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41. Miss S E Gregory
42. Mr J F Groombridge
Dr A L Laubscher
Mr D G Boff
Miss N Jacklin
43. Mr N Harrison
44. Mr N F Hollis
45. Dr R D Holt
46. Huddersfield Community Health Council
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48. Mr W A D Jack
49. Mr J B Jagger
50. Mr A J Jennings
51. Mr H G Kurer

52. Mr P Kurland
53. Mr K Landon
54. Mr J K Law and
Mr R D Morrison
55. Mr P W Lee
56. Mr P Lenny
57. Mr M J R Lindsay
58. Mr D J Linton
59. Mr P Lloyd
60. Ms C M Loftus
61. Miss A Lythgoe
62. Mr N M Mackenzie
63. Dr M J McLean
64. Mr B R Marston
65. Dr R J Mason
66. Mr D M Murphy
67. National Association of Administrative Dental Officers
68. Mr N Norman and
Miss F Ferguson
69. North Western Regional Dental Advisory Committee
70. Mr M O'Connor and
Mr J M Glynn
71. Dr G D O'Neill
72. Dr A Padfield
73. Mr I T Park
74. Mr D Pike
75. Ms J M Pinder
76. Mr G D Rawes
77. Mr G Read-Ward
78. Mr R T Rees
79. Resuscitation Council (UK)
80. Dr G J Roberts

81. Mr I C Robertson
82. Mr J Roche
83. Prof J P Rood
84. Mr N L Rosenbaum
85. Ms E Salisch
86. Dr P C H Schofield
87. School of Dentistry, University of Leeds
88. School of Dentistry, University of Liverpool
89. School of Dentistry, University College, London
90. Professor C Scully
91. Mr F Shields
92. Mr G Simmons
93. Mrs F P W Simpson
94. Mr A Smith
95. Society for Advancement of Anaesthesia in Dentistry
96. Mr E B Strachan
97. Mr D M Stevens
98. Mr P R Swinn
99. Tameside and Glossop District Dental Committee
100. Mr R J Tate
101. Mr D L Taylor
102. Mr E E Thompson
103. Mr C H Turner
104. United Medical and Dental Schools of Guy's and St Thomas's Hospitals
105. University Dental Hospital of Manchester
106. Mr G J Warner
107. Dr T Webb
108. West Midlands Regional Dental Committee
109. West of Scotland Centre for Postgraduate Dental Education
110. Mr W B Wilkinson

111. Mr R M Willetts

112. Mr M Willis

113. Dr T M Young

