

Conscious Sedation in Dentistry

Dental Clinical Guidance

Third Edition





Scottish Dental Clinical Effectiveness Programme

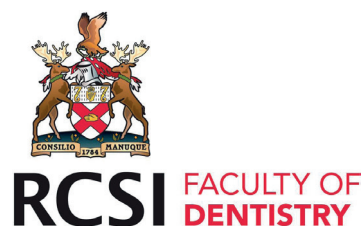
The Scottish Dental Clinical Effectiveness Programme (SDCEP) is an initiative of the National Dental Advisory Committee (NDAC) in partnership with NHS Education for Scotland. The Programme provides user-friendly, evidence-based guidance on topics identified as priorities for oral health care.

SDCEP guidance aims to support improvements in patient care by bringing together, in a structured manner, the best available information that is relevant to the topic and presenting this information in a form that can be interpreted easily and implemented.

Supporting the provision of safe, effective, person-centred care



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Scottish Dental Clinical Effectiveness Programme

Dundee Dental Education Centre, Frankland Building, Small's Wynd, Dundee DD1 4HN

Email scottishdental.cep@nes.scot.nhs.uk

Tel 01382 425751 / 425771

Website www.sdcep.org.uk

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1 Introduction

The provision of adequate anxiety control is an integral part of the practice of dentistry. The General Dental Council has indicated that this is both a right for the patient and a duty placed on the dentist.¹

All patients deserve appropriate anxiety control for any dental procedure. To be appropriate, the methods used must be considered for the individual patient having a specific treatment. A 'one size fits all' approach is inappropriate. When treatment planning for individual patients, practitioners should consider the use of the range of non-pharmacological methods of behavioural management as an alternative to sedation or as an adjunct.

It is important that a wide margin of safety is maintained between conscious sedation and the unconscious state provided by general anaesthesia. In conscious sedation, verbal contact and protective reflexes are maintained, whereas in deep sedation and general anaesthesia these are lost.²

Since 1998 there has been a significant change in the provision of pain and anxiety management in dentistry in the UK. This has resulted in an increased emphasis on the safe provision of conscious sedation instead of a reliance on general anaesthesia. General anaesthesia should only be provided in response to clinical need. The publication of *A Conscious Decision* in 2000 resulted in the cessation of general anaesthesia for dentistry in the primary care setting.³ The provision of safe and effective conscious sedation requires both clinical governance and, importantly, education of the profession and patients.

Recognising the need for accessible guidance on the provision of conscious sedation for dental care, SDCEP first published *Conscious Sedation in Dentistry* in 2006 and a second edition of the guidance in 2012. In 2016, a guidance development group was convened to review the guidance in light of certain specific developments since 2012 (Appendix 1). These include publication of: an evidence update for the National Institute for Health and Clinical Excellence (NICE) Guideline: *Sedation in Children and Young People* (2012); *Safe Sedation Practice for Healthcare Procedures* by the Academy of Medical Royal Colleges (AoMRC) (2013); *Standards for Conscious Sedation in the Provision of Dental Care: Report of the Intercollegiate Advisory Committee for Sedation in Dentistry* (IACSD) (2015).⁴⁻⁶ As described in Appendix 1, the review of the SDCEP guidance involved also searching for other sources of information and evidence including guidelines and systematic reviews, and appraisal of all eligible sources to assess their quality and to inform their utility as the basis for recommendations within this guidance.

The IACSD Report is the most significant recent development in this area and consequently is frequently cited in this guidance. The challenges of implementing the standards defined within the IACSD Report and consideration of subsequent developments aimed at facilitating their implementation were central in the group's deliberations to provide user-friendly, practical guidance for the provision of conscious sedation for dental care.

The updated SDCEP guidance encourages good clinical practice through the provision of recommendations and practical advice. These have been developed using a rigorous methodology and explanation of their basis is included. For many aspects of the provision of conscious sedation for dentistry, despite thorough searching, little research evidence to inform the recommendations was found. In such cases, recommendations are informed by recent guidelines through considered judgements made by the guidance development group.

1 Introduction

1.1 Scope

This guidance aims to promote good clinical practice for the provision of conscious sedation in dentistry that is both safe and effective. It is not intended to be a technical guide for sedation and therefore does not include details of drug doses or delivery. Similarly, adequate pain control is an important element of good dental practice but is outside the scope of this guidance.

This guidance is applicable to all patients receiving conscious sedation to facilitate the provision of any type of dental treatment whether it is delivered in a dental practice, in a public or community dental service clinic or in a hospital setting.

This guidance is primarily directed at healthcare professionals, including anaesthetists and medical sedationists, involved in the care of patients receiving conscious sedation for dental care in any setting in the UK. It will also be of relevance to those involved in dental education, undergraduate training and commissioners of services.

1.2 Development and Presentation of Guidance Recommendations

To develop the recommendations for this guidance, SDCEP convened a multidisciplinary guidance development group including medical and dental practitioners and specialists along with patient representatives. The key recommendations and practical advice presented in the guidance were developed through considered judgements made by the group, based on existing guidelines, the available evidence, the balance of risks and benefits, clinical experience, expert opinion and patient and practitioner perspectives. The impact of potential barriers to implementation identified during guidance development and through stakeholder involvement and external consultation was also considered (see Appendix 1).

Each key recommendation (indicated by a key symbol) is presented with a brief explanation of the basis for it in the accompanying text. Much of the evidence supporting these recommendations comprised guidelines, most of which were derived from expert opinion. Consequently, key recommendations informed by these guidelines are designated as based on expert opinion and are considered to be standard professional practice important for the provision of safe and effective care. In addition to key recommendations, further clinical practice advice is provided and is based on expert opinion and existing best practice. These advice points are indicated with molar bullet points (●). On occasion, wording from cited key sources is used verbatim in the recommendations and clinical practice advice if this was considered necessary to ensure a consistent message is conveyed.

Further details can be found in Appendix 1 and at www.sdcep.org.uk.

1 Introduction

1.3 Definitions

In the UK, the following definition of **conscious sedation** is widely agreed and accepted.⁵⁻⁷

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.

It is of fundamental importance that the level of sedation is such that the patient remains conscious, and is able to both understand and respond to verbal commands⁷ either alone or accompanied by a light tactile stimulus.⁶ If a patient is unable to respond to verbal contact when fully conscious, an effective means of communication must be maintained.

The definition describes the state of conscious sedation and does not attempt to prescribe how it is achieved. Specifically, it is acknowledged that a number of techniques involving the use of one or more drugs administered via different routes will fulfil this definition provided that there is an adequate margin of safety.

Any technique resulting in the loss of consciousness is defined as general anaesthesia,² and in the UK deep sedation requires the same level of care.⁵ General anaesthesia is not permitted in the primary dental care setting in the UK.³

For the purpose of this guidance, the following other definitions are used:

Child	A person under 12 years of age ^{6,8}
Young person	A person aged 12 – 16 years ⁶
Adult	A person aged 16 years or over ⁶
Standard sedation techniques*	<p>Also known as ‘basic’ techniques. Includes:</p> <ul style="list-style-type: none"> For a child, young person or adult, inhalation sedation with nitrous oxide/oxygen <p>and</p> <ul style="list-style-type: none"> For a young person or adult, midazolam by any route (intravenous, oral or transmucosal)

1 Introduction

Advanced sedation techniques*	<p>Also known as ‘alternative’ techniques. Includes:</p> <ul style="list-style-type: none"> For a child, young person or adult: <ul style="list-style-type: none"> certain drugs used for sedation (e.g. ketamine, propofol, sevoflurane); combinations of drugs used for sedation (e.g. opioid plus midazolam, midazolam plus propofol, sevoflurane plus nitrous oxide/oxygen); combined routes of administration (e.g. oral plus intravenous)^{6,8} <p>and</p> <ul style="list-style-type: none"> For a child, midazolam by any route
Dental sedation team	Clinical staff involved directly in sedation, including dedicated sedationist (dental professional, medical practitioner, anaesthetist), operator-sedationist and dental sedation nurse (or other sedation assistant)
Clinical team	Dental sedation team members and any additional clinical staff involved in the care and management of patients having sedation for dental treatment

* While it is recognised that the range of possible sedation techniques represents a continuum, for the purposes of writing and using this guidance it is convenient to distinguish standard and advanced techniques.

1.4 Statement of Intent

This guidance is based on careful consideration of the available evidence, professional regulations and other relevant information and has been developed through consultation with experts and end-users (see Appendix 1). As guidance, it does not override the healthcare professional’s right, and duty, to make decisions appropriate to each patient, with their valid consent. However, it is advised that departures from this guidance, and the reasons for this, are fully documented in the patient’s clinical record.

2 Environment for Conscious Sedation

KEY RECOMMENDATION



Ensure that the clinical environment for the provision of conscious sedation for dentistry has the necessary staff, facilities and equipment for the conscious sedation technique(s) used and the patients receiving care.
(Expert opinion)

This key recommendation reflects a principle that is longstanding professional practice,^{7,8} while the details reflect currently advocated practice.⁶ Further details about the development of the recommendations in this guidance can be found in Appendix 1 and at www.sdcep.org.uk.

All facilities that provide conscious sedation for the delivery of dental care should be subject to a quality assurance process that involves periodic inspection. The responsibility for quality assurance/inspection differs across the UK. It is not within the scope of this guidance to specify how and by whom inspection should be carried out. However, where mandatory inspection schemes do not exist, practitioners and others involved in the provision of dental services are encouraged to establish external inspections. The Society for the Advancement of Anaesthesia in Dentistry (SAAD) Safe Sedation Practice scheme provides a structured evaluation for sedation facilities for quality assurance purposes that is currently used as the basis for inspections in some areas.⁹

2.1 Facilities and Equipment



Ensure that treatment and recovery areas are large enough to enable adequate access for the clinical team.

- The recovery facility may be a dedicated recovery area or the treatment area and should be separate from the patient waiting area.



Ensure that all equipment and drugs recommended for treating medical emergencies and sedation-related complications are immediately available for use in both the treatment and recovery areas, with well-maintained equipment and drugs within their expiry date.¹⁰⁻¹⁴



Ensure that the facilities, knowledge and skills required for the prompt recognition and immediate management of sedation-related complications and medical emergencies are in place (also see Section 2.2).

- The sedation facility should have written local protocols that cover the management of collapse and adverse reactions, timely patient transfer to a hospital with appropriate resuscitation facilities, and regular checking of emergency equipment and drugs.¹⁵
- There must be adequate access for emergency services.⁹ Some facilities may not be suitable for sedation provision, for example where the physical layout or remoteness would restrict timely patient evacuation. Decisions about suitability should be based on assessment of the risk associated with the sedation technique under consideration.
- The clinical team must have the skills and equipment^{9,10,12,14} required to maintain life support until emergency services are able to attend.⁶

2 Environment for Conscious Sedation

- Keep contemporaneous records of all related operational procedures, including COSHH assessments, risk assessments and maintenance records and/or agreements.^{12,16}

2.1.1 Inhalation Sedation

- Only use dedicated, purpose-designed machines for the administration of inhalation sedation for dentistry that are maintained according to manufacturers' guidance with regular, documented servicing.⁷
 - This includes manufacturer recommended user maintenance, cleaning and infection prevention and control measures.
- Store gas cylinders safely and securely.^{10,17,18}
- Ensure that room ventilation and active scavenging of waste gases are sufficiently effective to conform with current COSHH standards.^{16,19}

2.1.2 Intravenous, Oral and Transmucosal Sedation

- Ensure that all the necessary equipment for the administration of sedation, including sedation agents and appropriate reversal agents, cannulae and labels, are available in the treatment area.⁷
 - Calibrated and appropriately maintained equipment is required for all intravenous infusion techniques.⁷
- Ensure that supplemental oxygen, and the equipment and staff with the skills required to deliver supplemental oxygen to the patient, are immediately available.⁷
- Ensure that calibrated and appropriately maintained pulse-oximeter (with audible alarm) and blood pressure monitors are available for use as indicated.^{7,10}

2 Environment for Conscious Sedation

2.2 Staffing

Conscious sedation for dental treatment may be provided by a team that includes a dedicated sedationist or operator-sedationist (i.e. dental professional assuming the dual responsibility of sedating the patient as well as providing dental treatment). Dental hygienists and therapists may be trained to act as operator-sedationists for inhalation sedation with nitrous oxide/oxygen only.²⁰ The required composition of the team delivering conscious sedation depends on the sedation technique used and patient being treated (Sections 4 and 5). For definitions of the terms 'dental sedation team' and 'clinical team' used in this guidance, see Section 1.3.

A dedicated sedationist (i.e. a suitably trained and experienced medical or dental professional) is required for certain advanced techniques (see Section 4.2) and may be advantageous in other circumstances, for example where:

- the patient is medically compromised, has a physical disability or is emotionally challenging;
- either the operator or the sedationist is relatively inexperienced;
- the patient has a history of being particularly difficult to manage;
- the dental procedure is complex or prolonged;
- treating patients at the extremes of age.⁶

- ♥ If an operator-sedationist is providing conscious sedation for the patient, ensure that a second sedation trained person (e.g. dental sedation nurse) assists.^{5,6,8,21}
 - This second person must be present throughout and be capable of monitoring the patient according to the sedation technique used and assisting the dentist in the event of a complication.⁷
 - Within any practice providing sedation, a member of staff (e.g. a receptionist) other than those required for sedation should be available to deal with other activities in the practice.
- ♥ Ensure that all members of the dental sedation team have the relevant knowledge and skills for the sedation techniques used and the patient groups being treated (Section 8).
- ♥ Ensure that the clinical team has the knowledge and skills to recognise and immediately manage sedation-related complications and medical emergencies (Sections 8.4 and 8.5).⁵⁻⁸
 - Records of annual life support training (see Appendix 2) and regular team-based participation in real-time emergency scenarios can provide evidence of this.¹⁵ Note that life support training does not have to be through a Resuscitation Council (UK) accredited ILS or PILS course.
- ♥ Document in advance in a written protocol the roles and responsibilities of members of the clinical team involved in the provision of conscious sedation throughout the patient journey.

2 Environment for Conscious Sedation

- ♥ Ensure that no member of staff is alone with a sedated patient at any time.²²
- ♥ If employing a dedicated sedationist, ensure that:
 - the sedationist is suitably trained in the use of the sedation technique for the patient group concerned;⁶
 - the sedationist and all other members of the clinical team are familiar with the emergency protocols, including roles in the recognition and management of sedation related complications;
 - the responsibilities and accountability of each member of the clinical team involved with each patient during preparation, sedation, recovery and discharge are clearly documented.

3 Preparation for Conscious Sedation

Indications for conscious sedation as a potential adjunct for patient management include patients with:

- dental anxiety and phobia;
- a need for prolonged or traumatic dental procedures;
- medical conditions potentially aggravated by stress;
- medical or behavioural conditions affecting the patient's ability to cooperate;
- special care requirements.

3.1 Responsibilities

All practitioners should recognise the limits of their own competency and, where appropriate, refer to teams with the required skills and experience.¹

Responsibilities of the Referring Practitioner

- To make as thorough a clinical assessment of the patient as possible.
- To explore alternative methods of pain and anxiety management with the patient.
- To assess whether referral, which may include sedation to enable the delivery of dental care, is absolutely necessary.
- If referring the patient, to try to ensure that if sedation is offered on referral, it is conscious sedation according to the agreed definition (Section 1.3).
- To provide appropriate clinical information about the patient with the referral, as far as patient compliance allows.
- To provide the patient with information about why they are being referred, likely options for care and what to expect.
- To provide preventive oral health advice and to encourage the patient to seek continuing dental care.
- To record details of the referral.

Responsibilities of the Operator-Sedationist or Operator and Sedationist

The treating dental professional could be the operator-sedationist or may work with a dedicated sedationist with whom the responsibilities should be shared.

- To ensure that a full assessment of the patient is carried out to confirm the dental treatment required, the need for sedation and the preferred technique (Section 3.2).
- To agree with the patient a treatment plan appropriate for the patient's needs and inform the referring practitioner of the treatment provided.
- To obtain written valid consent for provision of dental care with conscious sedation (Section 3.3).
- To provide the patient with information about their sedation including pre- and post-sedation instructions (Section 3.4).
- To provide safe and effective sedation for dental treatment.
- To provide preventive oral health advice and to encourage the patient to seek continuing dental care.

3 Preparation for Conscious Sedation

3.2 Patient Assessment for Sedation

KEY RECOMMENDATION



Carry out a full assessment of the patient to inform the need for sedation and, if indicated, the technique most suited to the individual patient.
(Expert opinion)

This key recommendation is informed by several recent guidelines^{5,6,8,21,23,24} and is consistent with current standard professional practice. Further details about the development of the recommendations in this guidance can be found in Appendix 1 and at www.sdcep.org.uk.

Thorough assessment is important to both determine the patient's suitability for sedation and to establish a comprehensive treatment plan. This is best achieved at a separate appointment prior to the patient's treatment under sedation to allow the clinician sufficient time to obtain and fully consider all of the required information and, for consent purposes, to give the patient time to consider options without concerns about receiving treatment the same day. Effective treatment planning may reduce the need for future treatment with sedation.



Carry out patient assessment for sedation at a separate appointment prior to the patient's treatment under sedation.

- In certain circumstances, other arrangements may be justifiable provided these ensure thorough assessment and allow valid consent to be obtained.
- Assessment on the day of treatment is acceptable in an emergency.
- Assessment is the responsibility of the operator-sedationist or sedationist and operator, who will have the appropriate knowledge, skills, training and experience.



Take a thorough medical, dental, social, anxiety and sedation history to ensure that the conscious sedation technique chosen is the most suitable to enable treatment for the individual patient.

- The medical history should include the patient's use of both prescribed and non-prescribed drugs (including recreational or illicit drugs).
- Appendix 3 includes the aspects of patient history that should be noted in the clinical records.



Determine and record the patient's ASA physical status (see Appendix 4) and consider the implications of this for treatment.

- While many ASA grade III patients will need to be referred to secondary care, some may be treated in primary care depending on the available facilities, knowledge, skills and experience and on the current stability of the patient's medical condition.
- ASA grade IV patients requiring dental sedation should be referred to an appropriate secondary care facility.

3 Preparation for Conscious Sedation

- ♥ Carry out an oral examination and agree a treatment plan with the patient and/or parent or carer.
 - In exceptional circumstances, lack of patient compliance may render pre-sedation examination impossible.
- ♥ Explore with the patient all relevant anxiety management techniques including non-pharmacological behaviour management techniques (e.g. cognitive behavioural therapy, distraction, guided imagery, hypnosis, play therapy) and, where necessary, general anaesthesia.
- ♥ Ensure that the decision to use conscious sedation is justified and that the most suitable technique is selected on each occasion.⁷
 - Adopting the principle of minimal intervention, the simplest and safest effective technique, based on patient assessment and clinical need, should be used.^{5,6}
 - It is preferable to use a carefully chosen technique for the patient from the outset, rather than progress through a range of techniques likely to fail.
- ♥ Document the justifications for conscious sedation and for the chosen technique in the patient's records.
- ♥ Record blood pressure, oxygen saturation and heart rate, as part of the assessment process to inform suitability for sedation, unless lack of patient compliance renders pre-sedation measurement impossible.
 - For healthy patients (most ASA grade I and II patients) having inhalation sedation with nitrous oxide/oxygen, these measurements are not usually necessary.

3.2.1 Individualised Patient Care

As for any aspect of healthcare, the provision of conscious sedation for dental treatment should be suitable and tailored for the individual patient. There should be a clear progression from patient assessment to the treatment plan, taking into consideration the patient's individual circumstances, abilities and needs.

The response of some patients to their environment and to interventions may be influenced by such factors as their degree of cognitive ability and cooperation and the impact of their medical history on the proposed treatment. Patient factors that may influence the provision of sedation include extremes of age, medication, extremes of BMI, physical status, or disabilities. Consequently, adaptations in treatment plans and protocols may be required. Examples include:

- a reduced drug dose for frail and/or older patients, with titration of smaller increments at increased time intervals;
- pre-operative recording of physiological data or intra-oral examination may not be possible for some children or patients with special care requirements;
- non-verbal means of communication;
- the use of a dedicated sedationist.

3 Preparation for Conscious Sedation

- ♥ Ensure that all staff responsible for patient assessment and the provision of conscious sedation have relevant experience of the patient groups in their care (e.g. children, young people or patients with special care requirements) and that the equipment and facilities are suitable or adapted for the patient.
- ♥ Record reasons for deviations from standard practice if any adaptation to treatment protocols is required.

3.3 Consent

It is a requirement of GDC standards that written consent is obtained where dental treatment involves conscious sedation.¹ It is a legal requirement that when obtaining consent clinicians take reasonable steps to ensure that patients are aware of any material risks involved in a proposed treatment, and of reasonable alternatives.²⁵

- ♥ Obtain valid written consent prior to premedication or the administration of sedative drugs.
 - The consent process should begin at a separate appointment prior to treatment, unless there are exceptional circumstances (e.g. acute pain). This is to allow the patient sufficient time to consider the information provided.
 - To inform the consent process, the sedation options, proposed technique, dental treatment and the benefits and risks of these should be fully discussed with the patient (and/or parent or carer, where applicable). Written information to support this should also be provided. Further advice on patient information is provided in Section 3.4.
 - The information provided should be appropriate for the patient's age and learning ability.
- ♥ Check that the patient (and/or parent or carer, where applicable) has understood the information provided and record this in the patient's notes.
- ♥ Where written consent was obtained at a prior visit, reconfirm, at least verbally, on the day of the procedure.
- ♥ If consent is obtained on the day of treatment, ensure that it is compliant with GDC Standards.

The legal position relating to consent for children and young people, or for patients who are unable to fully understand the nature and implications of the proposed treatment because of mental incapacity, is governed by legislation which differs across the UK.²⁶⁻³⁰ Even if unable to give consent legally, many patients have a level of understanding that means it is important and good practice to include them in discussions about the procedure and to confirm they are content to proceed.

Further guidance on consent is available.³¹⁻³⁵ Up-to-date advice may also be obtained from your professional indemnity organisation.

3 Preparation for Conscious Sedation

3.4 Pre- and Post-Sedation Instructions

KEY RECOMMENDATION



Prior to sedation, provide consistent instructions both verbally and in writing for patients, parents/carers and escorts, that are specific to the patient's needs and explain the effects of the proposed sedation and responsibilities both before and after treatment.

(Expert opinion)

This key recommendation is informed by several recent guidelines^{5,6,21,23,24,36} and is consistent with current standard professional practice. Further details about the development of the recommendations in this guidance can be found in Appendix 1 and at www.sdcep.org.uk.

- ♥ Ensure that the information provided explains what to expect before, during and after sedation, including clear instructions about fasting (Section 3.5) and escort requirements (Section 3.6).
 - The information provided should be appropriate for the patient's age and learning ability.
 - Information provided in alternative formats and local information such as directions, wheelchair access and images of the facility may be beneficial for some patients.
 - For some patients, alternative forms of communication may be required, such as sign language or video recordings.
- ♥ Include details of escort responsibilities (Section 3.6), post-operative risks and possible complications, analgesia, aftercare advice (including about the patient's usual medication), restrictions on post-sedation activities, contact details for the care provider and out-of-hours contact details for emergency advice and services.
- ♥ Record the instructions given in the patient's clinical notes.

The IACSD Report *Standards for Conscious Sedation in the Provision of Dental Care* provides useful examples of information for patients, parents and carers that may be adapted for local use.⁶

3 Preparation for Conscious Sedation

3.5 Fasting

KEY RECOMMENDATION



For conscious sedation, provide advice about whether or not to fast based on an individual assessment of the patient and the nature of the sedation and dental procedure.

(Expert opinion; Low quality evidence)

This recommendation reflects the importance of making an individual judgement for each patient^{5,6} and is consistent with the evidence based recommendations made by NICE.²¹ The evidence regarding fasting before dental sedation is of low quality²¹ and, depending on the circumstances, it may or may not be appropriate for the patient to modify food and drink intake before sedation. Further details about the development of the recommendations in this guidance can be found in Appendix 1 and at www.sdcep.org.uk.



Following careful consideration of all factors for each patient:

- if there are no indications for fasting, advise a patient who is to receive conscious sedation that they can eat and drink on the day of their appointment, avoiding alcoholic drinks and large meals.
- if there is judged to be a significant risk of aspiration, or another indication, consider fasting prior to sedation. The 2-4-6 fasting rule is a recognised fasting regime used in anaesthesia^a.



Record in the patient's notes the advice provided to the patient about eating and drinking prior to sedation and the justification for this advice.



Confirm and record food and fluid intake on the day of sedation.

3.6 Patient Escort

KEY RECOMMENDATION



Ensure that a responsible adult escort, who is capable of looking after the patient unaided, is present and accompanies the patient home after treatment under conscious sedation. Adults receiving inhalation sedation with nitrous oxide/oxygen do not usually require an escort.

(Expert opinion)

This key recommendation is informed by several recent guidelines^{5,6,24} and is consistent with current standard professional practice. Further details about the development of the recommendations in this guidance can be found in Appendix 1 and at www.sdcep.org.uk.

^a 2 hours for clear fluids, 4 hours for breast milk, 6 hours for solids.³⁷

3 Preparation for Conscious Sedation

For inhalation sedation with nitrous oxide/oxygen it is standard practice that an adult does not require an escort unless there are other indications such as mobility issues. It is the sedationist's responsibility to assess the patient and advise if an escort is required. Children and young people under 16 years of age do require an escort for inhalation sedation with nitrous oxide/oxygen.

- ♥ Provide the escort with written instructions about their responsibilities and post-operative care (see Section 3.4).
- ♥ For anything other than inhalation sedation with nitrous oxide/oxygen, ensure that the escort is aware of the need for a responsible adult to remain with the patient as a minimum for the rest of the day.⁷
 - For those sedated later in the day, the escort may need to remain with the patient overnight.
 - The role of the escort for an individual patient may be carried out by more than one person, for example for a patient returning to a residential facility or who requires two carers.
 - The responsibility of the escort extends to ensuring that the patient takes their normal prescribed medication and carries out the routines required to manage any concurrent chronic health conditions.
 - Wherever possible there should be arrangements in place for the patient and escort to travel home by private car or taxi rather than public transport. If this is impossible, the escort must be made fully aware of the added responsibilities of caring for the patient during the journey home.⁷
 - If either the patient or escort appears to be unwilling or unable to comply with these requirements, conscious sedation must not be administered.

3.7 Oral Premedication

A low dose of benzodiazepine may be prescribed as oral premedication for anxiolysis to assist with sleep the night before treatment or to aid an anxious patient's journey under close supervision to the treatment facility.^{11,13} Oral premedication can be used as a standalone method for anxiety management without necessarily being followed by sedation at treatment. Higher oral doses of benzodiazepine or use of other drugs orally constitute oral sedation and therefore would be subject to the guidance in Sections 4 and 5.

- ♥ Ensure that patients who are to receive oral premedication are given pre- and post-operative instructions.
 - A premedicated patient cannot give valid consent for treatment.
- ♥ Advise the patient that when premedicated they will need to be escorted to and from the treatment facility and should not drive.

4 Conscious Sedation Techniques

KEY RECOMMENDATION



Ensure that the sedation technique used is suited to the age and needs of the patient and delivered by a dental sedation team specifically trained and experienced in the technique and working in an appropriate environment. (Expert opinion)

This key recommendation is informed by several recent guidelines^{5,6,21} and is consistent with current standard professional practice. Further details about the development of the recommendations in this guidance can be found in Appendix 1 and at www.sdcep.org.uk.

This section is generally applicable to all patients, with additional or alternative guidance for specific patient groups indicated. Further guidance for the conscious sedation of children and young people is given in Section 5. This guidance is not intended to be a technical guide for sedation provision and as such does not describe drug doses or specific details of delivery.

Several effective and safe methods of sedation are regarded as standard techniques (Section 1.3) and are likely to be suitable for the vast majority of patients.⁶ A single titratable drug is preferable (i.e. nitrous oxide for inhalation or midazolam for intravenous sedation^b). When these are not suitable, for example for patients with special care requirements or those with extreme needle phobia, sedation using oral or transmucosal midazolam are acceptable standard techniques^{b,c}.

In certain circumstances, other methods of sedation may be useful. However, these advanced techniques (Section 1.3) require staff specifically trained and experienced in their use, working in a clinical environment suited to the technique.^{6,8}

Adopting the principle of minimal intervention, the simplest and safest effective technique, based on patient assessment and clinical need, should be used.^{5,6} Irrespective of the technique and despite any difficulties there may be in judging the level of sedation (e.g. patients who are normally unable to respond to verbal communication), this should not go beyond the definition of conscious sedation (Section 1.3).

^b Note that intravenous, oral and transmucosal sedation of children with midazolam are considered advanced techniques (Section 1.3).

^c As oral or transmucosal sedation may achieve the same target state as intravenous sedation using the same pharmacological agents, the same standards of care apply for all of these techniques.

4 Conscious Sedation Techniques

4.1 Standard Techniques

KEY RECOMMENDATION



If sedation is considered necessary for the delivery of dental care, use a standard sedation technique, unless there are clear indications to do otherwise.
(Expert opinion; Low quality evidence)

This key recommendation is largely informed by several recent guidelines^{5,6,21} and is consistent with current standard professional practice. Also, evidence of varying but overall low quality supports the use of midazolam. Moderate quality evidence supports midazolam as effective in alleviating anxiety³⁸ and there is low quality evidence for the use of intranasal midazolam to reduce anxiety and improve patient acceptance of cannulation and dental treatment.³⁹ Further details about the development of the recommendations in this guidance can be found in Appendix 1 and at www.sdcep.org.uk.

4.1.1 Inhalation Sedation with Nitrous Oxide/Oxygen

Inhalation sedation with nitrous oxide/oxygen is widely accepted as a safe and effective technique.^{5-7,21,40} The success of the technique depends on appropriate titration of nitrous oxide to the individual patient's response and is supported by behaviour management techniques. Dedicated inhalation sedation machines will not allow hypoxic levels of sedation.



Use a titrated dose of nitrous oxide with oxygen as the standard inhalation sedation technique.

Note that inhalation sedation with nitrous oxide/oxygen may be used before intravenous sedation to facilitate cannulation but, to remain a standard technique, would be discontinued prior to administration of midazolam.

4.1.2 Intravenous Sedation with Midazolam

Successful intravenous sedation with a wide margin of safety is dependent on titration of the drug dose according to the individual patient's response and therefore the use of fixed doses or bolus techniques is unacceptable.⁷



Use a titrated dose of midazolam as the standard intravenous sedation technique.



Maintain intravenous access by way of an indwelling cannula until the patient is fit for discharge.

- Oral premedication, topical local anaesthesia or inhalation sedation may facilitate cannulation for some patients.

Note that intravenous sedation of children with midazolam is considered an advanced technique (Section 1.3).^{6,8}

4 Conscious Sedation Techniques

4.1.3 Oral and Transmucosal Sedation with Midazolam

As an alternative or adjunct to intravenous sedation for some patients, sedation may be achieved through the oral or transmucosal (e.g. intranasal) administration of midazolam. These techniques can be used when the titratable techniques (inhalation and intravenous sedation) are not deemed to be suitable, for example for some patients with special care requirements or extreme needle-phobia. These techniques are also occasionally used in combination with other sedation techniques, in which case this would be considered advanced sedation.

The state of conscious sedation resulting from oral or transmucosal sedation might be comparable to that produced by the intravenous administration of drugs, but it is less controlled and therefore less predictable.

- For oral or transmucosal sedation, ensure that the dental sedation team is trained and experienced in the sedation technique used and competent in the use of intravenous sedation techniques.
- Ensure that oral sedation is administered at the sedation facility.
- Cannulate the patient as soon as possible.
 - Due to the less predictable nature of either oral or transmucosal sedation, the patient should be cannulated in case the administration of a reversal agent is required.
 - If this is not done, the sedationist should be able to justify their decision.
- Follow procedures for the off-label use of agents for oral or transmucosal sedation.^{11,41,42}

Note that oral and transmucosal sedation of children are considered to be advanced techniques (Section 1.3).^{6,8}

4.2 Advanced Techniques^d

KEY RECOMMENDATION



Only use an advanced technique if the clinical needs of the patient are not suited to sedation using a standard technique.
(Expert opinion)

This key recommendation is based on consideration of the additional risks associated with advanced techniques and is informed by several recent guidelines.^{5,6,8,21} Further details about the development of the recommendations in this guidance can be found in Appendix 1 and at www.sdcep.org.uk.

^d Note that not all sedation techniques are provided in primary care within the NHS (HSC in Northern Ireland).

4 Conscious Sedation Techniques

While standard sedation techniques will be effective for the majority of patients, advanced techniques when delivered by well-trained and experienced teams in the correct environment can provide valuable treatment options with advantages over both standard techniques and general anaesthetic.

Advanced techniques include the use of certain drugs used for sedation, combinations of drugs and/or combined routes of administration (see Section 1.3). Drug combinations have less predictable effects than single drugs, and some anaesthetic drugs and infusions used for sedation have narrower therapeutic indices. Consequently, advanced sedation techniques are likely to have reduced margins of safety, potentially increasing the risk of adverse events.^{5,6} The use of advanced sedation techniques has significant implications for staffing, training and skills and not all sedation settings will be able to meet the requirements.

- ♥ If using an advanced sedation technique, ensure that its use is justified and record the justification in the patient's records.
- ♥ Ensure that all members of the dental sedation team are specifically trained and experienced in the use of advanced techniques for the patient groups being treated (see Section 8).
 - A dedicated sedationist is required for certain advanced techniques for adults, including sedation with ketamine, sevoflurane, propofol (target controlled infusion), propofol with midazolam, and for any technique considered advanced for children or young people (Section 1.3).⁶
- ♥ Ensure that the facilities, knowledge and skills required for the prompt recognition and immediate management of sedation-related complications and medical emergencies are in place (see Sections 2.1 and 2.2)^{e, 5-8}
- ♥ If providing advanced sedation for children or young people, ensure that the additional skills required are available (see Section 5).

^e For 'advanced techniques' as categorised in this guidance, the IACSD Report states that '*the sedation team must have immediate access to the equivalent range of skills and facilities to be found in an NHS Acute Trust for the prompt recognition and immediate management of adverse events*'.⁶ The IACSD also explains that '*evidence might include written protocols for managing collapse and adverse reactions, the timely transfer of a collapsed patient to a hospital with appropriate resuscitation facilities and the regular checking of emergency drugs and equipment; current life support certificates and records of regular team-based participation in real-time emergency scenarios*'.¹⁵ Compliance with these points would be achieved by following the recommendations in Sections 2.1 and 2.2 of this guidance, which apply to the provision of all sedation techniques.

4 Conscious Sedation Techniques





4.3 Monitoring

KEY RECOMMENDATION



Ensure the patient is monitored peri-operatively by an appropriately trained member of staff in a manner suited to the patient and sedation technique.
(Expert opinion)

This key recommendation is informed by several recent guidelines^{5,6,21,24,43} and is consistent with current standard professional practice. Further details about the development of the recommendations in this guidance can be found in Appendix 1 and at www.sdcep.org.uk.

-  Monitor the patient from the pre-operative stage until the discharge criteria are met.
 - Monitoring must be appropriate for the sedation technique and patient and carried out by an appropriately trained member of the clinical team (Section 8).
 - The clinical team must be able to recognise a deteriorating patient and manage accordingly.
-  For all patients having inhalation sedation with nitrous oxide/oxygen, monitor the patient's clinical signs*.
 - Additionally, non-invasive blood pressure (NIBP) monitoring may be indicated for some patients, for example, those with significant degrees of cardiovascular disease.
-  For adults and young people having any sedation technique other than inhalation sedation with nitrous oxide/oxygen, monitor as a minimum, the patient's clinical signs*, oxygen saturation using pulse oximetry, and blood pressure.
 - NIBP monitoring should be carried out pre-operatively, intra-operatively at intervals appropriate to the patient's condition and technique, and post-operatively.
-  For children having any sedation technique other than inhalation sedation with nitrous oxide/oxygen, monitor the patient's clinical signs*, oxygen saturation using pulse oximetry and, unless likely to prevent completion of the procedure, blood pressure.
 - Record monitoring contemporaneously.
 - It is particularly important to record monitoring data for points where a significant event has occurred.

* Monitoring clinical signs includes checking the level of consciousness/depth of sedation, airway patency, respiration (rate and depth), skin colour, capillary refill, pulse rate, rhythm and volume⁶ as appropriate to the clinical situation, sedation technique used, patient status and sedation response.

Monitoring by electrocardiogram (ECG) or capnography is not currently required for conscious sedation for dental treatment.⁵ However, such additional monitoring may be appropriate for ASA grade III and IV patients.⁶

5 Conscious Sedation for Children and Young People

This section of the guidance is applicable to children under 12 years of age or young people between the ages of 12 and 16 and needs to be considered in conjunction with the preceding sections. It is recognised that the physical and mental development of individuals varies and may not necessarily correlate with their chronological age.^{6,8,44} For every patient, the treatment plan will depend on a thorough assessment of their psychological and physical maturity and consideration of the risks involved.

KEY RECOMMENDATION



Ensure that all staff involved in providing conscious sedation for children or young people are trained and experienced in sedating patients of these ages and that the staffing, equipment and facilities are appropriate for the age of the patient and the technique.

(Expert opinion)

This key recommendation is based on consideration of the importance of both the additional skills required to manage these patient groups and an appropriate environment, and is informed by several recent guidelines.^{5,6,21,43} Further details about the development of the recommendations in this guidance can be found in Appendix 1 and at www.sdcep.org.uk.





The child's response to their environment and to interventions may vary, influenced by such factors as their degree of cognitive ability and cooperation and the impact of their medical history on the proposed treatment. Corresponding adaptations in treatment protocols may be required: for example, pre-operative recording of physiological data or intra-oral examination may not be possible. Consideration should be given to providing a suitable child-friendly environment (e.g. posters suitable for children in waiting areas, paediatric only sessions).

- ♥ Use behavioural management techniques, such as play,⁴⁵ for children and young people where possible, as an alternative or adjunct to sedation (see Section 3.2).
- ♥ Ensure that the choice of sedation technique is based on a thorough assessment of the individual child or young person (see Section 3.2).
- ♥ Record reasons for deviations from standard practice, if any adaptation to treatment protocols is required (see Section 3.2.1).
- ♥ Ensure that the facilities, knowledge and skills required for the prompt recognition and immediate management of sedation-related complications and medical emergencies are in place (see Sections 2.1, 2.2 and 4.2) and appropriate for the ages of the children or young people being treated.

5 Conscious Sedation for Children and Young People

A Cochrane systematic review provides supporting evidence that nitrous oxide/oxygen is more effective than placebo and safe for children, although the evidence quality for this is judged to be very low.⁴⁶ A second systematic review provides very low quality evidence that nitrous oxide/oxygen can be effective and safe for children who were otherwise referred for general anaesthetic.⁴⁷ Low quality evidence also considered in the Cochrane review suggests that oral midazolam is more effective than placebo.⁴⁶ Two further systematic reviews provide low to very low quality evidence that intravenous and oral midazolam, respectively, are safe in children.^{48,49} Several guidelines consistently identify nitrous oxide^{7,21,22,40,43} or midazolam²¹ as suitable, effective and safe sedation techniques for children. Some recommend that nitrous oxide should be the first choice,^{6,7,22,40} with midazolam indicated for adolescents.^{6,22} The evidence provided in the systematic reviews supports their use.

For children and young people, planning treatment to be provided under sedation can raise significant issues. Failure to properly assess and treatment plan can lead to unnecessary repeat sedation episodes. This is a particular concern where advanced techniques are required, because of the potential risks involved and the greater impact on the patient and parent/carer.

-  For children, use inhalation sedation with nitrous oxide/oxygen as the preferred technique for conscious sedation, unless judged to be unsuitable for the patient and clinical need.
 - Inhalation sedation with nitrous oxide/oxygen is the only standard technique for children (Section 1.3).^{6,8}
 - A brief trial of nitrous oxide/oxygen at the assessment appointment may be helpful for the psychological preparation of some children.
-  For young people, use inhalation sedation with nitrous oxide/oxygen or intravenous midazolam as the preferred techniques, unless these standard techniques are judged to be unsuitable for the patient and clinical need.
 - Oral and transmucosal sedation using midazolam, while also considered standard techniques for young people, are only appropriate in a minority of cases (e.g. for patients with special care requirements or needle phobia).
-  When providing sedation by any technique for a child or young person with complex oral health needs, ensure that the clinical team is competent to develop a treatment plan that is appropriate to the needs of the patient.
 - If a practitioner considers such planning wholly or partially beyond their competence they should seek input from an appropriately trained and skilled colleague, likely to be a specialist or consultant in paediatric dentistry. This colleague may be part of the immediate clinical team or accessible through professional networks.
-  For a child or young person, only provide sedation using an advanced technique (Section 1.3) when the clinical needs of the patient are not suited to sedation using a standard technique.

5 Conscious Sedation for Children and Young People

5.1 Advanced Sedation for Children and Young People

If providing advanced sedation for a child or young person, in addition to the guidance in Section 4.2, the following applies.

- Ensure that all sedation team members are specifically trained, experienced and competent in the use of advanced techniques for children and young people of the age ranges to be treated (see Section 8).
- Ensure that the clinical team is competent to develop a treatment plan that is appropriate to the needs of the patient and which avoids unnecessary repeat sedation episodes.
 - If a practitioner considers such planning wholly or partially beyond their competence they should seek input from an appropriately trained and skilled colleague, likely to be a specialist or consultant in paediatric dentistry.
 - A clinical team providing advanced sedation for children or young people should ideally be working within a managed clinical network.
- Ensure that the sedationist has the skills equivalent to those expected of a consultant in anaesthesia competent in sedation for dentistry.⁶
 - Appropriately trained medical and dental sedationists may have these skills, which include competence in age-appropriate 'rescue' procedures in the event of cardio-respiratory complications associated with a deeper level of sedation than intended. The practitioner does not need to possess broader anaesthetic skills that are not directly relevant to the administration of dental conscious sedation.¹⁵

6 Recovery and Discharge





KEY RECOMMENDATION



Monitor the patient throughout the recovery period until they are assessed as fit for discharge.
(Expert opinion)

This key recommendation is informed by several recent guidelines^{5,6,23,36} and is consistent with current standard professional practice. Further details about the development of the recommendations in this guidance can be found in Appendix 1 and at www.sdcep.org.uk.

Recovery from sedation is a progressive step-down from completion of treatment, through to the patient's discharge.

-  Ensure that an appropriately trained member of the clinical team monitors the patient throughout the recovery period, and that both equipment and drugs for dealing with sedation complications are immediately available.
 - The recovery area should be separate from the patient waiting room (Section 2.1).⁷
-  Ensure that the sedationist remains available to see the patient urgently in the event of any complications.
-  Ensure that all of the discharge criteria (see Box 1) have been met before the patient is allowed to leave.
 - The decision to discharge a patient following any type of sedation is the responsibility of the sedationist,^{6,7,36} although aspects of the discharge process may be delegated to a suitably trained member of the clinical team.
 - Be aware of the need for sufficient recovery time following administration of a reversal agent.
-  Ensure that both the patient and escort have been provided with written and verbal post-operative instructions that include details of escort responsibilities, post-operative risks and possible complications, analgesia and aftercare advice, restrictions on post-sedation activities, contact details for the care provider and out-of-hours contact details for emergency advice and services (Sections 3.4 and 3.6)^f.

^f Examples of information for patients, parents and carers are provided in the IACSD Report *Standards for Conscious Sedation in the Provision of Dental Care*.⁶

6 Recovery and Discharge

Box 1: Discharge Criteria

- The patient is orientated in time, place and person.
- Vital signs are stable and within normal limits for the patient. Respiratory status is not compromised.
- Pain and discomfort have been addressed.
- Where relevant, haemostasis has been achieved.
- The cannula, where inserted, has been removed.
- The responsible escort is present and arrangements have been made for supervision as advised by the sedationist.
- Written and verbal post-operative instructions appropriate for both the sedation technique and the dental treatment have been given to the patient and escort (see Section 3.4 for details).

These discharge criteria are adapted from the IACSD Report *Standards for Conscious Sedation in the Provision of Dental Care*.⁶

7 Records and Documentation

Maintaining comprehensive and up-to-date records is an important aspect of the provision of high quality care that is safe, effective and person-centred. Good record keeping facilitates effective shared care and provides a permanent record of care, which might prove useful in the event of complaints or for medico-legal reasons.

- For each patient, keep a detailed record of the pre-sedation assessment, consent, the visit for conscious sedation including monitoring, the treatment procedure and the recovery.
- Further details of the information to be recorded, which depends on the patient's condition and the sedation technique, are given in Appendix 3.

8 Training in Conscious Sedation

KEY RECOMMENDATION



Ensure that all members of the dental sedation team have the knowledge and skills necessary for their role to safely and effectively deliver the sedation technique used (as described below).

(Expert opinion)

The type and extent of sedation training is not an area for which a standard evidence base exists or is likely to develop. However, the correct training of staff involved in the delivery of sedation is of critical importance for patient safety. This key recommendation reflects this importance and is consistent with currently advocated professional practice.^{5,6} Further details about the development of the recommendations in this guidance can be found in Appendix 1 and at www.sdcep.org.uk.

The emphasis on defined standards for training of providers of conscious sedation for dentistry⁶ places a responsibility on universities, deaneries and equivalent bodies to develop courses to meet the demand for this training.

For definitions of the terms ‘dental sedation team’ and ‘clinical team’ referred to in this section, see Section 1.3.

8.1 Dental Sedation Team Members New to Sedation

All healthcare professionals (including dentists, medical practitioners, dental sedation nurses and dental hygienists and therapists) new to sedation (i.e. who cannot demonstrate existing experience and maintenance of knowledge, skills and competency, as described in Sections 8.2 and 8.3) are expected to undertake validated training, relevant for their role and the techniques to be used, before practising.⁵ Validated training is training delivered by a recognised provider (UK universities, Health Education England, NHS Education for Scotland, the Wales Deanery, the Northern Ireland Medical and Dental Training Agency or Schools of Anaesthesia) or that is accredited through the dental faculties of the UK surgical royal colleges⁹.

Training courses, including ‘in-house’ programmes, can be validated by submitting an application for accreditation that describes the course learning outcomes and content, which should be mapped to the syllabuses listed in the IACSD Report, *Standards for Conscious Sedation in the Provision of Dental Care*.⁶ Training includes clinical practice in the techniques with an approved supervisor⁹ or a supervisor associated with a training course that is delivered by a recognised provider or that is accredited.

⁹ Further details about applications for accreditation of a dental sedation course leading to independent clinical practice and for approval of a clinical supervisor for dental sedation experience are provided at www.rcseng.ac.uk/dental-faculties/fds/publications-guidelines/standards-for-conscious-sedation-in-the-provision-of-dental-care-and-accreditation/.

8 Training in Conscious Sedation

The IACSD Report sets out generic learning outcomes and training syllabuses based on previous training standards^{5,50-52} for:

- Dentists: Basic conscious sedation techniques for children, young people and adults
- Dentists: Advanced conscious sedation for young people and adults
- Dentists: Advanced conscious sedation for children
- Dental hygienists and therapists: Inhalation sedation
- Dental nurses: Assisting during conscious sedation

These syllabuses should be used to develop, evaluate and review sedation training courses for healthcare professionals, including those for medical practitioners wishing to provide conscious sedation for dental procedures. Note that, if required, these syllabuses can be tailored to be relevant to the provision of training in a specific sedation technique.

There is a separate syllabus for anaesthetists published by the Royal College of Anaesthetists.⁵³

Ensure that all healthcare professionals intending to become involved in sedation provision for dental treatment (including dentists, medical practitioners, dental sedation nurses and dental hygienists and therapists) undertake validated training, relevant for their role and the techniques to be used^{h, 6}

8.2 Experienced Dental Sedation Team Members

Experienced members of the dental sedation team may continue to practise without undergoing formal validated training on condition that they can demonstrate that they are experienced and that they maintain their knowledge and skills as described in Section 8.3.

Given the diversity of individuals' circumstances, it is not possible to specify the requirements for a member of the dental sedation team to be considered experienced. However, they should be able to demonstrate that they have been performing their role in the provision of sedation for dental treatment recently and frequently enough to maintain their competence.

If an experienced healthcare professional meets the requirements for maintaining knowledge and skills (Section 8.3) while working in a suitable clinical environment (Section 2) with appropriate clinical governance (Section 9), this would be consistent with recommendations for experienced sedation team members as described in the IACSD Report.⁶

^h The National Examining Board for Nurses (NEBDN) *Certificate in Dental Sedation Nursing* (CDSN) (<http://nebdn.org>) and Scottish Qualifications Authority (SQA) Professional Development Awards (PDA) in *Inhalation Sedation for Dental Nurses* or *Intravenous Sedation for Dental Nurses* (www.sqa.org.uk) are examples of recognised qualifications for dental nurses.

8 Training in Conscious Sedation

8.3 Maintaining Knowledge and Skills

It is a professional requirement and fundamental good practice that all healthcare professionals work to monitor and constantly strive to improve the quality of care provided to all patient groups they manage. This applies to both those new to sedation and experienced members of the dental sedation team.

- ♥ Maintain a log of all sedation cases to demonstrate clinical practice.
 - A log may also be useful for the purposes of audit and quality assurance.
 - The log may include details of patient type, baseline vital signs, sedation drug used, route, dose, sedation score, reversal agents used, adverse events, as appropriate to the sedation technique and professional role.
 - This could be a team-based log that specifies individuals involved and their roles.
- ♥ Undertake regular, relevant, verifiable continuing professional development.
- ♥ Conduct regular sedation-based audit and reflection (see Section 9).
- ♥ Maintain competence in the management of medical, dental and sedation-related complications (see Sections 8.4 and 8.5).

Evidence of active participation in continuing professional development (CPD) is a statutory requirement for all registered dentists and dental care professionals.⁵⁴

- ♥ For all dental sedation team members, include sedation-related activities relevant to the patient groups managed and to individual learning needs, as part of annual CPD.
 - 12 hours of sedation-related verifiable CPD in each 5 year cycle is recommended.^{6,55}
 - It is important to review current practice and competency to identify individual learning and training needs.

Verifiable sedation-related CPD can be obtained in a variety of ways, including attendance at symposiums, participation in approved audits, structured team training and through online articles or training.

Note that CPD update courses do not have to be accredited.

8 Training in Conscious Sedation

8.4 Life Support

Whether involved in the provision of sedation or not, all GDC registrants are required to be trained in dealing with medical emergencies, including resuscitation.²⁰ The Resuscitation Council (UK) specifies that life support training covers cardiopulmonary resuscitation (CPR), including basic airway management and the use of an automated external defibrillator (AED), and that this is updated annually.⁵⁶

- ♥ Ensure that all members of the clinical team are trained and competent in life support.⁶
 - Learning outcomes for life support training suitable for all members of the team are provided in Appendix 2.
 - The training must be patient age appropriate and contextualised to the dental setting and team (i.e. within a dental surgery or simulation) and there should be an emphasis on regular team training.

Life support courses that cover the main elements of Resuscitation Council (UK) defined Immediate Life Support (ILS) and Paediatric Immediate Life Support (PILS), and which are adapted to the needs of dental practice, are acceptable.¹⁵ The life support training described here (also see Appendix 2) includes these required elements and it is not necessary to undertake a Resuscitation Council (UK) accredited ILS or PILS course.

8.5 Managing Sedation-Related Complications

KEY RECOMMENDATION



Ensure that the clinical team is trained and collectively competent in the recognition and management of sedation-related complications.
(Expert opinion)

This key recommendation reflects the critical importance for patient safety of staff training in the management of sedation-related complications, which is consistent with current standard professional practice.^{5,6} Further details about the development of the recommendations in this guidance can be found in Appendix 1 and at www.sdcep.org.uk.

Sedation-related complications include over-sedation, respiratory depression/apnoea, unconscious patient, airway obstruction, vomiting, idiosyncratic responses, delayed recovery and failure of conscious sedation.⁶

- ♥ Ensure that the clinical team, including members who are not formally sedation trained, participate in regular scenario-based training for sedation-related complications.⁵⁵

9 Clinical Governance

It is a requirement of clinical governance and fundamental good practice that all clinicians work to monitor and constantly strive to improve the quality of care provided to all patient groups being managed by their dental team. All facilities that provide conscious sedation for dentistry should undergo regular external inspections as part of a quality assurance cycle.⁶

- ♥ Carry out regular audit of sedation practice.
 - Topics for audit and review to improve the quality of dental care with conscious sedation may include: appropriateness of the technique used; fasting advice and outcomes; dose of drug administered; effectiveness of sedation; discharge procedure; record keeping and documentation.
- ♥ Ensure that a system of local protocols for the care and management of complications is in place.
- ♥ Ensure that critical incidents are reported.⁵
 - Examples include, but are not limited to, choking, vomiting, over-sedation, emergency use of flumazenil or naloxone and medical emergencies.
 - In addition to any local requirements, incidents should be reported through a national system. The Safe Anaesthesia Liaison Group (SALG) of the Royal College of Anaesthetists (www.rcoa.ac.uk/salg/report-a-patient-safety-incident) provides links to existing schemes for reporting patient safety incidents. National reporting is mandatory for 'never events' within NHS England and Wales.⁵⁷
- ♥ Carry out significant-event analysis.¹²
- ♥ Ensure that the facilities and clinical environment are compliant with inspection requirements.⁹

10 Recommendations for Future Research

In a systematic review of paediatric dental sedation, the authors found that the overall quality of studies was disappointing, with poor reporting frequently the main problem.⁴⁶ In addition, the variety of drug regimens compared and outcome measures used within the included studies made it impossible to aggregate the data reported or to conduct a meta-analysis. Consequently, these authors were unable to reach a definitive conclusion about the most effective sedation technique for anxious children. They made detailed recommendations for future studies assessing sedative agents.

Similarly, we previously found that the vast majority of publications concerned with conscious sedation in dentistry were not reported well enough to enable a reliable judgement to be made about how the trials had been conducted and the validity of their results. Future reporting of clinical trials should adhere to the CONSORT (Consolidated Standards of Reporting Trials) guideline.⁵⁸ Moreover, consideration of these recommendations at the outset may also improve trial design.

There are several factors specifically related to the investigation of conscious sedation that should be clearly stated in the reports of all studies, including:

- Details of the sample and how the sample size was determined.
- A precise description of the sedation procedure, including the use of supplementary inhalation sedation with nitrous oxide/oxygen.
- Whether physical intervention was used, because some methods are not acceptable practice in the UK.
- The level of sedation employed.
- An account of all adverse events. Even if none was observed, this should be stated.

The use of clinical sedation techniques should be research led. Evaluation of the literature illustrates that a range of techniques have been applied successfully for the sedation of dental patients. However, there is a need for high-quality randomised controlled trials carried out within an appropriate governance framework to improve this evidence base.

Areas for which further research would be beneficial to inform future guidance recommendations about provision of sedation for dental care include:

- Patient assessment to determine technique suitability and to reduce the risk of adverse events.
- Aspects of peri-operative management to improve patient safety.
- The suitability of different sedation techniques for particular patient groups.
- Informing patients effectively.
- The alternative or adjunctive use of pharmacological and non-pharmacological anxiety management techniques.

Inclusion of person-centred outcomes in research to inform the provision of sedation for dental care should be a priority.

Appendix 1 Guidance Development

The Scottish Dental Clinical Effectiveness Programme

The Scottish Dental Clinical Effectiveness Programme (SDCEP) is an initiative of the National Dental Advisory Committee (NDAC) and operates within NHS Education for Scotland (NES).

The NDAC comprises representatives of all branches of the dental profession and acts in an advisory capacity to the Chief Dental Officer in Scotland. It considers issues that are of national importance in dentistry and also provides feedback to other bodies within the Scottish Government on related, relevant healthcare matters.

SDCEP was established in 2004 under the direction of the NDAC to give a structured approach to providing clinical guidance for the dental profession. The programme's primary aim is to develop guidance that supports dental teams to provide quality patient care. SDCEP brings together the best available information that is relevant to priority areas in dentistry, and presents guidance on best practice in a form that can be interpreted easily and implemented. The guidance recommendations may be based on a variety of sources of information, including research evidence, guidelines, legislation, policies and expert opinion as appropriate to the subject. SDCEP guidance takes a variety of forms to suit the diverse topics being addressed.

Recognising that publication of guidance alone is likely to have a limited influence on practice, SDCEP also contributes to the research and development of interventions to enhance the translation of guidance recommendations into practice through its participation in the TRIaDS (Translation Research in a Dental Setting) collaboration (www.triads.org.uk).

All of SDCEP's activities are overseen by a steering group that includes representatives of the guidance development groups and the dental institutions in Scotland. Up-to-date membership of this steering group is available at www.sdcep.org.uk.

SDCEP is funded by NES and has made important contributions to the implementation of the Scottish Government's Dental Action Plan, which aims to both modernise dental services and improve oral health in Scotland. For the updating of *Conscious Sedation in Dentistry*, the four UK Chief Dental Officers provided funds to facilitate SDCEP in convening a UK-wide guidance development group. The views and opinions of the funders have not influenced the recommendations made in this guidance update.

Appendix 1 Guidance Development

The Guidance Development Group

The Guidance Development Group comprised individuals from a range of branches of the dental profession and other disciplines, with expertise and experience in dental sedation, and two patient representatives.

Vince Bissell (Chair)	Professor of Restorative Dentistry and Dental Education; Deputy Head of the Dental School, University of Glasgow
Mick Allen	Specialist in Special Care Dentistry, Newport; Postgraduate Sedation Tutor, Wales Deanery
Lucy Burbridge	Consultant in Paediatric Dentistry, Newcastle Dental School; British Society for Paediatric Dentistry Representative
Francis Collier	Specialist in Special Care Dentistry, NHS Grampian
Barry Corkey*	Specialist in Paediatric Dentistry, NHS Fife; Honorary Senior Lecturer, Edinburgh Dental Institute
Paul Coulthard	Professor of Oral and Maxillofacial Surgery; Head of School of Dentistry, University of Manchester
Giju George	Consultant Anaesthetist, Royal Liverpool and Broadgreen University Hospitals NHS Trust; Association of Dental Anaesthetists Representative
Abigail Heffernan	Consultant in Special Care Dentistry, Dundee Dental Hospital
Paul Howlett	General Dental Practitioner, Teesside
Dagmar Kerr	Patient Representative; Area Coordinator for Greater Glasgow & Clyde, Action for Sick Children Scotland
Karin Laidlaw*	Specialist Dental Nurse Tutor, NHS Education for Scotland, Edinburgh
Clare Ledingham	Specialist Paediatric Dentist, Liverpool Community Health NHS Trust; Honorary Secretary, British Society of Paediatric Dentistry
Simon Morrow	General Dental Practitioner, Ayrshire; Sedation Practice Inspector, NHS Ayrshire & Arran, NHS Greater Glasgow & Clyde, NHS Lanarkshire
Robin Smith	Patient Representative, Lothian
Peter Walker	Senior Dental Officer (Lead Sedationist), Stobhill Hospital, NHS Greater Glasgow & Clyde; NES Lecturer in Sedation; Honorary Clinical Sedation Teacher, University of Glasgow

* GDG members for 2006 guidance publication and 2012 update

Appendix 1 Guidance Development

The GDG would like to acknowledge Anne Littlewood, Anne-Marie Glenny, Tanya Walsh and Helen Worthington of the Cochrane Oral Health Group for performing literature searches and contributing to evidence selection and appraisals, and Colin Halliday, Jose Marshall and Karen Gordon, NHS Lothian, for advice on the learning outcomes listed in Appendix 2. The GDG also wish to acknowledge representatives of the Intercollegiate Advisory Committee for Sedation in Dentistry (IACSD), David Craig, Richard Ibbetson, Kate Rivett and Anna-Maria Rollin for their feedback and other personal communications during the guidance development process. SDCEP is grateful to individuals who participated in interviews during scoping and consultation, to all those who provided feedback through consultation and to peer reviewers.

Programme Development Team

SDCEP's Programme Development Team operates within NHS Education for Scotland and is responsible for the methodology of guidance development. Working with members of the Guidance Development Group, the team facilitates all aspects of guidance development. The following Programme Development Team members were directly involved in the development of this edition of *Conscious Sedation in Dentistry*.

Jan Clarkson	Programme Director; Professor of Clinical Effectiveness, University of Dundee
Douglas Stirling	Programme Manager – Guidance and Programme Development
Michele West	Research and Development Manager – Guidance Development
Linda Young	Programme Manager – Evaluation of Implementation
Gillian Forbes	Research Fellow
Claire Scott	Specialist Research Lead
Margaret Mooney	Programme Administrator
Elizabeth Payne	Programme Administrator

Appendix 1 Guidance Development

Guidance Development Methodology

SDCEP endeavours to use a methodology for guidance development that reflects that used to develop high quality guidelines. It aims to be transparent, systematic and to adhere as far as possible to international standards set out by the AGREE (Appraisal of Guidelines for Research and Evaluation) Collaboration (www.agreetrust.org). The updating of *Conscious Sedation in Dentistry* followed the NICE accredited methodology described in the SDCEP Guidance Development Process Manual (Version 1.3, February 2016). Details of SDCEP guidance development methodology are available at www.sdcep.org.uk/how-we-work/.

Following the TRiADS framework for translating guidance recommendations into practice⁵⁹ the views of dental professionals on current guidance were obtained via telephone interviews. Patient experiences and views were also obtained via telephone interviews. This research was used to inform the scope and content of the guidance update and the strategy for identifying evidence.

A comprehensive search of MEDLINE, EMBASE, CINAHL, the Cochrane Database of Systematic Reviews and the Cochrane Database of Abstracts of Reviews of Effects was conducted by the Trials Search Co-ordinator of the Cochrane Oral Health Group on 12 April 2016 and of the National Guidelines Clearinghouse on 13 April 2016. Potentially eligible articles were identified independently by two reviewers from the list of titles and abstracts retrieved. An article was considered potentially eligible if it met all of the following criteria:

1. The article was a systematic review or a guideline. For this purpose, an article would be included as a systematic review if it included a methods section, a search of one or more electronic databases and a list of included studies. An article was included as a guideline if it made recommendations for clinical practice.
2. The article referred to sedation for the provision of dental care that is consistent with the definition of conscious sedation in Section 1.3.

The details of all of the searches are available at www.sdcep.org.uk.

Additional manual searching of guideline repositories and other resources, and follow up of citations from relevant articles found through the systematic searching was also carried out. Other sources of evidence identified by GDG members were also considered, taking relevance and quality into account.

A list of clinical questions related to the scope of the guidance was compiled and eligible articles which were relevant for each question were identified. For the development of this guidance SDCEP used the GRADE (Grading of Recommendations, Assessment, Development and Evaluation) approach to assess and rate the quality of evidence (www.gradeworkinggroup.org). For guidelines, the AGREE II instrument was used, to assess the methodological quality of the retrieved articles (www.agreetrust.org).

Appendix 1 Guidance Development

The evidence from guidelines and systematic reviews was summarised and distributed to the GDG to inform and facilitate the development of the recommendations in the guidance. The process for development of recommendations was informed by the GRADE approach, in that considered judgements were made for each clinical question based on the quality of evidence, the balance of risks and benefits, the values and preferences of patients, and the practicalities of the treatment. The impact of potential barriers to implementation of the recommendations, which were identified during guidance development and through stakeholder involvement and external consultation, was also considered.

For the clinical questions underpinning this guidance, much of the evidence identified comprised guidelines, most of which were derived from expert opinion. Key recommendations informed by these guidelines are designated as based on expert opinion and, consequently, have not been assigned a strength. Nonetheless, these are considered to be standard professional practice important for the provision of safe and effective care.

A wide range of individuals and organisations with an interest in this topic were given advance notice of open consultation on the draft guidance. The four-week open consultation was initiated in January 2017. During this period the draft guidance was available on the SDCEP website for comment. Targeted external peer review and implementation interviews with potential end-users of the guidance also took place at this time. All comments received through the consultation process were reviewed, the feedback was considered by the GDG, and the guidance was amended accordingly prior to publication.

An assessment of the potential impact of this guidance on equality target groups was conducted.

Further information about SDCEP and the methodology used for the development of this guidance is available at www.sdcep.org.uk.

For this guidance, a review of the topic will take place three years after publication and, if this has changed significantly, the guidance will be updated accordingly.

Conflicts of Interest

All contributors to SDCEP are required to declare their financial, intellectual and other relevant interests. At each group meeting, participants are asked to confirm whether there are any changes to these. Should any potential conflicts of interest arise, these are discussed and actions for their management agreed. All declarations of interest and decisions about potential conflicts of interest are available on request.

Appendix 2 Learning Outcomes for Life Support Training

All members of the clinical team involved in managing patients having sedation for dental treatment must be competent in age-specific life support. The training must be patient age appropriate and should be contextualised to the dental setting and team.

Learning outcomes include being able to:

- Demonstrate the use of the ABCDE approach in the recognition and management of a sick patient.
- Recognise respiratory depression and cardiac arrest.
- Describe the procedure for alerting the cardiac arrest/medical emergency team or summoning help from the ambulance service.
- Demonstrate the use of effective chest compressions (rate, ratio, depth, recoil, compressor change) as a single rescuer and as part of a team.
- Demonstrate administration of oxygen using a bag-valve-mask and management of the airway using appropriate airway adjuncts.
- List the safety measures required before performing defibrillation.
- Demonstrate the safe and effective operation of an automated external defibrillator.
- Support, recognise and manage common medical emergencies in the dental practice and administer drugs appropriate to your role in the clinical team.

These example learning outcomes are based on those used for NHS Lothian Dental Immediate Life Support Training, 2016.

Section 8.4 describes life support training. Refer to Section 8.5 for information about additional training requirements for managing sedation-related complications.

Appendix 3 Patient Records and Documentation

Items to include in the patient's record are listed below. While most are required in all cases, some may not be relevant, depending on the sedation technique and patient factors.

The pre-sedation assessment

- Full medical history (including prescribed and non-prescribed drugs and any known allergies)
- Blood pressure
- BMI
- Heart rate and oxygen saturation
- Potential airway difficulties
- ASA status
- Dental history
- Social history
- Conscious sedation and general anaesthetic history
- Dental treatment plan
- Assessment of anxiety and any tools used
- The selected conscious sedation technique and justification
- Any individual patient requirements
- Provision of pre- and post-operative written instructions provided before treatment, including the advice given on fasting
- Written consent for conscious sedation and dental treatment

The visit for dental treatment under conscious sedation

- Presence of a responsible adult escort
- Time that food and drink were last consumed
- Arrangements for suitable post-operative transport and supervision
- Compliance with the pre-treatment instructions
- Presence of written consent for the procedure and reconfirmation
- Any changes in the recorded medical history or medication

The treatment procedure

- Dose, route and time(s) of administration of drugs
- Site of cannulation and/or attempted cannulation (for intravenous, oral and transmucosal sedation)
- Details of clinical and electromechanical monitoring (i.e. pre-operative, after drug titration, intra-operative and post-operative measurements, and in particular any significant events)
- Personnel present in surgery
- Patient reaction, sedation score and success of sedation
- Dental treatment provided

Appendix 3 Patient Records and Documentation

Recovery

- Monitoring – appropriate details of observations and measurements throughout
- Pre-discharge assessment by sedationist – appropriate discharge criteria met (see Section 6)
- Written post-operative instructions given and explained to patient and escort
- Removal of cannula (for intravenous, oral and transmucosal sedation)
- Time of discharge

Appendix 4 American Society of Anesthesiologists (ASA) Physical Status Classification System

ASA PS Classification	Definition	Examples, including, but not limited to:
ASA I	A normal healthy patient	Healthy, non-smoking, no or minimal alcohol use.
ASA II	A patient with mild systemic disease	Mild diseases only without substantive functional limitations. Examples include (but not limited to): current smoker, social alcohol drinker, pregnancy, obesity ($30 < \text{BMI} < 40$), well-controlled DM/HTN, mild lung disease.
ASA III	A patient with severe systemic disease	Substantive functional limitations; One or more moderate to severe diseases. Examples include (but not limited to): poorly controlled DM or HTN, COPD, morbid obesity ($\text{BMI} \geq 40$), active hepatitis, alcohol dependence or abuse, implanted pacemaker, moderate reduction of ejection fraction, ESRD undergoing regularly scheduled dialysis, premature infant PCA < 60 weeks, history (> 3 months) of MI, CVA, TIA, or CAD/stents.
ASA IV	A patient with severe systemic disease that is a constant threat to life	Examples include (but not limited to): recent (< 3 months) MI, CVA, TIA, or CAD/stents, ongoing cardiac ischemia or severe valve dysfunction, severe reduction of ejection fraction, sepsis, DIC, ARD or ESRD not undergoing regularly scheduled dialysis.
ASA V	A moribund patient who is not expected to survive without the operation	Examples include (but not limited to): ruptured abdominal/thoracic aneurysm, massive trauma, intracranial bleed with mass effect, ischemic bowel in the face of significant cardiac pathology or multiple organ/system dysfunction.
ASA VI	A declared brain-dead patient whose organs are being removed for donor purposes	

*The addition of “E” denotes Emergency surgery: (An emergency is defined as existing when delay in treatment of the patient would lead to a significant increase in the threat to life or body part) These definitions appear in each annual edition of the ASA Relative Value Guide®. There is no additional information that will help you further define these categories.

The ASA Physical Status Classification System (2014) above is reproduced with permission of the American Society of Anesthesiologists, 1061 American Lane, Schaumburg, Illinois 60173-4973 USA (www.asahq.org/resources/clinical-information/asa-physical-status-classification-system).

Appendix 4 American Society of Anesthesiologists (ASA) Physical Status Classification System

Abbreviations

ARD: Acute renal disease
CAD: Coronary artery disease
COPD: Chronic obstructive pulmonary disease
DM: Diabetes mellitus
HTN: Hypertension
PCA: Post-conceptual age

BMI: Body mass index
CVA: Cerebrovascular accident
DIC: Disseminated intravascular coagulation
ESRD: End-stage renal disease
MI: Myocardial infarction
TIA: Transient ischaemic attack

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Summary of the Guidance

The main sections of this guidance and the key recommendations made within each are listed below. For a full understanding of these recommendations, the basis for making them and other important considerations, **it is essential to read all of the guidance.**

Section 2 Environment for Conscious Sedation

Ensure that the clinical environment for the provision of conscious sedation for dentistry has the necessary staff, facilities and equipment for the conscious sedation technique(s) used and the patients receiving care.

(Refer to Section 2 for details)

Section 3 Preparation for Conscious Sedation

Carry out a full assessment of the patient to inform the need for sedation and, if indicated, the technique most suited to the individual patient.

(Refer to Section 3.2 for details)

Obtain valid written consent prior to premedication or the administration of sedative drugs.

(Refer to Section 3.3 for details)

Prior to sedation, provide consistent instructions both verbally and in writing for patients, parents/carers and escorts, that are specific to the patient's needs and explain the effects of the proposed sedation and responsibilities both before and after treatment.

(Refer to Section 3.4 for details)

For conscious sedation, provide advice about whether or not to fast based on an individual assessment of the patient and the nature of the sedation and dental procedure.

(Refer to Section 3.5 for details)

Ensure that a responsible adult escort, who is capable of looking after the patient unaided, is present and accompanies the patient home after treatment under conscious sedation. Adults receiving inhalation sedation with nitrous oxide/oxygen do not usually require an escort.

(Refer to Section 3.6 for details)

Section 4 Conscious Sedation Techniques

Ensure that the sedation technique used is suited to the age and needs of the patient and delivered by a dental sedation team specifically trained and experienced in the technique and working in an appropriate environment.

(Refer to Section 4 for details)

If sedation is considered necessary for the delivery of dental care, use a standard sedation technique, unless there are clear indications to do otherwise.

(Refer to Section 4.1 for details)

Summary of the Guidance

Only use an advanced technique if the clinical needs of the patient are not suited to sedation using a standard technique.

(Refer to Section 4.2 for details)

Ensure the patient is monitored peri-operatively by an appropriately trained member of staff in a manner suited to the patient and sedation technique.

(Refer to Section 4.3 for details)

Section 5 Conscious Sedation for Children and Young People

Ensure that all staff involved in providing conscious sedation for children or young people are trained and experienced in sedating patients of these ages and that the staffing, equipment and facilities are appropriate for the age of the patient and the technique.

(Refer to Section 5 for details)

Section 6 Recovery and Discharge

Monitor the patient throughout the recovery period until they are assessed as fit for discharge.

(Refer to Section 6 for details)

Section 8 Training in Conscious Sedation

Ensure that all members of the dental sedation team have the knowledge and skills necessary for their role to safely and effectively deliver the sedation technique used.

(Refer to Section 8 for details)

Ensure that the clinical team is trained and collectively competent in the recognition and management of sedation-related complications.

(Refer to Section 8.5 for details)



Scottish Dental Clinical Effectiveness Programme

The Scottish Dental Clinical Effectiveness Programme is an initiative of the National Dental Advisory Committee and operates within NHS Education for Scotland. The Programme provides user-friendly, evidence-based guidance on topics identified as priorities for oral health care.

SDCEP guidance supports improvements in patient care by bringing together, in a structured manner, the best available information that is relevant to the topic, and presenting this information in a form that can be interpreted easily and implemented.

Conscious Sedation in Dentistry aims to promote good clinical practice through recommendations and practical advice for the provision of conscious sedation in dentistry that is both safe and effective. For this third edition, the guidance has been thoroughly updated to take account of recent developments in this area, following SDCEP's NICE accredited methodology.

Scottish Dental Clinical Effectiveness Programme

Dundee Dental Education Centre, Frankland Building, Small's Wynd, Dundee DD1 4HN

Email: scottishdental.cep@nes.scot.nhs.uk | Tel: 01382 425751 / 425771

Website: www.sdcep.org.uk

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