Children and Parents Referred to a Primary Care Sedation Service

Sedation in Primary Care: Progress and Politics

SAAD Dental Nurse Prize Winning Essay
SAAD Trustees:

- D. Terry, MB BS FRCA, President
- D. Craig, BA, BDS, MMedSci, MFGDP(UK), MBCS, CITP, Immediate Past President
- D. Debuse, BDS MFGDP(UK), Hon. Secretary
- S. Jones, BDS, MSc, DDPHRCs, Hon. Treasurer
- B. Devonald, BDS LDSRCS MFGDP, Membership Secretary
- W. Hamlin, MB ChB Leeds DRCOG, FRCA, ADA Representative
- C. Mercer, PhD BDS FDSRCS ILTM, DSTG Representative
- P. Averley, BDS DGDP(UK) RCS, Dip SED MPhil PhD
- C. Boyle, BDS MFGDP FDSRCS MMedSci MSNDRSeD
- C. Holden, BDS LDSRCS(Eng) DGDP(UK)
- N. Robb, TD, PhD, BDS, FDSRCSEd, FDSRCPs, FDS(Rest Dent), ILTM
- D. Ryan BDS LDS RCS (Eng)
- M. Wood, B.ChD(Stel) MSc(Sed&SpCD) MF GDP MRD RCS(I) M SND RCS (Ed)

The SAAD Digest is published each January and the SAAD Newsletter each June annually by the Society for the Advancement of Anaesthesia in Dentistry.

Editorial Board:
P. Averley
W. Hamlin
C. Mercer
N. Robb
M. Wood
F. Wraith

Original articles and correspondence should be addressed to:
F. Wraith
Executive Secretary
21 Portland Place, London W1B 1PY
Tel: 01302 846149
Email: SAADoffice@aol.com

The subscription rate is £25 (UK) and £28 (international) per annum and includes the SAAD Digest and SAAD Newsletter, which are published on behalf of SAAD, 21 Portland Place, London W1B 1PY.

ISSN 0049-1160

The cover photograph is a scanning electro-micrograph of ketamine. It is reproduced with the kind permission of the National High Magnetic Field Laboratory, Florida State University.
EDITORIAL

Welcome to the third volume of the new-look SAAD Digest. Once again we have an interesting selection of articles for you read. I hope you find the journal interesting and informative.

I was asked to focus this editorial on education in conscious sedation for dentistry. There is no doubt that British dentistry is receiving a significant amount of bad press at the moment. The day before I wrote this editorial there was yet another article in the press about the lack of availability of NHS dentistry in England. The morale of the profession is obviously affected by such publicity, both in terms of undermining those who are still struggling to deliver NHS dentistry under the adversity of the new contract or feelings of guilt from those who have felt forced out of the NHS by the well publicised problems over recent years.

How does this reflect on education for conscious sedation in dentistry? Well, I think that this is one area where the dental profession can be rightly proud of what it has achieved. What we have may not be perfect, and as always there is room for improvement, but how do we compare with others? Those of you who attended the Annual Conference in 2005 will remember that in terms of the practice of sedation the UK was significantly ahead of the rest of Europe.

The answer was found in a survey of European dental schools that I carried out with Gastone Zanette from the University of Padua in Italy. We presented this work at the International Federation of Dental Anesthesiology Societies’ Meeting in Yokohama in October 2006. The results showed that the UK was the only one of the European Union countries surveyed where sedation was taught in all schools and students treated patients under inhalational and intravenous sedation. Thus the conclusion has to be that the UK is doing better than our European neighbours.

Although we can be encouraged by the progress that has been made in extending the provision of undergraduate dental education in the UK, it is worth noting that no British dental school currently achieves the targets set in the UK, it is worth noting that no British dental school currently achieves the targets set by our sister organisation, the Dental Sedation Teachers Group. These targets have been widely published as 20 patients treated under intravenous sedation, 10 under inhalational sedation and 5 assessments (3). We are still striving to reach this goal. It should be the aim of the undergraduate dental schools to provide the basic training in conscious sedation such that new graduates have a basic level of competence in sedation. Unfortunately, with all of the competing pressures in dental schools, we are still a long way from these targets. Until the undergraduate training in sedation is sorted out there will remain a large demand for training in the standard sedation techniques. The standard techniques of sedation have recently been defined (4). This report is described in detail in the report of the Annual Conference and is reviewed by Michael Wood in this Digest. There is also a large potential market for the education of European graduates who come to practise dentistry in the UK and who have not been exposed to education in conscious sedation techniques in their home countries.

The provision of postgraduate education in dental sedation is something that the dental profession can be rightly proud of. The first postgraduate course I can find record of was given by Dr Harry Langa, the founder of modern inhalational sedation, or relative analgesia as he called it. The course was delivered in 1949. It is interesting that in 1993 the Royal College of Surgeons of England published a report (5) that contained the recommendation that all who performed sedation should have received specific training in the sedative techniques to be used. Despite this publication at a meeting in the summer of this year the medical profession were still trying to agree on a course of instruction for standard sedation techniques!

Our Society remains the largest provider of postgraduate education in conscious sedation in dentistry. SAAD has provided courses in conscious sedation for over 50 years. The Society’s teaching is widely recognised as being of a high standard and conforming to contemporary standards. This should not be a surprise to anyone, as a look at the members of the working party that produced the latest document (6) will show that the majority are members of SAAD Council!

The dental profession must not, however, be lulled into a sense of complacency regarding education in conscious sedation. There are still areas where the school report might read ‘could do better!’. The first of these is the thorny issue of providing supervised clinical practice after standard technique courses. There have been various initiatives that have been tried, but, given the cost implications, none has been more widely available.

The second issue, which the DSTG has started to address in its publications (1-3) is how we train individuals to provide alternative sedation techniques. The recent Standards for Conscious Sedation in Dentistry: Alternative Techniques document (7) has provided a personal specification for practitioners who wish to use these techniques. The knowledge and experience required is also indicated in the soon to be published Guidelines for the Appointment of Dentists with Special Interests (DwSIs) in Conscious Sedation (8) which will be released from the Department of Health imminently.

The Trustees of SAAD are continuing to lobby for the advancement of anxiety and pain control in dentistry, as well as continuing to evolve the training we offer to ensure that it is fit for purpose in the 21st century. The attendance at our courses shows that the training we provide is still popular with the dental profession both in terms of training for dentists and training for dental nurses.

In these troubled times for the profession, I am delighted to be able to write an editorial highlighting an area in which the dental profession in the UK excels!

Nigel Robb

References

5. Department of Health/Faculty of General Dental Practice (UK). Guidelines for the appointment of Dentists with Special Interests (DwSIs) in Conscious Sedation. In press.
INVESTIGATING THE LIVED EXPERIENCES OF CHILDREN AND THEIR PARENTS WHO HAVE BEEN REFERRED TO A PRIMARY CARE SEDATION SERVICE

Dr P.A. Averley and Dr R. Hobman (dentists and investigators), Queensway Dental Practice & Anxiety Management Clinic, Billingham.
Prof. S. Bond, Head, School of Population and Health Sciences, University of Newcastle upon Tyne.
Dr N.M. Girdler, Consultant, Sedation Department, School of Dental Science, University of Newcastle upon Tyne.
Prof. J. Steele, Professor of Health Service Research, School of Dental Science, University of Newcastle upon Tyne.

Abstract

Anxiety is a major barrier to accessing dental care for a large group of patients. Anxiety can also be a cause of significant distress to patients undergoing dental treatment.
The study presented here is an investigation of the lived experiences of children, and parents of children, who have received dental treatment under conscious sedation (as an alternative to dental general anaesthesia in hospital) at Queensway Anxiety Management Clinic (a primary care based specialist conscious sedation referral service).
Focus group discussions were held separately with children and the parents of those children who had received care on referral. Discussions were facilitated using a topic guide to stimulate dialogue. The dialogue was recorded for subsequent transcription and analysis.
The results provided an insight into the lived experiences of anxious children and the lived experiences of the parents of those children. This will direct service developments and our future research agenda.

Keywords

Conscious sedation, dental anxiety, sevoflurane, intravenous midazolam, paediatric anxiety management.

Correspondence

Paul Averley, 170 Queensway, Billingham, Teesside TS23 2NT. Email: paul@averley.com.

Background

Queensway Anxiety Management Clinic (QAMC) is a referral-based primary care dental practice in Billingham, Teesside, UK. Referrals are received from dental practices throughout the county and adjoining counties. Each year, approximately 8,000 children and adults are treated at the practice using a variety of anxiety management techniques depending on the individuals’ level of anxiety, their ability to cooperate and/or the invasiveness of the intended procedure.
The first line of treatment for children referred to QAMC is a combination of behavioural management and relative analgesia (RA). However, RA does not provide adequate anxiety management for all children in all cases. Extremely anxious children, or those undergoing particularly invasive procedures, may require greater control of their anxiety than RA alone can provide.
In response to this, conscious sedation (CS) techniques were developed at QAMC to provide a greater level of support for patients. The aim of these CS techniques...
techniques was to provide an alternative to dental general anaesthesia (DGA) in hospital(2). The first of these techniques to reach publication was sevoflurane and nitrous oxide inhaled conscious sedation (SNICS). This study compared SNICS with nitrous oxide alone. The randomised controlled trial (RCT) of 411 children showed that SNICS reduces the need for DGA by 36.9% when compared with nitrous oxide alone(7).

In addition, intravenous (IV) CS techniques for paediatric patients were also developed. This involved an RCT to investigate the use of IV midazolam combined with different inhalation agents. This RCT reported on 697 children too anxious for management with RA, requiring invasive dental procedures for which a DGA would usually be required. The 697 children recruited were randomly allocated to one of three groups for different interventions: Group 1, a combination of inhaled medical air and titrated IV midazolam; Group 2, a combination of inhaled 40% nitrous oxide in oxygen and titrated IV midazolam; and Group 3, a combination of an inhaled mixture of 0.3% sevoflurane and 40% nitrous oxide in oxygen with titrated IV midazolam. The primary outcome measure was successful completion of the intended dental treatment with a cooperative child responsive to verbal commands. In Group 1, 54% (94/174 children) successfully completed treatment. In Group 2, 80% (204/256 children) and in Group 3 93% (249/267 children) completed treatment. This difference was significant at the 1% level. IV midazolam, especially in combination with the addition of inhaled nitrous oxide or sevoflurane and nitrous oxide, is an effective technique, with the combination of midazolam and sevoflurane the one most likely to result in successful treatment(4).

**Aim**

The principal aim of this study was to gain an overview of the lived experiences of anxious children, and the parents of those children, referred to QAMC to identify areas for service improvement.

**Objectives**

- To identify a sample of child patients and their parents who have been referred and received dental treatment at QAMC.
- To identify qualitatively the experiences of the sample in the context of the referral process.
- To use the resulting data in order to develop an understanding of the experiences of children and to make recommendations for service improvement.

**Reported experience of CS and DGA in the literature**

Focus groups have not been used to investigate patient experiences of CS or DGA and there was no evidence relating to children’s experiences of treatment under IV CS.

Veerkamp et al. have produced publications describing patients’ experience of treatment with RA. Anxiety reduction was achieved in highly anxious children over multiple visits(8); this was a long process involving multiple, long appointments over a number of months. RA was generally found to be acceptable by patients, with minimal associated morbidity. Progress, in terms of treatment completion, was slow. However, long-term anxiety was reduced in some cases. The reduction in anxiety achieved was more readily maintained over subsequent months when RA and behavioural management were used than when behavioural management was used alone(9).

Previous publications relating to patient experiences of treatment under DGA have tended to focus on operative morbidity. Holt et al. studied the acceptability to patients and parents of treatment under DGA at a day-case facility in London(10). When asked in a post-operative questionnaire whether treatment had been acceptable, 97 out of 103 families said that they would consider day-case DGA again in future if needed. Five families would have preferred an overnight stay and one would never consider DGA again. However, it must be considered that parents were making a choice between day-stay and in-patient procedures, and not between DGA and other anxiety management options. With respect to post-operative morbidity in this study, 20% of children suffered post-operative pain on the ward, with 32% of children still in pain at home. Nausea, vomiting and headache affected 20–21% of patients.

Bridgman et al. produced an account of patient experiences of a practice-based DGA paediatric extraction service(11). Published in 1999, the paper describes experiences of a service typical of those found in dental practices throughout the UK until stopped by guidance at the end of 2001(2). Quantitative data was collected relating to pre- and post-operative morbidity. Qualitative data was also collected through pre- and post-operative interviews with patients and parents to assess the acceptability of treatment. Of 80 children included in the study, 20% of children were distressed during DGA induction, with one child vomiting. In the immediate post-operative period, 28% were in pain, 44%
were crying and 71% were bleeding. More concerning was that, during the journey home, 24% were in pain, 37% were bleeding, 55% were drowsy and 5% vomited. At home, 15% continued to bleed, 37% were crying and 12% vomited. During the post-operative interviews, vivid accounts of the experience were recounted. One patient remembered struggling to remove the anaesthetic mask during gaseous induction. Several remembered crying and feeling sick after the procedure, with some describing nightmares and feelings of reluctance to return to the dental surgery in future.

Enever et al.\(^{(12)}\) compared post-operative morbidity following day-case DGA in patients with and without disabilities. Patients received a range of restorative and surgical procedures. Treatment was significantly more prolonged than in the two studies mentioned above; 76% of procedures lasted over 30 minutes and 20% lasted over an hour. No significant difference in morbidity was found in patients with or without disabilities. 44% reported post-operative symptoms. Nausea or vomiting occurred in 20% of patients and 13% required analgesia at home.

All three of the above studies appear to portray treatment under DGA to be associated with a significant degree of morbidity. However, the major flaw with all three studies is the lack of a control group.

**Methodology**

Methodology is the process by which researchers bridge the gap between philosophical theory and appropriate practical research methods\(^{(13)}\). When deciding on an appropriate method of data collection, it is essential to focus on the research question and aims of the research. The research question in the present study can be expressed as:

*What were the lived experiences of children, and parents of children, who underwent referral and subsequent treatment under CS at QAMC?*

The aims of the study also highlight a desire for an overview of experiences, rather than an in-depth account of one particular aspect of the experience.

**Focus groups**

Focus groups typically consist of between six and ten purposely selected subjects, and a group facilitator. Groups normally meet on one occasion, with a session lasting between one and two hours. Discussions are recorded, and later subject to systematic analysis. The key ingredient of focus groups is interaction between group members, prompting them to scrutinise their own way of thinking by listening to others. This in turn is intended to trigger further discussion and produce further information. The intended result is a broad overview of views and experiences. Discussion is guided by a facilitator but members of the group are free to ask questions of each other and discuss issues between themselves. The facilitator’s main role is to maintain an acceptable degree of structure and order, while encouraging discussions to take place.

There are some potential pitfalls in the use of focus groups. There is limited potential for collecting data on an individual basis. There is also the potential for alienation of group members and reluctance to express personal feelings in front of others. The facilitator must have the skills to stimulate and guide discussion, and to include all members of the group in the discussion, while maintaining the structure of the session. Focus groups were the most likely research tool to meet the aims of the study.

**Study design**

**SUBJECTS**

Ethical approval was sought and granted. A purposive sample of children between 6 and 14 years old were allocated into focus groups. Allocation was determined by two variables. The first variable was the age of the child (groups were 6–9 years, 10–12 years and 13–14 years). The second variable was the type of CS received. Recruited children had all taken part in a recent RCT described in the background section\(^{(4)}\). Allocation was based on the CS intervention they had been allocated to and whether the technique had facilitated the successful completion of their planned treatment or not. This gave two focus groups for each age group, making six child focus groups in total. Each focus group was intended to contain between six and eight subjects who had had a variety of techniques and a variety of outcomes. Six additional and separate groups were composed of the parents of the selected children, giving a total of 12 groups.

**DATA COLLECTION**

Focus group discussions took place at a local hotel. A standardised topic guide was used as a framework around which discussions were based. Data was collected by digital audio recording. The recordings were later transcribed verbatim into a Microsoft Word document. Data from the transcripts was transferred to a Microsoft Excel spreadsheet. Along the vertical axis were coded details of the participants. Along the horizontal axis were subheadings corresponding to
themes that had surfaced within the dialogue. Direct quotations from the transcripts were transferred into the relevant part of the spreadsheet. This allowed the grouping of all dialogue relating to a particular theme into a single column of the spreadsheet, to allow analysis of the information gathered.

RESEARCH PROTOCOL
Children were selected who had participated in the previous RCT described. Parents or legal guardians of suitable children were then contacted by post to enquire as to their willingness to take part in the study. Willing participants were offered payment for taking part and to cover travel expenses. The documentation sent included a written consent form, a written patient information sheet and a pre-paid envelope for reply. Completed consent forms were returned using the envelopes provided. Responses from those who had agreed to take part were assessed. Children were then purposefully selected and allocated into appropriate focus groups. Selected participants were contacted again to make arrangements for the focus group meetings.

CONFIDENTIALITY
All researchers involved in the study signed codes of confidentiality and conduct. Recommended data security and storage procedures were followed by the researchers (MRC Guidelines on Personal Information in Medical Research, 1999). All personal data collected and held was registered in accordance with the 1998 Data Protection Act, and the Newcastle University data protection policy was followed.

RESULTS
Data was recorded from a total of 59 participants: 25 children and 34 adults. The number of participants in each group ranged from four to eight, with some groups falling below the minimum target of six participants. Due to technical difficulties with recording equipment, no data was collected from one adult focus group and one child focus group. This unfortunately led to the exclusion of these two groups from the study, with data collected from a total of five child groups and five adult groups.

The results are presented under a series of subheadings, based on the themes that arose during the focus group discussions. Beneath each subheading, the results are illustrated where necessary with quotations from the focus group transcripts.

BEFORE TREATMENT
Reason for referral
Anxiety and the need for multiple or invasive interventions were by far the most common reasons for referral, accounting for most of the dialogue in this section.

‘He was very, very scared of the dentists. **** was really, really terrified to the point of shaking, he wasn’t sleeping at the thought.’

One child was referred primarily for medical reasons.

‘It must have been because he was diagnosed epileptic, they weren’t very happy to treat him.’

Previous treatment experience
Two children had no previous experience of dental treatment, other than check-ups.

‘Me own dentist just looks at me teeth.’

Three children had previously coped with simple treatment with their own dentist, but had been referred to this service for more invasive or extensive treatment. The majority of children had undergone treatment under either LA or DGA in the past. Without exception, this had caused some degree of anxiety to the child (see ‘Anxiety History’).

Anxiety history
The majority of children’s anxiety seemed to originate from an unfavourable treatment experience in the past. This was most likely to have been associated with treatment under LA.

‘She tried to remove the teeth on the right side which wasn’t frozen. So you can understand what he was like. But that experience frightened him, and scared the hell out of me, to see him go through it.’

‘Needles’ were cited most commonly as the aspect of treatment which children feared most. However, there was no significant correlation between age and anxiety stimulus. Anxiety was related to previous treatment under DGA in two cases.

‘**** had a bad experience with gas when having her teeth out. She didn’t like it all, and was just one of these kids that fought having the mask put on. Once she came round from the gas, she was hysterical, and that’s frightened her from going to the dentist. And we’ve had a hell of a job just to get her to go to the dentist for a check-up after that.’

One child’s anxiety arose purely from tales of dental treatment related to her by her sister. The child herself had received no previous dental treatment. In another isolated case, a child had received an injection in hospital at an early age for the purpose of blood testing. The incident was not related to dental treatment but had created a general fear of needles.

Parental anxiety
A minority of parents stated that they experienced no feelings of dental anxiety themselves. However, most
described some feelings of dental anxiety, which could usually be attributed to a traumatic dental experience in the past. ‘I had an abscess, and he gave me injections and pulled it, it was absolutely agony. I won’t go… if something bad needs doing, I’ll get it done but I won’t go back again. Like me, he’s not happy going to the dentist. My teeth are rotten, but I won’t go to the dentist.’

A number of parents specifically mentioned that receiving dental treatment under DGA as a child had been a key causative factor in their own anxiety.

‘I remember being three or four having to be sat on my mother’s knee and there’d be a mask coming towards you, and emm, I particularly don’t like going to the dentist now myself.’

Several parents were aware that their own anxiety had influenced their children.

‘I think a lot of the problem with children going to the dentist is that they hear so many people, adults and kids, saying “I hate the dentist” and they don’t know why, but they just know it’s something to be disliked.’

A proportion of parents mentioned that they undergo routine dental treatment under CS themselves. One parent said that she was so anxious that she could only receive dental treatment under DGA.

Patient/parental perceptions of CS
As mentioned earlier, there was some confusion as to exactly how anxiety would be controlled, in terms of the use of CS and DGA. Only four parents specifically stated that CS would be used. Some children struggled with the concept of CS.

‘Is sedation when you get put to sleep?’

However, others had a good understanding of CS.

‘Sedation is just where it relaxes you and you go to sleep if you want to go to sleep.’

Several parents were under the impression that their child had been referred for treatment under DGA. Perceptions of the service were generally based on information from the referring dentist, but also word of mouth, particularly in children.

‘When he talked to his friends at school, a lot of them have said “I’ve been there, I’ve been there”. And everybody was saying good things, so he felt it can’t be that bad if they’ve been there.’

There was a general feeling that it was not ideal for children to receive dental treatment under DGA. Two parents made the point that DGA is a means to an end (achievement of oral health).

‘I don’t think it solves the problem, with my first daughter it didn’t solve the problem with her fear of the dentist. She had the treatment done, but she has still has that fear.’

‘The answer isn’t to go to the hospital and get your teeth pulled out. That isn’t the answer at all. It doesn’t get rid of his fear. It gets rid of the teeth that needed removing, he’s not awake and he’s not aware of what’s happening, but it doesn’t solve the problem.’

However, it was accepted that DGA could be used as a last resort, if all other attempts at treatment had failed.

‘You don’t obviously want to be knocking every kid out with general anaesthetic, it’s not ideal by any means. Well if you’ve tried everything you’ve got in your armoury and it still hasn’t worked for one reason or another, you don’t really have any choice do you.’

DGA was perceived to be less safe than CS.

‘There’s always a risk with a general anaesthetic. I don’t think there’s always such a risk with sedation. When somebody is sedated the sedation will work off. When you’re using anaesthetic, there’s induction agents, and sometimes, well I’d think more often than not, when they are under general anaesthetic, somebody else is doing the breathing and everything for them. I think that’s a risk.’

TREATMENT
Was a separate assessment visit useful?
This question created a definite difference of opinion between subjects. A slim majority were in favour of a separate assessment visit. Those who were in favour liked the opportunity for explanation of procedures and discussion of anxiety management options. It also provided the chance for children to familiarise themselves with the practice and staff.

‘I wouldn’t have gone if she thought it was all going to be done there and then. She wanted to go and have a look and see what was going to happen.’

Those who were against the concept of a separate assessment visit found it inconvenient in terms of time taken off work (parents), or school (children) or would just have preferred to have got the treatment over and done with. Where incorrect information was given regarding separate assessment and treatment visits, unnecessary anxiety was caused to the child involved.

‘We went to the first appointment thinking she was getting it done there and then and she was petrified.’

Explanations and involvement
The involvement of parents, but particularly children, in discussion of treatment and anxiety management options was strongly felt to be a positive feature. Children generally liked to be treated as individuals and to be actively involved in the decision-making process.

‘They tell you what’s going to happen and they say if you don’t feel comfortable with that happening you have other options.’

‘I think involve him in the process, and give him the information he needs and let him decide if he wants it or
not. He’s 11 years old, he knows what he wants and what he
doesn’t want. I think it’s good to involve children from the
start.’

What was the treatment under CS like?
Children generally reported feelings of comfort and
relaxation during CS.
‘I wasn’t scared or anything, I just felt very comfortable.’
‘I was awake but I was like I was flying if you can imagine
that, I felt like I was above the ground, hovering.’
Some children found the experience of CS unpleasant.
‘I didn’t know who anyone was around us and I was all
confused and like dazed I suppose. I was like all by myself and
I was dead scared.’
Children who were classified as having ‘failed’ treatment
(according to the definition mentioned previously) were
no more likely to recall unpleasant aspects of treatment.
On the contrary, these children often had pleasant
memories of treatment. Amnesia was a strong feature in
this study, as would be expected with the sedative agents
used. The majority of children either had no recollection
of treatment or a small amount of recall without any
feelings of pain or distress.
‘I can’t really remember anything. I didn’t know I had a
needle. When they told me I’d had ten needles I didn’t realise
I’d had one.’
A small number of children recalled some unpleasant
aspect of treatment, which had not caused significant
distress.
‘I felt something getting pulled and a snapping sound, and I
bit the dentist, then I went back to sleep, I felt something, but
it wasn’t pain, I just felt the tooth getting pulled out.’
One child in the study recalled that she had undergone an
unpleasant experience of treatment under CS, which had
caused significant distress.
‘I can remember everything that happened, in terms of needles
and things like that… I knew what was happening and I was
like getting panicky.’
Amnesia seemed to be highly selective, with children
often remembering very specific details of their treatment.
‘I was just laying down, and on the ceiling there was a big
telly, and I was watching Harry Potter, and then I just fell
asleep.’
Anterograde amnesia was described vividly by a number
of children.
‘I remember seeing the little tube in my hand. All I can
remember is just seeing the tube in my hand and nothing else
until like I stood up and I looked at my watch and it was like
an hour later.’
Interpretation of what was happening also seems to
have been altered, particularly with respect to the ECG
electrodes that were placed on the children’s wrists.

[They were] putting clamps on my arms so my arms were
attached to the chair.’

Were the parents present during treatment?
The presence of parents in surgery during treatment is
normally dependent upon the preference of whichever
dentist is operating at the time. Some dentists prefer
parents to leave the surgery once the child is sedated,
whereas others are happy to have an audience throughout
the treatment. None of those parents who were asked to
leave had any objections to this.
‘I think maybe it was better I wasn’t in the room, because he
would respond differently to you than he perhaps would to me,
so I think that’s quite a valuable thing.’
Of those who were given a choice and stayed in the
surgery, the majority found the experience unpleasant.
‘I stayed in the room, and I wished I hadn’t.’
The parents who chose to leave were all glad that they
did.
‘I think I was making him more nervous because of my
nerves… …I did leave. I was glad I did, because I don’t think
I could have watched.’

Parental feelings during treatment
A number of parents specifically stated that they felt
anxious for their child during treatment. Of those parents
who did feel anxious, the feelings of anxiety were often
brought about by the thought of their child experiencing
pain or discomfort.
‘For me, it’s like you just want to say “that’s my kid that, stick
a needle in me, if there’s any pain I’ll have it, don’t give it to
my child” you know… You want to take away what you think
might be an unpleasant experience, and you’d sooner have it
yourself every time.’
Sitting in the waiting room during treatment was a
particularly difficult experience for some parents.
‘…you’re living it for them, aren’t you…’
‘Nothing happens between that time when you’re in the room
and you’re waiting, it seems to take ages for somebody to come.
If somebody just popped their head out and said “he’s OK” it
would have made me feel better. When they came out and said
“everything’s done”, it seemed like ages.’

AFTER TREATMENT
Recovery
Children generally reported feeling ‘strange’ during the
recovery phase, although no children described recovery
from CS as unpleasant. One child experienced prolonged
bleeding in recovery, (although hopefully not for as long
as described), and found this quite distressing.
‘I had to wait four hours because I couldn’t stop bleeding, so it
was horrible.’
Many parents were pleasantly surprised with the recovery of their child. ‘He bounced straight back. He was wide awake when we went to recovery, and he was anxious to get going. But he certainly wasn’t unsteady on his feet. He was raring to go.’ However, recovery was more prolonged in some cases. ‘**** took a long time to come round from it. She was very, very wobbly for ages.’ One parent felt that their child had been discharged prematurely by recovery staff. On the other hand, a proportion of parents felt that the time spent in recovery was excessive.

Home At home, most children remembered the feeling of having a numb mouth, but all recovered well. There were no reports of post-operative vomiting or headaches. Some remembered feelings of post-operative pain. ‘After I got home, I had a little bit of pain, but I fell asleep.’ ‘I just couldn’t talk because of the pain, because of the cold air hitting my mouth.’ Two children experienced some minor post-operative bleeding at home.

THE FUTURE

Changes in attitude to future treatment A proportion of children experienced a subjective reduction in their level of anxiety following treatment under CS. ‘She’s been a lot better since, she’s not scared of dentists. In fact, now when she does need an appointment, she makes it herself. She phones up and makes the appointment herself.’ However, only one child expressed a willingness to undergo future treatment without CS. ‘I’d rather go to my normal dentist because I’ve been there since I was born, since I started going to the dentist, so I’m used to my dentist.’ Most parents and children still felt it likely that CS would continue to be required for treatment in future, but that the child would be less anxious about having CS. ‘As and when the time comes when she needs an injection from the dentist that could be another matter.’ ‘I think if he needed treatment I think he’d prefer to come back to you.’ ‘[I’d feel] a lot happier, ‘cos I know what’s going to happen.’ ‘If she needed major treatment she understands now what’s going to happen.’ However, this was felt to be an acceptable situation. A proportion of children continued to be severely anxious of dental treatment and would not undergo treatment under CS in future if offered. ‘I’d rather have the general anaesthetic.’

‘I’m no further forward with dentists with him than I was before I went there.’

Changes in attitude to oral health A disappointingly small number of children seemed to have improved their attitude to dental health and prevention of further disease. However, there were some successes. ‘I think it’s made him realise that he has got to look after his teeth, because they really did drum it into him. I don’t let him drink Coca-Cola or Pepsi or anything like that now, and I think that has made a big difference to him.’ ‘[I’m] just looking after them more carefully I suppose.’

Focus group study conclusions

ANXIETY The major cause of anxiety in most cases was a traumatic experience of treatment, or attempted treatment, under LA. Often, the administration of LA itself provoked anxiety, which suggests that children should be supported with CS before trying and failing with LA and behavioural techniques alone. Improved training of dental practitioners in reducing pain on LA administration may be beneficial. Traumatic experiences involving DGA were less common. This may be a reflection of the relatively low numbers of DGAs being provided for dental treatment in the region in recent years. Of 25 children only two had undergone treatment under DGA in the past. Anxiety was not always related to previous dental experiences. One child had become generally needle-phobic following a blood test in hospital. Another child had never had dental treatment, but her sister’s accounts of her own treatment had caused anxiety. This study shed little light on any relationship between the age of the child and the cause or stimulus for their anxiety. A specific fear of ‘needles’ or a more general fear of ‘pain’ was common. According to previous research, signs of Separation Anxiety Disorder (SAD) may have been expected in some of the younger children involved in the study, particularly given that the children were placed in a stressful situation. No obvious cases of separation anxiety or evidence of SAD were found in any of the children involved, although the author is not an expert in this condition. In addition, although very few parents remained in the surgery during treatment, most stayed until their child was sedated. Parental anxiety has been identified in previous research.
as a significant aetiological factor in the dental anxiety of children\textsuperscript{15, 16}. The findings of the present study agree. A direct cause and effect relationship between parental and child anxiety is yet to be proved, although the amount of circumstantial evidence is persuasive. Several parents admitted feeling that their own anxiety had affected their child’s attitude to treatment.

The parents of this group of children, who were predominantly dentally anxious, were predominantly dentally anxious themselves. Taking steps to address parental anxiety and attitudes, as well as those of children, is required. Taking time to demonstrate to parents that pain and anxiety management techniques have advanced since their formative years benefits parents and children alike.

**EXPECTATIONS**

Expectations of the practice are based partly on information imparted to the patient by professionals and partly on word of mouth via friends and relatives. We have no influence on what the patient hears on the grapevine, but we can improve the way that information is given to them by referring practices and their own dentists.

Although both parents and children clearly understood their reason for referral to the practice, most commonly anxiety or the invasiveness of planned treatment, very few understood what to expect from the practice. It was not explained to some participants that no treatment is generally carried out at the first visit, which is normally set aside for assessment, treatment planning and discussion only. This caused significant distress to one young patient, which was completely avoidable.

Of more concern was the apparent confusion with respect to the use of DGA. A proportion of parents were still under the impression that DGA would be used. Several children also mentioned that they were going to be asleep during treatment, although it is unreasonable to expect all children to grasp the finer points of CS and DGA. Referring dentists do receive information packs from the practice, and open days have been held but poorly attended. All patients are sent an information sheet with their appointment slip. However, it would seem that the current system has its flaws, and communication between us, our patients and our referring dentists could be improved.

**THE ASSESSMENT VISIT**

Although some parents and children objected to making a separate assessment visit, most found it to be beneficial. It gave the opportunity to acclimatise the child, and to discuss anxiety management options. Children appreciated being involved in the selection of treatment options, as it gave them a sense of control. Selecting the most appropriate anxiety management option for an individual patient is crucial to the success of treatment. An assessment visit that included a discussion of anxiety management options was appreciated by most patients.

**THE TREATMENT VISIT**

The treatment visit was a tense time for parents and children. Anything that could be done to create a relaxed atmosphere was appreciated. Distraction was particularly important for children both before and during treatment. The DVD player in the treatment room seemed to be universally popular. However, the waiting room was felt to be a sterile environment.

Management of parents during treatment is often overlooked, because the focus is naturally on the child. However, it would seem that there may be some quite simple things that could be done to make their experience more bearable. The presence of parents in surgery during treatment is a contentious issue. Anxious parents are often keen to leave the surgery, and this is usually for the best. Less anxious parents will also often leave of their own accord, ‘so as not to get in the way’, or stay in the surgery and provide constructive support for the child. Difficulty can arise with anxious parents who insist on staying in the surgery. These parents require careful management. Indeed, it is not unheard of for these parents to be found sharing a recovery bed with their child – the child recovering from CS and the parent from a faint. Whatever the outcome, parents appreciate being involved and informed.

Although this study is far from being a comprehensive investigation of the amnesic effects of midazolam, it does suggest that it is unwise to rely on the amnesic properties of this drug when treating children. Although some children demonstrated classic anterograde amnesia, a proportion of children remembered very specific details of their treatment.

Success or failure of treatment under CS had little bearing on whether a child provided a positive or negative account of treatment. Whereas it may have been assumed that children who had failed treatment were likely to provide a negative account of their treatment, this was not found to be the case. The reason for this is likely to be twofold. Firstly, the amnesic effect of midazolam. Secondly, the definition of treatment failure used in this study, i.e. the need for the use of different sedative agents
from those originally planned to achieve cooperation, rather than failure to achieve cooperation outright.

THE POST-OPERATIVE PERIOD
Practice protocol dictates that any sedated patient must be 'street-fit' and able to walk unaided before discharge. In most cases, discharge occurred within a reasonable time. Some parents and children felt that discharge was unnecessarily delayed. In one case, a parent felt that discharge was premature. It is not possible to speculate on exactly why this was the case. Anecdotally, the last patient of the day tends to be discharged more speedily than the first. This is a well-known phenomenon, but is clearly unacceptable.

Post-operative pain was not a major issue but was experienced by some children. Analgesics are commonly prescribed for adults following surgical treatment but are not routinely prescribed for children under similar circumstances. This may be an area for further investigation. There were no reports of nausea, vomiting or headaches as described in previous studies into morbidity and DGA\(^\text{[10, 11, 12]}\).

Pharmacological anxiety management may be considered to be a compromise between cooperation and morbidity. At one extreme, DGA largely removes cooperation from the equation, but has been shown to create relatively high morbidity levels. At the other extreme, RA is associated with very little morbidity, but cooperation is by no means guaranteed. The ideal anxiety management method would strike an acceptable balance between morbidity and cooperation. A combination of inhalation and IV CS may achieve this balance to a greater extent than DGA or RA for many children.

PERCEPTIONS OF ANXIETY MANAGEMENT
CS was felt to have two advantages over DGA. First, CS was perceived to be safer than DGA. Second, treatment under CS at QAMC avoided the need for a visit to hospital, which was perceived to be more traumatic than treatment in a primary care setting. However, it was acknowledged that CS was not successful in all cases, and that DGA may be considered as a last resort, once all other options had been explored.

Attitude to future dental care
One of the aims of treatment at QAMC is to reduce anxiety towards future treatment. In this respect, QAMC seems to be achieving only limited success. The vast majority of children believed that they would continue to require treatment under CS in future. Ironically, the only change was that children would be less anxious about the actual process of CS in future, because they knew what to expect.

It was surprising that most children in this study did not seem to make the connection between preventive care and a reduced requirement for dental treatment. Even though these children were dentally anxious, they were doing very little to avoid the need for more dental treatment in future. Significant efforts are made to provide preventive advice as children pass through QAMC. However, priority is often given to completion of the operative treatment. Referring dentists remain the main source of ongoing preventive advice for most children.

Limitations of this study
Ideally, the views of more than 59 parents and children would have been obtained in this study. Fewer people were included in the study than was intended due to a combination of failed attendance and sound engineering. This was particularly true of the youngest age group, 6–9 years. Of the 25 children involved in discussions, only two
were from this age group. As a result, it was difficult to investigate age as a factor in patient anxiety and treatment experience. Steps were taken to reduce bias and increase validity and rigor\(^{17, 18}\). This included peer-reviewed ethical approval; purposive sampling; adherence to a topic guide; four focus group facilitators with different backgrounds; independent verbatim transcription of study data; enough focus groups to cater for the variety of lived experiences; a systematic approach to analysis by two individuals in an attempt to ensure consistent capture of themes and a balance of experiences within those themes; attention to negative cases and systematic reporting of results consistent with all the identified themes. By providing an overview of the lived experiences of parents and children who have received treatment at the practice, this study has achieved its main aim. It has also identified areas for service improvement. Work will progress to form a patient questionnaire, which will further investigate how we can better meet the needs of our patients. It is hoped that the establishment of a patient user group at QAMC will direct its future research agenda.

Reference list

POST-OPERATIVE NAUSEA AND VOMITING IN DENTAL PATIENTS
A Nurse’s View

Sharon Williams RDN DAN DSN Cert Ed
Senior Dental Anaesthetic Nurse
Royal Albert Edward Infirmary, Wigan

Aims and intended learning outcomes

In the study presented in this article, the aim is to provide an overview of the management of post-operative nausea and vomiting within dentistry, emphasising the nurse’s role.

After reading this article, one should be able to:
• describe the physical and psychological complications associated with post-operative nausea and vomiting
• discuss how vomiting is triggered by the brain
• explain the risk factors and how the risk assessment tool works
• look at areas for improvement within nurse education in the management of post-operative nausea and vomiting.

Introduction

Post-operative nausea and vomiting (PONV) was first described in 1848 by John Snow (1), within 18 months of the introduction of anaesthesia to Britain. The belief that anaesthetics alone were responsible for most cases of post-operative nausea and vomiting persisted until 1916 when Flagg reported that it may result from other causes including pain, reflex responses and the use of opioids (2). PONV is one of the most common post-operative complications and can affect as many as 40% of patients (2). It can cause patient distress, medical complications and has financial implications. The aetiology is multi-factorial (3), occurring in all types of patients and with all types of surgery and anaesthetics (3).

Nurses, therefore, spend a lot of time comforting and supporting patients. They assess and treat the symptoms caused by PONV, including clearing up after episodes of sickness and explaining the problem to patients. It can delay a patient’s discharge from the recovery room and increases the nurse’s workload. Although less than 1% of day surgery patients have to stay in hospital overnight because of uncontrollable nausea and vomiting, this makes it an expensive complication (3).

Physical complications of PONV in dental patients can vary from minor episodes through to more serious problems, such as:
• general delay in mobilisation and recovery
• possible disruption of tooth sockets leading to ongoing bleeding
• delay in giving oral analgesia and other medication
• increased pain, discomfort and distress
• dehydration
• aspiration of vomit with the risk of aspiration pneumonia
• obstruction of airway.

Psychological effects can also affect the patient’s recovery following surgery in the following ways (4):
• discomfort
• shame and embarrassment
• dissatisfaction with the outcome of dental surgery
• fear of further dental surgery under general anaesthetic.

Nausea and vomiting

Nausea is an unpleasant sensation commonly preceding vomiting (5). The vomiting reflex is an important defence mechanism for the expulsion of toxins. There are three components to the vomiting reflex: emetic detectors, coordinating centres and motor outputs (3).

• Emetic detectors: these are receptors in the gut wall that respond to distension, receptors in the mucosa of the stomach and the duodenum, monitor the internal environment. The stimulus is carried by the vagus nerve to the brain stem (5).
• Coordinating centres: the vomiting centre lies inside the blood brain barrier in the medulla. It coordinates the control of the vomiting reflex receiving signals from the pharynx, gastrointestinal tract and mediastinum via the vagus nerve. It also receives signals from a portion of the eighth cranial nerve and the chemoreceptor trigger zone. The chemoreceptor trigger zone e (CTZ) lies on the outside of the blood brain barrier in the medulla where it is exposed to circulating toxins. Stimulation of
the chemoreceptor trigger zone stimulates the vomiting centre to coordinate the physiological response of vomiting\(^3\).

- Motor output: the sympathetic nervous system mediates sweating, skin vasoconstriction, pupillary dilation and tachycardia, while salivation is mediated by the parasympathetic nervous system\(^3\). The physical phase of vomiting involves contraction of the abdominal wall and the diaphragm.

### Risk factors

There are many factors associated with the occurrence of PONV. The list indicates that there is no single, identifiable cause, although use of opioids is frequently at fault\(^4, 5\):

- **PREVIOUS POST-OPERATIVE NAUSEA AND VOMITING**: a previous history following surgery shows that there is an increased risk of PONV in subsequent anaesthetics.

- **PRE-OPERATIVE FASTING TIMES**: inadequate starvation time or prolonged fasting time can induce PONV.

- **POST-OPERATIVE FASTING TIME**: the optimum time to resume oral intake following surgery can be equally problematic\(^4\).

- **AGE AND GENDER**: the risk of PONV in children is commonly reported as almost twice that for adults. Prior to puberty male and female incidence is recorded as identical. Following puberty, females are three to two times more likely to suffer with PONV than males\(^6\). However, few data exist to compare the incidence under controlled circumstances, i.e. adults and children undergoing similar procedures with the same anaesthetic technique\(^5\).

- **MENSTRUAL CYCLES**: early research studies on the menstrual cycle and PONV suggested that the highest incidence of PONV occurred between the third and fourth week of the menstrual cycle. Unfortunately some of this research has shown deficiencies in the study design, including recall bias in the women giving incorrect information regarding the phase of the cycle. PONV may also be related to hormonal interactions and not directly to the menstrual cycle.

- **DRUGS**: induction agents such as thiopentone are associated with PONV, whereas propofol has a lower incidence of PONV\(^6\). Inhaled anaesthetic agents, such as nitrous oxide, increase the risk of PONV. Nitrous oxide causes gut distension and pressure on the middle ear, which can contribute to this complication. However, it has only a small emetogenic effect in balanced anaesthesia. Benzodiazepines and muscle relaxants have no effect on the incidence of PONV\(^6\). The use of opioids for pain relief can stimulate the vomiting centre via the CTZ. They also decrease gut motility, causing distension. Opioids can increase the sensitivity of the middle ear to movement, causing nausea in some people. This explains the association with motion sickness\(^4\).

- **MOTION SICKNESS**: patients who have a past history of motion sickness are three times more likely to experience PONV\(^4\). Patient transport (to and from theatre) may also trigger emesis in those prone to travel sickness.

- **OBESITY**: this may be a factor but the cause is not clearly understood\(^1, 4\). Fat-soluble anaesthetic agents accumulate in adipose tissue and the anaesthetics are slowly released\(^6\). Therefore the fatter the patient, the longer the side effects will last. Increasing difficulty in mobilising such patients may also accentuate these problems.

- **EMERGENCY SURGERY**: inadequate fasting time associated with emergencies may increase this complication.

- **LENGTH OF SURGERY**: research has been carried out in the past regarding length of surgery. Results may be conflicting but recent studies suggest that there is an increased risk of PONV for every hour of anaesthesia\(^1\).

- **SMOKING**: smoking appears to be protective against PONV. The mechanism by which this works, although this is unproven, suggests that tobacco may contain an anti-emetic substance\(^1\).

- **POST-OPERATIVE CONDITIONS**: dental patients are at risk of swallowing blood or debris during dental surgery (which no anti-emetic can counter\(^2\)). This can be addressed by routine use of throat packs, which seal off the back of the throat, reducing the chances of swallowing or inhaling any blood or debris. Hypoxia or hypotension during surgery can also be a risk factor\(^1\).

- **OTHER PONV PATIENTS**: the presence of other patients who are vomiting in the recovery area can induce sympathetic vomiting in some patients\(^5\).

- **ANXIETY**: patients who have experienced PONV previously or have concerns regarding their surgery can have an increased likelihood of PONV.

### Audit

Audit is a systemic process by which medical practice is assessed and improved\(^7\). It can involve the following steps in the case of PONV in dental patients:
identification of a particular aspect of practice – in this case PONV in dental patients

Table 1
Risk assessment tool
(Used in the Department of Oral and Facial Surgery)

<table>
<thead>
<tr>
<th>CATEGORY</th>
<th>SCORE</th>
</tr>
</thead>
<tbody>
<tr>
<td>FEMALE</td>
<td>1</td>
</tr>
<tr>
<td>NON-SMOKER</td>
<td>1</td>
</tr>
<tr>
<td>PREVIOUS PONV</td>
<td>1</td>
</tr>
<tr>
<td>MOTION SICKNESS</td>
<td>1</td>
</tr>
<tr>
<td>OPIOIDS GIVEN</td>
<td>1</td>
</tr>
</tbody>
</table>

Table 2
Post-recovery score
(Used in the Department of Oral and Facial Surgery)

<table>
<thead>
<tr>
<th></th>
<th>ADMISSION TO RECOVERY</th>
<th>AFTER 30 MINUTES</th>
<th>ON DISCHARGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>NO NAUSEA OR VOMITING</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>MILD NAUSEA, NO VOMITING</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>MODERATE NAUSEA AND/OR OCCASIONAL VOMITING</td>
<td>2</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>SEVERE NAUSEA AND/OR FREQUENT VOMITING</td>
<td>3</td>
<td>3</td>
<td>3</td>
</tr>
</tbody>
</table>

judgement by peer review as to whether certain standards are being met, i.e. deciding that more than 10% of patients suffering severe nausea is an unacceptable level

Audit carried out by the Department of Oral and Facial Surgery in 2005

<table>
<thead>
<tr>
<th>Total number of patients</th>
<th>Males (77 (32.4%))</th>
<th>Females (160 (87.5%))</th>
<th>Time of surgery</th>
<th>PONV details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exodontic dentistry</td>
<td>Males 182 cases</td>
<td>40 (21.9%)</td>
<td>7.54 yrs</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>Mean age</td>
<td>2</td>
<td>2</td>
<td>4.39%</td>
</tr>
<tr>
<td></td>
<td>PONV risk score</td>
<td>2</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Total PONV incidence</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Nausea incidence</td>
<td>18</td>
<td></td>
<td>23.7%</td>
</tr>
<tr>
<td></td>
<td>Vomiting incidence</td>
<td>23</td>
<td></td>
<td>14.6%</td>
</tr>
<tr>
<td>Restorative dentistry</td>
<td>37</td>
<td>18</td>
<td>1–2 hrs</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Mean age</td>
<td>21</td>
<td>23</td>
<td>9.1%</td>
</tr>
<tr>
<td></td>
<td>Total PONV incidence</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Nausea incidence</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Economics

PONV can be very distressing and can have an economic impact. It can prolong the hospital stay and so can have financial implications. The routine use of anti-emetics in all dental anaesthetics must be weighed against the cost of these drugs, which are expensive, and the likelihood of PONV. Protocols in place can address these issues.

PONV management

There are several factors to consider when managing PONV.

- Pre-operative assessment: identify those patients at risk from PONV.
- Risk assessment: nurses are in an excellent position to identify patients at risk. A risk assessment tool (Table 1) is used within the author’s department to ensure that all patients are assessed for their probability of PONV. In this risk assessment tool, anyone who scores 3 or above is routinely given anti-emetics for prophylactic reasons. Patients with a lower score than 3 but who have had previous PONV are also given anti-emetics.
- Use of prophylactic anti-emetics for those patients considered at high risk of PONV.
- Minimising the use of triggering agents during anaesthesia: the use of local anaesthetic reduces the need for opioids in some dental cases.
- Accurate charting of nausea and vomiting scores: this helps highlight problems and facilitates audit. The act of recording scores helps focus attention on PONV and, when combined with guidelines for management, will encourage prompt treatment of PONV(1). In the author’s department all charts are documented in the patients’ anaesthetic notes and reviewed prior to any subsequent anaesthetic (dental or otherwise).
- Prompt treatment of PONV: the use of guidelines, along with both doctor/nurse education, facilitates early treatment. Failure to institute treatment early can result in medical complications and patient distress and can influence patients’ expectations of future surgery(1).
- Education programmes: this is one of the areas that is useful regarding nurse education in PONV. A regular programme should be in place to ensure that all staff work together. Research carried out in previous studies has shown that it is an area for improvement, as there were gaps in nurses’ knowledge(8).
- Audit: this assesses working practices and areas for improvement. It works in conjunction with ‘Clinical Governance’ in maintaining standards of care to ensure the best possible care is given to patients(7). Good patient record-keeping is also important for audit purposes(4).
- Economics: use of guidelines may ensure that valuable resources are targeted at those most at risk(1).

Conclusion

It is necessary to monitor how well PONV is being managed to ensure good patient care and prevention of PONV. Patient preparation is important and by carrying out a risk assessment on each patient it ensures that the patients who are classed as ‘high risk’ for PONV...
are given appropriate treatment prior to surgery. The problems that nurses encounter range from lack of their own education regarding PONV and assessment of the patient, the under-use of anti-emetics and the side effects of the drugs prescribed. Doctors have different views on management of PONV. Some physicians routinely prescribe anti-emetics regardless of patient risk factors; others wait until the patient is in the recovery area. This unfortunately does not give a clear set of guidelines to nurses who are responsible for that patient’s care. The way to address this is by carrying out audits on patients, discussing the relevant points with the doctors concerned and hopefully producing a clear set of guidelines for all. Regarding nurse education, it is important for nurses working within the oral surgery/anaesthetic area to be educated in the management of the patients in their care. Regular training sessions, including encouraging feedback from the nurses, participating in audit and gaining experience within other surgical disciplines that use the PONV risk assessment tool, is invaluable to their training needs. Education is important in the use of anti-emetics. The doctor is ultimately responsible for the prescribing of any anti-emetics but it is beneficial for the nurses involved in the management of the patient to have an understanding of the drugs given, the different anti-emetics and the reasons for their administration, along with the side effects that can result. The introduction of education in PONV for nurses within the Department of Oral and Facial Surgery at the author’s workplace has culminated in an improvement in nurses’ knowledge and ultimately patient care.

References

A SEDATIONIST’S BRIEF GUIDE TO MEMORY

Jacqueline E. Pickrell, PhD (A)
Peter Milgrom, DDS (A, B)

(A) Dental Fears Research Clinic, University of Washington, Seattle
(B) Department of Sedation and Special Care Dentistry, King's College Dental Institute, London

Sedation provides a humane solution to medical surgical and dental procedures that are difficult, especially for anxious patients. Memory plays an important role in both the reasons that patients are fearful and the effectiveness of sedation treatment. In this paper we review important concepts in memory science through a sedationist’s question format, providing some clinician guidelines that may be of use in enhancing sedation treatment in the dental surgery.

Q.) Many fearful patients remember every detail of a past bad experience at the dental surgery, even if it was years ago. How are these experiences remembered? Do they get elaborated over time? It often seems as if it could not have happened that way. Is there special memory for painful experiences?

After experiencing something highly emotional and unexpected, people often feel they ‘remember it like it was yesterday’. In 1977, Brown and Kulik(1) identified what they believed was a special memory mechanism for events and experiences that were so important that the memory of the event was essentially ‘burned into the brain’ much like an image is burned onto film in a photograph. They coined the term ‘flashbulb memories’ to describe vivid and accurate levels of recall. These memories can be either positive or negative, but they are always emotionally laden and have personal importance. The events are thought about often, and that repeated recall strengthens one’s ability to remember the event at a later time. Additionally, this increased ability to recall leads the ‘rememberer’ to believe the memory is accurate and relatively permanent with the passage of time while subsequent research has demonstrated they are malleable(2).

In order to understand how it is a person confidently recalls a bad experience, declaring details that seem impossible to the clinician, it is helpful to understand the reconstructive nature of memory. Unlike a video recording of an event, memory of an event is not stored intact, existing in its entirety somewhere in our brain. Rather, as we experience an event we break it down, abstracting ideas and the gist and then storing those abstracted pieces. Later, when asked to recall the event, we reconstruct the event as we recall the pieces.

Numerous information-processing mechanisms exist to facilitate memory while at the same time allowing for the creation of memory errors. One of the leading explanations as to why we exhibit less than accurate recall, or forgetting, includes the role of interference(3). Information learned subsequent to the experience (saying to the patient, ‘Wow, that must have been very painful!’) and information learned prior to the experience (saying to the patient, ‘Don’t worry, my sister had the same procedure and she was only out of work for a week’) can interfere with the subjective experience. This new information becomes attached to the event and as we reconstruct the memory of our experience that other information may become part of our autobiographical memory. Sometimes the way a question is asked will alter a memory of an experience(4). For example, asking a dental patient to report on the level of pain they experienced, it might be wise not to include any information in the question. ‘Is the pain only when you bite down?’ and ‘What do you feel when you bite down?’ may result in people remembering their experience of pain quite differently. ‘Did the pain wake you up at night?’ implies there was pain, how did it affect you, while ‘Did you have any trouble sleeping?’ allows for the possibility of no pain at all.
In addition to misleading information, memory can also be altered when we fill in the gaps of our memory for an experience with guesses or thoughts about how it probably was\(^5\). These guesses, then, similar to the misinformation provided in questions or through other means, are stored with the gist of the event and may become part of the memory at the next construction (recalling) of the event.

Think of the medical and dental fields as having their own cultures. They definitely have their own language and terminology, their own specific physical space, as well as clothing and realms of possible experiences and behaviours. The experience of a patient, new to and unfamiliar with this culture, parallels the behaviour of someone who has travelled to a foreign country where they are unfamiliar with the language, customs and behaviours of the new culture. As such, the different and unfamiliar events will be interpreted and encoded differently from how they actually occurred. In addition to the influence schemas have on encoding, their use may also result in memory errors created when we begin filling in the gaps in the construction of the memory. Perhaps you really do not recall the injection you received, but your sedation schema dictates that the anaesthesia was administered by an injection; therefore, you report you received an injection and possibly even that you recall being given an injection. Then when your spouse asks you, ‘How painful was the shot?’ you add ‘pain’ to the event of injection and restore that to be retrieved at a later date. Essentially, a new, false memory has now been created, that of a painful injection.

Failed sedation, from the patient’s perspective, can be incredibly traumatic. When identifying elements of patient satisfaction or dissatisfaction from a sedation experience, Coyle and colleagues\(^7\) found that memory for the procedure significantly impacted on satisfaction reports. Of the patients dissatisfied with the operation, 20.9% recalled having pain. Additionally, when exploring patients’ memory of the operation, 32.1% reported being awake, 6% of those being unable to communicate. Particularly if the clinician is unaware of the patient’s state, care may not be taken in topics of verbal discussions, techniques that are quicker rather than less painful may be chosen and unfamiliar noises may become encoded as terrifying and negative rather than routine. With this increased level of emotion, the patient will keep thinking about these facts, strengthening their recall possibilities, and in lieu of knowledge of the procedural ‘culture’, uncertainty may be stored as fear and pain.

Q.) I want to give the pre-operative instructions for my patient in the best possible way so that they will be able to remember them, tell their spouse what to expect, remember to arrange a ride, not eat or drink before the procedure, be on time, wear loose clothing, short sleeves for cannula placement, not be nervous, etc. What processes are at play and how do I capitalise on them?

To be remembered, information must first be encoded. Although it sounds like common sense to say this, many people remain surprised about certain information they are unable to recall. We use schemas to encode information.

A schema is a cognitive structure that provides a meaningful framework for organising information. To build schemas, we use knowledge and assumptions of people, objects, events and the world, and construct the frameworks using the main ideas, or the gist of the information. While not every detail is contained in the schema, details are easily added back into the recalling of the event using this framework. Schemas aid in the efficiency of encoding, storage, and the retrieval of information. Very young children have poorer memory than older children, as they are unable to extract the gist of an event or information but rather attempt to remember it verbatim. As we age and develop cognitively, we develop the ability to extract the gist from an event to be remembered.

Although it is time-intensive, the clinician might take this opportunity to help the patient build a sedation schema. Teaching people what is important in the procedural process essentially instructs them as to what they should pay attention to. In building the schema ask whether they have had pre-operative instruction in the past, and whether they know what to expect. Do not make the assumption, if a patient says she has been in the dental surgery before and knows what to do, that her recall of your pre-operative instructions will be better than a patient getting them for the first time. Previous information (instructions from a prior session) may interfere with your patient’s ability to recall your more recent instructions. This proactive interference occurs especially when subject matters are so very similar, so that it is easier for the learning of old material to interfere with the patient’s ability to recall the new instructions.

In order to create conditions most likely to result in the highest level of adherence to the pre-operative instructions, the instructions first need to be learned or encoded so that at the appropriate time they will
be accurately recalled. The brain stores information as networks of associated concepts such that recalling a particular word becomes easier if another, related word is recalled first. This process is called priming\(^9\). Organising the instructions in like categories utilises this principle. Time might be used as one category, with instructions for the evening before the procedure, the morning of the procedure, the ride to the office, etc. Cue dependence theory states that recall is best when cues present at encoding are also available at retrieval\(^9\).

As you go through each time of day routine, attach new information to familiar, already learned information so that the old information acts as a cue for the newly associated instructions. For example, the evening before the procedure, as you are parking your car in the garage, remember to check on your arranged ride home; when you wake up in the morning, dress in loose clothing with a short-sleeve shirt for easy access and improved mobility. Then, instead of eating breakfast or having your morning coffee, recall you are not to eat or drink before the procedure.

Making the information meaningful to the patient increases their motivation to recall and follow the instructions. One key principle in learning is how we learn through observation and the experience of consequences\(^10\). Therefore, as you list the instructions, explain not only why each is important, but also a consequence of following instructions, such as, when you wear a short-sleeve shirt to the procedure, the preparations go a lot quicker. Elaborate on the instructions in a way the spouse and patient will relate to them. After the sedation, this is a great time to hang about and watch your favourite programme on the telly. What’s your favourite programme? In this way it becomes more meaningful and the patient will encode the instructions using imagery from the elaboration you provide, thus increasing the likelihood of recall.

The Encoding Specificity Principle for improving memory involves matching either or both internal and external states that exist at encoding (learning) with the states that exist at recall. The matching of external states is called context-dependent memory\(^9\). This theory holds that recall is improved when the environment setting is the same at encoding and recall. People often remember an event by placing themselves in the same context they were in when the event occurred. Applied to our pre-operative instruction scenario, patients may experience better recall of the instructions if they are at home when they receive them rather than in the office. Thus, sending pre-sedation instructions by post and having the nurse call and repeat them is likely to be more effective than giving them on the day of pre-examination in the surgery.

In addition, matching internal states, or state-dependent memory, suggests that recall improves when the emotional or physiological state is the same at encoding and recall. Studies have shown that memories for an event that occurred while subjects were intoxicated are better remembered when in an intoxicated state than when sober. In the delivery of pre-operative instructions this principle may be particularly helpful in the timing of the instructions with an anxious patient. If the pre-operative instructions are given too far in advance of the procedure, the patient theoretically may not be anxious as the procedure is still some time in the future. This creates a mismatch of states: the patient is calm when pre-operative instructions are given, and anxious when instructions need to be recalled in the hours before the procedure. Additional research exploring the effect of anxiety on memory finds that while elevated levels of anxiety often hinder problem-solving and complex thought, the encoding of factual instructions is strengthened\(^13\). These ideas both support delivery of the pre-operative instructions to the anxious patient close to the time of the procedure, when anxiety levels are likely to be high.

Finally, we consider the order of the instructions presented. The first words you give in a typical memory task are practised more and are transferred into long-term memory where they can successfully be retrieved later. The last words you use may still be in short-term memory and may be immediately ‘dumped’ out when recall is cued. In memory studies, these later words are quickly lost from memory. While the existence of these two systems is important to memory researchers, for the clinician the importance lies in the practical knowledge about memory encoding.

When instructing your patient on pre-operative procedures, realise they are more likely to recall the first instructions you give them more accurately than the later ones. Even if you ask them to repeat the instructions back to you and they successfully do so, unless they continue rehearsing them for the next few minutes, the instructions at the end of the list may be lost from memory and are unable to be retrieved at a later time. As a sedationist, use it to your advantage and tell the patient those things that are really important to remember first.

Q: What is the best way for the patient to remember the sedation experience as positive? When I place the cannula and put on the pulse oximeter probe my nurse
and I give a lot of reassurance especially if the patient is upset. We tell them ‘Everything will be all right…’. I don’t want patients to remember the experience in my surgery as negative, especially since we are using sedation to allow for a better experience than they have experienced in the past. Sometimes I try to distract them by talking about something else. Some want to watch the cannula placement while others look away.

Reassuring the patient that ‘everything will be OK’ leaves room for an active imagination to imagine the worst and may be too general for a particularly anxious patient to automatically trust. Be specific in your reassurances: ‘Great shirt, thank you for wearing short sleeves. Look at these great veins – this makes my job much easier.’ Those who want to watch might have their attention directed to some positive detail and elaborate on that. To those who do not want to watch, also provide positive specifics and then you can switch to distraction topics in the moments before they lose consciousness as this information will not be remembered well, if at all. The primary information encoded may well be your positive attitude and not the words you are speaking. The last thing you are told before sedation will likely not be remembered, as when our consciousness fades before we have had the opportunity to process the information, all information is lost(12).

Imagining a situation in which the sedationist experiences great difficulty cannulating the patient, with two failed attempts at finding the vein. Two major memory processes, one biological, the other cognitive, strengthen the possibility that memory of those failed attempts will be evident far beyond that one day(11,13). First, when highly aroused, the body increases its production of glucose in order to provide energy to the brain. As the brain is signalled that something important has happened, the amygdala or seat of emotion in the limbic system boosts its activity, allowing memories to be more rapidly consolidated. These biological processes ensure a stronger memory for the failed IV placement than an uneventful, successful attempt would have. Secondly, the patient will be focusing on the event, therefore keeping in consciousness the discomfort and fear associated with the experiences. High levels of emotion related to these types of traumatic events impair our ability to accurately sense and process peripheral information. The pleasant voice of the nurse or the calm of the operator will go unnoticed while the fear and pain memories will increase. Along with that increase will be a strengthening of associations, associations with dental treatment and fear, fear and pain, dental treatment and pain etc. with these fears ultimately being generalised to all dentists, needles and professional oral care.

With each remembering of the event the memory will strengthen. Keep in mind that we are no longer talking about what actually happened but the patient’s subjective experience of what happened including thoughts, feelings and fear, both actual and anticipated, because, importantly, we remember what we encode.

While there are no special memory mechanisms for good versus bad memories, special mechanisms do exist for highly emotional memories(14). Highly emotional memories are laid down chemically stronger and then reinforced through rehearsal. Additionally, during times of increased stress, such as may be experienced by some immediately before the sedation begins, the body produces a shot of norepinephrine, a natural response to acute episodes of anxiety that increases a person’s ability to react quickly. In addition, studies have demonstrated that norepinephrine levels, when elevated, have improved students’ performance in exams(13). If the procedure has been adequately explained in advance, chances are the anxiety experienced by the patient will not react as an acute response, but rather as a highly emotional, prolonged response. In this case, the anxiety is likely to increase worry, and in many cases worry serves as a distraction for the patient, resulting in decreased memory performance.

Peterson(14) demonstrated that patients receiving injections they perceived and reported as having been stressful were less able to identify the nurse who gave them the injection than they were a neutral person with whom they had also interacted. These results are consistent with other eyewitness research on the effects of stress and fear on memory. It appears that, just as in crimes with elevated victim anxiety levels due to the presence of a weapon versus those with relatively lower anxiety because a weapon is not present, increased anxiety decreases the person’s ability to encode peripheral details of the event. Although of course not criminal activity, to someone remembering a past bad sedation experience, the resulting information processing may be similar.

In order to construct the most conducive conditions that will foster and promote a positive memory of the sedation experience, do your best to immediately replace negative stimuli with positive. If something does not go well, or is particularly stressful, immediately follow it with a positive experience.

Recall that the primacy effect states we will remember more from the beginning of a series of stimuli than we will from the middle, and that the recency effect states we will be able to immediately recall the most recent
information given to us if it is not subject to interference from other information or another task. Therefore, when succumbing to the effect of a sedative, a patient should recall most clearly the last information they were told or heard, and had a chance to rehearse, before slipping into a sedated state.

Under sedation, information is less likely to be attended to unless it is related directly to the self, because it could be elaborated and associated with other events we were familiar with, or highly unusual stimuli, things that seemed out of place or not within our schema of what it is like to be sedated and have dental treatment. For example, most patients will not attend to the dentist’s request for cotton gauze or an explorer, but a request for a ham and cheese sandwich or a tree saw might be attended to long enough to be rehearsed and therefore encoded. Likewise, an emotional reaction by the dental team, for example, ‘Heavens, you’ve pushed that root into the maxillary sinus!’ would stand out against the schema a person might hold of the monotone and dry interactions of the dental team.

Conclusions

The current rate of reported failed sedations provides the clinician with an incentive to apply principles from other disciplines to sedation techniques. The use of a few established memory principles to your sedation procedures may increase the effectiveness of your treatments and aid in more positive lasting impressions. The timing of instruction delivery and the order of instructions delivered are easily implemented in your practice. Providing patients with useful strategies for improving their memory, while requiring more of your time in advance of treatment, may prove time well spent when directions are followed and necessary procedures completed. By monitoring the content of your questions to the patient, you may decrease possible suggestion of nonexistent details. And finally, the positive impressions that continue after the sedation can make a difference in the patient’s subjective experience, their future behaviours and in future referrals to your practice.

References

I spent my undergraduate years at the late lamented Royal Dental Hospital situated in the heart of London’s theatreland in Leicester Square. Academically, I was fairly undistinguished, but to my credit I did represent the hospital in tennis, soccer, table tennis, cricket and, on one occasion only when the team arrived at the ground one man short, hockey.

On qualifying, I was persuaded by a dentist friend to help him out for a few days following the sudden loss of his associate with health problems. Two days into my associateship my friend/boss informed me that he was off on a three-week holiday to the south of France. Suddenly, I was in charge! (VTs eat your heart out.) Forty-five years later I am still in the same practice.

In the early years we used to do some 10 or 12 GAs a week solely for extractions, and I gave the anaesthetic while my, by this time, partner would do the extractions. The nitrous oxide/oxygen mixture was administered using a Walton 3 anaesthetic machine. Actually, I think the more accurate term for the piece of kit would have been ‘asphyxia machine’. However, we had had it fitted with a vaporiser and were among the first users of halothane in general practice. This enabled me to give the patient a decent percentage of oxygen!

About this time, 1963, I first heard about SAAD and decided to join, attending my first meeting, a Saturday/Sunday seminar, at UCL. Suddenly a new world was opened for me: Jorgensen technique, intermittent Brietal, etc. I went on my first practical course and then introduced my new-found expertise into the practice.

This situation remained pretty much unchanged until ‘the’ report. I did not do sufficient numbers of GAs/sedations to justify the necessary financial outlay to continue and so, in partnership with the late Dr Colin Foggo, became a referral clinic, changing from mainly GA to wholly sedation in 1998 and presently doing some 5–6,000 cases annually.

My life outside dentistry

Although I was still playing badminton into my middle sixties, the death of my partner and one of the opponents of our regular ‘four’ brought this to a halt. Retrospectively, giving this up was probably just as well for me! I have always had a fascination with things nautical and three years ago bought myself an aging 37-foot sports cruiser. Off I went to evening classes, and in the next three years went from ‘competent crew’ to ‘yacht master’. However, I would best describe myself as a ‘petrol-headed Francophile’, and for me nothing compares with driving around France in a sports car, stopping from time to time to sample the local gastronomic and vinicultural delights of the region. I hope that I can, by my wealth of experience if nothing else, be of some assistance to our great Society.
Once again the Annual Conference of SAAD was held at the Royal Society of Medicine’s premises in Wimpole Street.

The Conference opened with the presidential address by Diana Terry, who warmly welcomed the delegates, making the point of how this annual event is going from strength to strength.

The topic of this year’s Conference was Sedation in Primary Care, and Diana went on to emphasise that being members of SAAD gave strength to both medical and dental practitioners working in this field when the inevitable political pressures were brought to bear.

SAAD was, she pointed out, born at a time when the various people working in our field were to a great extent at loggerheads; by our coming together the whole ethos of our professional aspirations gained a collective momentum. At this point Diana recalled the great contribution made by Peter Sykes who, sadly, passed away earlier this year. Douglas Pike was then called upon to summarise Peter’s life and work. A minute’s silence was observed.

Last, but by no means least, Diana informed us of SAAD’s new website: an ever-available forum for the exchange of ideas, views and suggestions, the lifeblood of any society.

The morning session was chaired by Derek Debuse, sporting a beautiful black eye, which he explained was the result of post-op bleeding following surgery on a BCC. Sounded reasonable to me, I think!

The first topic for the day was a combined presentation by Tony Wildsmith and David Craig. Their topic was an overview of the long awaited Standards for Conscious Sedation in Dentistry: Alternative Techniques.

The full report can be found on the appropriate website but, in summary, it would appear that it represents a consensus between the Royal College of Anaesthetists and the Royal College of Surgeons and that their message would appear to suggest that everybody who administers conscious sedation will have to adhere to the same guidelines and will be expected to provide the same levels of excellence in treatment.
2007 CONFERENCE

It would seem that, here again, SAAD has a pivotal role to play in ensuring that standards in primary care are at a level comparable with the hospital setting.

The next speaker, Christopher Holden, discussed the political minefield of general practice, stressing the importance of adhering to all relevant regulations. His opinion was that the new document, being as it is a consensus of several faculties, nicely balances the constraints of an over-zealous bureaucracy.

The final speaker of the morning, Michael Wood, gave a very informative and fascinating insight into the day-to-day running of a busy referral sedation clinic.

Lunch was taken at this point and, being an informal buffet format, gave the delegates a chance to chat with each other about the various issues raised in the morning session and, additionally, to wander around the trade stands.

Each year SAAD awards a prize to the nurse achieving the highest mark in the NEBDN examination. This year’s winner was Vanessa Hopkins. Her prize was presented by Diana Terry and David Craig with warm congratulations.

The afternoon session began with Pepe Shirlaw, who works at the allergy testing department at Guy’s Hospital. After giving us a brief overview of the theory behind basic immunology and allergic reactions, she gave us a great insight into her work at the allergy clinic. She informed us that thankfully latex and amalgam allergy is decreasing and that the majority of the work she undertakes these days relates to the testing of local anaesthetics. She explained that major complications of LA allergy are extremely rare, and then went on to detail the various patch tests done at her clinic for allergy testing.

Sharon Drake took over and gave us a brief overview of the fairly new field of Dentists with Special Interests, which is very relevant for us who undertake conscious sedation. This is a very important development, especially with the local commissioning that PCTs now do, and can be very useful where sedation referral clinics are operating. The most important message that came across was that any dentist who has a special interest as such must be able to perform the said duties to the same standard as a specialist in that field and must demonstrate appropriate training and experience in that field.

The afternoon session closed with Tim Newton and Carole Boyle giving us their overview of work they undertake in extremely anxious patients. The talk and video on the ‘staged approach’ regarding, for example, local anaesthetic administration was excellent.

The day closed with the Annual General Meeting.

To anyone with an interest in the field of conscious sedation the day was very worthwhile, and, even at this early stage, next year’s programme promises to be even better.

Derek Ryan
SAAD Trustee
The last decade saw major changes in the delivery of pain and anxiety management in dentistry. Previously, general anaesthesia was commonplace in spite of concerns about both clinical need and standards of practice, and the 1999 report from the Royal College of Anaesthetists can be viewed as a ‘yellow card’ to both dentists and anaesthetists. It demanded the same standards for dental practice as applied elsewhere, but major sequelae continued to be reported by an increasingly strident media. Fifty years earlier, an occasional death might not have attracted much attention, but this was not so at the end of the 20th century. The result was *A Conscious Decision*, effectively showing the professions a ‘red card’ and banning general anaesthesia from its very birthplace.

The report also promoted the wider use of conscious sedation in dentistry, while recognising that its standards needed to be high to maintain patient safety. This, and matters relating to sedation in medical practice, prompted the Academy of Medical Royal Colleges to publish *Safe Sedation Practice*. This report said nothing new about clinical care, but it did require that sub-speciality organisations defined appropriate techniques and their training requirements. This led the Standing Dental Advisory Committee to commission a report on the ‘standard’ techniques: IV benzodiazepines for adults and inhalation of nitrous oxide/oxygen mixtures for both children and adults.

There are some who believe that this is all that is required in general dental practice, but three arguments have been put forward to support the need for further advice:

1. developments in practice, notably the increasing use of intranasal midazolam, require some extension of the guidelines;
2. some patients require more than a ‘standard’ technique, but can be managed outwith the hospital setting; and
3. other techniques are being used, not without complications, and some guidance is better than none.

Each of these points, particularly the third, is controversial, but the new report has set a format for the
future. These recommendations should be viewed as the 'yellow card' on sedation in dental practice, with those ignoring them risking a 'red' one also.

J. A. W. Wildsmith
Tony has recently retired from the post of Professor of Anaesthesia in Dundee, with clinical interests in dental and vascular surgery and research centred on the pharmacology and use of local anaesthetic drugs, mechanisms of general anaesthesia and quality of life after intensive care. He chaired groups which produced reports on dental anaesthesia (Royal College of Anaesthetists) and conscious sedation (Academy of Medical Royal Colleges).

STANDARDS FOR CONSCIOUS SEDATION IN DENTISTRY: ALTERNATIVE TECHNIQUES
Dr David Craig

A Synopsis of the Recommendations
'The Board of the Faculty of Dental Surgery and the Council of the Royal College of Anaesthetists together with our colleagues in the Faculty of General Dental Practice (UK) endorsed earlier guidance provided in Conscious Sedation in the Provision of Dental Care published by the Standing Dental Advisory Committee in 2003. We now commend to you this new additional guidance encompassing the use of alternative conscious sedation techniques'.

Members of the Committee
Dr Paul Averley: DH Pilot Practitioner in Conscious Sedation
Dr Paul Cartwright: Royal College of Anaesthetists
Dr David Craig: King’s College London Dental Institute
Dr Christopher Holden: SAAD
Professor John Lowry: Faculty of Dental Surgery, RCS Eng (Chairman)
Dr Yusuf Omar: Medical Practitioner in Conscious Sedation
Dr Nigel Robb: Association of Dental Anaesthetists
Professor J. A. W. Wildsmith: Royal College of Anaesthetists
Dr Michael Wood: Faculty of General Dental Practice (UK)

This document develops the earlier guidance (Conscious Sedation in the Provision of Dental Care, Standing Dental Advisory Committee, 2003) to encompass the use of alternative conscious sedation techniques. It has been prepared for dental and medical practitioners including anaesthetists and their teams. The combined guidance is designed to provide practitioners with the information they need to ensure they provide conscious sedation services to the specified standards in order to safeguard patients regardless of the clinical setting. The standards set out in this guideline are the minimum requirements.

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

Standard conscious sedation techniques are:
• inhalational sedation using nitrous oxide/oxygen
• intravenous sedation using midazolam alone
• oral/transmucosal benzodiazepine* provided adequate competence in intravenous techniques has been demonstrated.

*Transmucosal (intranasal) sedation must only be administered by those:
• who are trained and experienced in intravenous sedation
• who are competent at intravenous cannulation
• who are competent in the management of sedation related complications
• who have evidence of training in these techniques.

Alternative conscious sedation techniques include:
• any form of conscious sedation for patients under the age of 12 years# other than nitrous oxide/oxygen inhalation sedation
• benzodiazepine + any other intravenous agent with sedative effects for example: opioid, propofol, ketamine
• propofol either alone or with any other agent for example: benzodiazepine, opioid, ketamine
• inhalational sedation using any agent other than nitrous oxide/oxygen alone
• combined routes for example: intravenous + inhalational agent (except for the use of nitrous oxide/oxygen during cannulation).

#It is recognised that the physical and mental development of individuals varies and may not necessarily correlate with the chronological age.

General recommendations
• Assure compliance with guidance.
• Introduce a robust system for assessment of the quality and safety standards of all NHS and independent clinical teams matched to the type of service provided.
• Develop a network of integrated referral centres (dental anxiety management services) providing an extended range of techniques improving service to patients while achieving revenue savings.
• Establishment of such centres should be clearly based on local needs.
• Develop and continuously update guidance on the quality standards required of such centres.
• Take advantage of the opportunities presented by the new centres to link teaching, training and research to service provision.

Specific recommendations
Requirements for the administration of standard and alternative techniques have been considered under the three broad headings of:
1. Environment and patient selection
2. Qualifications and training
3. Experience and CPD

1. Environment and patient selection
Premises must comply with the standards required for the practice of dentistry but the following require further consideration:
• waiting area
• surgery
• recovery facilities.

Drugs & equipment should be appropriate for the techniques utilised. These include those required for:
• sedation
• monitoring
• the management of complications and resuscitation.

The team:
• operator/sedationist
• dedicated sedationist
• dental care professionals (DCPs)
• recovery personnel
• support staff.

Each patient must be attended by at least two appropriately trained and experienced members of the conscious sedation team. A dedicated sedationist is required for the administration of any technique requiring the continuous IV infusion of a drug or drugs OR when three or more sedative drugs are used in combination regardless of the route.

An operator/sedationist using such techniques MUST be able to demonstrate appropriate training in the use of the specific method, expertise in its use and also provide audit records of its safe administration in that clinical setting.

Where a dentist works with a dedicated sedationist either employed by the dentist or employed by a third party there must be a formal or contractual responsibility for the treating dentist to clarify the responsibilities and accountability of each member of the dental team involved with each patient during preparation, sedation, recovery and discharge.

The patient:
• medical and dental history
• age
• ASA
• weight
• psychological status
• social aspects
• proposed dental procedure.

Documentation and protocols must comply with contemporary clinical governance standards for the practice of dentistry but the following require additional consideration:
• assessment and preparation
• written valid consent
• technical procedure and recovery
• written instructions for patient and escort.

2. Qualifications and training
Essential:
• primary registrable dental qualification
  OR
• primary registrable medical qualification
• appropriate knowledge, skills, attitude, behaviour and aptitude in the field of conscious sedation
• training in standard sedation techniques
• compliance with GMC/GDC CPD recommendations for conscious sedation
• compliance with contemporary standards
• evidence of training (even for anaesthetists) in specific alternative sedation techniques in an appropriate environment
• evidence of annual team training in Immediate Life Support or equivalent.

It is clear that, for a medical graduate, a period of training in anaesthesia would provide much of the requirement. For sedation in another clinical setting (first trimester termination of pregnancy) satisfactory completion of two years’ training in anaesthesia has been recommended.

Desirable:
• postgraduate dental qualifications (e.g.: MFDS/ MFGDP, MSc/Dip in sedation)
• trainer in conscious sedation
• postgraduate medical qualifications (e.g.: FRCA).

3. Experience and CPD
For entry to training in specific alternative techniques practitioners must have:
• documented experience of the relevant intravenous or inhalational standard techniques (at least 100 cases over last 2 years)
• not less than 4 years’ post-registration experience in the United Kingdom as a dental or medical practitioner.

Annex 2: Person Specification for Practice Assessor for Alternative Conscious Sedation Services

Annex 3: Inspection Checklist for the Provision of Alternative Conscious Services

Annex 4: Oral and Transmucosal Sedation with Midazolam

David Craig
David is the Head of Sedation and Special Care Dentistry at KCL Dental Institute. He is the Immediate Past President and current Course Director for SAAD. He chaired the DwSI in Conscious Sedation Working Group for the Department of Health and is a member of the Standing Committee on Sedation for Dentistry at the Faculty of Dental Surgery, RCS Eng.

Politics in primary care – the good, the bad and the ugly
Dr Christopher Holden

Politics is embedded in the whole of our lives and dentistry is no different from any other profession or trade. We usually think of politics in terms of political parties and government. More generally, politics is the process by which groups of people make decisions. Although a term commonly applied to civil government behaviour, it is observed in all human group interactions, including corporate, religious and academic institutions. So it follows that politics consists of social relations involving power or authority.

In an ideal world a patient would have needs and desires that would be met by the clinician with options and solutions readily provided between each party without interference. In the real world, however, there are many people involved in patient care, either directly or indirectly. Even for the simplest procedure this may involve over 50 individuals or institutions, all of whom want power (e.g. dentist, hygienist, practice manager, radiologist, technician, dental nurse, Royal Colleges, universities, Health & Safety Executive, secretary and cleaner, to name a few).

Just to practise dentistry requires compliance with many diverse regulations, from Acts of Parliament to fire regulations, radiation safety and NICE guidance. There are 37 major guidance documents to which a dentist must adhere to practise basic dentistry within the law.

Specific sedation guidance has been published copiously since the early 1990s. Guidance has been produced by the General Dental Council on numerous occasions, and the Royal Colleges, the Department of Health, the Dental Sedation Teachers Group, SAAD, the UK Academy of Medical Royal Colleges and Faculties, independent reports and various specialist societies whose major interest is not sedation.

It is not surprising that many practitioners are confused or unsure where to look for current guidance or indeed which guidance to follow. This has been reflected in cases where practitioners have been shown to fail patients on a regulatory level but have not been shown to be a risk to the public themselves. That is in itself contradictory in terms of standardisation of patient care and safety.

In simple terms there are three types of political guidance: Acts of Parliament, devolved regulatory guidance through the General Medical Council and the General Dental Council and ethical guidance from within the profession.

There are three important current documents with which any practitioner of sedation for dentistry should start. These are:
Forces for good in political control include the development of safe management techniques. There is assurance of ethical research and education, which develops public confidence in scientific advancement. Clinical provision becomes standardised within a culture and the community.

In contrast, power and authority can lead to over-control of clinical freedom and decision-making. Because of fear of disapproval or litigation, a climate of lack of incentive to innovate can pervade all clinical provision for individual patient care. Political diktat can also burden the profession with bureaucracy, which leads to disillusionment, apathy and a one-size-fits-all mentality.

Political power at its worst leads to corporate abuse of power and authoritarian arrogance within guiding institutions. This in turn can give rise to radical and dangerous individuals prepared to misrepresent for gain either inside or outside these groups, and clinicians willing to abandon guidance wholesale and provide the patient with ‘cavalier therapies’.

The General Dental Council states: ‘Clinical standards in dentistry are constantly developing. We do not issue clinical guidelines or statements on clinical standards. However, we do issue a policy statement on general anaesthesia and conscious sedation.’ Pain and anxiety control is a fundamental part of dental care and the regulatory body sees a political need to control this, ostensibly on patient safety grounds. Interestingly, this is politics in dentistry at its most active as there is less morbidity and mortality associated with this subject per se than with a number of other aspects of dentistry. However, in terms of public perception this guidance is vital to maintain confidence in the profession.

The universities are an important power base as they are independent academic authorities undertaking proper research as well as undergraduate and postgraduate training pathways. They are an important balance to the more centralised authorities.

The specialist societies represent the majority of those providing clinical care to patients as well as clinicians with an active interest in the field. The driving force of these groups is to encourage and promote and teach safe practice as well as to foster the furthersance of the development of patient needs. Their power lies in the diversity of the clinical skills training and knowledge contained within the range of job descriptions in dental employment. This power, when deployed in a unitary fashion, is politically strong both within society and the profession itself.

The Royal Colleges are the natural umbrella authorities of all persons with an academic interest and professional recognition at a postgraduate level. They are a focus for coordinating different specialist groups. They consider and promulgate standards and communicate openly with the public, representing a large core of the profession. They are seen as the historical power base of the professions.

The Department of Health represents governmental will from outside the professional regulatory mechanism. Both agonist and antagonist to the profession, this part of the executive represents the purest power of will. It can be used for the promotion of patient safety, for controlling cumulative professional power by subjugation and to direct the political will of the executive. It always professes to act in the interests of the community and is fettered by party political control.

Chris Holden and Michael Wood take questions from the floor

The specialist societies represent the majority of those providing clinical care to patients as well as clinicians with an active interest in the field. The driving force of these groups is to encourage and promote and teach safe practice as well as to foster the furtherance of the development of patient needs. Their power lies in the diversity of the clinical skills training and knowledge contained within the range of job descriptions in dental employment. This power, when deployed in a unitary fashion, is politically strong both within society and the profession itself.

The Royal Colleges are the natural umbrella authorities of all persons with an academic interest and professional recognition at a postgraduate level. They are a focus for coordinating different specialist groups. They consider and promulgate standards and communicate openly with the public, representing a large core of the profession. They are seen as the historical power base of the professions.

The Department of Health represents governmental will from outside the professional regulatory mechanism. Both agonist and antagonist to the profession, this part of the executive represents the purest power of will. It can be used for the promotion of patient safety, for controlling cumulative professional power by subjugation and to direct the political will of the executive. It always professes to act in the interests of the community and is fettered by party political control.
It is not possible to successfully practise dentistry and sedation for dental care without understanding the politics of dentistry. Failure to understand this will undoubtedly lead an unwary practitioner to the courts or the professional conduct hearings of the regulatory bodies.

A wise clinician will take heed by finding and reading current guidance, practising within individual limits and not blindly relying on others’ professionalism or career status. It is necessary to understand current guidance. Practice should be adapted to that and audited. Proper communication with patients and carers is as important as the therapies provided. Staff must be adequately trained and revalidated. Referrals need adequate and complete information.

To understand the politics of dentistry is vital. To act on new authority is sensible. To like political power is not necessary!

Christopher G. P. Holden  
Christopher is Immediate Past President of the International Federation of Dental Anesthesiology Societies and a past President of SAAD. He runs a practice in Derbyshire dedicated to the anxious and frightened patient, treating patients from both a local and an international base. He has been a member of many expert groups publishing guidance on conscious sedation in the last 15 years. Christopher has interests in regulation of conscious sedation and the medico-legal aspects of patient care, providing expert evidence in both the civil and criminal courts in the UK, Europe and worldwide.

CONTRACTING DENTAL SEDATION SERVICES  
Dr Michael Wood

The impact of the Health and Social Care Bill 2003 on dentistry was illuminated by the new General Dental Service (nGDS) contract which was implemented in April 2006 changing for ever the way in which NHS dentistry was provided and funded.

Primary Care Trusts (PCTs) had the responsibility to commission effective and appropriate dental care services that were required within their area. They were allocated a specific budget based on previous earnings of the dentists within the area, with slight uplift. Each dentist was eligible to have his or her own contract with the funds, which included the earnings of the indicative year, on which the earnings were based. Funds for individual dental practices were ringfenced until March 2009.

Patient charge revenue was to be underwritten by the PCT so that the predicted shortfall in revenue would not be detrimental to dentists. There would be no more items of service – only a service with four bands of treatment (plus one for emergency treatment). These were divided into Units of Dental Activity (UDAs).

Many contracts were initially in dispute and some are still in dispute. Most issues were regarding the size of the contract and the value of the UDAs for individual practices. Some dentists opted out but the majority tentatively braved the waters. Concerns were raised when PCTs started to act independently and inconsistently across the country, especially when it came to the selling of practices: to whom did the goodwill of a practice belong? The PCT could determine whether the contract would be honoured and for how much. If a dentist wanted to open a new NHS practice, the PCT could determine where that would be. Access to NHS dentistry for patients remained a problem – this was one of the problems that the nGDS contract set out to resolve. (This was particularly difficult for vulnerable groups with high dental treatment needs.)

NHS Dental Reforms: One year on (August 2007), published by the Department of Health (DH), has been widely criticised as a masterpiece of spin.

■ ‘This document bears no resemblance to the experience of patients or what we are hearing from the dentists!’

Derek Watson CEO GPA

■ In the 33-page document, conscious sedation (CS) is mentioned in one paragraph: ‘During 2007, the DH also issued specialist guidance on commissioning Conscious Sedation (CS) services. This is designed to help PCTs ensure the highest possible standards of safety and quality where dentists use a CS technique to enable phobic or anxious patients, or some patients with disabilities to receive treatment.’

There are two imminent investigations into the nGDS contract:
1. Commission for Patient and Public Involvement in Health (CPPIH) enquiry
2. Commons Health Select Committee plans to launch an inquiry into the government’s controversial dental reforms – October 2007.

A document Strategic Commissioning of Dental Sedation Services, June 2007 was published by the DH. This explained the regulations of the nGDS contract with relevance to sedation.
The ‘no mixing’ of NHS dental treatment with private sedation was emphasised – this time to explain that it had to do with the way in which sedation was regulated and for quality assurance. All dental sedation, whether on the NHS or private, was subject to the same regulations.

Indications for the use of CS were explained.

Use of CS in primary care: PCTs to be aware of the higher failure to attend (FTA) rate.

CS techniques: Safe and Effective, Appropriate and Simplest form that achieves the above criteria.

PCTs must assess the need for CS within their patch and see what current provision there is for this service. They then need to decide on their priorities and design appropriate services, and then manage demand and access to these services. They must manage the performance of the services and ask the public’s and patients’ opinions. There would have to be commissioning of these services across PCT boundaries, i.e. at Strategic PCT level. Quality would be measured by Dental Reference Officer visits and Expert Assessors in the case of practices offering alternative sedation techniques.

Regarding how patient charges are processed: sedation services should be provided for an entire course of treatment. UDAs are banded and the patient pays.

On referral: any treatment done by the referring dentist is a separate course of treatment – the patient pays and gets UDAs. New course of treatment at sedating dentist – UDAs and the patient pays again.

Most dental clinics in the South East that were contacted to find out about their sedation activity said that those who did not fulfil their contractual obligations regarding the number of sedations that were provided commented that the FTA rate was very high. Previously, a clinic could take a deposit when making an appointment to ensure attendance or alternatively levy a fine for non-attendance, but the new contract has removed this useful incentive for concentrating patients’ minds to attend their appointments. In previous years this had always worked successfully and was very effective in reducing FTAs.

Other clinics said that they had had their sedation contracts cut and so were sitting around for two to three months only providing private sedations. One clinic exceeded its contract by 1,200 sedations and the PCT said that it did not have any funds to compensate the practitioner.

Concerns for the future

How accessible will sedation be for patients if only a select few will be able to offer sedation?
Will the sedation clinic become the ‘dental dumping ground’?
Will only Dentists with Special Interests in sedation obtain sedation contracts?
If only a few dentists will be able to provide sedation in the future, will sedation training become a postgraduate subject?
Would we need a sedation department in every dental school if training was limited to postgraduates only?

Michael Wood

Michael is the principal dentist at Leagrave Dental Sedation Clinic (LDSC) in Luton, Bedfordshire. This is mainly a referral-based sedation service. As part of his base NHS contract the Luton PCT has contracted LDSC to provide 5,000 sedations annually for exempt patients. Sedation is also provided as part of two pilot surgical contracts.

Michael’s quest is to pursue the ideal that safe conscious sedation for dentistry can be offered to almost everyone in an appropriately funded system in primary care.

Allergies in dental practice – adverse reactions to materials used in dentistry – are we and our patients safe?

Dr Pepe Shirlaw

Allergies in dental practice are uncommon but can be frightening for both the dental team and the patient. A sound knowledge of the types of allergies, their diagnosis and management is essential for all general dental practitioners.
The types of hypersensitivities were reviewed, and the definition, diagnosis, aetiopathogenesis and management of anaphylaxis examined. Examples of oral mucosal hypersensitivity reactions were given, including examples of reactions to materials used in dentistry, particularly local anaesthetics, latex and amalgam. Recommendations for investigations and management of these reactions were suggested.

Pepe Shirlaw
Pepe is a Consultant in Oral Medicine and Head of Service Delivery for Dental Services at KCL Dental Institute at Guy’s, King’s College and St Thomas’ Hospitals. Her clinical interests include Sjögren’s syndrome and allergies related to dentistry.

DWSI IN CONSCIOUS SEDATION
Dr Sharon Drake

Background
A national framework for Dentists with Special Interests (DwSIs), Implementing a Scheme for Dentists with Special Interests (DwSIs) was published jointly by the Department of Health and the Faculty of General Dental Practice in May 2004. The document described the potential for DwSIs and highlighted the first four clinical areas to take forward as a pilot: orthodontics, periodontics, minor oral surgery and endodontics. The principle of establishing Practitioners with Special Interests developed within the NHS as a means of managing workload between primary and secondary care and thereby relieving pressure on secondary care services. By providing Primary Care Trusts (PCTs) with an opportunity to contract with dentists who have developed a special interest in addition to their generalist role, the choice available to patients in terms of the nature and locality of NHS dental care is widened. In April of this year, the Department of Health published a policy document, Implementing care closer to home: convenient quality care for patients, confirming the establishment and accreditation of Practitioners with Special Interests (PwSIs) as a commissioning option for PCTs, and DwSIs were identified as an integral part of this. In 2007, two further draft guidelines and competency frameworks have been developed for DwSIs in Conscious Sedation and Prison Dentistry.

What are Dentists with Special Interests (DwSIs)? A DwSI is any dentist contracting with a PCT to provide services in a primary care setting in addition to their usual and important generalist role. They may deliver a clinical service beyond that usually provided by a primary dental care practitioner, or they may deliver a particular type of treatment, in agreement with their local PCT. The DwSI provides a service that is complementary to secondary care but does not replace services provided by those who have undergone specialist training and are on the specialist lists. DwSI status should only be given to a practitioner following a local assessment by the PCT that there is a need to commission such a service, and an assessment of the practitioner against the competencies as published.

Guidelines for the appointment of Dentists with Special Interests (DwSIs) in Conscious Sedation
The DwSI in Conscious Sedation has been developed jointly with the Department of Health and the Faculty of General Dental Practice (UK), and will assist PCTs in reviewing existing conscious sedation services and help assure the quality of future services offering both standard and alternative techniques. The document acknowledges that standard conscious sedation techniques can be carried out by all primary care dentists who are competent to do so, and is not designed to restrict patients’ access to sedation services.

Following the principles as set out for DwSIs, a DwSI in Conscious Sedation is able to demonstrate a continuing level of competence in their general dental activities as well as a continuing level of competence in standard conscious sedation techniques. In addition, the DwSI will be able to demonstrate competence in some or all of the alternative techniques.

The document draws on existing guidance, in particular Standards for Conscious Sedation in Dentistry: Alternative Techniques, from which the definition of standard and alternative techniques is taken.

Sharon Drake
Development of competency frameworks

Special interests may be demonstrated through experience and/or through the completion of taught certificates and diplomas. To be accredited as a DwSI, the practitioner will need to demonstrate evidence of acquisition of competencies to national standards.

A working group was established to develop the guidance and competencies for a DwSI in Conscious Sedation and included representatives from SAAD, the Dental Sedation Teachers Group (DSTG), the Association of Dental Anaesthetists (ADA), the British Dental Association (BDA), primary care dentists, specialists, consultants, university departments, dental faculties, PCT managers, Strategic Dental Health leads and patients.

The presentation will cover the process behind the development of competencies for a DwSI in Conscious Sedation and will describe the system of assessing competencies and accrediting DwSIs. It will also include some of the practical issues in terms of taking this initiative forward from a practitioner’s perspective and what you need to do if you wish to be recognised by your PCT as a DwSI.

Sharon Drake

Sharon is the Deputy Registrar of the Faculty of General Dental Practice (UK). In 2005 she was seconded to the Department of Health to project-manage the development and implementation of Dentists with Special Interests (DwsIs), and continues to offer her expertise in the development of future DwSI schemes, including, most recently, the DwSI in Conscious Sedation.

MANAGING PATIENT ANXIETY

Dr Carole Boyle and Dr Tim Newton

A large proportion of adults in the United Kingdom are afraid of dentists, with evidence suggesting approximately one in four adults in the UK delay seeking help for a painful dental condition as a result of their dental fear. Pharmacological approaches to the management of dental anxiety are well established and may benefit from the introduction of complementary psychological approaches. The psychological therapy most commonly used in the treatment of any phobia is guided self-exposure. One meta-analysis of 38 behavioural treatment studies found that the treatments resulted in large reductions in dental fear and that 77% of subjects were seeing the dentist regularly after four years or more (Kvale et al., Community Dental Oral Epidemiology 2004; 32(4) 250–264). However, psychological services for fearful dental patients are not widely available. At

King’s College London we are developing programmes of computerised guided exposure. This presentation will describe the preliminary research that has been undertaken in preparation for the development of the programme and will demonstrate some of the materials that will form the basis of the programme.

Tim Newton

Tim is Professor of Psychology as Applied to Dentistry at King’s College London Dental Institute. In dentistry his particular interests include oral health-related quality of life, the working life of the dental team and patients’ perceptions of treatment.

Carole Boyle

Carole is Associate Specialist in Sedation and Special Care Dentistry at King’s College London Dental Institute. Her particular interests include the teaching of special care dentistry and the use of sedation techniques for special care patients.
The Annual General Meeting of SAAD was held after the main Conference and was attended by significant numbers, always a sign of a healthy Society.

Following the adoption of the minutes of the last AGM (2006), the Chairman (Dr Diana Terry) reported that the Society is in good shape, ready to face the challenges ahead. There are SAAD Board members (Trustees) on all the important committees related to conscious sedation in dentistry. The National Course in Conscious Sedation continues to provide the definitive training medium, with 240 dentists and 180 dental nurses attending each year.

The Secretary (Dr Derek Debuse) dealt with correspondence received, and reported that the arrangements with the Association of Anaesthetists of Great Britain and Ireland (AAGBI) were working well.

Dr Stephen Jones presented the Treasurer's report, announcing a healthy state of affairs, enabling SAAD to contribute financially to educational projects, thus fulfilling and justifying our charitable status.

Each year, two Trustees retire from the SAAD Board. This year, Dr Paul Averley and Dr Avril Macpherson retired. Dr Averley was re-elected, while Dr Macpherson resigned from the Board. Dr Chris Holden was proposed, seconded and duly elected to the Board. There is currently one vacancy on the Board.

Dr Anthony Morton thanked the SAAD Trustees for their work to date and urged them to continue, since their efforts are even more crucial in the present climate.

Derek Debuse
Hon. Secretary SAAD

SAAD BURSARY FOR UP TO TWO WEEKS’ SECONDMENT TO AN EU COUNTRY

The objectives of this scheme:
• To promote and develop conscious sedation in a European country of choice within that country’s state-funded healthcare system. (A hospital or academic institute would be the preferred environment for such a secondment to occur.)
• To develop and foster working relationships with European colleagues in the field of conscious sedation.

The candidate would be expected to:
• Submit an outline of the proposed project prior to SAAD Council granting approval.
• Deliver a report to SAAD Council on completion of the project.
• Present a short paper at the Annual Meeting.

For more information or to submit an application please contact:
Fiona Wraith, SAAD Executive Secretary,
21 Portland Place, London W1B 1PY • 01302 846149 • SAADoffice@aol.com
FREQUENTLY AND INFREQUENTLY ASKED QUESTIONS

As Hon. Secretary of SAAD, I get some mail, mostly by email, either directly or forwarded on from AAGBI via Busola Adesanya-Yusuf or our Executive Secretary, Fiona Wraith. Some of the questions are common queries, but occasionally there are those that need a bit of research and thought. I have collected a few from both categories that may be of interest to the membership of SAAD.

DENTAL NURSE QUALIFICATION

I was asked whether it is essential that a nurse who is assisting during sedation should be qualified. I replied that, although it is desirable, it is not a requirement to have passed the NEBDN Sedation exam. Nevertheless, it is very important that thorough training is undertaken. This is best done via a formal course such as the SAAD course, but can be done elsewhere. A careful record of all training sessions is advisable. A certificate of attendance is given at the end of all SAAD courses.

SCAVENTING SYSTEMS

An NHS Trust was looking into upgrading their extract system for scavenging during inhalational sedation with nitrous oxide. They asked for specific guidance. I was able to advise approaching specialist dental companies rather than anaesthetic contractors. I recommended by name two that SAAD have had dealings with.

SAAD COURSES OUT OF LONDON

There was a plea from a member in Glasgow asking whether SAAD courses can be provided north of the border. I could quite understand that, with a busy practice and a young family, a trip to London for a busy weekend is not feasible. The problem with providing the SAAD course out of town is that the equipment needed is substantial and difficult to transport. However, bespoke courses can be arranged on special application to SAAD. The content will vary, and the local organiser may have to provide equipment for the practical parts of the course.

USE OF FENTANYL

A practice in a fairly remote area of Cumbria had been using Nubain (nalbuphine) for a minority of patients for whom midazolam was not sufficient to provide good levels of sedation. Since Nubain has been withdrawn he was wondering what to use in its place, mentioning fentanyl or ketamine as alternatives. There are strict rules governing the storage of fentanyl as it is a controlled drug. It should be used with caution as more profound respiratory depression can be a result of the synergistic effect with midazolam. It should be given as a 50mgm bolus before titrating the midazolam. You must also have naloxone (Narcan) on hand as the antagonist. There must be compliance with the new guidance on alternative techniques of sedation. This will be found on the Royal College of Surgeons of England’s website.

PROTOCOLS FOR SEDATION

We were asked whether SAAD has produced a protocol for sedation for use in dental surgeries. The answer is ‘no’; protocols will vary from practice to practice. The basis for producing a bespoke protocol is in the Standing Dental Advisory Committee’s Conscious Sedation in the Provision of Dental Care. This is easily downloaded from the DH website (www.dh.gov.uk) or the SAAD or DSTG websites.
DRUG INTERACTIONS

While many drug interactions with midazolam are known and documented, there are occasionally drugs that are difficult to assess. One member’s patient had been to Africa and had just stopped taking anti-malarial drugs (Malarone). The BNF is not all that specific about drug interactions of Malarone, but I was able to confer with colleagues in the Department of Sedation and Special Care Dentistry. There are no reported interactions.

RECRUITMENT OF SEDATION STAFF

We were asked whether we could recommend a sedationist for a practice that was losing theirs. I was sadly unable to help as membership lists are not given out.

ORAL AND TRANSMUCOSAL SEDATION

One member asked where he could find information about these alternative techniques. As the use of midazolam via these routes is relatively recent, textbooks do not cover this area. A literature search on Medline or even Google will uncover much information. The guidelines on the use of alternative sedation techniques are shortly to be published on the Royal College of Surgeons of England’s website.

Members are encouraged to contact SAAD for advice but also to make comments about the provision of sedation in the UK, particularly where problems are encountered with PCTs.

Derek Debuse
Hon. Secretary

PLEASE TAKE TIME TO POSE QUESTIONS YOU MAY HAVE RELATING TO ANY ASPECT OF ANALGESIA, SEDATION, ANAESTHESIA, RESUSCITATION, ALTERNATIVE THERAPIES, ETC.

THE OPINIONS OF VARIOUS EXPERTS IN THE RELEVANT FIELDS WILL BE SOUGHT AND PUBLISHED IN THE DIGEST FORUM.
LETTER TO THE EDITOR

Your January issue of the SAAD Digest contained an interesting appraisal of the use of nitrous oxide inhalation sedation for first permanent molar extraction. (Foley J. SAAD Digest, 23: January 2007, 3–7.)

I found, upon reading this article, no mention of the associated use of local anaesthesia; in fact the suggestion seemed to be ‘…the use of conscious sedation as a safe alternative to general anaesthesia’. This is misleading as nitrous alone is not an alternative to GA but is used in conjunction with local anaesthesia and more to the point the quality and delivery of the LA can markedly affect the success rate in terms of patient behaviour and outcome.

Further, I cannot quite equate the percentage figures. It is claimed that 67% of cases had one or two teeth extracted and 12% all four. What happened to the other 21%?

Finally, the comment that to remove four teeth would take two hours! If that is so I would get some new exodontists! Surely if sedation is comfortably established and LA provided, the extractions could proceed within a much shorter time frame and save all the hassles of further appointments.

Sincerely

James Grainger
University of Sydney

Ed – Dr Foley was approached to reply to this letter.

Comment from the President

Members should be aware of an article published in Anaesthesia by Professor Leo Strunin entitled ‘Intravenous conscious sedation for dental treatment: am I my brother’s keeper?’(1). Professor Strunin is an expert witness in some cases where alleged harm has been associated with the use of sedation. In particular he points out the plethora of advice and guidelines for the practitioner undertaking sedation practice both in hospital and other locations. He is also critical of the DSTG for including in their autumn 2005 newsletter an article about sedation in children that had been presented as a free paper at their meeting in 2005. SAAD invites members to present free papers at the Annual Conference, to stimulate debate, but urges members to adhere to research governance, and clinical guidance when undertaking clinical studies. SAAD members are strongly advised to ensure that they are familiar with all the guidance referenced in Professor Strunin’s article. SAAD supports the use of current published guidance and standards in the delivery of sedation services to dental patients.

Reference:


Diana Terry
SAAD President
This guidance is an important document that was commissioned by the Chief Dental Officer (CDO), Dr Raman Bedi, following a serious sedation incident involving a healthy six-year-old boy in Cambridge in 2004.

Professor John Lowry convened a group of experts in sedation and formed the Standing Committee on Sedation for Dentistry, which initially reported to the Standing Dental Advisory Committee (SDAC), and thereafter the work was continued as a joint Faculty of Dental Surgery and Royal College of Anaesthetists document. The group first met in February 2005 and the document has only now seen the light of day.

The SDAC were asked to develop a strategy and make recommendations on:

- More rigorous maintenance of safety and quality standards for conscious sedation in the provision of dental care.
- Improving access to more effective services for pain and anxiety control by delivering appropriate techniques matched to individual patient needs in a timely manner at a convenient location.

Standards for Conscious Sedation in Dentistry: Alternative Techniques

A Report from the Standing Committee on Sedation for Dentistry, 2007

- The definition of Conscious Sedation remains unchanged.
- There remains disquiet about safety and quality standards in the provision of sedation for dental care. This applies particularly to the use of more advanced techniques + extending beyond the basic techniques described in Conscious Sedation in the Provision of Dental Care (Standing Dental Advisory Committee) 2003. There are nevertheless examples of good practice in the safe and effective administration of alternative techniques by well trained and experienced teams working in tightly controlled clinical settings.

- This document develops the earlier guidance to encompass the use of alternative sedation techniques. It has been prepared for dental and medical practitioners including anaesthetists and their teams. The combined guidance is designed to enable practitioners to take appropriate steps in the provision of a minimum standard of conscious sedation to supplement local anaesthesia for safe and effective patient care whatever the clinical setting.

- Standard and Alternative Sedation Services are defined:

Standard techniques are:
- inhalational sedation using nitrous oxide/oxygen
- intravenous sedation using midazolam alone
- oral/transmucosal benzodiazepine* provided adequate competence in intravenous techniques has been demonstrated.

*The transmucosal administration of conscious sedation is regarded by some sedationists as falling within the category of standard techniques. Nevertheless it is essential that strict protocols are in place. See Annex 4.
Alternative techniques include:
- any form of conscious sedation for patients under the age of 12 years other than nitrous oxide/oxygen inhalation sedation
- benzodiazepine + any other intravenous agent for example: opioid, propofol, ketamine
- propofol either alone or with any other agent for example: benzodiazepine, opioid, ketamine
- inhalational sedation using any agent other than nitrous oxide/oxygen alone
- combined (non-sequential) routes for example: intravenous + inhalational agent (except for the use of nitrous oxide/oxygen during cannulation).

*It is recognised that the physical and mental development of individuals varies and may not necessarily correlate with the chronological age.*

- The guidance on standards for alternative sedation techniques requires that for safe practice:
  - **Premises** must comply with the standards required for the practice of dentistry but the waiting area, surgery and recovery facilities require additional consideration (Paragraph 1).
  - **Drugs & equipment** should be appropriate for the techniques utilised and include those required for sedation, monitoring, the management of complications and resuscitation.
  - **The Team** includes operator/sedationist, dedicated sedationist, dental care professionals (DCPs), recovery personnel and support staff.
  - **Patients**’ medical and dental histories, age, ASA, psychological status, weight, social aspects and the proposed dental procedures must be carefully considered.
  - **Documentation and protocols** must comply with contemporary clinical governance standards but additional consideration must be given to assessment and preparation, written valid consent, the technical procedure and recovery, written instructions for patient and escort.
  - **Qualifications & Training Requirements** for the practitioner administering sedation using alternative techniques should acknowledge differences in educational and training backgrounds (Paragraph 2). Conscious sedation for children must be provided only by those who are trained and experienced in sedating children and where appropriate equipment and facilities are available.
  - **Entry to training** in specific alternative techniques requires that practitioners must have documented experience of the relevant intravenous or inhalational standard techniques (at least 100 cases over last 2 years) and not less than 4 years’ post-registration experience in the United Kingdom as a dental or medical practitioner (Paragraph 3).

- The Expert Working Group that was convened by the SDAC reached conclusions and made recommendations in September 2005.
  - the principles set out in *Conscious Sedation for the Provision of Dental Care* provide guidance applicable to all sectors of dentistry; laying emphasis on the training for and administration of the standard techniques which ensure a wide margin of safety.
  - an urgent need for more rigorous monitoring of quality and safety standards at the local level.
  - that a robust system for assessment of the quality and safety standards of all NHS and independent clinical teams should be introduced and matched to the type of service provided.
  - a proposal that referral centres providing an extended range of techniques clearly based on local needs be introduced.
  - a need to develop and continuously update guidance on the quality standards required of such centres.
  - the introduction of such centres would present opportunities to link teaching, training and research to service provision.

Following preparation of these recommendations there was a significant change in the national commissioning patterns and provision of dental services. More recently the Department of Health has published updated guidance on the commissioning of conscious sedation services in primary dental care. Under these circumstances and in view of the need for supplementary guidance on standards this work was then taken forward by the Royal Colleges, who produced various recommendations outlined earlier.

- An Inspection Checklist for the Provision of Alternative Conscious Sedation Services is provided. There is a clear distinction between this document and the one published in *Commissioning Conscious Sedation Services in Primary Dental Care*, which refers to the standard techniques. This has been clearly cross-referenced to the appropriate guidance paragraph in various authoritative documents.
- A Person Specification for Practice Assessor of Alternative Conscious Sedation Services is available as an annex, whereby it is hoped that commissioning bodies will use this to appoint the most appropriate person to carry out the inspections of facilities.
SDAC GUIDELINES

providing alternative dental conscious sedation services.
– A further annexure details guidance on oral and transmucosal (intranasal) sedation with midazolam.
– A list of reference documents is supplied at the end of the document.

The Expert Working Committee was widely representative of clinicians providing sedation and teaching sedation in hospitals and in primary dental care.

This document is to be read in conjunction with Conscious Sedation in the Provision of Dental Care. Report of an Expert Group on Sedation for Dentistry, Standing Dental Advisory Committee (SDAC) 2003, and is not meant to supersede it. These combined documents will be the authoritative guidance that will be used to monitor the provision of sedation in any facility where dental sedation is provided.

It is vital for all sedationists and dentists providing sedation to review their protocols, facilities and staff to make sure that they comply with the new guidance. It will be up to commissioners of sedation services to ensure that the guidance is monitored to facilitate the safe provision of dental sedation.

It is hoped that this guidance will go a long way to set new standards in patient safety particularly in the area of alternative sedation techniques.

FACILITATION OF THE PROVISION OF INHALATIONAL SEDATION

A PILOT SCHEME FOR SAAD MEMBERS

SAAD Council has recently approved a scheme to loan inhalational sedation and scavenging systems for a six-month trial period to SAAD members.

The two successful applicants will have the opportunity to purchase the systems at the end of the trial period.

Details of the scheme and application forms are available from the SAAD website, www.saad.org.uk or Derek Debuse, Hon. Secretary SAAD, contact details: derek.debuse@kcl.ac.uk, tel: 01403 780465.
There is a paucity of high-quality research in the field of conscious sedation, especially for paediatric dental patients in the UK. In a recent Cochrane systematic review of paediatric dental sedation (2005), the authors found that the overall quality of studies was disappointing, with poor reporting frequently the main problem. In addition, the variety of drug regimes compared and the outcome measures used within the included studies made it impossible to aggregate the data reported or to conduct a meta-analysis. Consequently, the authors were unable to reach a definitive conclusion about the most effective sedation method for anxious children. However, they did make detailed recommendations for future studies assessing sedative agents. These apply equally to conscious sedation research for children and adults.

It was also reported that the vast majority of publications concerned with conscious sedation in dentistry were not reported well enough to allow reliable judgements to be made about how the trials had been conducted and the validity of the results. Those who have an interest in conscious sedation research have an opportunity to develop and improve the quality of work being carried out in this area. Appropriate, robust studies are required in order to develop a sound evidence base to support best practice, with regard to drug regimes and sedation techniques.

### Cochrane recommendations

When designing and carrying out clinical trials the first principles researchers should adhere to are the CONSORT guidelines (Consolidated Standards of Reporting Trials). The CONSORT statement is an important research tool that takes an evidence-based approach to improve the quality of reports of randomised trials. Its critical value to researchers, healthcare providers, peer reviewers, journal editors and health policy makers is the guarantee of integrity in the reported results of research. CONSORT comprises a checklist and flow diagram to help improve the quality of reports of randomised controlled trials. It offers a standard way for researchers to report trials. The checklist includes items, based on evidence, that need to be addressed in the report; the flow diagram provides readers with a clear picture of the progress of all participants in the trial, from the time they are randomised until the end of their involvement. The intent is to make the experimental process clearer, flawed or not, so that users of the data can more appropriately evaluate its validity for their purposes.

The Cochrane Review authors give more specific recommendations regarding sedation-related clinical trials, intended as the basis for further debate in this area. These include:

- **Blinding:** ideally the operator, assessor and patient should be blind to the sedation agent and techniques being used. However, realistically it is accepted that this may not always be possible, for example where an inhalational sedation technique is being used.

- **Sample:** it is essential that an appropriate sample size is calculated prior to commencing any trial to ensure statistical significance can be appropriately calculated. It was clear from many of the studies reviewed that different age groups were being studied and a recommendation was made to divide age into three bands in accordance with the prescribing of drugs as laid out in the British National Formulary (BNF). The bands are 1 to 6 years, 6 to 12 years and over 12 years. One issue with this is that many dental trials are designed around the dental age of the patient, which may differ.

- **Design:** it is essential to prior design the trial appropriately taking into consideration carry-over effects that may be witnessed when studying the effects of sedation.
Outcome measures: issues regarding the most appropriate outcome measures must be clarified. In general, behaviour and anxiety are used to measure outcome of the management regime. It is important to ensure standard, validated and reliable tools are being used to allow direct comparison of work. The statistical tools that are used to analyse data must also be ratified and consistent.

Helpful tips

FIRST STEPS AND ESSENTIAL STARTING POINTS
Like many areas of dentistry, sedation is in dire need of a strong evidence base. Unlike many areas of dentistry, sedation is not a desperately difficult area to research and there are real prospects for conducting meaningful research in primary care. However, research is a discipline in itself and it does not always come easily to a clinician, partly because in order to conduct a project you have to stop being a clinician for a while, and that is not easy.

The most important piece of advice is simply this: never try to do a project on your own. If you have something that you want to do and feel you can do, then that is excellent, but you will need support from a number of sources, and should get this at the earliest opportunity. What may seem like a perfectly sensible study design to you may be simply unworkable or statistically unsound. Modern clinical research is highly professional now and tightly regulated. The regulation of research is such that someone with recent experience of the regulatory system, including ethics and trust approval mechanisms and honorary trust contracts, is an essential part of the process. Research also costs money. You will have to decide whether you are going to try and obtain additional resources for a project. You can go some distance on goodwill of course but cannot always rely on this. There are plenty of people who could advise you.

The points where help and advice are essential are included below. Finding the right person is sometimes difficult and we would advise contact either with your closest academic unit, or linking through this sedation network.

STEPS
The following are the key steps you need to take if you are interested in pursuing a piece of research:
• Identifying a research question
• Designing a project
• Reviewing the literature
• Compiling a protocol.

IDENTIFYING A RESEARCH QUESTION
You need to start by asking a precise question, and that means precise! Once you have formulated a question, check that it fulfils the following criteria:
• Keep it limited (i.e. specific and focused)
• Keep it small
• It must be precise.

The best research questions are based on your own experience or problems you have faced. Precision is key. For example, asking ‘How is blood pressure affected by drug A?’ is too vague. However, ‘Does mean diastolic blood pressure increase during routine dental treatment when drug A is used as an oral sedative agent when compared with drug B?’ asks a question that is specific enough for you to be able to design a study to answer it. You know what is being compared (drug A with drug B), in precisely what circumstances (routine dental treatment) and you also know the outcome measure you will use (mean diastolic blood pressure). This last part is critical – your outcome measure determines much of how you collect your data.

It can take a long time to get to the right question. Sometimes you need to have reviewed the literature before you can get to this stage, but get to it you must.

DESIGNING A PROJECT – PRELIMINARY
It helps to be aware of the design options when considering your research questions. Here is a conventional view:
X people – randomly assigned to drug A (intervention) or drug B (control – normal medication) – measure and compare outcomes.

This is basically an RCT (randomised controlled trial) and provides a high level of evidence, but you really need to know what you are doing. However, this is only one of many valid and useful approaches. Take a step back. Do you need numeric data at all?

QUALITATIVE RESEARCH – INTERVIEWS, FOCUS GROUPS, ETC.
This can be invaluable for exploring complex opinions and attitudes. It is also essential in designing questionnaires and other new outcome measures. It involves focus groups or interviews and really gets beneath the surface. It is fantastically useful but uses narrative text as data, not numbers or statistics. It is increasingly widely used and is excellent for understanding attitudes, barriers and beliefs. It is also invaluable before compiling a questionnaire as a way of making sure your questionnaire asks the right questions.
RESEARCH TOOLKIT

QUANTITATIVE RESEARCH
Pure clinical trials (as above) are time-consuming, frustrating and difficult to do well. However, they are very useful. Laboratory or experimental studies have no need for patients, though you may need volunteers. Questionnaire-based studies and surveys are much more difficult than they seem but can be done in a short time. You need to design your questionnaire scientifically and are strongly advised to seek help. A bad questionnaire is a waste of everyone’s time.

Choose an approach that will answer your research question with maximum efficiency. However, rather than just choosing it, find someone who knows about research methodology and involve them in key decisions at an early stage.

REVIEWS THE LITERATURE
It is essential you do this before you go too far. The last thing you want is to start your trial without realising that it has already been done, or that someone has got a perfect way of measuring outcome that you did not know about. Often you will need to review the literature before even tightening up the question. The more systematically you review the literature the better. Try to record your strategy for searching for literature. Publicly accessible databases such as PubMed have revolutionised this process. We would suggest the following pointers:

• Read widely initially.
• It is highly unlikely that anyone will have done precisely what you are planning, so don’t get paranoid.
• Be critical: don’t just report what you read; think. Quite a lot of published research is very flawed.
• When you start to review, never lose sight of your research question/aim/hypothesis.
• When you are reviewing, stay narrow and deep around your aim, not wide and shallow, and avoid running down blind alleys.
• Be careful not to revert to being a clinical dentist; use the evidence, not clinical judgements.

DESIGNING A PROTOCOL
This is your working manual, your point of reference, your rule book. It is important to stick to it. You will need this for applying to an ethics committee and for getting trust approval. A protocol is demanded by these organisations for good reason. If you have prepared one it means you have thought through the process. Bear in mind the following:

• You cannot begin to do this unless your research question is crystal clear.

• When drafting this it is worth taking your time and making sure that you get appropriate help. The areas you will need help with will almost certainly be for methodology and statistics (the two often go together). If you are intending to undertake any sort of quantitative analysis it is very important that you secure that stats advice early on.
• Sort out ethical approval early on, read the guidance instructions carefully and stick to them.

Finally:

• Clarify the question/aim/hypothesis and set some specific objectives
• Keep the project manageable
• Keep focused
• Don’t try to change the world
• Get help.

Research tools
For clinical trials it is important to ensure that standard, validated and reliable tools are being used to allow direct comparison of work. These should include tools to measure the following: (suggested tools are detailed below).

Pre-operative assessment of:

• Patient anxiety
• Cooperation
• Invasiveness of the intended procedure
• Recording of baseline physiological data.

During treatment, assessment of:

• Level of consciousness
• Level of cooperation
• Oxygen saturation (all vital signs are important)
• Pulse and, if appropriate, blood pressure.

Post-operative assessment:

• Oxygen saturation (all vital signs)
• Pulse and, if appropriate, blood pressure
• Level of consciousness
• Level of cooperation
• Success of treatment.

Other assessments:

• Patient/parent satisfaction
• Reporting of untoward or unexpected incidents
• Worst oxygen saturation (or falls below % of baseline)
• Any loss of responsiveness to verbal commands
• Assessment of amnesia
• Assessment of recovery over following 24 hours.
COOPERATION SCALES
A description of behaviour appropriate for adults and children.

The six-point Venham scale
1. **Relaxed**: Smiling, able to converse, best possible working conditions. Displays the behaviour desired by the dentist spontaneously, or immediately when asked.

2. **Uneasy**: Concerned. During stressful procedure, may protest briefly and quietly to indicate discomfort. Child willing and able to interpret experience as requested. Tense facial expression. Breath is sometimes held in. Capable of cooperating well with treatment.

3. **Tense**: Tense tone of voice, questions and answers reflect anxiety. During stressful procedure, verbal protest, quiet crying, hands tense and raised, but not interfering much. Child interprets situation with reasonable accuracy and continues to cope with his or her anxiety. Protest more, distracting and troublesome. Child still complies with request to cooperate. Continuity is undisturbed.

4. **Reluctant**: Tends to reject the treatment, difficulty in assessing threat. Pronounced verbal protest, crying. Using hands to try to stop the procedure. Protest out of proportion to threat, or is expressed well before the threat.

5. **Anxious**: Anxiety interferes with ability to assess situation. General crying not related to the treatment. Prominent body movements, needing restraint on occasion. Child can be reached through oral communication, and eventually with reluctance and great effort begins to cope. Protest disrupts procedure.


CONSCIOUSNESS SCALE

- Fully awake and orientated
- Drowsy
- Eyes open and responds to speech (partial ptosis and/or slurred speech)
- Eyes closed and responds to speech
- Eyes closed, responds to mild physical stimulation
- Unresponsive to mild stimulation.

VISUAL/VERBAL RATING SCALE FOR CHILDREN

<table>
<thead>
<tr>
<th>CHILDREN 4-8 VISUAL / VERBAL RATING SCALE</th>
</tr>
</thead>
</table>

For pain

0 | No hurt at all
1 | A little hurt
2 | A little more hurt
3 | Hurts even more
4 | Hurts a little bit
5 | Hurts a lot
6 | Hurts as much as I can imagine

SAAD DIGEST | VOL.24 | JANUARY 2008
ANXIETY SCALE FOR ADULTS
Modified Dental Anxiety Scale (Humphris et al.’s modification of the Corah DAS).

INVASIVENESS SCORE
The invasiveness of the planned dental procedure using a numerical scale where one point is scored per quadrant of the mouth being treated, one point is scored per primary tooth treated, and two points are scored per permanent tooth.

ASSESSMENT OF UNDERLYING STATE AND TRAIT ANXIETY AND DEPRESSION
The Hospital Anxiety and Depression Scale is a well validated method of measuring state anxiety and depression in adult patients. Alternatively, the EPQR Short Scale, available from Hodder and Stoughton Educational, London, UK, can be used. The Spielberger Self-Evaluation Questionnaire, available from Consulting Psychologists Press, Palo Alto, California, is availed method of assessing trait anxiety in adult patients.

Authors:
Kathy Wilson, Jimmy Steele, Nigel Robb, Paul Averley

SAAD FUNDING FOR RESEARCH

SAAD is introducing an annual research grant to aid research in pain and anxiety control in dentistry.

The award is open to all postgraduates with an interest in pain and anxiety control in dentistry.

Individual applications for sums up to £5,000 will be considered. There is the possibility of funding more than one project up to the annual limit. Consideration will be given to applications for pump-priming funds to enable more major projects to be commenced, as well as completely funding projects as appropriate.

Priority will be given to research (rather than audit projects). Ethical approval (if available) and indications of support from other interested parties such as drug companies or Health Trusts should be included.

If funding is sought prior to the obtaining of ethical approval, SAAD’s support will be contingent on this being obtained.
The Council meeting was held on 14 June 2007.

The poor attendance at recent meetings was discussed, along with the possible need to realign the Association and the idea of closer cooperation with the Dental Sedation Teachers Group (DSTG). Other suggestions were to send questionnaires to the membership, rename the Association, and increase the profile of ADA within the medical and dental professions, with increased publicity for the Annual Scientific Meetings.

The 2007 Scientific Meeting was organised by Dr Ken Ruiz and held at the Hilton Sheffield hotel. Invited speakers were followed by a session for the presentation of free papers. Professor I. Brooke gave a fascinating talk on the development of and advances in dental implant technology, and this was followed by another scholarly lecture from Professor P. Robinson on dental appearance. Both speakers illustrated how expert clinical management can be advanced with the use of imaging technology, and how advances in bio-medical engineering will open further avenues for dentistry. Mr R. Croscher and Dr J. McDonough from Rotherham demonstrated how major oro-maxillofacial surgery has developed, and what challenges this presents for the dental anaesthetist.

The second session provided an investigation of the management of dental fear by Mr J. Davis, a behavioural psychologist, and dental pain by Dr Loescher, which outlined strategies and theory to help patients who present with these problems.

Professor Coulthard from Manchester spoke about the DSTG and education issues, and on Day 2 Dr R. Muirhead gave an insight into IT software in dentistry.

A session with free papers was well supported, and some controversial work was presented concerning the use of multi-drug sedation for dentistry. As usual, there was lively discussion from the delegates – one of the strengths of professional societies where views are aired by those at the coal face of sedation and anaesthesia for dentistry.

ADA seeks to promote interest in all areas where dentists and anaesthetists have a common professional interest. We look forward to seeing members of ADA and SAAD at the joint meeting with the DSTG in Manchester on 9–10 May 2008.

Diana Terry
Welcome and Introduction

Chris Wright, a proud Brummie lad, in sartorial elegance (a designer T-shirt with an ‘I ♥ Birmingham’ logo), welcomed delegates to the city, and then gave a short illustrated introduction to the demographics of the West Midlands. The wide social diversity accounted for the large number of different cuisines available in the city centre (more than 200), which enabled Birmingham to proclaim that it could give a ‘Taste of the World’.

During the period of the Industrial Revolution Thomas Telford (1757–1834) and James Brindley (1716–72) oversaw the building of a vast array of canals, with the city centre as the hub of the network. There are more canals here than in Venice that are now utilised as a vital component of the leisure industry – one of the ‘thousand and one’ trades of the city.

During the winter Birmingham hosts a German Bierfest that, judging by the photographs Chris showed depicting the range of insensibility of some of the imbibers, justified his assertion that beer was the ‘Mother of Sedation’!

Facing the Future

The theme of the first session of the morning, labelled ‘Facing the Future’, was chaired by Kevin Fairbrother, Consultant in Restorative Dentistry at the Dental Hospital. The two speakers were Professor Phil Lumley, Director of the Dental School, and John Morris, Consultant in Dental Public Health for South Staffordshire and also Lecturer in Dental Public Health.

These two presentations highlighted the tensions that are becoming all too evident in this health service world of providers and commissioners; the theme of the Symposium had been well chosen!

Professor Lumley added his welcome to the 150 or so delegates, stating that it was a tribute to the enthusiasm and dedication of dental sedationists. He described how he was battling with the demands of putting a ‘quart into a pint pot’: how he had to balance an increasing student intake with a changing funding process, i.e. being expected to do more with an increasingly restricted funding stream.

He emphasised that in order to maintain the student experience understanding the overall picture was key and that joint working between various agencies such as the Dental School and Hospital was essential. An evolving, measured response coupled with thinking over the long term was the way to achieve learning outcomes that he categorised as essential, desirable or aspirational.

With regard to training in sedation at undergraduate level, Professor Lumley believed that competence in managing fear and anxiety was aspirational, on the grounds that it takes time to learn the necessary skills to become proficient in this area. Knowledge in inhalational sedation was essential; he classified knowledge of techniques in clinical sedation practice as desirable.
John Morris focused on the new GDS Contracts Regulations and the likely effect on sedation provision. He described the freedoms that dental practitioners enjoyed prior to April 2006: the freedom to practise where one wanted to, the freedom to undertake as much or as little NHS dental care (including sedation) as one wished, and on whomever. John described this as developing a private business using public money, with the downsides being the poor distribution of the workforce, access problems for patients and national over- and under-spends in different locations.

However, the new dental contract arrangements had now changed this anomaly by locking up resources within a fixed budget; PCTs would be able to vary the terms of existing contracts in the year 2009, when true local commissioning commences in earnest. This variation would be subject to planning and contractual agreement between the commissioner and the provider; the commissioner would decide the quantity of sedation services that should be purchased and from what pool patients would be recruited. Responsible commissioning would be based on strict clinical governance principles that would include a greater degree of formal scrutiny of quality standards. Providers would have to demonstrate compliance with the Standing Dental Advisory Committee document of 2003 relating to the provision of dental care and conscious sedation.

John posed the following questions:
‘Do commissioners really want to purchase small volumes of sedation from multiple providers?’
‘Should provision be based around a small number of providers who are able to maintain skills, following quality standards?’

The above question had parallels with the orthodontic commissioning model and raised concerns in many of the delegates.

Questions from a rather subdued audience were taken at the end of these presentations; the mood reflected the rather gloomy, inclement weather outside. A debate about specialism ensued, with arguments about generalist and specialist practitioners. Some delegates were of the opinion that intravenous and inhalational sedation were basic skills, not specialist ones; others predicted the complete demise of the General Dental Service if sedation was to be undertaken only in a few specialist practices. The issues of use of public money and funding models were raised. Strong but considered opinions were expressed in this, at times, prickly and turbulent panel session; this proved to be the most contentious part of the day.

POSTGRADUATE SEDATION EDUCATION – DIVERSITY OR STANDARD PATHWAY

The second session, chaired by Lesley Longman, University of Liverpool and Honorary Secretary DSTG, continued the theme of facing the future with a set of presentations that considered pathways, diverse or standard, for the delivery of postgraduate sedation education.

Jenny Hainsworth, Clinical Psychologist at Leicester General Hospital, outlined a survey she had undertaken that had investigated the perceived training needs in conscious sedation within a cohort of dentists based in the West Midlands; the focus of the study was their current use of anxiety management techniques.

A wealth of data had been obtained from a postal questionnaire of 460 dentists. Just over half had received training in anxiety management as undergraduates; the mean time period since graduation in this group was 18 years. Undergraduate training had been continued at a postgraduate level by 45% of the respondents; however, a large number had reported that they considered training in inhalational, intravenous and oral sedation to be less than adequate. This was disappointing as more than three quarters agreed that they had a responsibility to help anxious patients.

Reasons cited for not using anxiety-reducing techniques were time, inadequate NHS fees and lack of operator confidence; the expense of purchasing intravenous sedation equipment was also stated as an inhibiting factor.

The main conclusion of the study was that a lack of accredited training – particularly the inability to access clinical supervision further to attending a formal programme – led to practitioners avoiding the use of anxiety-control techniques. The new contract was also viewed as a barrier to developing such a service.

This set the scene for the following four presentations, which described how training issues could be addressed; there was a balance between standard and diverse approaches.

The ‘terrible twins’, Gerry Flaum, Associate Specialist in Primary Care and Oral Surgery, Birmingham Dental Hospital and Kevin Fairbrother then took centre stage.
with what at first sounded like a pre-lunch aperitif: ‘The Birmingham Cocktail’! As there is no ‘central department’ for conscious sedation within the Dental Hospital a ‘team cocktail’ has been developed to deliver a conscious sedation programme; this includes the Birmingham Sedation Group and staff from the departments of Oral Surgery, Paediatrics, Restorative Dentistry, Dental Nursing, General Anaesthetics and Special Care Dentistry.

While the School does not offer a diploma course, Gerry and Kevin described some programmes that are run. A core course in intravenous sedation occurs twice a year (June and December) catering for a total of 80 dentists; a similar arrangement is in place for inhalational sedation. Opportunities exist for dental nurses to attend a three-day course to enable them to receive appropriate training in sedation nursing.

There is the Birmingham SHO model in which four appointees rotate in the departments of Oral Surgery, Paediatrics, Restorative Dentistry and General Anaesthetics; approximately 80 to 100 sedation cases are logged during this programme.

Since 2004, clinical attachments have been available for dentists who have been on a SAAD or other postgraduate course. Two dentists at a time are taken on for a three-month period; 20 IV and five inhalational sedation cases is the expected experience target, and the total number of places is eight per annum. Course participants are given a compact disc that includes self-directed study.

Analysis of questionnaires related to these training methods concluded that theory-only courses were not adequate for independent practice; practical experience in the form of clinical attachments was required, but the number of cases undertaken was about right.

Chris Bell, Associate Specialist in Oral and Maxillofacial Surgery, University of Bristol, described two contrasting methods for the delivery of dental education with particular reference to sedation. The Bristol University Open Learning for Dentists (BUOLD) is a longitudinal programme that was devised by the University; it is specially written, supported by tutors and administered at a distance. This was contrasted with the short courses of ongoing education delivered by SAAD.

The objectives of the BUOLD course are to increase depth of knowledge, to update the participant in new techniques and methods, and to stimulate motivation and curiosity. A five-year period is allowed to successfully complete three units from the thirteen available, including ‘Anxiety Control and Sedation’. Assessment is by means of marked homework, log books and, where appropriate, examinations; mentoring for this particular unit could be obtained via the DSTG/SAAD mentors list. Chris outlined the educational content and objectives of the sedation unit, including the ‘hands-on’ study days, which he described as ‘two days of managed carnage’ in the Oral Surgery department! (Further details of BUOLD courses may be obtained from the South West Region Dental Postgraduate Department website: http://swdentalpg.net/.)

Chris described the role and activities of SAAD, highlighting it as a leading and dynamic body in this particular field, with the capacity to adapt to changing legislation to ensure that benefits are delivered to both patients and members. SAAD organises a National Course three times per year that provides an introduction to, and updates in, postgraduate conscious sedation through its faculty, whose members range from nationally recognised tutors to registered practitioners and dental nurses.

Contact with its members is maintained by SAAD through the publication of an annual Digest that includes peer-reviewed articles related to conscious sedation, and an annual Newsletter that combines updates and reports of relevant contemporary issues. A range of other publications are also produced, such as medical history forms, patient information leaflets and guidance notes.

Kathy Wilson, Senior Dental Officer and Honorary Associate Specialist, Department of Sedation, Newcastle Dental School, in a very comprehensive presentation entitled ‘The Diploma Model’, described how the ‘gold standard’ (the Diploma in Conscious Sedation) was achieved there. GDC, DSTG and SDAC 2003 documents were cited as the basis of this postgraduate sedation training programme. The aims, programme content and learning outcomes were stated in detail. Evaluation of the course by participants, external examiners, the GDC and the University produced highly favourable comments.

A total of 20 students per annum are admitted to the 15-month course, which has a 90% pass rate; there have been 123 Diplomats since 1997.

Diplomas in sedation are also awarded from the Universities of London, Lancaster and Glasgow, with a course at Manchester coming on stream.
Training in sedation for dental nurses was described by Liz Mills, Tutor Dental Nurse from the Dental Hospital, who gave an overview of the post-qualification Certificate in Dental Sedation Nursing that is awarded by the National Examining Board for Dental Nurses (NEBDN). The examination, which has been available since 1989, is held twice a year in March and September and comprises a written paper, viva and a portfolio of a record of experience that must demonstrate involvement in a minimum of 25 cases of IV and inhalational sedation and 25 recovery cases with two expanded case studies. Evidence of competence is also required.

This package ensures that there is external monitoring to a national standard, knowledge and skills are improved and a sense of achievement for candidates leading to enhanced financial rewards is attained.

The panel discussion that followed was dominated by the underlying concern of the commissioning of sedation services. Other interesting points that were raised centred on maintaining the IV and inhalational sedation aspects of the dental nurse certificate as an integral unit and not splitting them as two separate awards and the justification for not standardising the diploma course throughout the UK.

This session revealed that the ‘broad church’ approach for education and training in dental sedation existed and that one size did not fit all. Both the standard and diverse approaches were delivering.

AGM

The AGM followed, at which the Chairman, Paul Coulthard, Honorary Secretary and Honorary Treasurer presented their reports. Paul was appreciative of those who had set up the meeting and of the enthusiasm of DSTG attendees. He outlined some of the challenges that lay ahead: to promote excellence in sedation practice, to engage in and improve postgraduate education as it varied in the UK and to stand up against cuts in funding for sedation.

CELEBRATING EXCELLENCE IN SEDATION

After a more than adequate lunch at the City Thistle hotel and a visit to the trade stands, the afternoon session commenced. The opening presentation, ‘Reflections – Conscious or Unconscious’, was rather special and very personal. In tune with the theme of the Symposium, Meg Skelly, Senior Lecturer and Honorary Consultant in Dental Sedation, KCL Dental Institute, was ‘facing the future’ as she embarked on a new life in retirement. Her tapestry revealed an extensive panorama as she reviewed her career pathway and acknowledged the many distinguished professionals who had been faithful companions on this fascinating journey. She recounted how, between 1970–78, she became a general nurse, an anaesthetic nurse at the Radcliffe Hospital, Oxford, an ITU nurse in Norway, a sister at Dulwich serving in the Department of Anaesthesia at King’s College London and a dentist.

In 1981 Meg was headhunted by Jack Tully at Guy’s, where an impressive teaching career, guiding dental nurses, dental students and postgraduates, began. A significant partnership was forged when David Craig joined her at the Dental School and the Department of Anaesthesia. One of their collaborations led to the formation of the DSTG; this conception occurred over a beverage in the Cock and Lion public house one January in the 1990s!

An extensive research portfolio was described, much of it related to conscious sedation and the intravenous drugs commonly used in dental sedation. It was not too long into her dental career that Meg was introduced to SAAD, another avenue of exploration. Demands as an examiner for the NEBDN, for undergraduate and postgraduate qualifications including the Diploma in Sedation, MScs and to represent specialist societies at the GDC, Royal Colleges and DH, never relented.

It was clear that a full and extremely productive career had been enjoyed; the dental sedation fraternity have been fortunate to receive the benefits of Meg’s lifelong commitment.

A cut glass vase was presented to Meg by Derek Debuse, a close colleague from Guy’s, in recognition of her outstanding service and to celebrate an excellent career. He emphasised Meg’s contribution to dental sedation and praised her integrity, energy, modesty and inspirational qualities.

Alison Dougall, Consultant in the Department of Special Care Dentistry, Dublin Dental School and Hospital, reviewed the development of a national strategy to deliver special care dentistry in Ireland. The Irish National Survey of Dental Health of 2002–03 had included subjects with special care requirements; the following year Professor June Nunn had organised round-table discussions to determine a way forward, as Ireland did not enjoy a coordinated approach for this type of care.

The Irish Dental Council has recognised special care dentistry, which has been fast-tracked to become a
DSTG SYMPOSIUM

speciality by the year 2008 to accompany orthodontics and oral surgery. A three-year full-time postgraduate programme, with MFDS as an entry requirement, in special care dentistry commenced at the Dublin School in September 2007. Alison described the course contents, which include a sedation component with the opportunity for the chairside support team to obtain dental nurse sedation training at either Belfast or Birmingham Dental Hospital.

Alison stated that in Ireland sedation and special care dentistry go together; she then presented several clinical cases to illustrate how dental care could be provided to the most disadvantaged members of society. Her enthusiasm to deliver excellence to her patients was clear to see.

Another enthusiastic practitioner followed: Paul Averley, dental practitioner and Principal of the Queensway Anxiety Management Clinic, a specialist referral centre in Billingham, Teesside. This centre treats approximately 8,000 patients per annum, of which 70% are children; standard techniques are administered by the team of dentists, who all possess the Diploma in Conscious Sedation, while the alternative techniques are given by consultant anaesthetists. In Paul's opinion standard techniques were suitable for the 'high street' dental practice setting whereas alternative techniques should be administered in specialist centres.

Paul discussed the concept of developing a research agenda for dental sedation performed within the primary care environment. He suggested the way forward was to develop alternative sedation techniques appropriate for this environment supported by evidence-based research to demonstrate safety and efficacy. His personal research journey was detailed and he outlined projects in progress, including the development of performance indicators and the measurement of quality, and the effectiveness of combinations of systemic analgesics.

Research had to be targeted, of high quality and coordinated, preferably in collaboration with colleagues at other centres. The primary care setting was ideally placed for research as there was a pool of many enthusiastic practitioners caring for large numbers of subjects.

Paul’s parting shot was that research capacity in dental sedation had to be grown as a top-down and bottom-up process.

The final presentation on the excellence theme, given by Dr Nigel Robb, Senior Lecturer in Sedation in Relation to Dentistry, University of Glasgow Dental Hospital and School, was ‘Who’s Excellent at Undergraduate Training in Pain and Anxiety Control in Europe?’ The expansion of the EU, freedom of movement and employment and the unequal distribution of the workforce have had an impact on UK dentistry. The question ‘are all dentists within the EU trained to the same standard?’ had been raised.

Data for this research had been acquired through a questionnaire distributed to members of EFAAD (the European Federation for the Advancement of Anaesthesia in Dentistry); these included the UK, Italy, the Netherlands, Germany, France, Russia and Israel. The areas of investigation had focused on patient evaluation (physical and psychological) prior to sedation, tuition in local anaesthetics and techniques, sedation use and case load and whether general anaesthesia was taught to undergraduates.

This investigation had identified differences in expectations of dental graduates, differences in what they were allowed to do and differences in the philosophy of practice; the main conclusion was the existence of a wide variation in education for dental sedation in the EU.

Because of this freedom of movement, dentists potentially had access to drugs and techniques for which they had not 'received appropriate supervised theoretical, practical and clinical training before undertaking independent practice'. This would make the provision of postgraduate training significantly more complicated because of the variance in baseline skills and knowledge. However, the UK was doing well and, certainly at undergraduate level, led the field.

The meeting concluded with two free papers: ‘Special Care Sedation Training in Practice’ and ‘Patient Attitudes towards Fasting prior to Intravenous Sedation’.

The Chairman reminded members that next year’s meeting would be held in Manchester in mid-May and closed the proceedings.

It had been a full day with much to contemplate; while the presentations had described plurality for the delivery of training and education in dental sedation within the UK there had been many examples of excellence in operational outcomes. All roads lead to Rome? ■

Stephen Jones
DSTG Member
Sexual ideas or dreams are encountered in patients who have been sedated or anaesthetised. The Lancet recently published two medico-legal editorials reviewing midazolam. These experiences are believed to be real by the patient, although in many cases the environment would have made assault impossible. Current experience prompted a historical review.

First cases were reported in The Lancet in 1849, within three years of the demonstration of anaesthesia; this shows practitioners recognised the experience and that a chaperone was advisable.

The first reported case of sexual abuse during anaesthesia occurred in Paris in 1847. A Parisian dentist was accused of using ether to sexually assault two girls on successive days. Physical examination revealed that the first girl truly may have been assaulted. The second girl could recall details of the assault and said she was powerless to move and unable to fight off the dentist. In defence the court heard that these allegations were an ether-induced dream, so it is apparent that it was known that dreams and hallucinations occurred with ether. The court chose to convict, and the dentist went to prison on 30 October 1847.

In January 1849 the Westminster Medical Society discussed ‘Chloroform in midwifery’. Dr G. T. Green opposed the use of chloroform, quoting several cases where women under the influence had made use of obscene and disgusting language. Dr Tanner reported a case where an operation on the vagina of a prostitute under ether had produced lascivious dreams. Dr Hancock had also noticed this effect. Mr Miller thought these unpleasant manifestations were most frequent among the lower classes addicted to the use of ardent spirits.

Concern about sexual dreaming also occurred in America. In 1854 Dr S. T. Beale, a dentist, was accused of sexually assaulting a young woman while administering ether for a dental extraction. The dentist vigorously denied the accusation. The defence cited evidence of good character, the peculiarly exposed position of the chair, the likelihood of interruption, and the presence of three people in the next room. At the trial these people commented on how calm the woman was when she left the surgery. Fellow dentists were called to reveal their experience of hallucinations under ether.

The prosecution produced witnesses to refute the above, and the woman’s physician. He only saw her four days later and did not perform any physical examination. The dentist was found guilty and sentenced to 4½ years. This caused a huge outcry in the medical and dental community, with supporting articles in the journals of the day; the result was a rapid pardon by ‘The Executive of the State’.

In 1858 a dentist in Montreal was accused of attempted rape while using chloroform. At his trial the husband of another patient testified that his wife also thought she had been assaulted by the dentist, but that he had been present throughout the operation and no assault had occurred. Again the dentist was found ‘Guilty of attempt to commit rape, with recommendation to mercy’.

SEXUAL DREAMING DURING ANAESTHESIA: EARLY CASE HISTORIES 1849–1888 OF THE PHENOMENON

Strickland RA, Butterworth JF
Anesthesiology 106(6) June 2007 1232–1236.
Dr M. Stille, a physician prominent in American jurisprudence, wrote on the matter; his work includes the only man mentioned in these early reports. He urged the courts to receive the reports with proper suspicion and quoted six points on the effect on consciousness of ether or chloroform that the courts should take into account.

In 1874 *The Lancet* published two articles on alleged sexual assault, the second of which described three cases where the accusation against the physician was false and the cases were dismissed. One of these was a young girl having a dental extraction. *The Lancet* said: 'Surgeons should endeavour to have witnesses whenever ether or chloroform is administered to women'.

The last words, spoken over 100 years ago, are those of Dr D. W. Buxton (1855–1931). 'No administrator of anaesthetic is safe from having such a charge preferred against him, and if he and his supposed victim are alone it is simply a case of word against word'.

---

**INTRAVENOUS CONSCIOUS SEDATION IN CHILDREN FOR OUTPATIENT DENTISTRY**

Mikhael MS, Wray S, Robb ND.

**OBJECTIVES**
Introduces the reader to a safe multiple-agent IV sedation technique, enables an increased understanding of the use of IV sedation in children, and also explains that the depth of sedation can reliably be controlled according to the dosage that has been administered. This reliable sedation technique is not general anaesthesia.

**AUDIT DESIGN**
The balanced sedo-analgesic IV sedation technique is described, as is the rationale for the use of midazolam, remifentanil and ketamine. The assessment protocol and consent process with various safety protocols for the sedation, recovery and discharge are discussed. 1,000 ASA I and II children between 3 and 10 years of age were treated over a 21-month period.

**RESULTS**
The vast majority (993 out of 1,000) were successful. Almost all cases (997) had amnesia of the dental treatment while some (13) patients had low-grade crying throughout the procedure. Transient hypoxia was observed in 0.8% of patients and post-operative nausea and vomiting occurred in 5.3% of children. Duration of sedation had a mean time of 26 minutes and recovery and discharge was complete within 30 minutes in 93.1% of cases. All parents reported that the children were back to normal within four hours.

**DISCUSSION**
Using fixed doses per kg bodyweight, six children lost verbal contact during the procedure or early in recovery. Although all maintained their saturation, there is potential for airway obstruction or apnoea. Incremental titration reduces the risk of over-sedation even with the co-administration of drugs with differing half-lives. The authors warn of the risk of higher doses of ketamine – this could stimulate excessive secretions and there is an increased risk of laryngospasm. Along with the shared airway, this increases the risk of airway obstruction. The authors suggest that propofol may be substituted for midazolam in shorter procedures.

**CONCLUSION**
Only teams trained and experienced in these techniques should be using them in young children. Clinics in which these techniques are carried out should be subject to rigorous inspection and regulation. In young children this technique is safe and effective in the appropriate environment and if performed by a well trained and experienced team.

---

**EXPOSURE TO NITROUS OXIDE IN A PAEDIATRIC DENTAL UNIT**

Gilchrist F, Whitters CJ, Cairns AM, Simpson M, Hosey MT.

**OBJECTIVE**
The aim of this study was to evaluate the 8-h time-weighted average (8-h TWA) exposure to nitrous oxide of dentists working in a paediatric dental unit.

**METHODS**
Three operators wore dosimeters or sensors to detect nitrous oxide levels. 34 children were treated in 17 sessions where dental treatment was carried out under inhalation sedation with nitrous oxide/oxygen.

**RESULTS**
Active scavenging was used for all children; 23 were treated using the Porter/Brown scavenging system and 11 with the Accutron system. Exposure to nitrous oxide expressed as an 8-h TWA ranged from 16 to 374ppm, with a mean of 151ppm. The recommended 8-h TWA
of 100ppm was achieved in only 38% of cases. Increased levels of nitrous oxide were associated with poorer patient behaviour, with restorative treatment and with the extractor fans being switched off. Increased levels were found in children older than 10 years and during many sequential treatments being provided.

CONCLUSIONS
This study found that the recommended 8-h TWA was achieved in only 38% of treatment episodes, despite the use of active scavenging.

A COMPARISON OF THE ‘COST PER CHILD TREATED’ AT A PRIMARY CARE-BASED SEDATION REFERRAL SERVICE WITH THAT OF A GENERAL ANAESTHETIC IN HOSPITAL

Jameson K, Averley PA, Shackley P, Steele J.

AIM
To compare the cost-effectiveness of dental sedation techniques used in the treatment of children, focusing on advanced conscious sedation in a controlled primary care environment and on hospital-based dental general anaesthetic (DGA).

METHODS
Data on fees, costs and treatment pathways were obtained from a primary care clinic specialising in advanced sedation techniques. For the hospital-based DGA cohort, data were gathered from hospital trusts in the same area. Comparison was via an average cost per child treated and subsequent sensitivity analysis.

RESULTS
Analysing records spanning one year, the average cost per child treated via advanced conscious sedation was £245.47. As some treatments fail (3.5% of cases attempted), and the technique is not deemed suitable for all patients (4–5%), DGA is still required and has been factored into this cost. DGA has an average cost per case treated of £359.91, 46.6% more expensive than advanced conscious sedation. These cost savings were robust to plausible variation in all parameters.

CONCLUSION
The costs of advanced conscious sedation techniques, applied in a controlled primary care environment, are substantially lower than the equivalent costs of hospital-based DGA, informing the debate about the optimum way of managing this patient group.

BISPECTRAL INDEX IN SEDATION WITH INTRANASAL MIDAZOLAM AND INTRAVENOUS DIAZEPAM IN DENTAL PRACTICE

Minerva Stomatol 2007 Mar;56(3):85–104

AIM
The aim of this study was to assess by clinical evaluation and by bispectral index (BIS) the tranquilising properties of diazepam injected intravenously, and 0.1mg/kg midazolam by the intranasal route, in dental implant patients.

METHODS
A group of 34 patients undergoing implantology was divided at random into two groups of 17. They were evaluated physically, clinically and psychologically. Pre-operative anxiety was treated with diazepam per os, administered before induction of conscious sedation. In the first group, conscious sedation was accomplished by induction with titrated doses of IV diazepam, and in the second group with 0.1mg/kg of intranasal midazolam. BIS values were analysed as area under the curve (AUC).

RESULTS
The AUC BIS values after Valium pre-sedation overlapped in both groups. AUC after midazolam decreased after induction of conscious sedation (P < 0.05), during anaesthesia (P < 0.01) and during intervention (P < 0.01), compared with the diazepam treatment. In the midazolam group the BIS values were on average lower than 90, while in the diazepam group they were on average higher than 95 (P < 0.01). Psychomotor recovery was more impaired after midazolam.

CONCLUSIONS
The study shows that the nasal route ensures the quick absorption of midazolam, as seen during the first three minutes from drug administration. The depressant effect of midazolam increased as a function of time, reaching the highest levels during intervention. The results suggest that midazolam has sedative effects that may compromise the state of consciousness of the patient and be incompatible with the definition of conscious sedation in dentistry.
Patients appreciate being offered sedation for their dental treatment, whether they are fearful, phobic or simply have a long and tedious procedure in prospect.

The SAAD course provides underpinning knowledge and training in the clinical skills required to provide the basic sedation techniques. Alternative sedation techniques are introduced and discussed.

It is designed both as an introduction and as an update for more experienced sedationists. Guidance is given regarding further training and the acquisition of clinical experience.

Dentists are encouraged to enrol their dental nurses on the parallel course as successful sedation depends on effective team work.

SAAD’s teaching is provided by a faculty that includes some of the best-known names in conscious sedation in the UK. The courses are ‘busy’ but fun with many opportunities for hands-on sessions.

Quotes from recent evaluation forms:
‘A lively weekend with friendly and approachable lecturers.’
‘I am now confident that I can provide a better service to my patients.’

The course is held at
Mile End Road Campus, Queen Mary College, London.
It is registered with the FGDP and the KSS deanery for 12 hours CPD.

FORTHCOMING COURSES:
8/9 March 2008
21/22 June 2008
1/2 November 2008

DETAILS AND APPLICATION FORMS:
www.saad.org.uk

ENQUIRIES:
saaduk@freeuk.com
020 7631 8893
01403 780465 (24 hr message)
### SAAD Supplies

<table>
<thead>
<tr>
<th>Service</th>
<th>Members</th>
<th>Non-members</th>
<th>Postage</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Intravenous Sedation</strong></td>
<td>£17.50</td>
<td>£22.50</td>
<td>£7.80*</td>
</tr>
<tr>
<td>Pre-sedation instructions (per 200)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Dental Treatment for Anxious Patients</strong></td>
<td>£17.50</td>
<td>£22.50</td>
<td>£7.80*</td>
</tr>
<tr>
<td>Information brochure (per 200)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Medical History Forms</strong></td>
<td>£15.00</td>
<td>£20.00</td>
<td>£5.15*</td>
</tr>
<tr>
<td>(per 200)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Sedation Record Forms</strong></td>
<td>£15.00</td>
<td>£20.00</td>
<td>£5.15*</td>
</tr>
<tr>
<td>(per 200)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Standards in Conscious Sedation for Dentistry</strong></td>
<td>50p</td>
<td>50p</td>
<td>–</td>
</tr>
<tr>
<td><strong>Conscious Sedation: A Referral Guide for Dentists</strong></td>
<td>50p</td>
<td>50p</td>
<td>–</td>
</tr>
</tbody>
</table>

*If four or more items are ordered together, the postage and packing will be £15.60.

Order forms are available from
- www.saad.org.uk
- SAADoffice@aol.com
- 020 7631 8893
- SAAD Supplies
  21 Portland Place
  LONDON W1B 1PY

For further information please refer to www.saad.org.uk or contact Fiona Wraith on SAADoffice@aol.com or 01302 846149
Subscription fees for 2008 fall due in January 2008.

If you are unsure if you have paid your subscription fees please contact SAADoffice@aol.com or 020 7631 8893.

The subscription fees remain:

<table>
<thead>
<tr>
<th>Subscription Type</th>
<th>Fee</th>
</tr>
</thead>
<tbody>
<tr>
<td>UK members subscription fee</td>
<td>£25 per annum</td>
</tr>
<tr>
<td>Overseas members subscription fee</td>
<td>£28 per annum</td>
</tr>
</tbody>
</table>

There are three payment methods now available:

- **Cheque**
  (made payable to SAAD and sent to the address below)

- **Direct debit**
  (please contact SAADoffice@aol.com, 020 7631 8893 or www.saad.org.uk for a form)

- **Credit card**
  (please contact SAADoffice@aol.com, 020 7631 8893 or www.saad.org.uk for a form)

SAAD Membership Subscriptions
21 Portland Place
London W1B 1PY

Tel: 020 7631 8893  Email: SAADoffice@aol.com
Annual Conference and AGM

Saturday 27 September 2008

The Royal Society of Medicine
1 Wimpole Street, London W1G 0AE

Enquiries:
SAAD, 21 Portland Place, London W1B 1PY
020 7631 8893 | saad@aagbi.org | www.saad.org.uk
DENTAL STUDENTS

You are invited to express your views on any subject related to
CONSCIOUS SEDATION, ANALGESIA OR DENTAL ANAESTHESIA

A PRIZE OF £300

• Write an essay on one topic in ENGLISH on A4 paper,
double-spaced, formatted on disc as a Microsoft Word document and not exceeding 3,000 words
• Entries must be received by 31 March 2008
• The decision of the panel of assessors appointed by SAAD will be final
• Entries, accompanied by name and address, should be sent to:

SAAD
Dental Student Prize
21 Portland Place
LONDON
W1B 1PY
www.saad.org.uk

A PRIZE OF £300

For Dental Nurses!

Is sedation something more to you than a shot in the arm?
If so – the SAAD Dental Nurse prize could be yours!

You are invited to express your views on any subject related to
Conscious Sedation, Analgesia or Dental Anaesthesia

• Write an essay on one topic in ENGLISH on A4 paper,
double-spaced and also formatted on disc as a Microsoft Word
document and not exceeding 2,500 words
• Entries must be received by 31 March 2008
• The decision of the panel of assessors appointed by SAAD will be final
• Entries, accompanied by name and address, should be sent to:

SAAD
Dental Nurse Prize
21 Portland Place
LONDON
W1B 1PY
www.saad.org.uk
GUIDELINES FOR AUTHORS

The SAAD Digest accepts manuscripts either by email or mail.

MANUSCRIPTS should be word-processed in Microsoft Word format and double-spaced with a margin of at least 4 cm on the left-hand side. The pages should be numbered consecutively with numbers centred at the bottom of each page. The first page of the manuscript should give only the title of the article, and the author(s)/authors' name(s), qualifications and address(es).

SUBMISSION: in the case of paper submission, the author(s) should send two copies of the paper to: Fiona Wraith, Executive Secretary, SAAD, 21 Portland Place, London W1B 1PY. A copy of the paper on disc should also be submitted.

Authors are also encouraged to submit their manuscripts via email to SAADoffice@aol.com.

In both cases the submission should be accompanied by a covering letter signed by all of the authors.

PEER REVIEW is by at least two referees and the Chairman of the Editorial Board. Statistical advice may be sought if felt appropriate.

LENGTH OF CONTRIBUTIONS: ideally, contributions should be no more than 3,000 words, including tables and figures. Tables and figures will count as 100 words. Case reports may be submitted, but should be no more than 750 words in length. Titles must be descriptive of the contents of the article, but yet concise. Papers should be introduced with a short abstract.

ABSTRACTS should be able to stand alone. The abstract should not contain references or abbreviations, and should be no longer than 200 words.

DATA AND TABLES may be submitted in Microsoft Excel format or embedded in the text of the Word document. Figures or images should be submitted as external files in TIFF, JPEG or EPS format. The SAAD Digest is published in colour and colour illustrations are preferred.

ILLUSTRATIONS: If a person is recognisable from a photograph, written consent must be obtained prior to publication, and a copy sent to SAADoffice@aol.com. The submission of electronic images on disc or by email is preferred. If submitting hard copy, please do not submit the original until the manuscript has been accepted for publication. Once the manuscript has been accepted, the submission of photographs or slides for professional scanning is required.

Units used in the manuscript must conform to the Système International d’Unités (SI).

REFERENCES must be in the Vancouver style. They should be numbered in the order in which they appear in the text. The numbers should be inserted in superscript each time the author is cited (‘Jones’ reported . . . ’ or ‘Smith et al’ found . . . or ‘Other reports’ have . . . ’). A full list of references must be provided at the end of each manuscript. The reference list should give the names and initials of all the authors unless there are more than six, in which case only the first three should be given in full, followed by et al. The authors are followed by the title of the article; the journal title abbreviated as per Index Medicus and Index to Dental Literature; year of publication; volume number; and first and last page numbers in full. Titles of books should be followed by the place of publication; publisher; and year.

Examples of reference style:

Reference to an article

Reference to a book

Reference to a book chapter

Reference to a report

RESPONSIBILITY OF THE AUTHOR/PRINCIPAL AUTHOR: the author is responsible for the accuracy of the reference list for the article. It is a condition of the acceptance of manuscripts that they are solely the work of the author(s) listed on the first page of the manuscript and have neither been previously published nor are under consideration for publication in any other journal.

ETHICS: articles reporting clinical research should include a statement indicating that Ethical Committee approval has been granted.

ACKNOWLEDGEMENTS should be included in one paragraph between the text and the references. Permission and approval of the wording must be obtained from those who are listed.

The Editorial Board reserve the right to edit the manuscripts for clarity and to conform to acceptable style and the space available for publication. Proofs will be supplied for correction of misprints – material changes can only be made in exceptional circumstances.
Relative Analgesia is fast becoming the more natural choice for many dental practices performing sedation at chairside.

The transition from complete IV to RA & Sedation techniques is closer than it has ever been. Indeed, many practices have realised that R.A. can dramatically dispel patient’s fears of complex treatments.

**3 steps to successful analgesia...**

- The Digital MDM Mixer
- Porter brown Scavenger Breathing System
- The New Miniscav active scavenger unit Fully soundproofed

Holmes House, Skipton Road, St recton, West Yorkshire
BD20 6SD
Tel: 01535 652 444
Fax: 01535 653 333
www.ramomedical.com
The MC1 RA flow-meter from McKesson is an independent mixture control machine manufactured in the UK. The company provides a complete range of specialist equipment for inhalation sedation and relative analgesia.

MC1 is available as either a mobile or piped system. McKesson also supplies and installs medical gas delivery systems; representatives will be pleased to discuss the options available and give a free quotation. The illustration shows the MC1 RA as an integral part of the Cetradent surgery concept.
<table>
<thead>
<tr>
<th>2008</th>
<th>DATE</th>
<th>ORGANISATION</th>
<th>THEME/TITLE</th>
<th>VENUE</th>
<th>CONTACT</th>
</tr>
</thead>
<tbody>
<tr>
<td>JANUARY</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>16–18</td>
<td>WSM London</td>
<td>QEI Conf. Centre Westminster</td>
<td>QEI Conf. Centre Westminster</td>
<td><a href="mailto:WSMLondon@aagbi.org">WSMLondon@aagbi.org</a></td>
</tr>
<tr>
<td></td>
<td>25</td>
<td>ADSA</td>
<td>Human Simulation</td>
<td>Dayton, Ohio, USA</td>
<td><a href="http://www.adsahome.org/meetings.html">www.adsahome.org/meetings.html</a></td>
</tr>
<tr>
<td>FEBRUARY</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>15–17</td>
<td>ADSA</td>
<td>General Anesthesia and Moderate/Deep Sedation</td>
<td>Las Vegas, USA</td>
<td><a href="http://www.adsahome.org">www.adsahome.org</a></td>
</tr>
<tr>
<td>MARCH</td>
<td>8–9</td>
<td>SAAD</td>
<td>NATIONAL COURSE IN CONSCIOUS SEDATION FOR DENTISTRY</td>
<td>London</td>
<td><a href="http://www.saad.org.uk">www.saad.org.uk</a></td>
</tr>
<tr>
<td>MAY</td>
<td>1–3</td>
<td>BDA</td>
<td>Annual Conference: Strategies for Success: You and your team</td>
<td>Manchester Central Convention Complex</td>
<td><a href="http://www.bda.org/education/annual.cfm">www.bda.org/education/annual.cfm</a></td>
</tr>
<tr>
<td></td>
<td></td>
<td>ADSA</td>
<td>Annual Session</td>
<td>Puerto Rico</td>
<td><a href="http://www.adsahome.org/meetings.html">www.adsahome.org/meetings.html</a></td>
</tr>
<tr>
<td></td>
<td>8–9</td>
<td>ESRA</td>
<td>Silver Anniversary Zonal Meeting</td>
<td>Association of Anaesthetists and the Royal Institute of British Architects, Portland Place, London W1</td>
<td><a href="http://www.esraeurope.org/">www.esraeurope.org/</a></td>
</tr>
<tr>
<td></td>
<td>9–10</td>
<td>Joint Symposium of DSTG and ADA</td>
<td>Theme tbc</td>
<td>University of Manchester Conference Centre and Days Hotel</td>
<td><a href="http://www.dstg.co.uk">www.dstg.co.uk</a></td>
</tr>
<tr>
<td>JUNE</td>
<td>21–22</td>
<td>SAAD</td>
<td>NATIONAL COURSE IN CONSCIOUS SEDATION FOR DENTISTRY</td>
<td>London</td>
<td><a href="http://www.saad.org.uk">www.saad.org.uk</a></td>
</tr>
<tr>
<td>JULY</td>
<td>2–4</td>
<td>GAT</td>
<td>Annual Scientific Meeting</td>
<td>Liverpool</td>
<td><a href="http://www.aagbi.org">www.aagbi.org</a></td>
</tr>
<tr>
<td>SEPTEMBER</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>17–19</td>
<td>AAGBI</td>
<td>ANNUAL CONGRESS</td>
<td>Torquay</td>
<td><a href="http://www.aagbi.org">www.aagbi.org</a></td>
</tr>
<tr>
<td></td>
<td>24–27</td>
<td>ESRA</td>
<td>XXVII Annual ESRA Congress</td>
<td>Genoa, Italy</td>
<td><a href="http://www.kenes.com/esra/">www.kenes.com/esra/</a></td>
</tr>
<tr>
<td></td>
<td>27</td>
<td>SAAD</td>
<td>Annual Conference and AGM</td>
<td>The Royal Society of Medicine, London</td>
<td><a href="mailto:saad@aagbi.org">saad@aagbi.org</a></td>
</tr>
<tr>
<td>NOVEMBER</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>1–2</td>
<td>SAAD</td>
<td>NATIONAL COURSE IN CONSCIOUS SEDATION FOR DENTISTRY</td>
<td>London</td>
<td><a href="http://www.saad.org.uk">www.saad.org.uk</a></td>
</tr>
<tr>
<td></td>
<td>27–28</td>
<td>UK Society for Intravenous Anaesthesia</td>
<td>Annual Scientific Meeting</td>
<td>De Vere Grand Harbour, West Quay Road, Southampton SO15 1AG</td>
<td><a href="mailto:52008@sivauk.org">52008@sivauk.org</a></td>
</tr>
<tr>
<td>Children and Parents Referred to a Primary Care Sedation Service</td>
<td>Sedation in Primary Care: Progress and Politics</td>
<td>SAAD Dental Nurse Prize Winning Essay</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>-------------------------</td>
<td>-----------------------------------------------</td>
<td>-------------------------------------</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**SAAD DIGEST**

**JOURNAL OF THE SOCIETY FOR THE ADVANCEMENT OF ANAESTHESIA IN DENTISTRY**

**VOLUME 24 | JANUARY 2008**