

The implications of substance misuse for intravenous conscious sedation practice

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IN BRIEF

- Highlights the health implications and consequences of substance misuse and how this can impact on the delivery of general dental care.
- Emphasises why thorough information-gathering prior to any procedure is imperative for the safe delivery of care.
- Discusses the indications for appropriate referral of patients to secondary care and the multidisciplinary management of patients therein.

PRACTICE

Substance misuse is a major health concern in the United Kingdom, as the consequences for individuals are significant and may include multisystem organ damage. It is important for the dentist to know which patients are misusing substances as some pharmacological agents routinely used in dental practice may be contraindicated. The dentist should be aware of the range of clinical presentations that may arise from substance misuse and when suspected, a thorough drug history must be obtained. Patients may require special consideration and further investigations when planning elective procedures, particularly under intravenous conscious sedation. Therefore, management within a specialist centre and liaison with other health professionals may be indicated to ensure treatment is provided safely.

INTRODUCTION

Despite efforts in health education, prevention and rehabilitation, substance misuse remains a rising concern. According to the 2012/13 Crime Survey for England and Wales, 2.6% of adults aged 16–59 had taken a Class A drug in the last year (equivalent to almost 850,000 people). Cannabis was the most commonly used drug, with 6.4% of adults aged 16–59 using it in the last year. The next most commonly used drugs were cocaine and ecstasy (1.9% and 1.3%, respectively).¹ The exact figures for misuse of controlled drugs are unknown, however the All Party Parliamentary Group for Involuntary Tranquilliser Addiction have estimated that there are currently 1.5 million people addicted to controlled drugs within the UK.²

With the interplay of biological, genetic, psychological, social, cultural and environmental factors contributing to substance abuse, it is not surprising that understanding the complexity of the problem is challenging. The adverse effects of substance misuse may impact on the pulmonary, cerebral or cardiovascular systems and this compromise may be exacerbated and complicate the use of intravenous sedation (IVS). The dentist

also needs to be aware of substance misuse because of the long-term negative consequences that it may have on the patient's health and how it can impact on the delivery of general dental care.

The provision of adequate anxiety control is an integral part of the practice of dentistry. The General Dental Council has indicated that this is both a right for the patient and a duty placed on the dentist.^{3,4} All patients deserve appropriate anxiety control for any dental procedure; in order to be successful and appropriate, the methods used must be considered for the individual patient requiring specific treatment. A 'one size fits all' approach is inappropriate, particularly when considering patients with a history of substance misuse.

In this article we will be discussing some of the most frequently used recreational drugs, their effects and their relevance for the dental sedationist. We will also discuss why it is important to know a patient's history of substance abuse before administering local anaesthesia or systemic analgesia, as it allows us to predict adverse drug interactions and predict tolerance to certain agents. This article aims to promote good clinical practice through recommendations for the provision of safe and effective conscious sedation in dentistry.

PRE-PROCEDURAL PATIENT ASSESSMENT

Careful evaluation of the patient should occur before using any form of sedation technique. The purpose is to identify those with pre-existing medical conditions from

the medical history or findings on examination that may adversely affect the outcome of sedation.⁴ The medical history is taken and interpreted by the dentist before the elective treatment date. An appropriately trained nurse may be involved in taking routine observations such as heart rate, blood pressure, oxygen saturation and calculating the patient's BMI score.

A thorough medical, dental and social history is always taken or updated as part of the routine dental examination visit, and it is important not to neglect paying attention to both prescribed and non-prescribed medications to ensure that the sedation technique chosen is the most appropriate to enable treatment to be carried out effectively and safely.³

Examples of questions include:⁵

- 1. Do you drink alcohol? If the response is, 'no', then ask whether the patient used to drink alcohol and why they no longer do
- 2. Do you use any recreational drugs? If the response is, 'no', then make sure that the patient has understood the question by providing examples of common drugs such as cannabis, cocaine, heroin, amphetamines. Also ask whether the patient has ever used drugs in the past
- 3. Do you use any prescription drugs other than as directed by your doctor?

All questioning must be carried out in a non-judgemental manner, ideally once a rapport with the patient has been established. This increases the likelihood that the patient will divulge sensitive information. By asking open-ended questions and removing

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any assumptions and bias, you are more likely to receive honest information on drug and alcohol use from the patient. A thorough history of substance use should include the types of drugs used, routes of administration, frequency and duration of use and the time of last dose (Table 1).

When taking a history, it is important for the clinician to be alert, as not all patients will be honest about their substance misuse habit.

- Poor historians
- Vagueness about alcohol/drug intake
- Disproportionate demand for analgesia
- Lack of patent peripheral veins for venous access (IV drug users)

After a thorough history, the patient's vital signs may be recorded in order to determine the patient's American Society of Anaesthesiology (ASA) physical classification status.⁶ The ASA score is a subjective assessment of a patient's overall health that is based on five classes (I–V) (Table 2).

Patients who fall in the ASA IV and V categories are normally hospitalised or bed-ridden and are generally only seeking emergency dental treatment. Only ASA categories I and II are suitable for treatment in general practice whereas ASA III patients are best treated in an environment where more experienced support is available.⁷ Patients who give a history of substance misuse may present as ASA II/III due to the increased likelihood of mild to moderate systemic disease secondary to substance misuse; therefore, treatment is likely to be referred to a hospital based clinic or a sedation clinic where medical support is available. A routine check of vital signs can also alert to the presence of substance intoxication or withdrawal. A lower-than-normal temperature, an increased or decreased blood pressure, or an abnormal respiratory rate indicates a need for a thorough medical examination.⁸

SPECIAL INVESTIGATIONS

When substance abuse is disclosed or the clinician has a high index of suspicion of abuse although the patient has not reported it, a referral to secondary care is recommended, as special investigations may be deemed appropriate before the delivery of treatment. Examinations and testing will depend upon the presence of history, risk factors, symptoms and physical signs.

Some examples of typical investigations that may be necessary are:

- Examination of cardiovascular and respiratory systems, which may include chest Xrays and simple pulmonary function tests such as peak flow and FEV/FVC

Table 1 DOs and DON'Ts when asking about drugs and alcohol⁵

Do	Don't
Ask open-ended questions Quantify the drug or alcohol use Be inquisitive Be empathetic	Ask leading questions Judge a patient Ask questions in a judgmental way Assume that they are being truthful Settle for ambiguous answers

Table 2 American Society of Anaesthesiology Classification of Physical Status⁶

I	Patient is a completely healthy fit patient.
II	Patient has mild systemic disease.
III	Patient has severe systemic disease that is not incapacitating.
IV	Patient has incapacitating disease that is a constant threat to life.
V	A moribund patient who is not expected to live 24 hour with or without surgery.

- Coagulation screen to provide an initial broad categorisation of haemostatic problems which may result from alcohol abuse
- Platelet count to screen for thrombocytopenia caused by excessive cannabis, heroin, cocaine, ecstasy and MDMA use
- Liver function tests to screen for the presence of liver disease, affecting the production of vitamin K dependent clotting factors (II, VII, IX, X) which may be the cause of haemostatic problems as a result of infection or the use of heroin, inhalants and steroids
- Glomerular filtration rate to assess for renal damage or failure which may occur either directly or indirectly from dangerous increases in body temperature and muscle breakdown, or injection of substances into the blood which do not readily dissolve
- Oxygen saturation to assess for lung complications including tuberculosis and various types of pneumonia that may result from the poor health of the user or respiratory depression
- Hep B and Hep C, HIV screen, tuberculin test to screen for various infectious diseases
- ECG to assess for potentially fatal cardiac arrhythmias.

Their management may require consultation with the patient's general practitioner or addiction specialist, for whom it may be more appropriate to perform some of the above investigations, to outline a treatment plan that allows for conscious sedation to be carried out safely.⁹

Possible complications when providing IVS to patients with a history of substance misuse include:

- Local anaesthetic with vasoconstrictor may increase cardiovascular risks,

such as lethal cardiac arrhythmias and cerebral haemorrhage^{10–14}

- Patients have an increased bleeding tendency due to altered platelet function, liver disease and vitamin K deficiency
- Renal damage may be caused or exacerbated by substance abuse. Renal insufficiency can lead to prolonged sedation due to the reduced clearance and accumulation of metabolites
- Providing effective pain management is complex as patients with addiction are at increased risk of receiving inadequate pain management.¹⁵ Liaising with a medical professional is advisable to formulate an appropriate plan for postoperative analgesia that will be adequate and will not interact with any medications being taken.

Precautions to take when providing IVS to patients with a history of substance misuse include:

- Local anaesthetics with vasoconstrictors can increase the risk of myocardial infarction, hypertension, lethal cardiac arrhythmias and cerebrovascular accidents in substance abusers.^{16–23} It may be advisable to use plain local anaesthetic solutions to minimise these risks
- It has been advised that prescribing paracetamol for postoperative pain should be limited to less than 2.5 g daily in dental patients with a history of drug and alcohol abuse with compromised hepatic function¹⁸
- The nephrotoxicity of NSAIDs has been well described.¹⁹ They may be tolerated in patients with mild liver disease however should be avoided in patients with renal insufficiency due to the risk of hepatorenal syndrome and the morbidity relating to this complication²⁰
- In patients with renal insufficiency, no specific adjustments for the dosage

are required with the use of local anaesthetics²¹ as the clearance of local anaesthetics is not diminished because they are inactivated in the liver (amides) or hydrolysed in the plasma (esters), but the amount of vasoconstrictor should be minimised because of hypertension secondary to renal disease²²

- The main mode of transmission of hepatitis C is intravenous (IV) drug abuse.²³ Approximately 15–20% of persons who acquire HCV infection progress to potentially serious cirrhosis and end-stage liver disease.²⁴ The resulting compromise in the hepatic function requires extra caution with the use of amide-type anaesthetics like lidocaine and prilocaine, both of which are metabolised in the liver
- Hepatic insufficiency does not affect the duration of action of local anaesthetics. Therefore, these patients require the standard amount of local anaesthetic for each treated site; however it is advisable to treat only one quadrant at a time to minimise the total dose
- In the heavy-using marijuana patients when local anaesthetic with adrenaline is used, tachycardia and peripheral vasodilatation can be enhanced to possibly life-threatening levels especially if anxiety levels are also significantly elevated.²³ It is suggested that dentists tell their heavy-using marijuana patients to cease its use for at least one week before dental treatment.²⁵ It is sensible to suggest that plain local anaesthetic solutions are used where possible
- Pain tends to be under treated in this population due to biases, misconceptions and systemic issues. Patients with addiction often complain of higher levels of pain than would be expected for a given procedure/situation. Liaising with a medical professional may be advisable to formulate a plan for postoperative analgesia that will be adequate and safe.

MONITORING

Stringent clinical monitoring and appropriate recording of the level of responsiveness, airway, respiration, pulse and colour are of particular importance throughout conscious sedation procedures. All members of the clinical team must be capable of monitoring the condition of the patient. For intravenous sedation this must include the appropriate use of pulse oximetry with an audible alarm and blood pressure monitoring.

RELATIVE CONTRAINDICATIONS

There are few absolute contraindications for conscious sedation using dentist

operator-sedationist. These would include marked neuromuscular respiratory weakness including unstable myasthenia gravis; severe respiratory depression and acute pulmonary insufficiency. Relative contraindications are common and can only be considered following a thorough assessment of the patient.

When considering IV sedation, special care is required in the assessment and treatment modality selection for patients with a history of substance abuse, children, elderly, and ASA Grade III and above. Due to the severity of potential complications in providing IV sedation to these patients, the authors would advise referral to a specialist centre in the aforementioned cases, as they should be carefully assessed and managed by a dentist who is able to demonstrate expertise in the basic conscious sedation techniques. This may be in liaison with the patient's physician with any appropriate precautions put in place. Providing conscious sedation for these patients not to necessitate provision of sedation by a consultant anaesthetist where appropriate in a secondary care hospital setting.

DISCUSSION

It is known that patients often underestimate their alcohol intake both consciously and unconsciously; it cannot be assumed that they are answering truthfully when asked how many units of alcohol they consume on the average week. It is often more accurate to ask patients which kind of alcohol they drink and how much of each type, so the units can be estimated by a healthcare professional. There are recommended guidelines for the amount that can be most safely consume on a weekly basis for men and women.²⁶ Consumption of alcohol within these limits cannot be exclusively condoned as safe however keeping within these guidelines would equate to a low risk of harm. Anything over and above the recommended intake should be viewed with suspicion. In addition, behaviours such as frequently 'binge drinking', a previous diagnosis of pancreatitis and previous entry into an alcohol detoxification programme may indicate alcoholism/excessive alcohol intake and a need for further investigation.

In a similar manner, there will be a spectrum of drug misuse that will have little or no implications to the administration of sedation, through to the individual who poses a serious risk to themselves with potentially non-diagnosed disease secondary to drug misuse and concomitant poly drug effects. Determining where this threshold lies and how to accurately assess where the patient belongs on this spectrum is challenging.

If our experience with alcohol misuse in the population is to be extrapolated, it would

suggest that it is the constant drug misusers who pose the severest of risk. Therefore, it would be important to ascertain how long a patient has used a particular drug/drugs, and how frequently it is used. If there are clear indicators that the patient is at high risk, or if there is any doubt as to the disclosure of information, the authors would suggest a referral to secondary care.

Despite best efforts patients may not disclose regular or recreational drug use. The use of midazolam in conscious sedation has a wide margin of safety when administered appropriately.²⁷ Therefore, the authors would suggest maintaining best practice in administering sedation using titration techniques. If the patient does not respond in the expected manner, it can suggest excessive drug misuse. It may be prudent, although not exclusively necessary, to question the appropriateness of sedation for that particular patient; abandonment of the procedure although rare may be sensible.

CONCLUSION

Metabolic consequences of drug misuse are uncommon but increasing as substance misuse becomes more widespread. The range of associated medical problems is very wide although they most commonly occur with abuse of heroin, cocaine and ecstasy.

The treating dentist must remember that drug addictions affect all gender, socio-economic, and age groups. The dentist must discuss with the patient his or her history of drug abuse, in a non-condemnatory fashion, during the review of the patient's medical history before treatment.

Patients with a history of substance misuse frequently present requesting sedation and this can pose a challenge to the dental sedationist. These patients may have an acquired bleeding tendency, a cross-tolerance to sedative agents and opioid analgesics and may face potentially severe complications if certain precautions are not taken with the delivery of IV sedation. It may be appropriate in some cases for sedation to be delivered by an anaesthetist. For these reasons we would recommend a referral to secondary care for any patients reporting substance misuse.

This article highlights the importance of accurate information gathering to ensure an appropriate referral to secondary care can be made for the safe delivery of dental treatment in this challenging group of patients.

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Corrigendum

Practice article (*BDJ* 2014; **217**: 679–684)

Guidelines for management of sodium hypochlorite extrusion injuries

In the above practice article the author list should have read as follows:

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